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WOODROW WILSON BRIDGE PROJECT

Draft
Supplemental Environmental Impact Statement

U.S. Department of Transportation - Federal Highway Administration
Virginia Department of Transportation
Maryland State Highway Administration
District of Columbia Department of Public Works

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

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Report Number FHWA-MD-VA-DC-EIS-91-01-DS-3

WOODROW WILSON BRIDGE PROJECT

I-95/I-495 from west of Telegraph Road to east of MD 210

◇ City of Alexandria and Fairfax County, Virginia ◇ Prince George's County, Maryland ◇ District of Columbia

Draft Supplemental Environmental Impact Statement

Submitted Pursuant to 42 U.S.C. 4332 (2), 49 U.S.C. 303 and CEQ Regulations (40 CFR 1500 (et.seq.)

by the
U.S. Department of Transportation – Federal Highway Administration and
Virginia Department of Transportation
Maryland Department of Transportation, State Highway Administration
District of Columbia Department of Public Works

Cooperating Agencies:

U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Environmental Protection Agency
National Park Service
U.S. Fish and Wildlife Service

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District of Columbia

The proposed project is to enhance mobility while addressing community and environmental concerns along I-95/I-495 (Capital Beltway) from west of Telegraph Road to east of MD 210 in the vicinity of the Woodrow Wilson Memorial Bridge. Alternative 4A (Side-by-Side Drawbridges) was identified as the selected alternative for design and construction in the November 1997 Record of Decision following circulation of the August 1991 Draft Environmental Impact Statement/Section 4(f) Evaluation, the January 1996 Supplemental Draft Environmental Impact Statement/Section 4(f) Evaluation, the July 1996 Supplemental Draft Environmental Impact Statement/Section 4(f) Evaluation, and the September 1997 Final Environmental Impact Statement/Section 4(f) Evaluation, as well as a series of public hearings and full consideration of comments received. This Draft Supplemental Environmental Impact Statement addresses design changes to the selected alternative, expanded project area resulting from design changes and refinements, changes in resources identified since publication of the September 1997 Final EIS/Section 4(f) Evaluation, and information necessary for approval of the Section 404/10 permit.

Written comments on this Draft Supplemental Environmental Impact Statement are due by February 25, 2000 and should be sent to: Mr. John Gerner, WWB FHWA Project Manager, Woodrow Wilson Bridge Center, 1800 Duke Street, Suite 200,Alexandria, VA 22314.

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Summary

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S. Summary

S.1 Administrative Action

( ) Environmental Assessment
(X) Draft Supplemental Environmental Impact Statement
( ) Final Supplemental Environmental Impact Statement
( ) Finding of No Significant Impact

S.2 Informational Contacts

The following persons may be contacted for additional information concerning this document:

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S.3 Introduction

In accordance with 23 CFR Section 771.103, the FHWA, in partnership with VDOT, MSHA, and the DC-DPW, and in concert with cooperating agencies (EPA, USACOE, NPS, USFWS, and USCG), have prepared a Draft Supplemental Environmental Impact Statement (DSEIS) for the Woodrow Wilson Bridge Project (see Figure S-1). This DSEIS has been prepared, in part, to address changes since the Final EIS/Record of Decision (both prepared in 1997) that have resulted from design activities associated with the new bridge and the adjacent four interchanges that constitute the project. These changes are due to design refinements generated through public involvement, more detailed engineering base map data, new or different environmental data, potential construction related aquatic resource affects, detailed dredged and dredged material disposal studies, and other project specific modifications associated with preliminary (30% complete) design plan development. In addition, the limits of the project have been enlarged to accommodate lane tapers, resulting in the inclusion of more resources in the project limits (see Figure S-2). This SDEIS focuses on these changes and discusses the differences between Alternative 4A of the 1997 FEIS and Current Design Alternative 4A.

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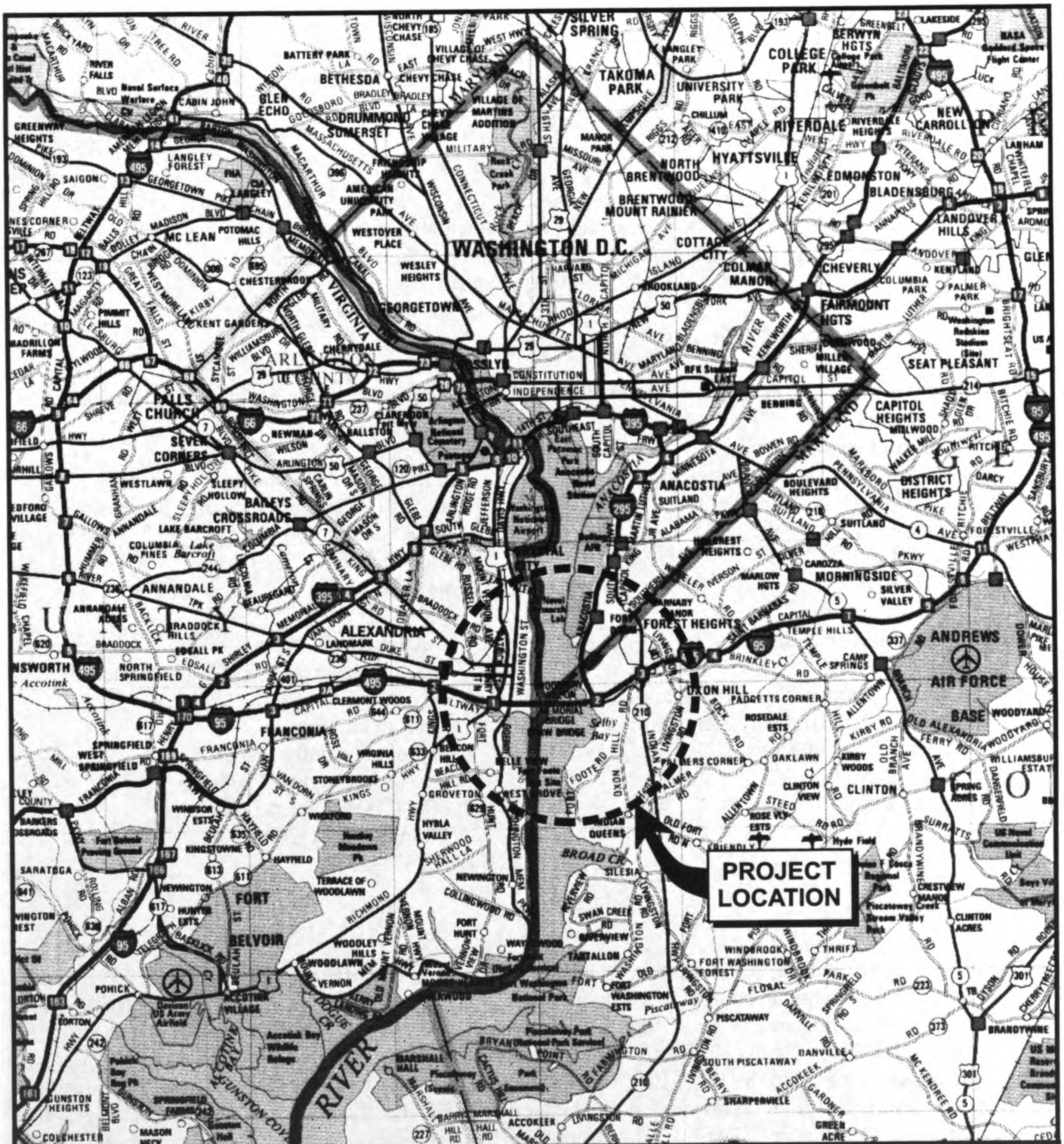

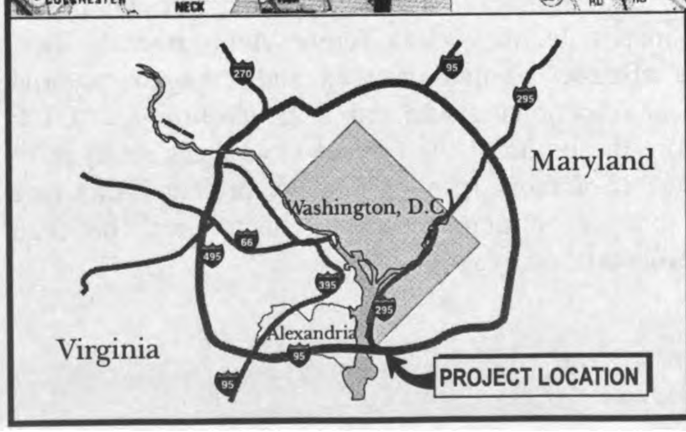

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Project Location Map

Date		Figure
December, 1999	Not to Scale	S-1

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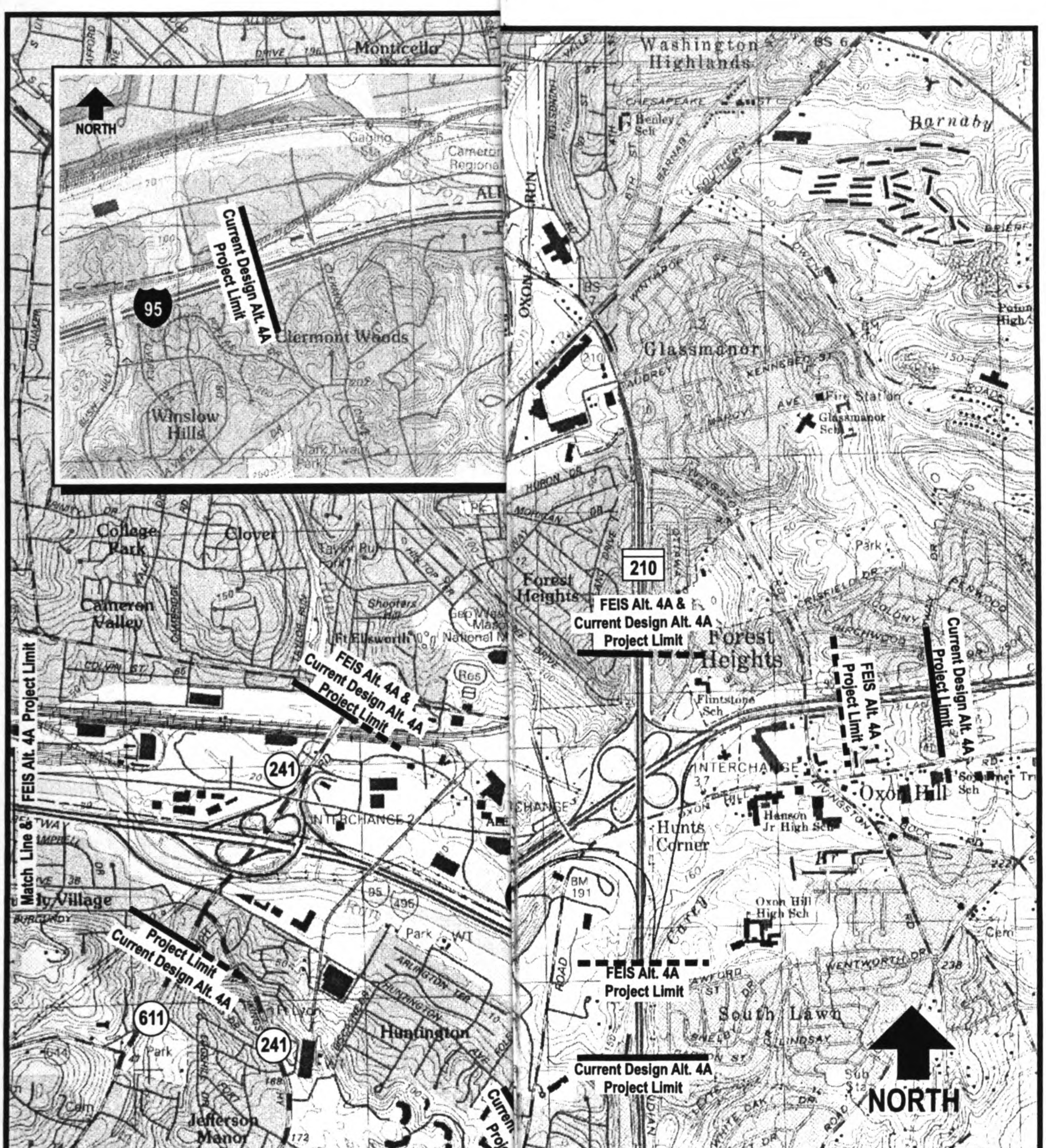

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Project Limits Current Design Alternative 4A and FEIS Alternative 4A

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	S-2

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S.4 Project Overview

A Final Environmental Impact Statement (FEIS)/Section 4(f) Evaluation, prepared in accordance with the National Environmental Policy Act (NEPA) was completed for the Woodrow Wilson Bridge Project in September 1997; the Record of Decision (ROD) was signed in November 1997. The signed ROD identified the selected alternative as Alternative 4A (Current Alignment Side-by-Side Drawbridges) which begins west of Telegraph Road in Virginia and continues along the current Capital Beltway (I-95/495) alignment to east of MD 210 in Maryland. Selected Alternative 4A, referred herein as FEIS Alternative 4A, is fully defined and described in Section 1, Selected Alternative of the ROD, which is included in Appendix D of this document.

Design activities associated with FEIS Alternative 4A were initiated in March 1998 for the Virginia interchanges, in August 1998 for the Maryland interchanges, and in March 1999 for the new Woodrow Wilson Bridge. Although design activities were initiated in March 1999 for the new bridge, the sponsoring agencies conducted a bridge design competition beginning in January 1998 (Section 1.3) that resulted in the selection of a bridge design concept that provided a higher level of engineering detail and analysis.

Design studies of the mainline and the individual interchanges were initiated and the sponsoring agencies solicited comments from a variety of stakeholders through the Stakeholder Participation Panel (SPP) process and technical comments from local, state and federal agencies through the Technical Coordination Team (TCT). As a result of these studies, a number of ramp modifications were developed to improve traffic flow in the Telegraph Road, US Route 1, and MD 210 interchanges. In addition, mainline acceleration and deceleration lane revisions resulted in project limit extensions described in Section S.8. Selection of the bridge design concept and successful completion of settlement discussions with the City of Alexandria contributed to modifications in the proposed I-95/495 mainline typical section as described in Section 2.3.1 and shown in Figure 2-3.

The above mentioned mainline and interchange configuration design modification recommendations were also reviewed and discussed with federal and state regulatory agencies. During these discussions, the regulatory agencies provided new environmental data and information relating to threatened and endangered species, submerged aquatic vegetation and cultural resources. The modifications to FEIS Alternative 4A are reflected in Table S-1.

Because of project limit extensions, interchange configuration modifications, more accurate baseline data, and new environmental data and information, a Draft SEIS has been prepared. Specifically, this DSEIS describes the Current Design Alternative 4A as compared to the 1997 FEIS Alternative 4A, presents the differences in impacts (where applicable), and addresses the new and/or additional environmental issues that were identified through on-going coordination with the cooperating agencies. These specific issues and items are as follows:

- Responded to public comments received during the USACOE public notification process on the previous Section 404/10 Joint Federal/State Permit Application
- Potential impacts to identified threatened and endangered species, specifically the bald eagle and shortnose sturgeon (see section 4.7.6)
- Potential additional impacts to aquatic resources (see section 4.7.4)
- Potential resource impacts because of construction related activities (see Appendix F)

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- Detailed data relating to additional quantity and disposal of required dredged material (Section 4.13 and Appendix C)
- Definition and refinement of the projects Phase I conceptual wetland mitigation plan (see Appendix B)
- Coordination on the Section 106 process and procedures/implementation of the Memorandum of Agreement (see Appendix C)
- Secondary and cumulative impacts analysis (see section 4.12)

S.5 Project Need

The need for the Woodrow Wilson Bridge project has not substantially changed since the 1997 FEIS which described numerous deficiencies that exist in the Woodrow Wilson Bridge corridor and concluded that a "major project to address the present and growing problems of congestion, structural conditions, and safety" was necessary to address these concerns. Four specific goals were described: (1) to provide adequate capacity for the existing and future travel demand by improving operating conditions and fixing the "bottleneck" caused by eight Capital Beltway through lanes converging into six lanes across the river, (2) to facilitate intermodal travel, such as transit, High Occupancy Vehicle (HOV) lanes, and bicycling, and to maintain maritime access up the Potomac River, (3) to improve safety in terms of reducing the number of accidents and improving access for emergency response vehicles, and (4) to protect the character and nature of the surrounding environment. These problems clearly indicate the need for timely action for replacing the existing Woodrow Wilson Bridge and reconstructing associated interchanges.

S.6 Activities From the 1997 FEIS Leading to the ROD

The FEIS/Section 4(f) Evaluation, signed in September 1997, identified the Preferred Alternative as Alternative 4A (Side-by-Side Drawbridges). The history of the Woodrow Wilson Bridge Project from its inception through the alternative selection phase and publication of the Final Environmental Impact Statement (FEIS) is documented in Section 1.2 of the 1997 FEIS. Section 1.2 of the 1997 FEIS includes a description of the Capital Beltway and the Woodrow Wilson Bridge, the 1989 Bridge Concept Competition, the 1991 Draft Environmental Impact Statement/Section 4(f) Evaluation, the Coordination Committee and the two Supplemental Draft Environmental Impact Statements Section 4(f) Evaluations, January 1996 and July 1996.

A Memorandum of Agreement (MOA), dated August 19, 1997, under the provisions of the National Historic Preservation Act and its implementing regulations, established a mechanism for oversight and enforcement of the commitments made to maintain the cultural heritage and integrity of the project features and is a part of the Record of Decision. A Design Review Working Group (DRWG) has been established and has actively begun its cultural resource related design review responsibilities as stipulated in the MOA.

The ROD, signed in November 1997, finalized the decision-making and National Environmental Policy Act (NEPA) requirements associated with the project. The ROD identified the Selected Alternative, Alternative 4A, within an approximate eight-kilometer (five-mile) corridor. The ROD identified key features that would continue to be included in the design of the project and included the following attachments:

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- Memorandum of Agreement for Section 106
- List of Commitments/Considerations to be completed during the design phase and incorporated in the project's standard construction specifications used by each State
- Summary of Comment and FHWA comment responses related to mitigation measures and content of the Final EIS.

S.7 Project Litigation

On January 30, 1998, the City of Alexandria filed a complaint in U.S. District Court alleging that the Federal Highway Administration (FHWA) did not comply with various environmental and cultural resource protection laws and regulations when it chose the Selected Alternative for the Woodrow Wilson Bridge Project. On May 21, 1998, a petition to intervene in the City's court action was filed by a group of Northern Virginia civic and environmental associations including the Coalition for a Sensible Bridge, the Historic Alexandria Foundation, and the Alexandria Historic Restoration and Preservation Commission, and collectively referred to as the Intervenors. Their complaint restated many of the allegations contained within the original Alexandria complaint and added emphasis to issues related to the project's effect (Section 106) or use (Section 4(f)) on historic resources and on the process of identifying historic properties.

A settlement was reached with the City of Alexandria and USDOT on March 1, 1999. However, similar common ground could not be found with the Intervenors, and oral arguments were heard on the case before Judge Stanley Sporkin in the U.S. District Court for the District of Columbia on March 11, 1999. The U.S. District Court issued a ruling on April 15, 1999 favoring the plaintiff Intervenors on all counts. The decision was reported at City of Alexandria v. Slater, 46 F. Supp. 2d 35 (P.D.C. 1999). Although the FHWA believed that the FEIS sufficiently addressed all feasible and prudent alternatives, a two-pronged approach to addressing the court's opinion was enacted:

1. The FHWA initiated studies and investigations to identify a range of potential ten lane mainline alternatives and corresponding interchange configurations to facilitate the mainline options.
2. Concurrent with continuing studies on the ten lane mainline and interchange options, the FHWA filed an appeal of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA) and Section 4(f) of the Department of Transportation Act portions of the District Court's ruling on June 16, 1999 and oral arguments were heard on October 26, 1999. The Clean Air Act count was not appealed and was resolved administratively.

The United States Court of Appeals for the District of Columbia Circuit Court reversed the District Court's ruling in an opinion (No. 99-5220) for the Court filed by Circuit Judge Silberman on December 17, 1999. The opinion concluded, *We hold that the Administration has satisfied the requirements of NEPA, the National Historic Preservation Act, and the Department of Transportation Act, and reverse (the District Court ruling).* Court documents can be viewed at the Woodrow Wilson Bridge project offices in Alexandria, Virginia and Oxon Hill, Maryland.

Based on the recent District Court of Appeals ruling, the project's sponsoring agencies plan to continue to develop Current Design Alternative 4A and move towards a goal of beginning construction in the Potomac River in late 2000. This schedule requires completion of a supplemental environmental document, appropriate public involvement, issuance of a supplemental Record of Decision, followed by application and procurement of requisite permits and approvals from the appropriate regulatory agencies, and other pertinent activities. Accordingly, this DSEIS is

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aimed at soliciting public comment on the information presented herein regarding changes to the project and new information since 1997 and facilitating the preparation of a Final SEIS to fulfill the project's environmental documentation requirements.

S.8 Current Design Alternative 4A

The basic lane configuration for Current Design Alternative 4A remains the same as FEIS Alternative 4A. This configuration consists of eight general use lanes to match the existing Capital Beltway, two HOV/express bus/transit lanes to match those under consideration on connecting systems, and two merging/diverging lanes (one in each direction between the interchanges) to ease traffic entering and exiting the Capital Beltway, particularly on the Potomac River crossing between the US 1 and I-295 interchanges. This has been referred to as the "8+2+2" section. The lanes would be configured in a divided express/local roadway system allowing for the physical separation of local and through traffic. The detailed description of the FEIS Alternative 4A is presented in Section 2.2 of the 1997 FEIS.

The existing Woodrow Wilson Bridge will be replaced with two new parallel drawbridges, one for eastbound traffic (the "Outer Loop") and the other for westbound traffic (the "Inner Loop"), constructed approximately 9.1 meters (30 feet) south of the existing bridge. As the result of the settlement on the City of Alexandria's lawsuit, the overall width of the new Woodrow Wilson Bridge was narrowed 8 feet through a reduction in shoulder widths as shown in Figure 2-3 of this document. The existing Woodrow Wilson Bridge will be used to maintain traffic during the construction of the new facility, after which it will be removed. Development of a demolition plan that includes an evaluation of impacts to the environment, in accordance with FHWA's regulations, will be completed as part of the project's final design process.

The design process began with mainline and interchange refinement studies to further define FEIS Alternative 4A. In accordance with the ROD, these refinements included involvement by four SPP's representing diverse public interests associated with the project. In addition, coordination continued with local jurisdictions, specifically the City of Alexandria, Fairfax County, Prince George's County, and Maryland–National Capital Park and Planning Commission (M-NCPPC). Potential design refinements as well as avoidance and minimization studies and analysis were also recommended by a host of other resource, environmental, and permitting agencies.

Mainline engineering studies resulted in modifications to FEIS Alternative 4A to extend project limits to improve the function, safety, and integrity of the mainline highway. A discussion of the changes to the logical, reasonable, and prudent project limits follows while a discussion of interchange modifications is included in Chapter 2. A review of Table S-1, indicates that the modifications described within this document do not affect traffic queuing, capacity, and projected bridge openings. Therefore, Current Design Alternative 4A still maintains the function and integrity of FEIS Alternative 4A.

The Current Design Alternative 4A at the Telegraph Road interchange requires project extensions to the west, along the westbound lanes of the Capital Beltway, and to the south, along Telegraph Road. The US 1 interchange does not require extensions along the US 1 roadway, although a direct connection loop ramp from northbound US 1 to the westbound Capital Beltway has replaced left turn access to the previously designed straight ramp. This revised configuration carries the ramp further to the east than previously anticipated.

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The northern limit of work on I-295 would be extended further north to include widening of I-295 and would meet the District of Columbia Department of Public Work's ramp reconstruction at the I-295/Laboratory Road interchange. South of the Capital Beltway, modifications to the I-295 interchange, especially those on public land owned by the M-NCPPC, are also included. The MD 210 interchange will require extension to the east along the westbound and eastbound Capital Beltway, in order to accommodate design requirements, such as lane tapers and mainline roadway transitions back to meet the existing Capital Beltway.

A detailed description of the Current Design Alternative 4A is presented in Section 2.3 of this document. A detailed description of specific changes from the FEIS Alternative 4A to the Current Design Alternative 4A are also presented in Section 2.3 to provide a clear understanding of the design changes.

S.9 Current Design Alternative 4A Impacts

Because of design refinements to FEIS Alternative 4A that are now reflected in Current Design Alternative 4A, a comparison of impacts is appropriate. However, a direct comparison of impacts associated with Current Design Alternative 4A to FEIS Alternative 4A is not possible. For the previous FEIS analysis, only planning level engineering detail, less detailed topographic base mapping and inventory level environmental features mapping were used. Additionally, the FEIS analysis was predicated on environmental data and information relevant to 1997 or before. This additional level of detail is normal as a project proceeds into the design phase. Had the current level of detail been available for the project prior to the FEIS and ROD, the impacts now would likely and similarly have been reported in the 1997 FEIS.

Since publication of the FEIS and signature of the ROD, the sponsoring agencies have completed detailed topographic surveys and established accurate and reproducible project controls. These data establish state of the art detailed engineering base mapping onto which jurisdictional determinations of Waters of the United States (specifically water, tidal and non-tidal wetlands, mudflats, submerged aquatic vegetation (SAV), and other special aquatic resources) can be located and potential impacts quantified. The sponsoring agencies have also initiated field surveys and completed new jurisdictional determinations of SAV limits within the Potomac River, Smoots Cove, Fox Ferry Cove, and Hunting Creek. This current SAV mapping reveals an increase in SAV in close proximity to the bridge and a change in SAV species mix from that reported in the FEIS. These increased impacts are only reflected in Current Design Alternative 4A impact assessments. Therefore, direct comparison of human and natural resources between the two alternatives would result in misleading conclusions because the basis of analysis is not consistent for both alternatives.

A discussion of environmental consequences associated with Current Design Alternative 4A is included in Chapter 4 of this document and a summary comparison of impacts between the two alternatives is included in Table S-1 below. FHWA and the Sponsoring Agencies will continue to work to avoid and/or minimize impacts wherever possible in the project's final design process. As shown in Table S-1, estimated impacts have increased in a number of categories. The reasons for these increases are described in detail in Chapter 4.

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Table S-1 Comparison of Human and Natural Resource Impacts

Description	FEIS Alternative 4A	Current Design Alternative 4A	Change
Transportation Design			
Length of Alternative (kilometers (miles))	9.0 (5.6)	12.0 (7.5)	+3.0 (1.9)
Length of Crossing (meters (feet))	1,920 (6,300)	1,852 (6075)	-68 (225)
Average Weekday Length of Queue (kilometers (miles))	(2 – 2.5)	(2 – 2.5)	None
Total Person Capacity	17,150	17,150	None
Projected Number of Bridge Openings (annual)	65	65	None
Land Use and Socioeconomic Resources			
Right-of-Way Required (hectares (acres))	21.9 (54.0)	21.4 (52.9)	-0.5 (1.1)
Residential Displacements	338	336	-2
Business Displacements	12	23	+11
Noise Impacts (dwelling units)	563	636	+73
Violations of Carbon Monoxide S/NAAQS Standards (1 hour/8 hour.)	0/0	0/0	None
Number of Public Parks Impacted	4	4	None
Potential Hazardous Material Sites	1	6	+5
Natural Resources			
Waters of the US (hectares (acres))			
Tidal Wetlands	3.20 (7.99)	5.60 (14.00)	+2.40 (6.01)
Non-Tidal Wetlands	0.83 (2.09)	1.80 (4.50)	+0.97 (2.41)
Tidal Mudflats	0.34 (0.84)	0.40 (1.10)	+0.06 (0.26)
Tidal Riverine/Open Water	0.91 (2.27)	3.40 (8.50)	+2.49 (6.23)
Tidal Vegetated Shallows (Submerged Aquatic Vegetation)	4.42 (11.04)	12.70 (31.70)	+8.38 (20.66)
Non-Tidal Riverine/Open Water	0.08 (0.20)	1.40 (2.60)	+1.32 (2.40)
TOTAL	9.78 (24.43)	25.30 (62.40)	+15.52 (37.97)
100 Year Floodplains (hectares (acres))	10.4 (25.7)	33.2 (82.0)	+22.8 (56.3)
Dredged Material (cubic meters (cubic yards))	30,600 (40,000)	376,380 (492,000)	+ 345,780 (452,000)
Woodlands (hectares (acres))	13.0 (32.5)	40.0 (98.7)	+27.0 (66.2)
Threatened and Endangered Species Potentially Affected	0	2	+2
Cultural Resources			
Adverse Effect to Historic Sites	3	3	None
Adverse Effect to Archeological Sites	4	3	-1

With regard to wetland impacts, Section 4.7.4 describes efforts to develop a suitable mitigation plan. FHWA, through the project partner agencies – VDOT and MD SHA – are moving forward with right-of-way acquisition and design of the sites identified in the mitigation plan.

Constructability reviews during the bridge design concept competition revealed that the construction concepts assumed in the 1997 FEIS would not work with the type and size of structure now being considered. It appears that a substantial increase in SAV acreage impacts and amount of river sediment removed will now be needed to permit construction of the bridge with the heavy equipment necessary to handle large steel girders and foundation elements. Constructability studies

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undertaken to identify possible alternate construction methods indicated that impacts to SAV and the quantity of dredge material could be reduced, but that the construction time, hazards to workers and costs would all increase commensurately.

With regard to the quantity of SAV and dredged material, the original ROD estimated these to be 4.42 hectares (11.04 acres) and 30,584 cubic meters (40,000 cubic yards). The FEIS assumed construction access channels on both sides of the new bridge whereas it has now been determined that construction of the new bridge would also require dredging under the new structure, on the north side of the existing bridge and for access to potential staging areas. For SAV impacts, currently estimated to be 12.70 hectares (31.70 acres) it is unlikely that they can be minimized during the construction process. However, an impact mitigation plan that includes 8.1 hectares (20 acres) of SAV creation and 30.5 kilometers (19 miles) of stream restoration and 12.1 hectares (30 acres) of tidal wetland creation has been developed and is described in more detail in Appendix B. While it is preferred to avoid these impacts altogether, the mitigation plan has been designed to replace the functions provided by the SAV. With regard to the dredging of river sediments and disposal of the material, Section 4.13 outlines the studies conducted and the steps we propose to take to minimize the impact of this work on the natural environment. These include:

1) Dredging during dormant periods for SAV, FISH (October 15 to February 15 inclusive).
2) Use of mechanical dredging equipment

With regard to disposal of dredged river sediments, we have evaluated 20 potential disposal options/sites. Section 4.13 discusses the sites considered. Currently, we have identified four primary disposal sites. The ACOE and Maryland Department of Transportation have indicated that the Poplar Island dredge disposal site may be used if the other three primary sites do not work out. These sites and outstanding issues related their use are discussed in Section 4.13.5.

This material included in this draft SEIS to invite public review and comment on disposal options. Additional testing to determine/confirm suitability of material for disposal at each of these potential sites will continue. Results of testing and identification of a preferred disposal option(s) will be reviewed by EPA and included in the final SEIS.

As discussed previously, a contributing factor in differences between the two alternatives is the location of logical project limit termini. Current Design Alternative 4A includes project limit termini based on detailed engineering design to the preliminary plan level (30% complete) while project limits associated with FEIS Alternative 4A were defined without the benefit of detailed engineering studies. Therefore, project limit extensions and their potential impact on jurisdictional determined Waters of the United States identified since the FEIS are reflected in Current Design Alternative 4A and not within FEIS Alternative 4A. Impacts to Waters of the US associated with Current Design Alternative 4A and the extent of avoidance and minimization studies completed to reduce these impacts to the greatest extent possible are included in Section 4.7 of this document.

A qualitative assessment of FEIS Alternative 4A, in terms of project limit extensions and application of detailed engineering base mapping, suggests that natural resource impacts for FEIS Alternative 4A would be commensurate (higher), with natural resource impacts associated with Current Design Alternative 4A. Modifications to the individual interchanges that have been recommended by local jurisdictions, local communities, and the general public have contributed to increases in impacts associated with Current Design Alternative 4A. These modifications, although

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providing requisite improvements to safety and operations on both the mainline and the local street network, have tended to expand interchange footprints and result in increased impacts to the human and natural environment. Although these modifications are generally associated with roadways, they also include incorporation of pedestrian/bicycle paths with emergency response vehicle access, improvements to local and regional parklands and recreational facilities, and linkages between parkland elements. The aggregate of these modifications and resulting resource impacts were not included in FEIS Alternative 4A. Public supported interchange modifications have also resulted in increased business displacements, while design refinements have decreased the anticipated right of way requirements in other parts of the project. The additional business displacements are focused south of both the Telegraph Road and US 1 interchanges, as shown in Appendix A. These displacements, resulting from reconfiguration of local street networks to improve safety and facilitate operational improvements, are primarily due to direct and indirect business frontage modifications and only in one case direct effects on the structure.

As previously noted, the nature and character of the selected bridge design concept in the context of the detailed engineering base mapping and jurisdictional limits of SAV within the river also contributes to the increase in impact associated with Current Design Alternative 4A. A review of all bridge entrants, not just the winning design, revealed that aquatic resource impacts and quantities of dredge material necessary for construction are similar to those anticipated for Current Design Alternative 4A.

To facilitate an evaluation of the Current Design Alternate 4A, the USACOE has requested that Section 404(b)(1) of the Clean Water Act be revisited as part of this project. This Section of the Clean Water Act requires a comparison of aquatic resource impacts between Current Design Alternative 4A (selected alternative) and other alternatives contained in the FEIS, and is included Appendix C.

Extension of the project limits also results in an increase in noise impacts to affected dwelling units associated with Current Design Alternative 4A from that reported for FEIS Alternative 4A. The affected properties are located along the mainline within areas of extended project limits. An assessment of noise sensitive sites and a prediction of noise levels at these sites indicate that further study and analysis is warranted as the design progresses. If the final acoustical analysis reveals that mitigation is appropriate, the sponsoring agencies will work with the property owners to define mitigation measures that comply with the individual state's noise program criteria. The existing project corridor contains existing measures to mitigate noise impacts to the local community; however, at two locations (I-95/I-495 east of MD 210 and I-95/I-495 west of Telegraph Road), existing noise walls may be impacted by the proposed construction. If these existing noise walls are impacted, the walls would be reconstructed at similar locations and of sufficient size to ensure that additional dwellings are not affected by the project.

S.10 Public Involvement/Agency Coordination

Following publication of the 1997 FEIS, the Woodrow Wilson Bridge project continued an extensive agency coordination and public involvement program focused on resolving design details for the Current Design Alternative 4A. Included in this effort has been the continuation of a number of working groups to address specific resources and technical aspects of the project, as described in Section 1.3 and other coordination activities described in Section 5.2.3. Among these groups and activities are the following:

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- The Interagency Coordination Group (ICG), representing twenty-five regulatory and resources agencies.
- The Design Review Working Group (DRWG) formed as a result of the Memorandum of Agreement to discuss Section 106 coordination.
- The Virginia Technical Coordination Team (TCT), comprised of FHWA, VDOT, Fairfax County and City of Alexandria engineering staff to provide design direction in Virginia.
- Coordination meetings with the Washington Metropolitan Area Transit Authority (WMATA), to assure engineering and policy compatibility concerning future transit.
- Additional coordination meetings concerning Potomac River navigation routes and dredged material placement location.

Since the publication of the 1997 FEIS, several means of public involvement and outreach have been utilized for the project. These include:

- Citizen Advisory committee for the 1998 Bridge Design Competition.
- Open Houses conducted in June and November 1998 and June and December 1999.
- "*Fast Facts*" summarizing key issues of the project, resource papers and four issues of the *Connections* newsletters, media placements.
- Stakeholder Participation Panels conducted in Virginia from December 1998 through June 1999 and in Maryland beginning in March 1999 and continuing to date.
- A project website (*www.wilsonbridge.com*) that debuted, as part of the design process, in November 1998 and is regularly updated.
- Work sessions and presentations to requested groups through the Project's Speaker's Bureau.
- Briefings to local officials.

Public involvement will continue through design and construction. Public hearings are scheduled in February 2000 in both Maryland and Virginia. District of Columbia residents will be invited to participate in the Maryland hearing. Public hearings are an opportunity for review and comment on this DSEIS and the project in general. Following the public hearings and the receipt of public comment on this DSEIS, Sponsoring Agencies (FHWA, VDOT, MSHA and DC-CDPW) will assess the comments and complete a Final SEIS. Definition of enhancement, mitigation and design refinements will continue through the intermediate and final design process. Public involvement during this period will include work sessions with Stakeholder Participation Panels, Open Houses, special presentations, and publication of additional fact sheets, project newsletters and an updated website.

Agency coordination in the preparation of this DSEIS was conducted throughout the study. A compilation of correspondence with agencies, public groups, and elected officials is included in this document in Chapter 5.

S.11 Project Funding

On June 9, 1998, Congress amended the Woodrow Wilson Memorial Bridge Authority Act of 1995 (Pub. L. No. 104-59, 109 Stat. 568). Under this amendment, the definition of the Project was revised to refer to "the upgrading of the Interstate 95 Potomac River crossing, consistent with the selected alternative as described in the ROD executed by the Secretary in compliance with the

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NEPA of 1969." Sec. 1116(a)(2), Transportation Equity Act for the 21st Century, (TEA-21), Pub. L. No. 105-178, 112 Stat. 107 (1998). An additional $900 million in federal funds was authorized. The amendments went onto require that a financial plan identifying the non-federal portion of the cost be developed prior to the start of construction. Sec. 1116(c).

On July 20, 1999, legislation was introduced in both the United States Senate and House of Representatives (S. 1405 and H.R. 2563) that proposed further amending the Woodrow Wilson Memorial Bridge Authority Act of 1995. This legislation intended to provide an additional $600 million in special federal funding and to cap the total amount to be made available for the project from the Highway Trust Fund at $1.5 billion. This legislation would also require a $400 M funding commitment from the "Capital Region Jurisdictions".

The 1997 FEIS, specifically Table 4-46, included estimated costs for the Preferred Alternative 4A (FEIS Alternative 4A), the No-Build Alternative, and the individual Build Alternatives. Each identified cost was based on 1995 estimates, which were escalated by an assumed three percent average annual growth factor to reflect 1997 estimates except for costs associated with FEIS Alternative 4A ($1.587 million). FEIS Alternative 4A costs were updated since publication of the SDEIS to reflect modifications in the design and more detailed mitigation plans. Since publication of the FEIS, project costs associated with FEIS Alternative 4A have been further refined to include escalation which results in a $1,890 million project cost estimate (based on "year of expenditure dollars").

At time of the printing of the DSEIS, project cost estimates associated with Current Design Alternative 4A are being developed. It is anticipated that the project cost estimate for Current Design Alternative 4A will be available in late winter and will be incorporated into the Final SEIS for public review.

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Chapter 1

Purpose and Need

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1. Purpose and Need

1.1 Purpose of Draft Supplemental Environmental Impact Statement

The Woodrow Wilson Bridge project, in accordance with the National Environmental Policy Act (NEPA) and 23 CFR 771, completed a Final Environmental Impact Statement / 4(f) Evaluation (FEIS) in September 1997, and signed a Record of Decision (ROD) in November 1997. Since signature of the ROD, the Federal Highway Administration (FHWA), Virginia Department of Transportation (VDOT), Maryland State Highway Administration (MSHA), and the District of Columbia – Department of Public Works (DC-DPW) herein referred to as the "Sponsoring Agencies" initiated management, oversight, and design activities for the Woodrow Wilson Bridge project. This initiation included performing feasibility studies, design analysis, and preliminary engineering for the FEIS Alternative 4A. During the preliminary engineering phase of the project, the project sponsors re-initiated coordination efforts with both federal and state level regulatory review agencies and public involvement activities.

This step from project planning level information completed for the FEIS to detailed engineering design resulted in better and more accurate information, refinement of logical project limits and facilitated determination of potential project impacts on the natural and physical or social environment. Through the project's public involvement process, specifically the stakeholder participation panel process, refinements to the individual interchange configurations, modifications of connections to the local communities, improved operations on access ramps and local streets, and inclusions of pedestrian/bike path connections, were recommended. During the Bridge Design Competition, four advisory committees, including a citizen's group, helped to further refine the Potomac River bridge component of the project. Coordination activities with the regulatory agencies revealed new environmental information and data that was not previously addressed in the project's 1997 FEIS. Additionally, the regulatory agencies requested additional information related to the following issues:

- response to pending public comments received during the project's public hearing,
- new rare, threatened, and endangered species data (bald eagle and shortnose sturgeon),
- potential additional impacts to aquatic resources,
- potential resource impacts because of construction related activities,
- detailed data relating to additional quantity of dredged material and dredged material placement,
- definition and refinement of the project's Phase I conceptual wetland mitigation plan,
- coordination on the Section 106 process and procedures (implementation of the project's Memorandum of Agreement (MOA)), and
- secondary and cumulative effects analysis.

In accordance with FHWA regulations and procedures, the sponsoring agencies initiated a re-evaluation of the FEIS which included, but was not limited to, new environmental information, public comments, involvement, and recommendations, regulatory agency requests, and detailed engineering data and analysis. Through this re-evaluation process and based on preliminary indications of changes to the FEIS Alternative 4A, the sponsoring agencies, in consultation with the project's cooperating agencies, agreed that the proper environmental documentation for the project would be a Supplemental Environmental Impact Statement (SEIS). As described in 23 CFR Section 771.130 (f), this Draft SEIS has been completed to address issues of limited scope, which follows

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the same *"process and format (i.e., draft EIS, final EIS, and ROD) as the original EIS except that scoping is not required"*.

The sponsoring agencies, in consultation with the cooperating agencies, have prepared this Draft SEIS document to describe environmental effects and quantify environmental consequences associated with the proposed action. Since the project has not substantially changed the impact to parklands and other recreation resources, a new Section 4(f) Evaluation, in accordance with Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 1653), is not required.

The proposed action is referenced within this document as Current Design Alternative 4A and represents modifications to the FEIS Alternative 4A. The Draft SEIS document is available for public comments and based on comments received, FHWA anticipates issuing a Final SEIS and revised ROD for Current Design Alternative 4A.

In accordance with the integrated NEPA/404 process, this document represents the project's resubmitted Section 404 permit application; however, it also is accompanied by detailed information and data from the project's Joint Federal/State Permit Application. In accordance with Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, a separate detailed permit application was resubmitted to the United Stated Army Corps of Engineers on November 8, 1999. In accordance with Section 401 of the Clean Water Act, a detailed permit application was resubmitted to the State of Maryland, Commonwealth of Virginia, and the District of Columbia on November 8, 1999. In accordance with Section 9 of the Rivers and Harbors Act of 1899, a separate detailed permit application was submitted to the United States Coast Guard on December 13, 1999. These said permit applications comply with all regulations and requirements of each State's and local jurisdiction's tidal and non-tidal wetland laws. These detailed permit applications in concert with this Draft SEIS would serve as the NEPA compliance for authorization of construction within federally regulated navigable channels, waterways, and wetlands.

1.2 Woodrow Wilson Bridge Project Purpose and Need

The 1997 FEIS explains various problems that exist in the Woodrow Wilson Bridge corridor and concludes that a "major project to address the present and growing problems of congestion, structural conditions, and safety" is necessary to avoid most of the problems that will otherwise plague the corridor on a daily basis. Four specific goals are described: (1) to provide adequate capacity for the existing and future travel demand by improving operating conditions and fixing the "bottleneck" caused by eight Capital Beltway through lanes converging into six lanes across the river, (2) to facilitate intermodal travel, such as transit, High Occupancy Vehicle (HOV) lanes, and bicycling and to maintain maritime access up the Potomac River, (3) to improve safety in terms of reducing the number of accidents and improving access for emergency response vehicles, and (4) to protect the character and nature of the surrounding environment. These problems clearly indicate the need for timely action for replacement of the existing Woodrow Wilson Bridge and associated interchange reconstruction.

The purpose and need for the Woodrow Wilson Bridge project has not substantially changed since the 1997 FEIS; therefore, reference to that document for specific information related to the project's purpose and need is suggested. Since there is no substantial change in the purpose and need, information related to this topic is not included in this document.

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Chapter 2

Alternatives

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2. Alternatives

2.1 Introduction

The Woodrow Wilson Bridge Improvement Study, began in 1989, culminated in a FEIS/Section 4(f) Evaluation and ROD in 1997. The FEIS includes a description of both I-95/495 and the Woodrow Wilson Bridge, the Bridge Concept Competition, the 1991 Draft EIS/Section 4(f) Evaluation, the Coordination Committee and two Supplemental Draft EIS/ Section 4(f) Evaluations (January 1996 and July 1996). The ROD was prepared and signed by the sponsoring agencies in cooperation with the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Coast Guard, and the National Park Service.

The document concluded that the Preferred Alternative 4A (Current Alignment Side-by-Side Drawbridges) successfully fulfilled the Project Need. However, interchange modifications to US 1 and MD 210 and other optional interchange modifications were suggested based on discussions with the Coordination Committee, Citizen's Interchange Working Groups, and comments from the Public Hearings. These modifications were to be investigated through the design phase of the project. The ROD also included provisions for several special design features, specifically constructed decks at Washington Street and on Rosalie Island, a pedestrian/bicycle facility on the new bridge, enhancements to Jones Point Park and future Queen Anne's Park, and other mitigation elements.

The ROD finalized the decision-making and NEPA requirements associated with the project and included the following attachments:

- ➢ Section 106 Memorandum of Agreement (MOA),
- ➢ List of Commitments/Considerations to be completed during the design phase and incorporated into the project's standard construction specifications used by each State, and
- ➢ Summary of Comments and FHWA comment responses related to mitigation measures and content of the FEIS.

Since publication of the FEIS in September 1997 and signature of the ROD in November 1997, congestion, travel times, and structural conditions associated with the current Woodrow Wilson Bridge have further deteriorated. As the traffic volumes continue to increase, the safety considerations due to the high traffic volume and large percentage of heavy vehicles continue to be of concern on I-95/495 in the project area. Although there is an on-going short-term rehabilitation program to ensure that the service life will continue until at least 2004, the continued stress on the structure requires a large investment to maintain it. This investment is reflected, at a minimum, in annual inspection and monitoring of the existing structure. Through these inspections, it has been determined that replacement of the grid deck portion of the bascule or movable span portion of the bridge is required in 2000. Further retrofit or remedial actions associated with the bridge are probable in the near future to maintain the structure.

Updated regional development data has been included in the land use and traffic modeling analyses described in Chapters 3 and 4 of this Draft SEIS. The incremental changes described in these chapters are further indications and reconfirmation of the basic and fundamental concerns outlined in the 1997 FEIS regarding safety, structural integrity of the bridge, levels of service, and travel time delays for the public. New data is incorporated throughout this Draft SEIS where relevant and appropriate and is so noted in individual sections.

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2.2 Location and Description of Project Limit

2.2.1 Mainline and Interchanges

The Woodrow Wilson Bridge project area, defined at the corridor level, is the twelve-kilometer (seven and one half-mile) section along I-95/495 (Capital Beltway) from west of Telegraph Road (VA 241) in Virginia to east of Indian Head Highway (MD 210) in Maryland, refer to Figure 2-1. The western portion of the corridor is located in Fairfax County and the City of Alexandria in Virginia. The side-by-side drawspans for the existing Woodrow Wilson Bridge is located in the southern tip of the District of Columbia; the eastern portion of the corridor is located in Prince George's County, Maryland. Improvements to the river crossing and the two interchanges in both Maryland and Virginia are included in this Draft SEIS. Design refinement of FEIS Alternative 4A, in part suggested through the ongoing public involvement process, has resulted in extensions of the project limits as shown on Figure 2-2 and a redefinition of FEIS Alternative 4A referred to as Current Design Alternative 4A.

As a result of the Stakeholder Participation Panel process in Virginia and Maryland, selection of the bridge design concept, construction related effects assessments, and the need to transition the proposed roadway into the existing I-95/495 alignment, the project limits have changed since the 1997 FEIS. The specific mainline and interchange modification are described in detail in Section 2.3 and a comparison of these modifications to FEIS Alternative 4A as shown in Table 2-1 of this document. A brief description of the project limit extensions at each interchange that have resulted in Current Design Alternative 4A is presented below.

- The Current Design Alternative 4A at the Telegraph Road interchange requires project extensions to the west, along the westbound lanes of I-95/495, and along Telegraph Road south of Lenore Lane. South of Telegraph Road these improvements focus on local street network reconfigurations to improve safety and operations at Huntington Avenue, Kings Highway, and Lenore Lane.
- The US 1 interchange does not require extensions along the US 1 roadway, although a revision to a ramp from northbound US 1 to westbound I-95/495 will have a revised configuration carrying the ramp further to the east than previously anticipated. Also extensions along George Washington Memorial Parkway are planned to enhance the gateway to the City of Alexandria. These enhancements focus on the inclusion of streetscape improvements from Hunting Creek Bridge north to the proposed Washington Street Urban Deck.
- The project limits along I-295 would extend from the Oxon Cove Bridge further north on the I-295 north movement only. This extension would improve safety and operations on I-295 through merge/diverge refinements by linking the acceleration lane from I-95/495 eastbound to I-295 northbound with the deceleration lane for the planned Laboratory Road interchange. South of I-95/495, modifications to the I-295 interchange, especially those on public land owned by the Maryland National Capital Park and Planning Commission (M-NCPPC), are also included. The modifications in this area include extension of ramps to the first logical termini for each included movement.
- The MD 210 interchange will require extension to the east along the westbound and eastbound I-95/495, in order to accommodate design requirements, such as lane tapers and merging back to meet the existing I-95/495.

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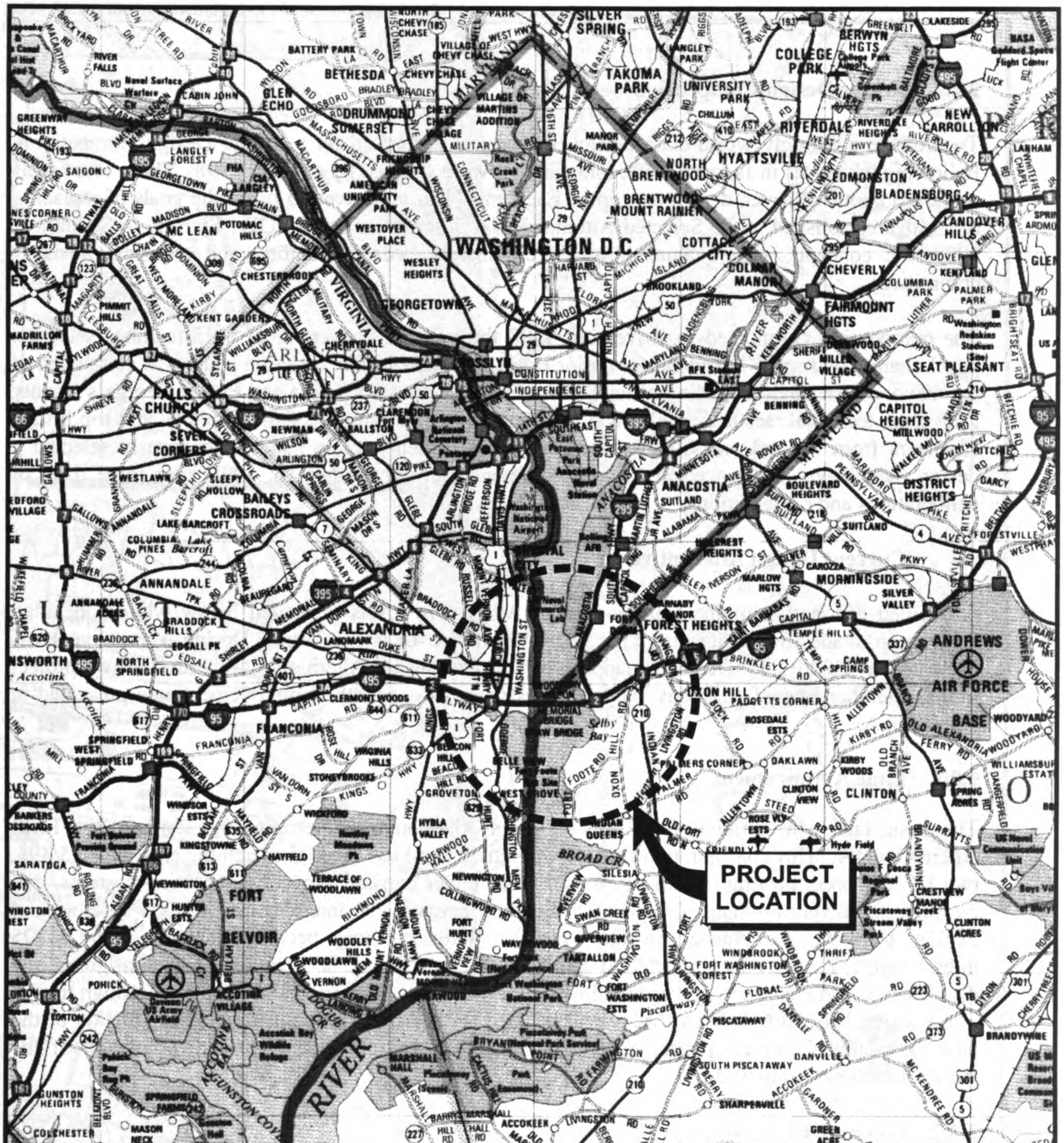

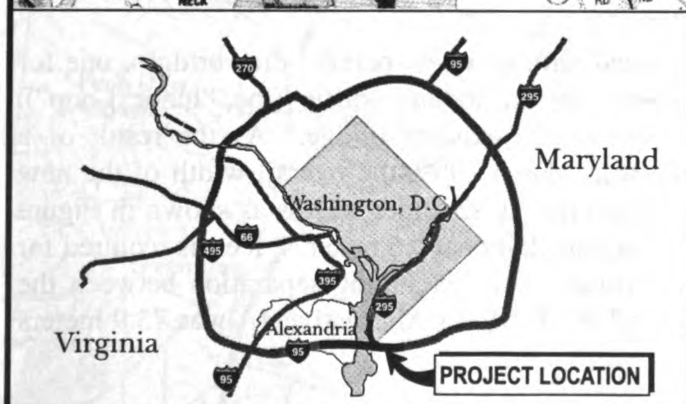

WOODROW WILSON BRIDGE PROJECT

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Project Location Map

Date		Figure
December, 1999	Not to Scale	2-1

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2.2.2 Bridge Design Competition

To produce a fittingly world-class design, the project embarked on a Bridge Design Competition. Following a kick-off in January 1998, four finalists were selected by summer 1998. These four teams produced a total of seven design concepts. Each entry was conceived to fulfill the goals of replacing the bridge established in the Selected Alternative 4A description in the ROD. Starting in September 1998, the concepts were evaluated by citizen, historic, constructability, and technical advisory committees.

The competition culminated in November 1998 through the convening of a 15-member selection panel chaired by former Maryland Governor Harry R. Hughes. The selection panel was comprised of the mayor of Alexandria, leading officials from Fairfax County, Virginia and Prince George's County Maryland, technical, aesthetic and urban planning experts (Architect of the Capitol), and top bridge engineers from Federal and State transportation departments. The panel unanimously selected a design, which was announced at a news conference, on November 18, 1998 after three days of deliberations and presentations.

2.3 Current Design Alternative 4A

A detailed description of the Current Design Alternative 4A is presented below while a detailed description of specific changes from the FEIS Alternative 4A to the Current Design Alternative 4A is presented in Table 2-1. Detailed mapping of Current Design Alternative 4A which shows project limits, interchange configurations, bicycle/pedestrian paths and other improvements are presented in Appendix A.

2.3.1 Lane Arrangement

The basic lane configuration for Current Design Alternative 4A remains the same as the FEIS Alternative 4A. This configuration consists of eight general use lanes to match the existing I-95/495, two HOV/express bus/transit lanes to match those under consideration on connecting systems, and two merging/diverging lanes (one in each direction between the interchanges) to ease entering and exiting I-95/495, particularly on the Potomac River crossing between the US 1 and I-295 interchanges. This has been referred to as the "8+2+2" section. The lanes would be configured in a divided express/local roadway system allowing for the physical separation of local and through traffic. The existing Woodrow Wilson Bridge will be used to maintain traffic during the construction of the new Eastbound Outer Loop bridge, after which it will be removed to permit completion of the Westbound Inner Loop bridge.

2.3.2 Potomac River Bridge

The existing Woodrow Wilson Bridge will be replaced with two new parallel drawbridges, one for eastbound traffic (the "Outer Loop") and the other for westbound traffic (the "Inner Loop"), constructed approximately 9.1 meters (30 feet) south of the existing bridge. As the result of a settlement with the City of Alexandria in its lawsuit in March 1999, the overall width of the new Woodrow Wilson Bridge was narrowed through a reduction in shoulder widths as shown in Figure 2-3. In addition to the width of the pedestrian/bikeway, an additional 0.6 meter (2 feet) is required for a railing along the pedestrian/bikeway. The total bridge width (excluding separation between the two independent structures) for both structures in the 1997 FEIS for Alternative 4A was 73.9 meters

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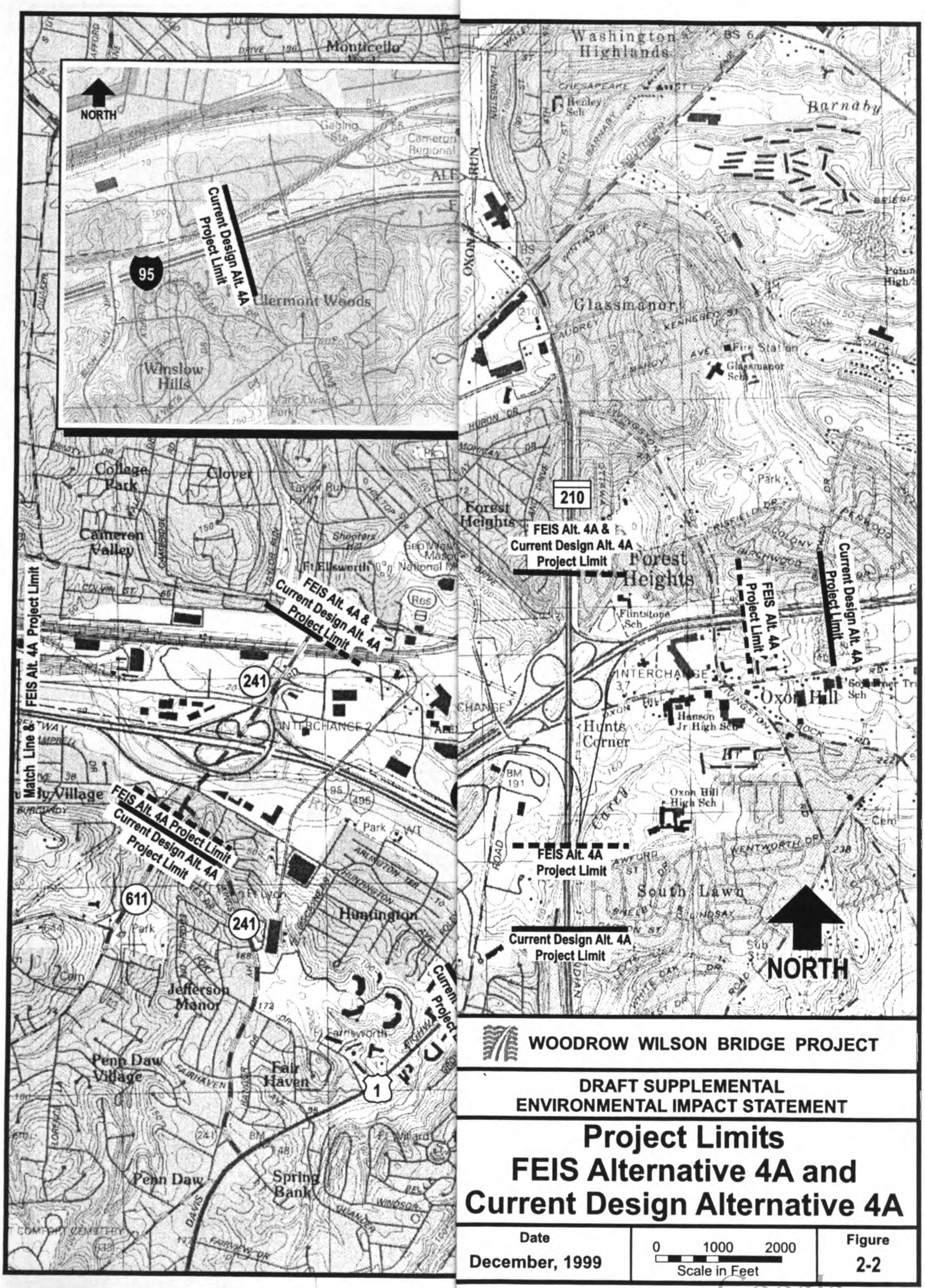

WOODROW WILSON BRIDGE PROJECT

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Project Limits FEIS Alternative 4A and Current Design Alternative 4A

Date	Scale in Feet	Figure
December, 1999	0 1000 2000	2-2

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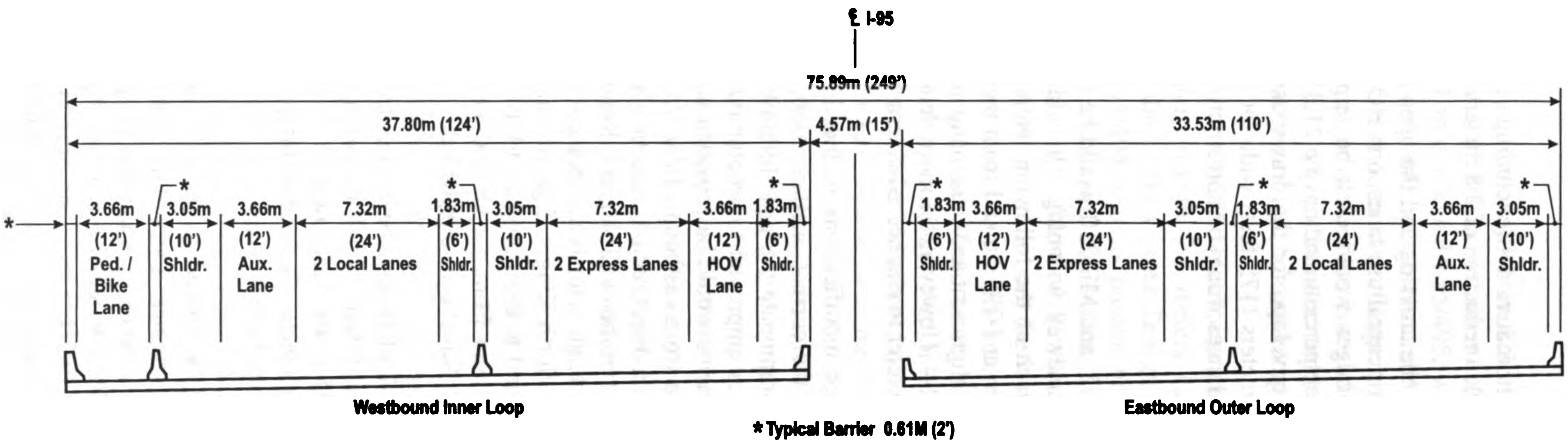

Current Design Alternative 4A

View Looking Towards Maryland From Virginia

WOODROW WILSON BRIDGE PROJECT		
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Current Design Alternative 4A Typical Section		
Date December, 1999	Not to Scale	Figure 2-3

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(242 feet). The width of the Current Design Alternative 4A (excluding separation between the two independent structures) is 71.1 meters (234 feet), a reduction of 2.8 meters (8 feet).

The above widths exclude the control tower on the crossing and the open distance between the two crossing spans. Each bridge would include four general use lanes, one HOV/express bus/transit lane and one merging/diverging lane. The two bridges would each be approximately 1,850 meters (6,075 feet) long, have a maximum grade of three percent, and have a 21.3-meter (70-foot) clearance over the navigational channel. The clearance envelope for the drawspans (in their open position) would be 41.1 meters (135 feet) high by 53.3 meters (175 feet) wide (at the center of the channel, between the two open bascule leafs, vertical clearances would be unrestricted).

2.3.3 Interchange Modifications

The interchanges at Telegraph Road, US 1, I-295, and MD 210 would be reconstructed to allow for smoother traffic flow, increased access, and roadway widening. In addition, direct HOV access would be provided between the I-95/495 and each of the following interchanges: US 1, I-295, and MD 210, although only provided in one direction at I-295 (to and from the west/north) and MD 210 (to and from west on the I-95/495). The general alignment and interchange configurations for Current Design Alternative 4A are illustrated in Figure 2-4. However, for more detailed mainline alignments, interchange configurations and ramp designation refer to engineered diagrams in Appendix A.

Telegraph Road Interchange: The interchange modifications included with the Current Design Alternative 4A at Telegraph Road would shift the current one-lane loop ramp from westbound I-95/495 to southbound Telegraph Road to accommodate the new I-95/495 roadway. The existing northeast, northwest, and southwest ramps will be improved to accommodate the movements to the new I-95/495 roadway. All interchange movements would be provided and would access the local lanes only. The two-lane directional connection from eastbound I-95/495 to northbound Telegraph Road would be relocated slightly to the west and a direct ramp connection to Pershing Avenue would be included. The eastbound I-95/495 ramp (to southbound Telegraph Road and Huntington Avenue and North King's Highway) would be split to align with North King's Highway and Huntington Avenue in order to improve traffic flow at both North King's Highway and Huntington Avenue. To accommodate this split, Burgundy Road would end at East Drive and East Drive would be extended to Telegraph Road at Lenore Lane. The movement from northbound Telegraph Road to the new directional ramp to Eisenhower Avenue at Stovall Street is also provided.

Optional interchange modifications from the 1997 FEIS have been included with the Current Design Alternative 4A to provide additional access to the Eisenhower Valley area in Virginia. The optional access between Eisenhower Valley and I-95/495 to the east towards US 1 and Maryland has been shown as an extension of the I-95/495/US 1 interchange. The access ramps include two direct access ramps to and from the east (serving only the express lanes)

US 1 Interchange: The US 1 mainline would be shifted to the east as part of the interchange reconfiguration at that location. The current one-lane loop ramp from westbound I-95/495 to southbound US 1 would become a two-lane loop ramp to accommodate the projected traffic increases. The existing loop ramp in the northeast quadrant would be replaced by a two lane directional connection from northbound US 1 to westbound I-95/495 local and express lanes. The existing loop ramp in the southeast quadrant would be shifted to accommodate the I-95/495 roadway. The existing directional ramp from southbound US 1 to eastbound I-95/495 would be replaced with two loop

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ramps. This common two-lane exit from US 1 would cross over the I-95/495 to provide one-lane access to both the local and express system in the southwest quadrant of the interchange. The ramps from northbound US 1 to eastbound I-95/495, westbound I-95/495 to northbound US 1 and Church Street, and eastbound I-95/495 to southbound US 1 will all be reconstructed to accommodate the change to the I-95/495 and other interchange ramps. Direct connections will be provided between US 1 and the HOV lanes in the express lanes of the I-95/495. Additionally, the Church Street ramp proposed in the 1997 FEIS will not be relocated but will be reconstructed in its current location further east of the proposed relocated Church Street ramp included 1997 FEIS Alternative 4A.

I-295 Interchange: At the I-295 interchange, FEIS Alternative 4A proposed raising the I-95/495 alignment approximately 6.1 to 9.1 meters (20 to 30 feet), in essence reversing the present "over/under" configuration. The Current Design Alternative 4A returns to the existing configuration, essentially keeping I-95/495 near its present vertical alignment and building elevated I-295 ramp connections. Many of these ramp connections are similar to the interchange modifications proposed with the FEIS Alternative 4A. Most of the ramp connections with National Harbor, although new, provide for movements to and from both the waterfront and beltway parcels. The southern limit of work at National Harbor would be the first intersection within each of the parcels. The existing loop ramp in the southwest quadrant would be replaced with a directional ramp. FEIS Alternative 4A included a loop ramp from National Harbor to I-95/495 westbound. Under the Current Design Alternative 4A, this ramp in the northeast quadrant has been reconfigured as a directional ramp serving the same movement. A new ramp has been added in the midst of the interchange to provide direct access from this area north to I-295. A new loop ramp would be added in the northwest quadrant to permit traffic from the westbound local lanes of I-95/495 to enter National Harbor. The eastbound I-95/495 to northbound I-295 ramp would be designed to accommodate a southbound connection from National Harbor. New ramp connections would be provided from National Harbor to the eastbound and westbound local I-95/495 lanes. The other existing ramps will be reconstructed to accommodate the revised mainline and express/local system. A ramp from the eastbound I-95/495 express lane to the S-curve towards the direction of MD 210 was added to the interchange as was the case for FEIS Alternative 4A. Finally, direct HOV connections between I-295 and the Woodrow Wilson Bridge/I-95/495 express lanes would be included.

MD 210 Interchange: The interchange modifications at MD 210 would replace three of the existing loop ramps with other types of ramps. The northbound MD 210 to westbound I-95/495 loop ramp would be shifted and expanded to two lanes. The southbound MD 210 to eastbound I-95/495 movement would be via Oxon Hill Road and a new ramp joining the northbound MD 210 ramp to the eastbound I-95/495 movement. The existing westbound I-95/495 to southbound MD 210 loop ramp in the northwest quadrant would be replaced with a signalized two-lane left-turn ramp off westbound I-95/495, this movement will also accommodate the westbound I-95/495 to northbound MD 210 movement. The existing eastbound I-95/495 to northbound MD 210 loop ramp in the southeast quadrant and the existing eastbound I-95/495 to Oxon Hill Road ramp in the southwest quadrant would be replaced with a ramp off of the southbound S-curve (through the County's park-and-ride lot that connects to Oxon Hill Road) and a reconfigured exit ramp in the southeast quadrant from the local I-95/495 lanes to Oxon Hill Road (adjacent to the proposed entrance ramp discussed above). An alternative to the ramp connection shown with FEIS Alternative 4A from Southbound S-curve to Oxon Hill Road (identified as Ramp E-1 through Prince George's County's park-and-ride lot) is also being considered – the alternative ramp would swing further south around the IRS building on the Salubria development and then connect directly with Oxon Hill Road. A direct access ramp to westbound I-95/495 express lanes from the northbound MD 210 S-curve has also been added.

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Because so many of the present loop ramp movements are being reconfigured, and must pass through the MD 210/Oxon Hill Road intersection, a grade separation is now proposed at this location. Essentially, Oxon Hill Road would be shifted north and depressed to approximately the elevation of the I-95/495, passing under MD 210. Small loop ramps would then connect Oxon Hill Road to MD 210 in the southwest and southeast quadrants of this grade separation. Existing bridges over Oxon Hill Road east and west of MD 210 would be replaced. Direct HOV connections to the I-95/495 express lanes would be included to and from the west at the MD 210 bridge over the I-95/495. The Bald Eagle Road bridge would be reconstructed east of its existing location. Based on discussion with the NPS, this new bridge would only serve pedestrian and bicycle traffic – a new "park driveway" to Oxon Hill Farm would be provided on MD 210 in the northwest quadrant of the MD 210/I-95/495 interchange.

2.3.4 Special Design Features

Current Design Alternative 4A also includes provisions for several special design features that were designated in the 1997 FEIS and are described as follows:

- Similar to the FEIS Alternative 4A, an Urban Deck would be constructed over I-95/495 in the area of Washington Street in the City of Alexandria providing opportunities for community enhancements and re-connecting portions of southern Alexandria on either side of I-95/495. Since the 1997 FEIS, coordination with the NPS, City of Alexandria, and the SPP has resulted in a reconfiguration and reduction in the size of the deck. The investigations at Freedmen's Cemetery have led to an intensive effort that has brought a memorial service for Veteran's Day 1999 to the site and commitments to appropriately memorialize the Freedmen's Cemetery. To fulfill this commitment, the sponsoring agencies will prepare conceptual sketches for fitting Freedmen's Cemetery memorials for coordination with the SPP's, the City of Alexandria, and the Friends of Freedmen's Cemetery. In addition, the Urban Deck program has been revised to include both active and passive uses based on comments from the City of Alexandria. Further considerations of signing, lighting, and opportunities for parking would be required to progress the design development for the Urban Deck. A conceptual plan of the Washington Street Urban Deck is included as Figure 2-5.
- Similar to the FEIS Alternative 4A, a deckover would be constructed over I-95/495 at Rosalie Island to provide opportunities to connect parkland on both sides of the mainline and provide vista of the river as well as passive recreational opportunities for users. A paved trail connecting the mainland to Rosalie Island would follow the mainline through portions of Smoots Cove. This path would provide the connection between the path system proposed on Rosalie Island and the proposed path system near Betty Blume Park. The conceptual plan identifying the features of the deckover and transitional parkland area is included in Figure 2-6; however, further coordination and design development would be completed in conjunction with the sponsoring agencies, the Maryland SPP, and current and future landowners.
- Similar to the FEIS, a 3.7-meter (12-foot) wide pedestrian/bicycle facility with appropriate safety offsets would be included on the new bridge (along the north side of the Westbound Inner Loop bridge).

2.4 Comparison of Alternatives

The following matrix, Table 2-1 presents design elements for both the FEIS Alternative 4A and the Current Design Alternative 4A, and highlights differences between the two.

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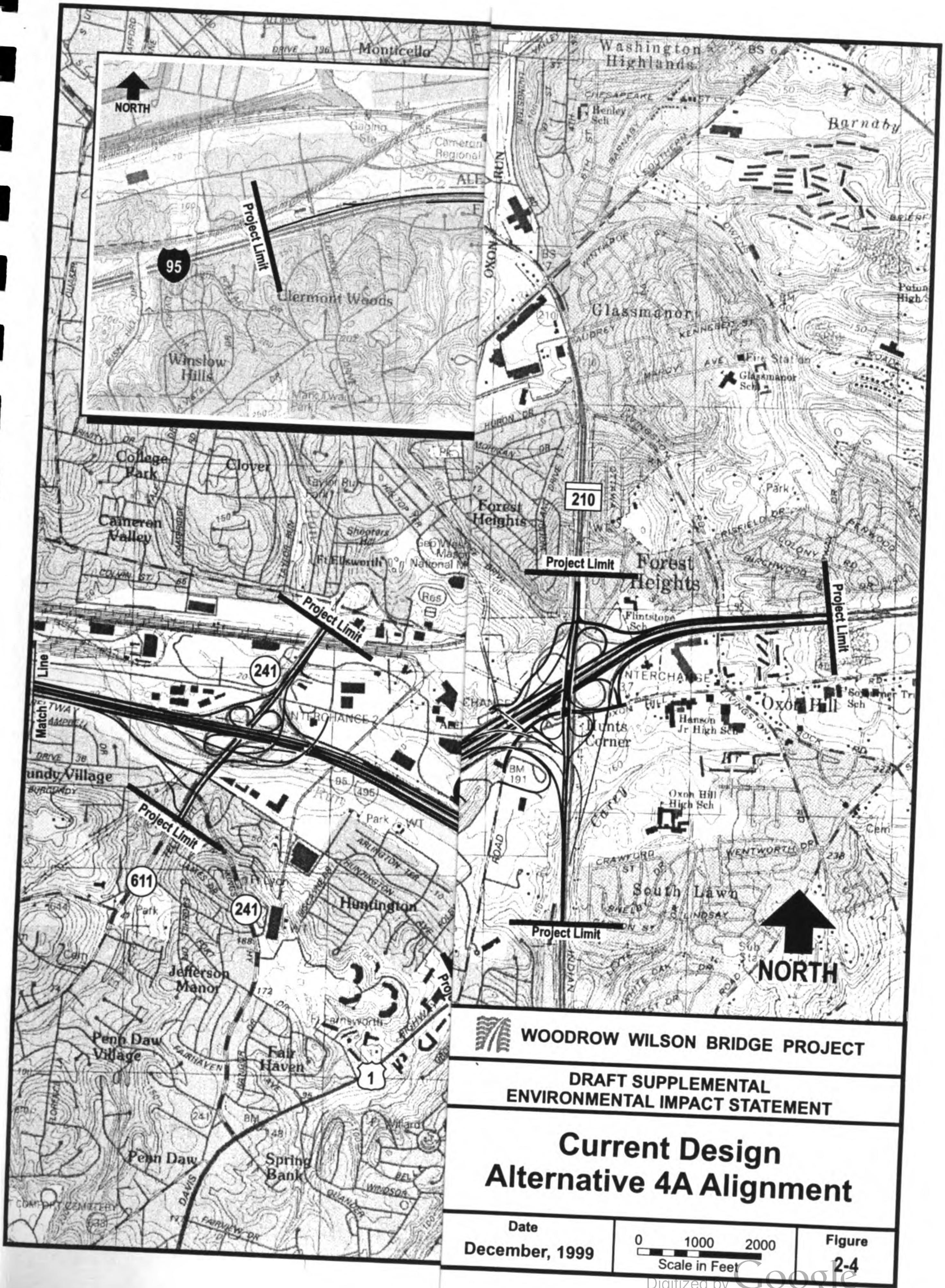

WOODROW WILSON BRIDGE PROJECT

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Current Design Alternative 4A Alignment

Date		Figure
December, 1999	0 1000 2000 Scale in Feet	2-4

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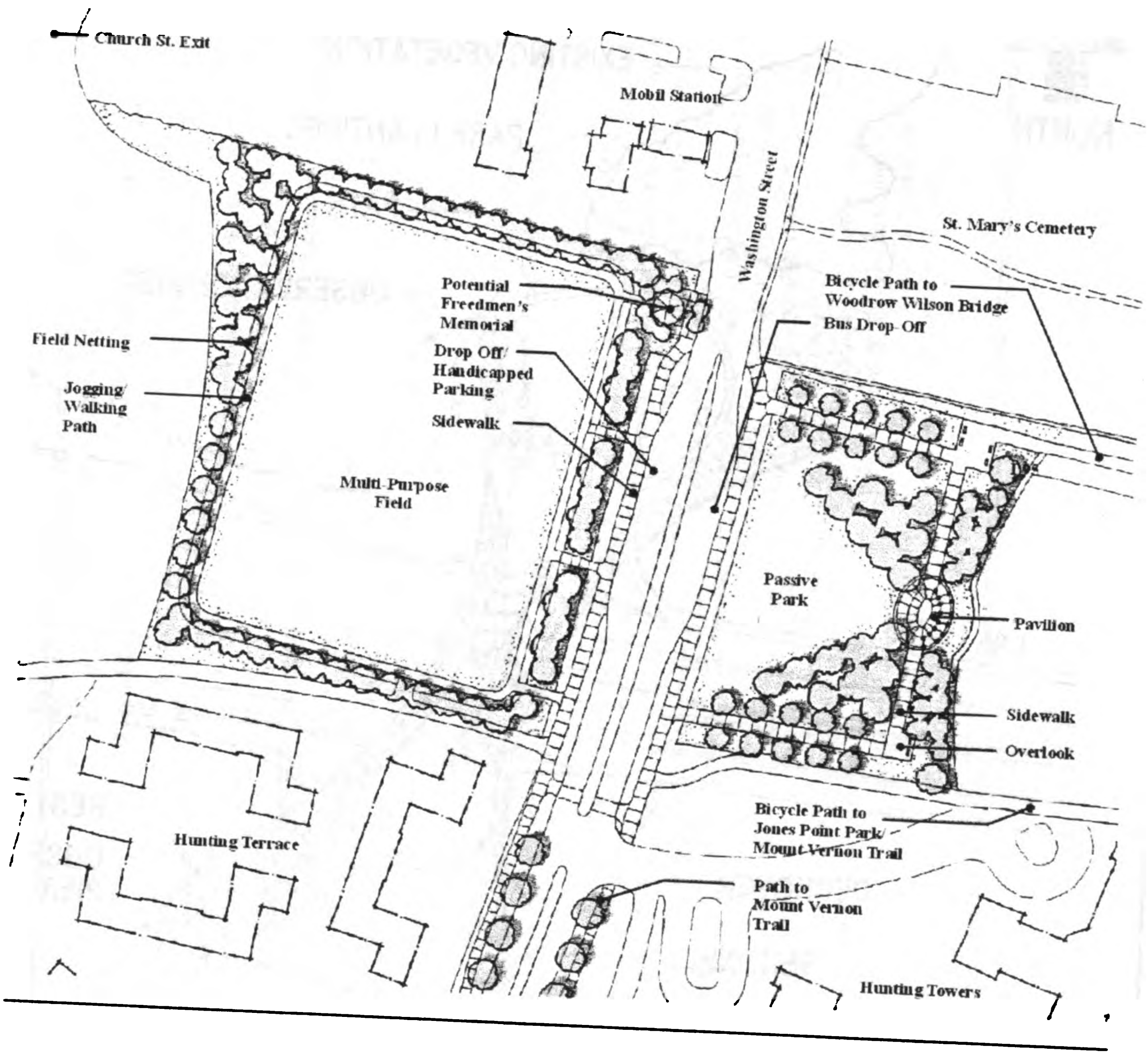

WOODROW WILSON BRIDGE PROJECT

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Washington Street Urban Deck Conceptual Mitigation Plan

Date		Figure
December, 1999	Not to Scale	2-5

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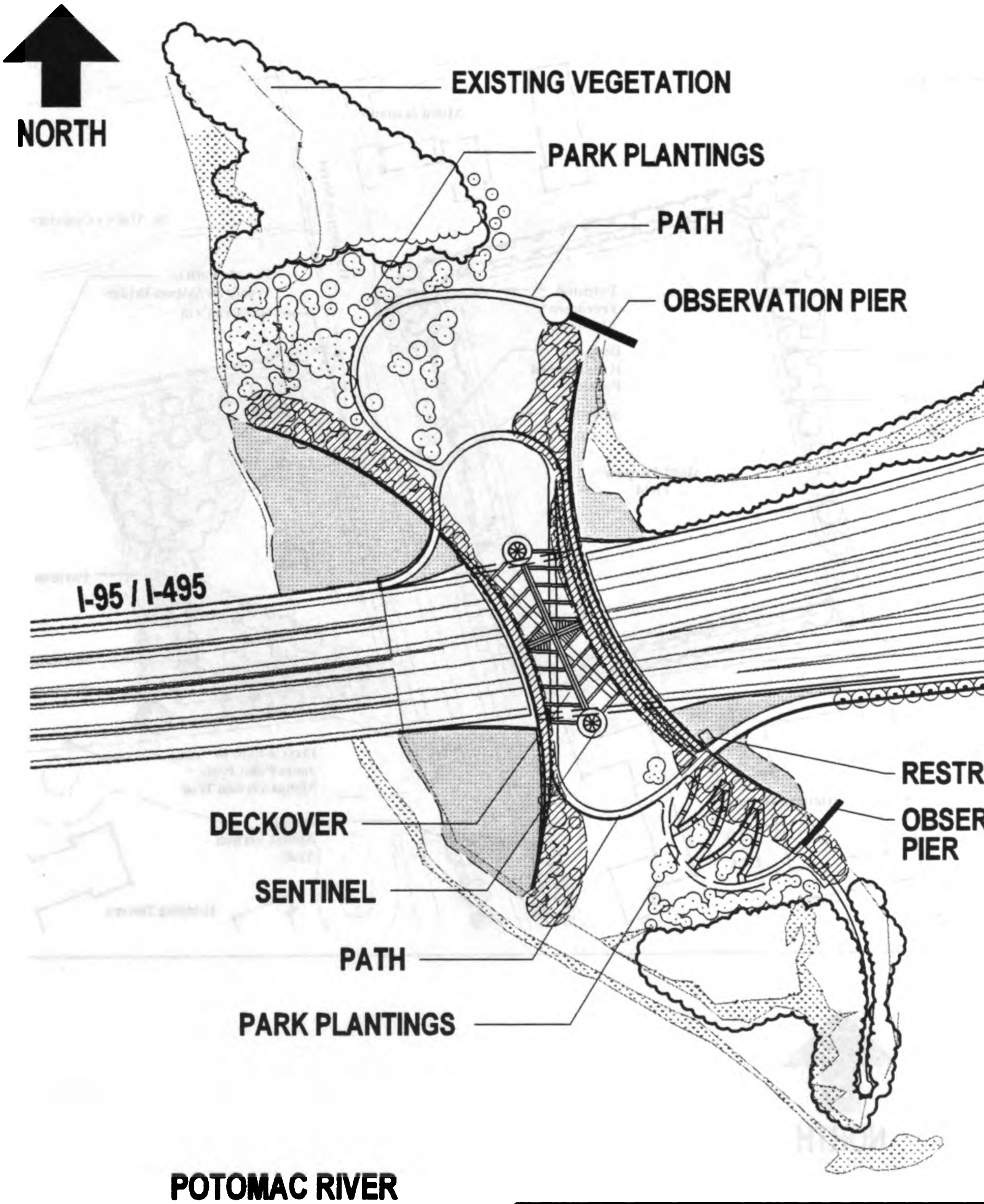

WOODROW WILSON BRIDGE PROJECT

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Rosalie Island Deckover Conceptual Mitigation Plan

Date	Scale In Feet	Figure
December, 1999	0 300 600	2-6

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Table 2-1: Comparison of Alternative Design Elements

FEIS Alternative 4A	Current Design Alternative 4A	Summary of Basis for Change Between FEIS Alternative 4A and Current Design Alternative 4A
Western Project Limits		
• Ends west of Telegraph Road approximately at the triple cell box culvert.	• Ends west of Telegraph Road in vicinity of Clermont Road/Eisenhower Connector interchange.	• Extension required due to design refinements. • Allows for safer and more efficient transition into the existing Beltway
Telegraph Road Interchange		
• Reconfiguration of Interchange replacing several existing loop ramps in the northeast and southwest quadrants with movements controlled by traffic signals.	• Loop ramps in the northwest and southwest quadrants remain in same configuration as current, adjusted to accommodate I-95/495 width changes.	• Suggested by SPP, maintains integrity of existing interchange configuration, removes traffic signals, and improves operations and safety.
• Added two connections directly into Eisenhower Valley at Stovall Street (from eastbound I-95/495 and northbound Telegraph Road).	• New direct connections similar to FEIS Alternative 4A into Eisenhower Valley (from eastbound I-95/495 and northbound Telegraph Road).	• Direct connections and separation of ramps remain consistent and will improve safety and operations.
• Ramp from eastbound I-95/495 to Telegraph Road was realigned to North King's Highway. Burgundy Road was realigned to Huntington Avenue.	• Ramp from eastbound I-95/495 to Telegraph Road split to provide access to North King's Highway to Huntington Avenue. Realigned East Drive extended to Lenore Lane.	• Ramp and local roadway changes were made to improve intersection operations and were made in response to Stakeholder Participation Panel suggestions.
• Required taking of two buildings in northwest quadrant of the interchange.	• Requires taking of 3 businesses and 2 buildings on south side of interchange. • Taking of buildings not required on north side of I-95/495.	• Ramps in northwest quadrant realigned to avoid impacts to buildings as suggested by the Stakeholder Participation Panel.
• Pedestrian accesses on cross streets not determined or specified.	• A 3.7-meter (12-foot) wide pedestrian bicycle trail on either a structure or combined with another ramp would be built to provide access across I-95/495. Another trail is also provided to the west under I-95/495 above Cameron Run to connect to Eisenhower Avenue.	• This is an additional mitigation measure that was suggested by the SPP to improve pedestrian/bicycle operations within the interchange and across the mainline.

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Table 2-1: Comparison of Alternative Design Elements continued

FEIS Alternative 4A	Current Design Alternative 4A	Summary of Basis for Change Between FEIS Alternative 4A and Current Design Alternative 4A
US 1 Interchange		
• Church Street relocated to west.	• Church Street remains in it's existing location	• The Church Street provision addresses the City of Alexandria and SPP concerns about the disruption to the community.
• Two new traffic signals within interchange for I-95/495 westbound and HOV movements.	• Removal of northern traffic signal and movement replaced with flyover ramp. This requires widening of the northbound to I-95/495 ramp to two lanes, which splits to the Outer and Inner Loops of I-95/495 . This will result in a decrease in the size of the US 1 bridge over I-95 • No change to HOV traffic signal.	• The revision for the northbound to westbound I-95/495 movement eliminates one signal following the study of several concepts, based on suggestions by the SPP. The change will improve traffic safety and operations.
• Eisenhower Valley ramps considered optional and exit from eastbound I-95/495 via express lanes and exit westbound via local lanes.	• Eisenhower Valley ramps included in the project and exit/enter mainline from Express lanes.	• A geometric study of the Eisenhower Valley access ramps allows for the change for access to/from the express lanes into Eisenhower Valley. This change was part of the settlement with the City of Alexandria's lawsuit against FHWA.
• Washington Street Urban Deck included to maximum size possible.	• Washington Street Urban Deck refined in size to address programmatic and functional needs.	• Washington Street Urban Deck refinement based on City of Alexandria, NPS, and SPP input.
• Provision of HOV with transition to rail transit at the time when rail is deemed appropriate. Eliminate HOV lanes to/from the east of the US 1 Interchange when rail would be installed. The rail would then occupy the previous HOV area as the lanes on the Woodrow Wilson Bridge are exclusively HOV or transit.	• HOV and transit would be provided to/from west of the US 1 interchange. HOV or transit provided to/from east of US 1 Interchange.	• The change for the inclusion of both HOV and transit west of the interchange does not preclude either HOV or transit facilities therefore increasing the options for future multi-modal travel in the corridor.
• Full width shoulders included in each set of local and express lanes.	• Reduction in shoulders to minimize impacts along the mainline roadways to match those changes on the Woodrow Wilson Bridge.	• Shoulder reduction on mainline reduced the impact in the Hunting Towers vicinity by approximately 9.8 meters (32 feet), minimizes environmental impacts, and size of Urban Deck.

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Table 2-1: Comparison of Alternative Design Elements continued

FEIS Alternative 4A	Current Design Alternative 4A	Summary of Basis for Change Between FEIS Alternative 4A and Current Design Alternative 4A
• Provide one additional lane in each direction on US 1 between the I-95/495 and Franklin Street with median width for plantings and streetscape.	• Width of section between I-95/495 and Franklin Street reduced.	• Width of section between I-95/495 and Franklin Street would minimize impacts to Lee Recreation Center and balance impacts more effectively on either side of US 1.
• Pedestrian accesses on cross streets not determined or specified.	• A 3.7-meter (12-foot) wide pedestrian/bicycle trail on either a separate structure or combined with another ramp would be built to provide access from US 1 to the Urban Deck and Jones Point Park.	• This additional mitigation feature was developed at the suggestion of the SPP.
• Connection from the Inner Loop to Mill Road extended along existing Mill Road to the intersection with Eisenhower Avenue.	• Refinements to the access resulted in the elimination of relocation of Mill Road to Eisenhower Avenue.	• Changes in configuration of the Mill Road access allowed for local circulation patterns to be accommodated and reduced impacts to the commercial properties along Mill Road and to the Alexandria Public Safety complex.
Potomac River Bridge		
• Proposed 8+2+2 configuration.	• Proposed 8+2+2.	• Maintain the mainline with the local/express split.
• 34.8 meters (114 feet) Inner Loop Width • <u>39.1 meters (128 feet)</u> <u>Outer Loop Width</u> **73.9 meters (242 feet) Total Width** (Excludes separation between bridges)	• 37.7 meters (124 feet) Inner Loop Width • <u>33.4 meters (110 feet)</u> <u>Outer Loop Width</u> **71.1 meters (234 feet) Total Width** (Excludes separation between bridges)	• Reduced width was part of settlement with City of Alexandria. It includes a physical separation between path and to provides future conversion of HOV lanes to rail transit.
• Overall bridge aesthetics.	• Concept further defined with the long spans and arch concepts.	• Concept further defined following 1998 Bridge Design Competition and other refinements in order to minimize visual impacts to the surrounding community and historic resources.
I-295 Interchange		
• Northern limit of project at Oxon Cove Bridge.	• Limit extended north to include DC-DPW's widening along I-295 to the Laboratory Road interchange.	• Project extension allows for safer merging operations along I-295 north of I-95/495.

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Table 2-1: Comparison of Alternative Design Elements continued

FEIS Alternative 4A	Current Design Alternative 4A	Summary of Basis for Change Between FEIS Alternative 4A and Current Design Alternative 4A
I-295 Interchange		
• Northern limit of project at Oxon Cove Bridge.	• Limit extended north to include DC-DPW's widening along I-295 to Laboratory Road.	• Project extension allows for safer merging operations along I-295 north of the I-95/495.
• Connections provided from west of I-295 to local and express lanes at MD 210.	• Minor adjustments for connections from west of I-295 to east of MD 210.	• Adjustments required to improve interchange geometrics and safety.
• Mainline profile dependent on bridge design, elevated above I-295.	• Profile of I-95 lowered to match the existing profile of I-95 near I-295.	• Profile changes resulted in lower earthwork cost, reduced impacts, and easier construction.
• Interchange ramps accommodated configuration of shift in I-95/495 to be over I-295.	• Mainline I-95/495 remaining beneath I-295, resulted in ramp revisions, reduced impacts, and cost savings. • New Ramp from National Harbors to northbound I-295. • Ramp in Northeast quadrant reconfigured from loop ramp to directional ramp.	• Ramp revisions take advantage of profile changes on I-95 and result in elimination of a merge/ conflict point and maintain continuity of and better operations through the interchange.
• Size of Rosalie Island deck dependent on I-95/495 geometrics.	• Length of deck on Rosalie Island (over I-95/495) reduced from 100.6 meters (330 feet) to 80.8 meters (265 feet) due to a narrower I-95/495 cross section.	• Size of deck reduced due to "narrowing" of horizontal alignment of I-95.
• Connections to National Harbor included northbound to westbound onto local lanes and eastbound to southbound from local lanes.	• Adjustments to ramp geometrics to tie-in with the separate National Harbor project. • Ramp from National Harbor to I-295 added. • Ramp in northeast quadrant reconfigured from loop ramp to outer directional ramp.	• Based on further refinements to the Woodrow Wilson Bridge project and National Harbor project, adjustments made to the interchange so as to not preclude ramp tie-ins.
MD 210 Interchange		
• Separation of I-95/495 local and express lanes east of project area tapers near Livingston Road bridge.	• Separation between local and express lanes for Outer Loop I-95 tapers out earlier (i.e., closer to MD 210).	• Taper location shifted west so as to not preclude future HOV access from/to MD 210 to/from I-95 east while not increasing impacts adjacent to properties (Flintstone Elementary School property).
• MD 210 bridge over I-95 in approximately same location.	• MD 210 bridge shifted approximately one-half width to west.	• MD 210 shifted to allow for staged bridge construction, thus better maintaining traffic on existing bridge.

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Table 2-1: Comparison of Alternative Design Elements continued

FEIS Alternative 4A	Current Design Alternative 4A	Summary of Basis for Change Between FEIS Alternative 4A and Current Design Alternative 4A
MD 210 Interchange continued		
• MD 210 profile over I-95/495 in approximate same location as existing MD 210	• Proposed MD 210 profile slightly raised to accommodate grade separation at the Oxon Hill Road/MD 210 intersection	• MD 210 studies, by SHA, included a grade separation at the existing Oxon Hill Road/ MD 210 intersection. At the request of the Maryland Stakeholder Participation Panel, the grade separation is now included in Woodrow Wilson Bridge project.
• MD 210 limits extend south to tie in of flyover ramp to northbound MD 210	• MD 210 limits extended slightly south	• MD 210 project limit extension addresses the geometric refinements and lane transition.
• Reconstruct Bald Eagle Road bridge just to the east of the existing bridge for both vehicular and pedestrian/bicycle traffic	• Relocate Bald Eagle Road further to the east to reduce the height of adjacent ramp profile on north side and only accommodate pedestrian/ bicycle traffic. • New entrance to Oxon Hill Farm from MD 210	• New direct connection to MD 210, as requested by NPS, permits Bald Eagle Road to be a pedestrian/bicycle facility.
• Northern tie of Bald Eagle Road extended into the gravel driveway serving Butler House	• North tie-in of Bald Eagle Road curves to tie into the paved Children's Farm parking lot.	• Revisions of the access to Oxon Hill Children's Farm reduced the impacts to the Butler property.
• Mainline shoulders in the four sets of lanes consistent through project	• Mainline shoulders reduced by 1.2 meters (4 feet) to minimize impact to adjacent properties	• Mainline shoulder reduction to minimize impacts to adjacent Oxon Hill Farm and Flintstone Elementary School.
• Access to Oxon Hill Road through the 649 space Park and Ride lot (40% occupied)	• Separation of movements through the Park and Ride lot allows a safer operation for existing traffic and ramp traffic	• Reduction in number of spaces in Park and Ride lot required to improve safety and traffic operations (615± spaces).
• Interchange design required local residents to negotiate several traffic signals (up to 4 in some cases) for loop ramp movements that are now free.	• Revised interchange design provides an additional exit from Outer Loop to Oxon Hill Road just east of MD 210.	• Revisions requested by Maryland Stakeholder Participation Panel to better serve local residents and businesses.
Eastern Project Limits		
• Ends in the vicinity of Livingston Road.	• Ends to the east of Livingston Road.	• Extension required due to design refinements.

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Chapter 3

Affected Environment

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3. Affected Environment

3.1 Introduction to Affected Environment

This chapter provides a description of the existing transportation, socioeconomic, natural environment, and cultural setting for the project area. The information presented pertains to the project area of Current Design Alternative 4A. Changes since the 1997 FEIS have been incorporated into this chapter, where appropriate. Those resources, where substantial changes have occurred, are presented in their entirety. Because a number of resources have had little or no change since the 1997 FEIS, reference to the appropriate section of the 1997 FEIS is provided.

Changes in the affected environment are due to three primary factors: updates in information using newly available data; additions due to increases in the project area limits to provide for a safer transition back into the existing roadways; and the inclusion of discontiguous areas for wetland mitigation, construction staging and dredge disposal. Where possible, the reason for the revised text is included in the applicable section(s). The information presented pertains to the project area of Current Design Alternative 4A. Current Design Alternative 4A, as described in Section 2.2, has been completed to a 30-percent level of design allowing for the identification of potential construction effects as well as potential mitigation measures. The affected environment associated with potential mitigation sites and potential construction staging areas has also been investigated.

New investigations were conducted on resources that have either changed since the publication of the 1997 FEIS or required updating of conditions based on acquired knowledge. This chapter presents the background data and issues that would have a bearing on the potential environmental consequences of Current Design Alternative 4A (these consequences are addressed in Chapter 4).

Findings are reported in Chapter 4, Environmental Consequences; Appendix B, Aquatic Resources Conceptual Mitigation Plan; and Appendix F, Construction Impacts.

3.2 Traffic and Transportation

3.2.1 Roadway Network

The roadway network associated with the Woodrow Wilson Bridge project is presented in Section 3.2.1 of the 1997 FEIS.

Safety: A description of safety and accident analyses for the project area and the Capital Beltway is presented in Section 3.2.1 of the 1997 FEIS. The analysis presented in this Draft Supplemental Environmental Impact Statement (DRAFT SEIS) provides an update on recent accident trends in the project area.

Highway safety throughout the project area is a key issue in the evaluation of existing conditions. The Maryland State Highway Administration and Virginia Department of Transportation (VDOT) have identified the Woodrow Wilson Bridge as a high-accident location on the Capital Beltway. A high-accident location, in this case, is defined as experiencing 38 accidents or more in a 0.8-kilometer (0.5-mile) segment (Inner and Outer Loop together) per year in at least two of three study years. Additionally, a high accident location could be defined by 19 accidents or more in a 0.8 kilometer (0.5-mile) segment (Inner or Outer Loop) per year in at least two of the three study years.

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Tabulations of the accident data on the Woodrow Wilson Bridge from 1996 to 1998 indicate the following:

- There were a total of 78 accidents in the three-year period, for an accident rate of 82.5 accidents per 100 million-vehicle-miles.
- One of the 78 accidents (one percent) involved a fatality.
- Thirty-four of the 78 accidents (44 percent) were injury accidents, with 60 total injuries.
- Forty-three of the 78 accidents (55 percent) were property damage accidents only.
- Nineteen of the 78 accidents (24 percent) involved trucks.
- Twenty-one of the 78 accidents (27 percent) occurred during the nighttime.
- Twenty-one of the 78 accidents (27 percent) occurred on wet pavement.

Table 3-1 shows the statistics on Capital Beltway accidents in Virginia and Maryland between 1996 and 1998. The number of accidents in Maryland is higher than in Virginia because the Capital Beltway is over two times longer in Maryland than in Virginia.

Table 3-1: Accident Summary for Capital Beltway Between 1996 and 1998

Accident Information	Virginia	Maryland
Total 1996-1998 Capital Beltway Accidents	2,971	4,895
Year		
1996	940	1,486
1997	1,103	1,687
1998	928	1,722
Accident Severity		
Property Damage Only	1,855	2,369
Injury	1,100	2,486
Fatal	16	40
Vehicle Types		
Autos Only	Data Not Available	4,003
One or more Trucks	Data Not Available	892

***Source:** Maryland State Highway Administration and Virginia Department of Transportation*

As shown in Table 3-2, the accident rates on the Capital Beltway in the project area in Maryland are lower than the rates in Virginia. The accident rate is used to assess the level of safety on a roadway and is a better measure with which to make a direct comparison of similar facilities than simply the total number of accidents. The accident rate is calculated by dividing the total number of accidents by the annual vehicle miles of travel at a location. The rates are usually expressed as the number of accidents per 100 million vehicle miles of travel (VMT). The accident rate on the Woodrow Wilson Bridge has decreased since the 1997 FEIS from 153.3 per 100 million VMT for the 1988-1992 period (see 1997 FEIS Table 3-1) to 82.5 per 100 million VMT for the 1996-1998 period. This is likely due to the increase in congestion on the bridge (when travel speeds decrease, the number and severity of accidents tends to decrease as well), and the extension of the queue on either side of the bridge, which pushes the start of the bottle-neck area outside of the bridge limits. However, despite this decrease, the accident rate is still significantly higher than the statewide rate of 44.3 accidents per 100 million VMT for Maryland or the 67.1 rate for Virginia for similar type roadways.

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Table 3-2: Project Area Accident Rates
(Based on 1996 to 1998 Data)

Location	Accident Rate (per 100 million VMT)
I-95/495 approaching Woodrow Wilson Bridge	
Virginia	112.4
Maryland	101.2
State average for similar type facilities	
Virginia	67.1
Maryland	44.3
American Legion Bridge*	64.6
Woodrow Wilson Bridge	82.5

* *The American Legion Bridge is a 10-lane facility on the Capital Beltway with shoulders and breakdown lanes.*
Source: *Maryland State Highway Administration and Virginia Department of Transportation*

3.2.2 Traffic Volumes and Operations

Travel Patterns: The Metropolitan Washington Council of Government's (MWCOG) Round 6.1 Cooperative Forecast regional model indicates that 30.3 percent of the traffic using the Woodrow Wilson Bridge originates in Prince George's County, Maryland and 36.3 percent originates in the City of Alexandria and Fairfax County, Virginia. Round 6.1 provides new information over that in the 1997 FEIS.

The transportation planning necessary to keep the Washington metropolitan region moving involves many levels of government - city, county, state, and federal. The National Capital Region Transportation Planning Board (TPB) is the federally designated Metropolitan Planning Organization (MPO) for the region, and plays an important role as the regional forum for transportation planning. TPB members in Maryland include the Cities of Bowie, College Park, Gaithersburg, Greenbelt, Takoma Park, and Rockville, and Prince George's County, Montgomery County and Frederick County. In Virginia, TPB members include the Cities of Alexandria, Fairfax, and Falls Church, and Arlington County, Fairfax County, Loudoun County, and Prince William County. MPOs prepare plans and programs that the federal government must approve in order for federal-aid transportation funds to flow to their regions. The TPB performs the following primary activities:

- Development of a Long-Range Plan, which must cover a planning period of at least 20 years
- Development of a six-year Transportation Improvement Program (TIP)

Staff support to the TPB is provided by the Department of Transportation Planning of the MWCOG. The TPB activities are closely coordinated with MWCOG programs for forecasting population and employment for the region, as well as the air quality planning activities of the Metropolitan Washington Air Quality Committee. The current land use forecast used by MWCOG is Round 6.1, which is one of the products of the TPB process, and includes the latest population and employment forecasts for each of the zones in the planning region.

Historical Trends

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Woodrow Wilson Bridge: Daily traffic volumes on the Woodrow Wilson Bridge have continued to increase steadily since the 1997 FEIS. The current (1998) average daily traffic (ADT) on the Woodrow Wilson Bridge is about 190,000 vehicles per day, which is 19 percent higher than the 1994 volume of 160,000 vehicles per day reported in the 1997 FEIS.

The Woodrow Wilson Bridge 24-hour diurnal traffic volumes for an average weekday and average weekend day in March 1998 are shown in Figures 3-1 and 3-2, respectively. In 1986, the high "peak period" volumes lasted for approximately two hours each in the AM and PM peak periods; in 1998, the peak periods increased to three hours in the AM peak period and nearly four hours in the PM peak period.

Crossing Arterial Roadways: Historic growth in traffic immediately north and south of the Capital Beltway on the crossing arterial roadways within the project area is summarized in Tables 3-3 and 3-4.

Daily Volumes - Woodrow Wilson Bridge: While the overall volumes have increased, the daily volume trends (i.e. peaking characteristics, queuing, speeds, etc.) on the Woodrow Wilson Bridge have not changed significantly since the 1997 FEIS.

Based on 1998 data, about 9,500 trucks per direction (10 percent of all daily traffic) cross the Woodrow Wilson Bridge in each direction every day. Most (69 percent) cross during the daytime hours of 6:30 AM to 7:30 PM. Almost two-thirds (64 percent) of these trucks are heavy trucks. A heavy truck is defined as a tractor-trailer with four or more axles. These heavy vehicles, however, tend to avoid the morning and afternoon peak periods, with the peak periods for tractor-trailers occurring just after the AM peak period and again at midday between 1:30 and 2:30 PM.

Table 3-3: Historic Daily Traffic Volumes (ADT) North of the Capital Beltway

Year	Telegraph Road	US 1	Washington Street	I-295	MD 210
1980	45,530	61,140	23,050	48,800	42,200
1985	51,300	67,400	not available	not available	49,000
1990	66,200	not available	not available	not available	not available
1991	64,640	73,480	24,140	70,400	19,250 *
1997	61,408	74,990	30,310	71,375	25,125

* *Traffic volumes on MD 210 decreased as a result of MD 210 ramp improvements built in 1990.*
Source: *1980-1991 data is from Woodrow Wilson Bridge Improvement Study, FEIS, September 1997*
1997 data is from MSHA, VDOT, and the City of Alexandria.

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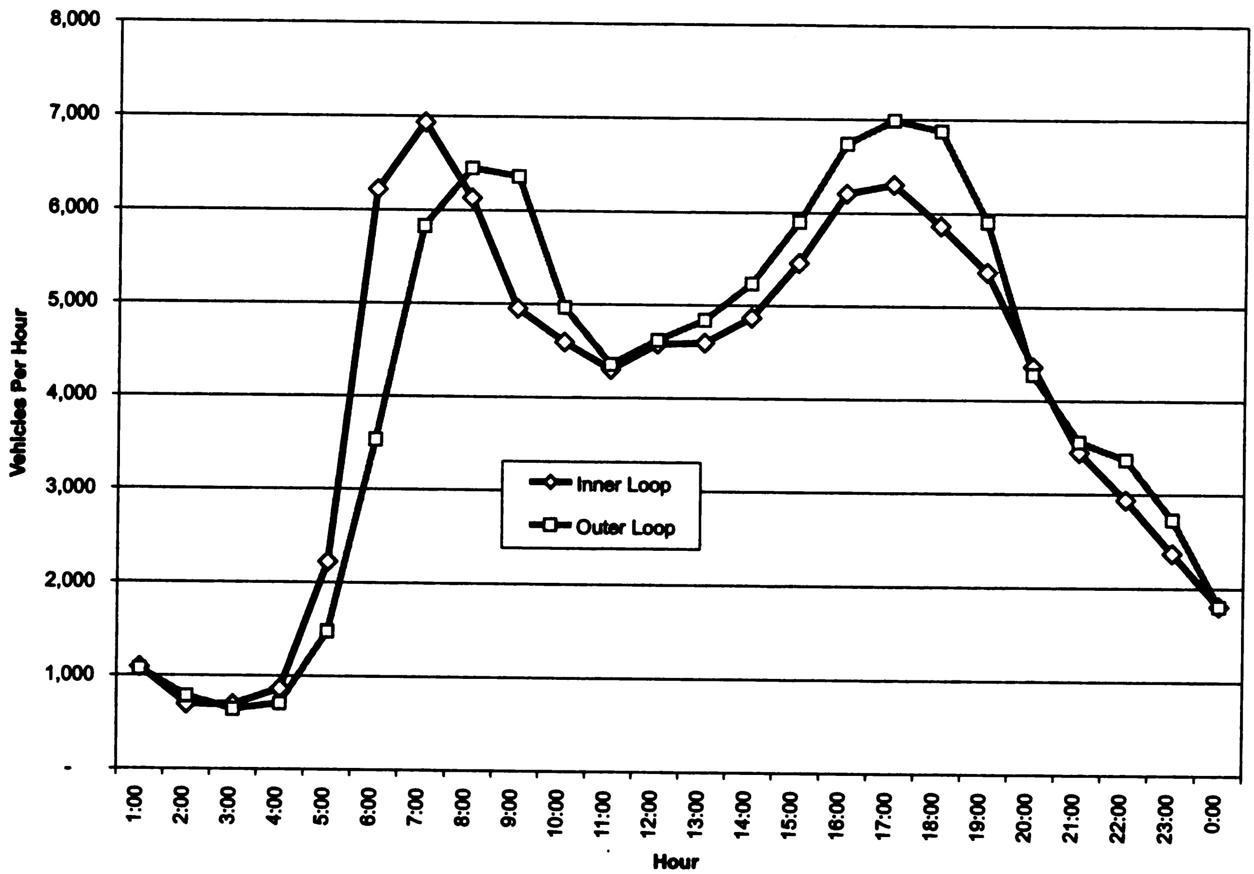

Source of Data:
MD SHA Traffic Count Data, 1998

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Existing Typical Weekday Hourly Volumes on the Woodrow Wilson Bridge (March 1998)

Date		Figure
December, 1999	Not to Scale	3-1

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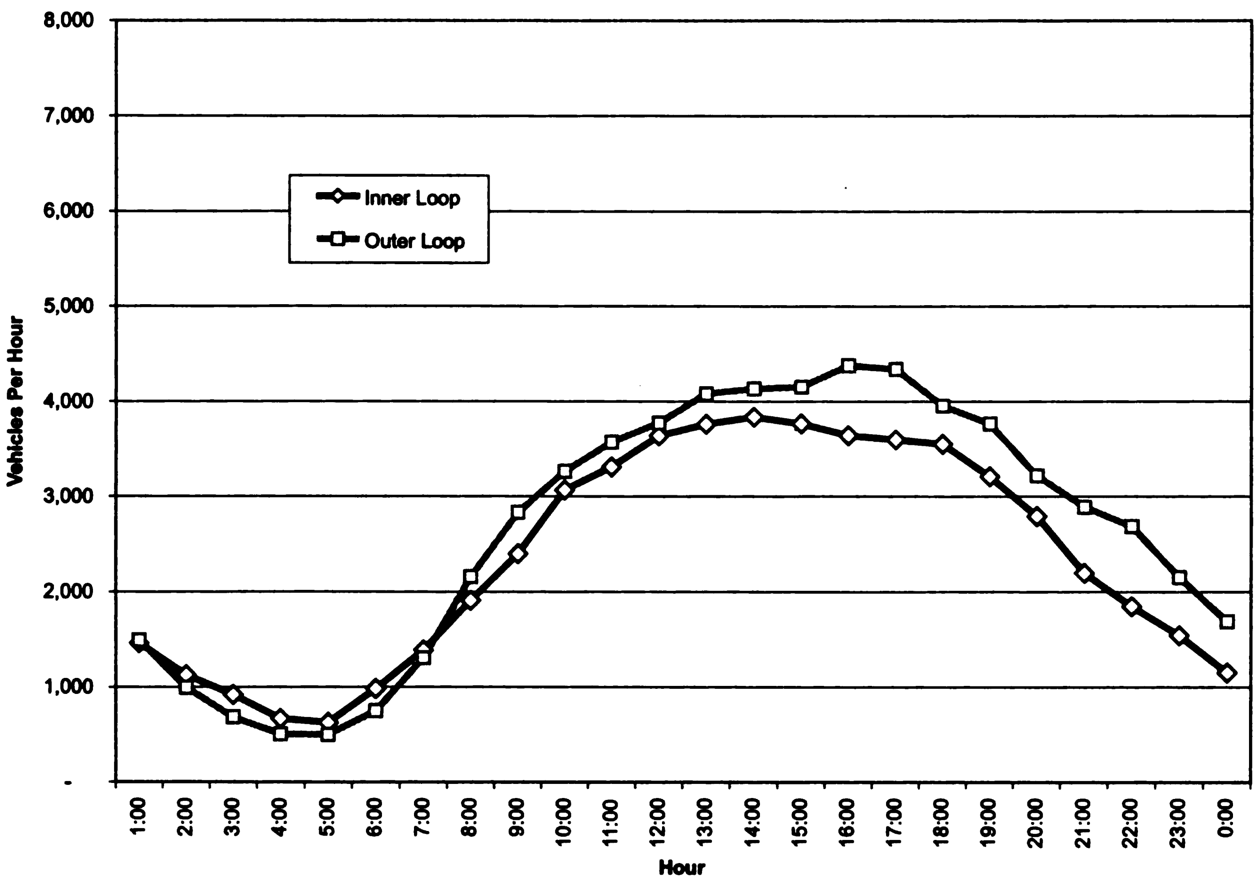

Source of Data:
MD SHA Traffic Count Data, 1998

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Existing Typical Weekend Hourly Volumes on the Woodrow Wilson Bridge (March 1998)

Date		Figure
December, 1999	Not to Scale	3-2

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Table 3-4: Historic Daily Traffic Volumes (ADT) South of the Capital Beltway

Year	Telegraph Road	US 1	Washington Street	I-295	MD 210
1980	22,545	35,155	27,570	not available	35,100
1985	26,825	41,720	27,700	not available	41,825
1990	24,065	47,760	not available	not available	not available
1991	28,400	47,000	31,700	14,600	25,800 *
1997	47,900	66,000	not available	not available	33,740

* *Traffic volumes on MD 210 decreased as a result of MD 210 ramp improvements built in 1990*
Source: *1980-1991 data from the Woodrow Wilson Bridge Improvement Study, FEIS, September 1997*
1997 data from MSHA, VDOT, and the City of Alexandria

Daily Volumes - Study Corridor: Average daily volumes along I-95/495 are provided below for 1997 and 1998 count years and represents new information since the 1997 FEIS:

- West of Telegraph Road — 166,000 vehicles per day (1997)
- Telegraph Road to US 1 — 172,000 vehicles per day (1997)
- US 1 to I-295 (Bridge) — 195,000 vehicles per day (1998)
- I-295 to MD 210 — 136,000 vehicles per day (1998)
- East of MD 210 — 117,000 vehicles per day (1998)

Woodrow Wilson Bridge Peak Period Volumes: Typical hourly weekday volumes on the Woodrow Wilson Bridge throughout the day are shown in Figure 3-1. The bridge carries heavier commuter traffic on the Inner Loop in the AM peak period and on the Outer Loop in the PM peak period. An Inner Loop AM peak hour volume of 6,936 vehicles was recorded on the bridge in March 1998. Approximately 6,992 vehicles were recorded during the PM peak hour on the Outer Loop. Approximately 73 percent of the daily traffic on the bridge occurs between 6:00 AM and 7:00 PM (down slightly from 75 percent in the 1997 FEIS, due to the spreading of peak hour traffic and increase in total traffic volume).

Level-of-Service (LOS): The Woodrow Wilson Bridge corridor continues to operate at level of service (LOS) E and F during both peak periods, as the capacity has not changed since the 1997 FEIS. With no increase in capacity, as traffic increases, peak periods tend to be extended. LOS E describes operations at capacity, where there is limited maneuverability and any incident can be expected to produce serious congestion with extensive queuing or back ups. LOS F describes forced flow, where queues form behind congestion points, recurring points of congestion exist (such as merge or weaving areas and lane drops), and the number of vehicles arriving at a particular location is greater than the number of vehicles departing it. An explanation of levels of service is provided in the Glossary, Chapter 9.

During the AM and PM peak hour, the Outer Loop operates at LOS E from west of the project area to just east of Telegraph Road. Approaching the US 1 interchange, the combination of the lane drop and the vehicles from US 1 on-ramps merging into the mainline cause the traffic flow to break

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down and conditions deteriorate to LOS F on the Outer Loop. After the Bridge and the I-295 exit ramp, the queue releases and the roadway operates at LOS E through the remainder of the corridor.

In the morning peak hour, the Inner Loop operates at LOS F from MD 210 to the Telegraph Road interchange. The high volume of traffic entering from MD 210, followed by a lane drop at the I-295 northbound exit ramp before the Bridge, produces very heavy weaving and merging. Queues also develop from the lane drop which extend back to MD 210. Conditions begin to improve after the US 1 exit, and the roadway operates at LOS D/E near the Telegraph Road interchange. In the evening, the Inner Loop operates at LOS E until just past the MD 210 interchange. Approaching the lane drop at I-295 and all the way across the bridge, the roadway operates at LOS F. Similar to the morning condition, afternoon/evening conditions improve after the US 1 exit ramp, and the roadway operates at LOS D at the Telegraph Road interchange.

3.2.3 Mass Transportation

Mass Transit: The Woodrow Wilson Bridge project area is served by a well-established transit system. The transit services within the region include fixed-route bus service, commuter express bus, Metrorail, commuter rail, paratransit services, rideshare, and high occupancy vehicle (HOV) facilities and are described in detail in Section 3.2.3 of the 1997 FEIS. These transit services are provided by both regional transit agencies (e.g., WMATA), local transit agencies (e.g., Fairfax Connector, DASH, OmniRide), VDOT and the Maryland Department of Transportation (MDOT).

High Occupancy Vehicle (HOV) Facilities: Dedicated HOV lanes are currently provided on I-66, I-95/I-395, I-270, and in Old Town Alexandria. There are currently no dedicated HOV facilities on the Capital Beltway or the Woodrow Wilson Bridge. However, HOV lanes are in design for US 50 and in planning for the MD 210 corridor south of the Capital Beltway.

3.2.4 Marine Transportation

Marine transportation operations have not changed substantially from what is described in the 1997 FEIS, Section 3.2.4.

3.2.5 Air Transportation

The Woodrow Wilson Bridge lies under the final approach to Ronald Reagan National Airport's Runway 36. Aircraft activities related to the bridge are described in Section 3.2.5 of the 1997 FEIS.

3.2.6 Pedestrian and Bicycle Facilities

Existing bicycle and pedestrian facilities in the project area have not changed substantially from what is described in the 1997 FEIS, Section 3.2.6. The only modification is that in 1999, a series of the existing trails in the City of Alexandria have been connected into a route called the Alexandria Loop Trail, linking existing cultural and historic resources together. No trails cross the Woodrow Wilson Bridge, although portions of this loop are located within the study area.

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3.3 Socioeconomic

3.3.1 Land Use and Land Use Planning

The primary land uses in the project area are residential, commercial, and parklands. Land use development in the project area is governed by multiple layers of planning authorities each associated with a geographic area, and sometimes within a specific boundary. In Virginia and Maryland, land use planning occurs at the regional planning authorities, while detailed planning and the regulation of land use is done by the city and county jurisdictions. In the project area, these jurisdictions are the City of Alexandria, Fairfax County, District of Columbia, and Maryland-National Capital Park and Planning Commission (M-NCPPC) on behalf of Prince George's County.

Master Plans: Detailed discussions of the master or comprehensive plans that govern land use patterns in the project area are included in the 1997 FEIS, Section 3.3.1. The extended project limits for Current Design Alternative 4A do not encompass additional planning areas within the jurisdictions. Planning areas for the extended project limits are shown on Figure 3.3. Since the publication of the FEIS in 1997, a preliminary plan for The Heights, located north of the Capital Beltway in Prince George's County's Sub-Region VII, has been released for public comment. Preliminary Master Plan and Proposed Sectional Map Amendments for the Heights and Vicinity - Planning Area 76A (June 1999) provide for increased development in the area of the three Metro stations in the area, Branch Avenue, Southern Avenue, and Suitland. The preliminary plan calls for changes in zoning to accommodate this development.

3.3.2 Existing and Future Land Use

The existing and future land uses for the expanded project area are depicted in Figures 3-4 and 3-5. The extended project limits for Current Design Alternative 4A include additional areas in all project area jurisdictions. However, the land use patterns within the extended project limits generally do not vary from the land use composition discussed in the 1997 FEIS for the different jurisdictions, with the exception of the District of Columbia, which was not discussed in the 1997 FEIS, Section 4.3.1.

The expanded limits of the project in the District of Columbia encompass the land uses that straddle I-295 just north of the Maryland jurisdictional boundary. The existing land uses in this expanded project area are primarily parkland to the south, major public utilities to the west (Blue Plains Wastewater Treatment Plant), and institutional (Naval Research Laboratory and DC Village) to the northwest and east. DC Village, a municipal complex, once contained a nursing home and a youth home. With the closure of these facilities, DC Village now houses the AmeriCorps and Job Corps residential and training facilities, as well as, the Metropolitan Police Academy, the Firefighter Training Facility, and the municipal automobile impound lot.

According to the District of Columbia Office of Planning, one proposed land use change, the addition of commercial properties among the municipal buildings in DC Village, is under consideration in the northern extension of the project area within the District of Columbia. Action on this proposal is not scheduled at this time.

The Comprehensive Plan for the District of Columbia (1998) establishes three development zones including one within the project area in DC Village. The intent of the development zones is to stimulate economic development by offering incentives to developers, first-time homebuyers and

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employers, who provide jobs and job training to zone residents. The plan addressed requests for increased access to the Department of Human Services for area residents by relocating that department to the former nursing home's main building in DC Village.

On the Maryland side of the Potomac River, National Harbor (formerly Port America) was discussed briefly in the 1997 FEIS. The current National Harbor development proposal would include a mixture of high-density retail, hotel, and commercial uses with a focus on attracting both local residents and regional visitors. A public promenade along the waterfront and a marina (scaled down to 80 slips) are features of National Harbor that were retained from previous designs. Unlike previous proposals, no residential construction is currently proposed. As proposed, the National Harbor Plan would blend hotel, retail, entertainment, and office uses. It will contain up to 18,580 square meters (200,000 square feet) of office space, up to 1,000 hotel rooms, and a major retail facility. A Final EIS for National Harbor was issued in April 1999.

On the Virginia side of the Potomac River, the Eisenhower Valley development area consists of more than 40 hectares (100 acres) of undeveloped land that is primarily zoned for mixed-use or high-density commercial uses. A more detailed discussion of this area can be found in Section 3.3.2 of the 1997 FEIS; however, an additional large-scale project, the relocation of the Patent and Trademark Offices (PTO), has recently been proposed in this area. Two of three sites, identified as alternatives that would meet the needs for 184,795 square meters (1,989,116 square feet) of office space for the PTO, are located in the Eisenhower Valley. Both sites are located in proximity to either the existing King Street or the future Eisenhower Avenue Metrorail stations. The alternative selected by the PTO is located at the Carlyle development near the King Street Metro. A lawsuit was filed challenging the PTO's decision and it is now under review by the District Court for the District of Columbia.

Maryland's Economic Growth, Resource Protection, and Planning Act of 1992 (Smart Growth Act) was enacted to encourage economic development, limit development sprawl, and protect natural resources. The Smart Growth Act contains the following major visions (policies):

- Development shall be concentrated in suitable areas.
- Sensitive areas shall be protected.
- In rural areas, growth shall be directed to existing population centers and resource areas shall be protected.
- Stewardship of the Chesapeake Bay and the land shall be a universal ethic.
- Conservation of resources including a reduction in resource consumption, shall be practiced.
- To encourage the achievement of Policies 1 through 5, economic growth shall be encouraged and regulatory mechanisms shall be streamlined.
- Funding mechanisms shall be addressed to achieve this policy.

The *1997 Smart Growth Areas Act*, which was enacted after the distribution of 1997 FEIS, builds on the foundation of the *1992 Smart Growth Act* by directing State spending to "Priority Funding Areas." These Priority Funding Areas are within existing communities and in locally designated growth areas where the State and local governments want to encourage and support economic development and new growth. The Heights, Subregion 76A of Planning Region VII in Prince George's County, is a designated a Priority Funding Area. The Woodrow Wilson Bridge project is situated in a Priority Funding Area.

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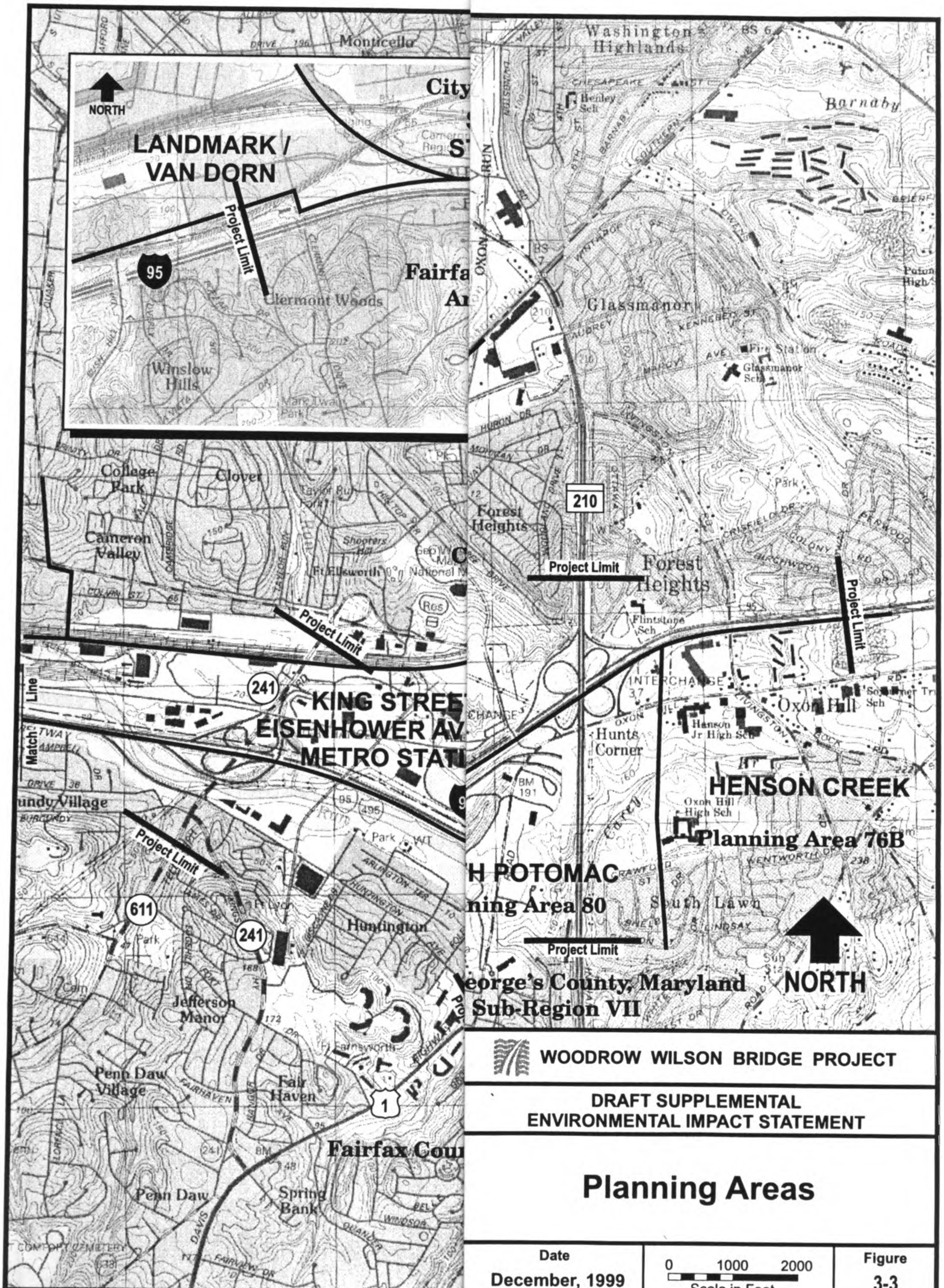

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Planning Areas

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	3-3

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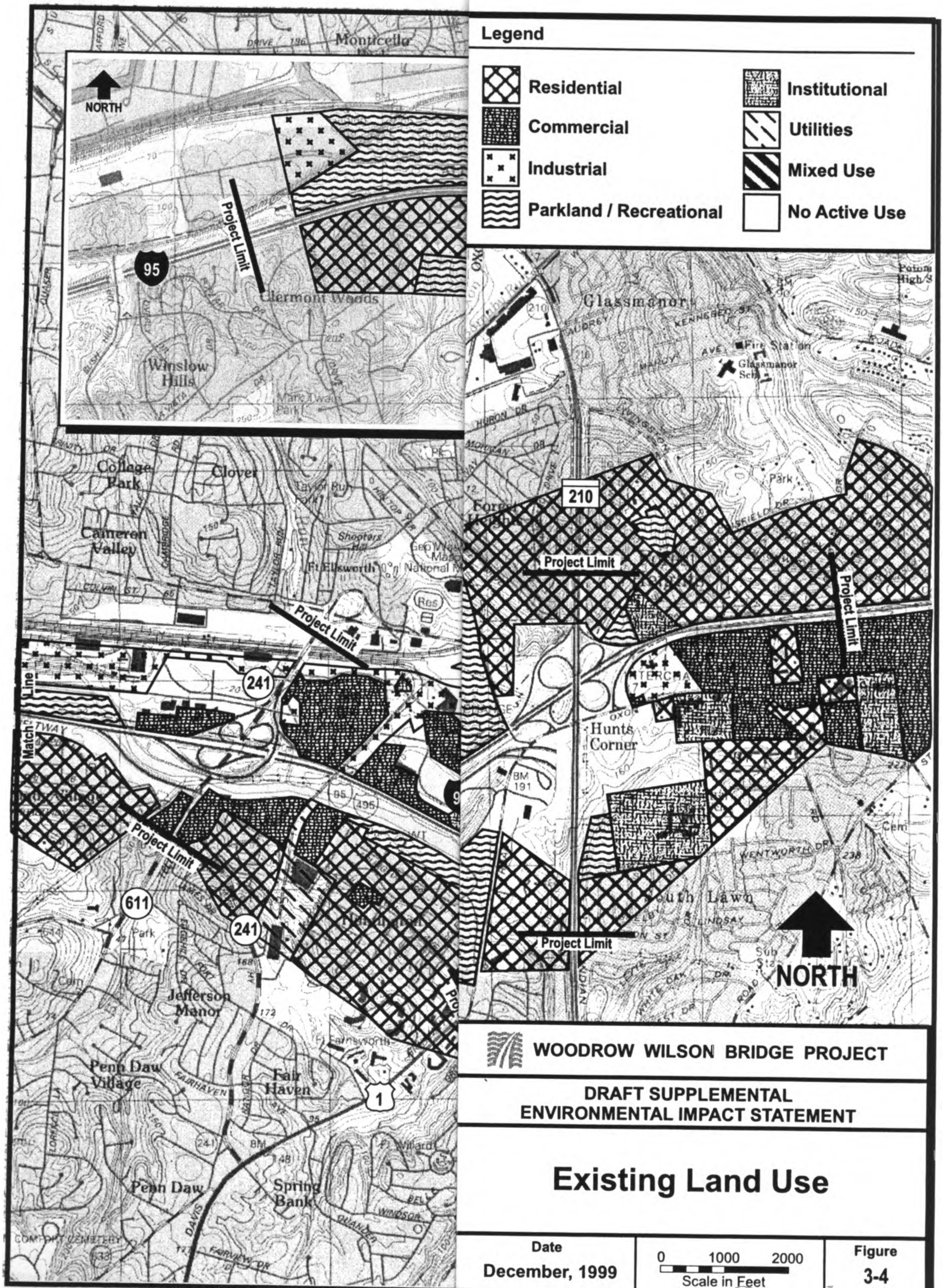

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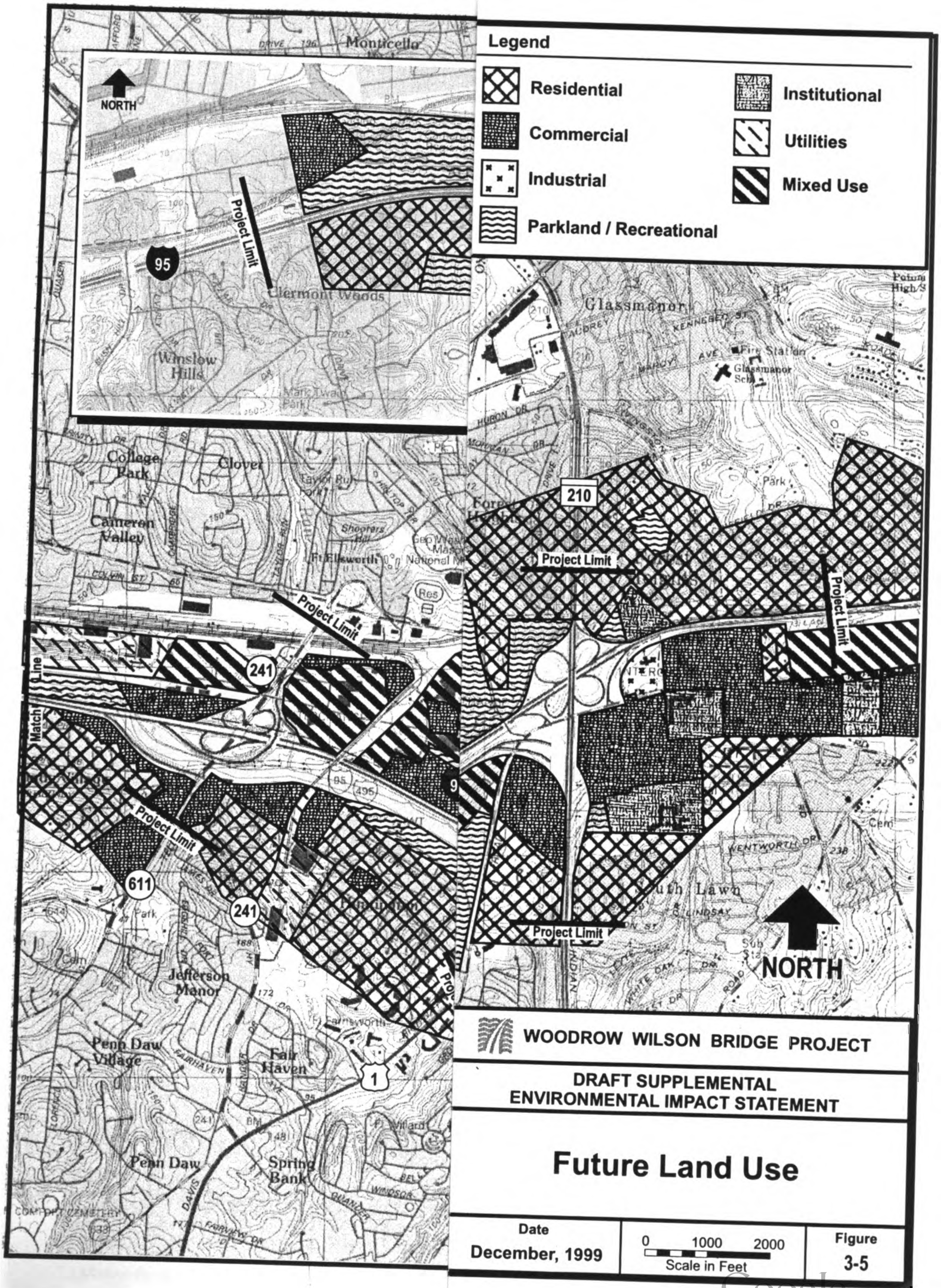

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Future Land Use

Date		Figure
December, 1999	Scale in Feet	3-5

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3.3.3 Demographics

Population: The 1997 FEIS analyzed population data for both the metropolitan region and current project area and using the 1990 Census and data from the MWCOG Round 5.1 population and employment forecast models, which was based on the 1990 Census. Since the publication of the FEIS in 1997, the MWCOG model was updated and is identified as Round 6.1 Cooperative Forecast. The project limits for Current Design Alternative 4A extend into four additional census tracts shown on Figure 3.6 and twelve additional Transportation Analysis Zones (TAZ) shown on Figure 3.7. The new data includes these areas and the latest MWCOG Round 6.1 Cooperative Forecast population and employment forecasts. These forecasts estimate population growth, market conditions, residential or commercial growth projects, and rezoning (see Table 3-5).

The MWCOG Round 6.1 Cooperative Forecast data predicts an 18.9 percent increase in population in the project area between 1990 and 2010, nearly identical with the projection of 18.7 percent stated in the 1997 FEIS. Ten of the 37 zones in the project area, scattered throughout all jurisdictions, are expected to experience a population reduction during this same period. The remaining 27 zones will experience population growth as shown in Table 3-5.

Between 1990 and 2020, the population is projected to increase a total of 25.0 percent with only eight zones experiencing a reduction in population. The remaining zones are forecasted to grow during the same time period. For the period 1990 to 2020, the MWCOG Round 5.1 Cooperative Forecasts used in the 1997 FEIS projected an increase of 37.2 percent in the project area compared to the 25.0 percent increase projected by the Round 6.1 data for the extended project area. The population forecasts for the City of Alexandria and Fairfax County are similar between the Round 5.1 and 6.1 forecasts, regardless of the expanded project limits. The difference in forecasts can be attributed to the reduction in the rate of growth predicted for Prince George's County (from 26.3 percent in the Round 5.1 forecast to 4.4 percent in the Round 6.1 forecast for essentially the same study area) and the addition of the District of Columbia to the project area which is projected to have a population reduction of 19.4 percent.

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Table 3-5: Population Trends Round 6.1 Cooperative Forecasts for Project Area

TAZ [1]	1990 Total Population	2010 Total Population	Percent Change from 1990	2020 Total Population	Percent Change From 1990
District of Columbia					
313 [2]	0	0	0.0%	0	0
314	295	314	6.4%	351	19.0%
315	1,473	950	-35.5%	1,074	-27.1%
Subtotal	1,768	1,264	-28.5%	1,425	-19.4%
Fairfax County, Virginia					
1405	477	0	-100.0%	0	-100.0%
1468	4,208	7,158	70.1%	7,465	77.4%
1469	3,216	3,439	6.9%	3,538	10.0%
1470	3,202	3,405	6.3%	3,486	8.9%
1476	1,222	922	-24.5%	943	-22.8%
1477	2,218	2,766	24.7%	2,879	29.8%
1478	846	1,064	25.8%	1,218	44.0%
1480	2,316	4,004	72.9%	4,054	75.0%
1494	3,416	4,958	45.1%	5,407	58.3%
Subtotal	21,121	27,716	31.2%	28,990	37.2%
City of Alexandria, Virginia					
1331	1,966	2,077	5.6%	2,089	6.3%
1332	1,626	1,830	12.5%	2,074	27.6%
1333	1,549	1,793	15.8%	1,806	16.6%
1334	1,432	1,027	-28.3%	1,088	-24.0%
1338	897	1,052	17.3%	1,065	18.7%
1339	1,813	2,510	38.4%	2,527	39.4%
1340	508	801	57.7%	804	58.3%
1341	5	496	9,820.0%	496	9,820.0%
1342	1,052	1,067	1.4%	1,069	1.6%
1343	756	710	-6.1%	713	-5.7%
1344	801	757	-5.5%	758	-5.4%
1365	0	2,390	not applicable	4,625	not applicable
1366	0	557	not applicable	606	not applicable
1367	0	787	not applicable	787	not applicable
1368	3	4	33.3%	4	33.3%
1369	151	554	266.9%	554	266.9%

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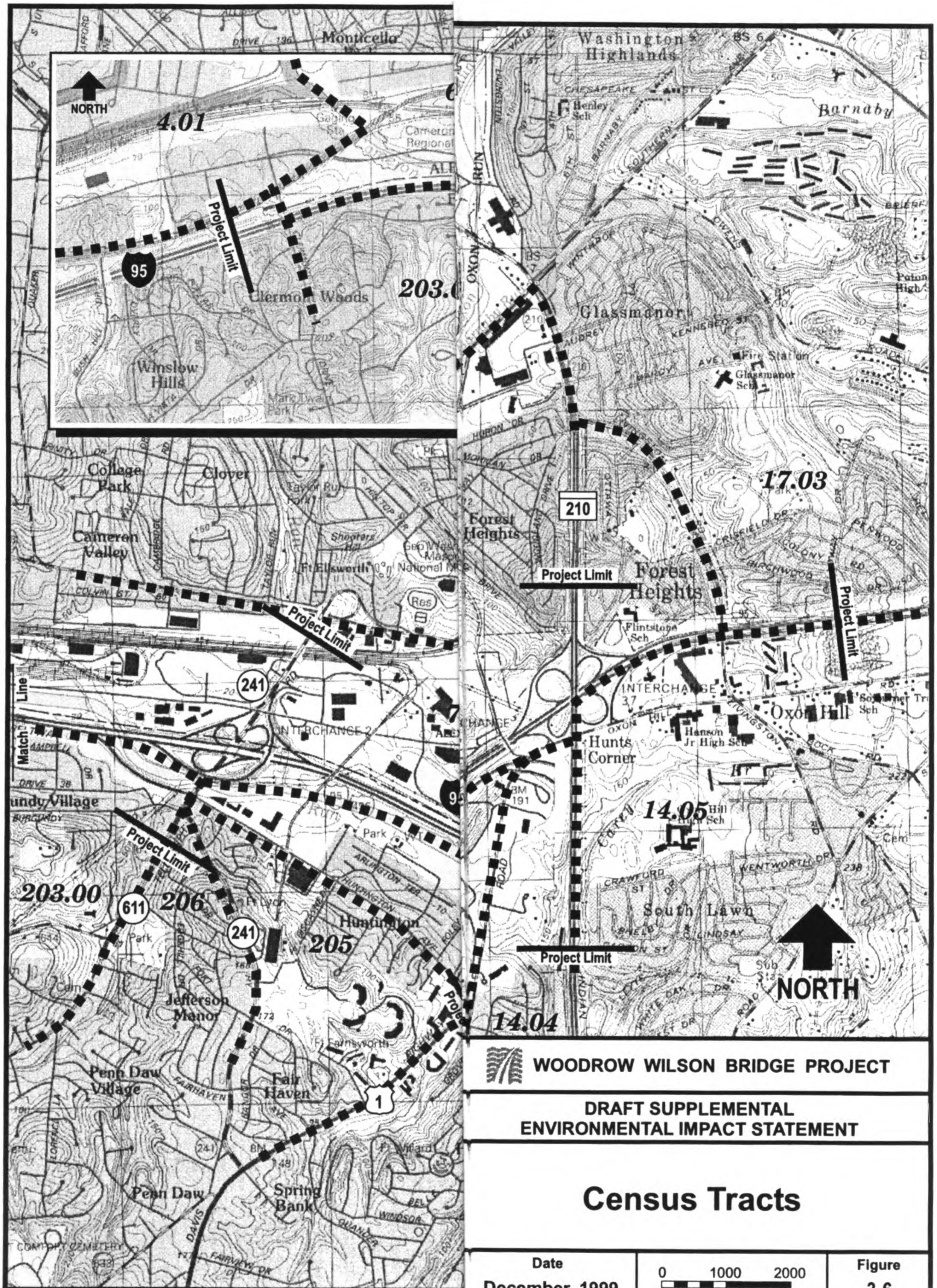

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Census Tracts

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	3-6

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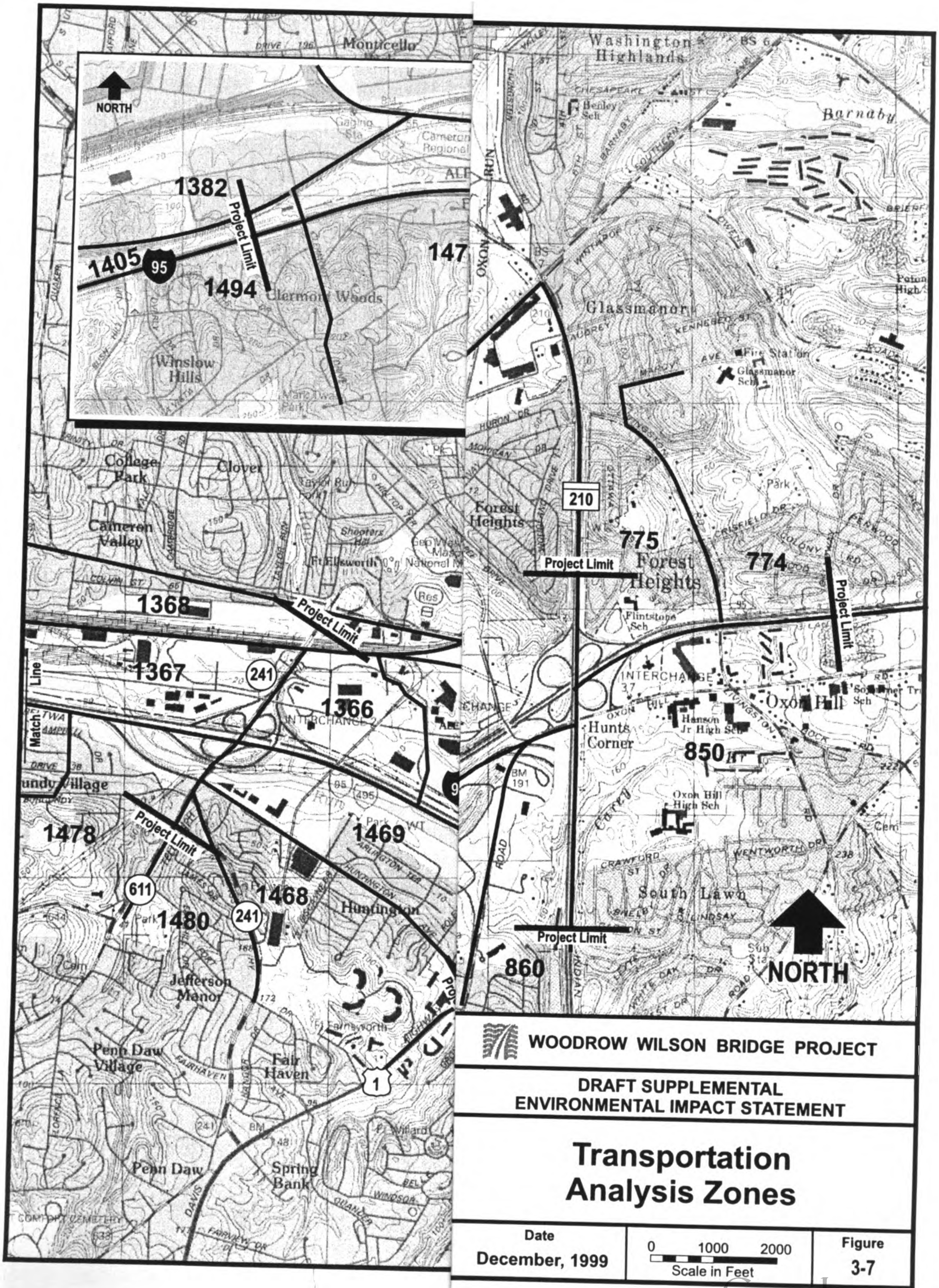

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Transportation Analysis Zones

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	3-7

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Table 3-5: Population Trends Round 6.1 Cooperative Forecasts for Project Area (continued)

TAZ [1]	1990 Total Population	2010 Total Population	Percent Change from 1990	2020 Total Population	Percent Change from 1990
City of Alexandria, Virginia, (continued)					
1370	3,117	3,112	-0.2%	3,130	0.4%
1382	0	0	0.0%	0	0.0%
Subtotal	15,676	21,524	37.3%	24,195	54.3%
Prince George's County, Maryland					
774	8,654	8,638	-0.2%	8,706	0.6%
775	6,125	5,768	-5.8%	5,835	-4.7%
779	1,618	1,492	-7.8%	1,467	-9.3%
780 [3]	0	0	0.0%	0	0.0%
850	4,043	4,189	3.6%	4,223	4.5%
859	7,430	8,770	18.0%	8,705	17.2%
860	3,411	3,668	7.5%	3,728	9.3%
Subtotal	31,281	32,525	4.0%	32,664	4.4%
Project Area Total	69,846	83,029	18.9%	87,274	25.0%

1 TAZ – Transportation Analysis Zone - see Figure 3-7 for location
2 TAZ 313 includes Blue Plains Wastewater Treatment Plant
3 TAZ 780 primarily includes water and undeveloped land
Source: *Washington Metropolitan Council of Governments. 1999. Round 6.1 Cooperative Forecast of Population, Households and Employment to 2020.*

Race: Racial data was analyzed by the following categories as defined by the U.S. Census Bureau including Black, Asian and Pacific Islander, and White populations. Populations classified as "Others" were incorporated into the total White population in this analysis. Table 3-6 shows that Blacks are by far the largest component of the minority population of the project area at 37.3 percent of the population; Asians and Pacific Islanders comprise 5.5 percent of the population; and Whites including "Others," account for 57.2 percent of the population. In addition, 5.1 percent of the population identified themselves as belonging to one of the racial categories discussed above and as Hispanic.

Whites are heavily concentrated in Fairfax County and Alexandria with 85 percent and 67 percent of the total in the project area, respectively. Blacks are concentrated in Prince George's County with 66 percent of the population in the project area. A high concentration of minority populations reside in the Prince George's County census tracts, particularly census tract 15.00 (very close to the MD 210 interchange).

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Table 3-6: Population and Racial Characteristics for Project Area

Jurisdiction	Total Population		Percent Change	1990 Census			
	1980	1990		Black	Hispanic*	Asian or Pacific Islander	White, Including Others
District of Columbia							
Census Tract 73.01	7,040	7,767	10.3%	2,664	515	408	4,695
Census Tract 73.08	812	709	-12.6	612	7	1	96
Project Area Subtotal	7,852	8,476	7.9%	3,276	522	409	4,791
Fairfax County, Virginia							
Census Tract 151.00	3,062	3,262	6.5%	341	38	146	2,775
Census Tract 152.00	3,458	3,165	-8.5%	137	133	71	2,957
Census Tract 203.00	4,445	4,935	11.0%	196	179	126	4,613
Census Tract 204.00	2,321	2,459	5.9%	364	330	34	2,061
Census Tract 205.00	3,492	5,030	44.0%	610	208	305	4,115
Census Tract 206.00	3,899	4,049	3.8%	771	592	385	2,893
Project Area Subtotal	20,677	22,900	10.8%	2,419	1,480	1,067	19,414
City of Alexandria, Virginia							
Census Tract 4.01	4,222	4,561	8.0%	1,016	731	318	3,227
Census Tract 6.00	3,622	4,010	10.7%	837	487	381	2,792
Census Tract 7.98	2,028	2,986	47.2%	1,660	94	15	1,311
Census Tract 16.00	3,849	3,443	-10.5%	2,278	173	33	1,132
Census Tract 18.02	2,077	1,968	-5.2%	680	36	7	1,281
Census Tract 19.00	1,695	1,728	1.9%	223	81	14	1,491
Census Tract 20.01	1,982	2,079	4.9%	108	0	0	1,971
Census Tract 20.02	1,981	2,234	12.8%	86	29	17	2,131
Project Area Subtotal	21,456	23,009	7.2	6,888	1,631	785	15,336
Prince George's County, Maryland							
Census Tract 14.03	5,764	6,489	12.6%	3,255	143	1,220	2,014
Census Tract 14.04	3,610	3,663	1.5%	2,024	59	283	1,356
Census Tract 14.05	3,733	3,548	-5.0%	1,423	67	363	1,762
Census Tract 15.00	3,001	2,877	-4.1%	2,052	52	124	701
Census Tract 17.03	9,483	10,227	7.8%	8,965	190	191	1,071
Project Area Subtotal	25,591	26,804	4.7%	17,719	511	2,181	6,904
Total Project Area	**75,576**	**81,189**	**7.4%**	**30,302**	**4,144**	**4,442**	**46,445**
Metropolitan Statistical Area (MSA)	3,060,922	3,923,574	28.2%	1,041,934	224,786	202,437	2,679,203
District of Columbia	638,333	606,900	4.9%	399,604	32,710	11,214	196,082
City of Alexandria, VA	103,217	111,183	7.7%	24,339	10,778	4,632	82,212
Fairfax County, VA	596,901	818,584	37.1%	63,325	51,874	69,338	685,921
Prince George's County, MD	665,071	729,268	9.7%	369,791	29,983	28,255	331,222
Commonwealth of VA	5,346,818	6,187,358	15.7%	1,162,994	160,288	159,053	4,865,311
State of Maryland	4,216,975	4,781,468	13.3%	1,189,899	125,102	139,719	3,451,850

* *Population identified as Hispanic in addition to belonging to an additional racial category*

Source: *1980 and 1990 Census of Population and Housing*

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The Black population comprises a larger percentage (37.3 percent) of the project area population as compared to the broader Metropolitan Statistical Area (MSA) Black population of 1990 (26.5 percent). At the same time, the White and "Other" population in the project area fell by 4.3 percent, decreasing from 48,449 to 46,377 between 1980 and 1990. An MSA is defined by the Office of Management and Budget as an area that includes a city of at least 50,000 population or an urbanized area with a population of at least 50,000 with a total metropolitan area population of at least 100,000. The Washington, D.C. – Maryland – Virginia – West Virginia MSA includes all of the District of Columbia, the southern half of central Maryland, the northern portion of Virginia, and the eastern edge of West Virginia.

Census data shows a gradual increase in the number of Hispanic citizens in the project area. The percentage of Hispanics (6.5 percent) who reside in the Fairfax County portion of the project area is larger than the percentage within the MSA (5.7 percent). Asian populations grew by 48 percent, which is the second highest project area average growth rate between 1980 and 1990 - this population is highly represented in the Prince George's County region of the project area.

Age: The percentage of people age 65 and older is slightly below that of the region-wide percentages (7.4 percent of the project area totals versus 8.7 percent of the MSA totals). According to 1990 data, five census tracts (73.08, 151.00, 152.00, 18.02, and 20.01) contained 10 percent or more of the project area's elderly population. The total elderly population within the project area showed a 21.1 percent increase between 1980 and 1990. The smallest increase was experienced in the City of Alexandria, which increased by only 2.8 percent in the project area. These figures are shown in Table 3-7.

Housing: As shown in Table 3-8, the total number of housing units increased from 1980 to 1990 in all census tracts except tracts 18.02 and 19.00 in the City of Alexandria, tract 15.00 in Prince George's County, and tract 73.08 in the District of Columbia. The largest number of housing units within the project area is concentrated in census tract 4.01 in the City of Alexandria and 17.03 in Prince George's County where a majority of high density housing is located. Census tract data shows that the total housing supply in the project area has increased by 9.2 percent from 31,359 to 34,232 between 1980 and 1990. Prince George's County experienced notable growth during this period in the South Potomac region of the project area, while the Fairfax housing stock increased in Region IV, primarily in census tract 203.00 bordered by US 1, Hunting Creek, and Kings Highway.

The total number of owner occupied units in the project area rose from 11,500 to 16,066 between 1980 and 1990, an increase of 39.7 percent, while the number of rental opportunities have generally declined in all project area jurisdictions, except the District of Columbia. Portions of the District within the project area experienced an 88.2 percent decline in owner occupied housing and an increase of 21.3 percent in rental units. Alexandria showed the smallest decrease (58.7 percent to 52.6 percent) between 1980 and 1990, while Fairfax County had the largest relative decrease (49.1 percent to 38.7 percent) in the percentage of rental housing for jurisdictions within the project area. The 1990 data shown in Table 3-8 also reveals that the population in the Fairfax County and Prince George's County portions of the project area consists of more homeowners as compared to renters. Conversely, renters comprise a larger number of the residents in the Alexandria and the District of Columbia portions of the project area.

Fairfax County census tracts had the highest increase in housing between 1980 and 1990, rising by 1,599 housing units. The census tracts in the City of Alexandria portion of the project area showed the

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smallest increase in housing stock between 1980 and 1990, an increase of 444 housing units. The total number of units in the MSA in 1990, was 1,459,358, of which 883,612 were owner occupied and 575,746 were renter occupied. The U.S. Census reports 1990 median gross monthly rent for jurisdictions within the project area were as follows: Fairfax County: $834, the City of Alexandria: $701, Prince George's County: $642, and the District of Columbia: $479.

The MWCOG Round 6.1 Cooperative Forecast household projections estimate a 21.9 percent increase in households between 1990 and 2010. Seven of the 37 zones are expected to experience a reduction of households with the remainder forecasted to increase during the same period. For the period from 1990 to 2020, growth in households is projected to increase 30.6 percent with only five TAZ's projecting a reduction of households. Round 5.1 data used in the 1997 FEIS noted that TAZ 1476 (formerly TAZ 550F) was expected to experience a 41 percent reduction in households between 1990 and 2010 with this reduction expected to decrease to 30 percent by 2020. The Round 6.1 data for this TAZ predicts an acceleration of this decrease over Round 5.1 data with a 45.7 percent reduction in households between 1990 and 2010 and further forecasts the reduction rate to hold steady at 44.5 percent to 2020. The remainder of the Round 6.1 data is not substantially different from the Round 5.1 data used in the 1997 FEIS. The MWCOG household projections are shown in Table 3-9.

The 1997 FEIS, Section 3.3.3 contains discussions on public housing and other residential units within the project area. This information has not changed substantially since the publication of that document.

Table 3-7: Age Characteristics for Project Area

Jurisdiction	Persons Age 65+ in 1980	Persons Age 65+ in 1990	Percent of Total in 1990	Percent Change from 1980
District of Columbia				
Census Tract 73.01	21	15	0.2 %	-28.6 %
Census Tract 73.08	488	235	33.1 %	-51.8 %
Project Area Subtotal	501	250	2.9 %	-50.1 %

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Table 3-7: Age Characteristics for Project Area (continued)

Jurisdiction	Persons Age 65+ in 1980	Persons Age 65+ in 1990	Percent of Total in 1990	Percent Change from 1980
Fairfax County, Virginia				
Census Tract 151.00	353	484	14.8 %	37.1 %
Census Tract 152.00	524	483	15.3 %	-7.8 %
Census Tract 203.00	169	441	8.9 %	160.9 %
Census Tract 204.00	97	95	3.9 %	-2.1 %
Census Tract 205.00	123	420	8.4 %	241.5 %
Census Tract 206.00	193	202	5.0 %	4.7 %
Project Area Subtotal	1,459	2,125	9.3 %	45.6 %
City of Alexandria, Virginia				
Census Tract 4.01	108	183	4.0 %	69.4 %
Census Tract 6.00	206	337	8.4 %	63.5 %
Census Tract 7.98	352	272	9.1 %	-22.7 %
Census Tract 16.00	406	333	9.7 %	-18.0 %
Census Tract 18.02	169	198	10.1 %	17.2 %
Census Tract 19.00	140	94	5.4 %	-32.9 %
Census Tract 20.01	246	346	16.6 %	40.7 %
Census Tract 20.02	384	304	13.6 %	-20.8 %
Project Area Subtotal	2,011	2,067	9.61 %	2.8 %
Prince George's County, Maryland				
Census Tract 14.03	222	322	5.0 %	45.0 %
Census Tract 14.04	152	299	8.2 %	96.7 %
Census Tract 14.05	186	343	9.7 %	84.4 %
Census Tract 15.00	188	271	9.4 %	44.1 %
Census Tract 17.03	282	379	3.7 %	34.4 %
Project Area Subtotal	1,030	1,614	6.0 %	56.7 %
Total Project Area	**5,001**	**6,056**	**7.4 %**	**21.1 %**
MSA	230,712	368,233	8.7%	59.6%
District of Columbia	74,310	77,847	12.8%	4.8%
City of Alexandria, Virginia	9,465	11,406	10.3%	20.5%
Fairfax County, Virginia	26,989	53,544	6.5%	98.3%
Prince George's County, MD	36,508	50,343	6.9%	37.9%
Commonwealth of Virginia	305,596	664,470	10.7%	117.3%
State of Maryland	334,441	517,482	10.8%	54.7%

Source: 1980 and 1990 U.S. Census Report

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Table 3-8: Housing Characteristics for Project Area

Jurisdiction	1980 Total Housing	1990 Total Housing	Percent Change 1980-1990	Owner Occupied 1980	Owner Occupied 1990	Percent Change 1980-1990	Renter Occupied 1980	Renter Occupied 1990	Percent Change 1980-1990
District of Columbia									
Census Tract 73.01	1,677	1,987	18.5 %	136	16	-88.2 %	1,511	1,830	21.1 %
Census Tract 73.08 *	0	1	NA	0	0	0	0	3	NA
Project Area Subtotal	1,677	1,988	18.5 %	136	16	-88.2 %	1,511	1,833	21.3 %
Fairfax County, Virginia									
Census Tract 151.00	1,150	1,300	13.0 %	821	1,078	31.3 %	154	153	-0.6 %
Census Tract 152.00	1,929	1,933	0.2 %	363	1,255	245.7 %	1,282	590	-54.0 %
Census Tract 203.00	1,458	1,849	26.8 %	1,166	1,562	34.0 %	161	235	46.0 %
Census Tract 204.00	1,608	1,659	3.2 %	170	178	4.7 %	1,209	1,226	1.4 %
Census Tract 205.00	1,840	2,767	50.4 %	378	1,352	257.7 %	971	1,275	31.3 %
Census Tract 206.00	1,489	1,565	5.1 %	524	643	22.7 %	873	811	-7.1 %
Project Area Subtotal	9,474	11,073	16.9 %	3,422	6,068	77.3 %	4,650	4,290	-7.7 %
City of Alexandria, Virginia									
Census Tract 4.01	2,951	2,953	0.1 %	299	363	21.4 %	2,017	1,936	4.0 %
Census Tract 6.00	1,478	1,613	9.1 %	1,002	1,046	4.4 %	429	516	20.3 %
Census Tract 7.98	1,148	1,328	15.7 %	207	408	97.1 %	827	862	4.2 %
Census Tract 16.00	1,360	1,371	0.8 %	401	601	49.9 %	854	750	-12.2 %
Census Tract 18.02	994	888	-10.7 %	378	498	31.7 %	516	419	-18.8 %
Census Tract 19.00	919	867	-5.7 %	280	380	35.7 %	496	456	-8.1 %
Census Tract 20.01	921	1,042	13.1 %	524	725	38.4 %	287	243	-15.3 %
Census Tract 20.02	1,600	1,753	9.6 %	209	496	137.3 %	1,254	1,153	-8.1 %
Project Area Subtotal	11,371	11,815	3.9 %	3,300	4,517	36.8 %	6,680	6,335	-5.1 %
Prince George's County, Maryland									
Census Tract 14.03	1,658	1,987	19.8 %	1,428	1,820	27.5 %	100	140	40.0 %
Census Tract 14.04	1,466	1,526	4.1 %	601	923	53.6 %	410	550	34.1 %
Census Tract 14.05	1,305	1,308	0.2 %	740	748	1.1 %	537	517	-3.7 %
Census Tract 15.00	941	933	-0.9 %	851	817	-4.0 %	66	102	54.5 %
Census Tract 17.03	3,467	3,602	3.9 %	1,022	1,157	13.2 %	2,021	2,175	7.6 %
Project Area Subtotal	8,837	9,356	5.9 %	4,642	5,465	17.7 %	3,134	3,484	11.2 %
Total Project Area	**31,359**	**34,232**	**9.2 %**	**11,500**	**16,066**	**39.7 %**	**15,975**	**15,942**	**-0.2 %**
Metropolitan Statistical Area (MSA)	781,916	1,674,507	114.2%	479,574	959,759	100.1%	302,342	606,375	105.6%
District of Columbia	276,984	278,489	0.5%	89,846	97,108	8.1%	163,297	152,526	-6.6%
City of Alexandria, VA	52,041	58,252	11.9%	17,878	21,566	20.6%	31,126	31,714	1.9%
Fairfax County, VA	215,739	307,966	42.7%	138,909	206,793	48.9%	66,257	85,552	29.1%
Prince George's County	236,465	270,090	14.2%	123,100	151,869	23.4%	101,689	106,142	4.4%
Virginia	2,020,941	2,496,334	23.5%	1,221,555	1,519,521	24.4%	641,518	772,309	20.4%
Maryland	1,554,996	1,891,917	21.7%	1,111,707	1,137,296	2.3%	443,289	611,695	38.0%

* *Census tract 73.08 houses individuals at two institutions, a nursing home and Job Corps, which are not housing units as defined by the U.S. Census*

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Table 3-9: Housing Trends - MWCOG Round 6.1 Cooperative Forecasts for Project Area

Jurisdiction	TAZ [1]	1990 Households	2010 Households	Percent Change 1990-2010	2020 Households	Percent Change 1990-2020
District of Columbia	313 [2]	0	0	0	0	0
	314	151	144	-4.64 %	156	3.31 %
	315	465	436	-6.24 %	477	2.58 %
Subtotal		616	580	-5.84 %	633	2.76 %
Fairfax County, Virginia	1405	176	0	-100.00 %	0	-100.00 %
	1468	2,285	3,336	46.00 %	3,478	52.21 %
	1469	1,746	1,625	-6.93 %	1,669	-4.41 %
	1470	1,231	1,330	8.04 %	1,360	10.48 %
	1476	654	355	-45.72 %	363	-44.50 %
	1477	832	1,003	20.55 %	1,046	25.72 %
	1478	317	391	23.34 %	452	42.59 %
	1480	841	1,682	100.00 %	1,701	102.26 %
	1494	1,254	1,776	41.63 %	1,957	56.06 %
Subtotal		9,336	11,498	23.16 %	12,026	28.81 %
City of Alexandria, Virginia	1331	971	1,028	5.87 %	1,034	6.49 %
	1332	785	884	12.61 %	1,002	27.64 %
	1333	948	1,100	16.03 %	1,108	16.88 %
	1334	1,078	772	-28.39 %	818	-24.12 %
	1338	428	501	17.06 %	507	18.46 %
	1339	750	897	19.60 %	903	20.40 %
	1340	281	443	57.65 %	444	58.01 %
	1341	3	265	8,733.33 %	265	8,733.33 %
	1342	607	618	1.81 %	618	1.81%
	1343	289	284	-1.73 %	285	-1.38 %
	1344	484	508	4.96 %	509	5.17 %
	1365	0	1,278	not applicable	2,473	not applicable
	1366	0	298	not applicable	557	not applicable
	1367	0	421	not applicable	421	not applicable
	1368	2	2	0.00 %	2	0.00 %
	1369	50	277	454.00 %	277	454.00 %
	1370	1,272	1,353	6.37 %	1,361	7.00 %
	1382	0	0	0	0	0
Subtotal		7,948	10,929	37.51 %	12,584	58.33 %

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Table 3-9: Housing Trends - MWCOG Round 6.1 Cooperative Forecasts for Project Area
(continued)

Jurisdiction	TAZ [1]	1990 Households	2010 Households	Percent Change 1990-2010	2020 Households	Percent Change 1990-2020
Prince George's County, Maryland	774	3,340	3,587	7.40 %	3,684	10.30 %
	775	2,412	2,460	1.99 %	2,539	5.27 %
	779	545	546	0.18 %	548	0.55 %
	780 [3]	0	0	0	0	0
	850	1,434	1,619	12.90 %	1,661	15.83 %
	859	2,299	2,949	28.27 %	2,986	29.88 %
	860	1,341	1,519	13.27 %	1,564	16.63 %
Subtotal		11,371	12,680	11.51 %	12,982	14.17 %
Total Project Area		29,271	35,687	21.92 %	38,225	30.59 %

Source: *MWCOG 1999 Round 6.1 Cooperative Forecast of population, Households and Employment to 2020*
1 TAZ – Transportation Analysis Zone
2 TAZ 313 includes Blue Plains Wastewater Treatment Plant
3 TAZ 780 primarily includes water and undeveloped land

Income: The income data from the project area shows an increase in average per capita income levels between 1980 and 1990 (see Table 3-10). The highest per capita income is concentrated in the City of Alexandria, particularly in census tracts 18.02, 19, 20.01 and 20.02. Several Alexandria census tracts doubled in per capita income over the ten-year period, while Prince George's County has undergone more subtle changes in income. Fairfax County data reveals a population with fairly uniform per capita incomes. The 1990 median household income indicates that the majority of project area households earn between $33,000 and $74,999 annually across all census tracts and all racial groups, except for census tract 73.08 in the District of Columbia.

In tract 73.08, with the lowest per capita income in the project area, per capita income rose 485.9 percent from $907 to $5,314 during the period between 1980 and 1990. This tract encompasses the Blue Plains Wastewater Treatment Plant, DC Village and a portion of the Naval Research Laboratory. According to the directors of the facilities, during this period the population of this tract consisted of approximately 300 nursing home residents and 400 Job Corps participants in residence at DC Village. This rise in income between 1980 and 1990 may be attributable to a modest rise in stipends for the Job Corps participants and an increased diligence on the part of the nursing home operator to gain local and federal financial support for previously unsupported nursing home residents.

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Table 3-10: Income Characteristics for Project Area

Jurisdiction	Per Capita Income in 1980	Per Capita Income in 1990	Percent Change from 1980
District of Columbia			
Census Tract 73.01	$5,294	$11,430	115.9 %
Census Tract 73.08	$907	$5,314	485.9 %
Project Area Subtotal	$3,101	$8,372	170.0 %
Fairfax County, Virginia			
Census Tract 151.00	$12,290	$28,105	128.7 %
Census Tract 152.00	$11,753	$29,595	151.8 %
Census Tract 203.00	$9,950	$23,838	139.6 %
Census Tract 204.00	$11,014	$23,412	112.6 %
Census Tract 205.00	$10,700	$27,380	155.9 %
Census Tract 206.00	$7,874	$18,531	135.3 %
Project Area Subtotal	$10,597	$25,144	137.3 %
City of Alexandria, Virginia			
Census Tract 4.01	$13,210	$20,750	57.1 %
Census Tract 6.00	$10,706	$19,666	83.7 %
Census Tract 7.98	$9,072	$20,523	126.2 %
Census Tract 16.00	$4,539	$17,413	283.6 %
Census Tract 18.02	$14,064	$38,998	177.3 %
Census Tract 19.00	$13,600	$40,304	196.4 %
Census Tract 20.01	$20,272	$68,897	239.9 %
Census Tract 20.02	$15,876	$37,237	134.5 %
Project Area Subtotal	$11,260	$29,310	160.3 %
Prince George's County, Maryland			
Census Tract 14.03	$11,799	$21,444	81.7 %
Census Tract 14.04	$10,746	$18,308	70.4 %
Census Tract 14.05	$8,301	$15,095	81.8 %
Census Tract 15.00	$8,084	$17,231	113.1 %
Census Tract 17.03	$7,284	$13,378	83.7 %
Project Area Subtotal	$9,243	$17,091	84.9 %
Total Project Area	**$8,548**	**$19,979**	**133.7 %**

Table continued on the following page.

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Table 3-10: Income Characteristics for Project Area (continued)

Jurisdiction	Per Capita Income in 1980	Per Capita Income in 1990	Percent Change from 1980
Metropolitan Statistical Area (MSA)	$10,249	$20,935	104.3%
District of Columbia	$8,960	$18,880	110.7%
City of Alexandria, Virginia	$12,177	$25,509	109.5%
Fairfax County, Virginia	$11,497	$24,833	116.0%
Prince George's County, MD	$8,616	$17,391	101.8%
Commonwealth of Virginia	$7,478	$15,713	110.1%
State of Maryland	$8,293	$17,730	113.8%

***Source:** 1980 and 1990 Census of Population and Housing*

3.3.4 Social Environment

Community Facilities and Services: Under Current Design Alternative 4A, additional community facilities and services were identified beyond those identified in the 1997 FEIS, Section 3.3.4. They are: Blue Plains Wastewater Treatment Plant, the Metropolitan Police Academy and Firefighter Training Center in the District of Columbia, Oxon Hill Library in Prince George's County, Strayer University – Alexandria Campus, and Cameron Elementary School and Burgundy Farm Country School in Fairfax County. The location of community facilities and services are shown in Figure 3-8.

Park and Recreation Areas: The project area contains many park and recreation resources, which were previously identified in the 1997 FEIS, Section 3.3.4. Five additional major parks and recreation areas have been identified in the vicinity of the extended project limits for Current Design Alternative 4A. Clermont Natural Park, Joseph Hensley Park and Cameron Run Park are located in the City of Alexandria. Burgundy Park and Loftridge Park are located south of the Capital Beltway in Fairfax County. Park and recreation areas are shown in Figure 3-8.

Cameron Run Regional Park/Lake Cook encompasses 44.60 acres and is located just north of the Capital Beltway, to the west of Telegraph Road, and is adjacent to Eisenhower Avenue. Cameron Run separates the park from the Capital Beltway. The park is under the jurisdiction of the Northern Virginia Regional Park Authority. It contains a developed area with a water park (wave pool, waterslides, etc.), miniature golf, batting cage, picnic shelter and fishing pond. There is also a nature preserve area and a wooded picnic area. It is crossed by train tracks and the Metro rail blue line.

Burgundy Park encompasses 7.37 acres and is located just south of the Beltway, to the west of Telegraph Road. It is under the jurisdiction of the Fairfax County Park Authority. It is developed with a practice tennis wall, two tennis courts, picnic area, playground, tot-lot, and hiker/nature trail. A noise wall separates the Park from the Capital Beltway.

Loftridge Park encompasses 48.14 acres and is located roughly one-quarter mile south of the Capital Beltway west of Telegraph Road. It is under the jurisdiction of the Fairfax County Park Authority. It is undeveloped except for bike and hiking trails. There are no plans for future development.

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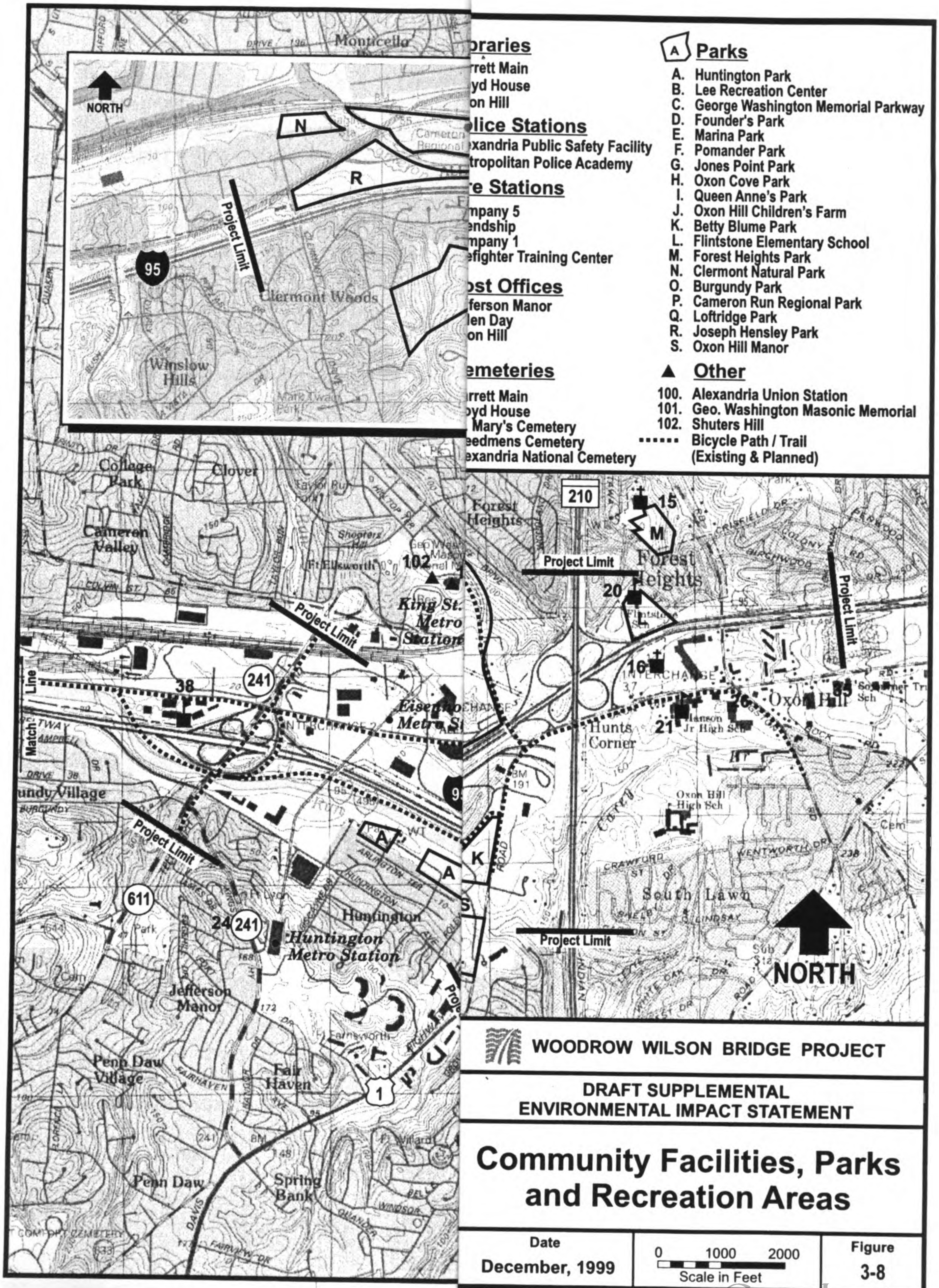

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Community Facilities, Parks and Recreation Areas

Date: December, 1999

Scale in Feet: 0 1000 2000

Figure 3-8

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Huntington Park encompasses 10.88 acres and is located roughly 0.1 mile south of the Capital Beltway between Telegraph Road and US 1, separated from the Capital Beltway by Cameron Run. Huntington Park is under the jurisdiction of the Fairfax County Park Authority. The park is developed with a basketball courts, baseball diamonds, a hiker/biker trail, and playground.

Joseph Hensley Memorial Park encompasses 14.8 acres and it located just north of the Capital Beltway, to the west of Telegraph Road and adjacent to Eisenhower Avenue. It is under the jurisdiction of the City of Alexandria. It is developed with lighted baseball diamonds and soccer fields.

Clermont Natural Park encompasses 5.49 acres and is located roughly one-quarter mile to the west of Telegraph Road. It is under the jurisdiction of the City of Alexandria. It is an undeveloped wooded/natural area and wildlife habitat.

3.3.5 Visual and Aesthetic Resources

The existing visual environment has not changed substantially from what is described in Section 3.3.5 of the 1997 FEIS.

3.3.6 Economic Setting

Regional Economy: The economy within the region is discussed in Section 3.3.6 of the 1997 FEIS and has not changed substantially since the publication of that document.

Local Economy: With the expansion of the project limits for the Current Design Alternative 4A, additional areas, primarily within the District of Columbia jurisdictional boundaries, contribute to the local economy studied for this document. The area just north of the District's southern jurisdictional boundaries and east of I-295 is a cluster of municipal office buildings and training centers called DC Village. No commercial or private development currently exists in this area. Eisenhower Valley development area, east of Telegraph Road and north of the mainline, and National Harbour along the Maryland shoreline, are primarily commercial and office developments of significance. The discussions regarding the local economy of Alexandria, Fairfax County and Prince George's County are included in Section 3.3.6 of the1997 FEIS.

3.4 Existing Air Quality

The purpose of this air quality section is to describe current air quality conditions and regulatory framework in the project area. Since the 1997 FEIS, EPA has added $PM_{2.5}$ as a criteria pollutant.

The potential air quality impacts of the proposed project are discussed in Section 4.4. The following includes a description of the pollutants considered for this analysis, ambient air quality standards, monitored pollutant concentrations, and the project's regulatory setting.

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3.4.1 Relevant Pollutants

"Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, or by adversely affecting human or animal health.

Eight air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide (CO), sulfur oxides (SOx), hydrocarbons (HC), nitrogen oxides (NOx), ozone (O_3), lead (Pb), particulate matter sized 10 microns or less (PM_{10}), and particulate matter with a size of 2.5 microns or less ($PM_{2.5}$). These pollutants, with the exception of HC, are collectively referred to as criteria pollutants. The EPA added $PM_{2.5}$ as a criteria pollutant in 1997.

The sources of these pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably. In the project area, ambient concentrations of CO, O_3 and Pb are primarily influenced by motor vehicle activity. Emissions of sulfur oxides are associated mainly with various stationary sources such as power plants and refineries. Emissions of nitrogen oxides and particulate matter come from both mobile and stationary sources.

Carbon monoxide is a colorless and odorless gas, which in the urban environment is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can lead to headaches, aggravation of cardiovascular disease and impairment of central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the severest meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance, 90 to 180 meters (300 to 600 feet) of heavily traveled roadways. Consequently, it is appropriate to evaluate concentrations of CO on a regional and on a localized or "microscale" basis. Overall CO emissions have been decreasing as a result of the State and Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Sulfur oxides (SOx) constitute a class of compounds of which sulfur dioxide (SO_2) and sulfur trioxide (SO_3) are of great importance. The health effects of SOx include respiratory illness, damage to the respiratory tract, and bronchioconstriction. Relatively little SOx is emitted from motor vehicles.

Hydrocarbons (HC) include a wide variety of volatile organic compounds (VOC) emitted principally from the storage, handling and use of fossil fuels. Though HC can cause eye irritation and breathing difficulty, their principal health effects are related to their role in the formation of O_3.

Nitrogen oxides are of concern because of their role as precursors in the formation of O_3. Most of the NOx emitted by motor vehicles or construction combustion equipment is in the form of nitric oxide (NO) which is not directly harmful to human health. Only a small percentage is emitted as nitrogen dioxide (NO_2) which can cause lung irritation and decrease capacity of the lungs. Once emitted, NO reacts slowly in the presence of sunlight with O_3 to form NO_2. Since the reactions are

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slow and occur as the pollutants are diffusing downwind, elevated NO_2 and O_3 levels are often found many miles from their sources. For that reason, the effects of hydrocarbons and nitrogen oxide emissions are generally examined on a regional basis, and not at a localized level.

Ozone is the principal component of photochemical smog. O_3 is a principal cause of lung and eye irritation in the urban environment. It is formed in the atmosphere through a series of reactions involving hydrocarbons and nitrogen oxides in the presence of sunlight. High O_3 concentrations normally occur only in the summer, when insulation is greatest and temperatures are high.

Particulate matter includes both liquid and solid particles of a wide range of sizes and composition. Of particular concern are those particles that are smaller than or equal to 10 microns or 2.5 microns in size (i.e., PM_{10} and $PM_{2.5}$ respectively). The data collected through many nationwide studies indicates that most PM_{10} are the product of fugitive dust, wind erosion and agricultural and forestry sources, while a small portion are the product of fuel combustion processes. In the case of $PM_{2.5}$, the combustion of fossil fuels accounts for a significant portion of this pollutant. The main health effects of air-borne particulate matter are on the respiratory system.

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In people it affects the blood-forming *(hematopoietic)* system, the nervous system and the renal system. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunologic and gastrointestinal systems. There is significant individual variability in response to lead exposure. The lead used in gasoline anti-knock additives historically represented a major source of lead emissions to the atmosphere. However, lead emissions have significantly decreased due to the mandated elimination of leaded gasoline, and the replacement of vehicles that burn leaded gasoline with those that cannot. In general, an analysis of lead is only performed for projects that emit significant quantities of the pollutant (e.g., lead smelters) or are near such projects.

In conclusion, of the seven criteria pollutants identified by the EPA, as being of nationwide concern, CO is the only pollutant currently requiring a detailed, microscale mobile source impact analysis for roadway projects.

3.4.2 National and State Ambient Air Quality Standards

As required by the Clean Air Act Amendments of 1970 (P.L. 91-064, December 31, 1970) and the Clean Air Act Amendment of 1977 (P.L. 95-95, August 7, 1977), the EPA has established National and State Ambient Air Quality Standards for the following air pollutants: CO, O_3, NO_2, PM_{10}, $PM_{2.5}$, SO_x, and Pb. Maryland, Virginia, and the District of Columbia have also promulgated ambient air quality standards for the same pollutants. Applicable state and federal standards are shown in Table 3-11.

The "primary" standards have been established to protect the public health with an adequate margin of safety. The "secondary" standards are intended to protect the nation's welfare and account for air-pollutant effects on soil, water, visibility, vegetation and other aspects of the general welfare.

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Table 3-11: National and State Ambient Air Quality Standards

Pollutant	Averaging Period	National and State Standards	
		Primary	Secondary
Ozone	1 Hour [b] 8 Hour [c*]	0.12 ppm (235 ug/m^3) 0.08 ppm (157 ug/m^3)	Same as Primary Standard
Carbon Monoxide	1 Hour [a]	35 ppm (40 mg/m^3)	-
	8 Hour [a]	9 ppm (10 mg/m^3)	-
Nitrogen Dioxide	Annual Average	0.053 ppm (100 ug/m^3)	Same as Primary Standard
Sulfur Dioxide	Annual Average	80 ug/m^3 (0.03 ppm)	-
	24 Hour [a]	365 ug/m^3 (0.14 ppm)	-
	3 Hour [a]	-	1300 ug/m^3 (0.5 ppm)
Suspended Particulate Matter (PM_{10})	Annual Arithmetic Mean [3]	50 ug/m^3	Same as Primary Standard
	24 Hour [e]	150 ug/m^3	Same as Primary Standard
Suspended Fine Particulate Matter ($PM_{2.5}$)*	Annual Arithmetic Mean [4]	15 ug/m^3	Same as Primary Standard
	24 Hour[e]	65 ug/m^3	Same as Primary Standard
Lead	Calendar Quarter	1.5 ug/m^3)	Same as Primary Standard
Total Suspended Particulate (TSP) **	Annual geometric mean 24-hour	75 ug/m^3 260* ug/m^3	60 ug/m^3 150* ug/m^3

Notes: * *New standard effective September 16, 1997 (Enforcement of this standard is awaiting decision of Court of Appeal for the District of Columbia Circuit)*

** *Virginia State Standard – Repealed on April 1, 1999*

a. *Not to be exceeded more than once a year*

b. *3-year average of the 4th highest 8-hour concentration may not exceed 0.08 ppm*

c. *Areas not attaining the 1-hour standard by the end of 1997 must attain that standard before demonstrating attainment with the 8-hour standard*

d. *Based on a 3-year average of annual averages*

e. *Based on a 3-year average of annual 98th percentile values*

Abbreviations:

ppm: *parts per million*

ug/m^3: *micrograms per cubic meter*

mg/m^3: *milligrams per cubic meter*

Source: *USEPA, "National Primary and Secondary Ambient Air Quality Standards" (49 CFR 50)*

3.4.3 Monitored Air Quality

Air pollutant levels throughout Virginia are monitored by a network of sampling stations operated under the supervision of the Virginia Department of Environmental Quality (VDEQ), the City of Alexandria, and Fairfax County. In Maryland, the Air and Radiation Management Administration (ARMA) of the Maryland Department of the Environment (MDE) operates the sampling stations.

The closest monitoring stations to the project area are located in Virginia at the Alexandria Health Department at 517 North Saint Asaph Street (Station L-126-C), the Mount Vernon Fire Station at 2675 Sherwood Hall Lane (Station L-46-B3), and the Lee District Park at Telegraph Road (Station 46-B9). There are no monitoring stations located in the vicinity of the Maryland portion of the

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project area. The closest monitoring station in Maryland is located in Suitland, approximately 9.6 kilometers (6 miles) away from the project.

The highest levels reported for the three stations in Virginia in 1998 (the latest year with available data) are reported in Table 3-12. The levels are within (i.e., do not exceed) the S/NAAQS for all pollutants monitored, with the exception of O_3, which exceeded the 8-hour standard at all three locations, and exceeded the 1-hour standard at the Mount Vernon Fire Station monitor site only.

3.4.4 Air Quality Regulations and Status of the Project Area

Air quality is regulated at the federal level under the Clean Air Act (CAA) and EPA's Final Conformity Rule (40 CFR Parts 51 and 93). The CAA requires each state to submit a State Implementation Plan (SIP) detailing its strategies for attaining the standards.

Section 107 of the 1977 Clean Air Act Amendment requires the EPA to publish a list of all geographic areas in compliance with the NAAQS, as well as those not attaining the NAAQS. Areas not in compliance with NAAQS are deemed non-attainment areas. Areas which were previously deemed non-attainment areas but which recently achieved compliance with the NAAQS are deemed maintenance areas. The designation of an area is based on the data collected by the state-monitoring network on a pollutant-by-pollutant basis.

The project area remains classified as a serious non-attainment area for O_3 and a maintenance area for CO. The area is designated as being in attainment for all other pollutants.

3.4.5 Conformance with Air Quality Standards

Under the requirements of the CAA and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), proposed transportation projects in the area must be derived from a Constrained Long Range Transportation Plan (CLRP) that conforms with the state air quality plans as outlined in the area's SIP. The SIP sets forth an area's strategies for achieving and maintaining air quality standards.

The CLRP is the official intermodal metropolitan transportation plan for the area that was developed through a planning process for the Washington metropolitan area as defined by MWCOG. The Transportation Improvement Program (TIP) is a staged, multiyear, intermodal program of transportation projects for the area that is consistent with the CLRP. Each year the transportation plans for the region are tested for conformity with the maximum emission level permitted in the air quality plans. In the Washington metropolitan area, the National Capital Region Transportation Planning Board (TPB) of MWCOG performs this task.

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Table 3-12: Air Quality Summary For Project Area
Virginia Air Quality Monitoring Sites Highest Recorded Levels during 1998

Pollutant	Alexandria Health Department	Mt. Vernon Fire Station	Lee District Park	Suitland
Carbon Monoxide (CO)				
Maximum 1-hour	6.3 ppm	7.0 ppm	Not Monitored	Not Monitored
Concentrations > 35 ppm		0	0	
Maximum 8-hour	3.5 ppm	3.5 ppm	Not Monitored	Not Monitored
Concentrations > 9 ppm		0	0	
Nitrogen Dioxide (NO_2)				
1-hour maximum	0.115 ppm	Not Monitored	Not Monitored	Not Monitored
Annual Arithmetic Mean	0.027 ppm	Not Monitored	Not Monitored	Not Monitored
Annual Mean > 0.05 ppm	0	Not Monitored	Not Monitored	Not Monitored
Particulate Matter < 10 micrometers (PM_{10})				
24-Hour	Not Monitored	65 ug/m^3	Not Monitored	61 ug/m^3
Concentrations>150ug/m^3	Not Monitored	0	Not Monitored	
Annual Arithmetic Mean	Not Monitored	22 ug/m^3	Not Monitored	23 ug/m^3
Mean > 50ug/m^3	Not Monitored	0	Not Monitored	0
Ozone (O_3)				
1-hour maximum	0.115 ppm	0.127 ppm	0.118 ppm	0.125 ppm
Concentrations>0.12 ppm	0	2	0	2
No. of 8-hour observations	4819	4976	2765	
8-hour maximum	0.101 ppm	0.111 ppm	0.105 ppm	0.111 ppm
Concentrations>0.08 ppm	10	17	14	25
Sulfur Dioxide (SO_2)				
24-hour maximum	0.027 ppm	0.017 ppm	Not Monitored	Not Monitored
Concentrations> 0.14 ppm	0	0	Not Monitored	Not Monitored
Annual Arithmetic Mean	0.006 ppm	NA	Not Monitored	Not Monitored
Lead (Pb)				
Quarterly Average	Not Monitored	0.01 ug/m3	Not Monitored	Not Monitored
Total Suspended Particulate (TSP)				
24-Hour	Not Monitored	83 ug/m^3	Not Monitored	Not Monitored
Annual Geometric Mean	Not Monitored	32 ug/m^3	Not Monitored	Not Monitored

Source: *Virginia Ambient Air Monitoring 1998 Data Report, Department of Environmental Quality*
Maryland Department of the Environment, 1998 Annual Air Monitoring Report

An assessment of the Air Quality Conformity Determination of the CLRP and FY2000-2005 TIP was prepared by the TPB and issued October 20, 1999. The FHWA, FTA, and the regional office of EPA reviewed this assessment and concurred in the finding that it conforms to the SIP and that the conformity determination has been performed in accordance with the Transportation Conformity Rule. Conformity to a SIP is defined as conformity to a plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of the standards.

Section 230 of the Omnibus Budget Reconciliation Act of FY2000 amended Section 408 of the Woodrow Wilson Memorial Bridge Authority Act (WWMBAA) (109 Statute 631) permanently exempts the Woodrow Wilson Project from the fiscal constraint requirements of Section 134 (Metropolitan Planning) and 135 (Statewide Planning) of Title 23. The project, therefore, can be included in the CLRP without meeting the financial constraint requirements of the Metropolitan Plan regulations promulgated by the FHWA and the FTA.

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The proposed project conforms to the SIP on a regional basis, as it as it is included in the recently approved conforming TIP and CLRP. The Woodrow Wilson Bridge project was defined in the conforming assessment as a 12-lane facility without a toll, and consisting of two weave/merge lanes, four local lanes, four express lanes, and two HOV lanes connecting to the HOV system on US 1 and the proposed HOV lanes either on the Capital Beltway or MD 210.

In order for this project to conform to the SIP on a localized (or microscale) basis, an air quality analysis must be conducted that demonstrates that the project would not cause or exacerbate localized violations of the S/NAAQS. This microscale analysis is being completed as part of this supplemental documentation and can be found in Section 4.4.

3.5 Noise

Existing noise conditions within the project area were measured to assist in evaluating the noise impact of the proposed project. Existing exterior noise levels were measured at 29 noise-sensitive sites for the 1997 FEIS. Traffic noise conditions have not substantially changed since completion of these measurements. Traffic noise assessment is based upon the traffic condition that produces the highest noise level. This usually occurs when the largest volume of vehicles are traveling at the greatest speed, which can be defined for freeways where the roadway capacity functions at the LOS D/E border. Within the project corridor, existing I-495/95 functions at LOS F during peak traffic hours. The peak noise hour occurs at times where peak traffic conditions do not occur.

Since the traffic condition has not substantially changed during peak-hour operations since the 1997 FEIS, new ambient noise measurements are not required. However, to verify this case, new measurements were completed at eight representative locations of the original 35 1997 FEIS measurement sites. Therefore, duplicate measurements were not necessary for this document. The results of these 15-minute increment measurements are shown in Table 3-13 while the location of these sites are shown in Figure 3-9. This table shows variation of ambient noise conditions that can be attributed to a change in the time increment, weather conditions at the site during sampling, or other factors. Reconciliation of these differences would be completed during the final noise acoustical analysis that would be completed at the appropriate level of design development (intermediate/final design stage).

Table 3-13: Existing Noise Levels Comparison, 1997 FEIS - 1999

Site No.	Description	1997 FEIS (Leq) (dBA)	1999 * (Leq) (dBA)
2	Huntington Park at end of Liberty Drive	65	64
6	Lee Recreation Center and on Basketball Court	65	63
8	Residence at 907 Church Street (corner of S. Alfred St.)	62	63
9	Hunting Terrace – Building F	61	61
15	St. Mary's School Play Area	64	62
23	Cul-de-sac near 113 Me. Mara Drive	56	55
24	Betty Blume Park Tennis Court Area	60	55
29	Flintstone Elementary School	60	60

* *Ambient noise was measured in 15-minute increments on November 18 and 19, 1999.*

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Based on expanded project limits, four new noise-sensitive sites were identified and measured to evaluate existing noise levels. These areas include, east of Livingston Road and north of I-95 in Maryland, and west of Telegraph Road and south of I-95/495 in Virginia. Noise sensitive areas do not exist within the expanded project area along I-295 north of I-95/495. Measurements were conducted consistent with the FHWA procedures as described in the 1997 FEIS, Section 3.5. The results of these 15-minute increment measurements are included in Table 3-14. Table 3-14 indicates the existing measured noise level for the expanded project area, measured in 15-minute increments on September 8 and 9, 1999.

Table 3-14: Existing Noise Levels Measured in 1999 for Expanded Project Area

Site No.	Description	Equivalent Sound Level (Leq) (dBA)		Dominant Noise Source(s)
		Total	Traffic Only	
100	Residence at 5524 South Quaker Lane (Virginia)	61	61	Traffic on the Capital Beltway
101	Residence at 5516 Linnean Street (Virginia)	47	47	Traffic on the Capital Beltway
102	Residence at 5504 Leisure Court (Virginia)	59	59	Traffic on the Capital Beltway
103	Residence at 5828 Galloway Drive (Maryland)	61	61	Traffic on the Capital Beltway

Note: *Ambient noise was measured in 15-minute increments on September 8 and 9, 1999.*

Existing noise levels within the extended project limits range from a low of 47 decibels A-weighted (dBA) for the residences at the end of Linnean Street in Virginia, to a high of 62 dBA for the residences near the intersection of Birchwood Drive and Dunwoody Avenue in Maryland. All sites measured within the expanded project area were behind existing sound barriers. The dominant noise source within the expanded project area is the Capital Beltway. Other sources within the area include periodic air traffic, local vehicle movement, insect sounds, rustling leaves and dogs barking. Observations of non-interstate traffic noise were completed during measurement periods to determine their contribution to the overall noise environment.

3.6 Energy

Energy estimates for the base year (1990) are presented in Section 3.6 of the 1997 FEIS.

3.7 Natural Environment

3.7.1 Surficial and Subsurface Geology

The topography, soils and subsurface formations have not changed substantially from what is described in the 1997 FEIS, Section 3.7.1. Geology in the expanded areas is similar to that presented for the project area discussed in the 1997 FEIS.

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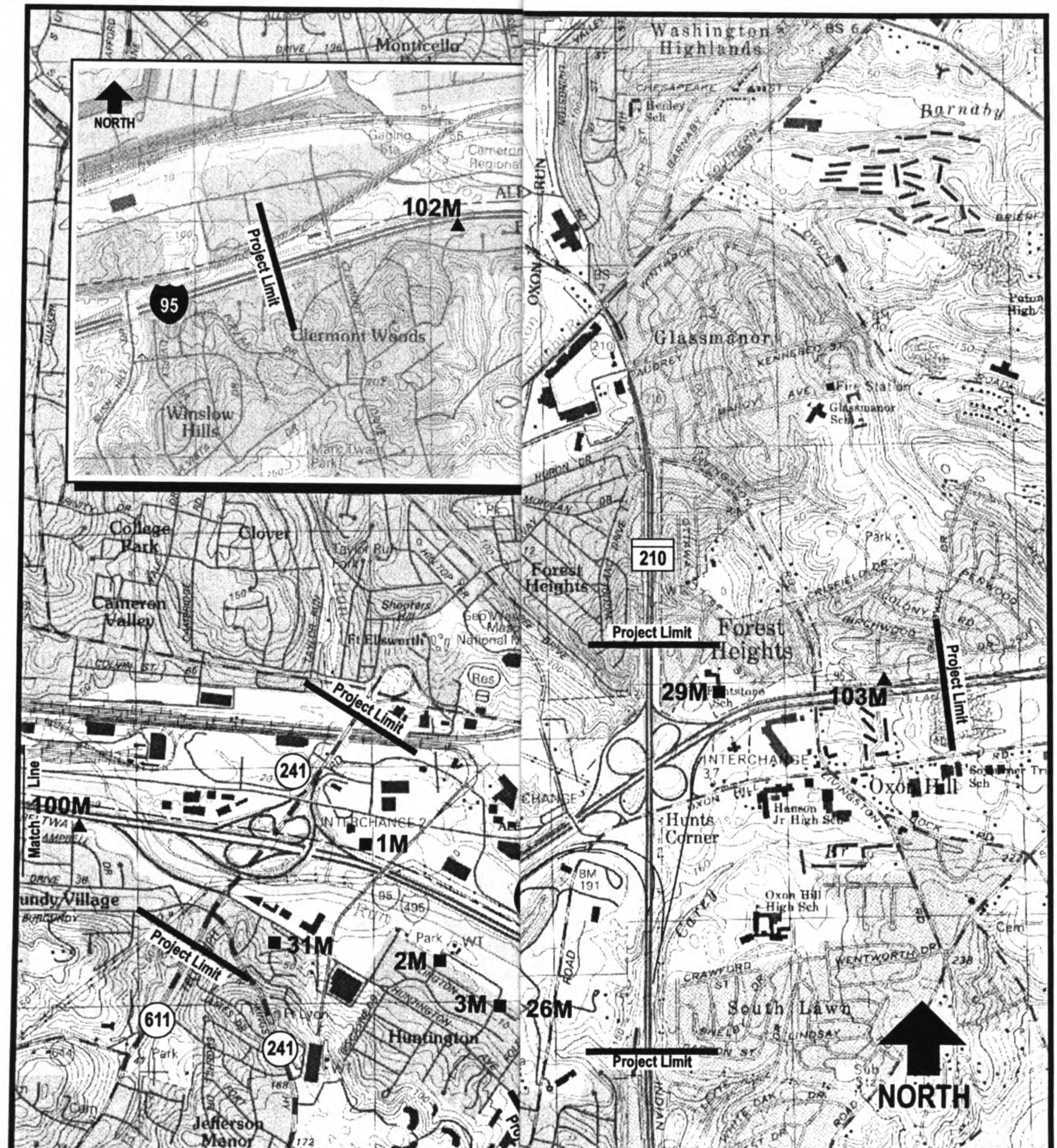

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Noise Measurement Sites

Date	Scale in Feet	Figure
December, 1999	0 1000 2000	3-9

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3.7.2 Water Quality

Groundwater and surface water quality within the project area are discussed in the 1997 FEIS, Section 3.7.2, and have not changed substantially since publication of that document. Water quality in the expanded areas is similar to that presented for the project area discussed in the 1997 FEIS.

Nutrient loading from both point and nonpoint sources has resulted in the eutrophication of tidal areas below Washington, D.C. High pH conditions have been observed during algal blooms and has increased photosynthetic activities in these areas. The high oxygen demands in the water column and sedimentation have lowered dissolved oxygen levels during the summer months in the Potomac River from the Woodrow Wilson Bridge to Piscataway Creek (MDNR 1996).

3.7.3 Floodplains

Executive Order 11988 (Floodplain Management) and 23 CFR 650.11 require that federal actions, to the extent possible, avoid short-and long-term impacts to floodplains and avoid direct or indirect support of floodplain development where a practicable alternative exists. As illustrated in the 1997 FEIS, Section 3.7.3, portions of the 100-year floodplains of the Potomac River, Cameron Run and Oxon Cove are located within the project area. Under Current Design Alternative 4A, additional floodplain areas have been identified. The new floodplain boundaries include extended areas of the floodplains of the Potomac River, Cameron Run, and Oxon Cove, as well as the floodplain of Carey Branch in Maryland. The 100-year floodplains delineated by the Federal Emergency Management Agency (FEMA) within the current project area are shown in Figure 3-10. The floodplain boundaries for the construction staging areas and the wetland mitigation sites have not been evaluated. However, effects on floodplains will be evaluated for all potential sites. A preliminary hydraulic and hydrologic study has been prepared for the fish blockage removals at Rock Creek and Northwest Branch.

3.7.4 Waters of the United States

In the spring and summer of 1999, wetland delineations within the extended project limits were completed in accordance with the 1987 USACOE *Wetland Delineation Manual* and subsequent guidance (see 1997 FEIS, Section 3.7.4 for further information on delineation methodology). During field investigations of the extended project areas, 15 new wetland areas were identified. Of these new areas, 14 are less than 0.4 hectare (1 acre) in size within the study limits of the project area. Additionally, seven of these 14 areas are less than 0.04 hectare (0.1 acre) in size within the study limits of the project area. Some of the wetlands identified extend beyond the study limits of the project area. The USACOE confirmed the jurisdictional wetland boundaries in the field on February 23, April 7 and 8, and September 7, 1999. The letters of jurisdictional determination from these field reviews are identified in Chapter 5, Comments and Coordination. Correspondence is available for viewing in the Woodrow Wilson Project Offices in Virginia and Maryland.

The characteristics of the vegetated wetlands identified within the project area, including those identified in the 1997 FEIS and those in the expanded project areas, are summarized in Table 3-15 and shown in Figure 3-11. Inclusion of a detailed description of wetlands identified in the 1997 FEIS is appropriate for this document to establish a complete picture of the affected natural environment and facilitate comparison of Current Design Alternative 4A within Chapter 4 of this document. Wetlands, which were included in the 1997 FEIS, are represented with a number

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designation (e.g., Wetland 6 or 6A), while wetlands identified more recently in the expanded project areas are given a letter or area designation. Wetland locations are shown in more detail on the project mapping included in Appendix A. Non-vegetated waters of the United States, which include the Potomac River, Cameron Run, Hunting Creek, Hooff's Run, Taylor Run, Oxon Creek, Carey Branch and their unnamed tributaries, are shown in Figure 3-12.

Activities affecting Waters of the United States, including vegetated wetlands, mud flats and submerged aquatic vegetation, are regulated by the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act of 1977, as amended, and Section 10 of the Rivers and Harbors Act of 1899. These areas are also regulated at the state level under the Maryland Nontidal Wetlands Protection Act of 1989, the Maryland Wetlands Act of 1970, the Virginia State Water Control Law, and the Virginia Wetlands Act of 1972. The majority of the Waters of the United States located within the project area were identified and described in the 1997 FEIS, Section 3.7.4. The Waters of the United States included in the 1997 FEIS were verified by the USACOE; this jurisdictional determination is valid until May 15, 2002. During subsequent design refinements the project area has been extended to include land areas where connections to the surrounding roadway network necessitate new merge lanes, changes in interchange configurations or other modifications. Also, current design level detail has resulted in a better quantification of impacts that are explained in Chapter 4. Additionally, tidal and nontidal Waters of the United States were identified adjacent to proposed mitigation sites and at potential construction staging areas.

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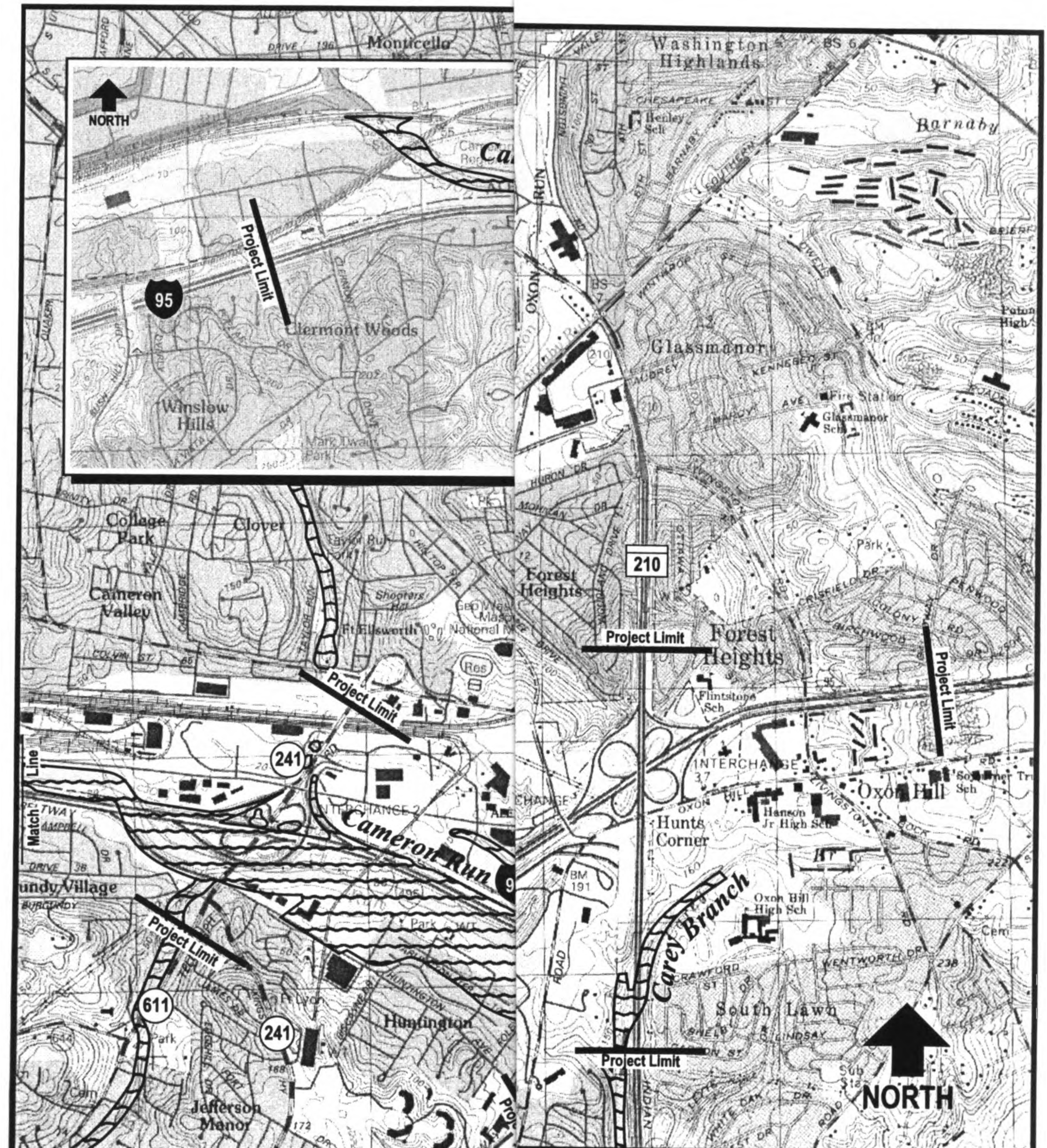

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

100-Year Floodplains

Date	Scale in Feet	Figure
December, 1999	0 1000 2000	3-10

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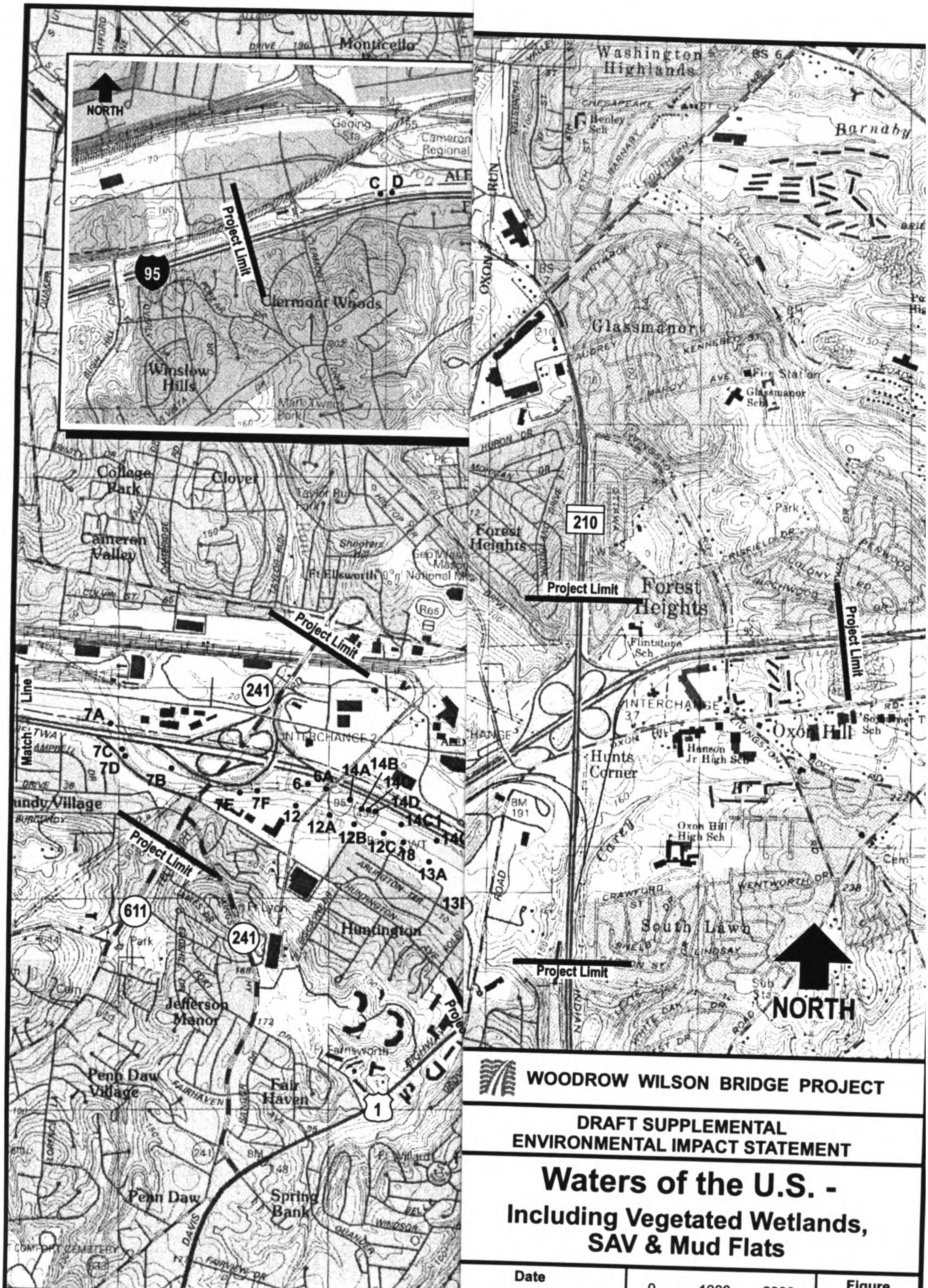

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Waters of the U.S. -

Including Vegetated Wetlands, SAV & Mud Flats

Date	Scale in Feet	Figure
December, 1999	0 1000 2000	3-11

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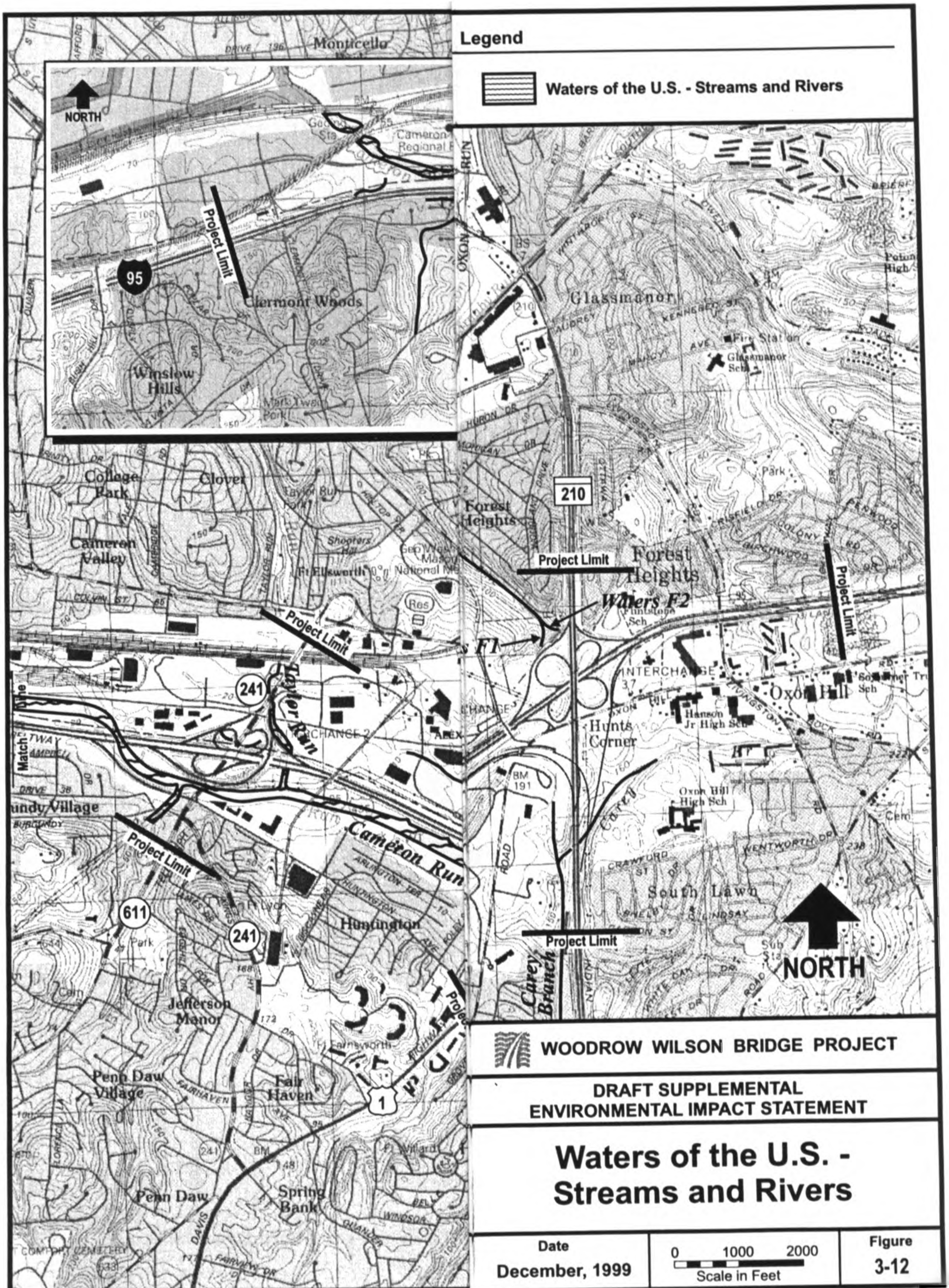

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Table 3-15: Summary of Vegetated Wetlands within Project Area

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
6, 6A	0.27 (0.67)	PEM1C	*Scirpus cyperinus* *Juncus effusus* *Solidago canadensis* *Eupatorium capillifolium* *Agrostis alba*	wool grass soft rush goldenrod small dog-fennel thorough-wort redtop	Unmapped Aquic moisture regime Gleyed or low-chroma colors	saturated drift lines water marks sediment deposits	FA S/TR WH
7A, 7B[1], 7C[1] and 7D[1]	0.38 (0.93)	PFO1A/C	*Acer saccharinum* *Acer negundo* *Cornus amomum* *Impatiens capensis* *Salix nigra* *Rubus argutus* *Lonicera japonica* *Toxicodendron radicans*	silver maple box elder silky dogwood jewelweed black willow serrate-leaf blackberry Japanese honeysuckle poison ivy	Chewacla silt loam	drainage swale water marks drift lines sediment deposits	WH
7E	0.24 (0.59)	PEM1C	*Acer rubrum* *Platanus occidentalis* *Salix nigra* *Impatiens capensis*	red maple sycamore black willow jewelweed	Unmapped Mottled 3-chroma entisol	fringe marsh along Cameron Run water marks drift lines	FA S/SS S/TR
7F	0.04 (0.10)	PEM1C	*Impatiens capensis* *Polygonum pennsylvanicum* *Scirpus cyperinus* *Juncus effusus* *Rubus argutus*	jewelweed Pennsylvania smartweed wool grass soft rush serrate-leaf blackberry	Unmapped Gleyed or low-chroma colors	drainage swale saturated	S/SS
12, 12A	0.29 (0.73)	PEM1T	No detailed description available in source documents, out of potential impact area.				
12B, 12C	0.22 (0.54)	PFO1T					
13, 13A, 13B	1.46 (3.60)	PFO1S					
14A	0.22 (0.54)	PFO1C	*Betula nigra* *Acer negundo* *Acer rubrum* *Impatiens capensis* *Lonicera japonica*	river birch box elder red maple jewelweed Japanese honeysuckle	Unmapped Ponded Gleyed or low chroma colors	inundated saturated upper 12" water marks	FA S/TR WH
14B1, 14B2[1]	0.03 (0.07)	PFO1T	*Acer negundo* *Cornus amomum* *Impatiens capensis* *Geum canadense*	box elder silky dogwood jewelweed white avens	Unmapped Aquic moisture regime gleyed or low chroma colors	inundated saturated upper 12" water marks drainage patterns	FA S/TR WH

Footnotes follow table.
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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class[3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
14C[1], 14C1, 14C2	0.75 (1.86)	PFO1S	*Betula nigra* *Toxicodenron vernix* *Fraxinus pennsylvanica* *Acer rubrum* *Acer negundo* *Chasmanthium laxum* *Lonicera japonica* *Toxicodendron radicans*	river birch poison sumac green ash red maple box elder slender spikegrass Japanese honeysuckle poison ivy	unmapped gleyed or low chroma colors	inundated saturated upper 12" sediments deposits drainage patterns	FA S/SS WH
14D	0.02 (0.06)	PSS1R	*Acer negundo* *Sambucus canadensis* *Impatiens capensis*	box elder elderberry jewelweed	unmapped sulfidic odor gleyed or low chroma colors	indundated saturated upper 12" sediment deposits drainage patterns	Not available in source documents
14E	0.09 (0.22)	PFO1C	*Toxicodendron vernix* *Lonicera japonica*	poison sumac Japanese honeysuckle	unmapped gleyed or low chroma colors	inundated saturated upper 12' water stained leaves	S/SS WH
15A, 15B	0.07 (0.17)	PFO1C	*Catalpa speciosa* *Robinia pseudoacacia* *Acer rubrum* *Lonicera japonica* *Impatiens capensis* *Vitis riparia* *Lonicera tartarica* *Toxicodendron vernix*	Northern catalpa black locust red maple Japanese honeysuckle jewelweed river bank grape tartarian honeysuckle poison sumac	unmapped gleyed or low chroma colors	saturated upper 12" water marks drift lines sediment deposits	FA S/SS
16	0.54 (1.34)	PFO1R	*Ulmus americana* *Acer negundo* *Sambucus canadensis* *Polygonum arifolium* *Rubus argutus* *Acer rubrum* *Lonicera japonica*	American elm box elder elderberry tearthumb serrate-leaf blackberry red maple Japanese honeysuckle	unmapped gleyed or low chroma colors	saturated upper 12" drift lines sediment deposits	FA S/SS S/TR F/SH WH

Footnotes follow table.
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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
17	0.24 (0.59)	PEM1T	*Typha latifolia* *Typha angustifolia* *Polygonum arifolia* *Peltandra virginica* *Pontederia cordata*	broad-leaved cattail narrow-leaved cattail tearthumb arrow arum pickerelweed	unmapped gleyed or low chroma colors	inundated saturated upper 12" drift lines drainage patterns	FA S/SS S/TR WH
18	0.36 (0.88)	PFO1R	*Ulmus americana* *Acer negundo* *Rubus argutus* *Typha latifolia*	American elm box elder serrate leaf blackberry broad-leaved cattail	unmapped gleyed or low chroma colors	saturated upper 12" sediments deposits drainage patterns	FA S/SS S/TR WH
18A	0.28 (0.68)	PFO1R	*Typha latifolia* *Hibiscus moscheutos* *Juncus effusus* *Ulmus americana*	broad-leaved cattail swamp rosemallow soft rush American elm	unmapped gleyed or low chroma colors	saturated upper 12" sediments deposits drainage patterns	FA S/SS S/TR WH
19, 19A	1.83 (4.52)	PEM1T	*Typha latifolia* *Phragmites australis* *Juncus effusus* *Polygonum hydropiperoides* *Hibiscus moscheutos* *Impatiens capensis* *Polygonum sagittatum*	broad-leaved cattail common reed soft rush swamp smartweed rosemallow jewelweed arrow-leaf tearthumb	unmapped gleyed or low chroma colors	inundated saturated upper 12" water marks drainage patterns	FA S/SS S/TR WH
19B	0.18 (0.45)	PFO1R	*Lonicera japonica* *Acer rubrum* *Ulmus americana* *Toxicodendron vernix* *Impatiens capensis* *Toxicodendron radicans*	Japanese honeysuckle red maple American elm poison sumac jewelweed poison ivy	unmapped gleyed or low chroma colors	saturated upper 12" drift lines drainage patterns	FA S/SS S/TR NR PE F&SH WH
20, 20A, 20B	0.10 (0.25)	PFO1R	*Acer saccharinum* *Fraxinus pennsylvanica* *Acer negundo* *Populus deltoides* *Vitis riparia* *Impatiens capensis* *Ulmus rubra* *Rubus argutus* *Viburnum prunifolium* *Cornus florida* *Toxicodendron radicans*	silver maple green ash box elder Eastern cottonwood grapevine jewelweed slippery elm serrate-leaf blackberry black haw flowering dogwood poison ivy	unmapped aquic moisture regime gleyed or low chroma colors	saturated upper 12" oxidized root channels water stained leaves water marks drift lines drainage patterns	FA S/SS S/TR NR PE F&SH WH

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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class[3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
20C	6.4 (15.7)	R1FL	No detailed description available in source documents, out of potential impact area.				
21	0.45 (1.12)	PEM1T					
22, 22A, 22B	0.25 (0.61)	PFO/PEM 1R					
23	0.08 (0.19)	PEM1T	*Acer rubrum* *Acer negundo* *Hibiscus moscheutos* *Typha latifolia*	red maple box elder rosemallow cattail	unmapped gleyed or low chroma colors	saturated upper 12" water marks drift lines	FA S/SS S/TR WH VQ/A
24	1.32 (3.27)	PFO/EM 1T	*Pontederia cordata* *Polygonum arifolia* *Typha latifolia* *Polygonum sagittatum* *Hibiscus moscheutos*	pickerelweed tearthumb cattail tearthumb swamp rosemallow	unmapped sulfidic odor gleyed or low chroma colors	inundated saturated upper 12" water marks drift lines sediment deposits	FA S/SS S/TR WH VQ/A
25	0.45 (1.12)	PFO1T	*Ulmus americana* *Acer saccharinum* *Acer rubrum* *Solidago rugosa*	American elm silver maple red maple wrinkled goldenrod	unmapped gleyed or low chroma colors	saturated upper 12" water marks drift lines sediment deposits drainage patterns	FA S/SS S/TR WH VQ/A
26	0.02 (0.06)	PFO1C	*Acer saccharinum* *Acer negundo* *Acer rubrum* *Toxicodendron radicans*	silver maple box elder red maple poison ivy	unmapped gleyed or low chroma colors	saturated upper 12" drainage patterns water stained leaves	WH
27	0.07 (0.18)	PFO1C	*Acer saccharinum* *Acer negundo* *Platanus occidentalis* *Lonicera japonica* *Hebera helix*	silver maple box elder sycamore Japanese honeysuckle English Ivy	unmapped gleyed or low chroma colors	inundated water stained leaves FAC-Neutral test	WH

Footnotes follow table.
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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation: *Scientific Name*	Dominant Vegetation: Common Name	Soils	Hydrology	Principal Function(s) [2]
28	0.04 (0.10)	PFO1R	*Acer rubrum* *Fraxinus pennsylvanica* *Cornus amomum* *Toxicodendron radicans* *Acer negundo* *Lonicera japonica* *Alliaria petiolata*	red maple green ash silky dogwood poison ivy box elder Japanese honeysuckle garlic mustard	unmapped gleyed or low chroma colors	inundated saturated upper 12" oxidized root channels	WH
29	0.33 (0.81)	PSS1R	*Acer rubrum* *Fraxinus pennsylvanica* *Acorus calamus* *Impatiens capensis*	red maple green ash sweetflag jewelweed	Mixed Alluvial gleyed or low chroma colors	inundated saturated upper 12" drainage patterns	FA S/SS S/TR WH
29B	0.03 (0.07)	PEM1C	No detailed description available in source documents, out of potential impact area.				
30A	0.15 (0.36)	PSS1T	*Ulmus americana* *Hibiscus moscheutos* *Juncus effusus* *Acorus calamus* *Festuca arundinacea*	American elm rosemallow soft rush sweetflag Kentucky fescue	Mixed Alluvial gleyed or low chroma	saturated upper 12" water marks drainage patterns	WH
30B	0.08 (0.19)	PEM1C	*Typha latifolia* *Acorus calamus* *Polygonum sagittatum*	cattail sweetflag tearthumb	Mixed Alluvial aquic moisture regime reducing conditions	saturated upper 12' drainage patterns	S/TR WH
31	0.37 (0.91)	PEM1T	*Impatiens capensis* *Populus deltoides* *Acer negundo* *Juncus effusus* *Hibiscus moschuetos*	jewelweed cottonwood box elder soft rush swamp rosemallow	Tidal marsh histic epipedon	saturated upper 12" drainage patterns	Not available in source documents
35A[1], 35B	1.20 (2.96)	PFO1C/S	*Acer negundo* *Acer rubrum* *Lindera benzoin* *Lonicera japonica* *Fraxinus pennsylvanica* *Plantanus occidentalis* *Ulmus americana* *Viburnum dentatum* *Viburnum prunifolium* *Impatiens capensis* *Toxicodendron radicans*	box elder red maple spicebush Japanese honeysuckle green ash sycamore American elm arrowwood black haw jewelweed poison ivy	Bibb silt loam gleyed or low chroma colors	seasonally high water table and runoff saturated drift lines	FA S/SS WH

Footnotes follow table.
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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
39A[1], 39B[1], 39C, 39D[1], 39E	2.16 (5.34)	R1US PFO1S	*Platanus occidentalis* *Acer saccharinum* *Acer negundo* *Lonicera japonica* *Populus deltoides* *Toxicodendron radicans*	sycamore silver maple box elder honeysuckle cottonwood poison ivy	Croom Urban Land Complex; gleyed or low chroma colors	tidal Potomac River shoreline water marks drift lines	FA S/SS WH
39F	0.10 (0.25)	PFO1C	*Populus deltoides* *Acer saccharinum* *Acer rubrum* *Acer negundo* *Lonicera japonica*	Eastern cottonwood silver maple red maple box elder honeysuckle	Bibb silt loam gleyed or low chroma colors	saturated in upper 12" drift lines drainage patterns	FA S/SS WH
A	0.03 (0.08)	PFO1A	*Betula nigra* *Acer rubrum* *Alnus incana* *Lonicera japonica* *Liquidambar styraciflua* *Toxicodendron radicans*	river birch red maple speckled alder Japanese honeysuckle sweet gum poison ivy	Mixed Alluvial gleyed or low chroma colors	inundated saturated in upper 12" drainage patterns	FA S/TR
B	0.09 (0.22)	PFO1A	*Salix nigra* *Betula nigra* *Acer rubrum*	black willow river birch red maple	Mixed Alluvial gleyed or low chroma colors	inundated saturated in upper 12" drainage patterns	FA S/TR
C	0.02 (0.06)	PEM1A	*Typha latifolia* *Juncus effusus* *Scirpus cyperinus* *Cephalanthus occidentalis*	cattail soft rush wool grass buttonbush	Mixed Alluvial gleyed or low chroma colors	inundated saturated in upper 12" drift lines drainage patterns	GR/D FA S/TR
D	0.03 (0.07)	PFO1A	*Parthenocissus quinquefolia* *Acer rubrum* *Toxicodendron radicans* *Smilax rotundifolia* *Juncus effusus* *Lonicera japonica* *Salix alba*	Virginia creeper red maple poison ivy greenbrier soft rush Japanese honeysuckle white willow	Mixed Alluvial gleyed or low chroma colors	inundated saturated in upper 12" water marks drift lines	S/TR PE

Footnotes follow table.
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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
E	0.05 (0.12)	PEM1A	*Juncus effusus* *Typha latifolia* *Eleocharis rostellata* *Cephalanthus occidentalis* *Liquidambar styraciflua* *Betula nigra*	soft rush cattail spike rush buttonbush sweet gum river birch	Mixed Alluvial gleyed or low chroma colors	inundated saturated in upper 12" drift lines sediment deposits	GR/D FA S/TR
G1	0.01 (0.03)	PFO1A	*Acer rubrum* *Platanus occidentalis* *Rosa multiflora* *Toxicodendron radicans*	red maple sycamore multi-flora rose poison ivy	mapping unavailable disturbed soils reducing conditions	saturated in upper 12"	FA S/TR
G2	0.08 (0.20)	PFO1E	*Acer rubrum* *Platanus occidentalis* *Rosa multiflora* *Toxicodendron radicans*	red maple sycamore multi-flora rose poison ivy	mapping unavailable disturbed soils reducing conditions	water marks drift lines	GR/D FA
H	0.19 (0.46)	PFO1C	*Acer rubrum* *Platanus occidentalis* *Salix nigra* *Cornus amomum* *Toxicodendron radicans*	red maple sycamore black willow silky dogwood poison ivy	mapping unavailable gleyed or low chroma colors	inundated saturated in upper 12" water marks drainage patterns	GR/D PE
I	2.28 (5.64)	PFO1C	*Acer rubrum* *Acer negundo* *Cornus amomum* *Phragmites australis*	red maple box elder silky dogwood common reed	mapping unavailable gleyed or low chroma colors	inundated saturated in upper 12" water marks drift lines	FA S/TR NR WH
J	0.03 (0.08)	PFO1E	*Acer rubrum* *Platanus occidentalis* *Acer negundo* *Cornus amomum*	red maple sycamore box elder silky dogwood	mapping unavailable gleyed or low chroma colors	saturated in upper 12" drift lines sediment deposits drainage patterns	FA S/SS S/TR
K	0.02 (0.04)	PEM2T	*Pontederia cordata* *Sagittaria latifolia* *Peltandra virginica*	pickerelweed arrowhead arrow arum	mapping unavailable sulfidic odor gleyed or low chroma colors	infrequent inundation from high tide and floods of the Potomac	SS S/TR NR

Footnotes follow table. *Table continued on following page.*

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Table 3-15: Summary of Vegetated Wetlands within Project Area (continued)

Wetland ID	Approx. Size Hectares (acres)	Cowardin Class [3]	Dominant Vegetation		Soils	Hydrology	Principal Function(s)[2]
			Scientific Name	Common Name			
L	0.20 (0.49)	PFO1E	*Acer rubrum* *Salix nigra* *Cornus amomum* *Typha sp.*	red maple black willow silky dogwood cattail	mapping unavailable gleyed or low chroma colors	water marks drift lines	FA S/SS WH VQ/A
Area 1	2.41 (5.95)	PFO1C	*Acer rubrum* *Platanus occidentalis* *Lonicera japonica* *Acorus calamus*	red maple sycamore Japanese honeysuckle sweet flag	Bibb silt loam gleyed or low chroma colors	Oxon Creek inundated saturated water marks drainage patterns	GR/D FA S/TR NR WH VQ/A
Area 2	0.57 (1.41)	PFO1N	*Acer rubrum* *Acer negundo* *Cornus amomum* *Hibiscus moscheutos*	red maple box elder silky dogwood marsh hibiscus	mapping unavailable gleyed or low chroma colors	inundated saturated in upper 12" drainage patterns	FA S/TR
Area 4	2.76 (6.82)	PFO1C	*Platanus occidentalis* *Acer rubrum* *Acer sacharinum* *Lindera benzoin* *Lonicera japonica*	sycamore red maple silver maple spicebush honeysuckle	Bibb silt loam reducing conditions	seasonally high water table and runoff saturated oxidized root channels	FA WH
M	0.18 (0.44)	PFO1A	*Betula nigra* *Acer rubrum* *Salix nigra* *Juncus effusus*	river birch red maple black willow soft rush	mapping unavailable gleyed or low chroma colors	saturated in upper 12" drainage patterns	S/TR
N	0.04 (0.09)	PSS1B	*Liriodendron tulipifera* *Liquidambar styraciflua* *Dicanthelium clandestinum* *Juncus effusus*	tulip poplar sweet gum deer-tongue grass soft rush	Fallsington silt loam gleyed or low chroma colors	adjacent to Carey Branch drainage patterns oxidized root channels	GR/D PE

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Notes for previous table:

1 *For purposes of description, wetlands have been grouped with similar wetlands based on classification, size and landscape position.*

2 *Key to Function symbols: GR/D- groundwater recharge/discharge; FA-floodflow alteration; S/SS-sediment/shoreline stabilization; S/TR-sediment/toxicant retention; NR-nutrient removal; PE-production export; F/SH-fish and shellfish habitat; WH-wildlife habitat; and VQ/A-visual quality and aesthetics. For more information on functions and functional assessment procedures, see the FEIS.*

3 *Explanation of Cowardin Classifications:*

Nontidal Wetlands: PEM1C - Palustrine, emergent, persistent, seasonally flooded
PSS1B - Palustrine, scrub shrub, broadleaf deciduous, saturated
PFO1A - Palustrine, forested, broadleaf deciduous, temporary
PFO1C - Palustrine, forested, broadleaf deciduous, seasonally flooded
PFO1E - Palustrine, forested, broadleaf deciduous, seasonal saturated

Tidal Wetlands:
PEM1R - Palustrine, emergent, persistent, seasonal tidal
PEM1T - Palustrine, emergent, persistent, semipermanent tidal
PEM2T - Palustrine, emergent, non-persistent, semipermanent tidal
PSS1R - Palustrine, scrub shrub, broadleaf deciduous, seasonal tidal
PFO1N - Palustrine, forested, broadleaf deciduous, regular tidal
PFO1R - Palustrine, forested, broadleaf deciduous, seasonal tidal
PFO1S - Palustrine, forested, broadleaf deciduous, temporary tidal
PFO1T - Palustrine, forested, broadleaf deciduous, semipermanent tidal

Riverine:
R1FL - Riverine, tidal, flat
R1US - Riverine, tidal, unconsolidated shore
R1OW/UB - Riverine, openwater/unconsolidated bottom (Potomac River)

3.7.5 Other Special Aquatic Sites

In addition to the tidal and nontidal wetland areas summarized in Table 3-15, the 1997 FEIS also noted the presence of submerged aquatic vegetation (SAV) within the project area. The extent of SAV shown in the Potomac River and Smoots Cove in Figure 3-19 of the 1997 FEIS was based on the 1995 Virginia Institute of Marine Science (VIMS) annual SAV monitoring surveys. In its determination issued on May 15, 1997, the USACOE took jurisdiction over the SAV within the project area as depicted in the 1997 FEIS. This determination expires December 31, 1999, and is currently being reauthorized.

For the reauthorization, the USACOE, in concert with the National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS) and Maryland Department of the Environment (MDE), based the boundary on the VIMS 1999 surveys as well as more detailed field verification being undertaken by USGS personnel and USACOE staff. Reviews of the 1999 aerial photographs and field visits by the USGS verify precursory assumptions that the resource is considerably changed from that identified in 1995. Based on these reviews, the 160 hectares (395 acres) of SAV shown in the 1997 FEIS appears to have increased to 255 hectares (631 acres) which represents an increase of 37 percent within the same study area. Other increases in SAV coverage have been observed throughout the upper tidal Potomac River Basin. In addition to shifts in bed locations and size, a notable dominance of the non-native hydrilla (*Hydrilla verticillata*) has been replaced with a greater diversity of species adding to the overall value of the resource for aquatic organisms. Seven different species of SAV were observed during ground truthing within the project area, see Table 3-16. Figure 3-11 illustrates the aerial extent of SAV in the project area.

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Table 3-16: Submerged Aquatic Vegetation Species Observed within the Potomac River SAV

Common Name	*Scientific Name*
Hydrilla	*Hydrilla verticillata*
Eurasian watermilfoil	*Myriophyllum spicatum*
Wild celery	*Vallisneria americana*
Coontail	*Ceratophyllum demersum*
Naiad	*Najas minor*
Naiad	*Najas guadalupensis*
Water stargrass	*Heteranthera dubia*

3.7.6 Wildlife and Habitat

Terrestrial and aquatic habitats and wildlife species observed or potentially occurring adjacent to the Woodrow Wilson Bridge were identified and described in the 1997 FEIS, Section 3.7.5. In the expanded project area, additional wildlife habitat exists along I-295 north of Oxon Cove in the District of Columbia and along MD 210 south of I-95/495 in Maryland. In Virginia, the expanded project area includes wildlife habitat along Cameron Run. These habitats and the potential wildlife using them are similar to those previously described in the 1997 FEIS. However, additional information has been gathered and studies conducted since completion of the 1997 FEIS. Forest stand delineations (FSD) were conducted at Jones Point Park, Rosalie Island, the I-295 interchange, and the MD 210 interchange to specifically document forest resources, target priority forest stands, and calculate forest impacts. Additional wildlife observations were conducted by the project team during new field studies, and bird sightings, recorded over many years of field observation by noted bird experts, were obtained and included in the document. Lists of these newly observed bird, mammal, and reptile species are provided in Table 3-17, Table 3-18, and Table 3-19.

The Jones Point Park FSD identified six forest stands, all belonging to a mixed mesophytic deciduous forest community. Forest land at Jones Point Park is generally characterized by mixed hardwood trees of uneven age with a dense understory comprised of many exotic, invasive shrub and understory species. Dominant canopy species throughout the site include silver maple *(Acer saccarinum)*, green ash *(Fraxinus pennsylvanica)*, box elder *(Acer negundo)*, and red maple *(Acer rubrum)*. Common understory species include multiflora rose *(Rosa multiflora)*, silky dogwood *(Cornus amomum)*, box elder *(Acer negundo)*, honeysuckle *(Lonicera japonica)*, English ivy (Hedera helix), poison ivy *(Toxicodendron radicans)* and porcelain berry *(Ampelopsis brevipedunculata)*. Many specimen trees with a diameter of 76.2 centimeters (30 inches) or greater were identified within the park, the largest ones scattered throughout the open areas of the park. Most large trees are silver maples *(Acer saccharinum)* with lesser numbers of red maples *(Acer rubrum)*, sycamore *Platanus occidentalis)*, cottonwood *(Populus deltoides)*, and elm *(Ulmus sp.)*. The forest stands north of the Beltway were the least disturbed and were higher in quality than those south of the Beltway. The forest stand that lies within the alignment of the proposed Woodrow Wilson Bridge is dominated by silver maple *(Acer saccarinum)* in the canopy. The stand is bisected by hiking trails and historic shipways and has been disturbed from foot traffic and human debris. However, it does contain ten large trees and provides habitat for resident birds, small mammals, reptiles, and amphibians.

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The Rosalie Island FSD identified two forest stands similar in composition to those identified at Jones Point Park across the Potomac River. The dominant canopy species include silver maple *(Acer saccharinum)*, red maple *(Acer rubrum)*, cottonwood *(Populus deltoides)*, black locust *(Robinia pseudoacacia)*, tulip poplar *(Liriodendron tulipifera)*, and sycamore *Platanus occidentalis*. The understory is comprised predominately of honeysuckle *(Lonicera japonica)*, poison ivy *(Toxicodendron radicans*, and other vines. Invasive exotic species, including the tree of heaven *(Ailanthus altissima)*, occur throughout each stand. Thirty-nine specimen trees with a diameter of 76.2 centimeters (30 inches) or greater were identified throughout the island, with over twice as many found on the north side. These large trees make the forests on Rosalie Island valuable as perch sites for bald eagles, ospreys, and herons.

The I-295/495/95 interchange FSD identified 17 forest stands ranging in size from 0.38 hectares (0.93 acres) to 6.5 hectares (16.16 acres). The stands are similar in age and composition to those described for Jones Point Park and Rosalie Island. Most stands are comprised of younger-aged trees with larger trees scattered throughout. Stand 2, located on the south side of the I-295/495/95 interchange, was assessed to be the most mature stand, with an average age estimated to be 30-40 years. This stand also has the most specimen trees (6) of the all stands assessed. Tulip poplar *(Liriodendron tulipifera)*, sweetgum *(Liquidambar styraciflua)*, sycamore *(Platanus occidentalis)*, black cherry *(Prunus serotina)*, and black locust *(Robinia pseudoacacia)* dominate the stand. However, the stand is only 2.4 hectares (6.0 acres) in size. The largest forest stand is stand 5, located along the west side of southbound I-295. It is in an early successional stage and is dominated by black cherry *(Prunus serotina)*, box elder *(Acer negundo)*, cottonwood *(Populus deltoides)*, and red maple *(Acer rubrum)*. Further from the road, some older, larger trees do occur within the stand. Many of the remainder of the stands occur within the cloverleaves of the interchange or are disturbed, smaller stands adjacent to the interchange.

The MD 210/495/95 interchange FSD identified 31 forest stands and eight forest areas ranging in size from 0.04 hectares (0.1 acres) to 1.8 hectares (4.4 acres). Forest stands are primarily characterized by upland deciduous canopy species including oaks *(Quercus sp.)*, beech *(Fagus grandifolia)*, black gum *(Nyssa sylvatica)*, maples *(Acer sp.)*, sweetgum *(Liquidambar styraciflua)*, cherry *(Prunus sp.)*, locust *(Robinia pseudoacacia)*, and pines *(Pinus sp.)*. Most stands are comprised of younger-aged trees with varying amounts of disturbance and exotic species invasion. Six stands are comprised of dominant canopy trees in larger size classes and have few exotic species. These priority retention areas range in size from 0.2 hectares (0.6 acres) to 1.6 hectares (4.0 acres). Four of the six priority retention areas occur within the larger forest areas east and west of MD 210 north of I-495/95. The other two occur within the larger forested area south of the interchange and west of MD 210. Stand 12 is located west of northbound MD 210 north of the interchange, and is in the vicinity of the proposed relocation of Bald Eagle Road. This priority retention area is a chestnut oak association that was estimated to be about 60 years old. Dominant canopy species include chestnut oak *(Quercus prinus)* and white oak *(Quercus alba)*. Dominant understory species include mockernut hickory *(Carya tomentosa)*, black gum *(Nyssa sylvatica)*, and red maple *(Acer rubrum)*. The shrub layer is comprised of mountain laurel *(Kalmia latifolia)*, tartarian honeysuckle *(Lonicera tatarica)*, and multiflora rose *(Rosa multiflora)*. The stand was considered a priority for retention because it is a healthy forest, occurs on steep slopes, contains six significant trees (trees with a diameter greater than or equal to 60 centimeters or 24 inches) and three specimen trees, exhibits excellent vegetative structural diversity, and it is part of a much larger forested area.

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Most of the observed species listed in Table 3-17 and 3-19 were identified during a Biological Assessment of the bald eagle (US DOT, 1999) conducted between October 1998 through March 1999 (see Section 3.7.6 below) and a bird survey of Jones Point Park (US DOT, 1999) conducted in June 1999. The remainder of the species were observed during the other environmental survey work conducted for the project. Birds listed in Table 3-18 were observed by Dave Czaplak of the New Columbia Audubon Society and Kurt Gaskill of Friends of Dyke Marsh over many years of observation in the Dyke Marsh and Hunting Creek areas.

The bird survey of Jones Point Park was conducted at the request of the National Park Service (NPS) to provide baseline information about wildlife resources potentially affected by proposed project activities. The bird study used a point count sampling methodology designed to census singing males. Seven census plots were established within the park at a minimum spacing of 122 meters (400 feet). Plots were systematically located to sample the representative habitats within the park. Each sample plot was censused for ten minutes between sunrise and 07:45 hours on three days during June 1999 (2^{nd}, 9^{th}, and 22^{nd}).

A total of 43 bird species were identified within the park during the study, including four species listed as forest interior dwelling birds (FIDB) as per MDNR (Chesapeake Bay Critical Area Commission, 1986). These results indicated that the park is marginal habitat for FIDB and important habitat for a number of resident and migratory land birds that use smaller patches of forest or forest edges. Of the four FIDB species detected at Jones Point Park, only two (Red-eyed Vireo and Northern Parula) were determined to be probable breeders, the others (Ovenbird and American Redstart) were determined to be late migrants. This contrasts with the 24 of 33 (73 percent) resident and migratory land birds that favor forest edge habitat determined to be probable or confirmed breeders in the park. The study also assessed the potential presence of Black Duck as a breeding bird within the freshwater marsh adjacent to Hunting Creek Bay. No Black Ducks were observed during the study and no waterfowl nests of any kind were observed within the marsh. However, six species of water birds were observed within or flying over the park. Other wildlife species were documented during bird census work within the park, including six species of mammals and two species of reptiles.

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Table 3-17: Birds Observed Since the 1997 FEIS within the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Common Loon	*Gavia immer*	Rock Dove	*Columba livia*
Horned Grebe	*Podiceps auritus*	Great Horned Owl	*Bubo virginianus*
Double-crested Cormorant	*Phalacrocorax auritus*	Short-eared Owl	*Asio flammeus*
Green Heron	*Butorides virescens*	Chimney Swift	*Chaetura pelagica*
Black-crowned Night Heron	*Nycticorax nycticorax*	Belted Kingfisher	*Ceryle alcyon*
Black Vulture	*Coragyps atratus*	Red-bellied Woodpecker	*Melanerpes carolinus*
Turkey Vulture	*Cathartes aura*	Northern Flicker	*Colaptes auratus*
Tundra Swan	*Cygnus columbianus*	Great-crested Flycatcher	*Myiarchus crinitus*
Wood Duck	*Aix sponsa*	Eastern Kingbird	*Tyrannus tyrannus*
American Wigeon	*Anas americana*	Warbling Vireo	*Vireo gilvus*
American Black Duck	*Anas rubripes*	Red-eyed Vireo *	*Vireo olivaceus*
Canvasback	*Aythya valisineria*	Fish Crow	*Corvus ossifragus*
Redhead	*Aythya americana*	Purple Martin	*Progne subis*
Bufflehead	*Bucephala albeola*	Tree Swallow	*Tachycineta bicolor*
Common Goldeneye	*Bucephala clangula*	Brown Creeper	*Certhia americana*
Hooded Merganser	*Lophodytes cucullatus*	Blue-gray Gnatcatcher	*Polioptila caerulea*
Red-breasted Merganser	*Mergus serrator*	Cedar Waxwing	*Bombycilla cedrorum*
Common Merganser	*Mergus merganser*	Northern Parula *	*Parula americana*
Osprey	*Pandion haliaetus*	Yellow-rumped Warbler	*Dendroica coronata*
Bald Eagle	*Haliaeetus leucocephalus*	Blackpoll Warbler	*Dendroica striata*
Northern Harrier	*Circus cyaneus*	Yellow Warbler	*Dendroica petechia*
Sharp-shinned Hawk	*Accipiter striatus*	American Redstart *	*Setophaga ruticilla*
Cooper's Hawk	*Accipiter cooperii*	Ovenbird *	*Seiurus aurocapillus*
Red-shouldered Hawk	*Buteo lineatus*	Common Yellowthroat	*Geothlypis trichas*
Red-tailed Hawk	*Buteo jamaicensis*	White-throated Sparrow	*Zonotrichia albicollis*
American Kestrel	*Falco sparverius*	Indigo Bunting	*Passerina cyanea*
Peregrine Falcon	*Falco peregrinus*	Red-winged Blackbird	*Agelaius phoeniceus*
American Coot	*Fulica americana*	Brown-headed Cowbird	*Molothrus ater*
Killdeer	*Charadrius vociferus*	Orchard Oriole	*Icterus spurius*
Laughing Gull	*Larus atricilla*	Baltimore Oriole	*Icterus galbula*
Herring Gull	*Larus argentatus*	American Goldfinch	*Carduelis tristis*
Caspian Tern	*Sterna caspia*		
Forster's Tern	*Sterna forsteri*		

* *Forest Interior Dwelling Birds (FIDB) as designated by MDNR (Chesapeake Bay Critical Area Commission 1986)*

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Table 3-18: Birds Observed by Others within the Project Area

Common Name	*Scientific Name*
Pied-billed Grebe	*Podilymbus podiceps*
Red-necked Grebe	*Podiceps grisegena*
American White Pelican	*Pelecanus erythrorhynchos*
Great Cormorant	*Phalacrocorax carbo*
Little Blue Heron	*Egretta caerulea*
Snow Goose	*Chen caerulescens*
Brant	*Branta bernicla*
Mute Swan	*Cygnus olor*
Gadwall	*Anas strepera*
Blue-winged Teal	*Anas discors*
Northern Shoveler	*Anas clypeata*
Northern Pintail	*Anas acuta*
Green-winged Teal	*Anas crecca*
Ring-necked Duck	*Aythya collaris*
Greater Scaup	*Aythya marila*
Lesser Scaup	*Aythya affinis*
Oldsquaw	*Clangula hyemalis*
Ruddy Duck	*Oxyura jamaicensis*
Common Moorhen	*Gallinula chloropus*
Black-bellied Plover	*Pluvialis squatarola*
American Golden-Plover	*Pluvialis dominica*
Semipalmated Plover	*Charadrius semipalmatus*
Killdeer	*Charadrius vociferus*
American Avocet	*Recurvirostra americana*
Greater Yellowlegs	*Tringa melanoleuca*
Lesser Yellowlegs	*Tringa flavipes*
Solitary Sandpiper	*Tringa solitaria*
Willet	*Catoptrophorus semipalmatus*
Spotted Sandpiper	*Actitis macularia*
Hudsonian Godwit	*Limosa haemastica*
Ruddy Turnstone	*Arenaria interpres*
Red Knot	*Calidris canutus*
Sanderling	*Calidris alba*
Semipalmated sandpiper	*Calidris pusilla*
Western Sandpiper	*Calidris mauri*
Least Sandpiper	*Calidris minutilla*
White-rumped Sandpiper	*Calidris fuscicollis*
Baird's Sandpiper	*Calidris bairdii*
Pectoral Sandpiper	*Calidris melanotos*
Dunlin	*Calidris alpina*
Stilt Sandpiper	*Calidris himantopus*
Short-billed Dowitcher	*Limnodromus griseus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Common Snipe	*Gallinago gallinago*
Wilson's Phalarope	*Phalaropus tricolor*
Red-necked Phalarope	*Phalaropus lobatus*
Bonaparte's Gull	*Larus philadelphia*
Franklin's Gull	*Larus pipixcan*
Lesser Black-backed Gull	*Larus fuscus*
Royal Tern	*Sterna maxima*
Common Tern	*Sterna hirundo*
Least Tern	*Sterna antillarum*
Black Tern	*Chlidonias niger*

Source: *New Columbia Audubon Society, Dave Czaplak. Friends of Dyke Marsh, Kurt Gaskill.*

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Table 3-19: Mammals and Reptiles Observed since the September 1997 FEIS within the Project Area

Common Name	*Scientific Name*
Short-tailed Shrew	*Blarina carolinensis*
Red Fox	*Vulpes vulpes*
Black Rat Snake	*Elaphe obsoleta*

3.7.7 Rare, Threatened and Endangered Species

During the preparation and final approval phases of the 1997 FEIS, Section 3.7.6, no federal or state listed rare, threatened, or endangered (RTE) plant or animal species were identified within the project area (FHWA 1997). At a June 4, 1998 interagency coordination group meeting and in a follow-up letter dated September 11, 1998, the US Fish and Wildlife Service (USFWS) informed the FHWA that a pair of bald eagles (*Haliaeetus leucocephalus*), a federally listed species (threatened), had recently established a nest adjacent to the project area. The USFWS indicated concern that the nesting behavior of this breeding pair may be affected by the proposed project. The NMFS more recently commented that shortnose sturgeon (*Acipenser brevirostrum*), another federally listed fish species (endangered), also potentially occurs in the project area. In response to these agency comments, Biological Assessments have been conducted for the bald eagle (FHWA 1999) and shortnose sturgeon (FHWA 1999). In addition, further consultation with federal natural resource management agencies pursuant to Section 7 of the Endangered Species Act has recently been completed with respect to the presence of threatened or endangered plant and animal species within the expanded project area, proposed mitigation areas, and proposed construction staging areas. The findings of the RTE studies and results of the recent RTE occurrence reviews for the expanded project area are summarized below. (See Appendices F and B for information related to potential RTE occurrence and impacts associated with construction staging areas and wetland mitigation sites, respectively.) In addition, coordination regarding federally listed species within the District of Columbia was begun on September 21, 1999 with the Washington, D.C. Natural Heritage Program; however, a response has not yet been received. Given the developed nature of the I-295 corridor, the presence of RTE is unlikely in this area. Agency consultation correspondence is identified in Chapter 5 and available for viewing in the Woodrow Wilson Bridge project offices in Virginia and Maryland.

Federally Listed Species

Bald Eagle: During the winter and spring of 1998 a pair of bald eagles established a nest and successfully raised two young in Betty Blume Park, just south of the Woodrow Wilson Bridge on the Maryland side of the Potomac River. A Biological Assessment of the bald eagle pair and of the wintering population of eagles occupying areas adjacent to the bridge was conducted to determine potential project-related effects on this protected species. Field work for the Biological Assessment was conducted between October 1998 and March 1999. A total of 167 survey hours were spent observing roosting, foraging, resting, and breeding behaviors of eagles along the Maryland and Virginia shorelines from Marbury Point north of the bridge to the mouth of Broad Creek south of the bridge. The Biological Assessment also includes a detailed literature search and consultation with recognized experts on the species. The Biological Assessment can be viewed at the Woodrow Wilson Bridge project offices in Virginia and Maryland.

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The resident nesting eagle pair was observed foraging from the Maryland shoreline north of the bridge, in Oxon Cove, and in Smoots Cove, including Rosalie Island. Other observations were of the resident pair on or near the nest tree engaged in pair bonding activities (e.g., nest building) during the day and going to roost in the evening. The majority of wintering eagles (a mix of adult and subadult individuals) were observed foraging from perches in trees or in the air along the Maryland shoreline from Oxon Cove to Fort Foote, including Rosalie Island. Lesser numbers of foraging eagles were observed along the Virginia shoreline primarily in the Dyke Marsh area. Temporary aggregations of perched (loafing) eagles were observed at low tide on the Hunting Creek and Oxon Cove flats. Potential project impacts to resident and migratory eagles are discussed in Chapter 4.

The Biological Assessment report of the bald eagle was submitted to USFWS on May 7, 1999. On September 2, 1999, USFWS informed the FHWA that formal consultation would be required under Section 7 of the Endangered Species Act and asked that FHWA send a letter requesting initiation of the process. A letter was sent by FHWA on September 22, 1999. A follow-up letter dated November 11, 1999 was sent by the FHWA to the USFWS to verify the regulatory review schedule. Correspondence is available for viewing in the Woodrow Wilson Project Offices in Virginia and Maryland. USFWS will have 90 days to review the project and conclude formal consultation followed by 45 days in which to render a biological opinion. The biological opinion will discuss the effects of the project on the bald eagle and whether it would jeopardize the continued existence of this species. The biological opinion will also discuss what, if any, compensation measures could be adopted to offset potential impacts to bald eagles.

In July 1999, USFWS began the formal process to remove the bald eagle from the federally threatened species list. USFWS solicited comments on the proposal to de-list the species through publication of a public notice. The comment period for the public notice expired in October 1999. USFWS will now review all comments and anticipates making a decision by summer 2000. The planned de-listing of the bald eagle does not affect the current project review of the species, because the species was listed at the time that federal review of the project began (Craig Koppie, personal communication). The species would also retain protection under the Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250), as amended.

Shortnose Sturgeon: In December 1998, NMFS wrote a letter to FHWA stating that the shortnose sturgeon may be present in the project area. In July/August 1998, USFWS began an investigation of the shortnose sturgeon in the Potomac River north of the Woodrow Wilson Bridge. The study was required by NMFS to assess potential impacts to shortnose sturgeon from a proposed USACOE project to dredge two channel segments of the *Potomac River below Washington* (Hunting Creek Bar and Mattawoman Bar) and at the Alexandria waterfront channel in the vicinity of Robinson's terminals of the *Potomac River at Alexandria* (Moyer, personal communication, October 27, 1999). Based on the unpublished results of the study, no shortnose sturgeon have been identified in the project area to date. The study has been extended for another year. In a memorandum dated September 24, 1999, NMFS recommended informal consultation regarding potential impacts to the shortnose sturgeon from the demolition phase of the project if hydraulic dredging or underwater blasting is proposed for removal of the existing bridge after traffic is shifted to the new structure. Though only mechanical dredging would be used, underwater blasting may be an option considered for demolition of the existing bridge. To satisfy this request, a Biological Assessment was completed for the shortnose sturgeon and a draft report submitted to NMFS on December 16, 1999.

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The report summarized data collected by the USFWS in the Potomac River and other information obtained from an extensive literature review.

The conclusion and findings of the Biological Assessment indicate that a very low potential for presence exists for the shortnose sturgeon, though suitable habitat exists. With that, a three pronged approach to further avoid and minimize the potential for effects to shortnose sturgeon has been developed including: time-of-year restrictions for underwater blasting and removal of debris from the river; the requirement of a stringent blast design which incorporates blast design techniques to minimize the shock wave(s); and the requirement of double-walled, dewatered cofferdams at the bascule structure. The bascule pier requires additional precautions as the structure would require the largest explosive charges and is adjacent to the navigation channel, which is an area of suitable habitat. This program is anticipated to further minimize the low potential for impact to the shortnose sturgeon.

State Listed Species

The review of potential RTE species occurrence within the expanded project area, proposed construction staging areas, and wetland and stream mitigation sites began in June 1999. A threatened/endangered species database search was conducted through the Virginia Department of Game and Inland Fisheries (VDGIF) for the Northern Virginia areas. A 4.8-kilometer (3-mile) radius search was conducted for several points located along the project corridor and near the potential construction staging areas. Results of the search indicated the potential occurrence of the state threatened henslow's sparrow (*Ammodramus henslowii*) and the state endangered brook floater mussel (*Alasmidonta varicosa*). A letter was sent to VDGIF on June 25, 1999 requesting verification that the two state listed species were correctly identified as being within the expanded project area. In a letter dated June 30, 1999, VDGIF replied that there are no currently documented threatened or endangered species in the project area. VDGIF did indicate that several species of anadromous fish, including alewife (*Alosa pseudoharengus*), striped bass (*Morone saxatilis*), and blueback herring (*Alosa aestivalis*), were found near the project area. It is likely that these species use this area for spawning in the spring.

For the expanded project area and proposed mitigation and construction staging sites in Maryland, coordination with the Maryland Department of Natural Resources began on August 23, 1999. No records for federal or state rare, threatened or endangered plants or animals were identified within the expanded Woodrow Wilson Bridge project area. However, RTE species were identified in the vicinity of several of the proposed mitigation sites in Charles County (see Appendix B).

3.7.8 Special Jurisdictions

Natural resources in the region and project area are regulated according to special federal and state laws designed to protect important national and regional resources, including the Potomac River, Chesapeake Bay, and the Coastal Zones of Virginia and Maryland. The federal and state protection programs applicable to these resources are discussed in the 1997 FEIS, Section 3.7.7.

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3.8 Cultural Resources

3.8.1 Introduction

The FHWA's historic preservation responsibilities under Sections 106 and 110 of the National Historic Preservation Act have been fulfilled through implementation of a Memorandum of Agreement (MOA) since publication of the 1997 FEIS. This MOA was signed by officials of FHWA, NPS, the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officers of Maryland, Virginia and the District of Columbia (SHPOs), as well as representatives of a number of concurring parties, including the Maryland State Highway Administration (MSHA), the Virginia Department of Transportation (VDOT), the City of Alexandria, the Maryland-National Capital Park and Planning Commission (M-NCPPC), Prince George's County, and the Mount Vernon Chapter of the Daughters of the American Revolution. Execution and implementation of this MOA is evidence that FHWA has afforded the ACHP an opportunity to comment on the Woodrow Wilson Bridge project and its effects on historic properties, and that the FHWA has taken into account the effects of this undertaking on historic properties. A copy of the executed MOA is included in Appendix D.

Since the execution of the MOA, the FHWA has proceeded to implement stipulations of the MOA. Specific actions taken in the implementation of the MOA stipulations have been detailed in bi-annual progress reports developed by FHWA and submitted to the parties to the MOA. Copies of all of the progress reports generated to date are included in Appendix E.

The FHWA, the MSHA, the DCDPW, and the VDOT in consultation with the Maryland, Virginia, and District of Columbia SHPOs defined the Area of Potential Effects (APE) for the Woodrow Wilson Bridge Improvement Study. The original APE, defined in September 1995, served as the basis of historic property identification for the January 1996 DRAFT SEIS, which assessed the effects of the alternatives considered in that document. Following Section 106 consultation, this APE was also used for analysis of alternatives considered in the July 1996 DRAFT SEIS. The original APE was broadly defined so as to consider all reasonably foreseeable potential effects of the proposed alternatives on historic properties. As a result of subsequent studies, a clearer understanding of the nature and range of potential effects of the project was achieved and the APE for the project was revised in April 1997. The revised APE was based on more detailed information on traffic projections, the size and scale of the proposed Bridge and interchanges, and air quality, noise, vibration, and visual effects. Both the 1996 APE, and the revised 1997 APE for Alexandria, Virginia are shown in Figure 3-13.

Since publication of the 1997 FEIS, there have been design changes and expansion of the Project limits that have resulted in an expanded Area of Potential Effects (APE). As required in Stipulation III.A. ("Treatment of Archaeological Resources") and Stipulation VI ("Identification and Evaluation and Treatment of Additional Historic Properties) of the 1997 MOA, the FHWA re-examined the design changes, examined areas within new Project limits, and assessed additional effects these changes to the Project might have to cultural resources. The following sections of this DRAFT SEIS describe the expanded APE and FHWA's efforts to identify and evaluate properties that have been newly identified through these changes to the project. FHWA has also performed additional investigations of historic properties that had been identified previously in the 1997 FEIS. FHWA's investigations of the historic properties previously identified in the 1997 FEIS are also discussed in the following sections.

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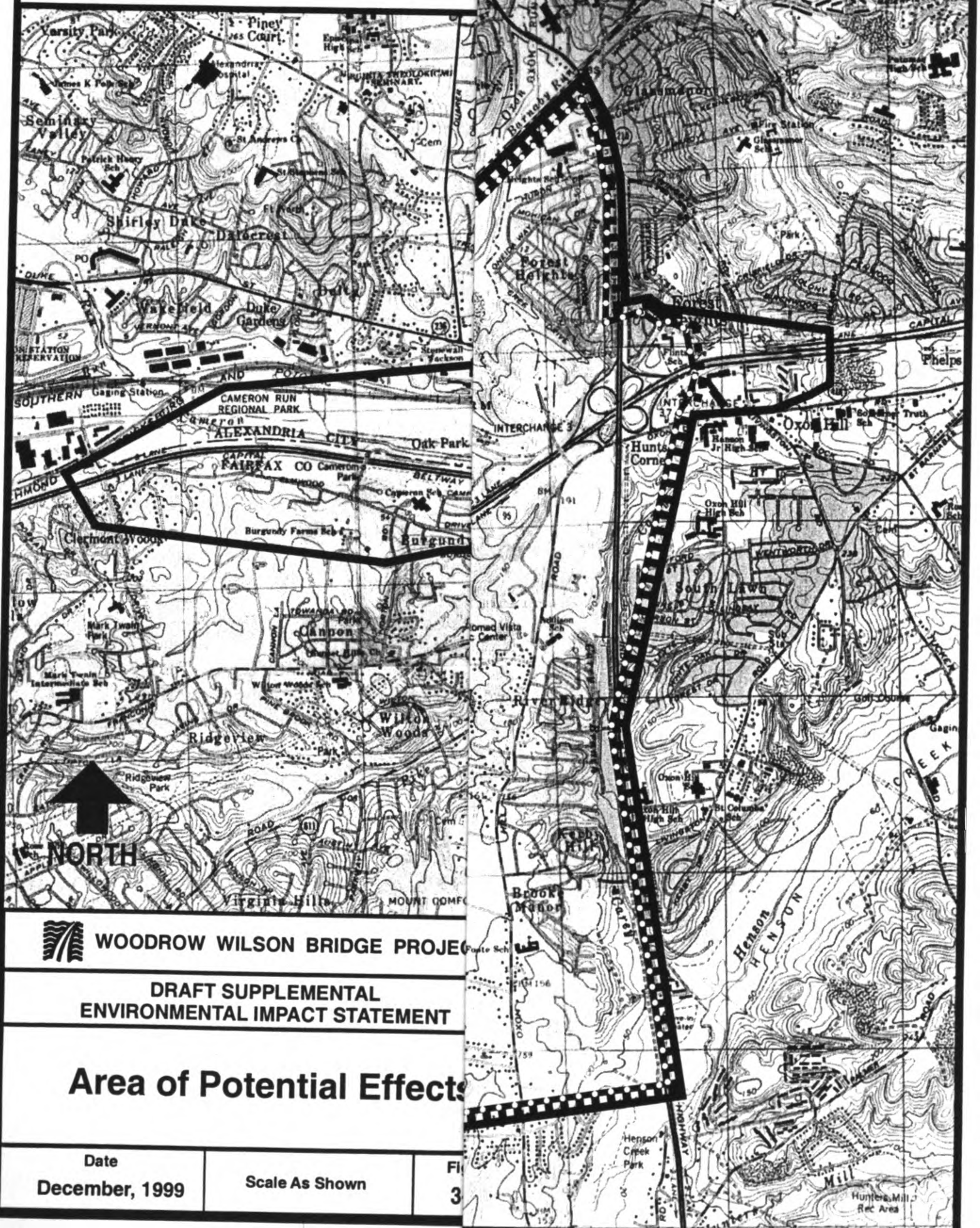
Legend

- Area of Potential Effects (APE), September 1999
- Refined Area of Potential Effects (APE), Alexandria, April 1997
- Area of Potential Effects (APE), 1



WOODROW WILSON BRIDGE PROJE

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Area of Potential Effects

Date		Fi
December, 1999	Scale As Shown	3

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FHWA has also conducted additional cultural resource investigations within proposed environmental mitigation sites (i.e., proposed wetland creation sites and fish passage improvement sites) and within proposed construction staging areas and dredge disposal sites. Investigations within proposed mitigation sites are discussed in Appendix B while those for construction staging areas and dredge disposal sites are presented in Appendix F.

3.8.2 Expansion of the Area of Potential Effects Determination

As noted above, design changes have resulted in an expanded APE for the project (Figure 3-13). The following discussions present the reasons for the expansion. A more complete description of the design changes that resulted in this expansion is presented in Chapter 2. The expanded APE was defined in consultation with the Maryland, Virginia, and District of Columbia State Historic Preservation Officer (SHPOs). Correspondence concerning the APE, new properties identified, and an assessment of effects were submitted to the District of Columbia and Virginia SHPO on November 11, 1999 and to the Maryland SHPO on November 29, 1999. The District of Columbia and the Maryland SHPOs have concurred, Virginia SHPO response had not been received as of the publication of this document. Correspondence related to this issue is identified in Chapter 5.

The expanded APE encompasses the project's construction limits and is extended beyond these areas to include the geographic area that may be affected by changes to the character or use of historic properties should these be present in the expanded APE. Such changes may include visual, audible, or atmospheric effects caused by roadway expansion or the width of bridges associated with interchanges, increases in roadway or bridge height, areas of dredging, and the expansion of interchanges connecting the Woodrow Wilson Bridge with nearby highways. In each case, the proposed improvements may lie within the viewshed of properties that are historic or may be considered historic.

Figure 3-13 also shows the boundaries of the newly expanded APE in relation to the previous APE presented in Figure 3-22 of the 1997 FEIS. It should be noted that the four discontiguous areas of the APE shown in Figure 3-22 and 3-30 of the 1997 FEIS are still considered part of the overall APE for the proposed project and effects to historic properties inside the discontiguous areas remain unchanged (one of the discontiguous areas is located on the east side of the Potomac River, three of these areas are south of the proposed Woodrow Wilson Bridge in Maryland, and one is north of the bridge in the District of Columbia).

Virginia

- The extension of work proposed for I-95/495 for a distance of 2.57 kilometers (1.6 miles) west of the former western terminus of the project in the City of Alexandria and Fairfax County, see Figure 3-13. This section of highway begins 0.8 kilometers (0.5 miles) west of the highway's existing interchange with Telegraph Road and will serve as a transition zone between the Capital Beltway's existing eight lane section outside of the APE and the twelve-lane typical section being considered for this project. Because this expansion will result in the creation of a tapering roadway for I-95/495 covering a distance of 0.8 kilometers (0.5 miles) west of the highway's existing interchange with Telegraph Road, the APE has been expanded to include adjacent areas should this section result in visual effects.

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- The expansion of work proposed for the two I-95/495 beltway interchanges in Alexandria (the US 1 interchange and the Telegraph Road interchange). Because design changes to these interchanges will result in a larger interchange footprint and the height of the interchange ramps will be increased and may therefore have a visual effect to adjacent areas, the APE has been expanded to include Shuter's Hill and the viewshed of the George Washington National Masonic Memorial that sits atop the hill.

Maryland

- The extension of work proposed to I-95/495 for a distance of 2.25 kilometers (1.4 miles) east of the former eastern terminus of the project in Prince George's County. This section of highway begins 0.48 kilometers (0.3 miles) east of the highway's existing interchange with MD 210 and will serve as a transition zone between the Capital Beltway's existing eight-lane section outside of the APE and twelve-lane typical section currently being considered for this project. Because this expansion will result in the creation of a tapering roadway for I-95/495 covering a distance of 0.48 kilometers (0.3 miles) east of the highway's existing interchange with MD 210, the APE has been expanded to include adjacent areas should this section result in visual effects.

- The extension of work proposed for the Beltway interchanges with MD 210 in Prince George's County, which will involve placing the interchange ramps at a higher elevation than originally planned and would therefore create the potential for visual effects to the surrounding area.

District of Columbia

- The extension of work proposed along I-295 for a distance of 2.57 kilometers (1.6 miles) north of I-95/495 resulting in the construction of two traffic lanes in addition to the existing highway's eight lanes (1.45 kilometers [0.9 mile] of this project expansion will be in the District of Columbia). While this expansion will involve ground-disturbing activities all work will occur within existing right-of-way and the new lanes will be constructed within the area now occupied by a grassed median. Hence, the expanded APE for this section of the project includes only the limits of the present right-of-way.

3.8.3 Terrestrial Archaeological Resources

Revised Area of Potential Effects: The expanded APE in Maryland encompasses two locations that had not been previously investigated in the 1997 FEIS. These areas include a MSHA owned parcel adjacent to the Flintstone Elementary School and a parcel near the I-295 interchange that is currently owned by the Maryland-National Capital Park and Planning Commission (M-NCPPC). The FHWA determined that all other changes to the Project occur in areas that do not have the potential to contain significant archaeological resources. The FHWA is currently consulting with the Maryland SHPO on this determination .

The FHWA conducted Phase I archaeological identification surveys within the MSHA parcel and the M-NCPPC property. These efforts involved extensive background research on the prehistory and history of these locations, followed by the systematic excavation of shovel tests across the parcels, and the placement of hand-dug excavation units within locations that contained

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archaeological sites. The MSHA property near the Flintstone School contains a small prehistoric, non-diagnostic lithic scatter. The FHWA has determined that the site is not eligible for listing in the National Register of Historic Places. The FHWA will consult with the Maryland SHPO on this determination pursuant to Stipulation III. B. of the MOA. The preliminary results within the M-NCPPC property indicate that the parcel contains an intact, stratified prehistoric site, known as the Smoots Cove Site. The site consists of a Late Woodland Potomac Creek component overlaying an earlier occupation represented by lithic artifacts. A Phase II evaluation will be conducted at this site in accordance with the terms of the MOA to define the site's significance. Based on the results of the Phase II study, the FHWA will consult with the Maryland SHPO on the site's National Register eligibility.

The FHWA is currently evaluating the need for Phase I archaeological identification surveys within the expanded APE associated with the Virginia interchanges, as newly designed. This evaluation is based on extensive background research on the prehistoric and historic land use of these locations, and on the how the construction of the current interchanges may have altered the area's prehistoric and historic landscapes. The FHWA will consult with the Virginia SHPO and the City of Alexandria on the need for a Phase I investigation, and the scope of such an effort, pursuant to Stipulation III. A. of the MOA.

Changes To Sites Previously Identified in 1997 FEIS: The FHWA is conducting additional investigations of three properties that were identified in the 1997 FEIS. These include the Virginia Shipbuilding Site (44 AX 78) and the possible historic ropewalk site (44 AX 165), both in Jones Point Park in Alexandria, Virginia; and the Freedmen's Cemetery (44 AX 179) (see Figure 3-14), also in Alexandria.

The FHWA is completing archaeological testing to define the southern and western boundaries of the Freedmen's Cemetery (44 AX 179) in Alexandria, Virginia in order to guide the design of the Washington Street urban deck and its associated features. The Virginia SHPO and the City of Alexandria concurred with the FHWA's scope of work for the testing of Freedmen's Cemetery. Fieldwork involved the excavation of hand-dug test units in the eastern portion of the site, given the shallow depth of grave shafts below the surface in this area. Testing within the western section of the site involved the mechanical excavation of trenches to expose original historic soils that had been buried beneath deep modern fill. Excavations only involved the definition of grave shafts. Excavations were not conducted within the grave shafts, nor were any human remains being exhumed from the shafts. The testing has identified approximately 45 grave shafts, all located in the eastern portion of the property, north of the Capital Beltway and west of Washington Street. No grave shafts were located in the western portion of the property, east of the Church Street exit ramp. This area contained deep deposits (up to 18 feet deep) of nineteenth and twentieth-century fill above natural soils. Based on the testing, the southern boundary of the cemetery is approximately 10 meters (35 feet) north of the edge of the Capital Beltway and approximately 67.1 meters (220 feet) west of Washington Street.

Phase I identification survey conducted during the previous project planning efforts were inconclusive as to the eligibility of the Virginia Shipbuilding Site (44 AX 78) and the ropewalk site (44 AX 165). Therefore, both sites were considered to be eligible for listing in the National Register for the 1997 FEIS, and commitments were made in the MOA to further evaluate these properties. The FHWA has now initiated Phase II investigations within the Virginia Shipbuilding Site (44 AX 78) to evaluate the site's National Register eligibility. The site will be affected by the

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construction of the new bridge. The Phase II effort involves extensive research on the history and features of the site, to be followed by archaeological investigations of the site's structures and artifact deposits. Archaeological excavations will involve excavation of hand-dug test units and mechanical trenching to reach archaeological deposits beneath modern fill. Based on the results of the Phase II investigation, the FHWA will consult with the Virginia SHPO on the National Register eligibility of the site.

The FHWA will conduct a Phase I identification survey of the possible ropewalk site (44 AX 165) in Jones Point Park. As with the Shipbuilding Site, the possible ropewalk site was considered to be eligible for listing in the National Register for the purpose of the 1997 FEIS, but no formal identification and evaluation studies were conducted. This site will also be affected by the construction of the new Bridge. The Phase I study will involve the systematic excavation of shovel tests across the site, and the placement of hand-dug test units to more fully examine any deposits or features within the site. Mechanical removal of modern fill soils will be required in some location in order to reach the historic deposits and features. Based on the results of the Phase I investigation, the FHWA will consult with the Virginia SHPO on the significance of the site, and whether or not additional work (i.e., Phase II) is required in order to fully evaluate the National Register eligibility of the site.

3.8.4 Underwater Archaeological Resources

Revised Area of Potential Effect: Additional Phase I underwater archaeological survey was conducted within the expanded APE, which included locations north of the bridge and an area (channel) proposed for removal of dredge material within Smoots Cove. The survey involved the use of a magnetometer to identify features on the river bottom surface. A digital acoustic recorder side scan sensor was also used to gather acoustic data. Divers then investigated (i.e., ground-truthed) identified remote sensing target locations. If no objects were found on the river-bottom surface, a series of systematic probes were conducted to identify the target source. The goal of the divers' investigation was to determine the nature of the material responsible for generating the remote sensing signature. This investigation revealed one potentially significant archaeological resource north of the bridge (designated Target 1-157) consisting of up to eight submerged wooden barges. Target 1-157 is considered potentially eligible for listing in the National Register under Criterion D. Several other targets identified in the expanded APE are considered ineligible for the National Register. These targets (3-120, 6-509, 5-115, -1-92, 2-245, and 3-207 north of the bridge; and 14-27, 27-8, 23-2, and 76-9 within Smoots Cove) included modern remains and debris (see Table 3-20).

The expanded APE also encompassed waters near the shoreline immediately to the north of Rosalie Island in Maryland. Therefore, this area was also subjected to a Phase I underwater archaeological survey. Preliminary results of this investigation indicate that ten wrecks are located on the north side of the island, and that several may be potentially eligible for listing in the National Register. These included eight barges, one framed boat, and the iron bow section of an unidentifiable boat. Consultation regarding these identified targets is on-going with the Maryland SHPO.

Changes to Sites Previously Identified in 1997 FEIS: Evaluation of three previously identified archaeological resources that will be impacted by the project is also underway. Designated Targets 64-3, 66-8, and 67-10, these sites will be impacted by dredging and/or pier construction (Table 3-20). FHWA is conducting a Phase II evaluation of these resources in order to determine

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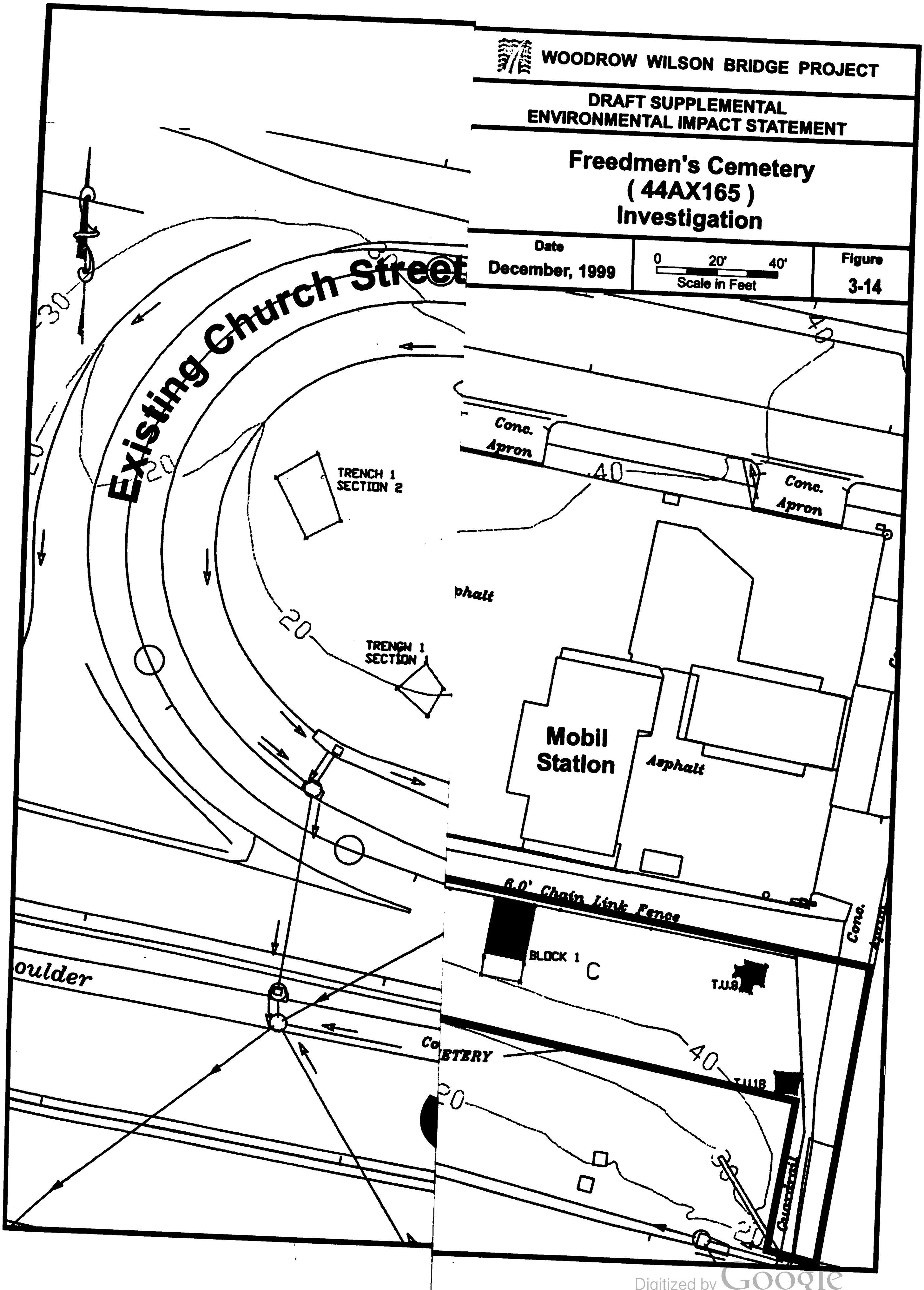

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their National Register eligibility. This effort involves the excavation of trenches across the targets in order to identify their form, function, and extent. Archival research will be conducted to provide a context for evaluation of the sites' National Register eligibility. Based on the results of the Phase II investigation, the FHWA will consult with the Maryland SHPO on the National Register eligibility of the sites.

Table 3-20: National Register-Listed or Eligible Underwater Archaeological Resources within the Project's Area of Potential Effects [1]

Target No.	Description	Ground Truth	Phase Ib Recommendation	Current Recommendation	National Register Status [2]
66-8	Barge [3]	Yes [4]	Phase II	Phase II	PE
67-10	Barge	Yes [4]	Phase II	Phase II	PE
64-3	Magnetic/canal boat [3]	Yes [3]	Phase II	Phase II	PE
1-157	***Barges***	***Yes [4]***	***Phase II***	***None***	***PE***
Rosalie Island Targets	**Eleven vessels**	***Yes***	***Phase II***	***None***	***PE***

Notes on following page.
Source: *Stevens et al. 1996*
Notes: *1 Underwater archaeological resources are identified in only that portion of the contiguous APE where disturbances are likely to occur*
2 Potentially eligible and unevaluated sites are considered National Register eligible for the purposes of the Woodrow Wilson Bridge Improvement Study
3 Ground truth completed – not eligible
4 Ground truth completed – potentially eligible

PE Potentially eligible for listing in National Register of Historic Places
E Eligible for listing in National Register of Historic Places
U Unknown
NE Not eligible for listing in National Register of Historic Places

Bold/Italics *= Sites identified since 1997 FEIS*

3.8.5 Historic Architectural Resources

Revised Area of Potential Effects: FHWA conducted an historic architectural survey of all locations within the expanded APE that had not been investigated under the 1997 FEIS (see Figure 3-13). This work included background historical research and a comprehensive field inventory. All work was conducted in accordance with the Survey and Documentation Standards of the two SHPOs (Virginia's "Guidelines for Preparing Identification and Evaluation Reports for Submission Pursuant to Sections 101 and 110, National Historic Preservation Act, Environmental Impact Reports of State Agencies, and Virginia Appropriation Act, 1992 Session Amendments"; and Maryland's "Standards and Guidelines for Architectural and Historical Investigations In Maryland"). In the District of Columbia, no additional architectural survey work was conducted because all project work will occur within I-295's existing right of way. The District of Columbia State Historic Preservation Officer concurred on November 17, 1999, reference summary of correspondence in Chapter 5.

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Prior to all fieldwork, FHWA consulted the historic architectural survey files at the State Historic Preservation Offices in Virginia and Maryland to obtain information on any previously documented above-ground properties that were not included in the previous historic architectural investigations conducted in support of the project's FEIS. These survey forms were collected and checked for accuracy and currency during fieldwork. Relevant historic maps were also examined to assess the nature and type of these properties. In addition to checking for the locations of historic properties, this assessment also included the review of survey reports conducted within the vicinity of the project area.

In both Alexandria, Virginia and Prince George's County, Maryland, FHWA consulted a wide range of historic source materials, including local newspapers as well as the City of Alexandria's Archives and Records Center and the Department of Code Enforcement. The City's Department of Planning and Zoning also provided a number of planning and cultural resource planning documents. Because Forest Heights extended into the expanded APE, FHWA contacted preservation planners in Prince George's County, Maryland including Ms. Susan Pearl, Historic Preservation Planner, and secured original plat maps and later plat re-subdivisions for the Town of Forest Heights at the Prince George's County Planning Department in Upper Marlboro, Maryland.

The historic context discussion presented in Section 3.8.3 of the 1997 FEIS remains valid and applicable to the historic architectural survey within the expanded APE. In addition, three other contexts were consulted in order to properly evaluate surveyed properties in the expanded APEs: the April 1999 Draft Historic Context "Public Housing in the United States, 1933-1949," prepared for the US Department of Housing and Urban Development and the US Department of Interior, National Park Service by Judith Robinson, Laura Bobeczko, Paul Lusignan, and Jeffrey Shrimpton; the September 1998 Draft "Context and Guidelines for Evaluating America's Historic Suburbs for the National Register of Historic Places," prepared for the National Park Service by David L. Ames; and the November 1997 Draft "Suburbanization Historic Context and Survey Methodology, Montgomery and Prince George's Counties, Maryland," prepared for the Maryland Department of Transportation, State Highway Administration by Paula Spero.

Several resources were identified within the revised APE and received closer examination in the fieldwork stage of the survey:

- The George Washington National Masonic Memorial, Alexandria, Virginia;
- Union Station, Alexandria, Virginia;
- Hunting Terrace Apartments, Alexandria, Virginia;
- Hunting Towers Apartments, Alexandria, Virginia; and
- A 1940s suburban neighborhood located in the Town of Forest Heights, Prince George's County, Maryland.

Of the five properties identified in the revised APE, only two (the George Washington National Masonic Memorial and Union Station) had been previously surveyed. Hence, survey forms were prepared for each of the other three properties following the appropriate state survey guidelines. Because none of the three resources had been assessed in terms of their National Register eligibility, the FHWA applied the National Register Criteria for Evaluation to each of the properties.

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The George Washington National Masonic Memorial: Built over a nine-year period beginning in 1923, the George Washington National Masonic Memorial is located atop Shuter's Hill, which is 108 feet above sea level, making the memorial the tallest building in Alexandria. At the April 6, 1998 meeting of the Virginia SHPO's National Register Evaluation Committee, the committee ruled that the George Washington Masonic National Memorial was eligible for the National Register of Historic Places on a National level of significance under Criterion C. However, because of owner objection, the Virginia SHPO staff has not forwarded the National Register nomination for the Masonic Memorial to the Keeper of the Register. Therefore, for purposes of the proposed Woodrow Wilson Bridge Improvement Project, this resource is considered eligible for the National Register.

Union Station: Also located in the revised APE is Union Station. An example of a railroad depot designed in the Colonial Revival style, this building was constructed in 1904. Located below Shuter's Hill at 110 Calahan Drive in Alexandria, this resource continues to function as a train station for Amtrak and commuter rail service. While the 1997 FEIS did not describe the building, Union Station appeared in Table 5-1 of the 1996 "Woodrow Wilson Bridge Improvement Study Integrated Cultural Resources Technical Report," which identified Union Station as being individually eligible for the National Register of Historic Places, for purposes of the proposed Woodrow Wilson Bridge Improvement Project. Hence, this resource is considered eligible for the purposes of the proposed Woodrow Wilson Bridge Improvement Project.

Hunting Terrace Apartments: Hunting Terrace Apartments were determined not eligible (NE) for listing in National Register of Historic Places for the 1997 FEIS, and agreed to by Virginia SHPO. However, in April 1999 the Advisory Council on Historic Preservation (ACHP) requested, pursuant to 36 CFR Part 60, the FHWA conduct a formal Determination of Eligibility (DOE) for Hunting Terrace in Alexandria. The Hunting Terrace apartments are a group of eight buildings that were constructed ca. 1942-1943 in the Colonial Revival style. The complex was designed by architect William H. Harris, who also participated in the design of Yates Gardens, a well known apartment complex within Alexandria's Historic District. The apartments are located at the southern end of the City of Alexandria just west of the George Washington Memorial Parkway, and just south of the Beltway, on a 16.6-acre parcel of property that slopes downwards towards Hunting Creek, a tributary of the Potomac River. The complex is organized into a grouping of eight structures, arranged in two rows running north to south orientation.

The FHWA submitted the DOE documentation to the Keeper of the National Register on September 9, 1999. The DOE documentation presented the FHWA's determination that Hunting Terrace was not individually eligible for listing in the National Register of Historic Places, nor was it a contributing element to the National Register-listed Alexandria Historic District. The FHWA inventory and evaluation of the Hunting Terrace Apartments demonstrated that this property did not meet the standards of significance for listing in the National Register. Its size of development, scale of landscape preparation, number of elements, type of amenities, variety of apartment sizes and layouts, and impact on future design of housing of its type does not compare to that of other similar National Register listed or eligible properties in the region. Nor does it embody the distinctive characteristics of other National Register listed or eligible examples of World War II garden apartments in Alexandria. There are a number of more important examples within the city, including Yates Garden, for which William Harris, the architect of Hunting Terrace, served as the lead designer. Hence, Hunting Terrace does not appear to meet the minimum evaluation standards for National Register eligibility established under Criteria A and C. The Keeper concurred with

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FHWA's determination on October 19, 1999. Reference to the Keeper's determination is included in Chapter 5.

Hunting Towers Apartments: The Hunting Towers Apartments consist of a group of three eight-story buildings that were constructed between 1949 and 1951, thus, in 1999 reaching 50 years old and therefore included for consideration. The apartments are located at the southern end of the City of Alexandria just east of the George Washington Memorial Parkway, and just south of I-495 (the Capital Beltway), on a parcel of property that overlooks the Potomac River. This complex is organized as a group of three structures, each built on a cross-shaped plan. The three buildings are arranged in a diagonal line running along the property in a northeast to southwest direction. The east and south portions of the building site, part of which was formed by fill, contain a number of outdoor attractions, including a swimming pool, tennis courts, and access to the Potomac River. FHWA determined that Hunting Towers did not meet the minimum requirements of eligibility for listing in the National Register of Historic Places, either as an individual property, or as a contributing element within an expanded Alexandria National Register Historic District. Moreover, an analysis of historical data for Hunting Towers failed to identify an association with a specific event marking an important moment in American history, but also failed to show any links to a pattern of events or a historic trend that made a significant contribution to the development of a community, state, or nation. In addition, this analysis showed that, based on the character of Hunting Towers and the contextual information mentioned above, other properties in the greater Northern Virginia region more completely embody the distinctive characteristics of style and design in a manner that better reflects the significance of mid-twentieth century architecture than Hunting Towers. Hence, Hunting Towers does not appear to be eligible for listing in the National Register under Criteria A or C. FHWA has consulted concurred with the Virginia SHPO on this determination on August 13, 1999, reference to the Virginia SHPO correspondence is included in Chapter 5.

Forest Heights: Originally platted by the Washington Heights Realty Corporation in 1940, the town of Forest Heights began as a suburban community located near the town of Oxon Hill in Prince George's County. According to the Maryland-National Park and Planning Commission's 1999 *Preliminary Master Plan and Proposed Sectional Map Amendment for the Heights and Vicinity*, "this area began to develop in the late 1940s to accommodate the explosive growth that occurred in the region during and after World War II. It contains a variety of housing types from duplexes, triplexes, garden apartments and single-family detached housing developments from that time. The Town of Forest Heights, an incorporated municipality, has the ambiance of a village of single-family detached homes, many of which have been expanded and added onto over the years (p. 67)." Although intact buildings within the Forest Heights neighborhood remain, none of these buildings possess sufficient distinction to be considered individually eligible. Also, the majority of residential buildings date from the mid-1950s to early 1960s. While the community is an example of a planned suburban neighborhood, it has experienced numerous changes such as the elimination or realignment of planned streets and alterations to landscape features. However, more disruptive to the integrity of Forest Heights as a historic district than the above alterations is the presence of Indian Head Highway within the boundaries of the community. Therefore, the FHWA determined that Forest Heights lacked the integrity to render it National Register-eligible under Criterion C. It lacks significance related to events and people and is not eligible under Criterion A or B. The Maryland SHPO has concurred on November 29, 1999 that Forest Heights is not eligible for listing in the National Register, reference summary of correspondence in Chapter 5. Table 3-21 provides a

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comprehensive listing of all National Register-listed or eligible historic architectural resources and districts in the Project's APE.

Table 3-21: National Register-Listed or Eligible Historic Architectural Resources and Districts in the Areas of Potential Effects Identified or Reassessed Since the 1997 FEIS

Site No.	Name	National Register Status
Virginia:		
---	Alexandria Historic District	Listed (NHL)
100-128	***George Washington National Masonic Memorial***	***Eligible***
100-116	Jones Point Lighthouse and District of Columbia Cornerstone	Listed
29-218	Mount Vernon Memorial Highway	Listed
100-124	***Union Station***	***Eligible***
Maryland:		
PG 76A-13	Oxon Hill Children's Farm (formerly known as Mount Welby)	Eligible

Bold/Italics *indicates sites identified since 1997 FEIS.*

3.9 Hazardous Materials

An inventory of known and potential hazardous substances and hazardous waste generators was undertaken for the Current Design Alternative 4A project area and for potential wetland mitigation sites in Virginia, Maryland and the District of Columbia. The new inventory effort was completed for an area encompassing all the Current Design Alternative 4A alignments (extending approximately ½ mile from the proposed improvements), including new and previously studied areas. The coverage area extends beyond the project area to account for potential underground pollutant migration. The database search was repeated for previously studied areas to report on sites added to the regulatory databases since the 1995 investigation. The database search identified 133 individual sites in the project vicinity where hazardous materials are present. The large increase in identified sites compared to the 1995 investigation reflects improvements in both regulatory compliance and electronic access to regulatory records.

Hazardous substances are defined as any material that poses a threat to human health and/or the environment. Hazardous wastes possess at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appear on the EPA lists. These wastes are by-products that can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous substances are regulated pursuant to the Toxic Substances Control Act of 1976 (TSCA), Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and Resource Conservation and Recovery Act (RCRA) of 1976.

The following databases were searched:

- Emergency Response Notification System (ERNS)
- RCRA Corrective Actions
- RCRA Notifiers-Hazardous Waste Generators
- RCRA Hazardous Waste Violations
- RCRA Treatment Storage and Disposal Facilities (TSD)

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- Comprehensive Environmental Response, Compensation and Liability Act (CERCLIS)
- National Priorities List (NPL)
- Toxic Release Inventory (TRI)
- Registered Underground Storage Tank List (UST)
- Registered Above ground Storage Tanks (AST)
- Leaking Underground Storage Tank List (LUST)
- Solid Waste Landfill (SWLF)
- State Cleanup List (SCL)
- State Spill List (SPILLS)

ERNS Database: The EPA Emergency Response Notification System (ERNS) documents releases of oil and hazardous substances. This database was reviewed to determine if past spill events have occurred in the project area. Included under the CERCLIS database are facilities where the CERCLA investigations have been terminated following a decision of "No Further Remedial Action Planned" (NFRAP). In addition, the State Spill List (SPILLS) which identified past spill events under state jurisdictions was reviewed. No ERNS events were recorded in the project area. However, four (4) sites were reported to have experienced past spill events.

RCRA Corrective Actions, Notifiers, Violations, and TSDs: The EPA Resource Conservation and Recovery Act (RCRA) database was searched to identify registered hazardous waste generators, transporters, treatment, storage, and disposal facilities in the vicinity of the project area. One (1) corrective action site, 36 notifier, three (3) violation, and no TSD sites were reported.

CERCLIS Database: The EPA Superfund Program (CERCLIS) database is a compilation of sites the EPA is currently investigating for the release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). In addition, the State Cleanup List (SCL) which identifies cleanup actions under state Superfund authority, was reviewed. One (1) CERCLIS sites and one (1) SCL site were reported. CERCLIS sites that have been archived under an EPA decision of "No Further Remedial Action Planned" (NFRAP) are excluded (the former Alexandria municipal landfill site).

NPL: The EPA maintains a National Priorities List (NPL) of Superfund sites. Superfund sites are abandoned or uncontrolled hazardous waste sites identified for priority remedial action under the Federal Superfund Program. No Superfund sites were reported in the project area.

Toxic Release Inventory (TRI): Database containing information on the industrial release of toxic chemicals as reportable under Title III of the Superfund amendments and reauthorization Act of 1986 (SARA Title III). No TRI sites were reported in the project area.

UST Database: The Commonwealth of Virginia and the State of Maryland maintain a comprehensive list of all registered underground (UST) and above ground (AST) storage tanks. Approximately eighty (80) UST sites in the project area are registered. USTs and ASTs that have been removed are excluded.

LUST List: List of all reported leaking underground storage tanks (LUST) in the Commonwealth of Virginia. The State of Maryland database contains information on cleanup activities at facilities that have had either a spill or leaking underground storage tank. UST releases that have been remediated and for which the regulatory file have been closed are excluded.

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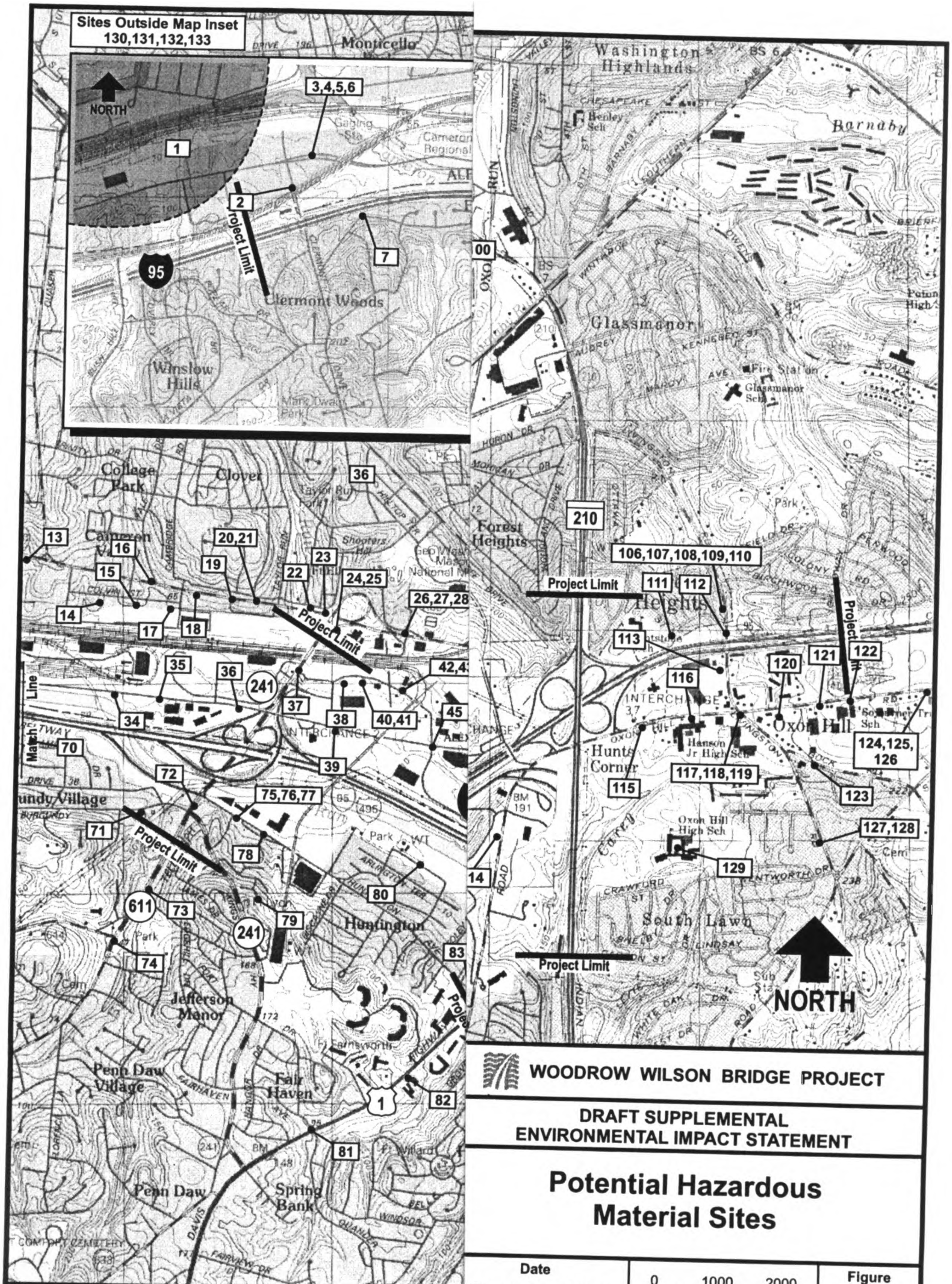

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Potential Hazardous Material Sites

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	3-15

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Solid Waste Landfill (SWLF): A state list of regulated solid waste management facilities was reviewed to identify sites, which could impact the project area. No such sites were reported.
Responses from the database searches are presented in Table 3-22, Hazardous Material Sites and Generators within the Project Area. Approximate locations of the Potential Hazardous Material Sites are illustrated in Figure 3-15. The Current Design Alternative 4A will require the acquisition of right-of-way that includes several properties with documented soil and/or groundwater contamination. The following properties have been acquired or are being considered for acquisition that have documented or potential contamination problems or potentially hazardous materials on site for normal business use.

U.S. Army Reserve Center (USARC), Jones Point, Alexandria, Virginia. This site contains minor soil and groundwater contamination that originated from the former heating oil underground storage tank (UST). Previously completed Phase 1 and Phase 2 site investigations have characterized the subsurface impact and identified the presence of lead-based paint (LBP) and asbestos-containing materials (ACM) in the existing structures. Industry standard demolition and debris disposal practices for LBP and ACM would be followed during preparation of this site. The residual heating oil contamination is not expected to present significant problems for the proposed construction. VDEQ has closed the regulatory file for the release based on a determination that remediation was complete.

Woodrow Wilson Bridge Tenders Building, Alexandria, Virginia. The tenders building would be demolished with the old bridge structure. Previous investigations have identified ACM and LBP incorporated into some flooring and painted surfaces. PCB residues were identified on a limited area of the transformer room floor. The PCBs originated from old transformers that were removed in 1990. PCB-containing oil is not used in any current Woodrow Wilson Bridge equipment. Demolition and disposal of ACM, LBP, and PCB impacted materials would be performed using industry standard procedures and in accordance with Occupational Safety and Health Administration (OSHA), United States Environmental Protection Agency (EPA), and state regulations.

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Table 3-22: Hazardous Material Sites and Generators within the Project Area

Site No.	Description	ERNS	RCRA CA	RCRA Notifier	RCRA Violation	RCRA TSD	CERCLIS	NPL	TRI	UST	LUST	AST	SCL	SPILLS	SWLF
1	Federal Facility		X				X			X	X				
2	Business									X					
3	Commercial – Storage Facility									X					
4	Commercial – Taxi Service											X			
5	Commercial – Delivery Service										X				
6	Commercial – Storage Facility									X					
7	Residential														
8	Business – Freight									X					
9	Commercial – Construction									X					
10	Commercial – Construction									X					
11	Commercial – Construction									X					
12	Institutional – School									X					
13	Commercial – Motor Equipment									X					
14	Commercial – Industrial									X					
15	Commercial –Roofing									X					
16	Commercial – Gas Station									X					
17	Commercial – Construction									X					
18	Commercial – Gas Station									X					
19	Residential – Multi-Family									X					
20	Business									X					
21	Commercial – Exterminator									X					
22	Commercial									X					
23	Maintenance Facility									X					
24	Municipal Facility											X			
25	Water Company									X					
26	Institutional – School									X					
27	Business											X			
28	Residential – Multi-Family										X				
29	Business										X				
30	Commercial – Petroleum										X				
31	Commercial – Auto Dealer										X				
32	Railroad Facility												X		
33	Business										X				
34	Rail Yard			X											
35	Business									X					
36	Business									X					
37	Industrial Facility									X					

Table continues on following page.

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Table 3-22: Hazardous Material Sites and Generators within the Project Area (continued)

Site No.	Description	ERNS	RCRA CA	RCRA Notifier	RCRA Violation	RCRA TSD	CERCLIS	NPL	TRI	UST	LUST	AST	SCL	SPILLS	SWLF
38	Commercial – Auto Repair									X					
39	Business									X					
40	Concrete Facility									X					
41	Industrial Facility									X					
42	Trucking Association									X					
43	Commercial – Distribution Center									X					
44	Water Facility			X											
45	Jail										X				
46	Commercial – Bank										X				
47	Commercial – Go-cart Track										X				
48	Industrial									X					
49	Commercial – Vehicle Rental			X											
50	Commercial – Auto Repair									X					
51	Industrial										X				
52	Railway Company									X					
53	Commercial – Vehicle Rental													X	
54	Power Station													X	
55	Sanitation Facility			X						X					
56	Commercial – Restaurant											X			
57	Commercial – Gas Station									X	X				
58	Commercial – Retail			X											
59	Business – Equipment Company									X					
60	Commercial – Auto Repair			X											
61	Commercial – Gas Station			X						X	X				
62	Residential –Multi-Family														
63	Commercial – Gas Station			X						X	X				
64	Commercial – Dry Cleaners			X											
65	Recreational – Club										X				
66	Commercial – Funeral Home										X				
67	Commercial – Gas Station									X	X				
68	Commercial – Gas Station									X					
69	Industrial – Vehicle Manufacturer									X					
70	Institutional – School									X					
71	Telephone Company			X						X					
72	Commercial – Gas Station									X	X				
73	Commercial – Dry Cleaners			X											

Table continues on following page.

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Table 3-22 Hazardous Material Sites and Generators within the Project Area (continued)

Site No.	Description	ERNS	RCRA CA	RCRA Notifier	RCRA Violation	RCRA TSD	CERCLIS	NPL	TRI	UST	LUST	AST	SCL	SPILLS	SWLF
74	Commercial – Gas Station			X						X	X				
75	Commercial – Auto Repair			X											
76	Commercial – Auto Repair			X											
77	Commercial – Auto Repair			X											
78	Commercial – Auto Repair			X											
79	Residential – Multi-Family									X					
80	Municipal Facility									X					
81	Institutional – School										X				
82	Residential – Multi-Family									X					
83	Commercial – Dry Cleaners			X											
84	Commercial – Gas Station			X						X	X				
85	Commercial – Auto Dealership			X						X					
86	Commercial – Auto Dealership			X						X					
87	Commercial – Gas Station			X						X					
88	Recreational – Country Club									X					
89	Commercial – Gas Station			X						X					
90	Commercial – Restaurant (Former)													X	
91	Commercial Gas Station				X					X	X				
92	Library									X					
93	Institutional – School									X					
94	Residential – Multi-Family									X	X				
95	Residential – Multi-Family									X					
96	Waste Water Treatment Facility			X						X	X				
97	Municipal Facility									X					
98	Hospital									X					
99	Business										X				
100	Business									X					
101	Municipal Facility									X					
102	Residential									X					
103	Federal Research Facility			X	X					X	X				
104	Residential - Multi-family										X				
105	Power Plant									X					
106	Commercial – Industrial										X				
107	Commercial – Auto Service			X											
108	Commercial – Auto Service			X											
109	Commercial – Auto Service			X											

Table continues on following page.

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Table 3-22: Hazardous Material Sites and Generators within the Project Area (continued)

Site No.	Description	ERNS	RCRA CA	RCRA Notifier	RCRA Violation	RCRA TSD	CERCLIS	NPL	TRI	UST	LUST	AST	SCL	SPILLS	SWLF
110	Commercial – Auto Service			X											
111	Institutional – School									X					
112	Commercial – Auto Service			X											
113	Commercial – Auto Service			X	X					X	X				
114	Residential									X					
115	Commercial – Hotel									X					
116	Federal – Postal Service									X					
117	Commercial – Auto Repair			X											
118	Commercial Dry Cleaners			X											
119	Commercial – Gas Station			X						X	X				
120	Residential – Multi-family									X					
121	Commercial – Dry Cleaners			X											
122	Commercial – Retail			X											
123	Business									X					
124	Commercial – Gas Station									X	X				
125	Commercial – Gas Station			X						X	X				
126	Bus Lot									X					
127	Commercial – Gas Station										X				
128	Commercial – Gas Station										X				
129	Institutional – School									X					
130	Commercial – Metal Finishing						X								
131	Commercial – Gas Station										X				
132	Commercial – Auto Service										X				
133	Business										X				

Source: *VISTA information Solutions, Inc.*

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Chapter 4

Environmental Consequences

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4. Environmental Consequences

4.1 Introduction to Environmental Consequences

The anticipated transportation, socioeconomic, cultural, natural, and other environmental effects associated with Current Design Alternative 4A for the Woodrow Wilson Bridge project are presented in this chapter. A compilation of quantified impacts anticipated to result from the project are presented on Table S-1 in the Summary chapter. The following sections describe the assessment methodologies, estimated impacts, and identify potential avoidance, minimization, and mitigation of those impacts. As compared to the 1997 FEIS, impacts in a number of resource categories have changed. These changes can be attributed to:

- Changes to the extent and magnitude of some resources, such as submerged aquatic vegetation;
- Further cultural resource investigations to fulfill the requirements of the Memorandum of Agreement signed in 1997, such as expansion of the Area of Potential Effects (APE);
- Expansion of the project limits at the roadway interchange locations to address stakeholder comments and as a result of design refinements;
- Inclusion of information that has become available since publication of the 1997 FEIS;
- Greater understanding of potential impacts due to the advanced level of design of Current Design Alternative 4A; and
- Avoidance/minimization techniques that were determined infeasible as a result of more refined design.

4.2 Traffic and Transportation

This section presents an update of the traffic and transportation considerations for Current Design Alternative 4A (a twelve-lane separated cross-section, the 8+2+2 plan), which includes high occupancy vehicle (HOV) lanes. This study was completed using updated 2020 travel forecasts based on Round 6.1 regional land use estimates provided by the Metropolitan Washington Council of Governments (MWCOG). The 1997 FEIS was based upon older Round 5.1 data. The newer data now available has been generated as a result of a routine update of the regional planning process.

4.2.1 Regional Travel Demand

The travel demand forecasts for this project were developed using a process similar to the 1997 FEIS. The 2020 regional demand forecasts were developed by MWCOG with the latest available (Round 6.1) Cooperative Forecasts and the roadway improvements provided in the latest Constrained Long Range Plan (CLRP) (Table 4-1). These improvements include HOV lanes on MD 210, National Harbor ramps to/from I-95/495 in Maryland, and ramps connecting Eisenhower Avenue to I-95/495 in Virginia. The CLRP also includes provision of an HOV system along I-95/495 from US 1 to MD 210, with direct access ramps provided at US 1, I-295 and MD 210.

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The MWCOG-generated daily regional demand forecasts were assigned to the project area using the detailed project area network model developed for the 1997 FEIS with Round 5.1 land use data. This sub-area model was used as it was carefully developed and calibrated for the 1997 FEIS and facilitates comparison of the impacts associated with FEIS Alternative 4A improvements and the latest roadway improvements included in this document.

Table 4-1: Key Road Improvements Assumed for 2020 Roadway Network within the Project Area

Location	Number of Lanes	Limits of Improvement
Virginia		
Road Improvements		
Telegraph Road	4	US 1 to Franconia Road
I-95/495 south of I-495	8 to 10	Extend HOV to the Stafford/Prince William County Line
Beulah Street	4	Telegraph Road to Franconia Road
Franconia Road	4	Telegraph Road to Craft Road
Eisenhower Avenue	4	Cameron Run to Telegraph Road (Complete)
New Roads		
Eisenhower Avenue Connector	1 to 2	Approved ramp connections
Clermont Avenue	4	Edsall Road to Eisenhower Avenue (Alignment No. 5)
Maryland		
Road Improvements		
MD 210	6+2 (HOV)	MD 228 to I-95/495 Capital Beltway
Oxon Hill Road	4	Careybrook Lane to South Bald Eagle Road
I-295	merge lane	Laboratory Road connection
National Harbor	na	Approved ramps and Connector Road to I-95/495/I-295
I-495	8	MD 210 to Telegraph Road
Brinkley Road	6	St. Barnabas Road to Allentown Road
Wheeler Road	2	St. Barnabas Road to Southern Avenue
MD 124	2	Airpark to Warfield Road
New Roads		
Allentown Road Relocated	4	MD 210 to Brinkley
District of Columbia		
Road Improvements		
I-295	merge lane	Laboratory Road connection

The detailed traffic model developed for the Round 5.1 forecasts, and modified for this document, includes the following:

Western limits: I-395/I-95/495

Northern limits: Extends past Old Town to Ronald Reagan Washington National Airport on the west, and through Prince George's County, Maryland, up to the South Capitol Street Bridge crossing of the Anacostia River in Washington, DC on the east.

Eastern limits: MD 4

Southern limits: Includes substantial portions of Fairfax County, Virginia and Prince George's County, Maryland

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Table 4-2-a presents the 1995 and 2020 population and employment data for Round 6.1. Table 4-2-b provides a comparison of the Round 5.1 and 6.1 land use data. As indicated in these tables, the Round 6.1 employment data is 2 to 19 percent lower than the Round 5.1 data in all areas except Fairfax County, where it shows a slight increase (3.2 percent). The population data for Round 6.1 is slightly higher (0.4 to 2.6 percent) than Round 5.1 in all areas except Fairfax and Prince George's Counties, where the population has decreased since Round 5.1. Therefore, based on the land use data in the project area, the new Round 6.1 volumes would be expected to decrease slightly from Round 5.1, which is confirmed by the average daily traffic (ADTs) volumes from the two models as shown in Table 4-3.

Table 4-2-a: Round 6.1 Population and Employment for Years 1995 and 2020

Jurisdiction	**Employment** (thousands)				**Population** (thousands)			
	1995	2020[1]	Percent Change	Share of Region's Growth (%)	1995	2020[1]	Percent Change	Share of Region's Growth (%)
City of Alexandria	91.9	115.9	26	2.6	117.3	140.9	20.1	2.0
District of Columbia	701.9	776.8	10.7	17.7	554.3	618.6	11.6	8.8
Arlington County	195.8	275.4	40.6	6.3	187.9	212.9	13.3	3.0
Fairfax County[2]	487.7	741.7	52.1	16.9	909.8	1,214.7	33.5	17.3
Prince George's County	301.4	452.4	50.1	10.3	767	923.2	20.4	13.1

1 *MWCOG, Round 6.1 Cooperative Forecasts*
2 *Fairfax County includes City of Fairfax and City of Falls Church*

Table 4-2-b: Comparison of Round 5.1 and 6.1 2020 Population and Employment

Jurisdiction	**Employment** (thousands)			**Population** (thousands)		
	Round 5.1	Round 6.1	Percent Change	Round 5.1	Round 6.1	Percent Change
City of Alexandria	143	115.9	-19.0	140.4	140.9	0.4
District of Columbia	907	776.8	-14.4	606	618.6	2.1
Arlington County	281	275.4	-2.0	207.5	212.9	2.6
Fairfax County[1]	719	741.7	3.2	1,236.3	1,214.7	-1.7
Prince George's County	494	452.4	-8.4	967.8	923.2	-4.6

1 *Fairfax County includes City of Fairfax and City of Falls Church*

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Table 4-3: Comparison of Round 5.1 and Round 6.1 Projected 2020 Daily Traffic Forecasts in Year 2020 for Woodrow Wilson Bridge

Travel Demand Forecast	Round 5.1 Bridge Volumes (Vehicles per Day)	Round 6.1 Bridge Volumes (Vehicles per Day)
Existing Traffic Volumes [1]	160,000 (1990)[1]	206,100 (1994)[1]
Baseline (No-Build) Condition	275,000	275,000
12-Lane Bridge	300,000	295,000
2-Way HOV Volumes	6,000	7,275

1 Existing Calibration Year set by MWCOG

4.2.2 Updated Traffic Volumes for the Woodrow Wilson Bridge Project Area

The Round 5.1 model (used in the 1997 FEIS) was updated for Round 6.1 land use to include changes in the Eisenhower Valley and National Harbor areas. The resulting traffic forecasts are provided in Table 4-3 for the average daily traffic volumes and in Figures 4-1 (Virginia) and 4-2 (Maryland) for the peak hour mainline and ramp volumes on I-95/495 between Telegraph Road and MD 210.

As indicated in Table 4-3, the projected 2020 ADTs on the Woodrow Wilson Bridge decreased slightly from the 300,000 vehicles per day (vpd) reported in the 1997 FEIS, to 295,000 vpd in this study, a decrease of two percent. This decrease is due to the changes in the MWCOG land use as previously discussed in Section 4.2.1.

The peak-hour traffic volumes have also changed slightly (a few percent) since the 1997 FEIS. The peak-hour fluctuations on each roadway link are a result of the land use changes, as well as the geometric changes in Current Design Alternative 4A from the FEIS Alternative 4A. On the Outer Loop, the 1997 FEIS indicated an AM(PM) peak-hour volume on the local lanes of 3,930 (5,020) vehicles per hour (vph). The current Round 6.1 data indicates a volume of 3,910 (4,820) vph for the same location, a decrease of 0.5 (4.0) percent. On the Outer Loop express lanes, the 1997 FEIS volumes were 5,295 (5,685) vph, while the current volumes are 5,315 (5,885) vph, an increase of 0.4 (3.5) percent. This increase is due to the rerouting of traffic from the Eisenhower Valley direct connection ramp to the express lanes.

The 1997 FEIS indicated an AM(PM) peak hour volume on the inner loop local lanes of 8,135 (7,085). The current Round 6.1 data indicates a volume of 7,925 (7,045) vph for the same location, a decrease of 2.6 (0.6) percent. On the inner loop express lanes, the 1997 FEIS volumes were 3,630 (4,295) vph, while the current volumes are 3,830 (4,335) vph, an increase of 5.5 (0.9) percent. This increase is again due to the rerouting of traffic from the Eisenhower Valley direct connection ramp from the express lanes.

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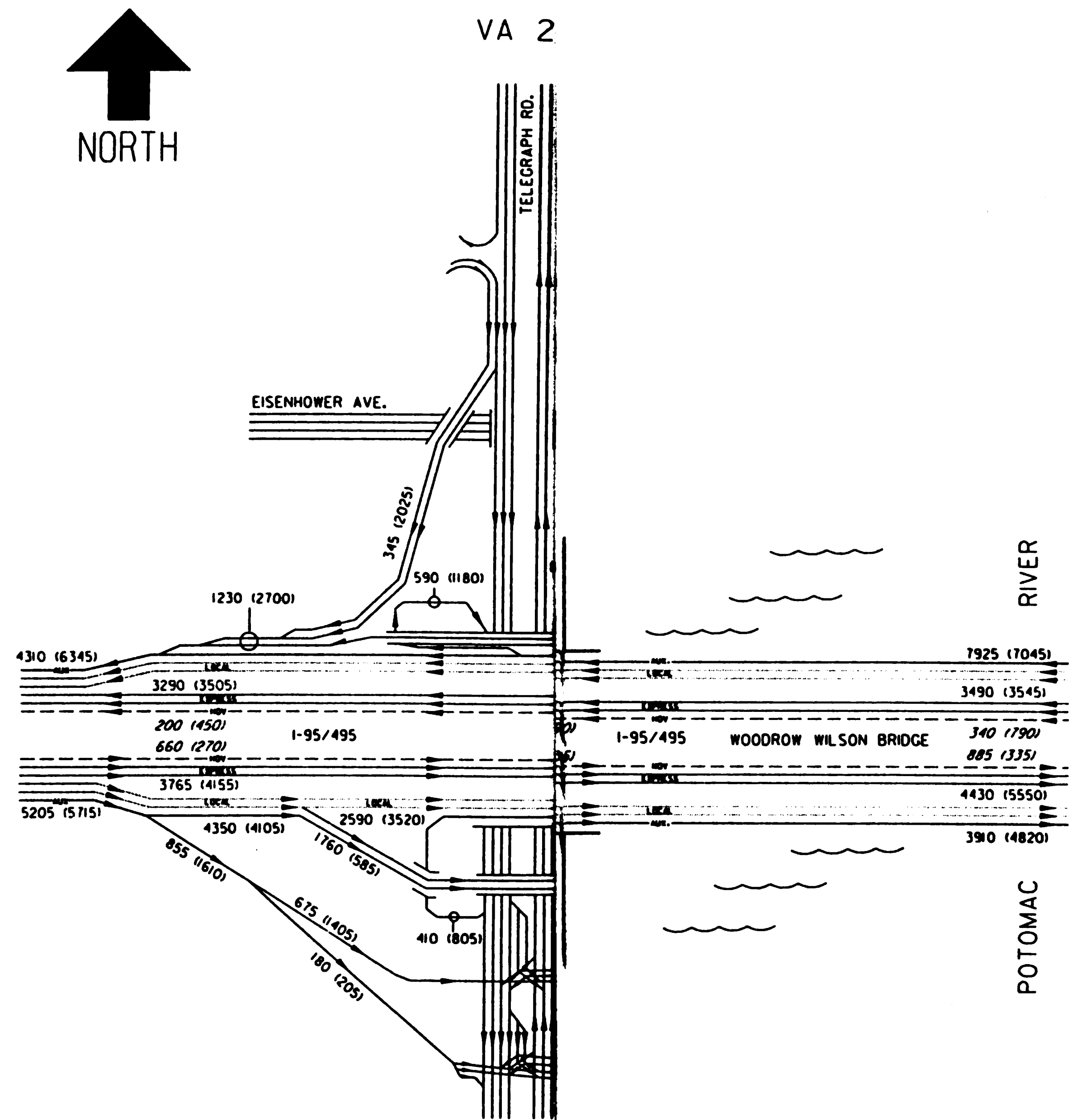

LEGEND

000 (000) - AM (PM) PEAK HOUR VOLUMES INCLUDES HOV VOLUMES WHERE SEPARATE HOV LANE AND VOLUME ARE NOT INDICATED.

000 (000) - AM (PM) HOV PEAK HOUR VOLUMES

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

[YE]AR 2020 CONSTRAINED DEMAND VOLUMES FOR THE CURRENT DESIGN ALTERNATIVE 4A VIRGINIA

Date		Figure
[DE]CEMBER, 1999	NOT TO SCALE	4-1

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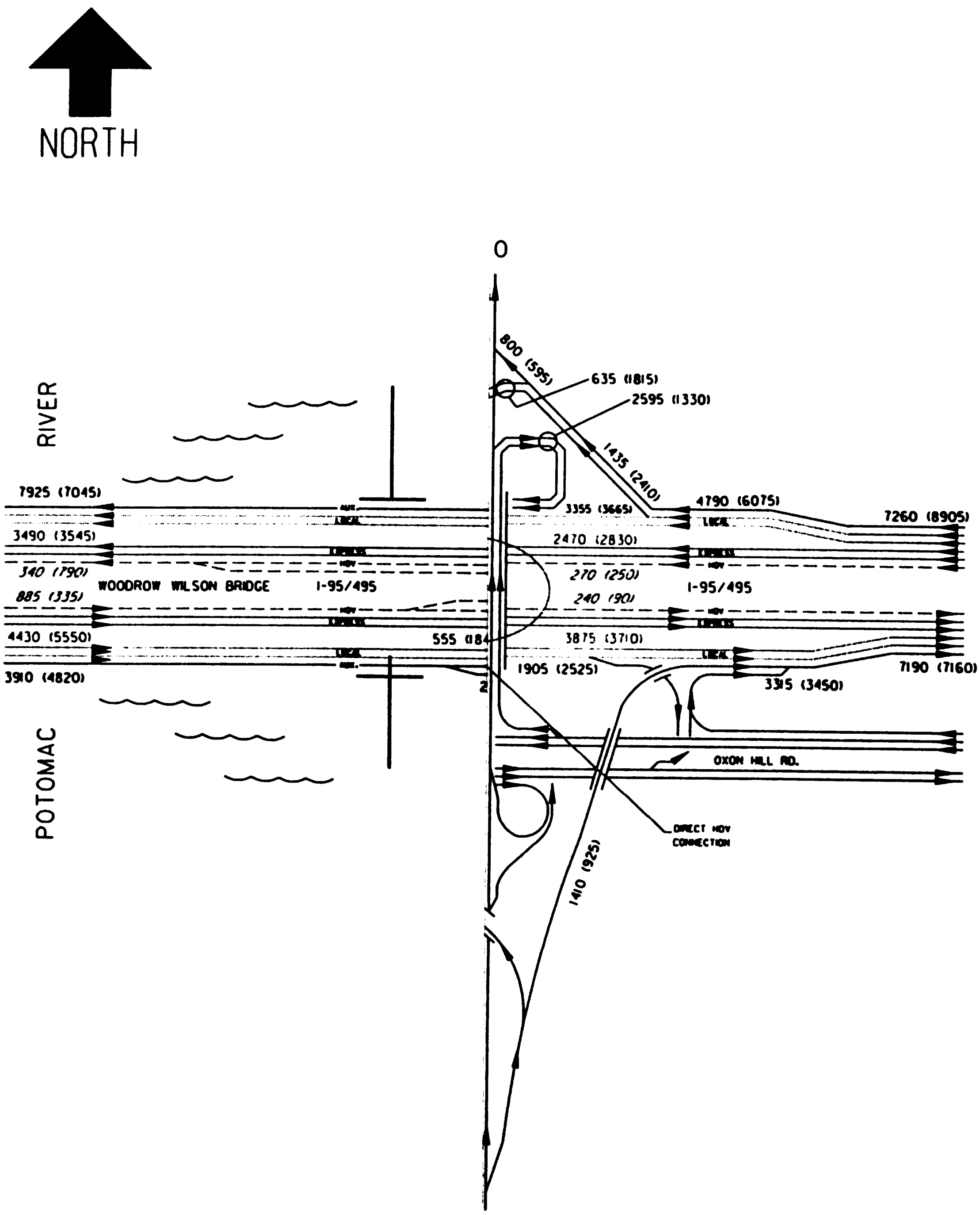

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

EAR 2020 CONSTRAINED DEMAND VOLUMES FOR THE CURRENT DESIGN ALTERNATIVE 4A MARYLAND

Date		Figure
ECEMBER, 1999	NOT TO SCALE	4-2

LEGEND

000 (000) - AM (PM) PEAK HOUR VOLUMES INCLUDES HOV VOLUMES WHERE SEPARATE HOV LANE AND VOLUME ARE NOT INDICATED.

000 (000) - AM (PM) HOV PEAK HOUR VOLUMES

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Table 4-4 provides a comparison of the Round 5.1 and Round 6.1 two-way peak-hour traffic volumes on the arterials. As indicated, the Round 6.1 arterial traffic volumes are slightly lower (less than 7 percent) than the Round 5.1 volumes in 2020 at all locations except northbound I-295 north of I-95/495 and MD 210 south of I-95/495. These locations show a greater reduction (about 9 percent) primarily due to the changes in travel patterns between the previously proposed Port America development and the currently proposed National Harbor development.

The proposed National Harbor development is located in Maryland south of I-95/495 near the I-295 interchange. The development was previously included in the 1997 FEIS as Port America, which was a primarily residential development generating substantial peak-hour trips on the network. Since the 1997 FEIS, this development, now with a new owner and renamed National Harbor, has been reconfigured as a retail/entertainment complex generating a greater number of off-peak and weekend trips. The total daily trips generated by Port America was 64,485; National Harbor generates slightly more (66,791), but a smaller percentage (5 to 6 percent) travel during peak periods than in the Port America 7 to 8 percent. Therefore, National Harbor is expected to have similar impact on the I-95/495 corridor during the peak periods, supporting the slight decrease in the Round 6.1 versus Round 5.1 volumes.

Table 4-4: Comparison of Round 5.1 and Round 6.1[1] Projected 2020 Two-Way Peak Hour Volumes for Arterial Roadways

Location	Round 5.1[1]		Round 6.1[1]		AM Peak Diff (%)	PM Peak Diff (%)
	AM Peak	PM Peak	AM Peak	PM Peak		
Telegraph Road South of I-95/495	6,925	6,425	6,875	6,270	-0.7	-2.4
Telegraph Road North of I-95/495	7,060	7,010	6,570	7,000	-6.9	-0.1
US 1 South of I-95/495	6,955	10,320	6,865	9,945	-1.3	-3.6
US 1 North of I-95/495	6,055	8,325	5,980	8,230	-1.2	-1.1
I-295 North of I-95/495	9,715	9,040	9,590	9,880	-1.3	9.3
MD 210 North of Oxon Hill Road	4,550	4,715	4,555	4,270	0.1	-9.4
MD 210 North of I-95/495	2,725	2,685	2,725	2,685	0	0

1 Developed with Metropolitan Washington Council of Governments Land Use and Regional Forecasts

4.2.3 Safety and Operational Performance

This section presents the results of the safety and operational performance assessment of Current Design Alternative 4A using the updated 2020 forecasts and the geometric and other project changes made since the 1997 FEIS. Refer to the 1997 FEIS, Section 4.2.4, for a detailed discussion of the safety improvements associated with an express/local freeway design.

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Traffic operations are expected to improve with Current Design Alternative 4A in terms of increased vehicle speeds and reduced delays. This is due to geometric improvements that are now included, as well as the slight decrease in projected traffic volumes with the new forecasted data. In terms of safety, the Current Design Alternative would provide the same benefits as the FEIS Alternative 4A, since it also eliminates the substandard geometric features, and separates traffic into express/local lanes. The local arterials should experience more substantial reductions in queuing and delay as a result of the direct access ramps and grade separations now proposed (refer to Section 2.2 for detailed discussion of the geometric improvements contained in Current Design Alternative 4A). The results of the operational performance evaluation of the Current Design Alternative 4A are discussed in more detail below.

Vehicle Speeds and Delay: Figure 4-3 shows the AM and PM peak-hour speeds along the corridor for Current Design Alternative 4A. The shaded areas show where the speeds drop below free flow resulting in queues along the corridor. The gray shades represent the lowest speeds and the locations with the most densely packed queues. The non-shaded bands represent locations where speeds are free flow, i.e., above 80 kilometers per hour (kph) (50 miles per hour (mph)). Projected queue lengths (by time of day) extending upstream of the critical bottlenecks are also shown at the bottom of the speed diagram.

A queue begins to form when speeds fall below 72 kph (45 mph). Within the queue, there may be stop-and-go traffic as well due to secondary bottlenecks; however, at locations where speeds rise above 72 kph (45 mph), the average speed within the queue is approximately 24 kph (15 mph).

Within the corridor, the critical bottleneck on the outer loop is located at US 1, where one lane of I-95/495 is currently dropped as a must exit lane to the US 1 northbound and southbound exit ramp. With the proposed twelve-lane express/local configuration, a merge lane on the local lanes between Telegraph Road and US 1 is dropped as a must exit in this location. This condition is necessary in order to allow southbound US 1 to eastbound I-95/495 traffic to enter in its own lane crossing the bridge. Currently, southbound US 1 to eastbound I-95/495 traffic is required to merge into the mainline. The provision of the merge lane improves the traffic flow on US 1 by allowing free entry to the mainline for merging vehicles. On I-95/495 mainline, however, the weaving movements to and from the merge lane drop create a bottleneck.

In a similar fashion, a merge lane on the inner loop would also drop as a must exit lane to the I-295 northbound exit ramp. As with the outer loop, the merge lane drop is necessary in order to provide a merge lane between I-295 and US 1.

Safety: Refer to Section 3.2.1 for a discussion of the existing safety.

Current Design Alternative 4A provides an express/local configuration, which is typically implemented to address safety concerns in high volume corridors. The safety benefits provided by an express/local configuration include: fewer traffic conflicts, additional breakdown areas, better incident management opportunities, and reduced driver stress. Refer to the 1997 FEIS Section 4.2.4 for a detailed discussion of these benefits, which are the same for both the Current Design Alternative 4A and the FEIS Alternative 4A.

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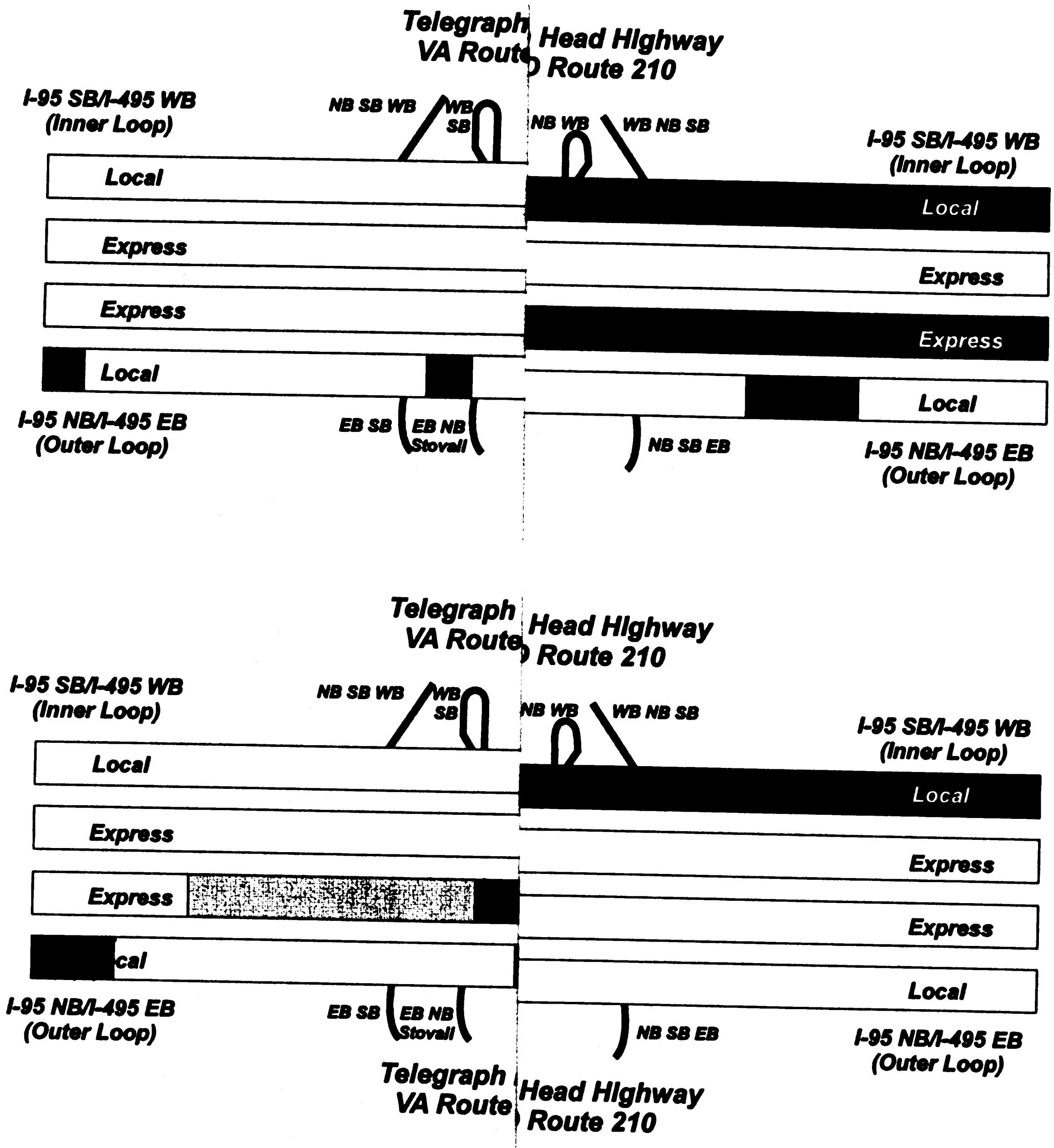

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

2020 Peak Hour Speeds Current Design Alternative 4A

Date	Scale	Figure
December, 1999	0.5 0 0.5 1 Miles Scale in Miles	4-3

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Based on these considerations and a review of the accident rates on similar facilities, it is anticipated that the accident rate in the corridor would be reduced with the implementation of Current Design Alternative 4A. This is because the current design will eliminate additional geometric deficiencies such as substandard acceleration/deceleration lanes, lack of lane balance and continuity, and lack of shoulders and/or breakdown areas. Current Design Alternative 4A provides more grade separations, eliminates four signalized intersections, two ramp intersections on Telegraph Road, one ramp intersection on US 1, and provides grade-separation of the MD 210/Oxon Hill Road intersection.

Queuing and Congestion: With the Current Design Alternative 4A, bottlenecks would occur in the local lanes, in generally the same locations as they exist today. Travel time through the corridor (Telegraph Road to MD 210) in the local lanes is expected to range between 10 and 15 minutes, roughly the same as 1997 FEIS Alternative 4A. In the express lanes, travel will be free flowing within the corridor, but queues in the local lanes will be present at the project limits for 2-3 hours per day during peak demand periods.

The peak-hour speed diagram (Figure 4-3) also shows the queue lengths upstream of the critical bottlenecks at US 1 and I-295 by time of day. Table 4-5 summarizes key measures of effectiveness across the operational scenarios, including the projected hours of congestion, average weekday maximum queue length, and peak-hour delay. Delay is calculated based on the time required to travel from the point of entry to the corridor to the point of exit from the corridor. The delay is the difference between the time it takes to travel from the point of entry to the point of exit when traveling at free flow speeds and when traveling at a lower speed.

Table 4-6 summarizes the vehicle and person capacity of the corridor. As shown in this table, the constrained demand for the Current Design Alternative 4A is slightly lower (3%) than the 1997 FEIS Alternative 4A. Vehicular and person capacity of the build alternatives is the same for the bridge, since both are 12-lane separated alternatives with HOV lanes in the median.

Table 4-5: Year 2020 Peak Hour Direction Delay and Congestion in the Freeway Corridor

<table>
<tr><th>Operational Scenario/Alternative</th><th>Local
FEIS
Alternative 4A</th><th>Local
Current Design
Alternative 4A</th><th>Express Current
Design Alternative 4A</th></tr>
<tr><td>Total Hours of Congestion</td><td>10</td><td>10</td><td rowspan="6">The express lanes are expected to be affected for only two to three hours in the day, largely due to queues in the local lanes extending past the express/local diverge.</td></tr>
<tr><td>Average Weekday Length of Queue kilometers (miles)</td><td>3.2 – 4.0
(2 – 2.5)</td><td>3.2 (2)</td></tr>
<tr><td>Peak Hour Total Delay Within Corridor [1,2] (hours)</td><td>1,070</td><td>1,000</td></tr>
<tr><td>Daytime Delay due to congestion within corridor [1,3] (hours)</td><td>5, 800</td><td>4,500</td></tr>
<tr><td>Peak Hour Delay per vehicle within corridor [4] (minutes)</td><td>2.0</td><td>2.0</td></tr>
<tr><td>Peak Hour Delay per vehicle for through trips [5] (minutes)</td><td>6.6</td><td>5.0</td></tr>
</table>

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Notes:

1 *Delay for all vehicles within the corridor, regardless of the length of the trip. Delay is computed for each hour by multiplying the number of vehicles in the hour by the difference between the travel time at free speed and the travel time at the actual speed in that hour. When vehicle throughput during the peak hour is low, the total delay may also be low because there are fewer vehicles experiencing the delay.*
2 *Peak hour assumed to be 7-8 AM and 5-6 PM.*
3 *Daytime delay calculated for the hours between 5 AM and 9 PM.*
4 *Estimated peak hour delay per vehicle for all vehicles within the corridor, regardless of the length of the trip.*
5 *Estimated peak hour delay per vehicle for through trips, travelling from one end of the corridor to the other.*

For the Current Design Alternative 4A, during the AM Peak Hour, the lowest speeds occur along the Inner Loop local lanes approaching the MD 210 and I-295 interchanges. Speeds along this segment range from 0 to 32 kph (0 to 20 mph). The speeds gradually increase to free flow as vehicles progress from the I-295 interchange to approximately mid-span on the Woodrow Wilson Bridge, but slow again to between 65 and 80 kph (41 and 50 mph) through the US 1 interchange. Other potential areas of decreased speeds include the Outer Loop express lanes between the MD 210 interchange and the express/local merge point, and the Outer Loop local lanes at mid-span on the Woodrow Wilson Bridge and east of MD 210.

For the Current Design Alternative 4A, during the PM Peak Hour, there are areas of lower speed on both the Inner and Outer Loops approaching the bridge span. On the Inner Loop local lanes, the speeds between the express/local diverge and I-295 are within the 0-32 kph (0-20 mph) range, gradually improving to free flow upon reaching the bridge. Speeds in the Outer Loop express lanes decrease from free flow to between 0-32 kph (0-20 mph near the US 1 interchange, then gradually return to free flow near mid-span on the Woodrow Wilson Bridge. On the Outer Loop local lanes, speeds decrease abruptly when approaching the US 1 interchange (from free flow to the 0-32 kph range), then progressively increase to between 81 and 96 kph (51 and 60 mph) near the I-295 interchange.

4.2.4 Level of Service

Level of service (LOS) is a qualitative measure that describes the operational conditions within a traffic stream and is traditionally used to evaluate alternatives. LOS is generally described in terms of speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. In congested corridors such as I-95/495, however, LOS on its own does not provide detailed information on operations during breakdown conditions. Consequently, additional measures have been used including speeds, delay, queue lengths, and the hours of congestion.

Table 4-6: Year 2020 Peak Hour Peak Direction Vehicle and Person Capacity on Crossing

Operational Scenario		FEIS Alternative 4A	Current Design Alternative 4A
Peak Hour Constrained Demand[1]		11, 700	11,415
Vehicle Capacity[2,3]	LOV	10, 500	10,500
	HOV	1,600	1,600
	Total	12,100	12,100
Person Capacity[4]	LOV	11,550	11,550
	HOV	5,600	5,600
	Total	17,150	17,150
Person Capacity Assuming Express Bus[5]		24, 650	24,650

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Notes:

1. *Since the project area contains a well-developed area with little opportunity for additional roadway capacity on the crossing arterials, the demand volumes were constrained by the arterial intersections feeding the I-95/495 mainline and ramps.*
2. *Capacity is defined as the number of persons or vehicles that can be accommodated in the peak hour.*
3. *LOV capacity for each alternative was estimated using output from the CORSIM microscopic freeway simulation model and refinement based on calibration. The HOV capacity was assumed to be 1600 vehicles per hour in order to maintain free flow conditions and still provide a travel time savings for users of the facility.*
4. *Average vehicle occupancy LOV = 1.1 persons per vehicle; average vehicle occupancy HOV = 3.5 persons per vehicle (based on MWCOG HOV Model).*
5. *A capacity of 1600 vehicles per hour is assumed in the HOV lane to calculate vehicle and person capacity on the crossing. However, current traffic projections indicate that HOV 3+ volumes would be approximately 1,000 vehicles per hour in the peak direction. Therefore, the HOV lanes can also accommodate up to 240 express buses per hour, with 40 persons per bus. These express buses could carry up to 9,600 persons per hour. The person capacity assuming express bus was calculated assuming 1,000 HOV 3+ vehicles and 240 express buses, which would maximize person capacity on the crossing.*

The criteria that was used in assigning the LOS for the Woodrow Wilson Bridge project were the speed and density of traffic on each of the links and at the ramp merges. The speed and density for each mainline link were obtained from the freeway simulation output for the AM and PM peak hours, and a LOS was assigned according to the 1994 Highway Capacity Manual Level of Service Criteria for Basic Freeway Sections. Level of service for the ramp merges was also computed using Highway Capacity Manual techniques.

The LOSs for Current Design Alternative 4A are provided in Figures 4-4 (Virginia) and 4-5 (Maryland). On the Maryland side of the bridge the AM (PM) LOS for the inner loop prior to the express/local diverge is LOS C(D). From this point westward, the LOS along the local lanes deteriorates, eventually reaching LOS F(F) on the Woodrow Wilson Bridge span. There are several on- and off-ramps to and from the local lanes between the diverge and the bridge span, most operating between LOS D and LOS F during the AM and PM peak hours. The exception is the off-ramp from the westbound inner loop to northbound and southbound MD 210, which operates at LOS C(D). The poorest operating conditions (LOS F during both the AM and PM peak hours) occur at the on-ramp from northbound MD 210 to the inner loop and at the weave section between the ramps from National Harbor. On the Virginia side of the bridge, the LOS along the local lanes improves from LOS F(F) on the bridge span to LOS D(D) west of the express/local converge. The off-ramps to Church Street and southbound US 1 both operate at LOS F(F), and during the PM peak hour, the on-ramp from Telegraph Road operates at LOS F. All other ramps to and from the inner loop operate at acceptable LOS. The LOS along the inner loop express lanes remains in the acceptable range (LOS C to LOS D) throughout its entire length. Each of the on- and off-ramps to and from the express lanes operates at LOS D during both the AM and PM peak hours.

LOS on the outer loop local lanes range from LOS C to LOS F between the express/local diverge and the bridge span. Each of the on- and off-ramps to and from these lanes operates at an acceptable LOS during the AM and PM peak hours (in both Virginia and Maryland). On the Maryland side of the bridge, the LOS in the local lanes ranges from LOS C(D) on the span to LOS D(D) east of the express/local converge. The LOS on the outer loop express lanes in Virginia varies from LOS E(E) near the diverge to LOS F(F) on the bridge span. The on-ramp from southbound Mill Road

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operates at LOS F during both the AM and PM peak hours. Toward the east, the LOS improves from LOS F(F) on the bridge to LOS D(D) past the express/local converge. The off-ramp to southbound MD 210 operates at LOS F during both the AM and PM peak hours.

A comparison of the LOS from the FEIS Alternative 4A with those from the Current Design Alternative 4A indicates that traffic operations improve throughout the entire corridor. During the AM peak hour, the inner loop lanes (local and express combined) have better LOS seven areas, and worse LOS in only three areas. These areas are the two on-ramps from MD 210 and the off-ramp to southbound US 1. During the PM peak hour, the inner loop had improved LOS in eight areas and worse LOS at the on-ramp from northbound MD 210, the off-ramp to southbound US 1, and the on-ramp from US 1.

Examining the differences between the outer loop LOS in FEIS Alternative 4A and Current Design Alternative 4A yields results similar to those from the inner loop comparison. Throughout the corridor, there were more areas with improved LOS than with poorer LOS. During the AM peak hour, there were seven areas with better LOS, including the off-ramp to southbound Telegraph Road and the off-ramp to I-295. There were only two areas with poorer LOS during the PM peak hour: the on-ramp from northbound US 1 and the freeway section of the express lanes on the Woodrow Wilson Bridge span.

Within the study corridor, speeds of 97.6 kph (61 mph) would not generally create queues nor lead to congested conditions. Therefore, LOS may be deceptive in describing conditions and may not be a discerning factor between the two alternatives. In this study, greater emphasis has been placed on actual speeds within the corridor, delay, queue lengths, and hours of congestion when comparing alternatives.

4.2.5 Intelligent Transportation Systems/Congestion Management Systems

To address year 2020 congestion levels still resulting after the proposed Current Design Alternative 4A improvements, additional system management improvements will be implemented. These improvements include technology changes, and are referenced as Intelligent Transportation Systems (ITS) and Congestion Management Systems (CMS). A comprehensive ITS will be implemented to support, facilitate and enhance MSHA and VDOT traffic management, incident management and traveler information dissemination responsibilities. Additional enhancements that will facilitate traffic management and incident management response and clearance functions will also be implemented, such as 50-inch high jersey barrier, shoulders within all four roadways, staging areas and barrier opening systems that facilitate incident response and clearance functions, fire suppressions systems, overhead lane-use control signs, and vehicular crossovers.

4.2.6 Public Transportation Testing

The public transportation testing was completed to determine the feasibility of incorporating mass transportation connections into the proposed design. The results of this effort are presented in Section 4.2.6 of the 1997 FEIS. In 1999, FHWA determined that Current Design Alternative 4A

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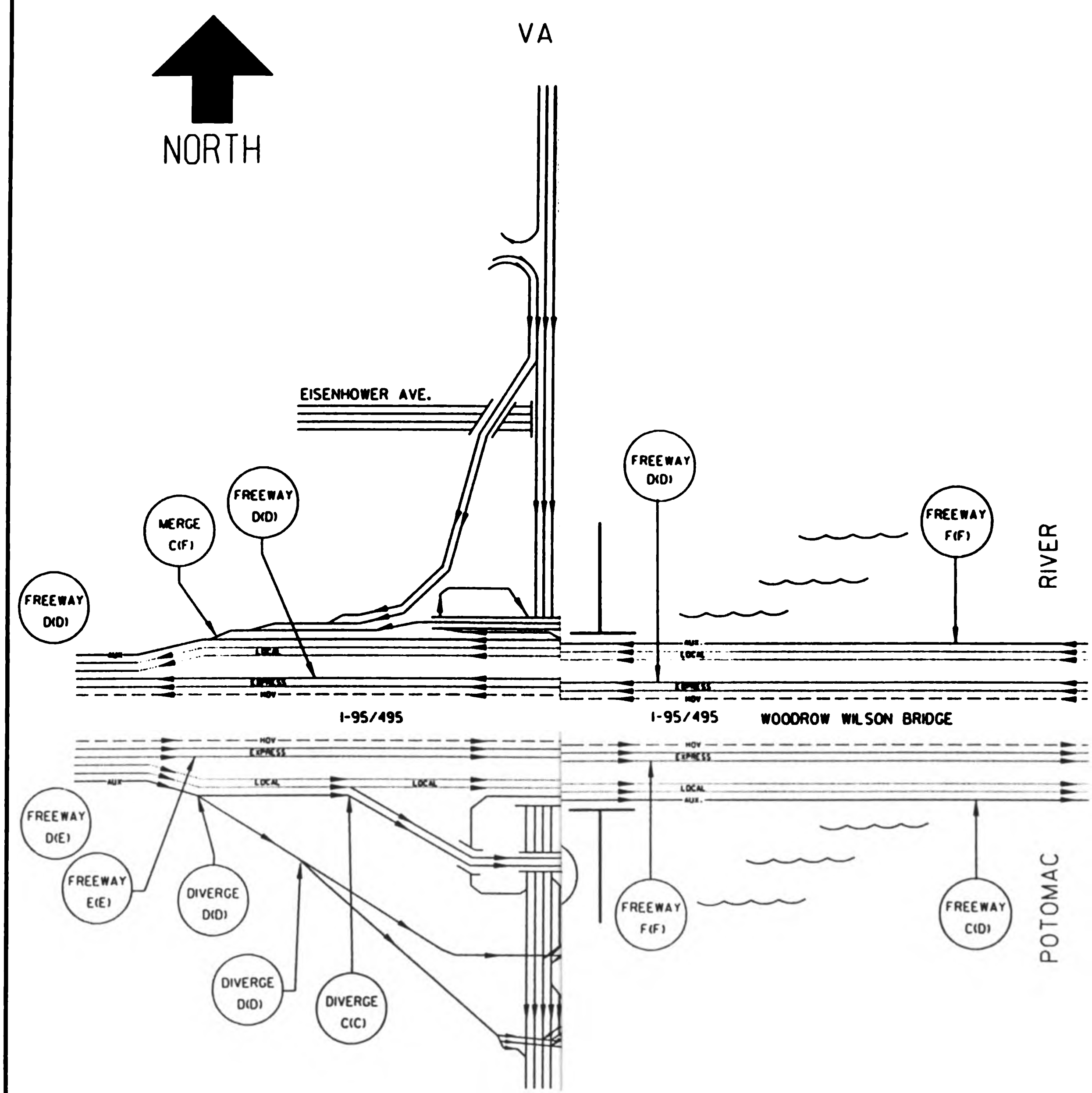

LEGEND

A (A) - LEVEL OF SERVICE DURING THE AM (PM) PEAK PERIODS

DESCRIPTION OF LEVELS OF SERVICE (LOS):

LOS A - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED ON TH RAMP MOVEMENTS CONDUCTED WITHOUT DISRUPTION T

LOS B - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED ON TH MINIMAL LEVELS OF DISTURBANCE DURING RAMP MOVE

LOS C - SLIGHTLY RESTRICTED OPERATIONS, AT OR NEAR FREI INCREASED LEVELS OF DISTURBANCE DURING RAMP MC DRIVING CONDITIONS ARE STILL RELATIVELY STABLE.

LOS D - MODERATELY RESTRICTED OPERATIONS, DRIVER COMFO SPEEDS DECREASE, AND QUEUES MAY BEGIN TO FORM

LOS E - ROADWAY OR RAMP OPERATING AT CAPACITY, DRIVERS REDUCED SPEEDS AND LESS DRIVER COMFORT. QUEUE

LOS F - DEMAND EXCEEDS CAPACITY. A BREAKDOWN IN VEHICU QUEUES ARE VISIBLE AT THE RAMPS AND MAINLINE A

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

EAR 2020 LEVELS OF SERVICE
FOR THE CURRENT DESIGN
ALTERNATIVE 4A
VIRGINIA

Date		Figure
ECEMBER, 1999	NOT TO SCALE	4-4

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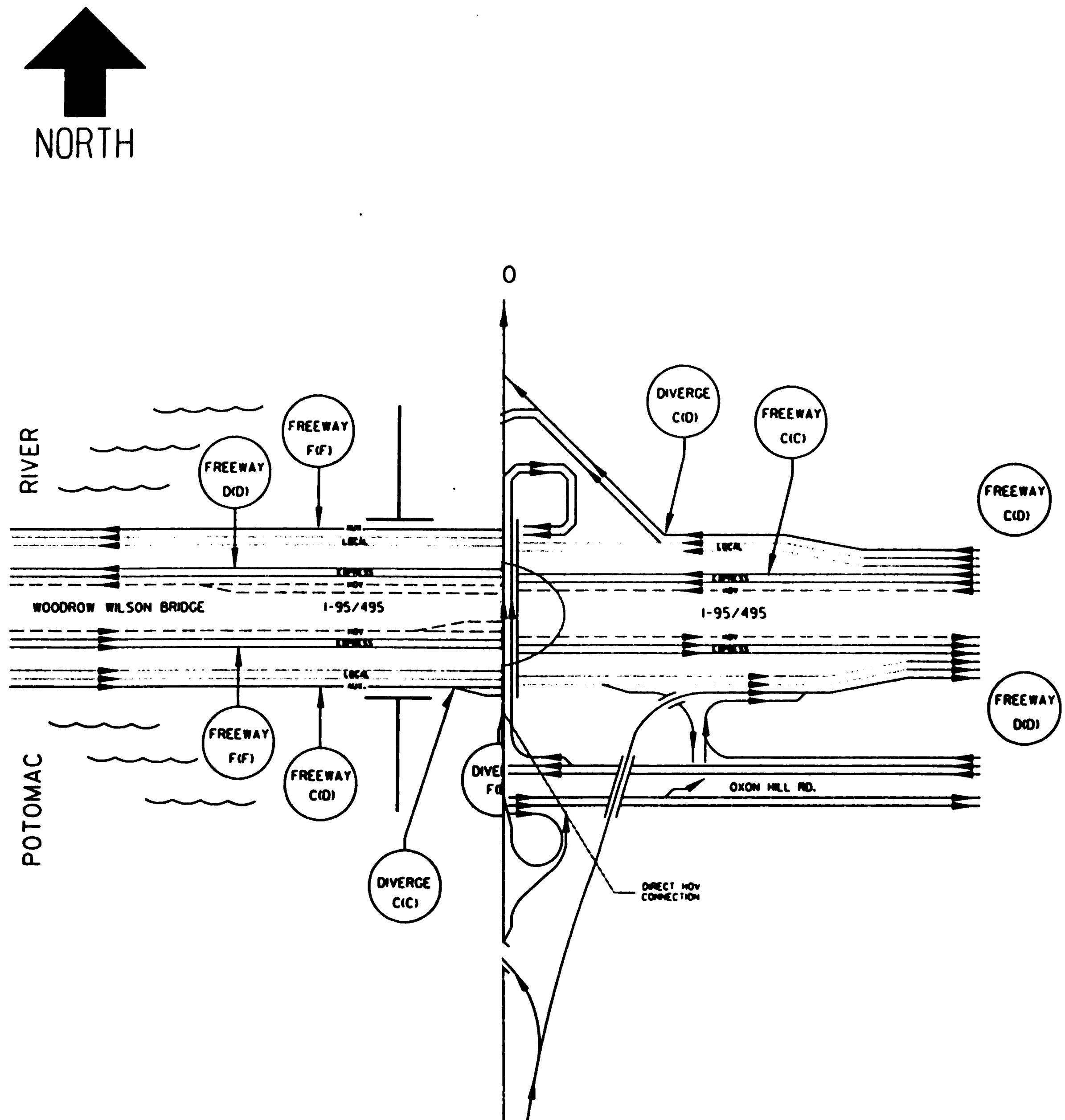

LEGEND

A (A) - LEVEL OF SERVICE DURING THE AM (PM) PEAK PE

DESCRIPTION OF LEVELS OF SERVICE (LOS):

LOS A - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED
RAMP MOVEMENTS CONDUCTED WITHOUT DISRUP

LOS B - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED
MINIMAL LEVELS OF DISTURBANCE DURING RAMP

LOS C - SLIGHTLY RESTRICTED OPERATIONS, AT OR NEA
INCREASED LEVELS OF DISTURBANCE DURING RA
DRIVING CONDITIONS ARE STILL RELATIVELY ST

LOS D - MODERATELY RESTRICTED OPERATIONS, DRIVER
SPEEDS DECREASE, AND QUEUES MAY BEGIN TC

LOS E - ROADWAY OR RAMP OPERATING AT CAPACITY. C
REDUCED SPEEDS AND LESS DRIVER COMFORT.

LOS F - DEMAND EXCEEDS CAPACITY. A BREAKDOWN IN
QUEUES ARE VISIBLE AT THE RAMPS AND MAIN

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

EAR 2020 LEVELS OF SERVICE
FOR THE CURRENT DESIGN
ALTERNATIVE 4A

MARYLAND

Date		Figure
CEMBER, 1999	NOT TO SCALE	4-5

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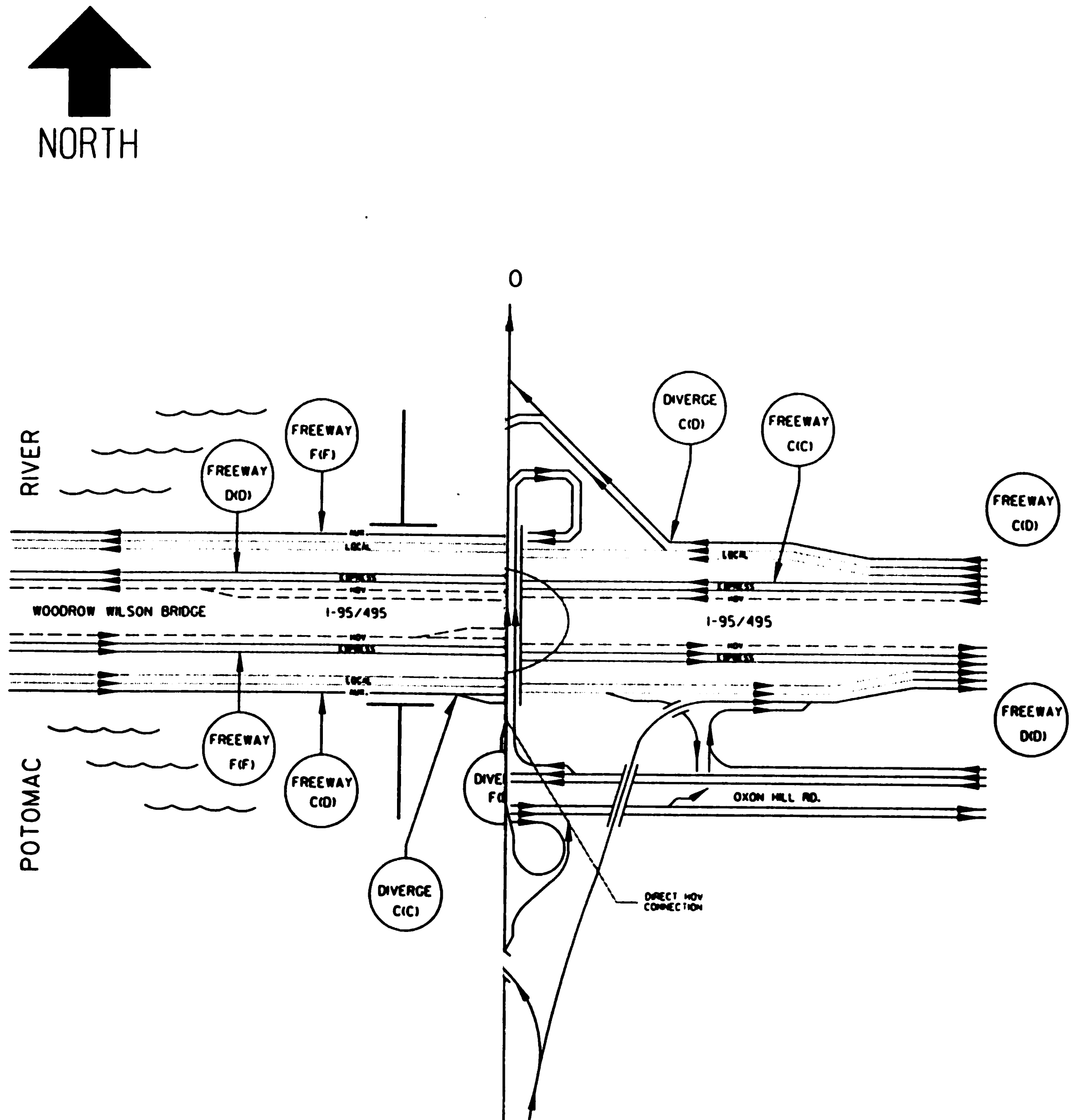

LEGEND

A (A) - LEVEL OF SERVICE DURING THE AM (PM) PEAK PE

DESCRIPTION OF LEVELS OF SERVICE (LOS):

LOS A - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED
RAMP MOVEMENTS CONDUCTED WITHOUT DISRUP

LOS B - UNRESTRICTED OPERATIONS, FREE-FLOW SPEED
MINIMAL LEVELS OF DISTURBANCE DURING RAMP

LOS C - SLIGHTLY RESTRICTED OPERATIONS, AT OR NEA
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DRIVING CONDITIONS ARE STILL RELATIVELY ST

LOS D - MODERATELY RESTRICTED OPERATIONS, DRIVER
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REDUCED SPEEDS AND LESS DRIVER COMFORT.

LOS F - DEMAND EXCEEDS CAPACITY. A BREAKDOWN IN
QUEUES ARE VISIBLE AT THE RAMPS AND MAIN

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

EAR 2020 LEVELS OF SERVICE
FOR THE CURRENT DESIGN
ALTERNATIVE 4A
MARYLAND

Date		Figure
CEMBER, 1999	NOT TO SCALE	4-5

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will be constructed so as not to preclude future mass transit on the bridge. This decision does not cause any additional environmental effect beginning on those areas evaluated.

4.2.7 Marine Traffic

As designed in Current Design Alternative 4A, the Woodrow Wilson Bridge would allow passage of any marine vessel that is capable of passing beneath the Governor Harry Nice Memorial Bridge (US 301 at Dahlgren). Current Design Alternative 4A would reduce the number of required drawspan openings by approximately 70 percent. Openings would be reduced from about 240 to 70, based on 1998-1999 marine activity (and vessel types) in the project area. In the case that new waterfront development occurs upriver (e.g., Old Town Alexandria, Hains Point, or Anacostia Waterfront), then the number of recreational and commercial vessels that may require drawspan openings could change.

The drawspan would be constructed with a vertical clearance of 21.3 meters (70 feet) at the navigation channel, approximately 6.1 meters (20 feet) higher than the existing bridge. A Section 9 Permit, pursuant to the Rivers and Harbors Act of 1899, would be required from the U.S. Coast Guard for the construction of the bridge. Coordination with the U.S. Coast Guard is ongoing, and is anticipated to result in required approvals. The project will comply with all stipulations of Section 9 through construction. A permit application was submitted to the US Coast Guard on December 13, 1999. The approval process will run concurrently with the Section 404/10 process. A joint public notice and hearing with the USACOE, the US Coast Guard, MDE, DC Department of Health, and FHWA, MSHA, and VDOT will be conducted.

An approximate 500-foot wide shipping channel exists on the west side of the Potomac River at the Woodrow Wilson Bridge. The water depth in this channel is approximately 30 feet deep. The horizontal clearance of the existing and proposed bridges is 175 feet from fender to fender. It will be the responsibility of the bridge contractor to maintain an adequate channel for ship traffic, and this responsibility will be stipulated as a special provision in the bridge construction contract. It is expected that the navigation channel may need to be temporarily closed for short durations during installation of the bridge superstructure girders and for other construction purposes. During these periods, the contractor will be required to coordinate the timing of these activities with the schedule for the regular openings of the drawspan, to ensure that navigation is not impeded while the drawspan is open. Interruption of marine traffic will be minimized to the greatest extent feasible through coordination of the construction plans with the U.S. Coast Guard.

As described in Section 4.13.3 the transport of dredged material from the Woodrow Wilson Bridge Project to the potential disposal sites will be accomplished using barges of satisfactory condition to prevent loss of material. These barges would travel from the dredge site to the potential disposal sites using the Potomac River navigable channel. Coordination with the U.S. Coast Guard would be conducted to insure that this transport of material does not effect normal and customary navigation within the channel. In consultation with the USCG, the project will provide appropriate notice to mariners of dredge and dredge material disposal transport as detailed information becomes available.

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4.2.8 Air Traffic

The highest points of the bridge and highway elements of Current Design Alternative 4A do not extend into any of the controlled airspace for the southern approach to Ronald Reagan Washington National Airport. Based on information received from the Federal Aviation Administration (FAA), bridges higher than 82.3 meters (270 feet) above mean sea level would penetrate obstruction clearance minimums. Current Design Alternative 4A would be well under than this maximum altitude, including structural elements, the control tower, and light and sign appurtenances. Adherence with FAA requirements is currently being prepared to obtain Federal Aviation Regulations (FAR) Part 77 compliance for the new bridge structure due to the proximity of Ronald Reagan Washington National Airport.

4.3 Socioeconomic

4.3.1 Land Use and Land Use Planning

Effects on Access to Project Area Developments: FEIS Alternative 4A and Current Design Alternative 4A were designed to respond in part to future traffic demands associated with additional development in the vicinity of the project area. It is likely that a substantial portion of this development would occur even without the proposed Woodrow Wilson Bridge project.

Three components of Current Design Alternative 4A offer connections that would directly support the approved land use plans in surrounding jurisdictions. The first two components, the Stovall Street flyover ramp and the eastern connection from I-95/495 to the Eisenhower Valley planned development area, were described in the 1997 FEIS, although their inclusion in the project was not determined until 1998. The third, the National Harbor development, located south of I-95/495/I-295 interchange, previously was given Federal Interstate Access Point Approval for access to and from the I-95/495 and I-295 in 1988. The missing movement, National Harbor to westbound I-95/495, was included in the 1997 FEIS and is retained with the Current Design Alternative 4A. An additional movement, National Harbor to northbound I-295, has been added to the I-295 interchange configuration under Current Design Alternative 4A. The movements shown in the 1997 FEIS have been modified and revised to serve traffic entering and exiting National Harbor. This increased accessibility would improve traffic operations and safety in the I-295 interchange area.

Consistency with Local Plans: Future development patterns and transportation improvements in the extended project area for Current Design Alternative 4A are guided by a number of regional and local plans, including those fully described in the 1997 FEIS:

- *Constrained Long-Range Transportation Plan* (MWCOG)
- *Comprehensive Plan for the National Capital* (National Capital Planning Commission)
- *Adopted and Approved Master Plan for Subregion VII* (Prince George's County's)
- *Comprehensive Plan for Fairfax County, Virginia - Area IV* (Fairfax County)
- *The Master Plan - Alexandria, Virginia* (City of Alexandria)
- *Oxon Cove Park Plan* (National Park Service)

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As described in Chapter 2, in the Metropolitan Washington area, land use planning occurs at the local level, but is coordinated and linked to transportation planning at the regional level. Therefore the Current Design Alternative 4A is consistent with the planned roadway and HOV improvements on the surrounding roadways. Additionally, the Current Design Alternative 4A is consistent with future land use plans for the area.

Development in the project area is included in land use planning decisions by Prince George's County, Fairfax County, and the City of Alexandria in accordance with their respective plans. Any new development, industrial, residential, or commercial, would be subject to state, Federal, and local permitting and environmental requirements. Site-specific environmental impacts associated with these developments would be addressed as part of the approval process for the individual projects.

Current Design Alternative 4A would facilitate movement through the region, provide access to proposed development areas, and strive to avoid and minimize environmental impacts. On September 18, 1996, the Maryland Office of Planning found the Woodrow Wilson Bridge project to be consistent with the State's plans, programs, and objectives. As a determination of consistency expires after three years, a new determination is requested as part of the review of this Draft Supplemental Environmental Impact Statement, and subsequent revisions thereof, by the Maryland State Clearinghouse.

4.3.2 Social Environment

Community Services and Facilities: Current Design Alternative 4A would improve police, fire, and rescue access in the project area compared to the 1997 FEIS due to the reduced congestion and delay, except for when the drawspan is open. These openings would cause traffic to come to a complete stop, thereby preventing access from both states for these services. With both the 1997 FEIS and the Current Design Alternative 4A, these openings would, however, be reduced by 70 percent due to the increased clearance over the navigational channel.

Pedestrian and Bicycle Facilities: The overall improvements to pedestrian and bicycle access with the addition of a pedestrian/bicycle facility on the river crossing was discussed in the 1997 FEIS. The effects of Current Design Alternative 4A on the Mount Vernon Trail, the Virginia bike trail system, the proposed Potomac Heritage Trail, and the bike trails in Jones Point Park are identical to those addressed in the 1997 FEIS for Alternative 4A.

As stated in the 1997 FEIS, the new bridge over the Potomac River would provide opportunities for both recreational and commuter cyclists. In addition, the connections would provide a link between the existing Mount Vernon Trail in Virginia and the proposed Potomac Heritage Trail in Maryland, and would be integrated with the urban decks planned for recreation at Washington Street in Alexandria and Rosalie Island. Current Design Alternative 4A would provide these same improvements, in addition to providing additional pedestrian/bike crossings over I-95/495 near the existing Bald Eagle Road in Maryland and at the US 1 and Telegraph Road interchanges.

In Maryland, the pedestrian/bicycle-only crossing over I-95/495 would be located north of the existing Bald Eagle Road crossing. With the FEIS Alternative 4A, a relocated Bald Eagle Road bridge would

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have provided both non-vehicular and vehicular access to the Oxon Hill Farm. With the Current Design Alternative 4A, vehicular access to the Farm would be provided in a new entrance off of MD 210 north of I-95/495, leaving the new bridge for bikes and pedestrians only. This pedestrian/bicycle crossing would maintain the connection between Oxon Hill Road, Oxon Hill Farm, and other existing designated pedestrian/bicycle facilities.

In Virginia, the plans for the relocation of existing trails and construction of new trails have been refined and expanded beyond that described in the 1997 FEIS for Alternative 4A. These refinements are a result of extensive coordination with community groups, bicyclist enthusiasts and the Stakeholder Participation Panels. These trail extensions, particularly the addition of protected pedestrian/bike trails along the Telegraph and the US 1 interchanges, would improve access across I-95/495. At the Telegraph Road interchange, a new crossing of I-95/495 would be accomplished by the construction of a dedicated pedestrian/bicycle lane adjacent to the Stovall Street flyover ramp (Ramp A-2), which would connect Telegraph Road to Stovall Street at Eisenhower Avenue. At US 1 a separate pedestrian/bicycle lane will be provided along a portion of the ramp from northbound US 1 to northbound I-95/495 (Ramp E). The trail will continue as it transitions to the grade of the proposed urban deck at Washington Street, where it will pass over I-95/495. These connections would create an additional 4,300 linear feet of trail to the Virginia bike trail system above that which is described in the 1997 FEIS.

Community Cohesion and Accessibility: Impacts on community cohesion can include the taking of land and homes, physical or perceived barriers dividing the community, or disruption of access within a community. Current Design Alternative 4A requires residential and business acquisitions similar to those described in the 1997 FEIS and discussed in greater detail in Section 4.3.3. However, the communities in the project area would not be divided and access would be maintained in the project area. The 1997 FEIS described an urban deck to be constructed in the vicinity of Washington Street, which is part of the Current Design Alternative 4A as described in Section 2.2. This feature would provide an improved connection between the neighborhoods in the City of Alexandria that has been separated from one another since the construction of I-95/495 in 1957. In addition, the new bridge would provide new pedestrian/bicycle access as well as increased vehicular traffic between Virginia and Maryland. The effects of Current Design Alternative 4A on community cohesion and accessibility are similar to those identified in the 1997 FEIS.

Parks and Recreation Areas: The following discussion re-evaluates the findings of FHWA's Section 4(f) Evaluation (Appendix D of the 1997 FEIS) to determine whether any new or additional impacts to parklands would result from the Current Design Alternative 4A (Side-by-Side Drawbridges). Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303), stipulates that the use of land from a significant publicly-owned public park, recreation area, or wildlife and waterfowl refuge, or from any significant historic site, may occur only if there is no feasible and prudent alternative to the use. Documentation of the use of Section 4(f) land must also demonstrate that the proposed action includes all possible planning to minimize harm to the property resulting from such use.

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Section 4(f) does not apply to temporary occupancy of Section 4(f) resources (areas needed for temporary construction easements or staging areas) when the following criteria as defined in 23 CFR 771.135, are met:

(i) Duration must be temporary; i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
(ii) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the section 4(f) resource are minimal;
(iii) There are no anticipated permanent adverse physical impacts, nor would there be interference with the activities or purposes of the resource, on either a temporary or permanent basis;
(iv) The land being used must be fully restored, i.e., the resource must be returned to a condition which is at least as good as that which existed prior to the project; and
(v) There must be documented agreement of the appropriate Federal, State, or local officials having jurisdiction over the resource regarding the above conditions.

Whenever the occupancy of a Section 4(f) protected resource will not meet the criteria for temporary use as described above, those impacts are included in this section as permanent 4(f) impacts. The potential for temporary occupancy of park areas during construction in accordance with the above regulation is described further in Appendix F, Construction Impacts.

Apart from a direct taking of land, a "constructive use" of a Section 4(f) resource may occur when a transportation project does not incorporate land from the Section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. 23 CFR 771.135(p). As discussed in the 1997 FEIS/Section 4(f) Evaluation, no constructive use impacts to any Section 4(f) properties are anticipated. The Current Design Alternative 4A would have moderate noise and visual impacts on some Section 4(f) resources, but impacts would not be substantially greater than those already imposed on those resources by the existing bridge and roadways. Thus, no constructive use of any Section 4(f) property is anticipated with Current Design Alternative 4A either. Discussions on visual and noise impacts to parks in the proximity of Current Design Alternative 4A can be found in Sections 4.3.8 and 4.5.3 respectively.

The 1997 FEIS/Section 4(f) Evaluation has detailed maps and descriptions of the following parks, recreation facilities, and historic sites protected by Section 4(f) located in or near the project corridor.

Virginia:

- Lee Recreation Center
- George Washington Memorial Parkway/Mount Vernon Memorial Highway/Mount Vernon Trail
- Freedmen's (Contraband) Cemetery
- Alexandria Historic District/Jones Point Park/Jones Point Lighthouse/District of Columbia Cornerstone
- Virginia Bike Trails

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Maryland:

- Queen Anne's Park (Future)
- Oxon Cove Park/Oxon Hill Farm
- Potomac Heritage Trail (Proposed)
- Butler House
- Flintstone Elementary School

In addition to those listed above, five parks and recreation areas are found in the vicinity of the extended project limits for the Current Design Alternative 4A, as discussed in Section 3.3.4 and shown in Figure 3-8. Clermont Natural Park, Joseph Henlsey Park and Cameron Run Park are located in the City of Alexandria. Burgundy Park and Loftridge Park are located south of the Beltway in Fairfax County.

Other than the impacts to the parks described in detail below and summarized in Table 4-7, there are no outright use, temporary use, or constructive use of any additional parks by the Current Design Alternative 4A in the extended project limits. Noise analyses have determined that elevated noise levels resulting from the Current Design Alternative in the area of the Saint Mary's School playground, Huntington Park, and the Flintstone School playground would be attenuated by the construction of noise barriers. In the area of Burgundy Park, additional noise analyses would need to be conducted to determine the height and mitigative effect of noise barriers.

Impacts of Current Design Alternative 4A compared with the impacts of FEIS Alternative 4A are described below and summarized in Table 4-7.

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Table 4-7: Summary of Section 4(f) Impacts

Site Name and Impact Category	FEIS Alternative 4A	Current Design Alternative 4A
Virginia		
Lee Recreation Center		
Right-of-Way Required - hectares (acres)	0.2 (0.5)	0.2 (0.5)
Loss of Park Functions	None	None
Noise Increase (Decrease) (dBA)	2	5
Virginia Bike Trails		
Length of trail displaced - meters (feet)	484 (1,588)	484 (1,588)
Loss of Functions	Temporary[2]	Temporary[2]
Noise Increase (Decrease) (dBA)	NA	NA
Jones Point Park		
Easement Required – hectares (acres)	2.7 (6.8)	2.6 (5.7)
Loss of Park Functions	None	None
Historic Resources Affected	Yes	Yes
Noise Increase (Decrease) (dBA)	(7)	(9)
Maryland		
Queen Anne's Park (Future)		
Right-of-Way Required - hectares (acres)	2.5 (6.2)	3.0 (7.3)
Loss of Park Functions	None	None
Noise Increase (Decrease) (dBA)	4	7
Oxon Cove Park/Oxon Hill Farm		
Right-of-Way Required - hectares (acres)	0.2 (0.5)	0.06 (0.16)
Loss of Park Functions	None	None
Historic Resources Affected	No	No
Noise Increase (Decrease)[3] (dBA)	5	5

Notes:
1. *Temporary displacement of Mount Vernon Trail along South Street to accommodate construction.*
2. *Temporary displacement of bike trail parallel* to I-95/495 *while relocated trail constructed slightly to the north.*
3. *Noise levels shown are at the wildlife area of Oxon Hill Farm*

Virginia

Lee Recreation Center: Current Design Alternative 4A would impact the same total land area of the Lee Recreation Center as did the FEIS Alternative 4A, 0.2 hectare (0.5 acre). However, the location of impact was shifted slightly as a result of design refinements to the proposed retaining wall along the southern boundary of the facility. As shown in Figure 4-6, the new area of impact is adjacent to the southern baseball diamond in the recreation area at the north end of the facility. This grassy area is outside of the right baseline and parallel to the existing property fence along US 1. The baseball diamond, pool, pump house, outdoor basketball court, tennis courts, and the Recreation Center building itself would not be disturbed and all outdoor activities would be maintained. Because the nature and extent of the use of land from the Lee Recreation Center is substantially identical, no additional Section 4(f) documentation or mitigation is required. Thus, the mitigation plan for the Lee Recreation Center provided in Appendix D of the 1997 FEIS remains unchanged.

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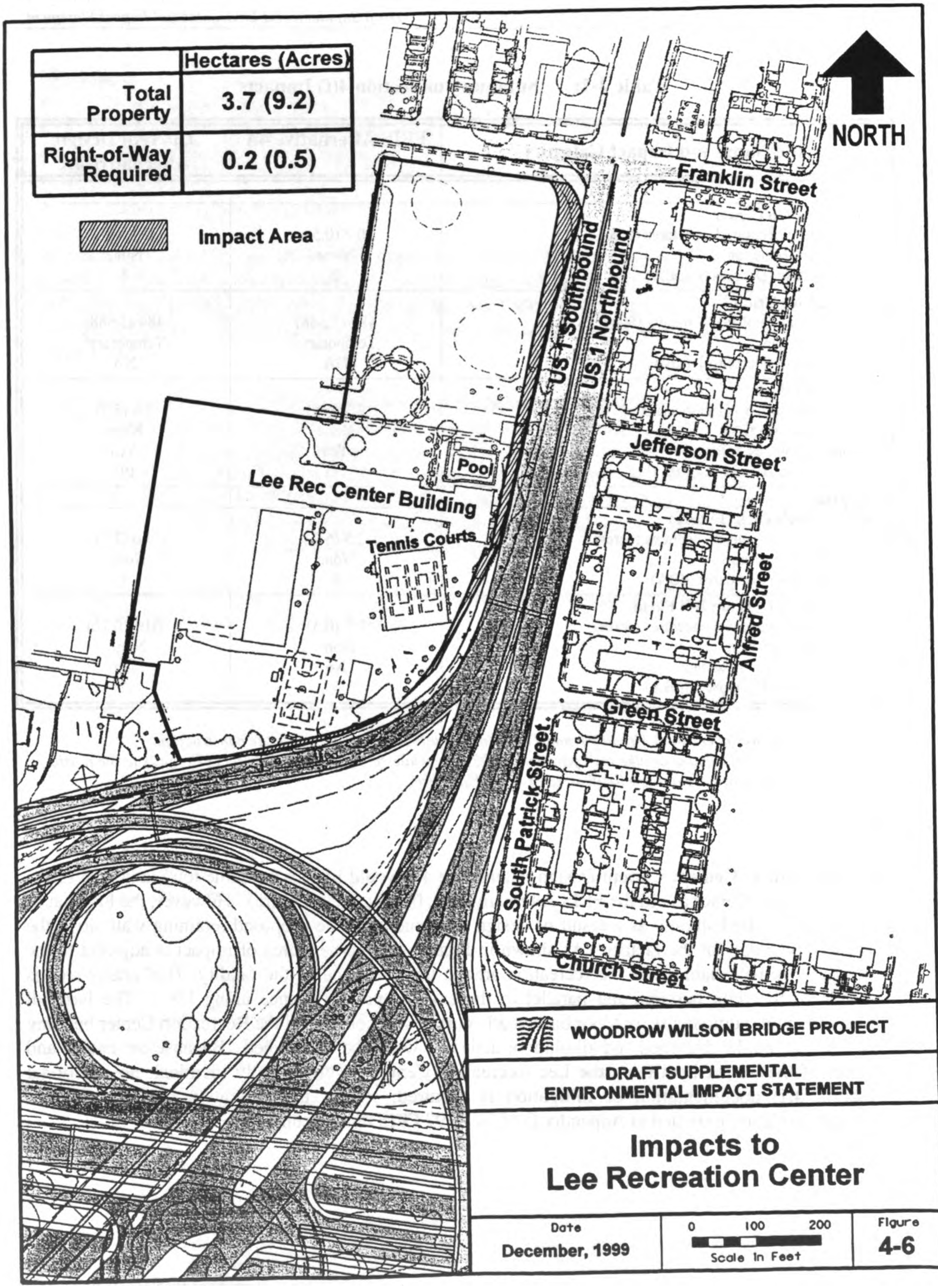
	Hectares (Acres)
Total Property	3.7 (9.2)
Right-of-Way Required	0.2 (0.5)

Impact Area



WOODROW WILSON BRIDGE PROJECT

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Impacts to Lee Recreation Center

Date	0 100 200 Scale in Feet	Figure
December, 1999		4-6

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Noise and visual impacts associated with the Current Design Alternative 4A are also substantially similar to those presented in the 1997 FEIS. Noise levels in the area of the Lee Recreation Center for the Current Design Alternative 4A (74 dBA) would increase by 3 dBA over the FEIS Alternative 4A (71 dBA) based on the new traffic and noise model that incorporates the most recent data. Such an increase is only slightly perceptible to the human ear. In addition, according to the Noise Barrier Abatement Analysis in Section 4.5.4, installation of a noise barrier at this location would reduce the project noise levels by 6 to 8 dBA, which would result in noise levels for the Current Design Alternative 4A that are below the existing noise levels. The installation of a noise barrier meets the criteria set forth in Virginia's noise policy and the decision to install these barriers will be based on further coordination with the City of Alexandria and area residents and additional design refinements during the final design phase.

Jones Point Park: According to area park authorities, Jones Point Park is the most heavily used 4(f) resource in the project area. The 1997 FEIS/Section 4(f) Evaluation described Jones Point Park as encompassing roughly 21 hectares (52 acres). More recent property investigations indicate Jones Point Park is closer to 28 hectares (70 acres) in size. The 1997 FEIS/Section 4(f) Evaluation described the use of 2.7 hectares (6.8 acres) of land from Jones Point Park with Alternative 4A, based on a rough calculation of a new aerial highway easement that would be needed south of the existing highway right-of-way. Based on the design refinements to this point, the bridge easement in Jones Point Park is expected to be 2.3 hectares (5.7 acres) under the Current Design Alternative 4A, as shown on Figure 4-7. This represents a reduction in the use of the park property of 0.4-hectare (1.1-acre) compared with the FEIS Alternative 4A. This calculation is based on the smallest possible perpetual bridge easement that would permit safe construction, operation, and maintenance of the new structure.

One change since the 1997 FEIS is in the impact to the soccer fields located on the southern half of Jones Point Park. Design refinements and construction methodology analyses have shown that the existing soccer fields would likely need to be either re-aligned in their current location or temporarily re-located elsewhere within the Park in order to ensure the safety of Park users during construction. Either scenario would be implemented prior to construction so that the recreational use is not interrupted. The FHWA is coordinating with the NPS and the City of Alexandria on issues relating to the continued use of the Park during the construction period.

Since the 1997 FEIS/Section 4(f) Evaluation, FHWA has given considerable attention to minimizing the harm to Jones Point Park. A number of minimization measures to reduce harm have advanced during this time. First, FHWA has committed to transfer ownership of all land owned by FHWA under and adjacent to the existing Woodrow Wilson Bridge to the National Park Service, prior to the start of construction activities. FHWA property currently divides the Park into two discontinuous areas. During World War II, the Department of Defense occupied the entire area of Jones Point. After the War, the property eventually became surplus and Congress designated a portion for highway use, a portion retained by the Army, and other areas for transfer to the Department of Interior. FHWA's land totals approximately 10 acres, and includes the existing highway right-of-way, land in the area of Lee Street extended, and the former Department of the Army facility. An easement held by the Virginia Department of Transportation over a portion of the existing bridge right-of-way would be temporarily retained in order to operate and maintain the

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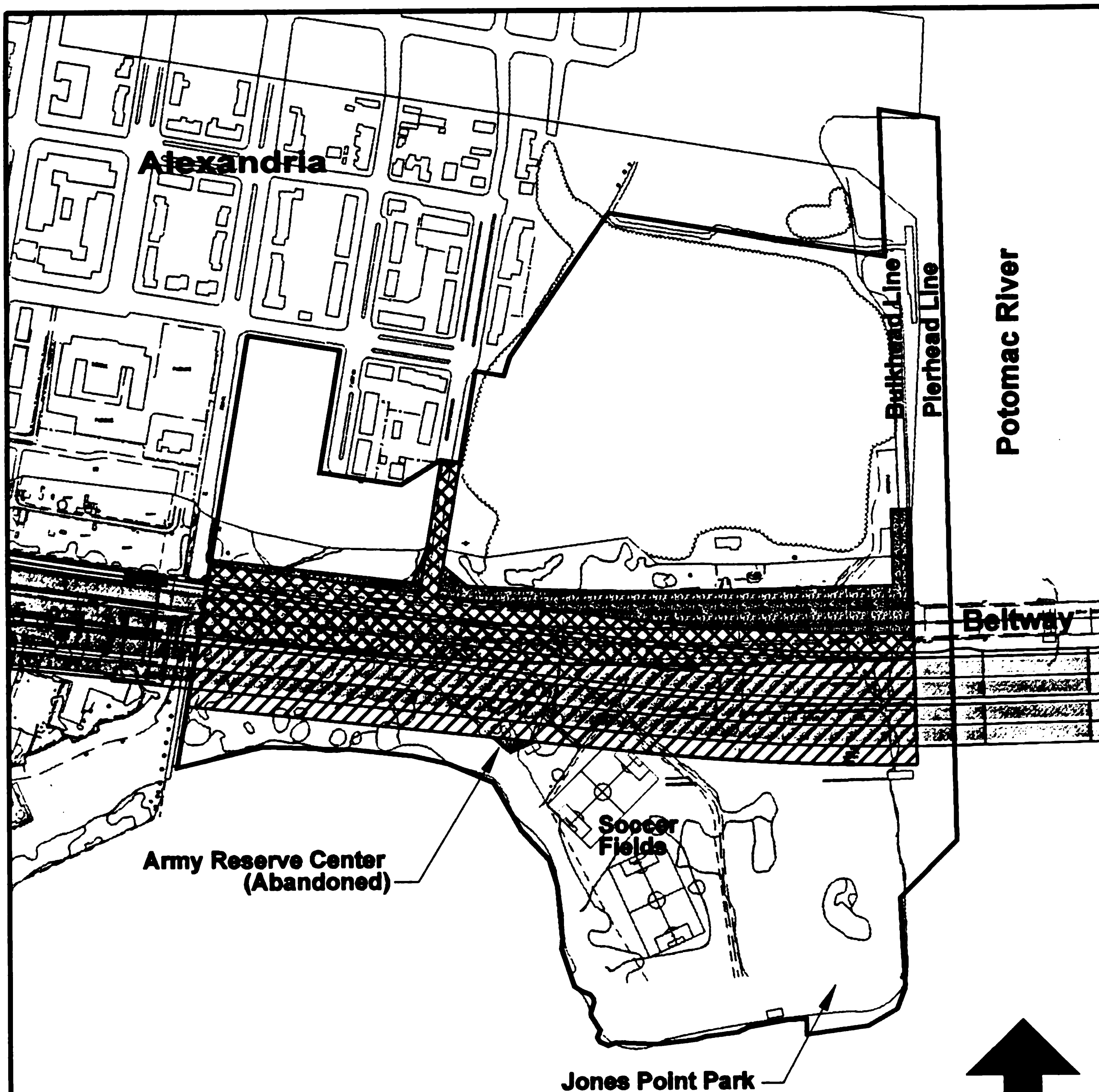

- Existing FHWA Bridge ROW
- VDOT Perpetual Easement Area
- FHWA Area To Be Conveyed To The National Park Service

	Hectares (Acres)
Total Property	28.5 (70.5)
Additional Easement Required	2.3 (5.7)

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Impacts to Jones Point Park

Date	Scale in Feet	Figure
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existing Woodrow Wilson Bridge until it is demolished to make way for completion of the project. At that point, the acreage would convert to Park use. Following construction, the entire area of Jones Point, with the exception of the area physically occupied by bridge piers, would function as parkland or facilitate park use. Proposed activities in the area to be donated by FHWA include a parking lot, active hard-surfaced play areas, and a grassy expanse linking recreational facilities that would exist both north and south of the bridge. This is a substantial improvement over what exists today.

Second, interested citizens since the 1997 FEIS have raised a concern about the closure of Jones Point Park for use as a construction staging area. After studying possible staging areas and possible construction methodologies, FHWA has determined that all of the recreational functions of the Park, including walking trails, fishing, soccer, and access to the historical Lighthouse/D.C. South Cornerstone can likely be maintained during construction. Of course, some activities may need to be temporarily relocated within the Park in order to ensure the safety of Park users at all times. In addition, outside of the construction corridor itself FHWA has decided not to pre-select any portion of Jones Point Park for staging activities. Since a large number of potential staging areas were identified (shown in Appendix F), it was determined that Jones Point Park may not be needed for staging and competitive bidding is best facilitated by following the normal practice of leaving the choice of staging areas to the contractors. Thus, while not required, a contractor may negotiate with the National Park Service for the temporary use of a portion of Jones Point Park (or any other National Park Service property) for construction staging. However, the staging activities would have to meet the regulatory requirements of temporary occupancy, listed in the Introduction section above, in order not to require a new Section 4(f) Evaluation. In addition, as part of the commitment to maintain Jones Point Park functions during construction, FHWA will not approve any staging area that would displace existing recreational facilities or result in an additional adverse effect to the historical resources in the Park. These limitations would not limit any potential construction staging activities to the portion of the Park that is north of the existing Woodrow Wilson Bridge, since the northern portion has no existing recreational facilities, no historical resources, and is slated for eventual clearing and grading activities as part of the mitigation package.

Third, since the 1997 FEIS, extensive coordination between the National Park Service and the City of Alexandria has been undertaken to further develop the mitigation and enhancement plan for Jones Point Park. Public input in this process has also been sought through formation of a Stakeholder Participation Panel as discussed in Chapter 2. The mitigation plan for Current Alternative 4A includes the following additional elements beyond those described in the 1997 FEIS/Section 4(f) Evaluation: hard surface courts and play areas; playgrounds and play equipment; public restrooms; open, passive recreation areas; nature and interpretive trails; and other miscellaneous elements. The proposed mitigation plan is shown in Figure 4-8.

Fourth, as discussed in Chapter 2, a design competition was conducted by the Maryland State Highway Administration in 1998 at a total cost of $400,000 for the four firms selected for the design competition. As a result, a bridge design concept was selected that would achieve the aesthetic goals set forth the 1997 FEIS and would be compatible with the parkland setting of Jones Point Park. The selected design concept, with its arched piers and long spans between piers, was selected in part because it would provide for open vistas within the park and a reconnection of park

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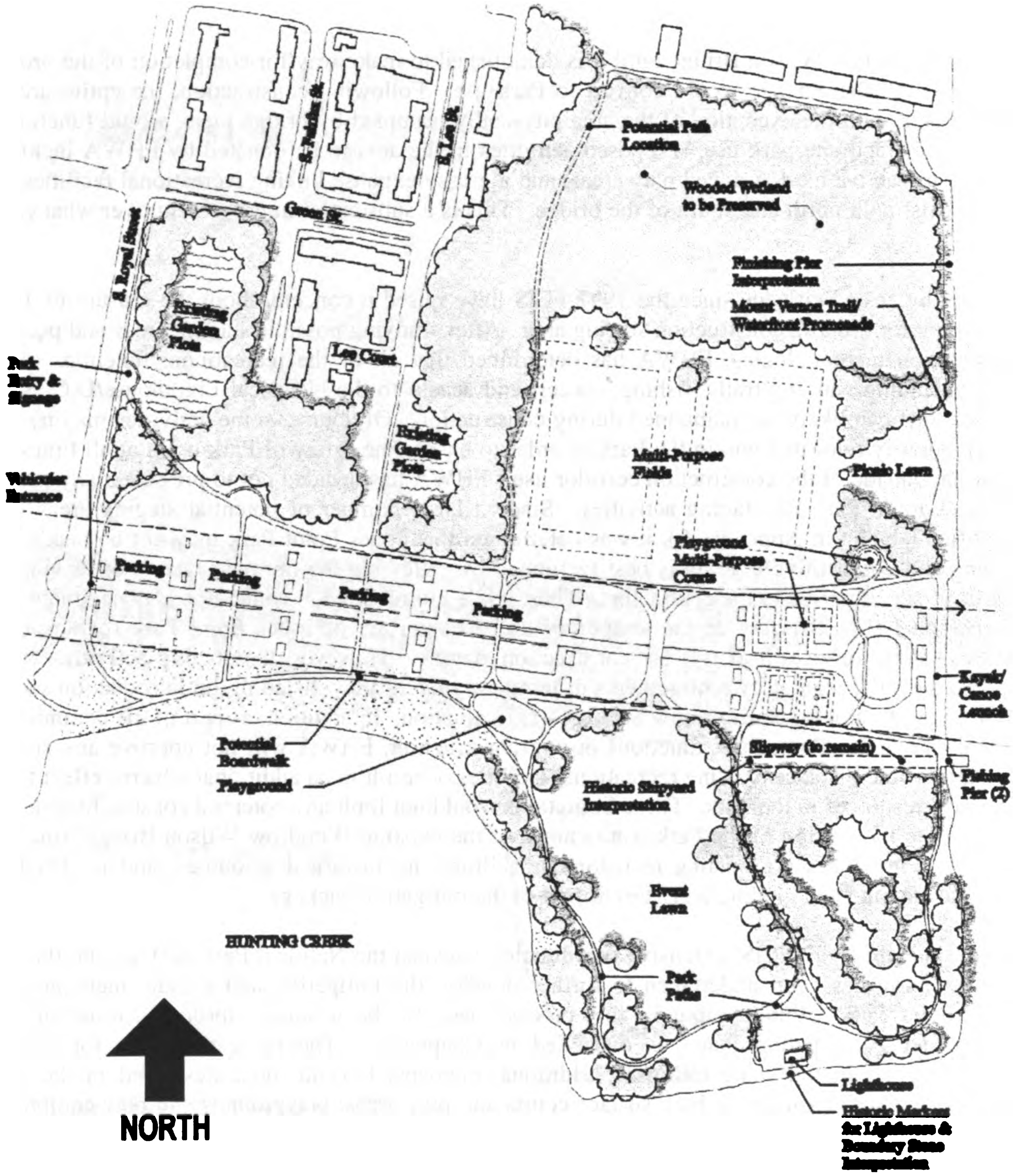

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Jones Point Park Conceptual Mitigation Plan

Date		Figure
December, 1999	Not to Scale	4- 8

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elements that are currently separated by the existing bridge. Therefore, the visual impacts of the bridge on the park have been minimized in accordance with the goals stated in the 1997 FEIS.

Fifth, noise levels for Current Design Alternative 4A would be reduced by 2 dBA (from 67 dBA to 65 dBA) over the noise level shown for FEIS Alternative 4A and 1 dBA under the existing levels (66 dBA). As stated in section 4.5.3-Project Noise Impacts, the potential resonation of the structure itself may increase the overall noise environment under the bridge. An extensive literature search was conducted to effectively evaluate the potential noise levels under the proposed bridge structure. The literature indicates that the proposed steel box-girder structure design features would minimize resonation, thereby minimizing increases in structure-borne noise in the overall noise environment.

The 1997 FEIS/Section 4(f) Evaluation considered Jones Point Park in combination with several historical resources that occupy the same area (the Alexandria Historic District and the Jones Point Lighthouse and D.C. Cornerstone South). The historic resources are discussed in more detail in Section 4.8 Cultural Resources. For purposes of Section 4(f), there is no new or additional Section 4(f) property use for Current Design Alternative 4A beyond what was described for FEIS Alternative 4A. Impacts to several historic resources in the Park were described in the 1997 FEIS/Section 4(f) Evaluation. For FEIS Alternative 4A, FHWA anticipated demolition one of the historic buildings on the former Army Reserve Center property due to pier placement. However, any additional building demolitions on the property were deferred until the final design phase of the project. The necessity of removing both buildings on this one Section 4(f) resource has been confirmed in the updated design of Current Design Alternative 4A. In addition, upon transfer of this property from the Department of the Army to FHWA it was discovered that the Historic American Building Survey documentation was not completed as reported in the 1997 FEIS. FHWA has therefore consulted with the appropriate agencies and begun completion of this documentation, which is required prior to demolition. The 1997 FEIS/Section 4(f) Evaluation also anticipated that Alternative 4A might impact historical archeological resources in the area of the former shipways and ropewalk within the Park. Recent testing has determined that there are archeological remains that may be adversely effected by the piers in this area. These remains are not an additional 4(f) use, however, because they are not valuable for preservation in place. Harm would be minimized though the coordination and mitigation required by the National Historic Preservation Act Memorandum of Agreement (Appendix E of the 1997 FEIS).

In summary, the use of Jones Point Park resulting from the Current Design Alternative 4A is substantially similar or less than the use described in the 1997 FEIS/Section 4(f) Evaluation for Alternative 4A. In addition, the harm to the Park has been reduced though the additional proposed minimization and mitigation measures described above. These measures would result in an enhancement of the Park's use over time as compared to the FEIS Alternative 4A.

Virginia Bike Trails: Impacts to the existing Virginia bike trail facilities resulting from Current Design Alternative 4A are substantially similar to those described in the 1997 FEIS/Section 4(f) Evaluation for Alternative 4A. However, as a minimization measure, FHWA agreed to investigate the possibility of enhancing bike and pedestrian crossings of the Beltway in the 1997 FEIS and Record of Decision. As described in the Pedestrian and Bicycle Facilities section above, the plans for the relocation of existing trails and construction of new trails have been refined and expanded since the

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1997 FEIS, as a result of extensive coordination with community groups, bicycle enthusiasts, and Stakeholder Participation Panels. The bike trails proposed as part of the Current Design Alternative 4A include the addition of 1,219.2 linear meters (4,300 linear feet) as part of the improvements to the Telegraph Road and US 1 interchanges. These trail extensions would improve access across I-95/495. Thus, after mitigation, the impact to the Virginia Bike Trails under Current Design Alternative 4A is less than the impact describe for the FEIS Alternative 4A.

Maryland

Queen Anne's Park (Future): In the area of future Queen Anne's Park, several design refinements have been made since the 1997 FEIS as a result of detailed design work undertaken by the Maryland State Highway Administration. These refinements relate to the alignment of the ramp from I-95/495 local lanes and are the result of the normal progression from the broad scale engineering done during the planning phase to more detailed design needed for development of construction plans. The specific design modifications include: increasing the length of curves to reduce dangerous abrupt steering changes, increasing the distance between successive exits along the ramp to meet the minimum gore spacing requirements of the National highway design standards, increasing the separation between adjacent roadways to accommodate required retaining walls, and realignment of the bridge approach to match the 4.6 meter (15-foot) separation between the two structures of the new Woodrow Wilson Bridge.

These design refinements, combined with an updated property survey, result in impacts on the future Queen Anne's Park that are slightly higher than those detailed in the 1997 FEIS. Impacts to the future Queen Anne's Park, as shown on Figure 4-9, are 1.2 hectares (2.9 acres) of property owned by the Maryland National Capital Park & Planning Commission (M-NCPPC) that is underwater and 1.8 hectares (4.4 acres) of upland future park area. This is an increase of 0.3 hectares (0.8 acre) of underwater MNCPPC land and 0.1 hectare (0.3 acre) of future park area. Much of the increase in the underwater impact area is attributable to the corrections to the metes and bounds survey and mapping discrepancies that were discovered during design work completed in October 1999, and thus would be applicable to any build alternative. These survey and map corrections resulted in a shifting of the park boundary approximately 51.9 meters (170 feet) from of the property line depicted in the 1997 FEIS. Because the underwater land acreage is not used currently nor is it part of planned active recreation use, the additional impact is not considered to represent a substantial change to the impacts to the future Queen Anne's Park from that described in the 1997 FEIS/4(f) Evaluation. The 0.1 hectare (0.3 acre) increase in upland future park acreage required for Current Design Alternative 4A is relatively minor (1.5 percent) in terms of the total future useable Queen Anne's Park area of 5.4 hectares (13.5 acres). Furthermore, no recreational functions are affected as the area is not currently parkland and the agency has no funding to begin park construction. FHWA's mitigation plan for this area includes construction of access, trails, and fishing piers. In addition, since the increase is largely caused by the need to meet safety-based National design standards, an analogous increase would likely have resulted under any of the project build alternatives during final design engineering.

Recent noise analysis also shows that Current Design Alternative 4A would increase noise levels by 3 dBA over FEIS Alternative 4A. An increase of 3 dBA is slightly perceptible to the human ear.

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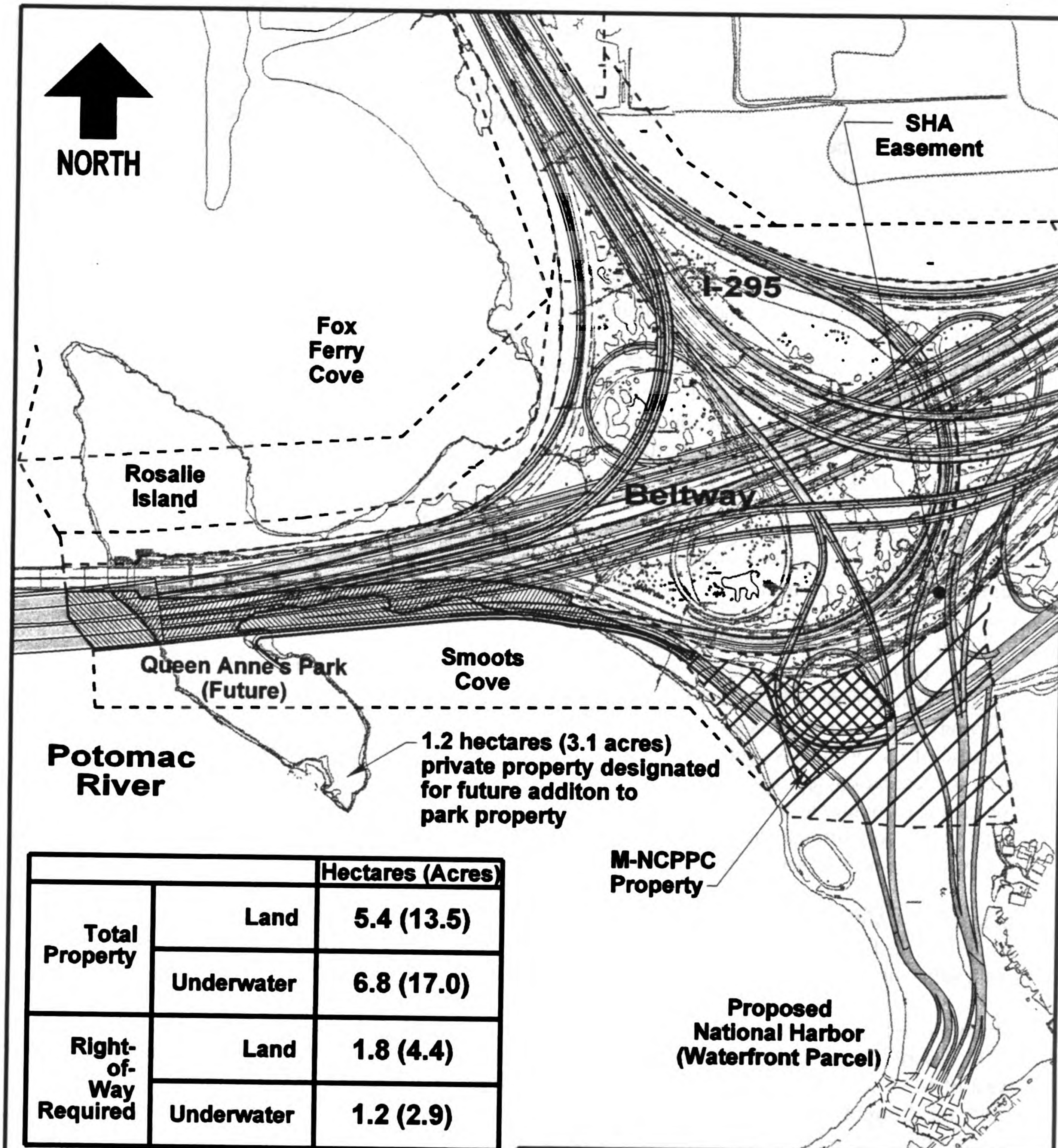

		Hectares (Acres)
Total Property	Land	5.4 (13.5)
	Underwater	6.8 (17.0)
Right-of-Way Required	Land	1.8 (4.4)
	Underwater	1.2 (2.9)

Upland Impact

Underwater Impact

Property owned by M-NCPPC but easement for transportation use

M-NCPPC Property

Property boundaries

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Impacts to Queen Anne's Park (Future)

Date	Scale in Feet	Figure
December, 1999	0 300 600	4-9

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While these projected noise levels meet the criteria for consideration of noise abatement measures, the installation of noise barriers is not considered reasonable at this location because they are not compatible with the proposed park design and its intended use, and therefore would be visually intrusive to the park user.
Proposed mitigation for the impacts to Queen Anne's Park (future) is described in detail in the 1997 FEIS. Following extensive coordination since that time, additional refinements to the proposed Rosalie Island Deckover to be constructed within Queen Anne's Park include the incorporation of designated viewing areas of the Potomac River and the installation of public restroom facilities. These updated mitigation and enhancement features are shown in Figure 4-10.

In 1985, approximately 23.2 hectares (57.2 acres) of land was conveyed from NPS to M-NCPPC for recreation and open space uses, although the conveyance allowed transportation uses, if needed, on the east side of the property just south of the I-295 interchange. A 5.9-hectare (14.5-acre) area was subsequently set aside for transportation purposes as allowed in the original conveyance to M-NCPPC. In 1989, MNCPPC granted a transportation easement to the owner of the then Port America (now National Harbor) project to be able to access the interstate as well as to be able to have local access between its two development parcels. This easement and the access roads to be built thereupon were subsequently dedicated to Prince George's County in 1990 for public use. The remaining of the 17.2 hectares (42.6 acres) was therefore available for park and outdoor recreation use. A small parcel of land, located in the middle of the transportation parcel, was inadvertently included in the park parcel. This small 1.3-hectare (3.3-acre) portion of the parcel is landlocked on all sides by the land set aside for transportation uses in the transportation parcel. This landlocked parcel was not impacted by the FEIS Alternative 4A but would be impacted by the Current Design Alternative 4A due to revisions to interchange ramps. This small parcel is not considered parkland because of its location within the transportation parcel, it is not accessible by the public and is not used for recreation and has no practical outdoor recreational value. Furthermore, there are no plans for future recreational use on this parcel. M-NCP&PC concurrence on this is pending receipt of letter; however, original assessment and correspondence from FHWA was completed, reference Chapter 5 for brief description of this correspondence.

In summary, after considering the context and intensity of all of the changes in use at future Queen Anne's Park, FHWA believes that the increased use required for Current Design Alternative 4A is not a substantial enough change to require additional Section 4(f) documentation.

Oxon Cove Park/Oxon Hill Farm: There are three changes to the use of this property. The 1997 FEIS described one impact to Oxon Cove Park property on the north side of I-95/495 immediately west of I-295 as a result of adjustments to the ramp from southbound I-295 to southbound I-95/495. First, the Current Design Alternative 4A would reduce the impacts to the park at this location, as shown on Figure 4-11. Under this alternative, the use of parkland would decrease to 0.04 hectare (0.1 acre), compared with 0.2 hectare (0.5 acre) used by FEIS Alternative 4A.

Second, the 106-hectare (265-acre) Oxon Hill Farm, a National-Register-eligible historic site, is part of the larger 196-hectare (485-acre) Oxon Cove Park. Since the completion of the FEIS, an additional impact to the Oxon Hill Farm portion of the Park has been identified. Approximately 0.02 hectare (0.06 acre) additional land from the Farm property would be required to build a retaining wall along

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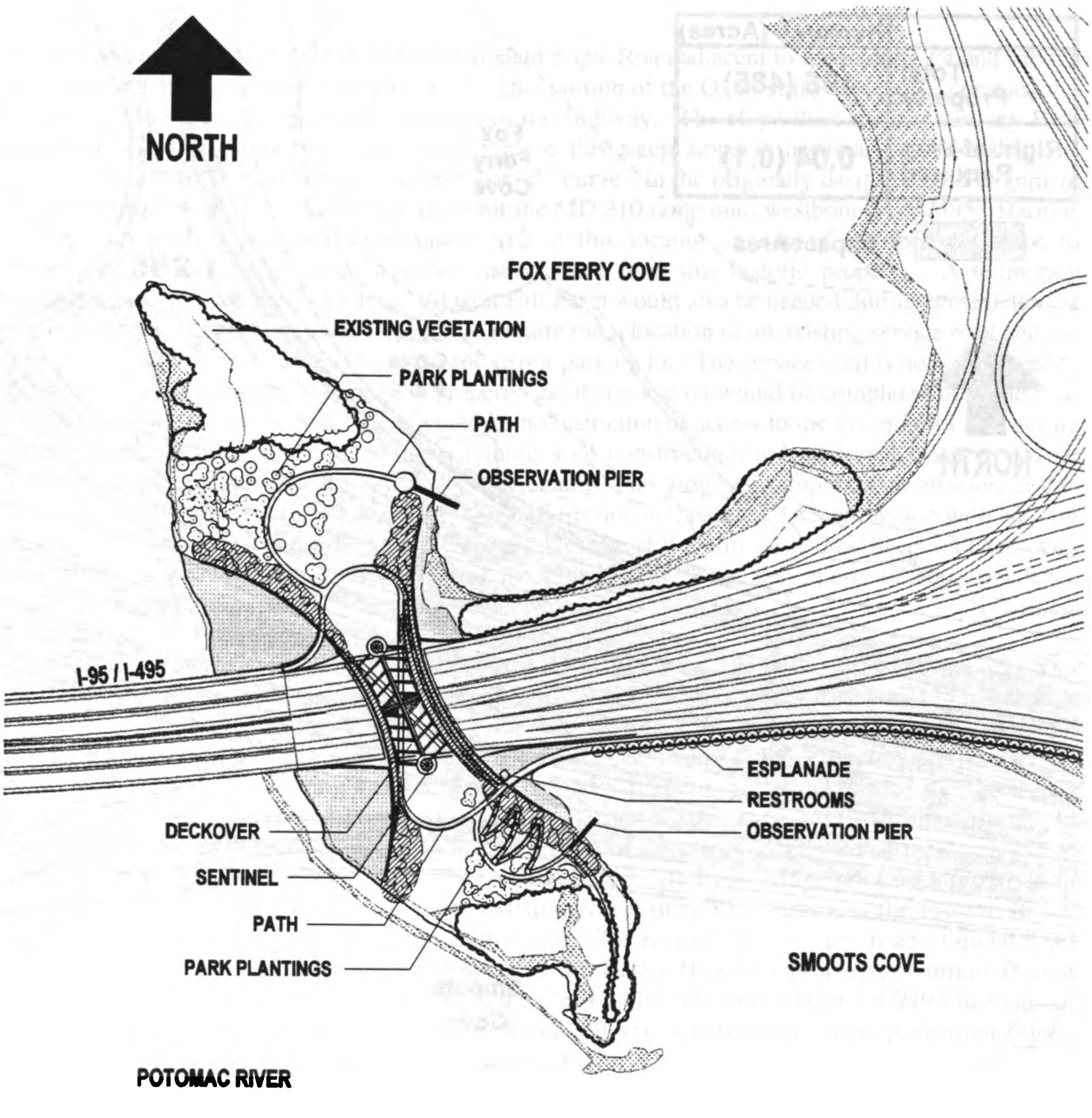

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Queen Anne's Park (Future) Conceptual Mitigation Plan

Date	Scale	Figure
December, 1999	0 200 400 Scale in Feet	4-10

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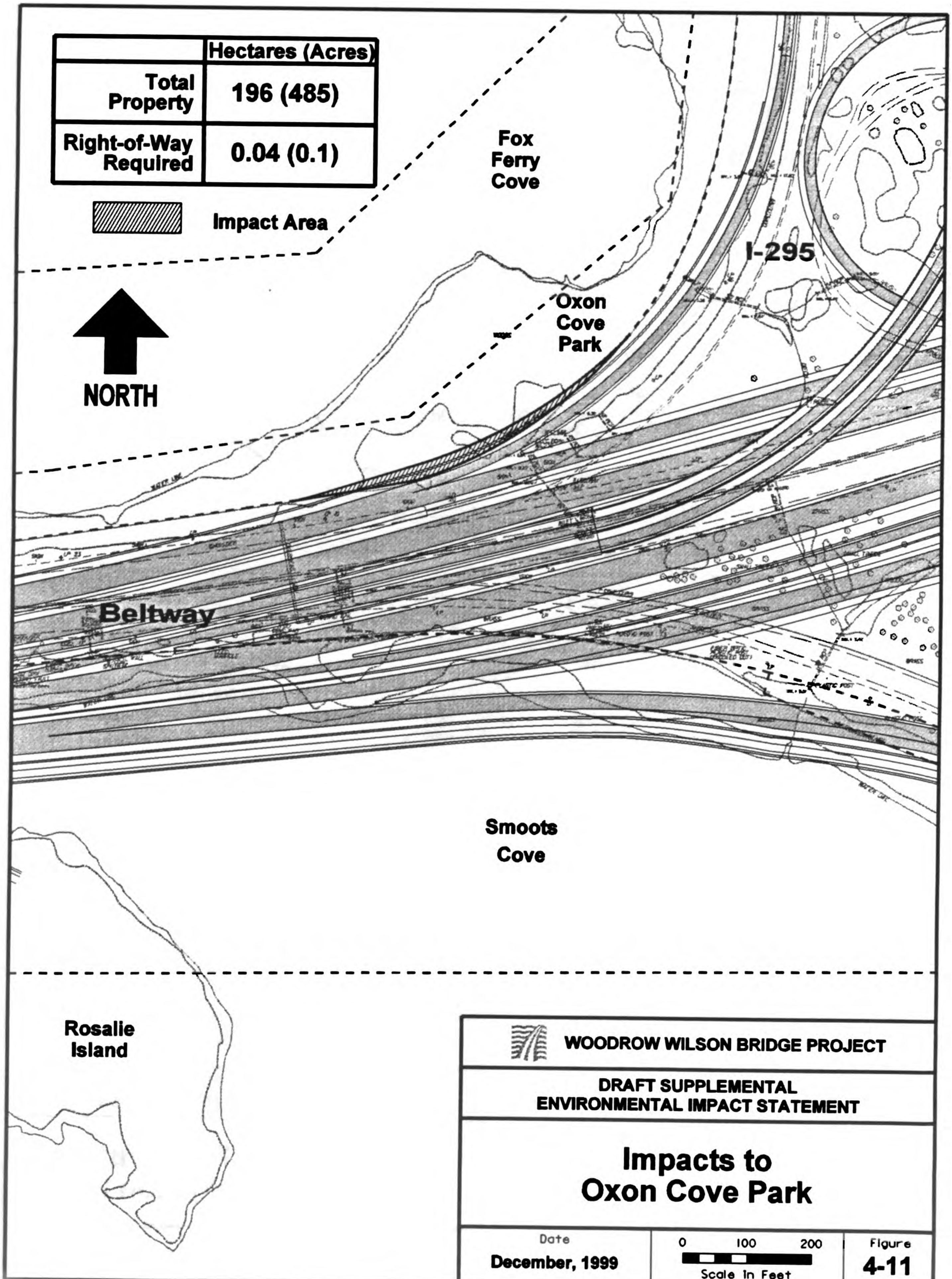
	Hectares (Acres)
Total Property	196 (485)
Right-of-Way Required	0.04 (0.1)



WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Impacts to Oxon Cove Park

Date: December, 1999

Figure 4-11

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the southbound lanes of I-95/495 just west of Bald Eagle Road adjacent to the parking lot and service road for the Farm, as shown on Figure 4-12. This portion of the Oxon Hill Farm parcel consists of a steep vegetated slope immediately adjacent to the Beltway. The slope does not contain any Park facilities. The retaining wall that would replace this steep slope is necessary to straighten the proposed roadway by eliminating a reverse - or "S" curve - in the originally designed road alignment and to provide a safe acceleration lane taper for the MD 210 ramp onto westbound I-95/495. Harm is being minimized by designing a retaining wall at this location in lieu of an open cut slope to minimize, to the greatest extent possible, use of land from this historic property. A temporary occupancy of 0.06-hectare (0.14 acre) of Oxon Hill Farm would also be needed during construction of the retaining wall. This temporary use would require the relocation of an existing service road and the connection of the service road to the adjacent visitor parking lot. The service road is not considered to be a contributing element to the historic property and its relocation would be completed in advance of the retaining wall construction. There would be no restriction of access to the Oxon Hill Farm during construction. After completion of the retaining wall construction, a landscaped berm would be provided in this location as visual and noise screening. The proposed temporary occupation in this area meets the criteria set forth for temporary use of Section 4(f) parkland. Coordination with NPS on this and other issues related to Oxon Cove Park/Oxon Hill Farm issue has been initiated with resolution anticipated prior to publication of the Final SEIS. Brief description of correspondence letter is included in Chapter 5.

Third, after publication of the 1997 FEIS/Section 4(f) Evaluation, the NPS suggested that access to the Oxon Hill Farm be relocated from Oxon Hill Road to MD 210 just north of I-95/495 to enhance the Park's visibility to passing motorists and improve access for the many school buses that frequent the Park throughout the year. The design of a new access road on a new alignment mostly on MSHA property, but involving a minor amount of NPS property north and east of the Oxon Hill Farm property was developed in conjunction with design plans for the MD 210 interchange. In order to tie this new Park entrance into the existing parking lot, a temporary construction easement of 0.05-hectare (0.12-acre) is required. The original Bald Eagle Road bridge relocation proposed in the 1997 FEIS required adjustments to the existing gravel driveway leading to the historic Butler property immediately east of the Oxon Hill Farm. The revised Park access road eliminates all impacts to driveway and there are no impacts to the Butler House or property. Current Design Alternative 4A also proposes construction of a pedestrian/bicycle bridge over I-95/495 just east of the existing Park access bridge (Bald Eagle Road) off Oxon Hill Road. This pedestrian bridge would take the place of the existing vehicle access bridge.

In summary, even with the additional impact of less than 0.02 hectare (0.06 acres) at the Oxon Hill Farm, the total impact to the Oxon Cove Park/Oxon Hill Farm complex has been reduced from 0.2 hectare (0.5 acre) to 0.06 hectare (0.16 acre). Noise and visual impacts are the same as described in the 1997 FEIS. Finally, FHWA has further minimized harm to these resources by agreeing to construct the new entrance to the Oxon Hill Farm property.

In conclusion, FHWA has re-evaluated the information in the FEIS/Section 4(f) Evaluation concerning impacts to park and historic resources in the project area. The re-evaluation included consultation with the owners of the impacted resources. Current Design Alternative 4A does not require a substantially greater use of 4(f) properties than did FEIS Alternative 4A, and all possible planning to minimize harm

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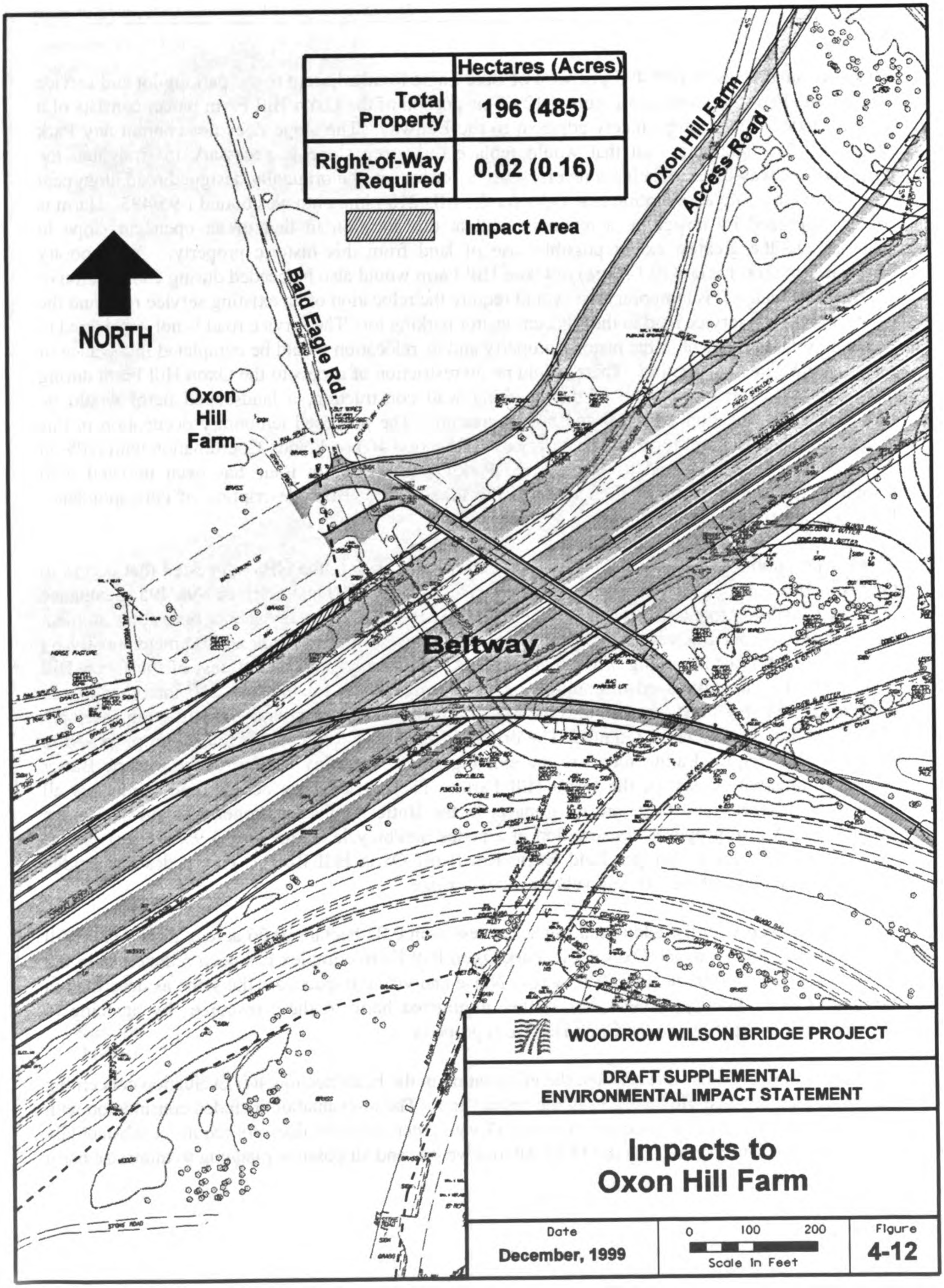

	Hectares (Acres)
Total Property	196 (485)
Right-of-Way Required	0.02 (0.16)

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Impacts to Oxon Hill Farm

Date: December, 1999

Scale In Feet: 0 100 200

Figure 4-12

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to the protected properties has been undertaken. Thus, a additional Section 4(f) documentation is not required for Current Design Alternative 4A.

4.3.3 Residential and Business Displacements

In 1997 it was estimated that the FEIS Alternative 4A would displace between four and six single-family residences in the northeast quadrant of I-95/495/MD 210 interchange in the Forest Heights community of Prince George's County. Additionally the northernmost Hunting Tower apartment building (a total of 265 dwelling units) and the three northernmost Hunting Terrace apartment buildings (67 dwelling units) located in the southeast quadrant of US 1 would also be displaced. Current Design Alternative 4A would have similar impacts, except that only four single-family residences would be displaced at I-95/495/MD 210 interchange, due to design refinements of the ramp from the southbound I-95/495 to northbound MD 210 in the northeast quadrant. Three of these four residences are occupied; the fourth was severely damaged by fire in 1997 and is no longer habitable. Maryland State Highway Administration (MSHA) has agreed to acquire this fourth property under hardship provisions that would allow the purchase to proceed in advance of other right-of-way acquisitions.

Under Current Design Alternative 4A grade separation of the MD 210/Oxon Hill Road intersection could displace a MSHA salt storage facility north of Oxon Hill Road in the southeastern quadrant of I-95/495/MD 210 interchange in Prince George's County. This facility is one of 16 such facilities in MSHA-District 3, which includes all of Prince George's and Montgomery Counties. Its primary use is for equipment supply/storage and for staging during snow events and road construction. The current design would require less than 0.1 hectare (0.2 acre) of this property with a residual of 0.7 hectares (1.6 acres). This acreage may be adequate for the facility to remain at this location. The addition of the MD 210/Oxon Hill Road grade separation to the project was prepared in response to requests from the Maryland Stakeholder Participation Panel as discussed in Chapter 5.

FEIS Alternative 4A required the displacement of two commercial properties in the northwest quadrant of I-95/495/Telegraph Road interchange in Alexandria, Virginia (the Marriott Courtyard Hotel, which employs approximately 75 people, and Strayer University, which has approximately 80 full-time, part-time, and temporary employees). Other commercial properties impacted by FEIS Alternative 4A included two office buildings fronting on Washington Street just south of I-95/495, which house about ten businesses with approximately 230 employees. Current Design Alternative 4A would avoid the taking of the Marriott Hotel and Strayer University as a result of reducing the radius of the circular ramp in the northeast quadrant of the Telegraph Road interchange. However, a number of design modifications in Current Design Alternative 4A would impact thirteen additional commercial properties in Virginia.

Eight of the additional commercial property acquisitions associated with Current Design Alternative 4A resulted from design refinements of the exit ramps from the northbound I-95/495 to Telegraph Road and removal of potential vehicular conflicts along a short stretch of Telegraph Road. Current Design Alternative 4A provides a split ramp at this location that allows direct access to Huntington Avenue and another direct access to N. King's Highway. This would eliminate some turning movements that otherwise would be required to access N. King's Highway or Huntington Avenue

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from the ramp. In addition, the acquisition of a gas station, service station, restaurant and a combination restaurant/convenience store would eliminate approximately six curb cuts, which currently provide access to these businesses. The elimination of these access points would decrease potential vehicular conflicts and increase safety in this area where three signalized intersections would be located in close succession. An automobile service station is impacted by the alignment of a new road, opposite from Lenore Lane, that is designed to maintain local access to Burgundy Road. These businesses employ a total workforce of approximately 15 to 20 people.

In the area south of I-95/495/US 1 interchange, five additional commercial properties will be acquired as part of the Current Design Alternative 4A. These acquired properties are two gas stations, a bank, a restaurant, and a hotel. Four of the properties are located between US 1 and Old Richmond Highway, and the fifth is in the southeast quadrant of the US 1 and Fort Hunt Road intersection. These acquisitions are a result of ongoing coordination with the Virginia Department of Transportation and Fairfax County, in an effort to accommodate planned transportation improvements along US 1. Unlike the FEIS Alternative 4A, the Current Design Alternative would consider a future interchange at Huntington Avenue and Fort Hunt Road and accommodate the dimensions of the typical sections of the future US 1 where it would join with the Woodrow Wilson Bridge project. In making these accommodations, the widening of US 1 southbound was extended to the west, which placed the curb line into the five commercial properties, constraining the use of the properties.

Table 4-8 summarizes the right-of-way and displacement requirements of FEIS Alternative 4A and Current Design Alternative 4A. The two alternatives differ mainly in the number of commercial properties being acquired and, to a lesser degree, in the number of residential properties and other right-of-way acquisitions.

Table 4-8: Right-of-Way and Displacement Requirements

Alternative	Right-of-Way hectares (acres)	Displacements			
		Residential	Business	Other (Non-profit, Federal facilities)	Total
FEIS Alternative 4A	21.9 (54.0)	338	12	1	351
Current Design Alternative 4A	21.4 (52.9)	336	23	1	361

Families, individuals, and businesses displaced by the project would be relocated in accordance with the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended, and relocation resources are available to all displacees without discrimination. All real property acquisitions would also be in accordance with the Uniform Act. A summary of each state's relocation assistance program is included in Appendix H of the 1997 FEIS.

The inventory of available replacement housing has been reduced since the 1997 FEIS due to the strong regional economic conditions and the influx of technology firms in the Washington metropolitan area. In Northern Virginia, where the majority of displacements would occur, the

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vacancy rate for Class B (built before 1988) rental high-rise apartments has fallen from 1.6 percent in September 1998 to 0.3 percent in September 1999, and rent has increased 6.5 percent per annum. However, according to Delta Associates, a national real estate research firm, the number of new units in the advanced planning stages (delivery will be the end of 2002) is expected to level out vacancy rates to approximately 5.1 percent, for short periods of time in select markets, over the next two to three years. At the same time, rent growth is expected to decrease to near the rate of inflation.

In nearby Fairfax County, the estimated vacancy rate for rental complexes with five or more units was 5.5 percent in January 1998, the last period for which statistics were compiled. Average monthly rent for one- and two-bedroom units was $775 and $893 respectively in 1998. These rates are comparable to the displaced units which were approximately $750 and $920 for one and two bedroom units, respectively, in 1997.

In neighboring Prince William County, available rental units are not inventoried and no vacancy rates are available. However, the County offers comparable accommodations at rental rates generally below those of the displaced units, perhaps due to the distance from the metropolitan area. Monthly rental rates for one bedroom units ranged from $475 to $720 and two bedroom units ranged from $600 to $875, according to the September 1999 Area Renters Guide, published by the County's Office of Housing and Community Development.

It appears that numerous vacant sites remain available for commercial/office development within the Eisenhower Valley area and along Richmond Highway. Here the current demand for commercial properties has generated a renovation and construction boom of commercial real estate brokers. According to Delta Associates, the vacancy rate for office space in the Washington metropolitan area has declined one percent (from 4.3 percent to 3.3 percent) since 1997. By the end of 2000, new construction is expected to outpace demand at which time the Metropolitan area-wide vacancy rate is expected to increase to 7.4 percent.

Public Law 105-117 was approved in 1997 and provides that a person who is an alien and is not lawfully present in the United States shall not be eligible for relocation payments or other assistance under the Uniform Act. It also directed all State displacing agencies that utilize federal funds in their projects to implement procedures for compliance with the 1997 amendments, in order to safeguard that funding. To this end, displaced persons would be asked to certify to their Citizenship or alien status prior to receiving payments or other benefits under the relocation assistance program.

Title VI Statement: It is the policy of FHWA, VDOT, District of Columbia Public Works (DCDPW), and MSHA to ensure compliance with the provisions of Title VI of the Civil Rights Act of 1964, and related civil rights laws and regulations that prohibit discrimination on the grounds of race, color, sex, national origin, age, and physical or mental handicap in all projects funded in whole or in part by FHWA. FHWA, VDOT, DCDPW, and MSHA would not discriminate in highway planning, highway design, highway construction, the acquisition of right-of-way, or the provision of relocation advisory assistance. This policy has been incorporated into all levels of the highway planning process in order that proper consideration be given to the social, economic, and environmental effects of all highway

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projects. Perceived discriminatory actions should be addressed to the Equal Opportunity Section of the appropriate jurisdiction for investigation.

4.3.4 Effects on Minorities, Elderly, and Handicapped

Social environments for the elderly, minority, or handicapped groups would be affected to differing degrees in the various jurisdictions. The racial and age composition of residents and tenants of affected properties has not changed substantially since the 1997 FEIS. Therefore, no impacts to these groups would result from the Current Design Alternative 4A.

4.3.5 Environmental Justice

Environmental justice is an important consideration in the development of this project. Title VI of the Civil Rights Act of 1964 and related statutes require Federal agencies to ensure that their programs, policies and activities do not have the effect of excluding populations the benefits of, or subject persons and populations to, discrimination because of race, color, or national origin. Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations" was signed on February 11, 1994 and reaffirms the principles of Title VI. The EO requires that each Federal agency identifies and address, as appropriate, any disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority and/or low-income populations. In addition, the EO adds low-income populations to the analysis when examining the effects of Federal programs, policies, and activities.

On June 29, 1995, USDOT published an environmental justice strategy in the Federal Register (60 FR 33986) to comply with the goals of EO 12898. USDOT Environmental Justice Order (60 FR 33899) was published on April 14, 1997 and is a key component of the strategy. The strategy states that USDOT and its operating administrations would integrate their implementation of the EO with existing requirements of NEPA, Title VI of the Civil Rights Act of 1964, and other applicable statutes concerning planning, public participation, social and economic factors, and health issues. TEA-21 echoes the USDOT strategy and promotes the public participation process by stressing the timely and meaningful participation of low-income and minority communities in transportation decisions affecting them. Participation by these groups in the planning process involves providing access to general information and receiving input regarding research and data collection needs, project design, and mitigation. Environmental justice public participation includes outreach and partnership efforts to affected communities.

Environmental justice issues were assessed based on the EO, Title VI, NEPA, USDOT's environmental justice strategy (60 FR 33899), and USDOT Environmental Justice Order. The extent to which the project would disproportionately affect minority and low-income populations was analyzed by considering the following factors:

1) Efforts used to assure a nondiscriminatory planning and public participation process under Title VI provisions;
2) The identification of impacts associated with the build alternatives and their effect on low-income and minority populations; and,

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3) Mitigation or enhancement measures recommended to avoid or minimize adverse impacts to low-income and minority populations.

In this discussion, the distribution of the project impacts, both beneficial and adverse, were compared to the demographic information defining the locations of minority and low-income populations in the immediate project area. In NEPA documents, environmental justice considerations can be addressed concurrently with social/community impacts. The potential for high and adverse effect on minority and low-income populations was examined with respect to the public participation, community impacts, access and traffic, air quality, and noise.

The USDOT Environmental Justice Order defines low income as a person whose median household income is at or below the Department of Human Services poverty level. This level was $13,359 for a four-person household in 1990, the last year in which complete census data is available and which was used as a basis for this Environmental Justice section. A minority is defined as a person who is Black (African-American), Hispanic, Asian American, American Indian and Alaskan Native. The USDOT Order also describes disproportionately high and adverse effect on minority and low-income populations as an adverse effect that: 1) is predominately borne by a minority population and/or a low-income population, or 2) would be suffered by the minority population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority and/or non-low-income populations.

The distribution of the minority population within tracts in the extended project area under Current Design Alternative 4A range from a low of 6.5 percent in tract 20.01 in the City of Alexandria to a high of 90.3 percent in tract 17.03 in Prince George's County. This range did not change from the 1997 FEIS. However, one additional tract (73.08) within the extended project limits was identified as having greater than 50 percent minority population (87.3 percent). In all, 8 out of 21 tracts within the extended project limits in Current Design Alternative 4A contain greater that 50 percent minority population. These are tract 73.08 in the District of Columbia; tracts 7.98 and 16.00 in the City of Alexandria; and, all five tracts in Prince George's County as shown in Table 4-9. In the 1997 FEIS, 7 of 17 tracts contained greater than 50 percent minority populations.

The distribution of population below the poverty level for each census tract in the extended project limits ranges from a low of 1.2 percent in tract 14.03 in Prince George's County to a high of 49.2 percent in tract 73.08 in the District of Columbia. This varies somewhat from the 1997 FEIS, where distribution of population below the poverty level ranged from 1.2 percent in tract 14.03 to a high of 22.6 percent in tract 16.00 in the City of Alexandria. This difference between FEIS Alternative 4A and the Current Design Alternative 4A is attributable to the extension of the project area, as the tract with the highest percentage of population below the poverty level is located in the extended project limits of the Current Design Alternative 4A. Table 4-9 includes the percent of population below the poverty level for each of the census tract within the project area, based on the 1990 census data.

The proportion of minority population within the project area (49.2 percent) is greater than that of the larger MSA (35.5 percent). Likewise, the percentage of the low-income population in the project area (11.8 percent) is greater than that of the MSA (6.4 percent). However, when the portions of the

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jurisdictions within the project area are compared with the District of Columbia, Fairfax County, the City of Alexandria, and Prince George's County as a whole, the percentage of minorities in the smaller area reflects that of the larger area with two exceptions. First, the percentage of low-income population in the portion of the District of Columbia in the project area (28.3 percent) is greater than that of the whole District (16.9 percent). Second, the percentage of the minority population in the portion of the project area in Prince George's County (71.3 percent) is greater than that of the whole county (58.4 percent). Therefore, the portion of the project area within the District of Columbia would be considered a low-income population, and the portion of Prince George's County within the project area would be considered a minority population, in accordance with the US DOT Environmental Justice Order.

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Table 4-9 Minority and Population Below Poverty Level

Jurisdiction	Census Tract	Percent Minority*	Percent of Population Below the Poverty Level
District of Columbia	73.01	45.6	7.4
	73.08	87.3	49.2
	District Total	72.6	16.9
Fairfax County	151.00	16.4	4.8
	152.00	9.2	4.0
	203.00	15.3	1.4
	204.00	31.2	5.8
	205.00	22.3	5.2
	206.00	42.9	9.3
	County Total	22.6	3.5
City of Alexandria	4.01	45.1	6.7
	6.00	42.4	8.4
	7.98	60.3	10.4
	16.00	71.1	22.6
	18.02	33.1	7.1
	19.00	22.1	15.8
	20.01	6.5	2.6
	20.02	8.8	2.7
	City Total	35.7	7.1
Virginia	State Total	24.0	10.2
Prince George's County	14.03	71.3	1.2
	14.04	66.4	2.7
	14.05	54.7	5.2
	15.00	73.9	3.1
	17.03	90.3	9.2
	County Total	58.4	5.8
Maryland	State Total	30.4	8.3
MSA	MSA Total	35.5	6.4

* *These census tracts include the US Census defined minority groups: Black, Hispanic, Asian and Pacific Islanders.*
Source: *1990 Census of Population and Housing*

Public Participation: The following describes the efforts made to engage representatives of a wide range of potential minority and low-income persons and communities interested in the Woodrow Wilson Bridge project since the 1997 FEIS.

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A Project Office was opened in May 1998 at 1800 Duke Street in Alexandria. This office offers the public an opportunity to learn about the project and to obtain project information. The office is located within one block of the King Street Metro station and along a WMATA bus line. In October 1999, a second Woodrow Wilson Bridge Office was opened at One Constellation Centre, 6009 Oxon Hill Road in Oxon Hill, Maryland with similar purposes. This office is also located on a WMATA bus line. In both offices, technical staffs are on-site to answer telephone calls and to meet with individuals.

The opening of the office in Alexandria was followed by an open house in June 1998 in which the full mailing list of citizens, businesses and community groups received notification. The community associations are representative of interested parties throughout the project area as well as others that are affected by the project's transportation improvements. The Project Office opening in Maryland was followed by an open house in December 1999.

In addition to the public hours, a speaker's bureau has met with various community and business groups in Maryland, Virginia and Washington, D.C. Approximately 50 meetings were held between March 1998 and November 1999. The speaker's bureau is advertised on the project's website as well as in project literature, including the *Connections* newsletter and fact sheet. Presentations have been made to elementary, high school and college students in Maryland, Virginia and Washington D.C. Some of these have been outreach efforts for school students interested in the engineering aspects of the project; others have been requested by the schools.

During winter 1998 and spring 1999, Stakeholder Participation Panel (SPP) meetings were initiated. The stakeholders were nominated by elected officials and other groups to advance the proposed final design. Membership on these panels was balanced with representation of the perspectives of those directly impacted, commuters, and the business community. Panel membership reflected the overall community character in terms of race, gender, age and socioeconomic standing. Selection of the 15 to 19 members of each panel was accomplished through a nomination process involving elected officials in each community or other relevant community leadership organizations. Nominators included:

- Maryland Senator Gloria Lawlah
- Fairfax County Supervisors Hyland and Kauffman
- City of Alexandria Mayor Donley
- Prince George's County Councilpersons Isaac Gourdine and James Estepp
- Prince George's County Executive Wayne Curry
- Forest Heights Mayor Warren Adams
- Fairfax County, Prince George's County and Alexandria Chambers of Commerce,
- American Automobile Association
- Maryland Motor Truck Association
- Environmental interest groups including the Fairfax County Wetland Board, Sierra Clubs of Maryland and Virginia,
- Bicycle communities in Alexandria and Prince George's County – M-NCPPC ,
- Alexandria Commission on Persons with Disabilities, Fairfax Area, Disability Services Board, and Individuals with Disabilities in Prince George's County

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- Flintstone Elementary School
- Friends of Jones Point Park
- Alexandria Parks and Recreation Department

While the Virginia SPP's completed their work meeting approximately one to two times per month over a six-month period, the Maryland Interchanges Panel continues to meet with active participation of local community residents in discussions resulting in refinements of Current Design Alternative 4A. In addition, SPP members in Maryland have been meeting with their constituents with materials provided by the project team. In other cases, the project team staff have made presentations at the request of members.

During the Bridge Design Competition, a representative group of citizens was engaged to discuss the competition entries. These citizens were also nominated to participate. The nominations sought by MSHA leading the effort were similar to the SPP process that sought diverse membership. This was achieved with representatives from Maryland, Virginia and the District of Columbia involved in the deliberations. A jury comprised of noted professionals from diverse backgrounds was engaged to serve as the Selection Panel for the Bridge Design Competition. Following the selection, an announcement was made on the project's website. The project also conducted an open house that evening.

Residential and Business Displacements: Of the 337 residential displacements associated with this project, 99 percent of these occur at the Hunting Towers and Hunting Terrace apartments in the eastern portion of the City of Alexandria. The facility management estimated that the minority population for these facilities to be five ten percent and the low-income populations were estimated to be less than one percent of the total.

The remaining one- percent of residential displacements involves four single-family residences along Terrell Avenue and Arapahoe Avenue near the MD 210 interchange. All four of the displaced residences in Prince George's County are located in tract 17.03 which has 9.2 percent of population below the poverty level and the highest percentage of minority persons (90.3 percent) of all tracts in the extended project limits.

Residential property displacements do not impact the minority or low-income populations more severely or to a greater magnitude than the non-minority and/or non-low-income population. Likewise, residential displacements are not predominantly borne by minority or low-income populations. Consequently, the residential property acquisition impacts do not adversely or disproportionately affect low-income or minority populations.

Depending on the occupancy status of the displaced persons of these homes (tenant or owner-occupant), various benefits are available under the Uniform Relocation Act. Tenants would be eligible to receive advisory assistance, replacement housing payments and moving cost expenses. Owner-occupants, in addition to receiving just compensation for the real property acquired for the project, may be eligible for replacement housing payments and moving cost expenses. For more information on the relocation assistance program, see Appendix H of the 1997 FEIS.

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The 1997 FEIS identified impacts to businesses in Virginia including two office buildings (10 businesses) on South Washington Street, a business school, and one hotel. The Current Design Alternative 4A would require acquisition of the two businesses on Washington Street; and a gas station, service station, restaurant, and combination restaurant/convenience store in the southern quadrants of I-95/495/Telegraph Road interchange. There is ample commercial, institutional, and office space available for the relocation of these businesses within the Alexandria area. The relocation of the businesses would not require any change to the current number of employees provided that adequate replacement commercial space is located. Replacement business sites, including parking spaces, have been identified in the project area. The previously identified business acquisition impacts and those impacts associated with Current Design Alternative 4A do not adversely or disproportionately affect low-income or minority populations.

Traffic Impacts: Traffic forecast numbers within the vicinity of the low-income and minority populations in the project area indicate that north-south traffic in the residential neighborhoods would not be affected by the Current Design Alternative 4A. East-west traffic, however, would experience some increase due to the projected traffic levels on I-95/495, which is expected to accommodate an increased amount of traffic due to regional growth. However, overall operational performance and safety would be improved and congestion reduced within the project area as a result of the changes incorporated in the Current Design Alternative 4A. The projected traffic volumes in the project area would not cause disproportionately high and adverse impacts to low-income and minority populations as compared to other non-minority and non-low-income communities in the project area.

There is the potential for temporary traffic increases during construction that may impact a community with a large percentage of minority residents within the project area of the Current Design Alternative 4A. These potential impacts could result from trucks hauling Potomac River dredged materials from the bridge construction site to Panorama Landfill, located on Palmer Road in Prince George's County. This landfill is one of four sites under consideration as a potential upland disposal site for a part of the estimated 492,000 cubic yards of dredged material generated by construction activities associated with the bridge. The potential route for the trucks would be along I-95/495, MD 210 (Indian Head Highway) south to Palmer Road and the landfill. The traffic would be restricted to daylight hours of the landfill facility for an approximate duration of approximately four to six months. Due to the limited hours of operation, the Panorama Landfill would likely receive only a portion of the total volume of dredged material generated by the bridge project. Accidental spillage of dredged material from dump trucks while en route to Panorama Landfill would be minimized by implementation of industry practices which include the use of fitted rubber gaskets and the use of adequate and properly functioning gate lock mechanisms. The rubber gaskets are fitted to the seam between the tailgate and dump body to create a watertight seal. Gate-lock mechanisms will be checked regularly to insure proper operation. Though not anticipated, if an accidental spillage was to occur, the contractor would be required to remove the spilled material in a timely fashion. Section 4.13 contains details on issues related to dredged material placement, and Appendix F – Construction Impacts contains a detailed discussion on Potential Traffic Mitigative Measures. If Panorama Landfill is selected for use as an upland disposal site for the Potomac River dredged material, mitigation measures would be instituted to ensure that the minority population would not be subjected to impacts that are more severe or greater in magnitude than those of the non-minority and/or non-low-income population. Due to the temporary nature of the use of the Panorama Landfill, if necessary, balanced

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with the reduction of congestion and the increased operational performance and safety, the projected traffic volumes resulting from the Current Design Alternative would not cause disproportionately high and adverse impacts to low-income and minority populations as compared to other non-minority and non-low-income communities in the project area.

Access to public transportation for the transit dependent would benefit from the increased river crossing capacity in the Woodrow Wilson Bridge corridor and related interchange improvements. The improved capacity and safety would reduce travel delays, especially bus services, in the currently congested portions of the project area. A description of the transportation and traffic impacts is provided in Section 4.2.

Air Quality Impacts: A detailed analysis of the air quality impacts is provided in Section 4.4. Air quality monitoring during construction and appropriate mitigative measures will ensure that regulated pollutant levels are not exceeded during the construction period. A discussion of construction related air quality impacts is included in Appendix F. Current Design Alternative 4A is not expected to cause disproportionately high and adverse impacts to low-income and minority populations as compared to non-minority and non-low-income communities in the project area.

Noise Impacts: Noise impacts are distributed along the length of the project area and are not predominantly imposed on minority or low-income populations. Temporary noise impact from construction will be minimized with the implementation of a construction noise control plan. Noise impacts would not be more severe in minority and/or low-income populations than in the population in general.

Minority communities have been involved in the public participation process and will continue to be included in ongoing coordination. Based on the analyses provided herein, it is anticipated that there will be no disproportionate impact to communities protected under Environmental Justice statutes.

4.3.6 Economic Development and Tax Impacts

The Current Design Alternative 4A would require right-of-way costs of approximately $130 million. Only $6 to $7 million of these costs result from the acquisition of properties in Maryland. This relatively low cost in Maryland is due, in part, to local protection of right-of-way conducted through the planning process in Prince George's County. The remaining costs come from acquisitions in the Washington Street, the US 1 interchange, and the Telegraph Road interchange areas in Virginia. Most of the acquisitions are similar between the Current Design Alternative 4A and the FEIS Alternative 4A except for the Marriott Hotel and Strayer University, which are avoided in the Current Design Alternative 4A. Four additional business acquisitions, identified during design refinement resulting in the Current Design Alternative 4A, are concentrated in the Telegraph Road area.

Although the acquisitions would generate tax losses, the net tax impact would likely be positive for Current Design Alternative 4A. The estimated tax loss for the Current Design Alternative 4A would be approximately five percent higher than those identified for the FEIS Alternative 4A. This increase is due to additional commercial displacements in Virginia and escalation costs. Approximate adjustments for Strayer University and Marriott Corporation (Marriott Courtyard) are included. These losses would

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be offset by tax gains from economic development and associated employment that would be facilitated by the new crossing. The new crossing, with it's improved operational and access characteristics, would help accommodate substantial amounts of planned commercial development. Much of this new development would occur in locations, such as Eisenhower Valley and National Harbor, which lie within the transportation corridor and in which multi-use development is planned and anticipated. This project provides direct access, in different configuration than the FEIS Alternative 4A, to Eisenhower Valley and National Harbor.

4.3.7 Washington Street Area Community Impacts

Since most of the residential displacements are concentrated in the Washington Street area, a detailed analysis for this area was conducted that considered information on the loss of residential and commercial properties, tenant relocation, and commercial and residential relocation plans. The analysis of the Washington Street area community impacts resulting from the Current Design Alternative 4A would be identical to that provided in the 1997 FEIS/Section 4(f) Evaluation.

4.3.8 Visual and Aesthetics Resources

The purpose of this section is to assess the visual impact of Current Design Alternative 4A. I-95/495 within the project area is a linear element in an urban landscape. I-95/495 is a landmark feature possessing forms and characteristics easily identifiable for the motorists to provide for a sense of direction and progress on I-95/495. Although the configuration of the interchanges has been slightly modified, the general perception of the mass and forms of the needed elements is the same as those in the FEIS Alternative 4A.

The following description proceeds from the west end through the east end of the project area and focuses only on the features that affect visual impacts that have changed from FEIS Alternative 4A.

Virginia Approach

Telegraph Road Interchange: Motorists traveling along I-95/495 from Virginia in the eastbound direction would have the option to access Huntington Avenue or North King's Highway from the most western off ramp at Telegraph Road. This would place the ramp roadway closer to the Burgundy Village community, although noise barriers would be placed between the community and I-95/495 ramp. This is a new ramp configuration compared to FEIS Alternative 4A. Previously, one ramp was provided to accommodate this movement. This interchange was not described in the 1997 FEIS. Noise barriers may be provided with supplemental landscaping on the beltway side as well as on the residential side to provide additional buffering and beautification. Existing trees and other vegetation would be preserved where possible. An at-grade connection would be made from Burgundy Village to Telegraph Road by an extension of Lenore Lane, thereby further encroaching visually on the Burgundy Village community.

The northwest quadrant of the interchange would allow the Strayer University and Marriott Hotel to remain thereby changing the visual affect from the FEIS Alternative 4A to that which would remain similar to today. A new ramp would be constructed in the northeast quadrant, which will rise above

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the westbound I-95/495 to the southbound Telegraph Road ramp. Other ramps within the interchange would be modified to provide improved traffic flow, and some ramps would increase in height to provide required clearance and connections. These modifications do not adversely affect the visual scale of the interchange in comparison to the FEIS Alternative 4A.

Parkland located west of the Telegraph Road Interchange and south of the mainline is not anticipated to be affected by the proposed mainline or interchange improvements. The parkland within this area (Burgundy Park and Loftridge Park) are currently protected from potential noise and aesthetic impacts by existing noise barriers located adjacent to the mainline. If these noise barriers are effected by the mainline improvements, they would be reconstructed in close proximity to their existing location.

Parkland located west of the Telegraph Road Interchange and north of the mainline is not anticipated to be affected by the proposed mainline or interchange improvements. The parkland within this area, specifically Cameron Run Regional Park and Joseph Hensley Park are active use parks located adjacent to the existing mainline. Because of their current use and their proximity to the mainline, Telegraph Road Interchange, and Eisenhower Avenue Valley these facilities would not be adversely effected by noise and aesthetics characteristics of the mainline and interchange improvements. Clermont Natural Park is not located adjacent to the mainline and is buffered from it by Joseph Hensley Park and the existing railroad line that crosses Cameron Run south of the Park. Because of the parks location and the existing buffer between the park and the mainline, noise and aesthetic impacts on this facility would not be anticipated.

US 1 Interchange: A flyover ramp would be provided to improve the access from northbound US 1 to westbound I-95/495 by an elevated ramp. This is a new ramp configuration compared to FEIS Alternative 4A. Previously, a left turn from US 1 to westbound Beltway was provided to accommodate this movement, which would have allowed for the visual impact to be maintained within the interchange. As in the description of the interchange in the 1997 FEIS, the driver's view would absorb more pavement, more ramps and more signs all of which would affect to some degree the driver's ability to enjoy more distant views. The highest elevation in the interchange would be one of the ramps carrying southbound US 1 to the eastbound I-95/495. The northbound US 1 to westbound I-95/495 flyover ramp would be closer to residential communities, however, it would not be the highest point of the interchange. This vertical alignment would not substantially alter the visual character of the interchange. These changes were evaluated by the Design Review Working Group using rendered photographs.

The off-ramp to Church Street would maintain the existing connection, but a provision for closing the access from Church Street to Columbus Street would be added. This could be an attractively landscaped area, improving the visual impact of the project in the area. This is a change from FEIS Alternative 4A in which the ramp to Church Street had been relocated further to the west that would have had a greater visual impact to the neighborhood adjacent to Church Street.

Parkland located west of the US 1 Interchange and south of the mainline, specifically Huntington Park would not be effected by the proposed action. Huntington Park is an active use area comprised of basketball courts, baseball diamond, hiker/biker trail, and playgrounds. Noise impacts have been considered in this area, reference Section 4.5.3, and indicate that a noise barrier to protect adjacent

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residential areas has been identified as a potential mitigation measure. Because of the current park use, visual and aesthetic impacts are not anticipated and due to consideration of a noise barrier to protect adjacent residential properties noise impact are not anticipated.

Washington Street Deck: Immediately after traversing the US 1 Interchange, eastbound motorists will pass under the Washington Street Deck. The deck would be constructed on either side of Washington Street in the City of Alexandria. The deck would provide opportunities for active and passive recreation and reconnection of portions of southern Alexandria on either side of the Beltway. It would be landscaped and would include a commemoration to the Freedmen's Cemetery. This deck structure remains generally at the proposed design height as identified for the FEIS Alternative 4A. The concepts presented in the 1997 FEIS, however, have been refined since their presentation and the description, therefore is superseded by the Current Design Alternative. The special features of the deck may include signage for Old Town Alexandria for northbound motorists on the George Washington Memorial Parkway. These northbound motorists traveling from the natural open section of the parkway from Mount Vernon towards the City of Alexandria will be reminded that they are on the George Washington Memorial Parkway through the use of signage. This deck would provide features that enhance a memorable visual experience to the parkway traveler. This is anticipated to provide a landscaped gateway to the City of Alexandria. The deck would provide a connection from the Mount Vernon Trail to the pedestrian/bicycle facility on the Potomac River Bridge. It would also provide a significant landmark to give the westbound I-95/495 motorist a sense of progress while driving along the Beltway.

The Potomac River Bridge: The bridge would form the central element of the project. It would be approximately 1,851.7 meters (6,075 feet) long at a maximum grade of 3 percent. A single cross-slope would be established for each bridge. The two independent bridge structures would be approximately 4.6 meters (15 feet) apart. This separation would provide a light, airy appearance for the span. The separation between bridges also allows more sunlight to the river below and through Jones Point Park in Virginia. The local/express roadways would be separated by 36-inch barriers, with a railing for safety on top of the barrier, for a 42-inch total barrier height. These taller barriers would also be located to the right side of the local lanes, due to safety considerations, and may impede the views of motorists in automobiles on the bridge as they look up and down the river.

The 1997 FEIS clearly made assumptions for the sake of illustration, which have since been interpreted and therefore further defined for the Current Design Alternative. For example, as a result of the 1998 Bridge Design Competition, many of the design goals stated in the MOA were achieved by the Current Design Alternative concept. The MOA stipulated that the design goals include that the structure would be designed with high aesthetic values, and would be an asset to the Nation's Capital and surrounding region. Minimization of the number of piers in the viewshed of the Alexandria Historic District properties was paramount. Furthermore, the design would preserve views southward along Royal, Fairfax and Lee Streets and preserve or enhance views along the Potomac River toward the Nations Capital. Features of the bridge respect Alexandria's Design Guidelines of the Alexandria Historic District and the Parker-Gray District. The design would also respect the distinguishing historic characteristics of the Alexandria Historic District, the Mount Vernon Memorial Highway, and the National Park Service General Management Plan for the facility. These goals have been met with the proposed design.

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The Bridge would reflect a graceful, seamless concept that would maintain an open appearance and a light, airy quality of the structure above, especially as it passes over and through the sensitive area of Jones Point Park and the Potomac River. Since the design's unveiling, the proposed bridge concept has received very favorable reviews, such as:

- "... the V-shaped piers looked like Neptune's hand reaching from the water to support the deck of the bridge."
- "... then number of piers reduced from 57 to 18."
- "... this structure is finely detailed which provides visual interest."
- "... this concept respects the tradition of the Memorial and Key Bridges but in a new, contemporary way for a long, over-water viaduct."

Design features of the bridge would include faux arches that echo the elegance and simplicity of upriver Memorial and Key Bridges. The long spans and minimal number of piers readily achieve a sense of openness. The moveable span is well placed and concealed within the structure. Each component of the bridge is consistent with a unifying theme. The elements of scale, style, materials and color are all incorporated into forms recalling the "V"-piers. The bridge abutments and piers would be faced with appropriate material, reminiscent of the 19th century transportation facilities within Alexandria, including the Orange and Alexandria Railroad Bridge over Hooff's Run and the Wilkes Street tunnel. Box girders under the bridge may be treated in a lighter shade than the concrete, thus emulating the white marble of the Lincoln and Jefferson Memorials. This reinforces the feel of the arches and visually "lifts" the bridge over the piers. Railings, poles for lights or other amenities, sign structures and the like would be designed and painted to give a light but formal appearance. The ship collision system is situated such that the domed tops extend above the waterline only at low tide only thereby maximizing views to and through the bridge.

The bridge design respects the Alexandria Historic District's design guidelines as stipulated in the MOA, by aligning with the historic grid pattern for streets. In addition, the piers have been situated to maintain or enhance historic viewplanes. Various features of the bridge design are appropriate and integrate with the historically important components of adjacent Alexandria and Jones Point Park. The long span through Jones Point Park encourages use of the area below and assists in separating uses within the park. Continuation of the "V" pier design concept and form would greatly enhance the views to the entire bridge while providing continuity in design.

The height of the bridge at the east end would be approximately three meters (10 feet) higher on the Maryland shoreline than shown in FEIS Alternative 4A. This will maximize the arch layout and provide improved views.

The Moveable Span: The moveable span would be a drawbridge, double leaf bascule bridge for each direction of traffic with 21.3 meters (70 feet) of clearance over the navigational channel. Operation of the drawbridge would occur from a bridge tender's house adjacent to the bridge in river.

The bridge tender's house would be located near the existing tower, and integrated within the bridge at the western end of the moveable span. It would be situated between the eastbound and

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westbound I-95/495 bridges and between the "V" piers to allow to close proximity to the water and navigational channel. Motorists on the bridge would see this bridge tender's house as the only feature situated between the two independent bridges. When the drawbridge is opened, the bridge tender would have full visibility of the channel. The bridge tender's house would receive architectural treatment suitable to integrate it with its location, or a specialized treatment to provide an interesting experience for the motorist.

Driver's Views: Eastbound drivers on the bridge would experience dramatic distant vistas of Maryland and the Rosalie Island deckover from the higher elevation of the moveable span (as in FEIS Alternative 4A). Westbound drivers on the bridge would be able to view Alexandria and the surrounding viewshed as well as the bridge tender's house and the Washington Street deck. A "gateway" into each state would be incorporated to the design of each deck. This would likely be an appropriate aesthetic feature to the specific area.

Pedestrian's and Bicyclist's Views: The Current Design Alternative 4Aincludes a 3.7-meter (12-foot) pedestrian/bicycle lane on the north side of the westbound bridge. This location would enhance the pedestrian and bicyclist's visual experience and provide for unobstructed and dramatic views to the Alexandria and Washington D.C. features. These resources include the Alexandria waterfront, natural features of the Potomac River and distant views of the Washington landmarks and monuments further northward.

In addition, overlooks would be located near the piers on either side of the moveable span. These overlooks would provide opportunities for pedestrians and bicyclists to take advantage of the unique features of the visual resources of the area.

Pedestrian/Bicycle facilities would be constructed to connect existing and proposed trail systems (where appropriate) in Virginia, Maryland, and the District of Columbia. The pedestrian way will be compliant with the Americans with Disabilities Act (ADA), July 1990 and will transition onto the Washington Street Deck, to the Mount Vernon Trail, and to Jones Point Park in Virginia as well as transitioning onto the Rosalie Island deckover on the Maryland side. Coordination is underway with the appropriate park and recreation departments to achieve the goals set forth by those agencies, as well as with the National Park Service.

Maryland Approach

Rosalie Island and Deckover: As the motorist enters Maryland they would pass beneath a deckover similar to that in Virginia. This deckover would provide a focal point in the visual corridor transitioning into Maryland. It also would maintain opportunities to connect parkland on both sides of the bridge, as it joins Maryland, and provide a connection to the proposed Potomac Heritage Trail, as well as other trails in Prince George's County. The deckover would provide a location to enjoy vistas of the Potomac River both north and south. The Rosalie Island and proposed Queen Anne's Park would become a passive recreation. The Rosalie Island Deckover would form a monumental gateway to Maryland in the eastbound direction.

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I-295 Interchange: The I-295 interchange has been modified from FEIS Alternative 4A to add ramps and service roads to accommodate traffic anticipated for the future National Harbor (Waterfront and I-95/495 Parcels). Otherwise, the interchange remains similar in visual character to that in the 1997 FEIS.

I-295 Northbound: The project would extend across the bridge at Oxon Cove. The Current Design Alternative 4A would provide an additional lane in the northbound direction. No change in elevation is proposed. The visual character of this section would essentially be maintained.

MD 210 Interchange: This interchange remains similar in visual characteristics to FEIS Alternative 4A. The exceptions include the addition of ramps from MD 210 and I-95/495 to Oxon Hill Road. A ramp lane has been added in the northwest quadrant of the interchange to facilitate traffic exiting I-95/495 to a signalized intersection with MD 210. MD 210 continues to pass over I-95/495. A partial interchange/grade separation is proposed for Oxon Hill Road at MD 210. Oxon Hill Road would be shifted to the north to allow for an improved alignment that would pass below Oxon Hill Road. Due to the urban characteristics of the area south of the Oxon Hill Road bridge, the visuals of the area would not change. Existing trees and other vegetation would be preserved where possible.

The Bald Eagle Road Bridge would be reduced in width to allow only pedestrian usage. This would change the visual impact from both the motorists on I-95/495 as well as the pedestrians and bicyclists travelling on the trails and on Oxon Hill Road. The vehicular access to the Oxon Hill Children's Farm would be relocated directly across from the off ramp from the westbound Beltway.

Amenities and Recreation: The Current Design Alternative 4A has been refined to provide many amenities. Studies of the lighting, sidewalks, retaining, structural support wall and barrier walls and railings would undergo further refinement along the entire length of the project to fully integrate with the surroundings. Some minor increases in height or dimensions of various items may occur due to more stringent requirements for safety issues, however, these changes would not be expected to cause significant visual differences. Stormwater management facilities that may be located within or adjacent to interchanges in Maryland would likely be designed with guidelines in mind as set forth by the Maryland Department of the Environment's *Maryland Stormwater Design Manual.* These guidelines facilitate community acceptance by incorporating best management practices to address water quality, appearance, performance and environmental benefit related to urban stormwater runoff.

A variety of recreational activities occur around or near the project area, depending on the season and on weather conditions. Fishing is a popular activity and boating, is of particular interest. Individuals enjoying these activities would be afforded outstanding views of the bridge and river from the piers(s) or vessels.

Staging Areas for Construction: Views of and from the project area during construction may be temporarily affected due to the construction staging, demolition activities, and material stockpiling and related construction equipment required for the work. All of these short-term efforts do not

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pose any long-term visual impact to motorists or residents. This will be reviewed in conjunction with the Final Potential Construction Staging Area Report, December 1999, to confirm whether unusually lengthy periods for construction staging areas may require temporary or interim visual screening. Existing vegetation and trees, where possible, will be preserved to assist in providing visual screening.

4.4 Air Quality

The Woodrow Wilson Bridge project is expected to change travel patterns in the region and change traffic conditions along I-95/495 corridor and intersecting roadways. The air quality effects of the project are directly related to the emissions from motor vehicles traveling on these roadways.

The pollutants considered for this analysis, and applicable air quality standards and regulatory requirements are presented in Section 3.4.

The 1990 Clean Air Act Amendments (CAAA) require that a federally-funded transportation project located within a designated carbon monoxide (CO) or ozone (O_3) non-attainment area must eliminate or reduce the number and severity of violations of the National Ambient Air Quality Standards (NAAQS) for CO in the area substantially affected by the project (localized effects). The project must also assist in the reduction of volatile organic compounds (VOC) and CO emissions in the project area (regional effects).

The air quality analysis conducted for the 1997 FEIS indicated that the FEIS Alternative 4A would not cause any violation of the NAAQS. The purpose of this air quality analysis is to confirm that Current Design Alternative 4A complies with the requirements of the 1990 CAAA and the area's Transportation Improvement Plan (TIP).

The effect of the Woodrow Wilson Bridge project on localized CO levels is the subject of this evaluation. This analysis includes an estimate of CO levels at sensitive land uses and affected intersecting roadways, and near the exit portals of the Urban Deck which is proposed at Washington Street in the City of Alexandria. The results of this air quality analysis indicate that future estimated CO levels associated with Current Design Alternative 4A would conform to all applicable national and state ambient air quality standards.

4.4.1 Assessment Methodology

The assessment of the air quality impacts of the project consisted of two separate microscale dispersion modeling analyses. These Woodrow Wilson Bridge analyses included the following:

- An analysis of localized CO levels at sensitive land uses located near all major roadways, interchanges, and intersections affected by the proposed project; and
- A separate analysis of CO levels at sensitive land uses located near the exit portals of the proposed Urban Deck.

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This analysis evaluates the effects of vehicular emissions released through the exit portals of the Urban Deck in the City of Alexandria. A separate analysis of portal emissions released through the deck on Queen Anne's Park, Maryland is not warranted because the length of the covered roadway is not long enough for substantial pollutant build-up below the deckover).

These analyses were performed for the traffic conditions anticipated under AM and PM peak, peak eight-hour traffic, and open bridge scenario for the year 2020. The results of the modeling analyses were added to the CO background levels for the project area, and the resulting total concentrations compared to the one and eight hour CO national and state ambient air quality standards.

4.4.2 Traffic Data

Roadways/Interchanges/Intersections Analysis: AM and PM peak hour traffic volumes, speeds, and vehicle classifications (percentage of auto, light-, medium- and heavy-duty trucks) for all affected roadway segments were based on the traffic forecasts described in Section 4.2 of this document. Intersection capacities and signal timings for each analyzed intersection were based on existing project forecasts and the Highway Capacity Manual (HCM) signal optimization program. The open bridge traffic scenario was based on a queuing analysis for a 10-minute bridge opening during off–peak conditions (the bridge does not open between 5-10 AM and 2-8 PM). The analysis estimated that queues at I-95/495 could last up to 25 minutes and extend up to two miles from the bridge barriers.

Urban Deck Exit Portal Analysis: Traffic volumes, speeds and vehicle classification for the AM peak, PM peak, highest eight-hour, and open bridge traffic scenarios for the express, local, HOV, and ramp movements on I-95/495 were also based on the traffic forecasts described in Section 4.2 of this document.

4.4.3 Vehicular Emissions

Mobile source emissions were estimated using the current version of the USEPA mobile source emission factor algorithm MOBILE 5B (EPA-AA-AQAB-94-01). Vehicular emissions are directly affected by vehicular speed, ambient temperature, thermal state of the engine, vehicle age and mileage distribution, inspection and maintenance programs, fuel volatility, and other local-area parameters.

The MOBILE 5B emission factor algorithm requires the specification of a number of modeling inputs pertaining to these parameters. Parameters appropriate for vehicles operating on the affected roadways were obtained from the Metropolitan Washington Council of Governments (MWCOG). The emission factors used for the Virginia portion of the project are based on the parameters used by MWCOG for the City of Alexandria, while the emission factors for the Maryland portion of the project are based on the parameters for Prince George County.

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4.4.4 Analysis Site Selection Process

The primary goal of the site selection process for the modeling analysis was to select sites that were located along the most heavily congested roadways during peak traffic periods; and, had the potential for the greatest air quality impacts as a result of the proposed project.

The four major interchanges and all signalized intersections located within the project's study area were considered for analysis. Sites were selected for analysis where: 1) the combined peak hour traffic approach volume to an interchange or intersection increased 10 percent or more as a result of the project; 2) the total estimated approach volume to the interchange/intersection is 3,000 vehicles per hour or more for any peak hour period; and/or 3) a congested roadway segment would be located closer to sensitive land uses as a result of the project. Based on these criteria, the following sites were selected for analysis:

Virginia: (1) the interchange of I-95/495 and Telegraph Road (Route 241), (2) the intersection of Telegraph Road / Huntington Avenue, (3) the intersection of Telegraph Road / Kings Highway, (4) the interchange of I-95/495 and US 1, (5) the intersection of US 1/Franklin Street, (6) the intersection of US 1/Fort Hunt Road/Old Richmond Road, and (7) the area between Washington Street and the water's edge (Jones Point Park) on both sides of I-95/495.

Maryland: (1) the interchange of I-95/495/I-295, (2) the area around the proposed deck on Queen Anne's Park in Rosalie Island, (3) Oxon Cove Park, (4)the access roads to National Harbor, (5) the interchange of I-95/495 / MD 210, and (6) the grade separated intersection of MD 210 / Oxon Hill Road (including adjacent ramps and the six new signalized intersections).

4.4.5 Receptor Placement

The locations were pollutant concentrations are estimated are known as "receptors." In accordance with the *EPA Guidelines For Modeling Carbon Monoxide at Roadway Intersections (EPA CO Modeling Guideline* (EPA-454/R-92-005)), receptors are located where the maximum projected total concentration is likely to occur and where the general public is likely to have access. For major congested urban areas, receptors are usually located on sidewalks.

For this study, receptors are located along the roadways right-of-way, on sidewalks (where they exist), on parklands (as close as feasible to the roadway right-of-way), on existing buildings (i.e., residences, schools, national historic areas, etc.), and at possible future building sites. For the Urban Deck portal analysis, multiple receptors were considered near each exit portal, at the nearest locations along the roadways' right-of-way, on the pedestrian walkways of the proposed Urban Deck, at the Hunting Towers buildings, Hunting Terrace apartments, Church Street residences, St. Mary's cemetery, and along the proposed bicycle/pedestrian paths.

The exact placement of these receptor locations was determined on a case-by-case basis based on roadway geometry, building locations, and the potential for public access. The placement followed

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the EPA Guidelines. Over approximately 200 receptor locations were selected for analysis. The specific location of each receptor can be found in Tables 4-10 to 4-18, and in Figures 4-13 and 4-14.

4.4.6 Background Carbon Monoxide Concentrations

Estimation of total ambient CO levels requires the inclusion of background levels. The background level is the component of the total concentration not accounted for through the modeling analysis. Applicable background concentrations are added to the modeling results to obtain total pollutant concentration at a receptor site. Background values were developed using ambient CO monitored data collected in 1998 at the Alexandria Health Department monitoring station. These values were adjusted to the future year 2020 following the procedures included in the *EPA CO Modeling Guideline*, and the results of the CO emission inventory prepared by MWCOG for the city of Alexandria.

The estimated future CO background levels for the year 2020 were 4.4 parts per million (ppm) for one-hour, and 2.9 ppm for eight hours.

4.4.7 Estimation of CO Concentrations near Roadway Interchanges/Intersections

Dispersion models are the basic analytical tools used to estimate ambient concentrations of CO under a given set of traffic conditions, emissions rates, exhaust system designs, and meteorological conditions. The mathematical expressions and formulations that comprise the various models attempt to describe an extremely complex physical phenomenon as closely as possible, and to provide reasonable worst case expected concentrations.

The dispersion modeling program used to estimate ambient CO concentrations near heavily traveled roadways, interchanges, and intersections for the project area is the CAL3QHC dispersion model (Version 2.0) developed by EPA. CAL3QHC is a Gaussian model recommended by EPA for estimating CO concentrations near roadway intersections. It includes the effects of both moving vehicles on roadways and idling vehicles at intersections. A complete description of the model can be found in the *User's Guide to CAL3QHC, Version 2.0, A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections* (EPA-454/12-92-006).

Peak one-hour CO concentrations: were estimated for the AM- and PM-peak traffic levels. The modeling analysis performed included the worst case meteorological conditions expected to occur at each receptor location.

Peak eight-hour CO concentrations: were obtained by multiplying maximum predicted one-hour values by a "persistence factor" of 0.69, a value developed based on the 10 highest measured one-hour and eight-hour CO concentrations at the Alexandria Health Department CO monitoring station. This is the procedure recommended in the *EPA CO Modeling Guidelines*. This factor accounts for variations in traffic and meteorological conditions that occur over eight hours compared to those conditions assumed to occur during one hour.

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Open bridge scenario peak one-hour concentrations: were based on the combined modeling results of 25 minutes of stalled traffic on I-95/495, and 35 minutes of the lowest of the two peak hour periods. For simplicity of analysis, the lower of the two peak hour periods was selected to conservatively represent traffic conditions during off-peak periods (i.e. when the bridge may be opened). The analysis included all the roadway links (I-95/495 and access ramps) that could be affected by the bridge opening up to two miles from the draw bridge location.

Open bridge scenario peak eight-hour concentrations: were based on the combination the modeling results of 25 minutes of stalled traffic scenario, and the eight-hour modeling results of the normal traffic scenario adjusted to 7 hours and 35 minutes.

4.4.8 Predicted CO Concentrations near Mainline

The results of the CO modeling analysis performed for the peak one- and eight-hour year 2020 traffic conditions at each receptor location analyzed are summarized in Table 4-10 for the Telegraph Road interchange, Table 4-11 for the US 1 interchange, Table 4-12 for the I-295 interchange, and Table 4-13 for the MD 210 interchange. The specific location of each receptor analyzed is shown in Figures 13 and 14.

The highest predicted concentrations for the Virginia side were 9.1 ppm for the one-hour and 6.1 for the eight-hour period at the southeast sidewalk of the intersection of Telegraph road (Route 241) and Kings Highway. The highest predicted concentrations for the Maryland side were 8.1 ppm (one-hour) and 5.3 ppm (eight-hour) at the right-of-way of the I-95/495 westbound exit ramp to MD 210.

The results of the CO modeling analysis performed for the peak one- and eight-hour open bridge scenarios are summarized in Table 4-14 for the Virginia side, and Table 4-15 for the Maryland side.

The highest predicted concentrations for the open bridge scenario on the Virginia side were 7.2 ppm (one-hour) and 4.9 ppm (eight-hour) at the south-east sidewalk of the intersection of US 1 and Franklin Street. The highest predicted concentrations for the Maryland side were 7.9 ppm (one-hour) and 4.7 ppm (eight-hour) at the right-of-way of the I-95/495 westbound exit ramp to I-295 northbound direction.

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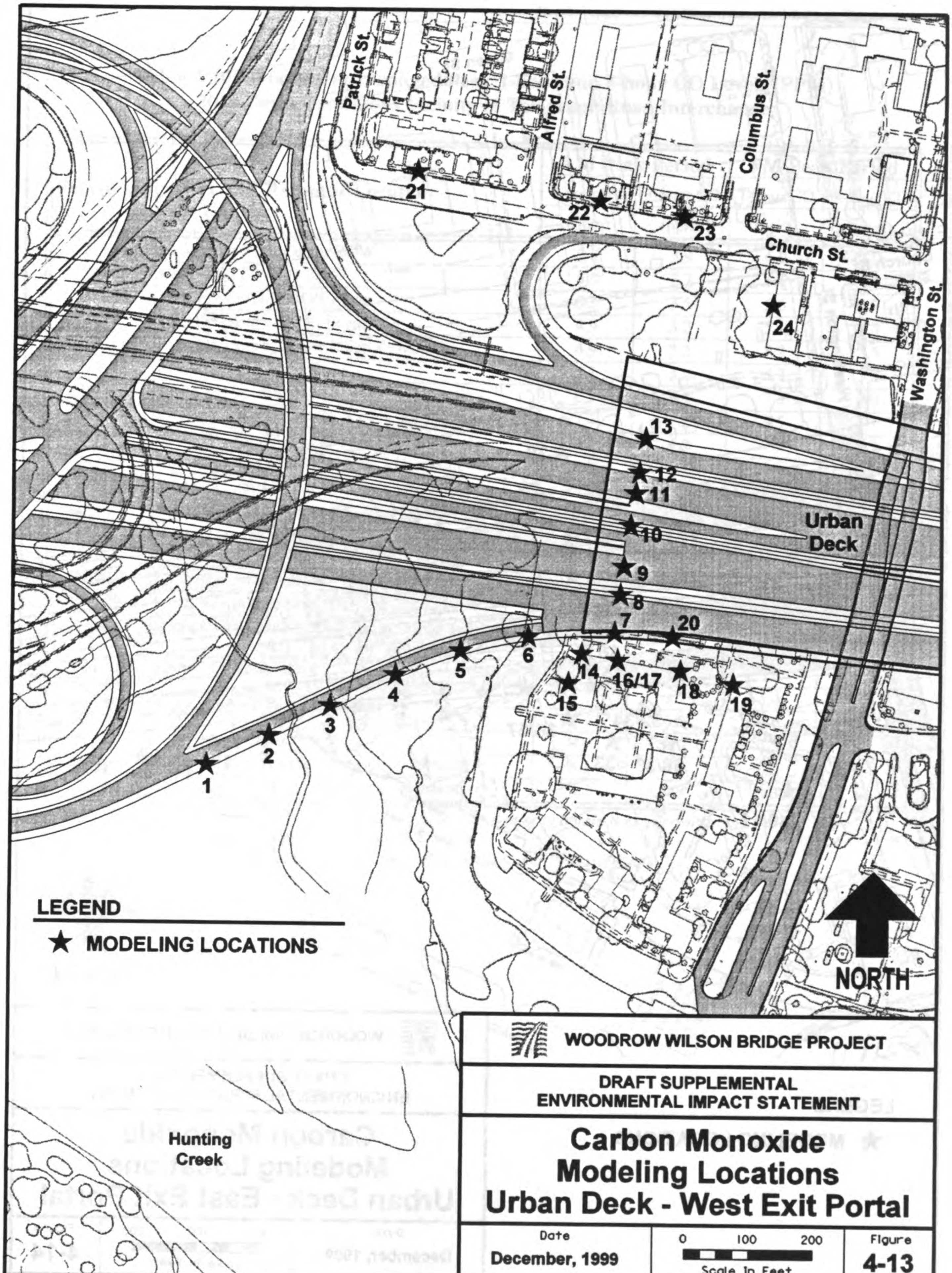

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Carbon Monoxide Modeling Locations Urban Deck - West Exit Portal

Date: December, 1999

Figure 4-13

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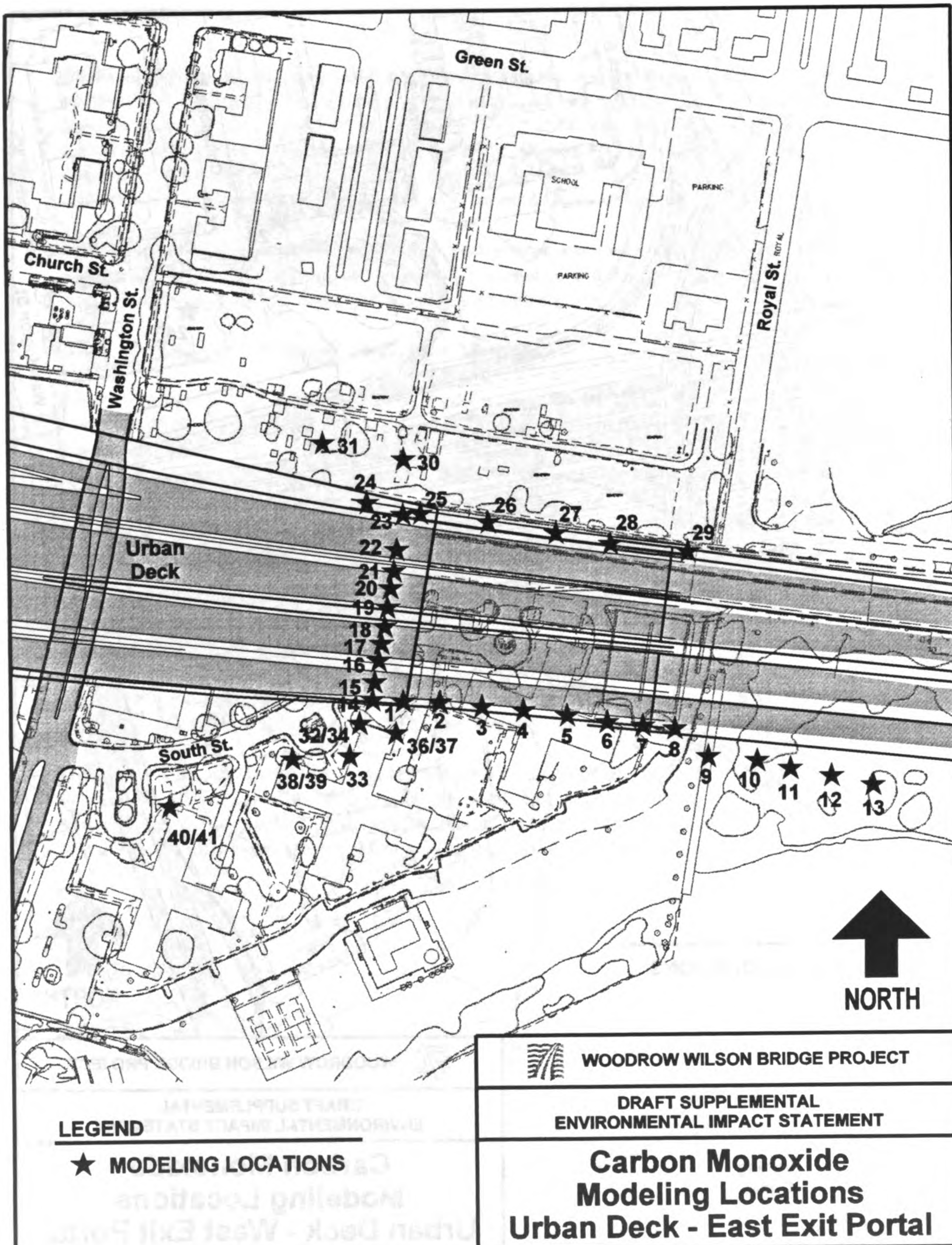

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Carbon Monoxide Modeling Locations Urban Deck - East Exit Portal

Date	Figure
December, 1999	4-14

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Table 4-10: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions Vicinity of Telegraph Road Interchange

Receptor #	Receptor Location	AM Peak Period		PM Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
241-4	Alexandria Tech Center ROW	5.8	3.9	6.0	4.0
241-5	westbound I-95/495 ROW	5.5	3.7	6.1	4.1
241-8	I-95/495 eastbound Off Ramp	5.3	3.5	5.6	3.7
241-9	I-95/495 eastbound Residence	4.9	3.2	5.1	3.4
241-11	I-95/495 eastbound Off Ramp Residence	4.9	3.2	5.2	3.5
241-12	Residence Elmwood Drive	5.1	3.4	5.3	3.5
241-13	Route 241 southbound Huntington Sidewalk	6.7	4.5	7.3	4.9
241-14	Route 241 southbound N. King's Hwy Sidewalk	7.7	5.2	8.5	5.7
241-16	Route 241 southbound Lenore Lane Sidewalk	7.3	4.9	7.9	5.3
241-19	Route 241 northbound N. King's Hwy Sidewalk	9.0	6.1	9.1	6.1
241-20	Route 241 northbound Huntington Sidewalk	8.5	5.7	8.4	5.7
241-22	Route 241 northbound I-95/495 eastbound on Ramp	7.5	5.0	7.4	5.0
241-23	Huntington Ave westbound Route 241	7.7	5.2	7.8	5.2
241-24	I-95/495 eastbound On Ramp ROW	5.2	3.5	5.2	3.5
241-27	I-95/495 westbound Off Ramp ROW	5.5	3.7	5.8	3.9
241-28	Residence Eisenhower Park	5.3	3.5	5.4	3.6
241-30	I-95/495 westbound Off Ramp Route 241 northbound ROW	4.9	3.2	5.0	3.3
241-32	Route 241 northbound Pershing ROW	5.1	3.4	5.3	3.5
241-33	Residence Burgundy Road	5.2	3.5	5.4	3.6
241-34	Route 241 northbound Huntington Sidewalk	8.9	6.0	8.6	5.8
241-35	I-95/495 westbound On Ramp ROW	4.9	3.2	5.3	3.5
241-37	Route 241 southbound Huntington Sidewalk	8.3	5.6	8.0	5.4
241-38	Route 241 southbound Huntington Sidewalk	8.2	5.5	8.3	5.6

Notes: 1. *A persistence factor of 0.69 was applied to 1-hr values to obtain 8-hr concentrations*
2. *1-hr NAAQS = 35 ppm; 8-hr NAAQS = 9 ppm*
3. ***1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.***

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Table 4-11: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions Vicinity of US 1 Interchange

Receptor #	Receptor Location	AM Peak Period		PM Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
1-1	US 1 SB ROW	5.8	3.9	6.3	4.2
1-5	US 1 SB ROW Courts	5.1	3.4	5.4	3.6
1-9	I-95/495 WB On Ramp ROW	5.5	3.7	5.9	3.9
1-12	I-95/495 EB Off Ramp ROW	5.0	3.3	5.5	3.7
1-15	US 1 SB Fort Hunt Road ROW	5.3	3.5	6.6	4.4
1-16	US 1 SB Fort Hunt Road ROW	5.1	3.4	7.1	4.8
1-17	US 1 NB I-95/495 EB On Ramp ROW	5.9	3.9	7.1	4.8
1-21	I-95/495 EB On Ramp ROW	5.2	3.5	5.9	3.9
1-22	Hunting Terrace Apartments	5.4	3.6	6.5	4.3
1-24	ROW St. Mary's Cemetery	5.1	3.4	5.4	3.6
1-27	Residence Church Street	5.3	3.5	5.8	3.9
1-28	US 1 NB Green Street Sidewalk	5.8	3.9	6.2	4.1
1-30	US 1 NB Jefferson St Sidewalk	5.6	3.7	5.9	3.9
1-31	US 1 NB Franklin St Sidewalk	7.2	4.8	7.0	4.7
1-32	US 1 SB ROW	5.3	3.5	6.2	4.1
1-34	I-95/495 WB On Ramp ROW	5.3	3.5	5.7	3.8
1-40	Jones Point Park I-95/495 SS	5.5	3.7	6.8	4.6
1-41	Jones Point Park I-95/495 SS	5.7	3.8	6.7	4.5
1-42	Jones Point Park I-95/495 NS	5.8	3.9	5.8	3.9
1-43	Jones Point Park I-95/495 NS	5.7	3.8	6.0	4.0

Notes: 1. *A persistence factor of 0.69 was applied to 1-hr values to obtain 8-hr concentrations.*
2. *1-hr NAAQS = 35 ppm; 8-hr NAAQS = 9 ppm.*
3. ***1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.***

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Table 4-12: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions Vicinity of I-295 Interchange

Receptor #	Receptor Location	AM Peak Period		PM Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
295-1	Queen Anne's Park Deck NS	5.2	3.5	5.6	3.7
295-2	Queen Anne's Park Deck NS	5.3	3.5	5.6	3.7
295-3	Queen Anne's Park Deck SS	5.6	3.7	5.7	3.8
295-4	Queen Anne's Park Deck SS	5.6	3.7	5.8	3.9
295-5	Oxon Cove Park I-95/495 WB ROW	5.6	3.7	6.1	4.1
295-6	Oxon Cove Park I-95/495 WB ROW	5.8	3.9	6.2	4.1
295-7	Oxon Cove Park ROW	5.3	3.5	5.3	3.5
295-8	Oxon Cove Park ROW	5.0	3.3	5.0	3.3
295-9	Oxon Cove Park ROW	5.0	3.3	4.9	3.2
295-10	I-295 SB ROW	5.1	3.4	5.0	3.3
295-11	I-295 NB ROW	4.9	3.2	4.9	3.2
295-12	I-95/495 WB Off Ramp to I-295 NB ROW	5.1	3.4	5.1	3.4
295-13	I-95/495 WB Off Ramp to I-295 NB ROW	5.3	3.5	5.3	3.5
295-14	I-95 WB ROW	6.8	4.6	6.7	4.5
295-15	I-95 EB ROW	5.1	3.4	5.2	3.5
295-16	I-95 EB ROW	5.0	3.3	5.2	3.5
295-17	I-95/495 EB On Ramp ROW	4.9	3.2	5.0	3.3
295-18	National Harbor Access I-95/495	4.7	3.1	4.8	3.2
295-19	National Harbor Access	4.7	3.1	4.9	3.2
295-20	I-295 NB Off Ramp NH ROW	4.8	3.2	4.9	3.2
295-21	I-95/495 EB Off Ramp NH ROW	4.6	3.0	4.6	3.0
295-22	I-95/495 EB Off Ramp NH ROW	4.7	3.1	4.7	3.1
295-23	I-95/495 EB Off Ramp ROW	5.1	3.4	5.2	3.5
295-24	I-95/495 EB Off Ramp ROW	5.5	3.7	5.6	3.7
295-25	I-95/495 EB ROW	5.7	3.8	5.9	3.9
295-26	Queen Anne's Park EB ROW	5.7	3.8	5.7	3.8
295-27	Queen Anne's Park EB ROW	5.7	3.8	5.9	3.9
295-28	Queen Anne's Park WB ROW	5.5	3.7	5.7	3.8
295-29	Queen Anne's Park WB ROW	5.2	3.5	5.6	3.7

Notes:
1. *A persistence factor of 0.69 was applied to 1-hr values to obtain 8-hr concentrations.*
2. *1-hr NAAQS = 35 ppm; 8-hr NAAQS = 9 ppm.*
3. ***1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.***

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Table 4-13: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions Vicinity of MD 210 Interchange

Receptor #	Receptor Location	AM Peak Period		PM Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
210-1	I-95/495 WB Residence	6.5	4.3	6.3	4.2
210-2	I-95/495 WB Residence	6.0	4.0	6.0	4.0
210-3	I-95/495 WB Flintstone School	6.3	4.2	6.5	4.3
210-4	I-95/495 WB Off Ramp Residence	6.0	4.0	6.0	4.0
210-5	I-95/495 WB Residence	6.2	4.1	6.0	4.0
210-6	I-95/495 WB Off Ramp Residence	6.2	4.1	6.3	4.2
210-7	I-95/495 WB Off Ramp Residence	6.1	4.1	5.4	3.6
210-8	MD 210 NB Residence	5.5	3.7	5.2	3.5
210-9	MD 210 SB Residence	6.2	4.1	6.2	4.1
210-10	I-95/495 WB On Ramp ROW	5.8	3.9	5.7	3.8
210-11	I-95/495 WB On Ramp ROW	7.9	5.3	7.0	4.7
210-12	EB On Ramp adj. Baptist Church	5.9	3.9	5.7	3.8
210-13	I-95/495 EB On Ramp F/MD210 ROW	6.4	4.3	6.4	4.3
210-14	I-95/495 EB On Ramp F/MD210 ROW	6.5	4.3	6.0	4.0
210-15	I-95/495 EB On Ramp F/MD210 ROW	5.9	3.9	5.8	3.9
210-16	ROW I-95/495/MD210 Connection	5.7	3.8	6.2	4.1
210-17	I-95/495 EB ROW	6.2	4.1	6.1	4.1
210-18	I-95/495 EB ROW	6.7	4.5	6.7	4.5
210-19	I-95/495 EB On Ramp F/MD210 ROW	7.1	4.8	6.5	4.3
210-20	I-95/495 WB Off Ramp ROW	7.6	5.1	8.1	5.5
210-21	I-95/495 WB On Ramp ROW	7.0	4.7	6.6	4.4
210-22	I-95/495 WB ROW	7.5	5.0	7.2	4.8
210-23	I-95/495 EB ROW	6.3	4.2	6.2	4.1
210-24	I-95/495 EB ROW	7.0	4.7	6.9	4.6
210-25	I-95/495 EB ROW	7.1	4.8	6.8	4.6
210-26	I-95/495 EB ROW	6.7	4.5	6.2	4.1
210-27	ROW Oxon Hill NB MD 210	6.0	4.0	5.9	3.9
210-28	MD 210 NB ROW	5.7	3.8	5.8	3.9
210-29	MD 210 NB ROW	5.1	3.4	5.4	3.6
210-30	MD 210 N Off Ramp Oxon Hill ROW	5.2	3.5	5.2	3.5
210-31	Oxon Hill Off Ramp MD 210 S ROW	5.0	3.3	5.1	3.4
210-32	MD 210 SB ROW	4.9	3.2	5.0	3.3
210-33	MD 210 SB ROW	4.9	3.2	5.4	3.6
210-34	I-95/495 EB ROW	6.6	4.4	6.5	4.3
210-35	Oxon Hill Road WB Ramp F-1	5.4	3.6	5.4	3.6
210-36	Oxon Hill Road EB Ramp F-1	6.1	4.1	6.2	4.1
210-37	Oxon Hill EB Ramp F-1	6.3	4.2	6.4	4.3
210-38	East Ramp NB Oxon Hill Road	6.4	4.3	7.2	4.8
210-39	Oxon Hill Road WB National Harbor	5.6	3.7	6.5	4.3

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Table 4-13 continued: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions Vicinity of MD 210 Interchange

Receptor #	Receptor Location	AM Peak Period		PM Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)	1-hour CO (ppm)	8-hour CO (ppm)
210-40	Ramp E-1 NB Oxon Hill Road.	6.4	4.3	7.2	4.8
210-41	MD 210 SB West On Ramp	5.2	3.5	5.5	3.7
210-42	MD 210 NB Residence	5.3	3.5	5.3	3.5
210-43	MD 210 SB West On Ramp	4.8	3.2	4.9	3.2
210-44	MD 210 NB Residence	4.8	3.2	4.9	3.2

Notes: 1. *A persistence factor of 0.69 was applied to 1-hr values to obtain 8-hr concentrations.*
2. *1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.*
3. *1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.*

Table 4-14: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Open Drawbridge Conditions Vicinity of US 1 Interchange

Receptor #	Receptor Location	Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)
1-1 (open)	US 1 SB ROW	6.1	3.9
1-5 (open)	US 1 SB ROW Courts	5.4	3.4
1-9 (open)	I-95/495 WB On Ramp ROW	5.7	3.7
1-10 (open)	I-95/495 WB ROW	5.5	3.6
1-11 (open)	I-95/495 EB Off Ramp ROW	5.5	3.3
1-12 (open)	I-95/495 EB Off Ramp ROW	5.3	3.4
1-15 (open)	US 1 SB Fort Hunt Road ROW	5.9	3.6
1-17 (open)	US 1 NB I-95/495 EB On Ramp ROW	6.4	4.0
1-21 (open)	I-95/495 EB On Ramp ROW	6.0	3.6
1-22 (open)	Hunting Terrace Apartments	6.5	3.7
1-23 (open)	ROW St. Mary's Cemetery	5.3	3.4
1-27 (open)	Residence Church Street	5.6	3.6
1-28 (open)	US 1 NB Green St Sidewalk	6.0	3.9
R29 (open)	US 1 NB Jefferson St Sidewalk	5.8	3.8
1-31 (open)	US 1 NB Franklin St Sidewalk	7.2	4.9
1-32 (open)	US 1 SB ROW	5.8	3.6
1-33 (open)	Hunting Terrace Apartments	5.6	3.3
1-42 (open)	Jones Point Park I-95/495 NS	6.6	4.0

Notes: 1. *A persistence factor of 0.69 was applied to 1-hour values to obtain 8-hour concentrations.*
2. *1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.*
3. *1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.*

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Table 4-15: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Open Drawbridge Conditions Vicinity of I-295 Interchange

Receptor #	Receptor Location	Peak Period	
		1-hour CO (ppm)	8-hour CO (ppm)
295-1	Queen Anne's Park Deck NS	6.1	3.6
295-2	Queen Anne's Park Deck NS	6.3	3.7
295-3	Queen Anne's Park Deck SS	6.4	3.8
295-4	Queen Anne's Park Deck SS	6.3	3.8
295-5	Oxon Cove Park I-95/495 WB ROW	6.8	3.9
295-6	Oxon Cove Park I-95/495 WB ROW	7.1	4.1
295-7	Oxon Cove Park ROW	6.0	3.6
295-8	Oxon Cove Park ROW	5.3	3.4
295-9	Oxon Cove Park ROW	5.3	3.4
295-10	I-295 SB ROW	5.2	3.4
295-11	I-295 NB ROW	5.0	3.3
295-12	I-95/495 WB Off Ramp to I-295 NB ROW	5.3	3.4
295-13	I-95/495 WB Off Ramp to I-295 NB ROW	5.7	3.6
295-14	I-95/495 WB ROW	7.9	4.7
295-15	I-95/495 EB ROW	5.6	3.5
295-16	I-95/495 EB ROW	5.5	3.4
295-17	I-95/495 EB On Ramp ROW	5.2	3.3
295-18	National Harbor Access I-95	5.0	3.1
295-19	National Harbor Access	5.1	3.2
295-20	I-295 NB Off Ramp NH ROW	5.0	3.2
295-21	I-95/495 EB Off Ramp NH ROW	4.8	3.1
295-22	I-95/495 EB Off Ramp NH ROW	5.0	3.1
295-23	I-95/495 EB Off Ramp ROW	5.5	3.4
295-24	I-95/495 EB Off Ramp ROW	5.9	3.7
295-25	I-95/495 EB ROW	6.3	3.9
295-26	Queen Anne's Park EB ROW	6.5	3.9
295-27	Queen Anne's Park EB ROW	6.4	3.9
295-28	Queen Anne's Park WB ROW	6.5	3.8
295-29	Queen Anne's Park WB ROW	6.2	3.6

Notes: *1. A persistence factor of 0.69 was applied to 1-hour values to obtain 8-hour concentrations.*
2. 1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.
3. 1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.

All of these results include the contribution from motor vehicle emissions from the affected roadways, plus background levels attributed to all other sources.

The results indicate that all of the receptor locations analyzed would be in compliance with the one-hour and eight-hour S/NAAQS of 35 ppm and 9 ppm, respectively.

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4.4.9 Estimation of CO Concentrations in the Vicinity of Rosalie Island Deckover

CO levels were estimated at eight locations in the vicinity of the Rosalie Island deckover (i.e., at receptors numbered 295-1 through 295-4 and 295-26 through 295-29). A separate analysis of the emissions released through the deck's portals is not warranted because the length of the covered roadway is not long enough for the pollutant build-up associated with the deck to substantially increase concentrations at nearby receptor sites.

4.4.10 Estimation of CO Concentrations in the Vicinity of the Washington Street Urban Deck

CO levels were estimated in the vicinity of the Urban Deck by assuming that all of the emissions generated by the vehicles traveling in the covered section would be exhausted out of each exit portal. CO levels at each of the receptor locations considered near each exit portal were assumed to include the following components:

- Emissions generated by vehicles traveling inside the covered roadway and exhausted from the exit portals;
- Emissions generated by vehicles traveling on I-95/495 immediately downstream of the exit portals (both directions); and
- Background levels.

Releases from Exit Portals: The approach used for analyzing the dispersion of tunnel-portal releases is based on the assumption that a jet of air exiting a tunnel portal maintains its integrity (i.e., uniform set of conditions under which pollutants disperse) for a finite distance along the roadway after exiting the portal. This is based on observations made by researchers that show interchanges/intersections that air emitted from a vehicular tunnel portal is both pushed out of the tunnel by vehicles prior to their exiting the tunnel, and dragged out of the portal by these same vehicles as they move downstream of the portal. This phenomena creates a continuous source of momentum and mechanical turbulence that maintains this jet of air with a finite length, width, and height.

The size and shape of this jet of air depends on several factors which may include: vehicle speed, atmospheric wind velocity and direction, the topography of the area surrounding the tunnel portal, the type of portal (i.e., whether it serves one-way or two-way traffic), the height and physical configuration of the portal, and the type of ventilation used in the tunnel.

The most adequate atmospheric dispersion model for estimating impacts from tunnel exhaust portal emissions is the Industrial Source Complex Model (ISC3) developed by EPA (EPA-454/b-95-003a). The computational procedures used to divide the overall emission source of the jet into separate finite sources were based on data collected from wind-tunnel studies conducted for similar roadway tunnels (Ginzburg and Schattanek, et al).

The total length of the urban deck used in this analysis was 219.5 meters (720 feet). The total length of the jet of air exiting the east portal was modeled at approximately 198 meters (650 feet, and the one exiting the west portal at approximately 158.5 meters (520 feet).

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Contributions from Vehicles Downstream of the Exit Portals: The effect of emissions from vehicles traveling immediately downstream of the portals, and on the opposite side of I-95/495, were also estimated using the ISC3 model. The lengths of these emission sources were estimated at approximately 274.3 meters (900 feet) for each side of the deck, and they were combined with the emission sources from the exit portals. This was assumed since beyond 274.3 meters (900 feet), east of the Urban Deck, the mainline becomes elevated over Jones Point Park. West of the Urban Deck, the mainline interacts with the US 1 interchange configuration. Beyond this 274.3 meters (900 feet),distance, the effects of traffic emissions were estimated following the modeling procedures used for the individual interchanges.

The following represents the basis for peak one-hour CO concentrations, peak eight-hour CO concentrations, open bridge scenario peak one-hour concentrations, and open bridge scenario peak eight-hour concentrations.

Peak one-hour CO concentrations were modeled using five years of hourly meteorological data from Ronald Reagan International Airport, and the AM and PM peak year traffic conditions.

Peak eight-hour CO concentrations were modeled using the same five years of meteorological data, and the highest eight-hour average traffic conditions.

Open bridge scenario peak one-hour concentrations were based on the combined motor vehicle emissions of 25 minutes of stalled traffic on I-95/495, and 35 minutes of the lower of the two peak hour periods (following the same modeling procedures as the peak hour roadway/interchange analysis).

Open bridge scenario peak eight-hour concentrations were based on the combination the emissions of 25 minutes of stalled traffic scenario, and the peak eight-hour average emissions adjusted to 7 hours and 35 minutes.

4.4.11 Predicted CO Concentrations in the Vicinity of the Washington Street Urban Deck

The results of the urban deck CO modeling analysis performed for the peak one- and eight-hour traffic conditions are summarized in Table 4-16 (western lid) and Table 4-17 (eastern lid). The specific location of each receptor analyzed is presented in Appendix A.

The highest predicted concentrations for the west side of the deck were 17.4 ppm for the one-hour and 8.1 for the eight-hour period at the northwest side of the deck itself. The highest predicted concentrations for east side of the deck were 29.4 ppm (one-hour) at the southeast side of the deck itself, and 8.5 ppm (eight-hour) at the bicycle/pedestrian path in front of the Hunting Towers area.

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Table 4-16: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions West Side of Urban Deck

Receptor	Receptor Location	AM Peak Period 1-hour CO (ppm)	PM Peak Period 1-hour CO (ppm)	Peak Period 8-hour CO (ppm)
UD-6W	Bicycle Path South of I-95/495	10.1	11.6	5.9
UD-9W	West Crosswalk on Deck	10.7	16.3	5.7
UD-11W	West Crosswalk on Deck	17.4	15.8	7.2
UD-12W	West Crosswalk on Deck	13.1	14.8	8.1
UD-14W	Hunting Terrace NW Building	10.7	12.6	6.0
UD-19W	Hunting Terrace NE Building	5.0	5.2	3.1
UD-20W	Bicycle Path at Deck South Side	9.9	12.8	4.9
UD-24W	Church Street Residencies	9.7	10.6	5.9

Notes: 1. *1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.*
2. *1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm*
3. *Receptor locations are shown on the mapping in Appendix A.*

Table 4-17: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Conditions East Side of Urban Deck

Receptor	Receptor Location	AM Peak Period 1-hour CO (ppm)	PM Peak Period	
			1-hour CO (ppm)	8-hour CO (ppm)
UD-1E	Bicycle Path South of I-95/495	9.8	17.4	8.3
UD-2E	Bicycle Path South of I-95/495	8.6	17.1	8.5
UD-3E	Bicycle Path South of I-95/495	9.8	15.6	8.3
UD-6E	Bicycle Path South of I-95/495	8.0	18.1	7.2
UD-14E	Bicycle Path at Deck South Side	8.8	17.9	6.5
UD-16E	East Crosswalk on Deck	11.5	29.4	8.0
UD-24E	Bicycle Path at Deck North Side	7.4	9.2	4.8
UD-28E	Bicycle Path North of I-95/495	7.6	10.1	5.9
UD-30E	St Mary's Cemetery	6.6	8.6	4.6
UD-32E	Hunting NE Tower – Windows	8.4	16.1	8.5
UD-33E	Hunting NE Tower - Windows	8.5	12.5	7.0
UD-40E	Hunting SW Tower - Windows	5.9	8.1	3.9
UD-41E	Hunting SW Tower - Windows	5.6	9.2	4.1

Notes: 1. *1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.*
2. *1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm*
3. *Receptor locations are shown on the mapping in Appendix A.*

The results of the CO modeling analysis performed for the peak one- and eight-hour open bridge scenarios are summarized in Table 4-18 (east-side only, there is no queuing on the opposite side).

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Table 4-18: Maximum Predicted Peak 1-hour and 8-hour CO Levels (PPM) 2020 Build Open Drawbridge Conditions East Side of Urban Deck, Virginia

Receptor	Receptor Location	Peak Period 1-hour CO (ppm)	Peak Period 8-hour CO (ppm)
UD-1E (open)	Bicycle Path South of I-95/495	17.0	8.5
UD-2E (open)	Bicycle Path South of I-95/495	16.8	8.6
UD-14E (open)	Bicycle Path at Deck South Side	17.4	6.6
UD-16E (open)	East Crosswalk on Deck	25.8	8.0
UD-24E (open)	Bicycle Path at Deck North Side	11.3	4.9
UD-28E (open)	Bicycle Path North of I-95/495	12.3	6.0
UD-29E (open)	Bicycle Path North of I-95/495	12.3	5.6
UD-30E (open)	St Mary's Cemetery	10.1	4.6
UD-32E (open)	Hunting NE Tower – Windows	10.1	8.6
UD-34E (open)	Hunting NE Tower – Windows	14.9	7.7
UD-36E (open)	Hunting NE Tower – Windows	14.3	8.0

Notes: 1. 1-hr S/NAAQS = 35 ppm; 8-hr S/NAAQS = 9 ppm.
2. 1-hr CO background level = 4.4 ppm; 8-hr background level = 2.9 ppm.

The highest predicted concentrations for east-side of the deck under the open bridge scenario were 25.8 ppm (one-hour) also at the south-east side of the deck itself, and 8.6 ppm (eight-hour) at the bicycle/pedestrian path in front of the Hunting Towers area.

All of these results include the contribution from motor vehicle emissions released form the exit portals, vehicles traveling downstream form the portals, and the background levels attributed to all other sources. The results indicate that all of the receptor locations analyzed would be in compliance with the one-hour and eight-hour S/NAAQS of 35 ppm and 9 ppm, respectively.

4.5 Noise

4.5.1 Noise Abatement Criteria

The noise impact associated with the Current Design Alternative 4A has been assessed in accordance with the FHWA, the VDOT and the MSHA noise assessment guidelines. The Federal Highway Administration (FHWA) has issued guidelines for noise evaluation as established in Title 23 of the Code of Federal Regulations (CFR) Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. Highway traffic noise studies, noise abatement procedures, coordination requirements and design noise levels in CFR Part 772 constitute the noise standards mandated by 23 U.S.C. 109(I). The design noise levels indicated in Table 4-19 have been used to determine highway traffic noise impacts and the need for considering abatement measures associated with different land uses or activities in existence at the time of the project approval date.

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Table 4-19 FHWA Noise Abatement Criteria Activity Relationships in CFR 772

Activity Category	Design Noise Level Leq(h)	Description of Activity Category
A	57 dBA (Exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 dBA (Exterior)	Residences, motels, hotels, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sports areas, and parks.
C	72 dBA (Exterior)	Developed lands, properties or activities not included in categories A and B above.
D	--	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

To describe noise environments, and to assess impact on noise sensitive areas, a frequency weighing measure, which simulates human subjective response to noise, is customarily selected. A-weighted ratings of noise sources, which reflect the human ear's reduced sensitivity to low frequencies, have been found to correlate well with human perceptions of the annoying aspects of noise, particularly from traffic noise sources. Consequently A-weighted noise levels, described in decibels-A, dBA, are the values cited by FHWA in its noise abatement criteria indicated in Table 4-19.

Most environmental noise fluctuates from moment to moment. To assess noise environments and the potential for community annoyance, a single-number noise descriptor, called the equivalent sound level (L_{eq}), is used for highway projects. The L_{eq} is the value or level of a steady, non-fluctuating sound that represents the same amount of acoustical energy over the same period of time, in essence, this value characterizes the fluctuating sound. For traffic noise assessment, L_{eq} is typically evaluated over a one-hour period, L_{eq}(h).

Noise-sensitive land uses potentially affected by the Current Design Alternative 4A are in Category B and Category E. The following Noise Abatement Criteria (NAC) is applicable: L_{eq} equals 67 dBA (exterior) for residential areas, schools and recreation areas where outdoor activity occurs and L_{eq} equals 52dBa (interior) for the Forest Heights Baptist Church. When the predicted design-year build alternative noises levels in the project area approach or exceed the NAC during the loudest hour of the day, noise impact occurs and consideration of traffic noise reduction measures is necessary. In December 1993, the FHWA issued guidance on interpreting the word "approach" in section 772.5(g) of 23 CFR as applied to Category B. As a result, the VDOT and the MSHA assess noise impacts when the loudest-hour L_{eq} is equal to or greater than one dBA less than the NAC, which is 66 dBA for Category B. Noise impact also occurs when predicted noise levels associated with the project substantially exceed existing noise levels. An increase of 10 dBA or more above existing levels is considered substantial. In Maryland, the increase of 10 dBA must result in a final noise which exceeds 57 dBA (i.e., an increase from an existing noise level of 45 dBA to a predicted noise level of 55 dBA, would not be considered an impact).

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If an impact has been defined, mitigation measures must be considered. Maryland's Sound Barrier Policy and Virginia's State Noise Abatement Policy differ in the determination of reasonableness and feasibility of mitigation measures. For impacted noise sensitive areas, the appropriate State policy would be used to determine mitigation measures. Since state line of division is within the Potomac River, no noise sensitive area falls within both states. The following factors are evaluated to determine whether mitigation is feasible and reasonable.

Virginia: Abatement Criteria

A. *A noise abatement measure would be considered effective if the cost of the measure per protected or benefited residential property does not exceed $30,000. Each residential dwelling would be considered as a single residential property.*

B. *The cost-effectiveness determination for non-residential properties would be handled on a case by case basis and would include, in addition to the abatement cost, the type and duration of the activity taking place, the size of the affected area, the severity of the impact, and the amount of noise reduction to be provided.*

C. *To be protected, a property must be impacted and receive a minimum of 5 decibels of noise reduction.*

Maryland: Sound Barrier Feasibility and Reasonableness

Feasibility ⇒ *Sound barrier feasibility is defined as the engineering and acoustical ability to provide effective noise reduction. Sound barrier feasibility would be based upon the following:*

If noise levels cannot be reduced by at least 3 decibels at impacted receptors, a noise barrier would not be considered feasible. The noise reduction goal for receptors with the highest noise levels (first row receivers) is 7 to 10 decibels. If a noise reduction of 7 to 10 decibels cannot be achieved, the barrier would be considered not to be feasible.

1. *If the placement of a sound barrier would restrict pedestrian or vehicular access or would cause a safety problem, such as limiting sight distance or reduction of a vehicle recovery area, the barrier would not be considered feasible.*

2. *If the construction of a sound barrier would result in substantial utility impacts, the barrier would not be considered feasible. Substantial utility adjustments can have a major impact on barrier design options and construction costs.*

3. *If construction of a sound barrier would have an impact upon existing drainage, it could be considered not to be feasible. Drainage is an important element in the location and design of a sound barrier. The potential for impact to drainage patterns and systems and flooding would be considered in the overall decision on whether construction is feasible and reasonable.*

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Only barriers that are determined to be feasible would be approved.
Reasonableness ⇒ *Each individual impact area would also be evaluated to determine if construction of a sound barrier is reasonable. Reasonableness would be based upon the following:*

1. *If 75 percent of the impacted residents do not approve the proposed sound barrier, the barrier could be considered not to be reasonable.*

2. *For Type I projects (construction of a new highway or capacity addition to an existing highway), if existing noise levels are expected to increase by 10 decibels or more, but the new elevated level is less than 57 decibels, a sound barrier would be considered not to be reasonable.*

3. *For Type I projects, if a change over no-build levels of less than 3 decibels would result from a build condition, a sound barrier could be considered not to be reasonable. In the assessment of the no-build to build noise level change, consideration would be given to the cumulative effects of highway improvements made after the original highway construction. If the cumulative increase in design year build noise levels at noise sensitive receivers that existed when prior improvements were made is equal to or greater than 3 decibels, noise abatement could be considered reasonable.*

   If noise levels equal or exceed 72 decibels at impacted noise sensitive receivers, SHA would consider a sound barrier reasonable for any proposed highway expansion that would increase noises levels provided that other feasibility and reasonableness criteria are met.

4. *If the cost of a sound barrier would exceed $50,000 per benefited residence, the barrier would be considered not to be reasonable. The cost/residence is determined by the dividing the cost of a sound barrier by the total number of benefited residences. The total number of benefited residences would be the sum of the following:*

   a. *The number of impacted residences that would receive a 3 decibel or greater noise reduction.*

   b. *The number of non-impacted residences (noise levels below 66 dBA Leq) that would receive a 5 decibel or greater noise reduction.*

   c. *The number of impacted and non-impacted non-residential noise sensitive receivers (schools, churches, etc.) that would benefit from a sound barrier.*

   All benefited receptors would be included in the cost/residence calculation. Non-residential receptors such as schools, churches, historic areas, etc. would be considered as equivalent residences for cost/residence calculations, based upon 10 equivalent residences for each use.

   Sound barrier cost is based upon the estimated cost of the barrier system, i.e. posts, panels, foundations and retaining walls required solely to support the sound barrier. The most

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recent five years of bidding experience would be used to calculate the square foot factor used to estimate barrier cost. If the cost of a barrier exceeds the $50,000 maximum, SHA would fund up to the maximum, if the balance is available from another source or sources. SHA would work with the local jurisdiction on options for alternative funding.

For Type I projects, SHA would look at both the cost/residence for individual noise sensitive areas and the average cost/residence for the entire project in determining reasonableness. Noise sensitive areas with a cost/residence of less than $100,000 would be included in the project cost averaging. If the average cost/residence for the project is less that $50,000, sound barriers would be considered reasonable.

5. *If a very tall sound barrier would have to be located close to the impacted receptors, and would have a negative visual impact, construction of the barrier could be considered not to be feasible. The relationship of the location of a sound barrier to the receptors to be protected would be considered in making a reasonableness determination.*

6. *If the construction of a sound barrier would result in an impact to a Section 4(f) resource, it could be determined not to be reasonable. Section 4(f) resources include publicly owned recreation areas and parks, wildlife areas, conservation areas and historic sites that are either on or considered eligible for the 'National Register of Historic Places.*

7. *The control of new development adjacent to state highways in high noise zones at the local level is critical to the overall abatement of highway noise. Sound barrier reasonableness would consider the local priority on approving new development adjacent to state highways in the determination of providing noise abatement for highway construction or reconstruction projects.*

4.5.2 Predicted Noise Levels

Noise Prediction Model. All traffic noise calculations and predictions were performed using FHWA-approved methods. The noise predictions were performed with the FHWA Traffic Noise Model (TNM) version 1.0b (FHWA-PD-96-009). The TNM model succeeds the STAMINA 2.0 computer model (FHWA-PD-58-1) as the state-of-the-art program for the prediction of noise in the vicinity of highways. The STAMINA 2.0 Model was the basis for the 1997 FEIS; however, due to technological advances the TNM will be the basis for this analysis. The model incorporates vehicle noise emission levels, updated for modern vehicle classification, traffic speed and traffic volume, sound propagation factors from atmospheric absorption, divergence, intervening ground, intervening barriers, intervening rows of buildings and areas of heavy vegetation.

Computed Noise Levels: Noise levels were computed for the design year (2020) Current Design Alternative 4A. Hour-by-hour traffic volumes (including vehicle classification) and speeds were developed for the 2020 Current Design Alternative 4A. These data were used to determine the loudest hour of the day. For the Current Design Alternative 4A, the loudest hour was the hour ending at 2:00 PM; therefore, 1:00 PM to 2:00 PM was chosen as the hour for which traffic volumes and

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speeds were taken to evaluate the impact of traffic noise. For the 1997 FEIS existing case, projected loudest hour of the day conditions were modeled.

All noise levels computed were the A-weighted equivalent sound level, L_{eq} dBA. For each noise sensitive area, computer modeled receptors were added within the TNM model too more accurately predict the noise levels within the entire area. For simplification, however, selective sites have been chosen to represent the entire noise sensitive area. In most instances, these representative sites are where noise measurements were completed. In some locations, additional sites have been shown to provide a more comprehensive understanding of the noise environment. Sites that were measurement sites as well as predicted sites have been designated with an "M"; predicated only sites have been designated with a "P". Table 4-20 presents the computed loudest-hour noise level at each of the measured and predicted sites. Figure 4-15 indicates the location of the predicted and measurement sites in relation to the project.

Noise sensitive areas do not exist within the expanded project area along I-295. This area represents a mixture of industrial sites, including the Blue Plains water treatment facility, the Metropolitan Police and Fire Training facility and the District of Columbia impound lot.

4.5.3 Project Noise Impact

Table 4-21 summarizes the noise impact at residential dwellings for the Current Design Alternative 4A. For residential noise sensitive land uses, noise impact is assessed where the projected noise levels are expected to approach or exceed the FHWA's Noise Abatement Criterion of 67 L_{eq}, or be exposed to a substantial increase (10 dBA or more) over existing noise levels in the loudest hour of the day.

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Table 4-20: Project Noise Levels

Site * Number	State	Land Use **	Location Description	Loudest-Hour Leq (dBA), and Distance to Nearest Edge I-95/495			
				1997 FEIS Existing		Current Design Alternative 4A	
				Leq	Distance (meters (feet))	Leq	Distance (meters (feet))
1M	Virginia	H	Holiday Inn	71	70.0 (200)	70	54.9 (180)
2M	Virginia	PK	Huntington Park	66	195.1 (640)	68	195.1 (640)
3M	Virginia	MF	Mount Vernon Dr./Arlington Terr.	58	265.2 (870)	66	225.6 (740)
4M	Virginia	MF	Riverside Apartments, Bldg. 3	73	143.3 (470)	69	73.2 (240)
5M	Virginia	H	Howard Johnson's Hotel	65	323.1 (1,060)	69	265.2 (870)
6M	Virginia	PK	Robert E. Lee Rec. Center	69	210.3 (690)	74	204.2 (670)
7M	Virginia	PK	Belle Haven CC, 15th Green	61	423.7 (1,390)	65	365.8 (1,200)
8M	Virginia	MF	Church Street (Townhouses)	70	106.7 (350)	75	103.6 (340)
9M	Virginia	MF	Huntington Terrace Apts, Bldg. F	66	91.4 (300)	78	24.4 (80)
10M	Virginia	MF	Huntington Terrace Apts, Bldg. D	76	12.2 (40)	Displaced	
10P	Virginia	PP	Deck-Over (West End)	n/a		67	(300)
11P	Virginia	MF	Porto Vecchio South Balcony	54	393.2 (1,290)	65	323.1 (1,060)
12M	Virginia	MF	Porto Vecchio Northeast Lawn	62	280.4 (920)	65	213.4 (700)
13M	Virginia	MF	Hunting Towers Center Bldg.	71	76.2 (250)	70	12.2 (40)
14P	Virginia	MF	Hunting Towers Pool	64	(550)	69	103.6 (340)
15M	Virginia	S	Saint Mary's School, playground	71	106.7 (350)	70	106.7 (350)
16M	Virginia	MF	Hunting Towers Apts, Bldg 1200	78	33.5 (110)	Displaced	
17P	Virginia	MF	Fairfax Street/Lee Street	71	100.6 (330)	68	109.7 (360)
18M	Virginia	PK	Jones Point Park, soccer field	71	79.2 (260)	62	3.1 (10)
19M	Virginia	PK	Jones Point Park, Lighthouse	66	304.8 (1,000)	65	219.5 (720)
20M	Virginia	PK	Jones Point Park, Fishing Wall	70	94.5 (310)	67	143.3 (470)
21M	Maryland	PP	Future Queen Anne's Park (Rosalie Island)	68	91.4 (300)	75	42.7 (140)
22M	Maryland	PP	Oxon Cove (Heritage Trial)	76	21.3 (70)	70	15.2 (50)
23M	Maryland	SF	Mel Mara Drive (cul-de-sac)	56	579.1 (1,900)	65	542.5 (1,780)
24M	Maryland	PK	Betty Blume Park	56	600.5 (1,970)	55	573.0 (1,880)
25P[1]	Maryland	PR	Proposed National Harbor Condos	71	121.8 (400)	Not Applicable	
26M	Maryland	PK	Oxon Hill Manor, Historic Site	58	478.5 (1,570)	58	481.6 (1,580)
27M	Maryland	PK	Oxon Hill Farm, Wildlife Area	62	112.8 (370)	67	85.3 (280)
28M	Maryland	PK	Oxon Hill Farm, Welby Building	56	378.0 (1,240)	63	344.4 (1,130)
29M	Maryland	S	Flintstone School, playground	65	109.7 (360)	68	125.0 (410)
30P	Maryland	MF	Comanche Drive/Quade Street	69	64.0 (210)	68	73.2 (240)
31M	Maryland	MF	Huntington Club Apts. Tennis Court	63	353.6 (1,160)	68	344.4 (1,130)
34P[2]	Maryland	SF	Cambell Road (Houses)	70	64.0 (210)	Not Applicable	
35P	Maryland	SF	Elmwood Drive/Burgundy Road	65	248.4 (815)	69	237.7 (780)
36P	Maryland	MF	Hunting Terrace Apts, Bldg. H	63	118.9 (390)	69	112.8 (370)
100M[3]	Virginia	SF	South Quaker Lane (houses)	61	36.6 (120)	65[4]	73.2 (240)
101M[3]	Virginia	SF/PK	Linnean Street (houses)/Burgundy Park	47	82.3 (270)	65[4]	76.2 (250)
102M[3]	Virginia	SF	Leisure Court (houses)	59	76.2 (250)	63[4]	42.7 (140)
103M[3]	Maryland	SF	Galloway Drive (houses)	61	38.1 (125)	63[4]	30.5 (100)
104P[3]	Maryland	C	Forest Heights Baptist Church	64	76.2 (250)	74	70.0 (200)

Notes:* *M ⇒ Measured & Predicted Site* *P ⇒ Predicted Only*
** Land Use: H – Hotel; MF – Apartments, Townhouses or Duplexes; *PK – Park; PP – Proposed Park*
PR – Proposed Residential; S – School; SF – Single Family Residence; C – Church
1. Noise receptors are no longer required due to National Harbor Development revisions
2. Predicted Site 34P has been replaced with measured site 100M.
3. Existing and predicted noise levels not included in the 1997 FEIS, ambient measurement shown.
4. Predicted noise levels based on 5.5-meter (18-foot) replacement barriers in place.

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Table 4-21: Project Noise Impact

Land Use and Area	Project Noise Impact Current Design Alternative 4A
Residential: Dwelling Units	
West of Telegraph Road[1]	0
Telegraph Road to US 1	159
Riverside Apartments	203
Old Town Alexandria	114
Hunting Terrace Apartments	33
Hunting Towers Apartments[2]	27
Porto Vecchio Condominiums	0
Mel Mara Drive	0
Junction I-95/MD 210	100
Total Dwelling Units	636

Notes: *1.* *Community currently protected by existing noise barrier.*
2. *Exterior effects considered at individual units rather than common outdoor area.*

Residences: Table 4-21 shows that 636 dwelling units would be affected by the Current Design Alternative 4A. The increase over the projected 563 impacted residence associated with the FEIS Alternative 4A is a result of the changes to the project limits, and increase in projected noise levels at the Huntington Club Condominiums. In Virginia and Maryland, the extended project limits increase the noise impacts to residences west of Telegraph Road and east of MD 210, respectively. These residences currently are protected by an existing barrier system that lies within the proposed typical section of the Current Design Alternative 4A. Based on the level of design, it has been concluded that the proposed construction would impact the existing noise barrier. Any currently protected communities that have a noise barrier, a replacement barrier will be constructed to insure that these properties are protected at the completion of construction. Minimization techniques would be implemented to avoid removal of these existing noise barriers. These residences are not included as impacted in Table 4-21.

As with the 1997 FEIS document, noise affects were considered at the exterior units of the Hunting Towers. As originally documented, this is a result of the outdoor activity area being somewhat shielded from traffic noise by the buildings themselves.

School Playgrounds: The playgrounds at Saint Mary's School in the City of Alexandria and the Flintstone Elementary School in Maryland would be both impacted by the Current Design Alternative 4A.

Parks and Recreation Areas: Noise levels within the extended project limits in Virginia would impact the Burgundy Park, adjacent to the Cameron Elementary School. This neighborhood park contains a tennis court, children's play area and picnic tables secluded in a wooded area between the existing I-95/495 noise barrier and the residences along Keota Street. A replacement barrier will be constructed.

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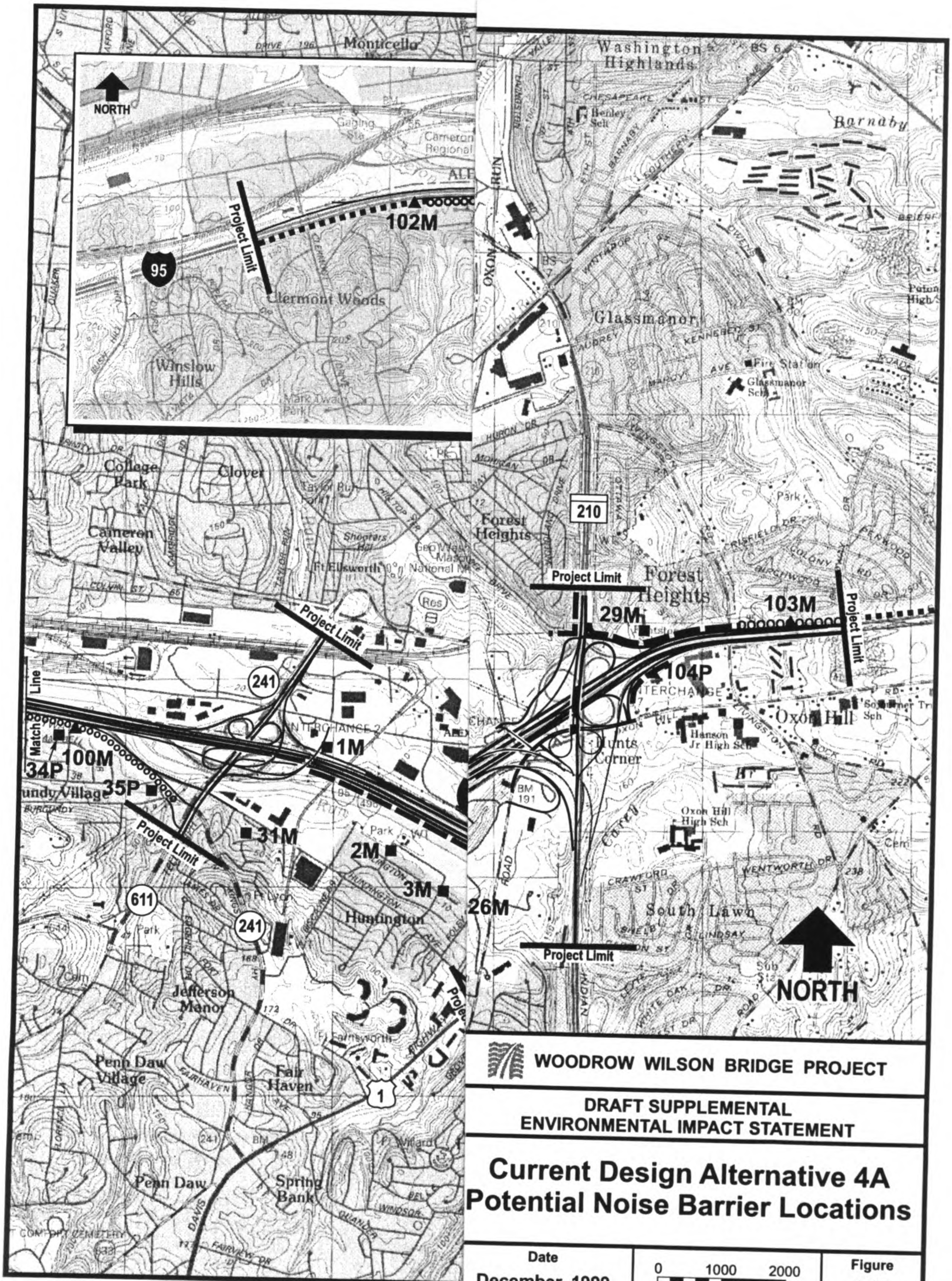

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Current Design Alternative 4A Potential Noise Barrier Locations

Date	Scale	Figure
December, 1999	0 1000 2000 Scale in Feet	4-15

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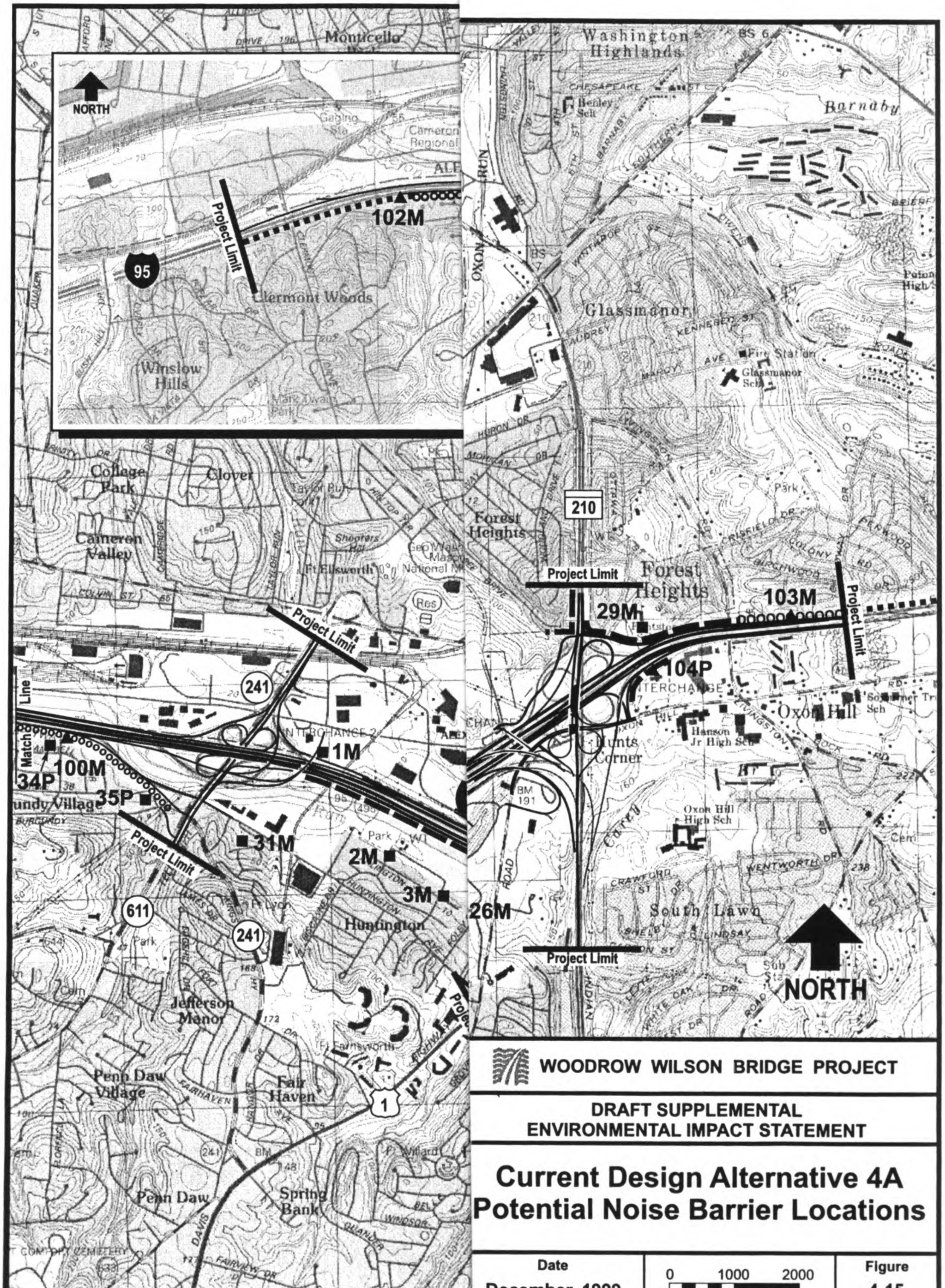

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Current Design Alternative 4A
Potential Noise Barrier Locations

Date	Scale in Feet	Figure
December, 1999	0 1000 2000	4-15

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The entire area of the ballfields at the end of Liberty Drive in Huntington Park would be exposed to noise impact under the Current Design Alternative 4A. Roughly half of the area containing the basketball and tennis courts of the Robert E. Lee Recreation Center would be affected under the build condition.

The Jones Point Park area lies partially under the future bridge structure. Theoretically, areas under the bridge or within the bridge shadow, where there is no direct line of sight to traffic, would have lower noise levels than areas that do have a direct line of site. Receptors 18M (soccer field) and 20M (fishing wall) support this assumption by a predicted noise level of 62 dBA and 67 dBA respectively. However, the potential resonation of the structure itself may increase the overall noise environment within the shadow zone. An extensive literature research was conducted to effectively evaluate the potential noise levels under the bridge structure. Based on this research and development of details for the proposed structure, it was concluded that the proposed steel box girder structure design features would minimize resonation, thereby reducing the potential for structure borne noise to increase the overall noise environment.

The Belle Haven Country Club would be exposed to a slight increase in noise levels, affecting the very northern portion of the golf course, near the fifteenth green. The predicted noise level on the fifteenth green dropped to just below the impact threshold, 65 dBA, but the area surrounding the green to the north and west would experience noise levels at the 66 dBA criteria level.

The proposed Urban Deck at Washington Street in Virginia would be exposed to noise impact for the Current Design Alternate 4A. The proposed activities on the urban deck are a mixture of active recreation, in the form of soccer fields, and passive recreation, in the form of park benches within a garden area.

The proposed improvements to Rosalie Island (future Queen Anne's Park) include a deckover I-95/495 upon which a sculpted garden area would be constructed, offering viewsheds of the Potomac River both north and south, and views of the proposed National Harbor development to the southeast and Washington D.C. skyline to the north. The proposed activities on the Rosalie Island deckover are a mixture of passive recreation, in the form of natural stone sitting areas, and limited active recreation, in the form of a hiker/biker trail. The hiker/biker trail connects both ends of the island, and includes ties to the proposed National Harbor development and northern Virginia. Noise levels throughout the proposed park are projected to exceed the noise impact criteria.

The noise impact area would extend approximately 350 feet (106.7 meters) north into the Oxon Hill Farm property under the Current Design Alternative 4A. No extensive activity is undertaken within this area. The primary outdoor activity areas and the Mount Welby building are set back from the highway where future noise levels would be below the impact criteria.

Churches: An impact assessment to the Forest Heights Baptist Church was not considered as part of the 1997 FEIS. The Forest Heights Baptist Church, located in the southeast quadrant of the MD 210 interchange, is adjacent to I-95/495 and Oxon Hill Road. Predicted exterior noise levels indicate an impact (74 dBA) during the loudest hour of the weekday within the grounds of the

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church. Most church activity occurs during weekend periods when traffic volumes would be reduced. Other active times include Wednesday morning and evening, as well as, weekday after school daycare, which utilizes the church grounds for recreation. Existing traffic counts in this area indicate that peak weekend traffic hour equates to peak noise hour total volume. However, truck volumes are reduced by about half during this period. Acoustically, a reduction in truck traffic, with the overall traffic volume remaining the same would produce a change in the noise environment of less than 3 dBA. Weekend volumes that continue this trend in the design year would exceed the impact criteria for exterior noise levels at the church, during both weekday and weekend periods.

Understanding that minimal exterior activity occurs within the church grounds, an important assessment could be completed based on FHWA's Noise Abatement Activity, Category E (52 dBA interior). Exterior noise levels at the church are predicted to be 74 dBA for the Current Design Alternative 4A. Interior noise levels were not measured. However, 23dBA change from exterior to interior must occur for noise levels to be below the Category E impact threshold. The church hierarchy has indicated a desire for a noise barrier to protect the church, and has agreed to allow interior measurements. Further analysis will be completed during final design.

4.5.4 Noise Mitigation

The FHWA has identified certain noise abatement measures that may be incorporated into projects to reduce traffic noise impact, such as the construction of noise barriers. Alternative mitigation measures studied for the 1997 FEIS included traffic management and alteration of horizontal and vertical alignment. However, these alternatives were considered either ineffective or impractical.

Noise Barriers: The feasibility of noise barriers has been investigated at all locations where noise impact has been predicted to occur for Current Design Alternative 4A. Where the construction of barriers was found to be physically practical, barrier noise reduction was estimated based on roadway, barrier and receiver geometry.

Table 4-22 provides a summary of preliminary noise barrier data. All barriers for residential areas have been found to be reasonable and feasible except for one, which is described below. These barrier locations are shown on Figure 4-15, and design data in Table 4-22 includes an approximate length and height for each barrier as well as the estimated noise reduction or "insertion loss" (IL) that it would provide. Estimates of total cost and cost per dwelling unit protected are also provided. Barrier costs in Virginia are based on a unit cost of $16.00 per square foot, and in Maryland, on a unit cost $16.50 per square foot. These costs are based on averages of actual barrier construction costs and on bid analysis each state has experienced.

One barrier was found to not be reasonable and feasible along Telegraph Road between Huntington Avenue and Lenore Lane (Site 31 - Huntington Club Condominiums). This barrier could not be designed to provide the minimum 5 dBA noise reduction for the condominium units within the Huntington Club complex as well as the single family homes located on Kathryn Street, and two single family homes, one located on Lenore Lane and one on N. King's Highway. A reasonable

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reduction in noise could not be achieved because the barrier location is limited by cross streets and commercial access.

Multiple noise barriers required to protect the proposed Rosalie Island improvements would not be reasonable and feasible. These barriers would have a negative visual impact to the proposed park.

Possible noise barriers were not considered at the three hotels (Holiday Inn, Marriott Courtyard, and Hampton Inn) in Virginia or at the Strayer College located in the northwest quadrant of the Telegraph Road interchange, as these locations do not have noise sensitive exterior uses.

Table 4-22: Noise Barrier Abatement Analysis

Description and Location				Barrier Data			Cost Data		
Noise-Sensitive Area	Sites	Land Use[1]	2020 Leq (dBA) w/o barr.	Height (feet/ meters)	Length (feet/ meters)	Insertion Loss (dBA)	Total ($x1000)	# Residence Protected	$ per Residence
Virginia									
Riverside Apartments Fenwick Drive to Mount Vernon Drive	2M, 3M, 4M	MF, PK	66-69	12 (3.66)	4665 (1422)	7-8	896	203[2]	4,400
Robert E. Lee Recreation Center	6M	PK	74	18 (5.49)	1800 (549)	6-8	519	n/a	n/a
Washington Street Urban Deck (both east and west ends of deckover)	10P	PP	67	10 (3.05)	730 (222)	5-7	117	n/a	n/a
Hunting Terrace, (Belle Haven Country Club)	7M, 9M	MF,PK	66-78	10 (3.05)	3,500 (1067)	5-7	560	33	17,000
Old Town Alexandria (West of Washington Street)	8M	MF	71-81	12 (3.66)	1,600 (488)	7-10	308	88	3,500
Old Town Alexandria and Jones Point Park (East of Washington St)	15M, 17P, 20M	S, PK, MF	66-72	12 (3.66)	4,200 (1280)	5-7	807	18, school, park	44,800
Hunting Towers and Jones Point Park	18M, 19M, 13M, 14P	MF, PK	66-70	10 (3.05)	3,300 1006)	5-7	528	27[2], park	19,600
Maryland									
Cree Drive/Sachem Drive	n/a	SF	66-69	18 (5.49)	1,400 (427)	7-8	417	14	29,800
MD 210 to Birchwood Ct.	29M, 30P,103M	SF, MF, S	68-73	18 (5.49)	4,900 (1494)	9-10	1459	95, school[3]	13,900
Forest Heights Baptist Church	104P	C	74	16 (4.88)	1,400 (427)	8	370	Church[3]	37,000

Notes:
1. *Land Use: H – Hotel; MF – Apartments, Townhouses or Duplexes; PK – Park; PP – Proposed Park PR – Proposed Residential; S – School; SF – Single Family Residence; C – Church*
2. *The Barrier would only protect dwelling units on the first two floors of high-rise apartment buildings.*
3. *Maryland assigns a school and church as 10 dwelling units.*

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Where noise barriers are physically practical and provide sufficient noise reduction (minimum of five dBA in Virginia and 7 to 10 dBA for first row receptors in Maryland), reasonableness of construction is next evaluated on cost-effectiveness criteria. Noise abatement is considered cost effective by VDOT at a cost of $30,000 or less per dwelling unit and by MSHA at $50,000 per dwelling unit. Barriers for schools, parks and recreation areas have been presented as potentially reasonable and feasible and have been incorporated into conceptual mitigation plans for those sites. Existing noise barriers that can not be avoided and would be impacted by the project will be reconstructed to continue protecting residences with the project area.

Final decisions on these barriers would be made in the context of each State's noise policy. In some locations barriers that protect parks and recreation areas also protect residential areas such as Burgundy Park, Huntington Park, St. Mary's School and Flintstone Elementary school. Barriers at these locations could be reduced in length, but not eliminated if the State determines that protection of the park is not warranted. Additional cost associated with a barrier on structure was not included in the total cost of the barrier system.

All noise barrier feasibility analysis was performed using the barrier analysis element of the TNM program, except for areas in Virginia to the east of US 1. Roadways that contribute to the noise environment in the eastern half of the US 1 interchange were too numerous to efficiently calculate the noise levels with barriers. Impacts were determined utilizing a TNM model with no barriers. Barrier feasibility analysis for these areas was performed using a line-of-sight approach. Barrier height was set so as to break the line-of-sight between heavy trucks on the roadway and the ground floor level of the noise-sensitive areas. The resulting barriers are typically 3.1 to 3.7 meters (10 to 12 feet) high. The length of each potential barrier was determined by extending it beyond the end of the impacted area by a distance equal to the distance from the roadway to the impacted receiver that is furthest from the roadway.

Construction Noise: An assessment of the impacts from noise associated with construction activities can be found in Appendix F of this document. Additional analysis of potential construction noise impacts will be completed during final design.

4.6 Energy

A quantitative review of energy consumption resulting from the operational and construction phases of Current Design Alternative 4A was made to assess both direct and indirect energy consumption. Input variables were collected and a quantitative evaluation was made. Indirect energy consumption was also calculated for Current Design Alternative 4A.

The methodology used to assess the energy consumption impacts of the project is based on the Federal Highway Administration (FHWA) report entitled *Energy and Transportation Systems* published in July 1983 by the Caltrans Transportation Laboratory, California.

This report presents the direct and indirect energy consumption estimates for Current Design Alternative 4A under the 2020 Build condition. Energy consumption is quantified in British

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thermal units (BTUs). Consumption rates are also translated into equivalent barrels of crude oil (Bbl).

4.6.1 Direct Energy Analysis

Vehicular fuel consumption estimates for the direct energy analysis were calculated based on vehicle miles traveled (VMT) and annual travel speeds. Vehicle mix information was derived from information obtained through the Metropolitan Washington Council of Governments. The estimated fuel consumption figures take into account expected future fuel efficiency improvements. Current Design Alternative 4A is predicted to have a daily VMT of 1,680,178 and an average speed of 45 mph.

As shown in Table 4-23, Current Design Alternative 4A is predicted to consume roughly 9.94×10^9 BTUs daily of direct energy. Annually Current Design Alternative 4A is predicted to consume 3.63×10^{12} BTUs of direct energy.

Table 4-23: 2020 Direct Energy Consumption

Project	Total Daily VMT	1,680,178
	Average Speed	45 mph
Passenger Vehicles	Daily VMT	1,465,955
	Gallons Consumed	
	Gasoline	45,672
	Diesel	0
	BTUs (millions)	6,563
Medium Trucks	Daily VMT	38,140
	Gallons Consumed	
	Gasoline	2,590
	Diesel	0
	BTUs (millions)	372
Heavy Trucks	Daily VMT	176,083
	Gallons Consumed	
	Gasoline	7,390
	Diesel	13,137
	BTUs (millions)	3,001
Daily Direct Energy Totals	BTUs Consumed	9.94×10^9
	Bbl Consumed	1,713
	Total Fuel Consumed (gallons)	68,788
	Fuel Efficiency (mpg)	24.4
Annual Direct Energy Totals	BTUs Consumed	3.63×10^{12}
	Bbl Consumed	625,245
	Total Fuel Consumed (gallons)	25,107,620
	Fuel Efficiency (mpg)	24.4

Notes:
1 Gallon gasoline = 143,700 BTUs (including energy consumed in fuel refining)
1 Gallon diesel fuel = 147,600 BTUs (includes energy consumed in fuel refining)
1 barrel crude oil = 5,800,000 BTUs (average for all crudes)
One British thermal unit (BTUs) is the energy necessary to raise one pound of water one degree Fahrenheit.
Conversion Factors: U.S. Department of Energy, 1989, State of California Department of Transportation, 1983.

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4.6.2 Indirect Energy Analysis

Indirect energy is the energy needed to construct the proposed facility. Current Design Alternative 4A is predicted to require roughly 3.57×10^{12} BTUs of indirect energy. The indirect energy estimate reflects one-time, non-recoverable energy costs associated with the construction of new roadways. The indirect energy analysis was based on the number of lane miles along Current Design Alternative 4A that would include construction of surface and elevated highway segments. Current Design Alternative 4A is estimated to contain 98.8 lane kilometers (61.4 lane miles) of at-grade roadway and 28.5 lane kilometers (17.7 lane miles) of bridge construction/modification. These figures were then multiplied by construction energy factors which estimate the amount of energy necessary to extract raw materials, manufacture and fabricate construction materials, transport materials to the work site and complete construction activities.

The results of the 2020 indirect energy analysis are summarized in Table 4-24. The construction of Current Design Alternative 4A is predicted to consume 3.36×10^{12} BTUs of indirect energy.

Table 4-24: 2020 Indirect Construction Energy Consumption

Type of Construction	Number of Lane kilometers (miles)	BTUs Consumed	Barrels of Crude Oil Consumed
Current Design Alternative 4A At-Grade Roadways	98.8 (61.4)	1.05×10^{12}	181,024.2
Woodrow Wilson Bridge project bridges	28.5 (17.7)	2.31×10^{12}	397,880.7
Total	**127.3 (79.1)**	**3.36×10^{12}**	**578,904.9**

Notes:
Surface highway construction = 17,100 million BTUs/lane mile.
Elevated highway construction = 130,379 million BTUs/lane mile.

4.6.3 Conservation of Energy

Conservation of energy could be achieved in facility planning, construction, operation, and maintenance. Conservation could also be applied to recycling pavements, hardware items (guardrails, signals, tires, right-of-way, etc.), using indigenous plants for landscaping, and applying Best Management Practices in roadway maintenance. Other measures that could be applied include using high pressure sodium vapor lamps for light, promoting carpools, vanpools, buses, and bicycle projects.

4.7 Natural Environment

4.7.1 Surface and Subsurface Geology

Topography: Current Design Alternative 4A would affect topography in both the Maryland and Virginia portions of the project area. Highway improvements would require grading in areas with rolling topography in order to achieve suitable elevations for roadway construction. Cut and fill practices that would cause overall changes to the existing topographic characteristics will generally be the same for Current Design Alternative 4A as for FEIS Alternative 4A.

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Soils: Impacts on soils for Current Design Alternative 4A will generally be the same as the soil impacts for FEIS Alternative 4A.

Subsurface Formations: Subsurface geologic formations in the project area would not be affected by construction of Current Design Alternative 4A.

4.7.2 Water Quality

Groundwater: Highway construction can reduce the effectiveness of aquifer recharge areas through direct conversion of pervious to impervious surfaces, increased runoff rates, and potential introduction of highway derived stormwater contaminants. Current Design Alternative 4A will require the construction of additional impervious surfaces. Because known groundwater recharge areas are located west of the project area, it is not anticipated that there would be an impact to groundwater recharge areas by construction of Current Design Alternative 4A. With regard to the impact of the project on potable water supplies, community wells are known to exist in the project area south of I-95 and west of MD 210 and west of Oxon Hill Road. These wells would not be impacted by Current Design Alternative 4A. Current Design alternative 4A would not require deep subsurface excavation in proximity to local groundwater supplies.

Undeveloped land throughout the project area currently provides for infiltration of rainwater, particularly in forested areas. Current Design 4A will have a negative effect on this local groundwater function when undeveloped pervious lands are converted to impervious surfaces. Stormwater management practices such as infiltration trenches and basins, and other stormwater management practices that retain stormwater of sufficient duration to allow for infiltration of runoff will partially offset this impact.

Surface Water: Long-term effects to surface waters could result from a variety of activities associated with the implementation of the Current Design Alternative 4A. The proposed project includes an increase in impervious surfaces within the project areas; direct impact to waters of the U.S., which provide valuable water quality functions and the potential for the release of excess sediment and other pollutants during dredging within the Potomac River and other construction related activities. Impacts to wetlands and other waters of the U.S. would require a Section 401 Water Quality Certification from the Maryland Department of the Environment (MDE) and a Virginia Water Protection Permit from the Virginia Department of Environmental Quality.

Impacts to waters of the U.S. and mitigation required for loss of functions and values are discussed in Section 4.7.4, Waters of the United States. Water quality impacts during dredging could include increases in turbidity and potential release of nutrients and contaminants. Testing of river-bottom sediments to date has shown that contaminant levels within the sediments do not exceed standard limits. Consequently, toxic releases during dredging are not anticipated. Some level of increased turbidity and nutrient release is expected, however, this will occur only during the two, four month dredging periods which will occur four to six years apart. Best management practices such as turbidity curtains will be used to minimize the magnitude of the temporary effect.

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Impacts from terrestrial construction activities could include erosion and sedimentation resulting from the exposure of soils during earth moving and stockpiling. Best management practices would also be implemented to reduce potential short- and long-term terrestrial construction impacts through the use of erosion and sediment controls specified in the Virginia Erosion and Sediment Control Handbook and MDE Erosion and Sediment Control Guidelines for State and Federal Projects. Potential effects from construction activities are further discussed in Appendix F, Assessment of Potential Construction Effects.

As mentioned above, the Current Design Alternative 4A would result in an increase in impervious surfaces within the project area. Including existing impervious areas, the construction of Current Design Alternative 4A would result in approximately 141.6 hectares (350 acres) of impervious land draining to designated study points within the project limits. The 1995 *Draft Stormwater Management Concept Plan* referenced in the 1997 FEIS reported a post-construction impervious area of approximately 109.7 hectares (271 acres). The 32 hectares (79 acres) of additional impervious area under the Current Design Alternative 4A is primarily a result of the extension of the project limits further north along I-295 towards the District of Columbia, along I-95/495 west of the Telegraph Road I-95/495 interchange and south of the Telegraph Road I-95/495 interchange for the Burgundy Road relocation. The increase in impervious area over that presented in the FEIS is not anticipated to cause additional water quality impacts in comparison to those discussed in the FEIS, because stormwater management plans have been modified to address the increased impervious area. The change between the Current Design Alternative 4A and the FEIS Alternative 4A are summarized in Table 4-25.

Table 4-25: Post-Construction Impervious Area

Alternative	Impervious Area hectares (acres)
FEIS Alternative 4A	109.7 (271)
Current Design Alternative 4A	141.6 (350)

Increased runoff generated from new impervious surfaces from the Bridge, I-95/495 and modified interchanges would discharge both directly and indirectly to the Potomac River and Cameron Run. Uncontrolled runoff from impervious surfaces has been linked to thermal and chemical pollution, as well as loss of stream stability and aquatic habitat (Schueler 1987). These impacts are primarily caused by increases in the level and frequency of peak discharges in receiving streams and by the introduction of pollutants such as particulates, petroleum-based fuels, metals, deicing salts and other contaminants that typically accumulate on road surfaces and become mobilized during rain events.

Due to the large size and drainage area of Cameron Run and the Potomac River and stormwater management techniques proposed, the additional runoff from the project would not have a substantial effect on the hydrologic regime or water quality of the River. Potential cumulative effects to water quality within the Potomac River are discussed in Section 4.12.8.

Long-term impacts to surface waters would be minimized to the extent possible through the implementation of approved stormwater management plans. Stormwater management compliance is

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regulated at the state level by the Maryland Department of the Environment (MDE) in Maryland, the Virginia Department of Conservation and Recreation (VDCR) in the Commonwealth of Virginia, and at the federal level by the Environmental Protection Agency (EPA) in the District of Columbia. In addition, Maryland's Chesapeake Bay Critical Areas Protection Law provides another level of stormwater runoff regulation within 304.8 meters (1,000 feet) of tidal waters (Chesapeake Bay Critical Area).

Conceptual Stormwater Management Plans have been developed separately for the Maryland and Virginia portions of the project in accordance with MDE's Stormwater Management Guidelines and Maryland Chesapeake Bay Critical Area Regulations in Maryland, and VDCR Stormwater Management Law in Virginia. Both jurisdictions require water quantity treatment to insure that there be no net increase in peak discharge over the pre-development condition and water quality treatment of the first ½ inch of runoff from additional impervious areas. In the Maryland Chesapeake Bay Critical Area, an additional requirement exists for a 10 percent reduction in phosphorous loading (10 percent rule) to the Potomac River from predevelopment conditions.

In Maryland, hydrologic analyses of various drainage points were conducted using the Soil Conservation Service's TR-55 and TR-20 computer models in conjunction with the "10 percent rule" for portions of the project within the Critical Area. The results of the hydrologic analysis showed a substantial increase in imperviousness and runoff at a number of drainage points. Eleven stormwater management facilities consisting of a mix of shallow marsh and retention basins have been proposed to control runoff within the Maryland portion of the project area. Six of these facilities are located in or adjacent to the ramp loops of the I-95/I-295 interchange and five are located in or adjacent to the MD 210 interchange. All facilities are located in uplands and would be designed to provide the required quantity and quality control in accordance with MDE guidelines. Requests for stormwater management waivers would be submitted for portions of the project where proposed hydrologic conditions meet MDE's requirements for post-development runoff. Treatment for the bridge deck and other proposed development areas where management would be required but cannot be accommodated due to right-of-way constraints would be provided through compensatory storage for currently untreated impervious areas in the eleven proposed facilities. Final stormwater management plans would be submitted to MDE for review and approval. Approvals for compliance with the Critical Area "10 percent rule" would be sought separately as part of the overall Critical Area permitting process.

In Virginia, similar hydrologic analyses were completed for drainage points receiving runoff from the proposed project. A number of the drainage points qualify for a stormwater management exemption under a memorandum of understanding between Virginia Department of Transportation (VDOT) and Virginia Department of Environmental Quality (VDEQ), because the difference between the pre-and post-construction impervious area draining to the study point is less than 0.4 hectares (one acre). Seven stormwater management facilities have been proposed to control runoff for areas where substantial increases in imperviousness are anticipated. Four of the facilities are located within or adjacent to the Telegraph Road interchange, two are within the US 1 interchange, and one is located between Mill Road and I-95. Due to right-of-way limitations, stormwater management can not be accommodated at all points requiring controls. Consequently, the combination of shallow marsh and extended detention dry pond facilities proposed have been sized to provide compensatory treatment

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for untreated areas. Final stormwater management plans would be consistent with Virginia Stormwater Management regulations and would be submitted to VDCR for review and approval.

All stormwater facilities and drainage points discharging to tidal waters will be designed to outfall above mean high water or will incorporate structures to prevent tidal flushing. In addition, best management practices will be used to dissipate flows and provide stable conveyance to tidal waters. Final approval of stormwater management plans will be completed in concert with request for final Section 401 - Water Quality Certifications for Maryland, Virginia, and the District of Columbia. In addition, all discharges will comply with National Pollutant Discharge Elimination System (NPDES) requirements. In Maryland and Virginia, a Notice of Intent (NOI) will be filed with the state, in conjunction with overall stormwater management permitting, prior to construction. In the District of Columbia, EPA is responsible for NPDES compliance. Consequently, NPDES coordination and submittal of an NOI for the District will be undertaken directly with EPA.

4.7.3 Floodplains

FEIS Alternative 4A was reported to have 10.4 hectares (25.7 acres) of floodplain encroachment (see Table 4-23 in the 1997 FEIS). The associated quantity of fill required for this area of encroachment was not reported in the FEIS. Under the Current Design Alternative 4A, floodplain encroachment has increased to 33.2 hectares (82 acres), requiring 1,238,612 cubic meters (1,620,043 cubic yards) of fill. The increase in floodplain encroachment is due to the greater level of design detail now available in the 30 percent design plans, the extension of the project limits into areas which include more floodplain and further study of avoidance and minimization techniques proposed in the 1997 FEIS.

Table 4-26: Floodplain Encroachment[1]

Alternative	Encroachment hectares (acres)
FEIS	10.4 (25.7)
Current Design Alternative 4A	33.2 (82.0)

[1] hectares (acres)

Areas where extension of the project endpoints added to the overall floodplain impact for the project include:

- I-295 north and south of I-95/495 along the Potomac River floodplain;
- Telegraph Road west of the Telegraph Road I-95/495 interchange including the continuation of the Cameron Run floodplain; and
- Burgundy Road relocation south of Telegraph Road I-95/495 interchange, which crosses the floodplain of Pike Branch, a tributary of Cameron Run.

Further increases in floodplain encroachment have been identified as a greater understanding of potential impacts developed during the preliminary (30 percent complete) design phase and the detailed constructability review of the overall project. Based on this information, and input from the SPP, numerous roadway design aspects were refined since the 1997 FEIS that resulted in

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additional impacts to floodplains. Specific increases in impacts in Maryland, would occur for the incorporation of transition lanes north of the I-295 interchange near the District of Columbia boundary. On Rosalie Island, the bridge height was raised since the 1997 FEIS to accommodate a deckover that would provide pedestrian and maintenance vehicle access to the island. This in turn required an increase in the fill slopes at either end of the deckover and along the landside portion of the mainline from the Maryland shoreline to the Island resulting in increased impacts to the Potomac River floodplain.

In Virginia, increased impacts to the floodplain of Pike Branch and Cameron Run would result from the realignment of Burgundy Road to connect to Telegraph Road opposite Lenore Lane and a new ramp connecting northbound US 1 with the westbound Beltway. This realignment was added as a result of recommendations of a Stakeholder Participation Panel. Impacts to the Potomac River floodplain at Jones Point Park are also proposed for the construction of park improvements. Additionally, relocation of transformation towers along Cameron Run was not fully assessed in the 1997 FEIS.

In both Maryland and Virginia, increased impacts to floodplains resulted from an expanded project footprint. Assumptions made in the 1997 FEIS were based on earlier design phases and the greater information on current design requirements lead to expansions in the encroachment needed to accommodate adequate fill slopes. In addition, some retaining walls that were used as avoidance and minimization techniques in the FEIS were eliminated in the Current Design Alternative 4A because of design incompatibilities.

Executive Order 11988, *Floodplain Management*, as implemented through 23 CFR (Part 650), *Location and Hydraulic Design of Encroachment on Floodplains*, requires an assessment of long- and short-term adverse effects associated with encroachment in floodplains. An encroachment is defined as an action within the limits of the 100-year floodplain boundary. The criteria used to evaluate the environmental effects of floodplain encroachment from project alternatives include:

- risk of flooding to highways and/or adjacent properties attributable to the increased encroachment,
- impacts on natural and beneficial floodplain values,
- support of incompatible floodplain development,
- measures designed to minimize floodplain impacts of the alternative, and
- measures designed to restore and preserve natural and beneficial floodplain values affected by the alternative.

The replacement of the existing Woodrow Wilson Bridge would necessitate the construction of a new bridge structure across the broad floodplain of the Potomac River. In addition, improvements to the Bridge approach along I-95/495 and its interchanges in Virginia would occur within portions of the floodplain of Cameron Run. The Current Design Alternative 4A would almost entirely span the lateral extent of the Potomac floodplain, and the bridge deck would be well above the 100-year flood elevation. The bridge, including the piers, would be designed to insure that there would be no adverse increase in the 100-year flood surface elevation. Fewer bridge piers are proposed for the new bridge in comparison to the existing span, however, the new piers would be considerably larger in size,

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resulting in greater surface area within the River and its floodplain. Preliminary one-dimensional hydraulic models using HEC-RAS 2.2 have been developed for the project, and specifically for the Potomac River crossing. According to these models, there would not be a substantial increase in flood surface elevations from the project. The models predict that the Bridge is in compliance with federal requirements to meet or exceed the hydrologic performance of existing structures and insure that any increase in backwater surface elevation would be 0.3 meters (1 foot) or less. All other bridge and culvert structures will be designed to meet this regulation as well.

Construction of the Current Design Alternative 4A would increase the amount of impervious surfaces within the project area, thereby increasing stormwater runoff. The increased amount of road surface draining into the area would be small in relation to overall drainage areas of the waterways. Increases in backwater surface elevations and velocities due to encroachments would be minimal. There would be no incompatible development or substantial longitudinal encroachment as a result of the project.

In Maryland, where the 100-year floodplain is in close proximity to the Potomac shoreline, floodplain encroachments are primarily related to the fill required for the bridge abutment, the Rosalie Island deckover, and widening and/or realignment of I-295 and the ramps for access and egress to and from I-295 and National Harbor. Within the Maryland portion of the project, 12.3 hectares (30.4 acres) of floodplain encroachment, requiring 1,330,325 cubic meters (1,740,000 cubic yards) of fill, is anticipated. As mentioned above, the preliminary hydraulic assessments developed for the project indicate that the 100-year flood levels shown on the Federal Emergency Management Agency's (FEMA), Flood Insurance Rate Maps for the Potomac River would not increase substantially as a result of the project. In addition to compliance with FEMA regulations, all activities within Maryland floodplains would comply with the Maryland Department of Natural Resources' Waterway Construction Regulations (COMAR 08.05.03) and would be designed in accordance with Maryland State Highway Administration's *Interim Hydrologic and Hydraulic Design Manual.*

In Virginia, where there is less topographic relief, the floodplains of the Potomac River and Cameron Run extend over a large percentage of the I-95/495 and the US 1 and Telegraph Road interchanges. Approximately 20.9 hectares (51.7 acres) of floodplain encroachment using 350,166 cubic meters (458,000 cubic yards) of fill would be required. Encroachment is primarily related to additional fill required for widening of I-95/495 and realignment of the interchanges. Despite this encroachment, hydraulic models indicate that the 100-year flood surface elevation would decrease by 0.2 meters (0.8 feet) at Telegraph Road and 0.4 meters (1.2 feet) along I-95/495 under the proposed conditions. This is due to the implementation of new bridge and culvert designs over Cameron Run that provide larger areas for flows to pass and better alignment, creating a more hydrologically efficient structure. All activities within the 100-year floodplain would be reviewed and approved by FEMA for compliance with federal regulations.

Borrow areas for fill required for the project have not yet been identified. Identification of suitable borrow areas will be undertaken during subsequent phases of design. Priority will be given to avoiding natural resource impacts and obtaining clean and stable fill materials.

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4.7.4 Waters of the United States

Changes in Impacts Since the FEIS: Waters of the United States, including nontidal and tidal wetlands, tidal mudflats, nontidal and tidal open water areas and submerged aquatic vegetation would be impacted by the construction of Current Design Alternative 4A. The area of impacts to Waters of the United States proposed by Current Design Alternative 4A has increased overall by 16.12 hectare (38.97 acres) since the 1997 FEIS. Table 4-27 illustrates the impact differences between the 1997 FEIS and Current Design Alternative 4A.

Table 4-27: Area of Impacts to Waters of the United States within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Area of Impact in Virginia, Maryland, and District of Columbia hectares (acres)		
	1997 FEIS	**Current Design**	**Change**
Tidal Wetlands	3.20 (7.99)	6.10 (15.00)	+2.90 (7.01)
Non-Tidal Wetlands	0.83 (2.09)	1.80 (4.50)	+0.97 (2.41)
Tidal Mudflats	0.34 (0.84)	0.40 (1.10)	+0.06 (0.26)
Tidal Riverine/Open Water	0.91 (2.27)	3.40 (8.50)	+2.49 (6.23)
Tidal Vegetated Shallows (Submerged Aquatic Vegetation)	4.42 (11.04)	12.80 (31.70)	+8.38 (20.66)
Non-Tidal Riverine/Open Water	0.08 (0.20)	1.40 (2.60)	+1.32 (2.40)
Total	**9.78 (24.43)**	**25.90 (63.40)**	**+16.12 (38.97)**

Source: Federal Highway Administration, Virginia Department of Transportation, Maryland State Highway Administration, and D.C. Department of Public Works. Joint Federal/State Permit Application – Virginia and ***Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999.***

The main Waters of the United States functions that would to be impacted by the proposed action include groundwater recharge/discharge, floodflow alteration, sediment/shoreline stabilization, sediment/toxicant retention, nutrient removal/retention/transformation, production export, fish and shellfish habitat, recreation, educational/scientific value, visual quality/aesthetics, and wildlife habitat. Impacts to Waters of the United States are a result of filling, excavation, utility relocations, park improvements, road crossings, culvert installation, sediment erosion control, construction assess, and bridge/ramp constructions. Mitigation is proposed to replace the functions impacted by the project (refer to Appendix B for the proposed mitigation plan).

The increase in impacts to Waters of the United States results from the following conditions that have changed since the 1997 FEIS:

- *Natural Changes to the Areal Extent of Submerged Aquatic Vegetation (SAV) Beds:* The 1997 FEIS delineated SAV based on 1995 Virginia Institute of Marine Science (VIMS) annual SAV monitoring program aerial photography. The SAV delineation in the Potomac River, Smoots Cove and Hunting Creek was re-evaluated for Current Design Alternative 4A using 1999 aerial photographs. In addition, field visits by the USGS and USACOE were conducted to verify precursory assumptions that the resource has changed from that identified in 1995. Based on

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those reviews, the 160 hectares (395 acres) of SAV shown in the 1997 FEIS appear to have increased to 255 hectares (631 acres) representing an increase of 37 percent within the project area.

- *Expansion of the Project Limits:* Additional Waters of the United States were identified at extensions to the endpoints of the project as a result of further study since the 1997 FEIS. The following is a list of project extensions where new Waters of the United States were identified:
  - I-295 north of I-95/495 to Chesapeake Street (approximately 3.7 kilometers (2.3 miles)). Four new Waters of the United States areas were identified.
  - MD 210 east of Livingston Road (approximately one kilometer (0.6 mile)). One new Waters of the United States area was identified.
  - Maryland 210 north of the Beltway (approximately one kilometer (0.6 mile)). One new Waters of the United States area was identified.
  - Maryland 210 south of Oxon Hill Road (approximately 1.2 kilometers (0.75 mile)). Three new Waters of the United States areas were identified.
  - Telegraph Road west of the Telegraph Road I-95/495 interchange (approximately 2.4 kilometers (1.5 miles)). Five new Waters of the United States areas were identified.
  - Burgundy Road relocation south of Telegraph Road I-95/495 interchange. One new Waters of the United States area was identified.

- *Change in Project Scope in Maryland:* Greater understanding of potential impacts were identified during the 30% design phase and a detailed constructability review of the overall project was conducted. Based on this information,.and input from stakeholder panels, numerous roadway design aspects were refined since the 1997 FEIS that resulted in additional impacts to Waters of the United States. Specific increases in impacts in Maryland would occur for the incorporation of transition lanes north of the I-295 interchange near the District of Columbia boundary and the interchange connection ramps to National Harbors south of the I-295 interchange. On Rosalie Island, the bridge height was raised since the FEIS to accommodate a deckover that would provide pedestrian and maintenance vehicle access to the island. This in turn required an increase in the fill slopes at either end of the deckover and along the causeway from the Maryland shoreline resulting in increased impacts to Waters of the United States. At the MD 210 interchange, the realignment of Bald Eagle Road will result in additional impacts to Waters of the United States.

- *Further Analysis of Construction Requirements for the Bridge Structure:* Since the 1997 FEIS, a detailed analysis of methods for construction of the V-Piers and the superstructure resulted in increased dredging requirements which increases impacts to SAV and tidal open water habitats. The preferred construction methodology is based upon construction methods and operations that a contractor would require to have complete and safe access to construct the spans across the SAV bed. This includes the need for large cranes placed on large barges, the perpendicular orientation of crane barges to the bridge for efficient lifting, and the need for watercraft access while the crane barge is in operation.

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- *Change in Project Scope in Virginia:* In Virginia, increased impacts to Waters of the United States would result from the addition of a connector road between an existing residential neighborhood and Telegraph Road, opposite Lenore Lane and a new ramp connecting northbound US 1 with the westbound Beltway. This connector road was added as per recommendations of a Stakeholder Participation Group. Impacts to Waters of the United States at Jones Point Park are also proposed for the construction of park improvements. Additionally, relocation of transmission towers adjacent to Cameron Run was not fully assessed in the 1997 FEIS.

- *Further Study of Avoidance and Minimization Measures Proposed in the 1997 FEIS:* The avoidance and minimization techniques used in the 1997 FEIS were determined to be infeasible from a constructability analysis. Greater understanding of potential impacts were identified during the 30% design phase and a detailed constructability review of the overall project. Impacts of Waters of the U.S. are a result of filling, excavation, utility relocations, park improvements, road crossings, culvert installation, sediment erosion control, construction assess, and bridge/ramp constructions.

Vegetated Waters of the United States: Vegetated Waters of the United States (i.e., wetlands), including tidal and nontidal habitats will be impacted by the project in Maryland, the District of Columbia, and Virginia. Table 4-28 provides a summary comparison between the 1997 FEIS impacts and the Current Design Alternative 4A impacts. Table 4-29 lists the area and functions of these resources that will be impacted by Current Design Alternative 4A.

Table 4-28: Area of Impacts to Vegetated Waters of the United States within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Area of Impact in Maryland, District of Columbia, and Virginia hectares (acres)		
	1997 FEIS	**Current Design**	**Change**
Tidal Wetlands	3.20 (7.99)	6.10 (15.00)	+2.90 (7.01)
Non-Tidal Wetlands	0.83 (2.09)	1.80 (4.50)	+0.97 (2.41)

Source: *Federal Highway Administration, Virginia Department of Transportation, Maryland State Highway Administration, and D.C. Department of Public Works. Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999.*

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Table 4-29: Impacts to Each Vegetated Waters of the United States within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Waters of the United States Number	State	Impacted Area hectares (acres)	Function and Value to be Impacted*
Nontidal Forested Wetland	A	Virginia	0.04 (0.10)	FA, S/TR
Nontidal Forested Wetland	B	Virginia	0.10 (0.30)	FA, S/TR
Nontidal Emergent Wetland	C	Virginia	0.04 (0.10)	GR/D, FA, S/TR
Nontidal Forested Wetland	D	Virginia	0.04 (0.10)	S/TR, PE
Nontidal Emergent Wetland	E	Virginia	0.08 (0.20)	GR/D, FA, S/TR
Nontidal Emergent Wetland	6	Virginia	0.20 (0.60)	FA, WH
Nontidal Forested Wetland	7A	Virginia	0.04 (0.10)	WH
Nontidal Forested Wetland	7C	Virginia	0.04 (0.10)	WH
Nontidal Emergent Wetland	7F	Virginia	0.04 (0.10)	S/SS
Nontidal Forested Wetland	14A	Virginia	0.20 (0.70)	FA, WH
Tidal Forested Wetland	14B1	Virginia	0.04 (0.10)	FA, S/TR, WH
Tidal Forested Wetland	14B2	Virginia	0.04 (0.10)	FA, S/TR, WH
Tidal Forested Wetland	14C1& C2	Virginia	0.97 (2.40)	FA, S/SS, WH
Nontidal Forested Wetland	14D	Virginia	0.04 (0.10)	Not available in source documents
Nontidal Forested Wetland	14E	Virginia	0.08 (0.20)	S/SS, WH
Nontidal Forested Wetland	15A	Virginia	0.04 (0.10)	FA, S/SS
Tidal Emergent Wetland	15B	Virginia	0.04 (0.10)	FA, S/SS
Tidal Forested Wetland	16	Virginia	0.57 (1.33)	FA, F/SH, S/TR, S/SS, WH
Tidal Emergent Wetland	17	Virginia	0.61 (1.50)	FA, S/TR, S/SS, WH
Tidal Forested Wetland	18 & 18A	Virginia	0.28 (0.70)	FA, S/TR, S/SS, WH
Tidal Emergent Wetland	19 & 19A	Virginia	1.25 (3.10)	FA, F/SH, S/TR, NR, PE, S/SS, WH, VQ/A
Tidal Forested Wetland	19B, 20, & 20A	Virginia	0.20 (0.50)	FA, F/SH, S/TR, NR, PE, S/SS, WH
Tidal Forested Wetland	23	Virginia	0.01 (0.03)	FA, S/TR, S/SS, WH, VQ/A
Tidal Forested Wetland	24	Virginia	0.05 (0.10)	FA, S/TR, S/SS, WH, VQ/A
Tidal Emergent Wetland	24	Virginia	1.25 (3.10)	FA, F/SH, S/TR, NR, PE, S/SS, WH, VQ/A
Tidal Forested Wetland	25	Virginia	0.02 (0.04)	FA, S/TR, S/SS, WH, VQ/A
Nontidal Forested Wetland	26	Virginia	0.02 (0.05)	WH
Nontidal Forested Wetland	27	Virginia	0.60 (0.15)	WH
Tidal Forested Wetland	28	Virginia	0.04 (0.10)	WH
Tidal Scrub/Shrub Wetland	29	Virginia	0.08 (0.20)	FA, S/TR, NR, PE, S/SS, WH
Nontidal Emergent Wetland	30A & 30B	Virginia	0.20 (0.50)	FA, S/TR, NR, PE, WH, S/SS
Tidal Emergent Wetland	31	Virginia	0.04 (0.10)	Not available in source documents
Nontidal Forested Wetland	35A	Maryland	0.16 (0.40)	FA, S/SS, WH
Nontidal Forested Wetland	35B	Maryland	0.08 (0.20)	FA, S/SS, WH
Tidal Forested Wetland	39C & 39E	Maryland	0.40 (1.00)	FA, S/TR, NR, PE, S/SS, WH
Tidal Forested Wetland	39D	Maryland	0.08 (0.20)	FA, S/SS, WH
Nontidal Forested Wetland	39F	Maryland	0.10 (0.30)	FA, S/SS, WH
Tidal Forested Wetland	Area 1-2	Maryland	0.10 (0.30)	GR/D, FA, S/TR, NR, WH, VQ/A
Nontidal Forested Wetland	Area 1-2	Maryland	0.04 (0.10)	GR/D, FA, S/TR, NR, WH, VQ/A

* Abbreviations for functions and values: groundwater recharge/discharge (GR/D), floodflow alteration (FA), sediment/shoreline stabilization (S/SS), sediment/toxicant retention (S/TR), nutrient removal/retention/transformation (NR), production export (PE), fish and shellfish habitat (F/SH), visual quality/aesthetics (VQ/A), educational-scientific value (ESV), and wildlife habitat (WH).

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Unvegetated Waters of the United States: Unvegetated Waters of the United States (i.e., streams and mudflats), including tidal and nontidal habitats will be impacted by the project in Maryland, the District of Columbia, and Virginia. Table 4-30 provides a summary comparison between the 1997 FEIS impacts and the Current Design Alternative 4A impacts. Table 4-31 lists the area and functions of these resources that will be impacted by Current Design Alternative 4A.

Table 4-30: Area of Impacts to Unvegetated Waters of the United States within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Area of Impact hectares (acres)		
	1997 FEIS	Current Design	Change
Tidal Mud Flats	0.34 (0.84)	0.40 (1.10)	+0.06 (0.26)
Tidal Riverine/Open Water	0.91 (2.27)	3.40 (8.50)	+2.49 (6.23)
Non-Tidal Riverine Open Water	0.08 (0.20)	1.40 (2.60)	+1.32 (2.40)

Source: *Federal Highway Administration, Virginia Department of Transportation, Maryland State Highway Administration, and D.C. Department of Public Works. Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999.*

Table 4-31: Impacts to Each Unvegetated Waters of the United States within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Waters of the United States Number	State	Impacted Area hectares (acres)	Function and Value to be Impacted *
Nontidal Waters	A	Virginia	0.08 (0.20)	WH, F/SH
Nontidal Waters	B	Virginia	0.04 (0.10)	WH, F/SH
Nontidal Waters	C	Virginia	0.04 (0.10	WH, F/SH
Nontidal Waters (Cameron Run)	D	Virginia	0.69 (1.70)	WH, F/SH
Nontidal Waters	E	Virginia	0.28 (0.70)	WH, F/SH
Nontidal Waters	2	Virginia	0.04 (0.10)	WH, F/SH
Nontidal Waters	3A	Virginia	0.04 (0.10)	WH, F/SH
Nontidal Waters	3B	Virginia	0.04 (0.10)	WH, F/SH
Nontidal Waters	3C	Virginia	0.08 (0.20)	WH, F/SH
Nontidal Waters	4A	Virginia	0.20 (0.50)	WH, F/SH
Nontidal Waters (Taylor Run)	4B	Virginia	0.08 (0.20)	WH, F/SH
Tidal Waters	Hooffs Run	Virginia	0.16 (0.40)	WH, F/SH
Tidal Flat	Hunting Creek	Virginia	0.45 (1.10)	WH, F/SH
Nontidal Waters	24	Virginia	0.04 (0.10)	WH, F/SH
Tidal Waters	Potomac River	DC	0.16 (0.40)	WH, F/SH
Tidal Waters	Potomac River	Maryland	1.74 (4.30)	WH, F/SH
Nontidal Waters	F1 & F2	Maryland	0.04 (0.10)	WH, F/SH
Tidal Waters	Oxon Cove	DC	0.80 (2.00)	WH, F/SH

- Abbreviations for functions and values: groundwater recharge/discharge (GR/D), floodflow alteration (FA), sediment/shoreline stabilization (S/SS), sediment/toxicant retention (S/TR), nutrient removal/retention/ transformation (NR), production export (PE), fish and shellfish habitat (F/SH), visual quality/aesthetics (VQ/A), educational-scientific value (ESV), and wildlife habitat (WH).

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Submerged Aquatic Vegetation: SAV of the Potomac River will be impacted by Current Design Alternative 4A for dredging construction access channels and construction of bridge piers. SAV provides fish and shellfish habitat, wildlife habitat, and nutrient removal/retention/transformation functions. Further study of access for barge mounted cranes, work boats, barges, and design of the bridge structure resulted in changes in impacts to SAV from the 1997 FEIS. A detailed discussion of the scenarios studied for construction of the bridge resulting in the currently proposed impacts to SAV is presented in Appendix F, Assessment of Potential Construction Effects. Table 4-32 provides a summary comparison between the 1997 FEIS impacts and the Current Design Alternative 4A impacts. The increase in SAV impacts are attributed to expanded jurisdictional limits of SAV within the project area as defined by 1999 USGS and VIMS surveys of SAV coverage. These increases are also due to expanded work area requirements to facilitate safety concerns for construction of the bridge and impacts associated with water dependent potential construction staging areas.

Table 4-32: Area of Impacts to SAV within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Area of Impact in Maryland and the District of Columbia hectares (acres)		
	1997 FEIS	Current Design	Change
Tidal Vegetated Shallows (SAV)	4.42 (11.04)	12.80 (31.70)	+8.38 (20.66)

Source: FHWA, VDOT, MSHA, DC-DPW Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999.

The impacts to SAV are further described within Table 4-33, that lists the areas and functions of SAV resources that will be impacted by Current Design Alternative 4A.

Table 4-33: Area of Impacts to SAV within the Project Area and Potential Construction Staging Areas

Waters of the United States Type	Waters of the United States Number	State	Impacted Area hectares (acres)	Function and Value*
SAV	Potomac River	DC	0.30 (0.80)	F/SH, NR, WH
SAV	Potomac River	Maryland	12.50 (30.90)	F/SH, NR, WH

* Abbreviations for functions and values: groundwater recharge/discharge (GR/D), floodflow alteration (FA), sediment/shoreline stabilization (S/SS), sediment/toxicant retention (S/TR), nutrient removal/retention/transformation (NR), production export (PE), fish and shellfish habitat (F/SH), visual quality/aesthetics (VQ/A), educational-scientific value (ESV), and wildlife habitat (WH).

Avoidance /Minimization: During the project's current design stage, measures to avoid and minimize impacts to Waters of the United States were investigated and used where feasible. These methods include: lowering ramp elevations to reduce fill slopes, reducing shoulder widths, limiting the shift of I-95/495 in the Cameron Run area, combining noise walls and retaining walls to reduce footprint area, adjusting ramp alignments, bridging wetlands and streams, using 2:1 embankment slopes and retaining walls, and replacing bridge piers at their existing locations.

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Telegraph Road: Complete avoidance of impacts to Waters of the United States is not practicable. I-95/495 and Telegraph Road are immediately adjacent to and cross Cameron Run and several named and unnamed tributary streams. Existing bridges over Cameron Run cannot be further widened without adversely impacting established flood elevations. Box and pipe culvert systems will need to be extended to accommodate the proposed roadway improvements. All prudent and feasible efforts are proposed to avoid impacts to existing Waters of the United States.

- The design of the I-95/495 Telegraph Road interchange, including necessary widening along I-95/495 and Telegraph Road is in general accordance with the Alternative 4A as presented in the 1997 FEIS. As part of the preliminary design process, modifications and refinements to the 1997 FEIS Alternative were undertaken to improve traffic operations and to address the concerns of constituents and the various agencies involved. During the development of these modifications and the subsequent preliminary design process, every effort to minimize additional impacts associated with the proposed improvements were considered.

Additional impacts to Waters of the United States along Cameron Run have been avoided or minimized by the following measures:

- Minimizing the profile grade changes along I-95/495 to provide the required vertical clearances of 16.5 feet at overpasses. This change minimizes impacts to waters by reducing encroachment from increased fill slopes.
- Reducing shoulder widths along the local lanes in both directions near the existing Metro Bridge over I-95/495 to avoid further widening to the south along Cameron Run.
- Limiting the centerline shift of I-95/495 to the south to avoid and minimize additional impacts to waters and wetlands along Cameron Run.
- Combining proposed noise walls and retaining walls along the south side of the Outer Loop Local lanes to avoid or minimize impacts to Waters of the United States between the Eisenhower Avenue Connector and I-95/495/Telegraph Road Interchanges.
- Additional impacts from construction access requirements have been included. Due to traffic maintenance and safety concerns on I-95/495, avoidance of construction access impacts in certain areas is not practicable.

Specific avoidance was accomplished at several locations where design enhancements were minimized or eliminated to avoid impacts to Waters of the United States completely. These are listed below.

- Wetland 7D – Potential channel improvements were eliminated. Construction techniques are designed to avoid this wetland, which is approximately 60 feet downstream of the proposed widened bridge. Although this was identified as an undisturbed area in the FEIS, additional design efforts were used to maintain this area as undisturbed.
- Wetland 7B – Potential channel improvements were eliminated. In addition, fill impacts from Ramp A were minimized to avoid this wetland. Although this was identified as an undisturbed area in the FEIS, additional design efforts were used to maintain this area as undisturbed.

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- Wetland 7E – Ramp A2 was shifted to the north and placed on structure when compared with the FEIS design as part of the modifications made to Alternative 4A. This wetland impact has now been completely avoided.
- Impacts to Waters of the United States from construction access requirements will be minimal, as no permanent fills are proposed. In addition, construction access conditions will be implemented to reduce and minimize secondary impacts from these actions. These construction access conditions will include the use of work mats, cofferdams or other acceptable construction methods when working in Waters of the United States Impacts to forested wetlands for construction access will be mitigated in-kind in place after construction, as no permanent fill is proposed.

Minimization measures, which have been incorporated into the preliminary design plans, are presented in Table 4-34 from west to east along I-95/495.

Table 4-34: Avoidance and Minimization Efforts – Telegraph Road Interchange

Waters of the United States Number	Unavoidable Impacts	Minimization Efforts
WOUS C	WOUS between Inner Loop and Cameron Run at widened section near Eisenhower Avenue Connection Interchange.	2:1 embankment slope being used. Slope stability may allow these impacts to be changed to temporary during later design phases.
Wetland C	Wetland between Inner Loop and Cameron Run at widened section near Eisenhower Avenue Interchange.	2:1 embankment slope being used. Slope stability may allow these impacts to be changed to temporary during later design phases.
Wetland D	Wetland between Inner Loop and Cameron Run at widened section near Eisenhower Avenue Connector Interchange.	2:1 embankment slope being used. Slope stability may allow these impacts to be changed to temporary during later design phases.
Wetland B	Wetland south of the Outer Loop along unnamed tributary to Cameron Run. Maintenance of traffic concerns.	Retaining/Noise wall to be provided to avoid permanent impacts. Impacts along this area will not involve permanent fill and will be mitigated on site, in kind. Construction access impacts only.
WOUS B	WOUS at upstream end of culvert south of the Outer Loop along unnamed tributary to Cameron Run. Maintenance of traffic/safety concerns on I-95/495 limit construction access for sound wall construction.	Retaining/Noise wall to be provided to avoid permanent impacts. Impacts along this area will not involve permanent fill and will be mitigated on site, in kind. Construction access impacts only.
Wetland A	Wetland south of the Outer Loop along unnamed tributary to Cameron Run.	2:1 embankment slope being used.
WOUS A	WOUS south of Outer Loop along unnamed tributary to Cameron Run.	2:1 embankment slope being used.
Wetland E	Wetland north of project between Inner Loop and Cameron Run along widened section.	2:1 embankment slope being used.
Wetland 7A	Wetland under WB on-ramp (Ramp D) from Telegraph Road to I-95/495.	WB on-ramp from Telegraph Road to I-95/495 shifted north. Bank stabilization, grading and a retaining wall will be used.
WOUS D	Cameron Run under I-95/495.	Piers extended on north and south sides. Removal and replacement of piers to their existing positions will minimize impacts to Cameron Run.

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Table 4-34 (continued) -Avoidance and Minimization – Telegraph Road Interchange

Waters of the United States Number	Unavoidable Impacts	Minimization Efforts
Wetland 7C	Wetland under I-95/495 and widened bridge (Outer Loop Local lanes).	Bank stabilization, grading and a retaining wall will be used.
WOUS E	WOUS under the I-95/495 exit ramp (Ramp H) from Outer Loop Local lanes to Huntington Avenue and Southbound Telegraph Road. Also includes relocated Burgundy Road.	Extension of box culverts will minimize impacts on water quality and stream flow and will maintain surface water connectivity.
WOUS D	Cameron Run under Telegraph Road.	Removal and replacement of piers to existing position will minimize water quality and stream flow impacts on Cameron Run. Temporary bridges will be used during construction.
WOUS 4A	Taylor Run under I-95/495 exit ramp from Inner Loop Local lanes to NB Telegraph Road and Pershing Ave. (Ramp G).	Installation of culverts will minimize impacts on water quality and stream flow and will maintain surface water connectivity and hydrology source for lower-lying non-tidal Wetlands 7E, 7F and 12.
WOUS 3A	WOUS 3A east of Telegraph Road Inner Loop access ramp (Ramp F) lane additions on I-95/495 shifted this access ramp into this WOUS. Due to the large wetland area to the south of I-95/495 (Wetland 7E), this impact was unavoidable. Bridging this WOUS was not practicable due to the existing culverts up and downstream.	Impacts will be minimized by the extension of existing culverts to maintain water quality, stream flow and surface water connectivity.
WOUS 3B & 3C	WOUS 3B under Ramp E on ramp from Telegraph Road to the Outer loop. WOUS 3C located under bridge structures Ramp A1 and A2. Due to the lane expansion on I-95/495 and the need for local traffic lanes, the avoidance of these ramp impacts was not feasible. The avoidance of the WOUS 3B impact through bridging was not practicable due to existing upstream box culverts. WOUS 3C will be bridged, but due to the need for construction access and scour protection requirements, avoidance was not practicable.	Due to the lack of upstream stormwater management, this stream requires scour protection to the vicinity of Cameron Run. Impacts will be minimized through the maintenance of stream flow and surface connectivity. In addition, 3C waters will be maintained as open waters.
WOUS 4B	WOUS 4B (Taylor Run) under Telegraph Road, I-95/495 and exit from NB Telegraph Road (Ramps A1 and A2).	The convergence of the ramp connections from NB Telegraph Road and the Outer Loop Local lanes to Eisenhower Ave. was shifted SW. Impacts to WOUS 4B and lower-lying non-tidal Wetlands 12 and 12A will be minimized by the installation of culverts to maintain water quality, stream flow and surface water connectivity.
Wetlands 6, 14A, 14B1, 14B2, 14C1	Wetlands in the path of Outer Loop I-95/495.	Impacts will be minimized by buffer zones and grading to ensure maintenance of water quality and hydrology sources for the southern portions of Wetlands 6, 14B1, 14B2 and 14C1.

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US 1: Complete avoidance of impacts to Waters of the United States is neither prudent nor feasible. The existing roadway is surrounded by and crosses extensive open water, wetlands and tidal flats. Expansion of the existing roadway will necessitate additional impacts to these resources. All prudent and feasible efforts have been taken to avoid impacts and to minimize all unavoidable impacts.

The design of the facility, and thus the avoidance of Waters of the United States, is constrained by commitments made during the 1997 FEIS. The project includes commitments that dictate the width and location of the bridge over the Potomac River, which is the eastern terminus for this design section. Since the 1997 FEIS, modifications were undertaken to improve traffic operations or to address the concerns of constituents or other agencies. During development of these modifications, every effort was made to minimize the footprint of the interchange. The modifications, which affect wetlands or waters, include:

- Reserving space in the median for future transit (i.e., light rail), requiring a wider foot print.
- Addition of Ramp D to allow US 1 north to I-95/495 south movement.

All efforts were made to avoid impacts to wetlands, however the design requirements and the presence of wetlands immediately adjacent to the existing facility made complete avoidance of impacts impossible. The proposed facility was placed as far to the north and away from the wetlands and open water as possible, given the physical constraints located along the northern edge of the project. The minimal footprint was employed which could accommodate all of the required design elements (number of lanes, ramps, shoulders, etc.).

Avoidance by moving the facility further north is not prudent or feasible due to the large number of physical constraints north of the existing facility, including: the Metrorail line, an office building, the Mill Road connection, the Alexandria Public Safety Building, high power transmission lines, Lee Recreation Center (4(f) property), Freedmen's Cemetery (4(f) property), St. Mary's Cemetery (4(f) property), and the Alexandria Historical District (4(f) property).

Moving the facility further south to avoid the wetlands associated with Cameron Run and Hunting Creek is not prudent or feasible. Moving the facility further south will increase encroachment into the open waters of Cameron Run and Hunting Creek, and increase impacts to tidal wetlands and unvegetated tidal flats. In addition, it will increase impacts to the Hunting Towers and Hunting Terrace residential complexes.

The design of this section has minimized unavoidable impacts to Waters of the United States, including open water, vegetated wetlands, and unvegetated tidal flats. The following efforts were used to minimize unavoidable impacts:

- Alignment 4A was shifted north as far as possible to reduce impacts, while still maintaining the connection to Mill Road.
- Shoulder width was narrowed on the inside shoulders to further minimize impacts.

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- Retaining walls have been proposed for all fill slopes that will encroach into the Cameron Run channel to minimize impacts to Waters of the United States and protect flood conveyance.
- Structures have been proposed for all unavoidable encroachments into the Cameron Run channel to minimize impacts to Waters of the United States and protect flood conveyance.
- Structures have been used for many of the ramps, overpasses and flyovers to minimize impacts to vegetated wetlands and unvegetated tidal flats. The use of structure instead of fills will reduce the footprint of impacts, maintain tidal and flood flows, and allow wildlife movement.

Specific reasons for unavoidable impacts and site specific efforts to minimize impacts are presented for each vegetated wetland impacted by the proposed project.

- Open Waters, Wetlands 14C1, 14C2, 14D - The Outer Loop Local will consist of three lanes with inside and outside shoulders. This travelway will increase in grade in order to transition into a structure, thus it will be constructed on fill within a set of retaining walls. The proposed roadway will carry twice the number of lanes as the existing facility. The proposed Outer Loop Local has been designed to minimize impacts to wetlands, waters and flood conveyance in Cameron Run. The alignment has been shifted as far north as possible while avoiding impacts to the Metro line, office buildings and the Public Safety Building. Impacts to Cameron Run were minimized by use of a retaining wall along the entire length of this road section. Placing this entire section of roadway on structure will not entirely avoid impacts to wetlands and will cost an additional $14.5 million. This cost to minimize, but not avoid impacts to wetlands was deemed not prudent. A 20-foot wide temporary construction zone will be required along the length of the retaining wall. This temporary construction zone will encroach into wetlands and open water, but will be restored after completion of construction. Temporary causeways or trestles will also be used for construction of the portion of the Outer Loop Local located on structure.

- Wetland 14E, Hooffs Run - The Outer Loop Local will consist of three lanes with inside and outside shoulders. The Outer Loop Express will consist of two conventional lanes and one HOV/Express lane, as well as shoulders. Ramp L will provide access from Mill Road to the Outer Loop Express. The proposed Outer Loop Local has been designed to minimize impacts to wetlands, water and flood conveyance in Cameron Run. The Outer Loop Local and Ramp L will be placed on structure over the wetland, while the Outer Loop Express will be placed on fill across the north edge of the wetland. The alignment has been shifted as far north as possible without increasing impacts to the high-tension lines and Hooffs Run. The use of a retaining wall to minimize encroachment of the Outer Loop Express into Wetland 14E was determined not to be prudent since it costs an additional $2.1 million to reduce impacts to only 0.2 acres of wetlands. Temporary causeways or trestles will also be used for construction of the portion of the Outer Loop Local located on structure.

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- Tidal Waters, Wetlands 15A, 15B - The Inner Loop Local will consist of three lanes with inside and outside shoulders. The proposed Inner Loop Local has been designed to minimize impacts to wetlands, water and flood conveyance. The Inner Loop Local will be placed on fill, however, the alignment has been shifted as far north as possible without increasing impacts to the high-tension lines and Hooffs Run. The use of a structure to minimize impacts to these wetlands was determined not to be prudent due to the additional $2.1 million to reduce impacts to only 0.17 acres of wetlands. Additionally, raising the vertical elevation to accommodate a structure may not be feasible.

- Open Waters, Wetlands 16, 17, 18, 18A - The Outer Loop Local will consist of three lanes with inside and outside shoulders. This travelway will increase in grade in order to transition into a structure, thus it will be constructed on fill within a set of retaining walls. The proposed roadway will carry twice the number of lanes as the existing facility. The proposed Outer Loop Local and ramps has been designed to minimize impacts to wetlands, waters and flood conveyance in Cameron Run. The alignment has been shifted as far north as possible while avoiding impacts to Lee Recreational Center. There are no other feasible minimization efforts. Temporary causeways or trestles will also be used for construction of the portion of the Outer Loop Local and the Ramps located on structure. The causeways will impact a portion of Wetland 17, as well as open water and tidal flats.

- Tidal Waters, Tidal Flats, Wetland 19, 19A, 20A - Ramp E provides access from US 1 northbound to the Outer Loop Local (I-95/495 NB). A bikeway is also included on this structure providing access between US 1 and the urban deck. The impacts of the ramp have been minimized by placing the entire ramp on structure over tidal waters, tidal flats, and wetlands. Ramp E has been designed to minimize impacts to wetlands, waters and tidal flats. The entire ramp north of Cameron Run is on structure over wetlands, waters and tidal flats. There will be a temporary construction trestle required to construct Ramp E, which will be removed after construction is completed.

- Tidal Flats, Wetland 19B/20 - Ramp D will carry US 1 NB to Inner Loop Local and Express. Ramp D extends from Ramp E over the Outer and Inner Loops. Its impacts are limited to only three piers placed in tidal flats along Hunting Creek. There will be a temporary construction trestle required to construct Ramp D, which will be removed after construction is completed.

- Tidal Flats, Wetland 19B/20, 19A - The Outer Loop Local will consist of three lanes with inside and outside shoulders. The Outer Loop Express will consist of two conventional lanes and one HOV/Express lane, as well as shoulders. The proposed Outer Loop Local and Express have been designed to minimize impacts to wetlands, waters and tidal flats. The slope was steepened as much as possible. The use of retaining walls to further minimize impacts was determined not to be prudent due to the additional costs of $7.4 million to reduce impacts to one acre of wetlands. Placing this section on structure was also determined not to be feasible since it will conflict with the vertical alignment of the urban deck. This section of the Outer Loop Local and Express, which will be on fill, will require extensive soil consolidation using pre-loading. This

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will result in an 80-foot wide temporary encroachment into the tidal flats and wetlands. Upon completion of construction, this area will be restored to tidal flats and wetlands.

- Wetlands 29, and open waters - Ramp C will carry US 1 SB to Outer Loop Local and Express. The ramp will cross over Cameron Run and Wetland 29, at a height of more than 40 feet. Avoidance of Wetland 29 is not possible since the ramps can not have a tighter radii and Wetland 29 extends along the entire southern bank of Cameron Run. Placing the ramp on structure over the wetland and Cameron Run has minimized impacts. There will be limited temporary impacts to Wetland 29 from two temporary causeways or trestles will also be used for construction of Ramps C, C-1 and I.

- Wetlands 30A, 30B, 31 and tidal waters - US 1 will carry three lanes of traffic in each direction, as well as connections for Ramp I and Ramp E, providing access to I-95/495. Compared to the existing facility, this represents a 50% increase in the width of the roadway. Extending the structure further to the south may minimize impacts to these wetlands. Additional geotechnical assessments in later design stages are required before the feasibility of extending these structures can be determined. Temporary causeways may be used for construction of Ramp E, I and US 1 over Cameron Run and a small portion of Wetland 31.

- Wetlands 24, 25, 26, 27, and 28 - The bridge through Jones Point Park will carry 12 lanes of traffic and a pedestrian pathway across the park and the Potomac River. The 12-lane bridge is located immediately south of the existing bridge. Wetlands 26, 27 and 28 are forested wetlands located within a larger forested area in the park. The bridge will cross directly over these three wetlands. The area under the bridge will be converted into parking areas.

Minimization measures, which have been incorporated into the preliminary design plans, are presented in Table 4-35 from west to east along I-95/495.

Table 4-35: Avoidance and Minimization Efforts – US 1 Interchange

Waters of the United States Number	Unavoidable Impacts	Minimization Efforts
14C1 & 14C2	Avoidance of Wetland 14C1 and 14C2 under Outer Loop Local will require relocation/demolition of the Metro line, an office building, and the Public Safety Building.	Shifting the alignment to the north minimized impact and a retaining wall was used to reduce encroachment into Cameron Run.
14D	Avoidance of Wetland 14D under Outer Loop Local will require relocation/demolition of the Public Safety Building, Mill Road, and high-tension power lines.	Shifting the alignment to the north minimized impact and a retaining wall was used to reduce encroachment into Cameron Run.
14E	Avoidance of Wetland 14E will require relocation of high-tension power lines and encroachment into Hooffs Run or increased encroachment into Cameron Run.	Placing Ramp L and the Outer Loop Local on structure minimized impacts. Fill slopes from Outer Loop Express have been reduced.

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Table 4-35 (continued): Avoidance and Minimization Efforts – US 1 Interchange

Waters of the United States Number	Unavoidable Impacts	Minimization Efforts
15A & 15B	Avoidance of Wetland 15A will require relocation of high-tension power lines and encroachment into Hooffs Run or increased encroachment into Cameron Run.	No feasible minimization efforts possible. The use of retaining wall will not reduce impacts.
16	Avoidance of Wetland 16 will require moving the Inner Loop Local travelway, and Ramps F, L, C, C-1 and I. This will increase encroachment into the channel of Cameron Run to the south or into Lee Recreational Center to the north.	Placing Ramps L, F, I, C, and C-1 and Outer Loop Local on structure have minimized impacts over Wetland 16.
17	Avoidance of Wetland 17 will require moving the Inner Loop Local travelway, and Ramps F, L, C, C-1 and I. This will increase encroachment south into Cameron Run or north into Lee Recreational Center.	Placing Ramps L, F, I, C, and C-1 and Outer Loop Local on structure have minimized impacts over Wetland 17.
18 & 18A	Avoidance of Wetland 18/18A will require moving the Inner Loop Local travelway, and Ramps F, L, C, C-1 and I. This will increase encroachment south into Cameron Run or north into Lee Recreational Center.	Placing Ramps F and I, and Outer Loop Local on structure have minimized impacts over Wetland 18 and 18A.
19 & 19A	Avoidance of Wetland 19 and 19A will require substantial encroachment south into Hunting Creek and Cameron Run, or north into the Freedmen's Cemetery and Historical District.	Placing Ramps E and F and US 1 on structure over Wetland 19 and portion of Wetland 19A have minimized impacts. Fill slopes were minimized to the extent practicable.
19B/20	Avoidance of Wetland 19B/20 will require substantial encroachment south into Hunting Creek and Cameron Run, or north into the Freedmen's Cemetery and Historical District.	Reducing fill slopes has minimized impacts.
20A	Avoidance of Wetland 20A will require elimination of Ramp E.	Impacts have been minimized by placing Ramp E on structure over Wetland 20A
24 & 25	Avoidance of Wetland 24 and 25 will require encroachment into Freedmen's and St. Mary's Cemeteries if moved north, or encroachment into the tidal flats of Hunting Creek if moved south.	Placing roadway on structure over Wetlands 24 and 25 has minimized impacts.
26, 27 & 28	Avoidance of these wetlands, which are located directly under the bridge will require encroachment into the historical district to the north or increased encroachment into Hunting Creek.	Placing roadway on structure over Wetlands 26, 27 and 28 has minimized impacts.
29	Avoidance of Wetland 29 is not feasible since these loop ramps can not be made tighter, and Wetland 29 extends along the entire shore of Cameron Run.	Impacts have been minimized by placing Ramp C on structure over Cameron Run and Wetland 29
30A	Avoidance of Wetland 30A will require relocation of US 1 to the east resulting in impacts to commercial properties and Wetland 31.	Placing much of Ramp I on structure over Wetland 30A has minimized impacts.
30B	Avoidance of Wetland 30B will require relocation of US 1 to the west resulting in impacts to commercial properties and Wetland 29.	Impacts have been minimized by placing much of Ramp E on structure over Wetland 30B
31	Avoidance of Wetland 31 will require blocking traffic on US 1 during construction of Ramp E, which was determined to not be a prudent measure.	Impacts have been minimized by placing Ramp E on structure over Wetland 31

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Mainline Bridge: Complete avoidance of impacts to Waters of the United States is neither prudent nor feasible. Eight basic construction scenarios were evaluated by a team of construction professionals and engineers to develop a recommendation as to the most prudent approach to construction that can be ascertained at this phase of design. Each of these scenarios was evaluated with respect to feasibility, SAV impacts, dredging requirements, safety implications, construction cost and schedule impacts.

The preferred construction methodology is based upon construction methods and operations that a contractor would require to have complete access to construct the spans across the SAV bed. The first element to consider is the size of the main construction access channel from the main navigation channel of the Potomac River into the shallow water area. The size of this channel will be predicated on the size of the barges that will use it. The size of the larger barges will in turn be predicated on the size of a crane necessary to lift the heavier construction elements and provide the necessary reach to assemble these elements.

It is anticipated that the reach to place a portion of steel box girder will be as far as 35.1 meters (115 feet), whereas an upper arch segment will be much less. A large crane ranging in width from 21.4 meters (70 feet) to 30.5 meters (100 feet) would be required. Research showed that often the barges with widths of 21.4 meters (70 feet) to 24.4 meters (80 feet) frequently have additional floats added, bringing the width to approximately 30.5 meters (100 feet).

A typical length for these barges is 45.7 meters (150 feet). This scenario assumes that at least two large crane barges are required for this type of heavy construction, each approximately 30.5 meters (100 feet) wide and 45.7 meters (150 feet) long. A 64-meter (210-foot) wide channel for this scenario allows a 45.7 meters (150-foot) long crane barge to rotate from a parallel position to the bridge to a perpendicular position to the bridge for setting the bridge outside girders. It further allows the crane barge to position itself far enough away from the girder line so that the crane boom does not hit the V-pier when erecting the girders. This maneuvering width also allows two 30.5 meters (100 foot) wide barges to pass one another. The assumed minimum depth of channel for the barges is 2.7 meters (9 feet), requiring approximately 2.3 meters (7.5 feet) of dredging. A 3:1 slope at the outer edge of the channel adds an additional 6.9 meters (22.5 feet) to the width of dredged area.

In addition to the main construction channel, dredging would be required for direct access immediately adjacent to the foundation and pier locations of the bridge. Since the piers are V-shaped and constructed in a segmental, balanced cantilever erection process, the width of the pier increases during construction, becoming largest at the top of the pier. This results in the crane barge needing substantial room to move laterally to construct these piers. Access is also needed between adjacent piers to position a crane barge to erect the superstructure, further adding to the area under the bridge that needs to be accessible to the floating equipment. These combined needs create a required accessible area that occupies the full footprint under the bridge. Therefore, the entire area under the bridge would need to be dredged.

Dredging would also be required for a channel north of the existing bridge to facilitate demolition of the existing bridge without interfering with any concurrent construction activities on the

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westbound (northern) bridge. This would also allow demolition in this area to occur at any time, even after the westbound (northern) bridge is open to traffic. It is estimated that an average demolition barge is 15.2 meters (50 feet) wide, therefore this channel has been sized to allow a 15.2 meters (50-foot) wide demolition crane barge to move parallel to the existing bridge. This demolition channel would also be 2.7 meters (9 feet) deep requiring approximately 2.3 meters (7.5 feet) of dredging. In addition, this channel would need to be extended under the full width of the existing bridge in order to facilitate construction of the new westbound or northern bridge.

With this proposal, the required channel width, including the area under the existing bridge is approximately 206.3 meters (677 feet), taking into account 3:1 side slopes. The width of the two channels impacting the SAV beds is 178 meters (584 feet) – 155.9 meters (511.5 feet) for the new bridge and 22.1 meters (72.5 feet) for the demolition channel taking into account 3:1 side slopes. Under this scenario, the amount of combined dredge volume required is 290,607 cubic meters (380,100 cubic yards). SAV impacts are approximately 12.8 hectares (31.7 acres), or approximately 7.0 percent of the acreage of SAV in the project area.

An alternative method that minimizes the width of the required channels while still maintaining relatively convenient access to construct the spans across the SAV beds. This scenario assumes similar construction sequencing and activities as those discussed above, but proposes a 45.7-meter (150-foot) wide channel south of the eastbound bridge instead of a 64-meter (210-foot) wide channel. In addition, this channel would be shifted northward to within five feet of the foundations of the new bridge, resulting in a portion of the channel being under the new bridge. This 45.7-meter (150-foot) wide channel would allow a 30.5-meter (100-foot) wide crane barge and a 12.2-meter (40-foot) wide working barge to safely pass during construction operations. This scenario also would allow the crane barge to position itself perpendicular to the new bridge, which is the safest position for the barge during heavy lifts for the superstructure since it will be working along its strong axis.

Under this arrangement, the southern pier of the eastbound (southern) bridge can only be partially constructed to allow a portion of a girder to be set on the northern pier of the eastbound (southern) bridge. If the southern pier was fully constructed to its finished height, the crane beam will hit it when reaching past to erect the girders over the northern pier.

Demolition of the existing bridge with this method would use a crane barge in the area between the existing bridge and the eastbound (southern) bridge instead of a channel north of the existing bridge. During demolition, working barges would be shuttled along a channel between the footings of the westbound (northern) bridge and the southern edge of the existing bridge. This area is 13.7 meters (45 feet) wide allowing a 12.2-meter (40-foot) wide barge, which is somewhat smaller than desired, to navigate parallel to the bridges across the full width of the SAV area to transport portions of the existing bridge that have been removed.

The required width of the channel for this method would be approximately 175.1 meters (574.5 feet), taking into account 3:1 slopes. Under this scenario, the amount of combined dredge volume required is 246,569 cubic meters (322,500 cubic yards). SAV impacts are approximately 9.1 hectares (22.5 acres), or approximately 5.7% of the acreage of SAV in the project area.

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This approach was not selected because it is somewhat less efficient than the recommended approach. A one-percent premium is estimated to be added to the construction cost to reflect these inefficiencies, adding $5.4 million to the cost of the bridge. In addition, it should be noted that demolition activities will be sharing areas with construction activities, causing more interaction of equipment, and potentially compromising site safety to a greater extent.

A third scenario that was studied uses the same approach to the construction of the new bridge as the second method, however, demolition of the existing bridge will occur from the new westbound (northern) bridge prior to all lanes being open to traffic or with lighter floating equipment not requiring dredging. This alternative assumes the same 45.7 meter (150-foot) wide channel to allow a 30.5-meter (100-foot) wide crane barge and a 12.2-meter (40-foot) wide working barge to pass. It also allows a 45.7-meter (150-foot) long barge to be positioned perpendicular to the proposed eastbound (southern) bridge.

This construction scenario assumes that the existing bridge will be demolished without a dredged access channel north of or under the existing bridge. Light floating equipment, or heavier equipment used during higher river flows, will be used to remove portions of the existing substructure and remove the piles to a depth at least below the bottom of the construction channel. Some demolition operations may be staged from the new westbound bridge as it is completed. This method severely limits the contractor during demolition. In addition, it requires the westbound (northern) bridge to be fully constructed with all equipment confined to the area between the existing and eastbound (southern) bridge. This will probably require two barge cranes to work in tandem for the heavier lifts or require the contractor to shift to a heavy lifting operation where girders are hoisted into position.

The required width of the channel for this method would be 133.2 meters (437 feet), taking into account 3:1 side slopes. Under this scenario, the amount of combined dredge volume required is 187,392 cubic meters (245,100 cubic yards). The width of the channel impacting SAV is 133.2 meters (437 feet), resulting in approximately 8.4 hectares (20.6 acres) impacted or approximately 5.2% of the acreage of SAV in the project area.

It should be noted that by confining the movements of the contractor while constructing the westbound (northern) bridge, additional time will inherently be added to the construction schedule. In addition, site safety will be compromised since it will be more difficult to evacuate the construction site in case of a major storm. Also, the heavy cranes, barges, materials, etc. will be working in a more confined area, increasing the potential for interference and accidents. This area becomes even more confined once the piers are constructed and the contractor begins to erect the superstructure. Due to the inefficiencies that have been introduced a year would likely be added to the construction schedule.

By adding appreciable inefficiencies into the construction process, a premium will also be added to the construction cost. It is estimated that construction bids will be inflated by approximately 2.5 % adding nearly $13.5 million to the cost of the bridge. In addition, delaying the bridge by one year

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also delays construction of the two adjacent interchanges by one year. This added duration will add inflation costs to the project.

A fourth method that was studied uses the same general approach as with Scenario 3, but with a narrower channel. Under this scenario, the channel has been narrowed to allow only a single 30.5 meters (100-foot) wide barge to move parallel to the new bridge. Any working barges will have to trail behind the crane barge since the channel will not be wide enough for two barges to conveniently and safely pass each other once the footings are constructed. This also requires certain heavy lifts to be performed off the side of the barge, which is its weakest axis. This will require the lifts to be light and will, therefore, introduce additional construction joints and field splices. In addition, working off the side of the barge instead of the front or back compromises the safety of crane operations on the barge.

The required width of the channel for this method would be 199.5 meters (392 feet), taking into account 3:1 side slopes. Under this scenario, the amount of combined dredge volume required is 168,202 cubic meters (220,000 cubic yards). The width of the channel impacting SAV is 199.5 meters (392 feet), resulting in approximately 7.5 hectares (18.4 acres), or approximately 4.7% of the acreage of SAV in the project area. Since this alternative decreases the maneuverability of the barges, additional inefficiencies will impact the duration and cost of construction. It is estimated that construction bids will be inflated by approximately 5% adding nearly $27 million to the project. In addition, schedule projections show that completion of the eastbound (southern) bridge will slip to 2005 adding a year to its schedule. The westbound (northern) bridge will experience a similar delay and extend out to 2008, two years behind schedule. The difference in present worth costs (1997) between a six year construction schedule and an eight year construction schedule equates to $118.3 million for the bridge and two adjacent interchanges assuming a 3.5% inflation rate. The total impact to the construction cost then amounts to $145.3 million.

An alternative was studied to minimize the acreage of SAV impacts regardless of schedule commitments and financial constraints. The approach involves constructing the new eastbound (southern) bridge from a channel that is primarily under the westbound (northern) bridge. The existing bridge would be demolished for a channel under the westbound (northern) bridge. The westbound (northern) bridge would then be constructed from a channel extending under the existing bridge. As in the previous scenarios, a minimum width of channel has been held at 150 feet not including side slopes.

It should be noted that the area under the westbound (northern) bridge would be used as the access channel for the eastbound (southern) bridge. Therefore, no construction activity can take place on the westbound (northern) bridge until the superstructure is erected for the eastbound (southern) bridge.

The required width of the channel for this method would be 133.2 meters (437 feet), taking into account 3:1 side slopes. Under this scenario, the amount of combined dredge volume required is 187,392 cubic meters (245,100 cubic yards). The width of the channel impacting SAV is 104.8 meters (344 feet) by 94.3 meters (309.5 feet) under the new bridge and 10.5 meters (34.5 feet) north

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of the existing bridge. The SAV impacts resulting from this combined width is approximately 6.3 hectares (15.5 acres).

With the demolition of the existing bridge being a critical step before much of the substructure of the westbound (northern) bridge could be started, a contractor would likely have demolition and construction operations occurring concurrently and in close proximity. These overlapping operations will further compromise site safety.

Under this scenario, since the first stage construction focuses resources on constructing the eastbound (southern) bridge first, this bridge should be completed in 2004. However, since much of the substructure of the westbound (northern) bridge cannot begin until the existing bridge is demolished, the westbound (northern) bridge will be delayed. With no southern construction channel, a portion of the existing bridge will need to be removed and the area underneath dredged before construction of much of the substructure of the westbound (northern) bridge across the SAV beds can begin. In the prior scenarios, it was anticipated that this portion of the substructure would be started sometime in the first four years. An estimated schedule shows that the westbound (northern) bridge would likely be completed by 2008, two years behind schedule. Approximately $118.3 million would be added by delaying the completion of the bridge and adjacent interchanges by two years. In addition, since this alternative decreases the maneuverability of the barges, additional inefficiencies would impact the duration and cost of construction. It is estimated that construction bids would be inflated by approximately 5% adding nearly $27 million to the project. The total construction cost would then be inflated by $145.3 million.

As an alternative to further reducing the construction related impacts in the river, consideration was given to an approach involving trestle cranes. This approach would require two trestle installations with cranes to construct both halves of the new bridge. One trestle would be located to the south of the proposed bridges. The other trestle would need to be either between the two new bridges, which may require them to be separated further, or to the area occupied by the existing bridge which would cause schedule impacts. A closed deck trestle would be recommended for this operation.

It should also be noted that 43,580 cubic meters (57,000 cubic yards) would need to be excavated in order to construct the foundations. This dredging would be done by the trestle cranes and shipped to a disposal site. In addition, at least 6 hectares (15 acres) of SAV would be impacted as a result of construction of the new bridge and temporary impacts form the southern most trestle, assuming a 21.4 meters (70-foot) trestle width. Additional SAV impacts would result if the northern trestle was to the north of the westbound (northern) bridge. The cranes on these trestles would need to run the full width of the SAV area, approximately 617 meters (2,024 feet). In addition, loading platforms would need to be located at either end of the trestle to handle and store construction materials. These platforms would need to be approximately 45.7 meters (150 feet) in length, adding 91.4 meters (300 feet) to the length of one trestle. It should also be noted that pile bents will need to be located about every 12.2 meters (40 feet) and at an estimated 16 piles per bent, these trestles will require nearly 1,900 piles to be driven and later pulled from the river bottom.

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In order to carry the load of a large crane, a trestle system of this nature has been estimated to cost approximately $140 per square foot. This would add nearly $52 million to the project for the two trestle installations, but would save as much as $18.5 million in dredging when compared with other alternatives.

The time to construct the first trestle would likely delay the initiation of construction of the foundations in the river. This would cause a year to be added to the schedule even with an assumption that the trestle cranes could continue to be constructed outside of the time of year restrictions. The construction of the eastbound (southern) bridge would then slip to 2005, adding a year to its schedule. The construction start of the westbound (northern) bridge would experience a similar delay and extend out to 2008, two years behind schedule. The schedule delays for completion of the bridge and adjacent interchanges by two years would add $118.3 million to the project due to inflation. It is estimated that construction bids for the bridge would also be inflated by approximately five percent because of inherent inefficiencies adding nearly $27 million. The total impact to the construction cost would then amount to $125.5 million.

As an alternative to dredging a full width channel, consideration was given to minimize the quantity of dredging. Under this scenario, it was assumed that the foundations would be constructed from a barge and that tower cranes would be erected off those foundations to construct the piers and superstructure. Since the foundations will require a lighter crane, the channel proportions have been set-up for a 21.4-meters (70-foot) wide crane barge. The main construction channel would be wide enough for a 21.4-meters (70-foot) wide crane barge and a 12.2-meters (40-foot) wide working barge to pass. Access to the foundations would be provided by the narrowest finger channel that is reasonable. This finger channel would be wide enough for a 21.4-meters (70-foot) wide crane barge to maneuver close to the foundation locations.

This required channel width would be 55.3 meters (181.5 feet) wide at the surface taking into account 3:1 side slopes. This configuration would be dredged perpendicular to the main construction channel at the six pier locations. The dredging for this scenario amounts to 118,506 cubic meters (155,000 cubic yards) for the main channel and the five finger channels. SAV impacts associated with this alternative would be approximately 7.8 hectares (19.4 acres) or approximately 5% of the acreage of SAV in the project area. The estimated cost to dredge this channel and transport and dispose of the spoil material a disposal site will be approximately $7.0 million.

This scenario assumes that the existing bridge would be demolished largely from the new bridge prior to all lanes being opened to traffic. However, due to the restricted maneuverability of the barges under this scenario, it is likely that the necessary foundations may not be completed in the first period when there are no time of year restrictions. Therefore, at least a year would be added to the schedule for the eastbound (southern) bridge.

In addition, it should be noted that a tower crane would need to be constructed at each pier location in order to erect the superstructure by a balanced cantilever method. This tower would have to be erected and dismantled five separate times for one half of the bridge, ten times in total, requiring additional time and cost. The schedule impact may add another year to the schedule for the first

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half of the bridge causing it to be completed by 2005-2006, one or two years behind schedule. Furthermore, once the piers are constructed, positioning the girder elements on barges to be lifted by the tower cranes becomes problematic. The girder elements would have to be positioned under the piers and raised by the cranes very delicately between the piers. The safety aspects and cumbersome nature of these lifts is a very undesirable arrangement and was not recommended as a viable solution to this project.

Constructing the five piers, and associated superstructure, incrementally from the spans in deeper water was considered as a method to further reduce the SAV impacts since neither the construction channel nor the trestle systems would be needed. "Top down construction" is feasible for short span structures specifically designed for construction by this technique with spans in the range of 50 to 15.2 to 30.4 meters (100 feet). The span length and configuration of the proposed bridge precludes consideration of this construction technique.

Dolphins and Construction Access: Regardless of the construction technique selected for the Woodrow Wilson Bridge, additional dredging will be required for the construction of dolphins at the navigational channel. Dolphins are structures placed near the navigation channel that protect against damage to the bridge piers from ship collisions with the bridge. Fourteen dolphins are proposed resulting in additional dredging quantity of 25,689 cubic meters (33,600 cubic yards) and impacts to Waters of the United States. These dolphins are essential for safe navigation and protection of the bridge structure and their impacts to Waters of the United States can not be avoided.

In order to construct any type of bridge crossing, areas to store and supply materials and equipment must be provided. A detailed discussion of construction staging areas can be found in Appendix F, Assessment of Potential Construction Effects. One of the sites would likely require water access so that these materials can be transported to the construction area by watercraft. 17 sites have been analyzed since the 1997 FEIS as potential construction staging areas and the use of seven of the sites could potentially impact Waters of the United States. Upland disposal of dredge material may be used for this project and impacts to Waters of the United States (primarily tidal waters and SAV areas) would be anticipated for this activity. The impacts would result from the dredging of an access channel and construction of a shore-based offloading area. Impacts to these resources is included in the impact tables provided earlier in this section. These impacts can not entirely be avoided, and they are minimized by proposing dredging the minimum width of channel required and constructing the minimum length of shore-based offloading area that is feasible.

I-95/495/I-295 Interchange: Complete avoidance of impacts to Waters of the United States is not practicable. I-95/495 and I-295 are situated along the Maryland shore near Waters of the United States that are very close to the existing embankment slope toes. Since the resources are very near the existing facility, it was not feasible to avoid all of these resources for the proposed roadway improvements. All prudent and feasible efforts have been taken to avoid impacts, and to minimize all unavoidable impacts.

The design of the facility, and thus the avoidance of Waters of the United States, is constrained by commitments made during the 1997 FEIS. The project includes commitments that dictate the width and location of the bridge over the Potomac River, which is the western terminus for this design

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section. Since the 1997 FEIS, modifications were undertaken to improve traffic operations or to address the concerns of constituents or other agencies. During development of these modifications, every effort was made to minimize the footprint of the interchange. The modifications which affect Waters of the United States include:

- Adding transition lanes near the District of Columbia boundary.
- Revisions to the dimensions and construction methods for the bikeway.
- Site design requirements at Rosalie Island for the deckover.

All efforts were made to avoid impacts to Waters of the United States, however the design requirements and the presence of these resources immediately adjacent to the existing facility made complete avoidance of impacts impossible. All prudent and feasible efforts are proposed to avoid impacts to existing Waters of the United States.

Specific reasons for unavoidable impacts and site specific efforts to minimize impacts are presented for each vegetated wetland impacted by the proposed project.

Wetland Area 1/2 - I-295 Northbound (NB) is designed to carry two lanes of traffic from I-95/495 Outer Loop Local (Ramp B), two lanes of traffic from MD 210 (Ramp F), one lane of traffic from I-95/495 Inner Loop Local (Ramp I), one lane of traffic from National Harbor (Ramp T), and one lane of HOV traffic from I-95/495 Outer Loop Express for a total of seven lanes. These lanes are required to satisfy traffic capacity requirements for the design year 2020. I-295 NB has been designed to transition these seven lanes to three lanes north of the Oxon Run Bridge. Four lanes of I-295 NB traffic are to be carried over the reconstructed bridge at Oxon Run.

In comparison, existing I-295 provides four lanes from existing Ramps B, I, and F and quickly merges to two northbound lanes. In essence, three additional lanes are proposed on I-295 NB: one additional lane on Ramp B, the northbound ramp from National Harbor (Ramp T), and the HOV ramp from I-95/495 Outer Loop Express. The proposed I-295 NB alignment and the associated ramps that converge to I-295 NB have been designed to minimize wetland impacts, avoid Section 4(f) impacts to Oxon Hill Farm, minimize additional right-of-way requirements, and simplify maintenance of traffic patterns during construction. The I-295 NB alignment as designed will result in permanent impacts to tidal forested wetlands and to non-tidal forested wetlands (Wetland Area 1/2). The impact to this large wetland system was minimized by utilizing a retaining wall along the entire length of I-295 NB, Ramp F, and Ramp I to the Oxon Run Bridge crossing. The use of a retaining wall along I-295 and Ramp F reduced the impacts to Wetland Area 1/2 versus the alternative of safety grading and 2:1 maximum side slopes. The construction of the retaining wall will require temporary impacts to Wetland 1/2. The temporary impact includes a 1.5 meter (5-foot) wide area between the retaining wall and the limit of disturbance line. The temporary impacts will consist primarily of erosion control measures and temporary equipment access. The temporarily impacted area(s) will be returned to its pre-construction condition.

Wetlands 4, 35A, and 35B - Ramp M carries traffic from I-295 southbound (SB) to I-95/495 Inner Loop Local, across the Potomac River to Virginia. The Ramp M alignment is designed to closely parallel the existing ramp, and will be constructed just outside of the existing ramp. This

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configuration is necessary to maintain the existing travel lanes during project construction, and to achieve the required design speed of 50 miles per hour (mph). A compound curve on Ramp M has been designed to avoid and/or minimize impacts to Wetland Area 4, 35A, and 35B. Existing Ramp M carries one lane of traffic and will continue to carry one lane of traffic under proposed conditions. Existing I-295 SB provides two lanes of traffic, while proposed I-295 SB will provide three lanes to accommodate the capacity requirements for the design year 2020. The construction of Ramp M and its associated deceleration lane will result in impacts to two wetland areas, Wetland Area 35A and Wetland Area 35B, both non-tidal forested wetland systems. The proposed Ramp M alignment will result in permanent impacts to Wetland 35A and to Wetland 35B. Wetland 4 exists along the western edge of I-295, north of the Ramp M exit. Impacts to Wetland 4 are avoided by employing minimum safety grading and 2:1 fill slopes. Wetland 35B exists west of the existing ramp, near the merge with the Inner Loop of I-95/495. The permanent impacts to Wetland 35B is unavoidable due to the 50 mph design speed of Ramp M and the widening of I-95/495 which shifts the Ramp M/I-95/495 Inner Loop Local to the north. Shifting the Ramp M alignment east to further reduce impacts to Wetland 35B is not feasible given the required 50 mph design speed, the proximity of Ramp N, which is designed at the minimum radius for its design speed of 30 mph, and maintenance of traffic requirements during construction. Therefore, given the necessary alignment of the ramp while maintaining its design speed, the most effective measure to reduce wetland impacts is through the use of a retaining wall to minimize fill impacts. The retaining wall option is thus used from Sta. 1120 to the abutment of the Woodrow Wilson Bridge (approximately 1,700 feet). Temporary impacts, consisting primarily of equipment access impacts, is expected in Wetlands 35A and 35B. The temporary impact areas will be restored to their pre-construction condition.

Riverine Tidal, SAV, Wetland 39C, 39E, and 39F - Ramp B is proposed to carry traffic from I-95/495 Outer Loop Local to the National Harbor area and I-295 northbound. The location of the new roadway, south of the existing six-lane roadway, and the ramp exit design speed predetermines the geometric layout and alignment of Ramp B, which is south of the existing ramp exit location. The entire mainline section east of the bridge has been reduced in width from the FEIS alignment. To provide for maintenance of traffic during construction, the section was reduced from the north. The mainline alignment is fixed based upon the location of the bridge and the adjacent ramps are then fixed by the mainline location. Based upon this alignment, further options were explored in an effort to minimize the unavoidable impacts to the submerged aquatic vegetation, wetlands and waters on the north shore of Smoots Cove. A second component of the roadway system in this area is the pedestrian path to Rosalie Island. The island is currently being designed as a public park as part of the Section 4(f) mitigation package. The Rosalie Island park concept dictates the need for pedestrian, bicycle and vehicular access from the Maryland shoreline to the island, and its associated park facilities. Additionally, the pedestrian path and the deckover on the island, provide a required connection between the bicycle path on the north side of the bridge and the mainland on the Maryland side. The design of the access pathway requires that it provide an accessible route in accordance with the Americans With Disabilities Act (ADA) for pedestrians and cyclists traveling to the island, while maintaining a minimum width, turning radius and slope to provide access for emergency and maintenance vehicles. With a final destination being the proposed visitor center on the Maryland side, it was necessary for the pedestrian path to cross the roadway at some point east of the bridge. Based upon the complexity of the I-95/495/I-295 Interchange, it was determined to

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be most appropriate to cross the roadway by way of a deckover on Rosalie Island. This sets up a scenario whereby the path must cross Smoots Cove on the south side of the mainline roadway.

Because of this connection between the pathway and roadway, a number of options were developed for the Outer Loop Express and Local Lanes, Ramp B, and the Pedestrian/Bicycle Path to Rosalie Island. These options explore a number of variations for the design of the roadway and the access path to Rosalie Island. The options present a wide range of design solutions; each reflecting different impacts to submerged aquatic vegetation (SAV), wetlands and Waters of the US, maintenance requirements, and construction costs. The options and their associated design characteristics, impacts, and costs are explained below.

Roadway Option A: Roadway Option A places the Outer Loop Express and Local lanes of the I-95 roadway on a combination of structure, retained fill, and fill slopes in an effort to minimize impacts to open waters and wetlands. The pathway alternatives with Roadway Option A include an adjacent 16-foot wide path on structure (Option A1), and a 16-foot wide path on structure crossing Smoots Cove approximately 200 feet south of the roadway (Option A2). This combination of bridges, retained fill and reduced slopes attempts to avoid impacts to the wetland areas by carrying the roadway on structure over these resources. Although this option results in minimal fill impacts to wetlands, permanent impacts due to shading from the structure must be considered. A shading impact occurs when the height of the proposed structure is less than its width. The height of the proposed bridge structure(s) ranges from approximately 10 feet to 30 feet; the proposed bridge is 80 feet wide. This minimal clearance results in permanent shade impact to the SAV and wetlands within the bridge/roadway drip line. Additionally, the forested wetlands would be permanently impacted, as all trees would be removed during construction. This shading invariably leads to diminished functional capacity of the wetlands. This permanent loss of vegetation results in diminished wildlife habitat, sediment/toxicant retention (due to decreased vegetation/water interspersion and vegetation density), nutrient removal/retention/transformation (woody and emergent vegetation removed), production export (wetland no longer supplies food for wildlife or produces detritus), and sediment/shoreline stabilization (vegetation and roots absent, energy absorbing emergent, aquatic and shrub vegetation removed) functions. Option A would likely result in a functional loss of Wetlands 39C, 39E and the aquatic beds (SAV) of Smoots Cove.

This bridging option would still preserve a majority of the Open Water Habitat underneath the new structure. While this open water area will provide fish spawning habitat, it is almost certain that the lack of vegetation, sedimentation, and accumulation of debris will reduce the quality of the habitat.

There are other factors that need to be considered in evaluating the merit of this option. The bridge options, as proposed in Option A has raised maintenance concerns. Trapped debris under the roadway is anticipated to be an especially significant maintenance concern. The permanent removal of shoreline vegetation under the bridges (due to shading) may also result in increased shoreline erosion. The expected erosion and debris accumulation could result in indirect, post-construction impacts to the waters under the bridged roadway that is proposed by Option A. In addition, Officials from Prince George's County, Maryland have expressed safety concerns where low structures such as this option would provide shelter for transient individuals. The remote location of the structure would make police enforcement extremely difficult. The inspection and

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maintenance of the structure may also result in future periodic impacts to the preserved resources under the bridge, as barges will probably be required to access the superstructure and substructure of the bridge.

The wetland impacts attributable to roadway Option A are:

Tidal aquatic bed (SAV)	0.9 acres
Non-Tidal / Tidal forested wetland	0.6 acres
Non-Tidal/Tidal forested wetlands	0.6 acres
Non-Tidal forested wetland	0.2 acres
Non-Tidal forested wetland	0.2 acres
Non-Tidal wetland buffer	0.3 acres
Open water	0.3 acres

The wetland impacts attributable to Path Option A1 are:

Tidal aquatic bed (SAV)	0.5 acres
Non-Tidal / Tidal forested wetland	0.3 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	0.4 acres

The wetland impacts attributable to Path Option A2 are:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.4 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.2 acres
Open water	0.5 acres

To avoid frequent maintenance and disturbances in the future, the structures would probably be designed with larger concrete pilings and beams. Construction using these concrete members would require larger cranes. Cranes could gain access to the construction area from the land side through the use of log mats if the existing ground is stable enough to support the mats. Even if the log mats prove feasible on the landside, barges will be needed to construct the structures furthest out in the cove because the distance from the staging area to the structure is too long for conventional cranes to move the concrete beams and piles. The barges necessary for the construction require approximately 6 feet of water depth to maneuver. Based upon the bathymetric surveys, the cove becomes shallower than 6 feet approaching the proposed structures. In order to construct the bridges with barges, the barges would be floated in during high tide, run aground, and anchored to set up the cranes. Alternatively, the construction access area could be dredged to a depth of 6 feet. Any SAV beds in the area of construction would be impacted by either the sweeping of the bottom and grounding of the barges or by the dredging operation.

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Roadway Option B: Roadway Option B considers the lowest cost design option of using 2:1 fill slopes along the south side of Ramp B without the expense of retaining wall or bridge to minimize wetland impacts. Wetland 39C, Wetland 39E, Wetland 39F, and open waters (Smoots Cove) would be permanently impacted by this option. This option minimizes construction costs and provides for the most desired path design to the island, but results in substantial impacts to wetland areas. The pathway option considered with Roadway Option B is built as a "bench" on the fill slope of the roadway. The path would have landscaping opportunities on both sides and would make for a comfortable walking or cycling experience out to the Rosalie Island Park.

Option B proposes that the pathway be built along the roadway as a bench constructed into the roadway fill slope. This Option allows for minimal maintenance requirements compared to the other options utilizing structures. Construction would be accomplished from the land side without additional construction impacts into Smoots Cove for barge access. Future maintenance would not necessitate access from the water or additional impacts to jurisdictional resources

Option B impacts are:

Tidal aquatic bed (SAV)	1.5 acres
Non-Tidal / Tidal forested wetland	1.1 acres
Non-Tidal forested wetland	0.3 acres
Non-Tidal wetland buffer	0.4 acres
Open water	3.8 acres

Roadway Option C: Roadway Option C attempts to minimize wetland impacts while limiting construction costs by constructing the Outer Loop Local roadway on bridge to cross wetlands and waters, and constructing the Outer Loop Express on retained fill.

As with Option A, this combination of bridges attempts to minimize impacts to Smoots Cove and adjacent wetlands through the use of bridges and retaining walls. However, the height of the individual bridge structures are less than their width, resulting in shade impacts to the wetlands and SAV beds being crossed. Open water impacts were calculated for the areas to be impacted by the supports for the structure only (no shading impacts). The shading of the wetland is considered a permanent impact to the wetland, and results in the loss of wetland function. Wetlands 39E and 39 F, both forested wetland systems, will be cleared during construction to provide clearance for the bridge structures, which will be within approximately 12 feet of the ground. In addition, the shading will prevent revegetation of the wetlands, resulting in a permanent functional loss of these forested wetlands. Wetland functions that will likely be lost or at least substantially reduced include wildlife habitat, sediment/toxicant retention, nutrient removal/ retention/ transformation, production export, and sediment/shoreline stabilization. The loss of the sediment/shoreline stabilization function, over time, will likely lead to increased erosion of, or debris deposition into, the wetland areas, ultimately resulting in permanent loss of the wetland area.

The proposed structures for Option C present identical concerns with regard to future maintenance and safety as Option A. It is anticipated that roadway structures for Option C would require the

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same methods of construction as Option A. It would be necessary to have Barges access the southern side of the bridge structures.

Option C2 considers the same roadway alignment with the pedestrian path located on structure, parallel to the roadway at a constant distance of 200 feet to the south. The path would maintain a ten foot height over the water to allow for a touchdown point on Rosalie Island at grade. This path arrangement presents a reduction in environmental impacts, but is less preferred from the design perspective. As with Options A1 and A2, the separate structure out in the Cove does not allow for the option of utilizing landscaping to enhance the human experience along the path. Option C2 also carries the same maintenance concerns presented in Option A1 and 2. This pathway alignment does reduce impacts to the SAV beds along the Smoots Cove shoreline, and reduces the shade impacts to wetlands. The pathway as proposed for Option C1, although on structure, results in greater shade impacts to wetlands because the majority of the path structure is adjacent to a retained fill roadway. Thus, with Option C1, only the south side of the structure would be open, whereas Option C2 allows both sides of the path structure to be open, thereby allowing far more sun exposure. Additionally, the Option C2 pathway requires less SAV impacts than C1.

The roadway for Option C results in the following impacts:

Tidal aquatic bed (SAV)	0.9 acres
Non-Tidal / Tidal forested wetland	0.7 acres
Non-Tidal forested wetland	0.2 acres
Non-Tidal wetland buffer	0.3 acres
Open water	0.6 acres

The wetland impacts attributable to Path Option C1 are:

Tidal aquatic bed (SAV)	0.5 acres
Non-Tidal / Tidal forested wetland	0.2 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	0.4 acres

The wetland impacts attributable to Path Option C2 are:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.3 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.2 acres
Open water	0.6 acres

Roadway Option D: Roadway Option D attempts to minimize the roadway construction impacts while balancing the construction costs through the construction of the roadway on retained fill. The option considers the use of retaining wall from the Maryland shoreline to Rosalie Island. Four pathway options were considered for the retained fill option.

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The Roadway impacts associated with Option D are as follows

Tidal aquatic bed (SAV)	1.0 acres
Non-Tidal / Tidal forested wetland	0.7 acres
Non-Tidal forested wetland	0.2 acres
Non-Tidal wetland buffer	0.3 acres
Open water	1.8 acres

Path Design Option D1 considers the use of an esplanade adjacent to the roadway for the entire distance to the Island. The pathway would be placed on retained fill (effectively a widening of Ramp B) for approximately half the distance to the Island, to the point where the pathway elevation rises above the roadway elevation, whereby the path would continue to the Island as a retained fill with retaining walls on both sides of the fill. This design Option shows a reduction of impacts seen in Option B (fill with 2:1 Slopes) through the use of the retaining walls. Construction of this Option would be accomplished from the land side with a sheet piling on the water side to allow for construction of the retaining walls.

The Path impacts associated with Option D1 are as follows:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.4 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	1.0 acres

Path Design Option D2 considers the 16 foot wide path as an independent structure over water, at a constant distance of 200 feet from the proposed roadway. As with Options A2 and C2, this option minimizes impacts to wetlands and waters by locating the pathway away from the shoreline to avoid and minimize impacts to SAV beds. This Option is a less desirable alignment for access to Rosalie Island because of the added distance required to reach the deckover and the challenges of providing an ADA accessible path from the touchdown point at elevation 10 and the deckover at elevation 76. This alignment also greatly increases the travel distance to the pedestrian/bicycle path on the bridge. SAV impacts would be required on the eastern end of the structure due to the low elevation of the structure (10 feet) compared to its width (16 feet) and due to the required construction access.

Path Design Option D3 proposes "hybrid" path that utilizes retained fill adjacent to Ramp B for the eastern end of the path, and a separate structure on the western end of the path providing access to Rosalie Island. This Option provides the desired touch down point on the Island at elevation 56. Some SAV impact would be required for the construction of the separate structure and the retained fill, but a reduction is seen from Option D1.

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The Path impacts associated with Option D2 are as follows:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.3 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	0.6 acres

The Path impacts associated with Option D3 are as follows:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.4 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	0.4 acres

Path design Option D4 proposes a path on a separate structure in a more curvilinear design. This Option provides the desired touch down point on the Island at elevation 56 and the sinuous nature of the path provides for a more varied experience for the user. Impacts for this Option would include SAV areas under and around the bridge for construction access, and Open water impacts for the individual piers.

The Path impacts associated with Option D4 are as follows:

Tidal aquatic bed (SAV)	0.3 acres
Non-Tidal / Tidal forested wetland	0.2 acres
Non-Tidal forested wetland	0.1 acres
Non-Tidal wetland buffer	0.1 acres
Open water	0.5 acres

Riverine Tidal, SAV, Wetland Nos. 39C and 39D - The concept of creating a park on Rosalie Island has received programmatic approval from M-NCPPC, NPS, and Prince George's County as part of the Section 4(f) park mitigation package. Because the island is effectively divided by I-95/495, a means to access both halves of the proposed park is necessary. Additionally, it was deemed appropriate to make the connection of the bicycle trail from the bridge to the Maryland mainland across the island. To meet this requirement, a deckover structure to effectively and safely move pedestrians and emergency and maintenance equipment from one side of the island to the other has received preliminary approval from the sponsoring agencies. This deckover will provide an aesthetically pleasing, yet functional, pathway over the I-95/495 roadway. The deckover is designed to meet ADA requirements, provide access for emergency and maintenance vehicles, and minimize impacts to the natural resources of Rosalie Island. The deckover was designed to provide the minimum clearance over I-95/495 (16.5 feet) and maximum slopes back down to existing ground surface to minimize impacts. These measures reduce the limits of grading and in turn avoid impacts to Wetlands 39A and 39B and minimize impacts to Wetlands 39C and 39D. Based upon

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the latest design for the park, a secondary path is required to access the southern potion of the island west of Wetland 39D. A crossing is shown at the wetland's narrowest point, and impacts are anticipated to the northernmost tip of the wetland system. In addition to the deckover impacts, open waters impacts will occur during the construction of two planned observation decks off Rosalie Island. One deck is planned for Fox Ferry Cove and one is planned for Smoots Cove. Both decks will range in width from 5 - 10 feet and extend approximately 50 - 70 feet from the existing shoreline. The location of the piers was determined by the location/proximity of the proposed island access pathways, and through avoidance of wetland impacts on the island. It is anticipated that open water/riverine and tidal wetlands will be temporarily affected during the construction activities on Rosalie Island. The temporary impacts will occur during the construction of the retaining wall along the pathway interface. Temporary impacts will be attributable to temporary access for construction equipment, potential water diversion activities and sediment/erosion control measures. Temporarily impacted areas will be restored to pre-construction condition.

Minimization measures, which have been incorporated into the preliminary design plans, are presented in Table 4-36.

Table 4-36: Avoidance and Minimization Efforts – I-295 Interchange

Wetland ID	Unavoidable Impacts	Minimization Efforts
1/2	Wetland at widened section along Ramp F and I-295 northbound.	Retaining wall used to minimize permanent impacts. Temporary impacts will be minimized by construction techniques.
4	Wetland along Ramp M and I-295 southbound.	2:1 embankment slopes and minimum AASHTO safety grading to avoid permanent impacts. Aligned ramp as near to existing ramp as possible to maintain design speed.
35A	Wetland along Ramp M.	2:1 embankment slopes and minimum AASHTO safety grading to minimize permanent impacts. Aligned ramp as near existing ramp as possible to maintain design speed.
35B	Wetland along Ramp M and I-295 southbound.	2:1 embankment slopes and minimum AASHTO safety grading to minimize permanent impacts. Aligned ramp as near existing ramp as possible to maintain design speed.
39C	Wetland along east side of Rosalie Island at outer loop.	Combination of impacts from roadway, pedestrian path and deckover result in impacts to this wetland. No option avoided impacts while achieving project purpose.
39D	Wetland on the south side of Rosalie Island at the proposed path alignment.	Designed path to tie into the island at an elevation to minimize grading. Used a switchback pattern to get path to island grade in as short a distance as possible.
39E	Wetland east of Rosalie Island at outer loop.	Retaining wall along Ramp B and outer loop local to minimize fill impacts. Pedestrian path to island adjacent to roadway. No options avoid impact to this wetland.
39F	Wetland along Smoots Cove and Maryland shoreline.	Retaining wall along south side of pedestrian path to minimize permanent fill impacts.
SAV	In Smoots Cove at Ramp B, outer loop local and pedestrian path.	Retaining walls along south side of pedestrian path to minimize impacts.
Riverine Tidal/ Open Water	Smoots Cove's waters and shoreline along Ramp B, outer loop local and pedestrian path.	Retaining walls along south side of pedestrian path to minimize impacts.

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I-95/495/Maryland 210 Interchange: Complete avoidance of impacts to Waters of the United States is not practicable. The only Waters of the United States in this interchange is a stream that is immediately adjacent to the right-of-way in the northwest quadrant of this interchange. Due to extreme topography at this location, avoidance of impacts to the Oxon Hill Childrens Farm (Section 4(f) property) and a constrained right-of-way, impacts to these Waters of the United States are unavoidable. Specific avoidance was accomplished at several locations where design enhancements were minimized or eliminated to avoid impacts to Waters of the United States completely. These are listed below.

Waters of the United States F1 - Due to grade differences and a constrained right-of-way, a proposed retaining wall along I-95/495 is needed, which requires a proposed 54-inch (1.4-meter) outfall pipe at station 586+00, 90 feet (27.4 meters) left, with an invert out of 147.0. The existing channel inside Ramp H needs to be lowered approximately 4 feet (1.2 meters). The existing 48-inch (1.2-meter) pipe under existing Ramp H, therefore, needs to be replaced with a 60 inch (1.5 meter) pipe. The 60 inch (1.5 meter) pipe will produce similar flow quantity as the existing 48 Inch (1.2 meter) pipe. The existing 48 inch (1.2 meter) headwall is also deteriorated to the point of needing replacement. The invert of the proposed 60 inch (1.5 meter) pipe is approximately 5 feet (0.13 meters) lower than the invert of the existing 48 inch (1.2 meter) pipe. In addition, the location of the 60 inch (1.5 meter) pipe is set 45 feet (13.7 meters) north of the existing 48 inch (1.2 meter) pipe so that the outfall more closely aligns with the existing stream thereby eliminating the outfall elevation drop. This will allow the existing pipe to function during construction of the new pipe. The proposed structure, outlet protection, and stream diversion for erosion and sediment control contribute to the remaining impact to Waters of the United States.

Waters of the United States F2 - At the request of the National Park Service (NPS), an alternative to the existing Bald Eagle Road bridge over I-95/495 was investigated. Several options were given to the NPS for review and a decision as to which of the options should be pursued has not been made to date. For the purposes of this EIS, the greatest impact scenario is shown. The avoidance and minimization measures, which are being investigated as part of the options analysis are retaining walls, design speed reduction, and a combination of both methods. However, driver safety and option costs are major concerns. The existing pipe will either be abandoned or extended, but the drainage flowing to the stream will be maintained.

Mitigation: Mitigation to compensate for impacts to Waters of the United States from the proposed action is proposed on-site and off-site. Typically with projects of less complexity, available areas for in-kind mitigation adjacent to the project area can be obtained. However, due to the project's location within an urban region, most areas that are not already wetlands, are existing forests, parkland, or are already developed. It is not the project sponsor's policy to utilize properties with these types of land cover for wetland mitigation. While some wetland mitigation is proposed on vacant lands within the project area, the available area for wetland mitigation in the project area is limited.

An Aquatic Resources Conceptual Mitigation Plan (ARCMP) was prepared as part of the FEIS on May 1997. The ARCMP identified 70 preliminary sites, of which 31 were considered potential

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mitigation sites. Subsequent field investigations and agency reviews determined that only seven sites would be suitable to replace the function and values of the wetlands impacted by the project. After the planning study was completed, additional site searches were conducted and 182 potential mitigation sites were identified.

Tidal mitigation sites have been pursued to the extent possible within the freshwater tidal Potomac, but some areas in the saltwater tidal zone have also been examined. Nontidal wetland mitigation sites have been investigated within the watersheds that drain to the tidal freshwater Potomac. Mitigation for open water impacts is proposed through removing fish passage barriers along Northwest Branch, Rock Creek, Little Paint Branch, and Indian Creek, and conducting hatchery restocking. Providing juvenile fish habitat in shallow waters at Occoquan Bay is also proposed as mitigation for impacts to open water and tidal mudflats. The removal of these barriers would replace impacted functions by reopening historic spawning areas and habitat for anadromous and resident fish.

A Phase I Conceptual Mitigation Plan for impacts to aquatic resources, including jurisdictional wetlands and waters, has been prepared to address the unavoidable impacts associated with this project (See Appendix B, Phase I Conceptual Mitigation Plan). Mitigation requirements specified in this plan are based on the maximum potential limit of disturbance for construction. The goals and objectives of the wetland mitigation plan were established to replace the principal wetland functions and values within the same watershed of impact. The mitigation plan includes the creation of new tidal and nontidal wetlands, creation of submerged aquatic vegetation beds, enhancement of existing wetlands, and improvements to stream channels, fish blockage removal, and fish passage. The mitigation package has been compiled to meet the recommended replacement ratios as well as replace the functions and values. Table 4-37 details the functions and values impacted by the project and the functions and values proposed at the mitigation sites. Refer to Appendix B for more detailed information on the mitigation package proposed.

Some mitigation sites may require incidental impacts to small areas of existing wetlands to successfully implement the mitigation plan. Mitigation for these incidental impacts would be provided at the mitigation site where the impact occurs. Coordination with Federal, state, and local regulators and commenting agencies has been conducted in determining these mitigation measures.

Table 4-37: Mitigation Proposed for Impacts to Waters of the United States

Summary of Compensatory Wetland Mitigation in Maryland and Virginia		
Functions Impacted* hectares (acreage)	**Functions Proposed hectares (acreage)**	**Location**
0.4 ha (1.0 acre.)/nontidal wetland GR/D, FA, S/TR, NR, WH, VQ/A PE, S/SS	0.8 ha (2.0 acres) nontidal wetland creation GR/D, FA, S/TR, NR, WH, VQ/A, S/SS	Bevard Advance Mitigation Site
0.6 ha (1.5 acres)/tidal wetlands FA, S/TR, NR, PE	2.0 ha (5.1 acres) tidal wetland enhancement (*Phragmites australis* removal) F/SH, S/TR, NR, FA, WH, S/SS, VQ/A, ESV	Anacostia East
	0.6 ha (1.6 ac.) tidal wetland creation S/TR, NR, WH	Earnshaw Property

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Table 4-37 (continued): Mitigation Proposed for Impacts to Waters of the United States

Summary of Compensatory Wetland Mitigation in Maryland and Virginia		
Functions Impacted* hectares (acreage)	**Functions Proposed hectares (acreage)**	**Location**
12.8 ha (31.7 acres)/ SAV 2.7 ha (6.7 acres)/tidal water WQ, WH, F/SH, S/SS	Fish blockage removal at 19 blockages and hatchery restocking for 3 years at selected tributaries of the Anacostia River F/SH, WH,	Rock Creek, Indian Creek at Greenbelt Road, Little Paint Branch, Northwest Branch,
	12.1 ha (30.0 acres) tidal wetland creation S/SS, WH, F/SH, S/TR, NR	Port Tobacco 1 Port Tobacco 2
	4.0 ha (9.9 acres) tidal wetland enhancement (*Phragmites australis* removal) F/SH, S/TR, NR, FA, WH, S/SS, VQ/A, ESV	Anacostia East
	8.1 ha (20.0 acres) SAV restoration WQ, WH, F/SH, S/SS	Mouth of Potomac River and Chesapeake Bay , St. Mary's County
1.4 ha (3.5 acres) / nontidal wetlands and 1.0 ha (2.5 acres) nontidal waters FA, S/TR, GR/D, NR, S/SS, WH, F/SH, PE	2.9 ha (7.1 acres) nontidal wetland creation GR/D, F/SH, S/TR, NR, WB 0.9 ha (2.15 acres) nontidal wetland creation GR/D, S/TR, NR, FA, WH, F/SH 04. ha (1.0 acre) nontidal enhancement (*Phragmites australis* removal) WH, GR/D, ESV, VQ/A	North Fork Mitigation Bank Hart Property Four Mile Run Park
5.5 ha (13.5 acres)/ Tidal Wetlands, 0.7 ha (1.8 acres)/Tidal Open Waters, and 0.5 ha (1.1 acres)/Tidal Mudflats WQ, WH, F/SH, S/SS	0.22 ha (0.55 acre) Tidal wetland creation 0.04 ha/145 meters (0.10 acre/475 feet) tidal streambank stabilization/riparian buffer creation WH, GR/D, ESV, VQ/A	Four Mile Run Park
	0.18 ha (0.45 acre) tidal wetland creation F/SH, S/TR, NR, WH, S/SS	Site behind Dodge dealer
	0.1 ha (0.25 acre) tidal wetland creation F/SH, S/TR, NR, WH, FA, S/SS	Site behind Hampton Inn
	0.63 ha (1.55 acres) tidal wetland creation F/SH, FA, S/TR, NR, WH, S/SS, VQ/A	Cameron Run 3
	0.34 ha (0.85 acre) tidal wetland creation F/SH, S/TR, NR, FA, WH, S/SS, VQ/A	Hunting Terrace
	0.4 ha (1.0 acre) tidal wetland creation F/SH, S/TR, NR, FA, WH, S/SS, VQ/A	Hunting Towers
	0.8 ha (2.15 acres) tidal wetland creation F/SH, S/TR, FA, WH, NR	Whipsawasons Point
	0.8 ha (2.00 acres) tidal wetland creation F/SH, S/TR, NR, WH, S/SS, VQ/A	Aquia Harbour
	6.4 ha (15.85 acres) tidal wetland creation S/SS, F/SH, WH	Garners Creek
	0.14 ha (0.35 acre) tidal wetland creation F/SH, FA, S/TR, NR, WH, S/SS, VQ/A	Devon Property
	0.4 ha (1.00 acre) juvenile fish habitat at shallow area along Occoquan Bay F/SH, S/SS	Mason Neck National Wildlife Refuge
	0.4 ha (1 acre) juvenile fish habitat at shallow area along Occoquan Bay F/SH, S/SS	Mason Neck State Park

* *Abbreviations for functions and values: groundwater recharge/discharge (GR/D), floodflow alteration (FA), sediment/shoreline stabilization (S/SS), sediment/toxicant retention (S/TR), nutrient removal/retention/transformation (NR), production export (PE), fish and shellfish habitat (F/SH), visual quality/aesthetics (VQ/A), educational-scientific value (ESV), and wildlife habitat (WH).*

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4.7.5 Wildlife Resources

Terrestrial Habitat/Species: Terrestrial forests would be impacted by the Current Design Alternative 4A through the conversion of terrestrial habitats to developed areas. Impacts would include clearing and grubbing for road improvements and new ramp construction. Table 4-38 illustrates the potential impacts to terrestrial forest habitats resulting from the Current Design Alternative 4A and the FEIS Alternative throughout the project area. The Current Design Alternative 4A would result in the loss of 31.5 hectares (77.8 acres) of forest in Maryland and 8.5 hectares (20.9 acres) of forest in Virginia. This contrasts with the forest loss projections for the FEIS Alternative 4A in Maryland of 9 hectares (22.6 acres) and Virginia of 4 hectares (9.9 acres). Within the 30.5-meter (100-foot) Chesapeake Bay Critical Area buffer in Maryland, forest impacts are projected to be 4.8 hectares (11.8 acres). Within the remainder of the Critical Area outside the buffer, forest impacts are projected to be eleven hectares (27.2 acres).

Table 4-38: Terrestrial Forests Affected

Alternative	Maryland hectares (acres)	Virginia hectares (acres)	Total hectares (acres)
FEIS	9.0 (22.6)	4.0 (9.9)	13.0 (32.5)
Current Design Alternative 4A	31.5 (77.8)	8.5 (20.9)	40.0 (98.7)

The increase in forest clearing associated with the Current Design Alternative 4A is the result of a more accurate estimate of impacts based on 30 percent design plans, expanded project limits, and more detailed forest stand assessments within the Maryland portion of the project area. Specific increases in forest clearing in Maryland, above that proposed in the FEIS, would occur along the proposed ramps from I-95/495 into the National Harbor site, at the I-295 interchange, at the MD 210 interchange, and on Rosalie Island. In Virginia, increases in forest clearing are proposed at the Telegraph Road interchange and at Jones Point Park.

In both Maryland and Virginia, these increases result from an expanded footprint based on design refinements of the projected fill slopes and the elimination of some retaining walls in the Current Design Alternative 4A because of design incompatibilities. On Rosalie Island, where forest impacts are now projected to be 6.6 hectares (16.2 acres), the bridge height has been raised from the FEIS design elevation. This change required a corresponding increase in the height of the planned deckover to provide pedestrian and maintenance vehicle access to the Island. This in turn required an increase in the fill slopes at either end of the deckover. Specific design refinements at the I-295 interchange in Maryland include new ramp construction leading into the National Harbor site and fill slopes associated with all ramps. At the MD 210 interchange, the realignment of Bald Eagle Road will result in additional forest impacts. These impacts would be to a forest stand, identified in a Forest Stand Delineation for the interchange.

In Virginia, increased forest impacts would result from the realignment of Burgundy Road to connect to Telegraph Road opposite Lenore Lane. This connector road was added as per recommendations of a Stakeholder Participation Group. Forest impacts at Jones Point Park would

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total 2.7 hectares (6.7 acres). This additional clearing would result from creation of athletic fields and the preservation of historic shipways.

Removal of forest would create a reduction in the availability of upland and wetland forest habitat for wildlife species. While highly motile species such as most mammals and birds could escape direct impacts from clearing of forested areas, most displaced individuals would not be expected to survive, as they would presumably be forced into already occupied and defended territories and competition for resources and predation pressures would be extremely high. Less motile species, such as amphibians and reptiles, would be impacted directly by clearing and grubbing of forested areas. Additionally, more roadways adjacent to remaining forested areas would increase the likelihood of wildlife/vehicle collisions.

Forest clearing impacts would most likely affect more common wildlife species adapted to smaller forest stands and edges, as proposed project-related impacts would be to smaller, isolated woodlots. These more common and widespread species could include squirrels, groundhogs, rabbits, foxes, deer, raccoons, opossums, robins, doves, wrens, chickadees, titmice, woodpeckers, various species of sparrows, box turtles, black rat snakes, and red-backed salamanders. Area sensitive species, such as Forest Interior Dwelling Birds (FIDB), would not be expected to inhabit the forest stands proposed to be impacted because of their relatively small size. However, these forested areas could support FIDB and other songbirds during migration. Many of these migratory songbirds are considered Neotropical Migratory Landbirds (NML), or birds that breed in North America and undertake long migrations to and from tropical wintering areas in Central and South America. NML populations have shown declining trends in recent years primarily because of habitat losses on the breeding and wintering grounds. However, recent studies have also shown that habitat loss along major migration routes could be contributing to losses of these species. One of the major migration flyways is the Eastern Seaboard of North America, including the project area. Forest losses within the project area would reduce the availability of "stop-over" habitat for these migratory species. In summary, forest losses would result in a reduction in the densities of wildlife populations and could contribute to an overall decline in species diversity in the project area.

In order to minimize impacts to wildlife, Best Management Practices, including tree protection measures, would be used during forest clearing. Examples of BMPs to be used include: limiting clearing to only that required for construction, minimizing disturbance during the breeding season of most terrestrial vertebrates (May-August), and providing reforestation of temporarily disturbed areas.

Mitigation for forest clearing impacts in Maryland would be implemented in accordance with the provisions of Forest Conservation Act and Reforestation Law Natural Resource Article 5-103 for state funded projects and Maryland's Chesapeake Bay Critical Area Protection Law. Maryland's law requires transportation projects that impact 0.4 hectares (one acre) or more of forest to replace the lost forest resources at a 1:1 ratio. Within the Critical Area, forest habitat cleared within the 30.5-meter (100-foot) buffer would be replaced at a 3:1 ratio while forest cleared elsewhere in the Critical Area would be replaced at a 1:1 ratio. No statewide forest laws exist in Virginia. Provisions of the Chesapeake Bay Preservation Act regulate forest clearing within the 30.5-meter (100-foot) buffer along tributary streams, however, the Woodrow Wilson Bridge project was

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exempted from the Chesapeake Bay Preservation Act requirements by the Commonwealth of Virginia Chesapeake Bay Local Assistance Department in a letter dated October 11, 1991. While no state or local reforestation requirements exist in Virginia, mitigation for forest clearing within Jones Point Park lands would be implemented at a 1:1 ratio. These mitigation measures would be expected to provide future, protected forest resources for wildlife species adjacent to the project area.

Non-forested habitats, including grasslands (managed and unmanaged) and shrubby areas, occur within the expanded project limits of the Current Design Alternative 4A. Open habitats or edges between open and forested habitats are valuable for certain species of plants and wildlife adapted to these conditions or that use these areas to disperse to other areas. Most open habitat within the expanded project limits occurs as managed grasses growing in linear strips along existing roadways or as areas formerly cleared for development that have become abandoned or infrequently maintained. These areas are of limited value for wildlife within the project area and impacts are not anticipated to be major.

Aquatic Habitat/Species: The Current Design Alternative 4A is designed to have the same alignment and number of piers for the proposed bridge crossing of the Potomac River as the FEIS Alternative 4A. Therefore, permanent impacts to benthic habitats from bridge piers is anticipated to be the same as was projected in the FEIS. However, road improvements and new ramp construction elsewhere in the project area will result in large increases in impacts to wetlands and waterways and the aquatic organisms that reside in them, over what was anticipated in the FEIS. In addition, construction related impacts, addressed in Appendix F, will result in increases in aquatic resource impacts, particularly to SAV.

As described in previous sections, most of the increases in proposed wetland and waterway impacts, associated with the Current Design Alternative 4A, are the result of design refinements and an assessment of impacts beyond just the actual footprint of the bridges and roadways, as was done in the FEIS. Specific design changes that would result in increased aquatic impacts in Virginia include the addition of a connector road between a residential neighborhood and Telegraph Road and a new ramp connecting northbound US 1 with the westbound Beltway. In Maryland, specific design refinements affecting aquatic resources include the raising of the proposed Bridge over Rosalie Island and fill slopes required for the planned deckover, new ramps leading into the National Harbor site, and the realignment of Bald Eagle Road at the MD 210 interchange.

The newly designed Telegraph Road and MD 210 interchange improvements would result in outfall and road crossing impacts to nontidal waterways. The stream associated with the relocated Bald Eagle Road is a narrow, headwater stream while the one associated with Telegraph Road is a broader, flatter stream that drains directly to Cameron Run. Both systems are somewhat degraded, but for different reasons. The MD 210 stream is severely eroded from runoff from impervious roads and developed land while the Telegraph Road stream flows through shrubby vegetation behind commercial establishments and along a high tension power line.

The stream at MD 210 flows through a small area of mature forest before entering a culvert that carries the flow beneath the developed community of Forest Heights. The stream eventually

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discharges to Oxon Creek. The open section of stream flows over bedrock and ironstone, which gives a rust color to the water. Few aquatic organisms would be expected to survive in these conditions and none were observed during field investigations.

The Telegraph Road stream receives trash laden runoff from commercial sites immediately to the east. Much of the vegetation is regrowth, as larger trees have been removed under the power lines. While this stream has been disturbed, it would likely provide some habitat for small fishes and aquatic invertebrates. Impacts to these resources would be minimized through the use of box culverts and the proposed maintenance of a low flow channel through the culvert.

The new US 1 ramp construction over Hunting Creek will result in an increase in the number of support piers in this area. These piers will permanently displace benthic invertebrates such as worms and clams, as well as emergent wetland vegetation. The shading effect of the bridged ramp could also cause a reduction in emergent wetland vegetation. The open water and mud flat portion of Hunting Creek has been shown to be valuable winter waterfowl habitat and shorebird and wading bird habitat during migration (see Table 3-19). The presence of new bridge supports in Hunting Creek would not be expected to inhibit use of the area by waterfowl, wading birds, and shorebirds after they are constructed. However, during construction these birds would likely be displaced to less disturbed areas. Construction of the bridge piers would be accomplished using either temporary causeways or trestles alongside the proposed alignment of the bridged ramps. This temporary impact will cause local losses of sessile benthic organisms and perhaps some crustaceans as well. However, following construction, the fill for causeways and the girders for the trestles would be removed and the habitat allowed to return to pre-construction conditions.

Construction of the deckover on Rosalie Island will create additional fill within tidal forested wetlands, SAV beds, and benthic areas of Smoots Cove. These permanent impacts will displace benthic invertebrates; reduce available foraging areas for bald eagles, ospreys, waterfowl, and wading birds; and eliminate foraging, spawning, and nursery habitat for fish, including anadromous species. Additional permanent impacts to benthic organisms and SAV beds would result from dredging operations necessary to gain access to the Woodrow Wilson Bridge and shoreline construction staging areas. As indicated in Section 4.7.4, SAV impacts would be substantial north and south of the Bridge to allow barge access during construction. This impact would eliminate large areas of benthic habitat for aquatic plants, microbes, plankton, worms, bivalves, crustaceans, and other invertebrates. This would have an effect on the rest of the food chain that relies on these producers and primary consumers, including fish and birds. The SAV beds function in providing foraging, spawning, and nursery habitat for a variety of fish. Fish species that use the beds during some portion of their life cycle include carp, largemouth bass, herring, alewife, perch, shad, and striped bass. Elimination of a large section of this habitat will reduce the overall carrying capacity of the resource within the Upper Potomac River. Further discussion of these and construction staging area impacts are included in Appendix F.

Elsewhere in the expanded project area, impacts to aquatic resources would be minimized through the use of Best Management Practices such as erosion and sediment control measures, turbidity curtains, and coffer dams. All practices would be selected and implemented according to federal, state, and local standards and technology. Also, structural techniques would be employed to minimize adverse

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effects on aquatic resources. These techniques include structural spanning (e.g., bridges), retaining walls, bottomless culverts, and countersunk box culverts.

4.7.6 Rare, Threatened and Endangered Species

Federally Listed Species

Since completion of the 1997 FEIS, the federally listed bald eagle (threatened) and shortnose sturgeon (endangered) were identified as present and potentially present, respectively, within the project limits. A Biological Assessment of the bald eagle was completed in March of 1999 and a Biological Assessment of the shortnose sturgeon was completed in December of 1999. The *Bald Eagle Biological Assessment* was based on a six month study conducted by the project team between October 1998 and March 1999. The *Woodrow Wilson Bridge Shortnose Sturgeon Biological Assessment* was based on a sampling study carried out by the USFWS for an unrelated USACOE project within the Potomac River. Potential impacts to these listed species are discussed below. Subsequent coordination and consultation was conducted with the USFWS and the District of Columbia Natural Heritage Program pursuant to Section 7 of the Endangered Species Act of 1973 for the expanded project limits of the Current Design Alternative 4A and for sites selected to serve as mitigation for unavoidable wetland and waterway impacts. Results of the expanded project RTE review have not yet been received.

Bald Eagle: As discussed in Chapter 3, a nest of the Federally threatened Bald Eagle was located in the winter of 1998 adjacent to the project in Betty Blume Park. Coordination with the USFWS led to completion of a Biological Assessment of the eagle within the project limits. The USFWS initiated formal Section 7 consultation on September 22, 1999, and is anticipated to issue a Biological Opinion on the eagle by early February 2000.

The bald eagle nest is located approximately 0.4 kilometers (0.3 miles) south of the I-95/495 and approximately 1.4 kilometers (0.9 miles) east of Rosalie Island. Neither the nest tree nor the surrounding trees in Betty Blume Park on M-NCPPC property would be impacted by the Woodrow Wilson Bridge project. The USFWS recommends a 400-meter-radius (1,320-foot-radius) buffer for bald eagle nests in the Chesapeake Bay Region, with recommendations for differing restrictions in three zones: Zone 1, 0 to 100 meters (0 to 330 feet), Zone 2, 100 to 200 meters (330 to 660 feet), and Zone 3, 200 to 400 meters (660 to 1,320 feet). Construction of the replacement bridge is planned over a continuous five- to six-year period. Construction of the replacement bridge and most other project-related activities are not likely to affect the resident nesting pair when they are on the nest, because construction activities are outside of Zone 3. However, ramp construction and construction staging activities, such as vehicle traffic and materials storage, may occur within Zone 3 on the National Harbor property. In addition, the proposed I-295/I-95/495 access ramps are within the outer edge of Zone 3, however, these ramps would be constructed within the vicinity of the existing ramps. To minimize adverse effects to nesting eagles within Zone 3, the USFWS generally recommends a time of year restriction for construction activities between December 15 and June 15. However, specific time of year restrictions and other conditions will be addressed in the future Biological Opinion for the project.

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Potential impacts to the resident nesting pair consist primarily of temporary disturbances associated with construction activities for the Bridge and adjoining interchanges. Permanent impacts to the resident nesting eagles may occur from disturbance to Rosalie Island for bridge and park facility construction. Tree clearing is proposed over much of the interior of the island for construction of the new bridge spans and for improvements associated with the proposed Queen Anne's Park. While many trees would be saved around the perimeter of the island, subsequent use of the island by pedestrians may affect regular use by the resident eagles. Since the island comprises the closest good foraging habitat to the nest, it is the place likely to be used first and most by fledgling eagles. Reduced perching sites and introducing regular pedestrian activity on the island would likely force young eagles into less favorable locations around Smoots Cove, and could result in complete abandonment of the nesting site.

While potential temporary and permanent impacts could occur to the resident pair of bald eagles nesting in Betty Blume Park, the impacts would be indirect. The nest tree and the birds themselves would not be harmed. Therefore, it is not likely that these potential indirect impacts would result in a jeopardy opinion, however, an incidental take situation for the resident nesting pair could occur. If so, it is not known what, if any, compensation measures would be acceptable to the USFWS to offset the potential effects. As indicated above, the USFWS is reviewing the project and a Biological Opinion is anticipated by early February 2000.

Shortnose Sturgeon: The NMFS required a shortnose sturgeon Biological Assessment to be completed for the Woodrow Wilson Bridge project to facilitate the inclusion of underwater blasting or a viable alternative for the demolition of the existing bridge. The NMFS did not require additional fish sampling for completion of the Biological Assessment. Instead, NMFS directed the project team to use data collected by the USFWS during a field study on the shortnose sturgeon being conducted for the USACOE. The study began during the summer of 1998 (July/August) and is scheduled to be completed by summer of 2000. The work is being done as part of Section 7 consultation with the NMFS on the proposed maintenance dredging of the Potomac River Federal Navigation Project. To date, no shortnose sturgeon have been observed during the study, although sturgeon habitat is present within the Action Area. Results of the first year of data collection by the USFWS were obtained from the USACOE and are summarized in the *Woodrow Wilson Bridge Shortnose Sturgeon Biological Assessment*, available for viewing in the Woodrow Wilson Project Offices in Virginia and Maryland. This data coupled with available research data strongly indicates that the probability of the presence of shortnose sturgeon within the Woodrow Wilson Bridge Action Area is very low.

Potential project related impacts to shortnose sturgeon include direct impacts to the fish during dredging and bridge demolition. To further minimize impacts during these activities, early coordination with NMFS indicated their preference for the use of mechanical dredging as opposed to hydraulic dredging, and the use of mitigation techniques during bridge demolition. In-stream work restrictions for dredging activities include a permitted construction window between October 15 and February 15. The habitat assessment and life cycle of he shortnose sturgeon indicates that a time restriction of May 1 to July 15 for the shallows and June 1 to December 15 for the navigation channel may be appropriate to minimize the potential for impact. To further reduce the potential for impacts, blast design techniques and impact reduction techniques will be used as appropriate for

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mitigation. A detailed discussion of potential impacts to shortnose sturgeon from bridge construction demolition activities and potential mitigation measures to minimize impacts are included in the *Woodrow Wilson Bridge Shortnose Sturgeon Biological Assessment*.

State Listed Species

Both the bald eagle and shortnose sturgeon are listed as endangered by the MDNR. These species are also federally listed species under review by the USFWS and NMFS. The MDNR has placed the responsibility for review of these species with the federal agencies. Within the expanded project area MDNR had no additional records of RTE species. However, as indicated in Chapter 3, MDNR did identify potential RTE species on or adjacent to proposed sites selected as mitigation for wetland and waterway impacts. A discussion of potential impacts to RTE species at these sites is discussed in Appendix B.

The VDGIF stated in a letter dated June 30, 1999 that no State threatened or endangered species were present within the expanded project limits or construction staging areas identified within Virginia. The VDGIF also completed a review of the potential wetland mitigation sites in Virginia. In a letter dated December 13, 1999, they indicated that there were no currently documented threatened or endangered species at any of the mitigation sites. However, they did indicate that there were some species of note in the vicinity of some of the sites. Details of these occurrences are included in Appendix B.

4.7.7 Special Jurisdictions

Coastal Zone Management Program: Prince George's County, Maryland and Fairfax County and the City of Alexandria in Virginia are within the jurisdiction of the Coastal Zone Management Program. Program compliance of the Current Design Alternative 4A has been undertaken through coordination with Federal, State and local agencies to satisfy regulatory requirements for wetlands, water quality, fisheries, and air quality. The MDE and VDEQ would make a consistency determination following approval of the SEIS. Final certification of consistency is documented by the applicant through submittal of a signed authorized state and federal Section 404/10 permit.

Maryland Chesapeake Bay Critical Area: The Chesapeake Bay Critical Area Commission requires reduction of impacts to resources within the Critical Area including wetlands, SAV, water quality, critical habitats, rare, threatened and endangered species, forests and floodplains. Particular attention is given to impacts that occur within 30.5 meters (100 feet) of tidal waters which is known as the "100 foot buffer". Preliminary information necessary to evaluate the consistency of this project with the Maryland Chesapeake Bay Critical Area Protection Act is located throughout this document. Avoidance and minimization of impacts to specific resources within the Critical Area has been undertaken in compliance with other regulatory programs for wetlands, SAV, floodplains and rare, threatened and endangered species and is detailed in the related Sections of this document. Additional measures that would be required for compliance with Critical Area regulations for the proposed project include:

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- a 10 percent reduction in phosphorous loading to the tidal waters from pre-development levels,
- mitigation of forest impacts on a 3:1 basis within the 30.5 meter (100 foot) buffer,
- mitigation of forest impacts on a 1:1 basis in the remainder of the Critical Area, and
- buffer replacement and forest plantings at proposed tidal mitigation sites.

The 10 percent reduction in phosphorous loading has been included in the development of conceptual stormwater management plans for the project and would be accommodated in final stormwater plans as well. Although a specific site has not yet been identified, forest impacts would be mitigated on land within the Critical Area in accordance with Commission guidance. Tidal wetland mitigation sites that would impact the "100 foot buffer" have been designed to accommodate the required buffer replacement and plantings at the direction of the Commission. A report detailing the project's consistency with Chesapeake Bay Critical Area regulations would be prepared following Final Design and submitted to the Commission for approval.

Virginia Chesapeake Bay Preservation Act: As described in the 1997 FEIS, the project area contains, Resource Protection and Management Areas as designated by the Northern Virginia Planning District under the Chesapeake Bay Preservation Act. As a public road project, the Current Design Alternative falls under a provision of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (Virginia Administrative Code 9VAC10-20 et seq.) allowing compliance to be demonstrated through the approval of erosion and sediment control and stormwater management plans by the VDCR. These approvals would be sought when final designs are available.

4.8 Cultural Resources

4.8.1 Assessment of Effects to Cultural Resources

The Memorandum of Agreement (MOA) included in Appendix D stipulates the procedures to be followed by the FHWA on how project effects on historic properties are taken into account. The 1997 MOA, as executed under the former regulations, is still valid, and remains in effect. Therefore, the references throughout discussion of cultural resources are to the regulation 36 CFR Part 800 as amended in 1986.

Section 106 Criteria: The terminology and criteria used in the assessment of effects follows the criteria outlined in Section 106 of the National Historic Preservation Act (NHPA), as amended in 1986, in accordance with 36 CFR Part 800.9. Determinations of effects to National Historic Landmarks (NHL) also follow the Section 106 criteria; however, any effects to National Historic Landmarks are automatically reviewed by the Advisory Council on Historic Preservation. The Section 106 regulations define an "effect" as follows: "an undertaking has an effect on a historic property when the undertaking may alter the characteristics of the property that may qualify the property for inclusion in the National Register." The focus of the assessment is to determine (1) whether an action has an effect, and subsequently (2) whether that effect is adverse. Using the Criteria of Effect and Adverse Effect specified in 36 CFR 800.9, three basic findings can be made:

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No Effect: There is no effect, either harmful or beneficial, on the historic property; or

No Adverse Effect: There is an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion in the National Register; or

Adverse Effect: There is an effect, and that effect could diminish the integrity of such characteristics.

The Criteria of Adverse Effect state that "an undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." Adverse effects on historic properties include, but are not limited to:

1. Physical destruction, damage, or alteration to all or part of the property;
2. Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
3. Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
4. Neglect of a property resulting in its deterioration or destruction; and
5. Transfer, lease, or sale of the property (36 CFR 800.9).

Other Assessment Methods: The other assessment methods that were used to measure air quality, noise, and traffic levels and that were discussed in 4.8.1 of the 1997 FEIS remain applicable. In addition to these assessments, digital photographs and computer-generated visualizations were also prepared to assess the visual effects of the proposed Telegraph Road and US 1 interchanges to historic properties.

4.8.2 Effects to Significant Terrestrial Archaeological Resources

Table 4-39 summarizes the effects on each of the terrestrial archaeological resources identified in Section 3.8.3, and on those resources discussed in Section 4.8.2 of the 1997 FEIS. The following discussions focus on those resources that were newly identified during the archaeological investigations of the revised APE and on those resources that had been previously identified in the 1997 FEIS, but were subjected to new, additional investigations in association with the current design alternative 4A. It should be noted that the effects upon those resources previously considered in the 1997 FEIS which were not subjected to additional investigations, remain unchanged in terms of the Current Design Alternative 4A.

Revised Area of Potential Effects: Based on the results of the proposed Phase II study of the Smoots Cove archaeological site within the Maryland-National Capital Park and Planning Commission property south of the I-295 interchange (see Section 3.8.3), the FHWA will consult with the Maryland SHPO on the site's National Register eligibility. If the site is determined to be eligible through consultation with the Maryland SHPO, then the FHWA will endeavor to mitigate effects to the site. If the site cannot be avoided, the FHWA will develop and implement a treatment plan to minimize or mitigate the effect, pursuant to the MOA. As the significance of this site is based on the important information that it contains, the site will not require preservation in place.

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Therefore, the treatment plan would involve archaeological data recovery, pursuant to Stipulation III. C. of the MOA. The data recovery plan would include all of the components listed in Stipulation III. C., and would be developed in consultation with the Maryland SHPO and appropriate concurring parties to the MOA.

Changes To Sites Previously Identified in 1997 FEIS: The Virginia Shipbuilding Archaeological Site (44 AX 78) in Jones Point Park in Alexandria, Virginia, if determined to be eligible for the National Register based on additional investigations, will be adversely affected by the project. As the site cannot be avoided by the bridge construction, the FHWA will develop and implement a treatment plan to minimize or mitigate the effect, pursuant to the MOA. As the significance of the portions of the site to be affected would be based on important information that is contained in these locations, the site areas will not require preservation in place. Therefore, the treatment plan would involve archaeological data recovery, pursuant to Stipulation III. C. of the MOA.

If the ropewalk site (44AX 165), also in Jones Point Park, is determined to be eligible for listing in the National Register, the FHWA will develop and implement a treatment plan to minimize or mitigate the effect, pursuant to the MOA. As the significance of the portions of the site to be affected would be based on the important information that these locations contain, the site areas will not require preservation in place. Therefore, the treatment plan would involve archaeological data recovery, pursuant to Stipulation III. C. of the MOA.

Table 4-39: Effects to Terrestrial Archaeological Resources

Site No.	Site Type	NRHP Status[1]	NRHP Eligibility Criteria[2]	Nature of Impact	Applicable Criteria of Effect[3]	Determination of Effect[4]
44AX78	Virginia Shipbuilding Corporation 1919-1921	PE+C	Proposed: A (?) & D	Direct	1	No Adverse Effect*
44AX165	Historic mid-19th century (Ropewalk?)	PE+C	Proposed: D	Direct	1	No Adverse Effect*
44AX179	Freedmen's Contraband Cemetery	PE+C	Proposed A (?)+D	None	---	No Effect

Key to Table:

1. NRHP Status
   - NR National Register-Listed or Eligible
   - PE Potentially eligible, considered eligible for purpose of assessment; pending evaluation and SHPO concurrence
   - C Contributing resource to Alexandria Historic District (National Register), if determined eligible.
2. NRHP Eligibility Criteria
   - A Associated with events
   - B Associated with lives
   - C Distinctive characteristics
   - D Information source
3. Criteria of Adverse Effect
   - 1 Destruction or alteration of property
   - 2 Isolation/alteration of contributing environment
   - 3 Intrusive elements (visual, audible, atmospheric)
   - 4 Neglect
   - 5 Transfer, lease, or sale of property
4. Determination of Effect

4.8.4 * Assumes an Adverse Effect from the project if all or part of the site is disturbed.

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4.8.3 Effects to Underwater Archaeological Resources

Revised Area of Potential Effects: Proposed dredging north of the bridge will not extend into the area of Target 1-157, which has been determined by FHWA to be potentially eligible for listing in the National Register. Therefore, no additional work (i.e., Phase II testing) will be required on this resource cluster as the project will have no effect on underwater resources within the expanded APE. Buoys will be placed around the target during bridge construction to clearly show that this location is off limits during construction. The results of this Phase I work and recommendations will be coordinated with the Maryland SHPO in accordance with the terms of the MOA. Further, the FHWA will also demarcate the area of the potential National Register-eligible underwater sites along the northern shore of Rosalie Island, and place them off limits for access during construction. FHWA will also coordinate these findings and recommendations with the Maryland SHPO.

Changes to Sites Previously Identified in 1997 FEIS: If targets 64-3, 66-8, and 67-10 are determined to be National Register eligible, and they continue to be located within the construction limits of the bridge associated with this alternative, then the project would have an adverse effect on these resources. If the sites cannot be avoided, the FHWA will develop and implement a treatment plan to minimize or mitigate the adverse effect, pursuant to the MOA. As the significance of these sites would be in terms of the important information that they contain, the sites will not require preservation in place. Therefore, the treatment plan would involve archaeological data recovery, pursuant to Stipulation III. C. of the MOA.

Table 4-40 summarizes the effect to each of the potentially National Register eligible underwater archaeological resources identified in Section 3.8.4.

Table 4-40: Effects To Potentially National Register Eligible Underwater Archaeological Resources

Site No.	Site Type	NRHP Status[1]	NRHP Eligibility Criteria[2]	Nature of Impact[3]	Applicable Criteria of Effect [4]	Determination of Effect[5]
66-8	Barge	PE	Proposed:D	Direct	1	Adverse Effect*
67-10	Barge	PE	Proposed:D	Direct	1	Adverse Effect*
64-3	Barge	PE	Proposed D	Direct	1	Adverse Effect*
Rosalie Island Targets	Eleven vessels	PE	Proposed D	None	1	No Effect
1-157	Eight Barges	PE	Proposed:D	None	1	No Effect

Notes continued on next page.

Notes:

1. *NRHP Status*
- *NR National Register-Listed or Eligible*
- *PE Potentially eligible, considered eligible for purpose of assessment; pending evaluation and SHPO concurrence*
- *C Contributing resource to Alexandria Historic District (National Register), if determined eligible.*

2. *NRHP Eligibility Criteria*
- *A Associated with events*
- *B Associated with lives*
- *C Distinctive characteristics*
- *D Information source*

3. *Nature of Impact*
Direct impact may occur if site is determined eligible and if disturbed by piers or dredging.

4. *Criteria of Adverse Effect*
- *1 Destruction or alteration of property*

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2 *Isolation/alteration of contributing environment*
3 *Intrusive elements (visual, audible, atmospheric)*
4 *Neglect*
5 *Transfer, lease, or sale of property*

5. Determination of Effect
* *Assumes an Adverse Effect from the project if all or part of the site is disturbed.*

4.8.4 Effects to Historic Architectural Resources

Table 4-41 summarizes the effects on each of the historic resources identified in Section 3.8.5, and on those resources discussed in Section 4.8.4 of the 1997 FEIS. The following discussions focus on those resources that were newly identified during the historic architectural investigations of the revised APE and proposed mitigation sites, and on those resources that had been previously identified in the 1997 FEIS, but were subjected to new, additional investigations in association with the Current Design Alternative 4A. It should be noted that the effects upon those historic resources previously considered in the 1997 FEIS which were not subjected to additional investigations, remain unchanged in terms of the current design alternative 4A.

Revised Area of Potential Effects: The only additional National Register eligible or listed historic resources present in the expanded APE are the George Washington National Masonic Memorial and Union Station, both in Alexandria, Virginia. Design changes to the two I-95/495 interchanges in Alexandria (the US 1 interchange and the Telegraph Road interchange) resulted in a larger "footprint" and an increased height in the interchange ramps. These changes would have potential visual effects; therefore, the APE was revised to include the viewsheds of both Union Station and the George Washington National Masonic Memorial, which sits atop Shuter's Hill. In the case of each property, on-site field visits revealed that their viewsheds had already been compromised by numerous nearby intrusions including the Metro line and station, and by a number of modern multi-story office buildings.

To illustrate how much the viewsheds had been compromised, digital photographs were taken and then used to create computer-generated visualizations simulating the viewsheds once the project had been completed. On the basis of these simulations FHWA determined that the proposed bridge project would have no effect to either the George Washington National Masonic Memorial or to Union Station because it is not an alteration to the characteristics of an historic property qualifying it for inclusion in or eligibility for the National Register. The FHWA is currently consulting with Virginia SHPO in letter dated November 24, 1999 (correspondence regarding this issue is identified in Chapter 5).

Changes to Resources Previously Identified in 1997 FEIS: Two contributing properties in the Alexandria Historic District would be demolished in order to construct the Current Design Alternative 4A: the Shipyard Administration Building/Army Reserve Training Center and the Reserve Center Storage Building. Because each building contributes to the historic district, Current Design Alternative 4A would have an adverse effect to the National Register-listed Alexandria Historic District because of physical destruction of the property. FHWA coordinated with Virginia SHPO on effects and proposed recordation and Virginia SHPO concurred (November 24, 1999) (correspondence is identified in Chapter 5). In accordance with Stipulation III C of the MOA, the two buildings would be recorded through coordination with the Historic American Building Survey (HABS) program.

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Because of design changes and in response to a November 8, 1999 letter from the Maryland SHPO, written on behalf of the Design Review Working Group, an additional effects assessment was made of the proposed project work at the MD 210/I-95/495 interchange. Although a retaining wall would be constructed and a temporary use of land for construction along the edge of the National Register-listed Oxon Cove Farm would occur, both the retaining wall and the temporary use of land would occur on a steep slope and near the visitor's parking lot at the National Park Service-owned property. Furthermore, these changes would not alter the physical features within the property's setting nor diminish the integrity of the property's significant features.

Based on the findings of this assessment, the FHWA has made a preliminary determination that the additional work proposed at the interchange (including work proposed for the interchange ramps A, B, E, and F, and for the Bald Eagle Road Bridge) would have no adverse effect to Oxon Hill Children's Farm. Hence, the effects of the proposed Woodrow Wilson Bridge project to the Oxon Hill Children's Farm would be changed from a no effect finding to a no adverse effect determination. The FHWA is currently consulting with the Maryland SHPO on this effects evaluation, November 11, 1999 FHWA to MD SHPO and November 29, 1999 MD SHPO to FHWA. (correspondence is identified in Chapter 5).

Table 4-41: Effects To Historic Architectural Resources Identified Since the 1997 FEIS

Site No.	Property Name	NRHP Status	NRHP Eligibility Criteria[1]	Nature of Effect	Applicable Criteria of Effect[2]	Determination of Effect[4]
Virginia:						
---	Alexandria Historic District (NHL)	Listed (NHL)	A, C	Visual for FEIS 4A, Draft SEIS 4A	3	Adverse Effect
	George Washington National Masonic Memorial	Eligible	A, C	Potential Visual		No Effect
100-116	Jones Point Lighthouse and DC South Cornerstone	Listed	A	Change to Setting	2, 3	Adverse Effect
	Union Station (Alexandria)	Eligible	A, C	Visual	Potential 5	No Effect
Maryland:						
PG-76A-13	Oxon Hill Children's Farm	Eligible	A, C	Potential Change in Use, Potential Visual	Potential 3	No Adverse Effect
PG-76A-14	Butler House	Eligible	A, C	Potential Visual	Potential 3	No Adverse Effect

Notes:

1. <u>*NRHP Status*</u>
- *NR National Register-Listed or Eligible*
- *PE Potentially eligible, considered eligible for purpose of assessment; pending evaluation and SHPO concurrence*
- *C Contributing resource to Alexandria Historic District (National Register), if determined eligible*

2. <u>*NRHP Eligibility Criteria*</u>
- *A Associated with events*
- *B Associated with lives*
- *C Distinctive characteristics*
- *D Information source*

3. <u>*Criteria of Adverse Effect*</u>
- *1 Destruction or alteration of property*
- *2 Isolation/alteration of contributing environment*
- *3 Intrusive elements (visual, audible, atmospheric)*
- *4 Neglect*

4. <u>*Determination of Effect*</u>

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4.8.5 Potential Avoidance or Mitigation Measures for Adverse Effects to Cultural Resources

As stipulated in the MOA the FHWA will continue coordination on avoidance and minimization measures for adverse effects on cultural resources. The MOA complies with Sections 106 and 110 processes and is the vehicle to ensure that all activities associated with these measures are implemented to the fullest extent possible. The MOA is presented in Appendix D as an attachment to the 1997 Record of Decision.

The regulations governing the Section 106 process stipulate that when adverse effects on cultural resources are identified as a result of a Federal undertaking, consultation among the Federal agency, the SHPO, the ACHP, and any other consulting parties occurs to explore ways to avoid or reduce those adverse effects. Section 110 of the NHPA of 1966, as amended, requires Federal agencies to undertake planning and actions to minimize harm to NHL. Avoidance and reduction of adverse effects to cultural resources range from the conceptual to the specific, and are stipulated in detail in the ratified MOA (see Appendix D).

The FHWA intends to continue on-going coordination on cultural resources issues with the appropriate Federal and State agencies, as well as local governments, through the completion of the Section 106 and 110 processes during the final design and construction of the proposed project. The ACHP, the three SHPOs, the NPS, the MSHA, the VDOT, the DCDPW, the City of Alexandria, and other interested and consulting parties have ratified a Memorandum of Agreement (MOA). The ratified MOA (see Appendix D) identifies cultural resources with known or potential Adverse Effects from the current design alternative 4A, and includes stipulations for treatment that would avoid, reduce, or mitigate these effects. Moreover, the MOA provides for future consultation in those cases where additional determinations of effect are made (such as those for current design alternative 4A). The MOA stipulates that further consultation would occur through ongoing design of the project (especially the bridge), and that additional cultural resources investigations (including identification, evaluation, and treatment) would be undertaken as appropriate. Treatment measures may include design changes to avoid or lessen impacts, data recovery, public interpretation, public display, and/or other measures as detailed in the MOA. The ratified MOA will be included with the Record of Decision for this project.

4.9 Hazardous Materials

The location of potential hazardous waste sites throughout the project were identified in Chapter 3, listed in Table 3-22, and shown on Figure 3-17. The Current Design Alternative 4A would require the acquisition of right-of-way that includes several properties with documented or potential soil and/or groundwater contamination. The following properties have been acquired or are being considered for acquisition that have documented or potential contamination problems or potentially hazardous materials on site for normal business use:

Hunting Towers: 1204 South Washington Street, Alexandria, Virginia. The proposed alignment would cross the footprint of the easternmost apartment building. Considering the 1952 construction date, demolition of the structure would likely involve removal and disposal of ACM and LBP. VDEQ documented a petroleum fuel release from a leaking UST on this property in 1993. VDEQ determined that remediation was complete and closed the site file in 1994. The risk that construction of the new alignment would encounter soil or groundwater contamination appears minimal. A Phase 1 site assessment should be completed before acquisition of the property to investigate the potential presence of ACM, LBP, and other hazardous materials.

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Texaco Service Station: 5905 Richmond Highway, Alexandria, Virginia. This property may be acquired as right-of-way for the proposed interchange improvements. The VDEQ UST and leaking UST databases include this property (indicated as Site No. 87 in Chapter 3). VDEQ closed the leaking UST regulatory file for this site in 1994 after determining that the petroleum release was remediated. However, the presence of undocumented USTs and some degree of petroleum hydrocarbon impact to site soil or groundwater remain possible. Phase 1 and Phase 2 site assessments will be completed before property acquisition, unless previous assessments are adequate.

Sunoco Service Station: 5928 Richmond Highway, Alexandria, Virginia. This property may be acquired as right-of-way for the proposed interchange improvements. The VDEQ UST and leaking UST databases include this property (indicated as Site No. 84 in Chapter 3). The VDEQ leaking UST regulatory file for this site indicates that remedial efforts continue. Phase 1 and Phase 2 site assessments will be completed before property acquisition, unless previous assessments are adequate.

Burgundy Auto Repair, Lee's Auto Body and Paint Shop, and Rainbow Rentals, Inc.: 2630, 2634, and 2638 Huntington Avenue, Alexandria, Virginia. The structure that houses these three businesses will be acquired as right-of-way for the proposed interchange improvements. The VDEQ RCRA Small Quantity generator databases include these properties (indicated as Site No75, 76, and 77 in Chapter 3). Phase 1 site assessments will be completed before property acquisition. Phase 2 site assessments will be performed if necessary.

Citgo Service Station: 5644 Telegraph Road, Alexandria, Virginia. This property would be acquired as right-of-way for the proposed interchange improvements. The VDEQ UST and leaking UST databases do not reference this site. However, the presence of undocumented USTs and some degree of petroleum hydrocarbon impact to site soil or groundwater remain possible. Phase 1 and Phase 2 site assessments would be completed before property acquisition, unless previous assessments are adequate.

Exxon Service Station: 5640 Telegraph Road, Alexandria, Virginia. This property may be acquired as right-of-way for the proposed interchange improvements. The VDEQ UST and leaking UST databases include this property (indicated as Site No. 72 in Chapter 3). VDEQ closed the leaking UST regulatory file for this site in 1994 after determining that the petroleum release was remediated. However, the presence of undocumented USTs and some degree of petroleum hydrocarbon impact to site soil or groundwater remain possible. Phase 1 and Phase 2 site assessments would be completed before property acquisition, unless previous assessments are adequate.

4.10 Project Costs

The 1997 FEIS, specifically Table 4-46, included estimated costs for the Preferred Alternative 4A(FEIS Alternative 4A), the No-Build Alternative, and the individual build Alternatives. Each identified cost was based on 1995 estimates which were escalated by an assumed three percent average annual growth factor to reflect 1997 estimates except for costs associated with FEIS Alternative 4A. FEIS Alternative 4A costs were "*updated since publication of the 1996 SDEIS to reflect modifications in the design and more detailed mitigation plans*." Since publication of the FEIS, project costs associated with FEIS Alternative 4A have been further refined to include

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escalation which results in a 1,890 million dollars year of expenditure project cost estimate and not the estimated 1,587.1 million dollar project cost expended in base year 1997 dollars.

At time of the printing of this Draft SEIS, project cost estimates associated with Current Design Alternative 4A are being developed. It is anticipated that the project cost estimate for Current Design Alternative 4A will be available in late winter and would be incorporated into the final SEIS for public review when available.

4.11 Construction Related Impacts

Potential effects of construction activities were assessed. A working group of construction, environmental, and bridge and highway design experts was assembled to review construction staging and access issues related to Current Design Alternative 4A. The results of this assessment are presented in Appendix F.

4.12 Secondary and Cumulative Effects Analysis

Potential secondary and cumulative effects on the environment which may result from the Woodrow Wilson Bridge project, Current Design Alternative 4A and other past, present, and reasonably foreseeable future actions regardless of the agency (Federal or non-federal) or organization which may undertake such action, are addressed in this analysis.

A secondary and cumulative effects analysis (SCEA) was presented in Section 4.3.8 of the 1997 FEIS. Efforts have been undertaken to further develop this analysis and include and reference projects adjacent to the Woodrow Wilson Bridge project.

4.12.1 Analysis Approach

The Woodrow Wilson Bridge is part of the I-95 and I-495 highway systems. Intrastate and interstate development that has occurred as a result of these two highway systems, the location of the systems and the locations of their respective interchanges has been considered in this analysis. Development in the region has occurred unrelated to the Woodrow Wilson Bridge. In addition it is our intent to provide text describing the history of the crossing location decision and an overview of the ramifications of this decision.

This SCEA was prepared to evaluate secondary impacts and cumulative effects associated with the proposed improvements to the Woodrow Wilson Bridge and the adjacent associated interchange improvements in Virginia, Maryland, and the District of Columbia. Various federal and state guidelines have been published defining the scope and analysis methodology of secondary and cumulative effects. Guidance for the Woodrow Wilson Bridge project analysis has been obtained from the following publications:

- Council on Environmental Quality's (CEQ) regulations (40 CFR Sections 1500 – 1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. Sections 4321 et seq.).
- Council on Environmental Quality 1997 guidelines, *Considering Cumulative Effects Under the National Environmental Policy Act.*
- Maryland State Highway Administration's Internal Secondary and Cumulative Effects

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Guidelines, January 1999.

- Federal Highway Administration Position Paper: Secondary and Cumulative Impact Assessment in the Highway project Development Process.
- Virginia Department of Transportation *(VDOT) follows the CEQ guidelines for secondary and cumulative effects.*

Definitions of Secondary and Cumulative Effects

Secondary or indirect impacts are described in the CEQ's regulation (401508.8(b)) as:
caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

The CEQ regulations for implementing the NEPA define cumulative effects as:
the impact on the environment which 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 non-Federal) or person undertakes such other actions (40 CFR § 1508.7), 1997.

4.12.2 SCEA Scoping

Scoping for secondary and cumulative effects consisted of identifying the geographic area to be studied (geographic boundary, Figure 4-16) and the time frame (temporal boundary) for which the analysis was conducted. In addition, other projects in the region to be considered with the Woodrow Wilson Bridge project were identified. Based upon the format of available data, analysis methodologies to be employed were selected. Both the scope and the methodologies for the secondary and cumulative effects analysis of the Woodrow Wilson Bridge project are described below.

4.12.3 Geographic Boundary

The geographic boundary for secondary and cumulative effects analyses (referred to as the SCEA boundary) was determined by using a series of overlay mapping. Overlays of the areas of traffic influence, census tracts, subwatersheds, and the Upper Tidal Potomac River boundaries were created. These overlay maps were set atop a base map of the greater Washington D.C. metropolitan area. A synthesis of these overlays define the SCEA boundary, an area of approximately 36,470 hectares (140.8 square miles) as shown in Figure 4-16. This boundary was used for data collection and for mapping of socioeconomic, natural and cultural resources studied. Other considerations in the determination of the SCEA boundary included:

- The Potomac River, which represents the single largest water resource in the region. Natural resource concerns, including water quality, wildlife, wildlife habitat, vegetation, and others, all are intricately connected to the River. Historic development of the region is also intricately connected to the Potomac River.
- The Alexandria Historic District, a National Registered Historic District.
- Maryland communities located adjacent to the Woodrow Wilson Bridge, including Forest Heights and Oxon Hill.

Explanation of each of the subjects addressed in the mapping overlays is presented below.

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Areas of Traffic Influence: Areas of traffic influence, shown in Figure 4-17, indicate the geographic extent to which the Woodrow Wilson Bridge project would affect traffic levels. A select link analysis was completed to identify 2020 traffic volumes with and without the Current Design Alternative 4A alignment. This analysis is conducted on the MWCOG Round 6.1 Cooperative Forecast land use assumptions for the region and therefore, the land use assumptions in the analysis are the same for both scenarios. The differences in traffic volumes and travel patterns identified show the geographic extent of the traffic influenced by the project. The area of traffic influence associated with the project is concentrated adjacent to the project limits.

Subwatersheds and the Fresh Tidal Potomac River: Current Design Alternative 4A, and the areas of traffic influence lie within the Potomac River Basin. The Basin, shown in Figure 4-18, is a watershed of approximately 3,108,000 hectares (12,000 square miles) reaching into Virginia, Maryland, the District of Columbia, Pennsylvania, and West Virginia. Within the Potomac River Basin, the areas of traffic influence lie within six (6) subwatersheds: Cameron Run, Four Mile Run, and Belle Haven subwatersheds in Fairfax County, Virginia; Oxon Run, Broad Creek, and Henson Creek subwatersheds in Prince George's County, Maryland; and the Oxon Run subwatershed in the District of Columbia as shown in see Figure 4-19. Each of these subwatersheds are encompassed in their entirety within the SCEA boundary.

Upper Tidal River: Some land use areas within the areas of traffic influence drain directly into the Potomac River Basin rather than via a subwatershed system, therefore a portion of the Potomac River is included in the SCEA boundary. The tidal portion of the Potomac River and estuary extends 183 kilometers (114 miles) from Little Falls near Chain Bridge in the District of Columbia, down to the river's mouth at the Chesapeake Bay. The US Geological Survey has divided the Potomac into three segments by salinity regimes, and the tidal fresh segment called the Upper Tidal River is the area that may potentially receive drainage from the Areas of Traffic Influence and is encompassed in the SCEA boundary (see Figure 4-16).

Census Data: Areas of traffic influence lie within an area that includes 35 Census Tracts, approximately 10,400 hectares (40 square miles) as shown in Figure 4-20. The analysis would be concentrated here, although there are 192 census tracts, encompassing approximately 36,000 hectares (139 square miles), within the SCEA boundary. The census tracts reach into all three jurisdictions within which the Woodrow Wilson Bridge project lies. These census tracts represent areas that can be studied for historic and projected changes in population, housing, employment, and land use.

4.12.4 Temporal Boundary (Time Frame)

A review of historic population trends and employment data was undertaken to define the temporal boundary of the SCEA. Population and employment data for Virginia, Maryland, the District of Columbia, Fairfax and Prince George's Counties, and the City of Alexandria was compiled and reviewed. Population data for these jurisdictions was collected and reviewed for the decades of 1940 through 1990 (see Table 4-42). The data shows an increase in population from 1940 through 1970, a substantial drop in growth rate between 1970 and 1980, and a slight increase during the decade to 1990. The growth between 1940 and 1950 follows post World War II population shifts and growth nationwide. The changes in population growth between 1950 and 1970 do not

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indicate a direct correlation and direct influence of the initial opening of the Woodrow Wilson Bridge in 1961.

Employment data, available from 1970 to 1990, was collected and reviewed (see Table 4-43). The data shows substantial increases in employment in Fairfax County, Virginia, and Prince George's County, Maryland. Both counties not only experienced growth in employment, but also experienced growth rates larger than their respective states. This growth continued to occur during a time when the bridge was operating under severe congestion conditions.

Table 4-42: Regional Population Data, 1940 through 1990

Jurisdiction	1940	1950	1960	1970	1980	1990
State of Maryland	1,821,244	2,343,001	3,100,689	3,922,399	4,216,975	4,780,753
Percentage Change		*22.3*	*24.4*	*20.9*	*7.0*	*11.8*
Prince George's County	89,490	194,182	357,395	660,567	665,071	728,553
Percentage Change		*53.9*	*45.7*	*45.9*	*0.7*	*8.7*
State of Virginia	2,644,250	3,301,429	3,966,949	4,651,448	5,346,797	6,187,358
Percentage Change		*19.9*	*16.8*	*14.7*	*13.0*	*13.6*
Alexandria City		61,787	91,023	110,938	103,217	111,183
Percentage Change			*32.1*	*18.0*	*-7.5*	*7.2*
Fairfax County	40,929	98,557	275,002	454,275	596,901	818,584
Percentage Change		*58.5*	*64.2*	*39.5*	*23.9*	*27.1*
District of Columbia	663,100	802,200	764,000	756,500	638,300	606,900
Percentage Change		*17.3*	*-5.0*	*-1.0*	*-18.5*	*-5.2*

While the data does not point to a specific decade or event that influenced growth in the project area, a historic temporal boundary of 1950 is suggested to ensure that any influence of the bridge opening could be captured and addressed. The future temporal boundary for analysis was identified as the year 2020, the design year for the Woodrow Wilson Bridge project.

The ultimate goal of the SCEA was to identify the effects of the project considered so that adverse impacts could be avoided or mitigated. The suggested 70-year time span (1950 through 2020) proposed is adequate to understand any issues associated with the bridge so that an analysis of the effects of the project can be studied.

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Table 4-43: Regional Employment Data, 1970 through 1990

Jurisdiction	1970	1980	1990
State of Maryland	1,702,278	2,074,440	2,756,579
Percentage Change		*21.9*	*32.9*
Prince George's County	198,928	264,675	378,407
Percentage Change		*33.1*	*43.0*
State of Virginia	2,157,627	2,801,536	3,719,613
Percentage Change		*29.8*	*32.8*
Alexandria City	62,528	83,591	109,121
Percentage Change		*33.7*	*30.5*
Fairfax County	149,072	303,455	558,372
Percentage Change		*103.6*	*84.0*
District of Columbia	673,726	706,417	786,573
Percentage Change		*4.9*	*11.4*

http://fisher.lib.virginia.edu/reis/index.html (September 27, 1999).
Source: Regional Economic Information Services (REIS) Database, prepared by the Bureau of Economic Analysis.

4.12.5 Other Projects

Planned or programmed projects that are located within the SCEA boundary have been identified for their consideration in cumulative effects on resources (see Figure 4-21). In addition, recent impacts analyses completed for these other projects in the area have been reviewed where available (i.e., National Harbor Study and the Patent Trademark Office (PTO) NEPA documents) for relevant data. Projects considered are presented below and may also contain a summary of the project's direct impacts. These direct impacts combine to have a cumulative effect within the SCEA boundary.

Springfield Interchange Improvement Project: The I-95/495/I-395/495 Springfield Interchange Improvement Project located in Springfield, Virginia, is a multi-year program to improve traffic flow at this heavily congested interchange location. The Virginia Department of Transportation (VDOT) is rebuilding the interchange to make it safer for commuters and long-distance travelers. The improvement project is anticipated to be completed in 2008. The estimated total improvement cost is $430 million.

The Federal Highway Administration determined that the project would not have substantial impact on the human environment and that an Environmental Impact Statement was not required. This finding is based on the Final Environmental Assessment/4(f) Evaluation dated September 19, 1994. However, the chosen alternative does have a few direct impacts. There are 0.05 hectares (0.12 acres) of wetlands and 0.09 hectares (0.21 acres) of floodplains within the right-of-way. Of the Resource Protection Areas, 0.62 hectares (1.54 acres) will be impacted. Three parks will be affected with a total of 0.94 hectares (2.33 acres) impacted. No archaeological or historic sites will be impacted.

Potomac Yard / Crystal City Area - Commonwealth Atlantic Properties Development: The proposed medium density plan for the 73-hectare (180-acre) site known as Potomac Yard in Virginia includes 176,510 square meters (1.9 million square feet) of office space, a 625-room hotel,

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7,432 square meters (80,000 square feet) of new town center and neighborhood serving retail, and 1,900 residential units. A continuous linear park connects the open space throughout the site, and includes plans for a state-of-the-art bioretention facility. Three active recreation multi-use/soccer fields are planned, in addition to numerous neighborhood focused finger parks and green spaces spread generously throughout the Alexandria portion of Potomac Yard.

Potomac Yard / Crystal City Area - Transportation Study: The General Assembly during the 1999 session directed the Virginia Department of Transportation (VDOT) to study and develop a plan that recommends short and long-term transportation improvements affecting the Potomac Yard/Crystal City area with respect to the proposed development by Commonwealth Atlantic Properties. A NEPA document has not yet been written, and no direct impacts associated with this project are available at this time.

National Harbor: The National Harbor development is located south of I-95/495 (I-95/495/I-495), between the Woodrow Wilson Bridge and its interchange with Indian Head Highway (MD 210), east of the Potomac River, north of Fort Foote Road and Rosier Drive and west of Oxon Hill Road in Oxon Hill, Maryland. The National Harbor Plan would blend hotel, retail, entertainment, and office uses. It would contain up to 18,580 square meters (200,000 square feet) of office space, up to 1,000 hotel rooms, and a major retail facility.
According to the National Harbor 1999 FEIS, National Harbor will have positive impacts on Pedestrian and Bicycle uses, Marine Transportation, Employment, Economic issues and Environmental Justice issues. Despite the implementation of mitigation, the following adverse effects that cannot be avoided include the following:

- The project will create an estimated 12,350 new jobs at build-out;
- An estimated 12 million visitors are expected annually;
- There will be a positive impact of $29 million annually in new tax revenue at project build-out in Prince George's County;
- There will be a disturbance of seven known archeological sites that are eligible or potentially eligible for listing;
- There may be minor long-term surface erosion impacts, but there will be no impacts to water-producing aquifer zones within a 3.2-kilometer (2-mile) radius;
- 98 acres of will be lost;
- There will be short-term suspension of bottom sediment and increased turbidity resulting from construction activity;
- There will be adverse impacts to 0.40 hectares (0.10 acres) of federally regulated tidal wetlands due to fill and shading and 0.17 hectares (0.42 acres) and 954.6 meters (3,132 linear feet) of state-regulated, nontidal wetlands and intermittent streams due to fill on expanded site;
- There will be adverse impacts to SAV habitat (1.20 hectares/2.96 acres), intertidal areas (0.64 hectares/1.59 acres), and deep water areas (9.34 hectares/23.08 acres) as a result of filling;
- There is a potential for long-term increased turbidity due to suspension of bottom sediments caused by waterfront activity (water taxis and 80 boat slips) and shoreline treatment (1,601 meters/5,252 feet of vertical bulkhead);
- There will be a net reduction in the 100-year floodplain due to shoreline treatment;

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- There may be minor impacts to fish species due to dredging and loss of shallow water habitat;
- Short-term adverse impacts on air quality and noise will result from construction activities at the site, and long-term operational impacts from traffic on air quality and noise would contribute to existing adverse conditions at some area roadways and intersections; and
- There will be positive impacts on Marine Transportation due to the addition of a waterfront destination for recreational boaters and the potential for a water-taxi service.

Potomac River Federal Navigation Project: In December 1999, the USACOE began maintenance dredging of the Potomac navigation channel in three areas; along the Alexandria waterfront, at Hunting Creek Bar just downstream of the Woodrow Wilson Bridge and at Mattawoman Bar, just south of Indian Head, Maryland. Approximately 564,000 cubic yards of material will be dredged from seven miles of channel: 104,000 cubic yards from Alexandria Waterfront, 96,000 cubic yards from Hunting Creek Bar, and 364,000 cubic yards from Mattawoman Bar. Dredge disposal is proposed at a deep hole location in Gunston Cove, near Fort Belvoir in Virginia. As presented in the Environmental Assessment prepared for the project, the effects of the project will include minor short-term turbidity at dredging and placement sites, temporary displacement of fish species, removal of sessile aquatic organisms from the channel, and burial of sessile organisms at the placement site. All dredging must be completed prior to the anadromous fish spawning closure period which begins February 15, 2000.
Columbia Island Marina: Under the direction of the National Park Service, the USACOE has begun the dredging of 3,000 feet of channel and 55 boat slips to maintain access and navigation at the Columbia Island Marina. The project, which began in December of 1999, involves the removal of 110,000 cubic yards of dredge material. The project will be completed in February 2000, avoiding any potential conflict with fish spawning in the river. Effects from the project are anticipated to be minimal and include temporary increases in turbidity and permanent conversion of shallow water habitats within the marina.

Washington Sailing Marina: The National Park Service plans to dredge 40,000 cubic yards of material at this location. An Environmental Assessment is currently being prepared for the project, however, based on communications with the USACOE who is providing technical support for the project, effects will be limited to temporary turbidity increases and the conversion of shallow-water habitat. The original channel will be realigned to avoid impacts to newly established SAV beds in the existing channel.

King Street Feasibility Study: The Virginia Department of Transportation is interested in identifying and analyzing potential alternative concepts to address congestion concerns along King Street, Walter Reed Drive, and Beauregard Street in Arlington and Fairfax Counties and the City of Alexandria. The project area is essentially bound by George Mason Drive to the west, Seminary Road to the south, I-395 to the east, and Four Mile Run Drive to the north. No resource inventory or impacts analysis has been completed at this time.

I-95/495/I-395 HOV Restriction Study: The I-95/495/I-395 High Occupancy Vehicle (HOV) facility is a reversible two-lane freeway, about 70 kilometers (27 miles) long, between the southern terminus at Dumfries, VA near VA 234 and the northern terminus between VA 27 and Eads Street in Arlington, VA. Beyond this northern terminus, there are separate lanes for northbound and southbound traffic that extend across the Potomac River on the Rocheambeau Bridge. Alternatives identified for evaluation include:

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- Changing the HOV lane occupancy requirements from HOV 3+ to HOV 2+ for either the entire corridor or for a portion of the corridor (e.g., HOV 2+ outside I-95/495 and HOV 3+ inside I-95/495);
- Changing the HOV-restricted times during the morning (AM) and/or afternoon/evening (PM) periods;
- Providing additional access ramps to/from the HOV facility at appropriate locations; and
- Providing three (3) HOV lanes inside I-95/495.

In addition, the potential impacts on HOV lane-demand that could result from upcoming construction activities associated with the Springfield I-95/495/I-395/495 interchange improvement project were studied. No resource impacts analysis has been completed at this time.

I-95/495 Study – Virginia: Virginia Department of Transportation (VDOT) began the I-95/495 Study in 1995 to gain a more comprehensive understanding of the current problems and future transportation needs along I-95/495 in Virginia. The initial phase of the study involved the preparation of a Major Investment Study (MIS) to identify the most promising transportation improvements for the I-95/495 corridor. The MIS evaluated 20 different strategies, including traffic management measures, use restrictions, an express bus system, a rail transit system, and various roadway improvements. The study concluded that highway improvements would be the most effective transportation investment in the I-95/495 corridor. Two types of highway improvements were recommended for further study: adding HOV lanes and converting I-95/495 into an express/local roadway. Additional study of possible interchange improvements and accommodations for express bus operations was also recommended in the MIS. During the second phase of the I-95/495 Study that is now underway, VDOT is preparing an Environmental Assessment that will develop various design options for these improvements and assess the potential environmental impacts that could result from their construction and operation. Therefore, no resource impacts analysis has been completed at this time.

I-95/495 Study – Maryland: This study investigates the feasibility of introducing HOV lanes and mass transit on I-95/495. The goal is to improve traffic conditions on Maryland's 67.6 kilometer (42-mile) section of the I-95/495, from the American Legion Bridge to the Woodrow Wilson Bridge. The primary and interrelated issues this study addresses are traffic congestion, regional transportation, growth trends, and safety considerations. Environmental Assessment Forms for this project are in draft form. These assessments indicate that there could be impacts to the 100-year floodplain; wetlands; public recreation areas and parks; and the Potomac River, a state-designated scenic river in Montgomery County.

Patent and Trademark Office: Due to a need for more office space, the Patent and Trademark Office completed the EIS process to find a site with which to relocate. A total of approximately 7,100 employees would be consolidated as part of the proposed action. The study considered three sites; the Eisenhower site, also known as the Hoffman site, situated between I-95/495, Eisenhower Avenue, Telegraph Road and Mill Road; the Crystal City site in Arlington, situated between 23rd Street, 20th Street, US 1, and George Washington Memorial Parkway; and the Carlyle site which was the preferred alternative in the 1999 FEIS and selected in the Record of Decision. The selection of this site has since been challenged in court and the project is currently awaiting a ruling. A favorable ruling for the PTO would initiate the process of securing the lease for the Carlyle site in Alexandria.

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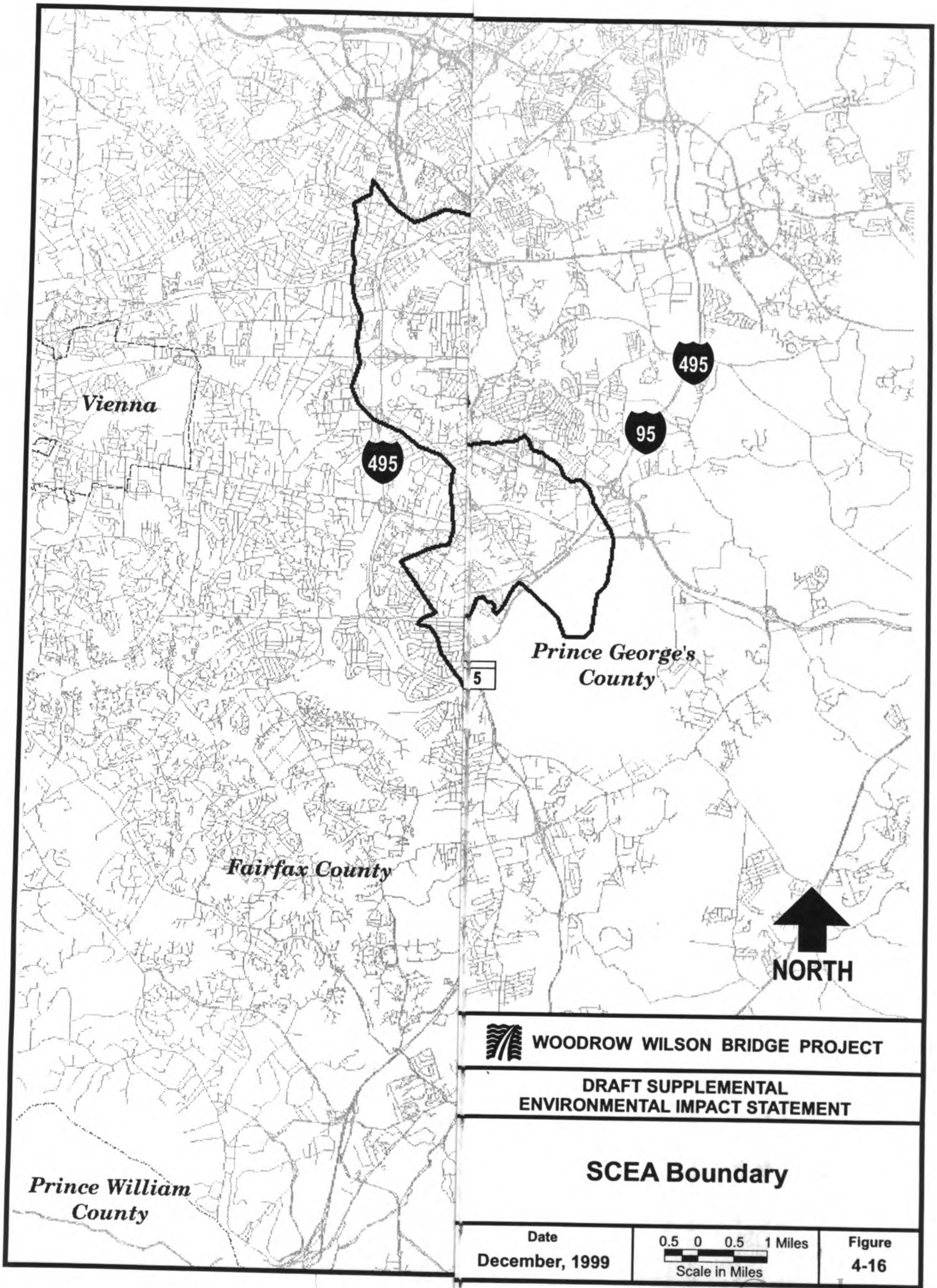

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

SCEA Boundary

Date December, 1999

Figure 4-16

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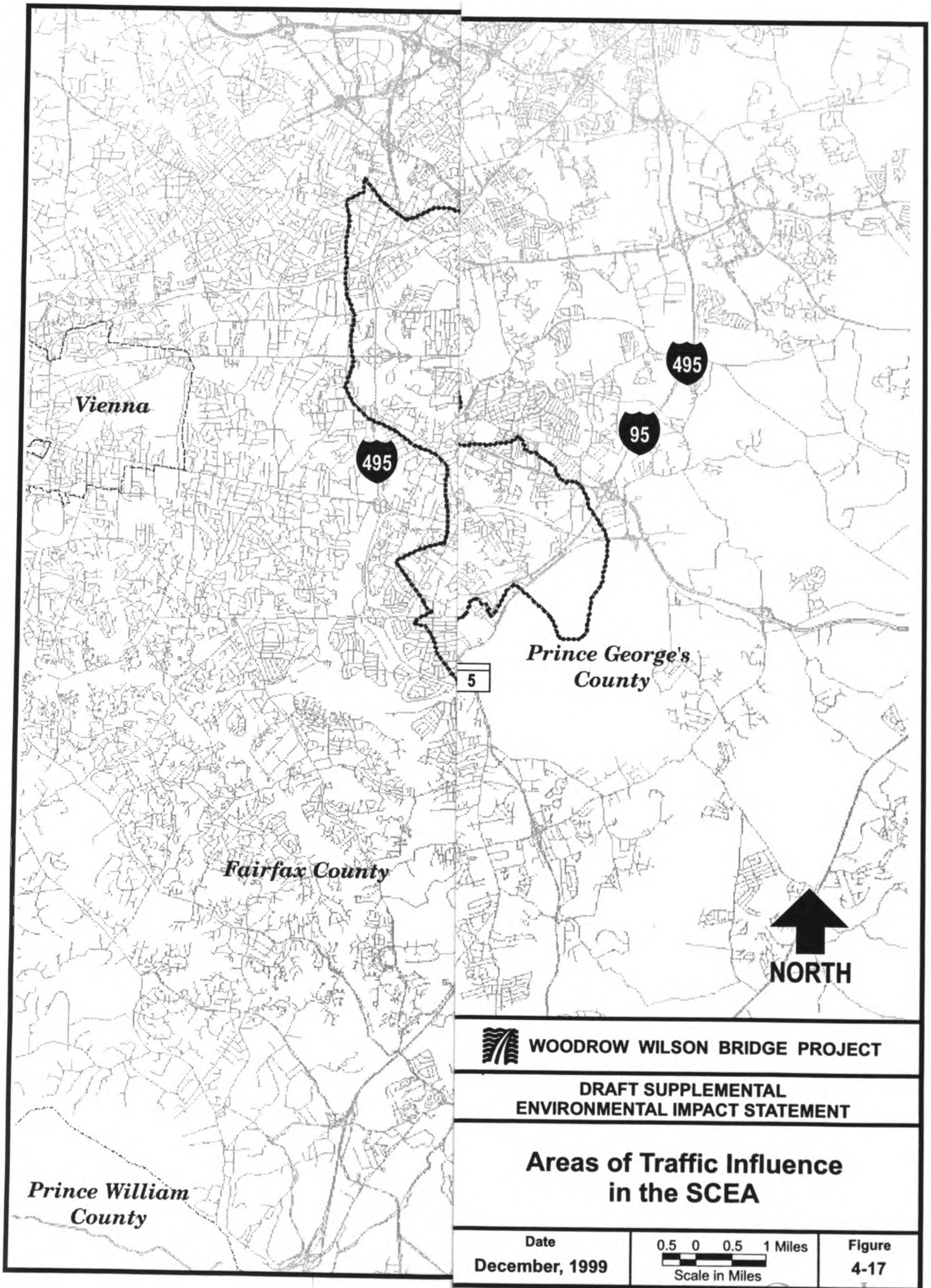

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Areas of Traffic Influence in the SCEA

Date		Figure
December, 1999		4-17

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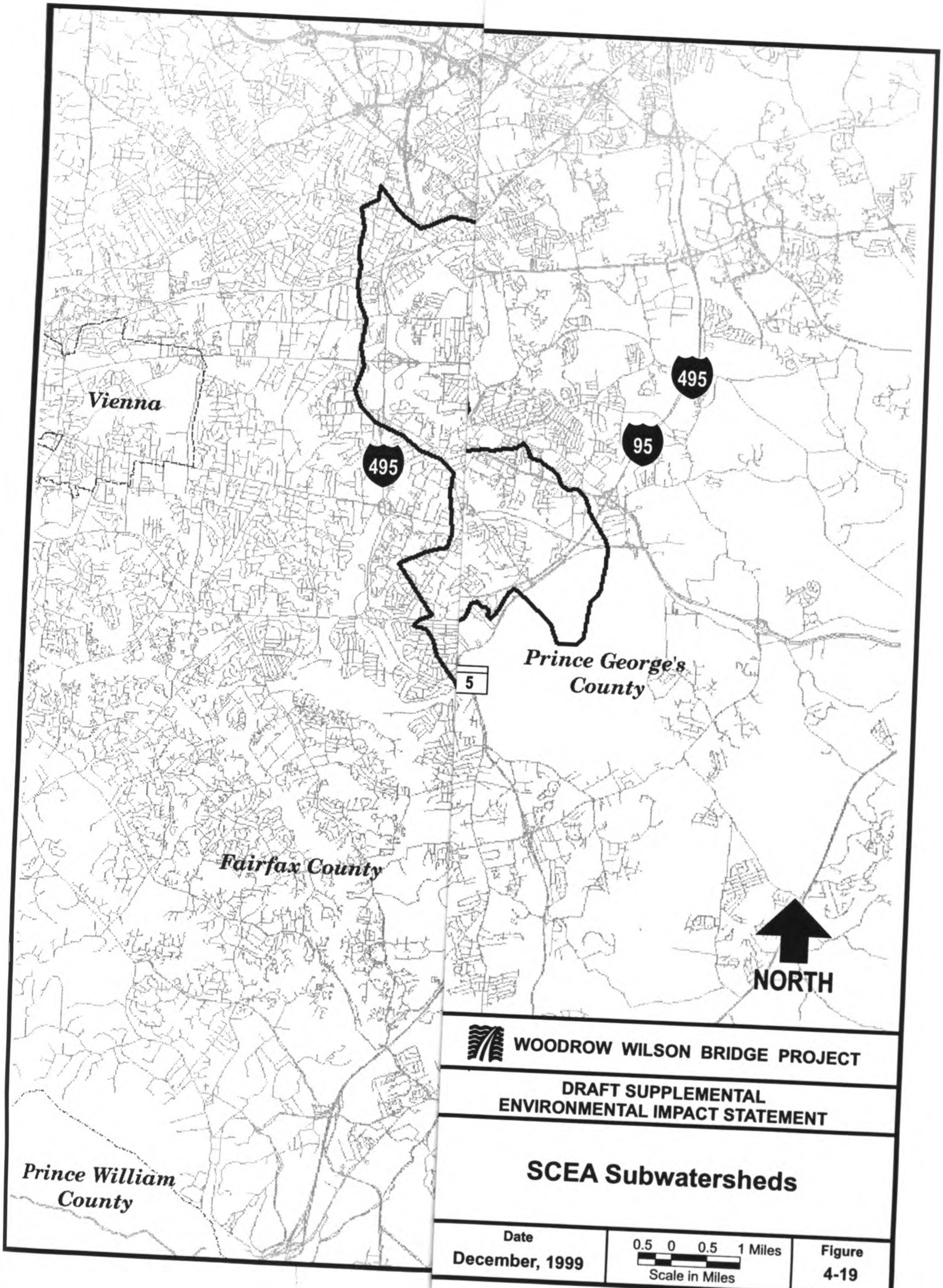

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

SCEA Subwatersheds

Date December, 1999

Figure 4-19

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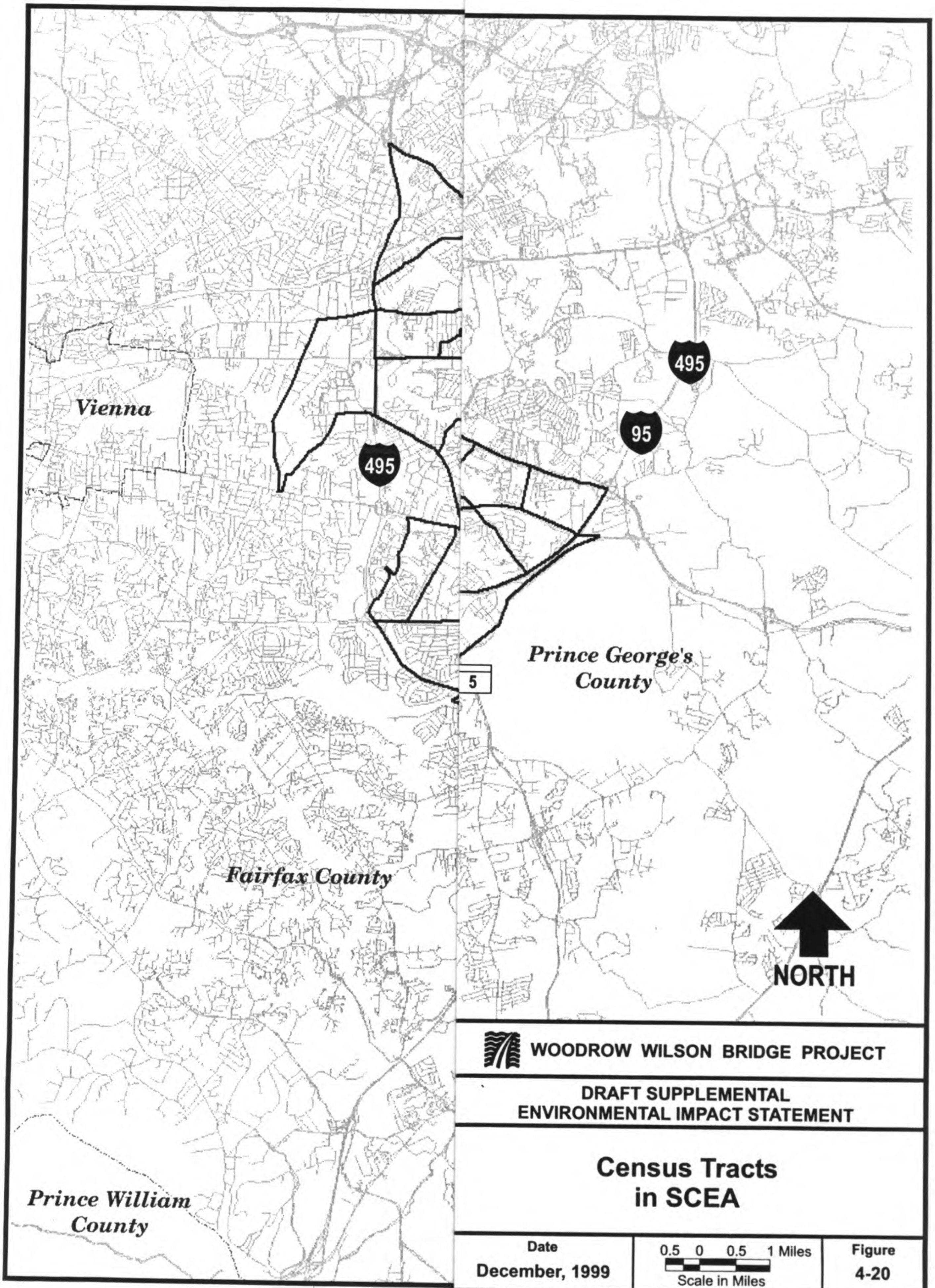

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Census Tracts in SCEA

Date		Figure
December, 1999	0.5 0 0.5 1 Miles Scale in Miles	4-20

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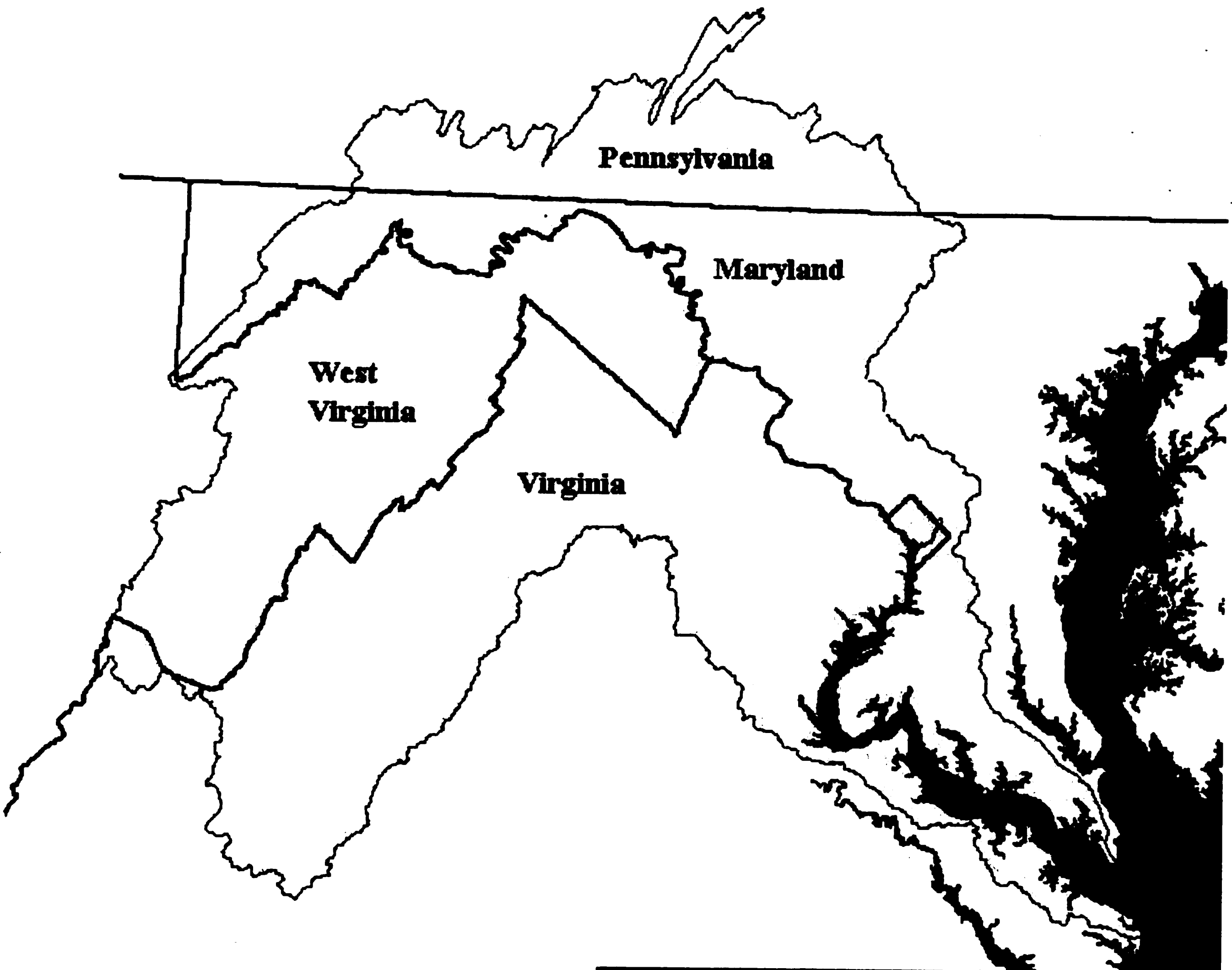

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Potomac River Basin

Map Source: SHA, ESRI	Date	Figure
	December, 1999	4-18

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The Carlyle site consists of six land parcels located within a planned urban mixed-use community. This site is comprised of approximately 6 hectares (15 acres) and would contain five office buildings and two parking garages flanking the east and the west sides of the office buildings. There would be 213,670 square meters (2,300,000 square feet) of rental space. Retail uses would be located in two of the buildings. The two parking structures would accommodate approximately 1,900 parking spaces each for a total of approximately 3,800 on-site parking spaces.

Despite the implementation of mitigation, the Patent and Trademark Office 1999 Draft Environmental Impact Statement describes the following adverse effects that cannot be avoided:

- Ground disturbance and minimal vegetation removal, including 5,097 cubic meters (60,000 cubic yards) of soil excavated from the site;
- Land use impacts include the change from a vacant site to 213,677 square meters (2.3 million square feet) of office complex.
- Minimal adverse effects on water quality from pollutant loadings associated with stormwater runoff, including an additional 12.04 acres of impervious area;
- The project may contribute to reduced level of service at several area intersections that are already experiencing capacity problems;
- Short-term adverse impacts on air quality and noise would result from construction activities at the site, and long-term operational impacts from PTO-generated traffic on air quality and noise would contribute to existing adverse conditions at some area roadways and intersections;
- Contaminated soils would be exposed during construction, but proper mitigation would reduce and possible avoid any resultant adverse impacts;
- Short-term adverse impacts on traffic and noise could result from utility construction required to serve the proposed PTO complex;
- There will be temporary closure of one lane of existing two-lane ramp from I-95/495 to northbound Telegraph Road for possible construction of Ramp A-1/A-2 as mitigation;
- Increased energy use would result from PTO operations;
- There will be a positive impact of approximately $6.5 million in new property tax revenue over existing conditions in the City of Alexandria;
- There are no known National Register-listed or eligible archeological resources present; and
- There will be a positive short-term impact of creating 4,200 new full-time equivalent construction jobs.

I-295 Widening Project: The District of Columbia Department of Public Works project from Chesapeake Avenue interchange south to meet the Woodrow Wilson Bridge project proposed improvements to the I-295 interchange.

Anacostia River and Tributaries, Maryland and District of Columbia Phase One Project: The Anacostia River has a total drainage area of 44,030 hectares (170 square miles) within Maryland and the District of Columbia. In a December 1991 reconnaissance report, the USACOE determined that federal actions related to navigation and flood control directly degraded more than 1,052 hectares (2,600 acres) of wetland, 202 hectares (500 acres) of aquatic habitat, and 324 hectares (800 acres) of bottomland hardwoods. Subsequently, the USACOE and five non-federal sponsors undertook a $2,570,000 feasibility study (non-federal sponsors include Montgomery County, Prince

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George's County, the District of Columbia, and the Maryland National Capital Park and Planning Commission). The feasibility study, which included an environmental impact statement, was completed in July 1994 and recommended 13 sites for environmental restoration. This project was authorized in the Water Resources Development Act of 1996, at a total cost of $17.1 million.

This project is located in Montgomery and Prince George's Counties, Maryland, and the District of Columbia. The project is comprised of 13 actions to restore 32 hectares (80 acres) of wetlands, restore 13 kilometers (5 miles) of stream, and create 13 hectares (33 acres) of bottomland habitat within the Anacostia Basin. The 13 actions include two wetland restorations, development of five stormwater management wetlands, and the restoration of six stream reaches. Project Construction was initiated in July 1999. The construction activities are slated to continue through September 2001, with project monitoring planned through September 2004.

The direct impacts of the project have a cumulative effect on the region. The plan would restore 604 fish and wildlife habitats annually over the 50-year life of the project. In the District of Columbia, 30.4 hectares (75 acres) of freshwater tidal wetlands would be restored within Kingman Lake and along the river. Reforestation is also proposed for 2.4 hectares (6.0 acres) in the vicinity of Kingman Lake. Within Prince George's County, a 0.8-hectare (2.0-acre) wetland would be constructed, 2,438 meters (8,000 feet) of the Northwest Branch would be restored, and 6.5 hectares (16 acres) of riparian area would be reforested. In Montgomery County, three existing stormwater management ponds would be retrofitted, two new stormwater management wetlands would be constructed, and 5,182 meters (17,000 feet) of Sligo Creek, Paint Branch, and Northwest Branch would be restored. The project's Final Environmental Impact Statement (FEIS) states that there would be no substantial adverse environmental impacts and the recommended plan would not reduce the National Economic Development (NED) benefits of existing flood control and navigation projects. A Section 404(b)(1) evaluation shows that the plan meets the Clean Water Act guidelines and an exception under Section 404(r) of Public Law 92-500, as amended, is requested.

US 1 Corridor Study: In 1994, the General Assembly directed VDOT to conduct a complete and comprehensive study of the US 1 corridor in Fairfax and Prince William Counties. The purpose of this study is to inventory existing transportation related features in the corridor, document existing conditions and deficiencies, recommend short term improvements, project future travel demand, and develop and evaluate alternatives to address transportation needs while accommodating county-specific economic development goals. A NEPA document has not yet been written, and no direct impacts associated with this project are available at this time.

MD 210: The Maryland Department of Transportation and State Highway Administration are conducting a project planning study for MD 210 (Indian Head Highway), between I-95/495/I-495 and MD 228 in Prince George's County. MD 210 is a six-lane divided arterial highway with partial control of access. It serves as a major route connecting I-95/495/I-495, the District of Columbia, and Virginia with southern Prince George's County and Charles County. The project planning study was initiated because of growing frequency and severity of traffic congestion and associated safety concerns along MD 210 between I-95/495 and MD 228. While final environmental documentation has not yet been prepared, a preliminary environmental summary table has been created. It examines the impact of five alternatives, not including the No Build alternative. This preliminary assessment indicates that there will be impacts on the following resources:

- Parkland or recreation: 0 to 3 areas

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• Stream crossings:	7 to 18 crossings
• 100-year floodplains:	1.6 to 9.3 acres
• Wetlands:	0.3 to 1.6 acres
• Woodlands:	25 to 81 acres
• Chesapeake Bay Critical Area:	0 to 13.7 acres

Largo Metrorail Extension: The Metrorail Extension is a 5-kilometer (3.1-mile) extension of WMATA's Blue Line from Addison Road Station to Largo Town Center with a stop at Summerfield. All three stations are in Prince George' County, Maryland. The 1999 Largo Metrorail Extension Final Environmental Impact Statement, which is expected to be signed at the end of 1999, describes both direct and secondary and cumulative impacts. The direct impacts of this project on wetlands are expected to be minimal. Seven non-tidal and/or Waters of the United States will be crossed and .31 acres of forested wetland will be affected. Plans are not currently at a sufficient level of detail to confidently predict required forest clearing. Preliminary assessment indicates that between 11.62 and 13.2 acres of forest will be affected. Within the 100-year floodplain permanent structures will fill approximately .05 acres. Two parks will be affected by the Metrorail Extension, and will result in a permanent loss of .6 acres of parkland. The Metrorail Extension is not expected to have adverse effects on historic resources. With regard to secondary and cumulative effects, the Metrorail Extension is not expected to spur development beyond what is expected in area master plans. In fact, because zoning changes and development has occurred in advance of extension construction, many of the secondary impacts expected to occur in response to the Metrorail extension in the immediate project area have already occurred. Although implementation of the project may encourage development, which may have a negative effect on wetlands in the Western Branch watershed and on terrestrial resources in the project area, linking such effects to the project should not be overstated. The entire region is experiencing rapid growth and it is likely that the vast majority of the development expected to occur would occur even if the project were not built. At most, the project may affect the timing of when the development would occur. Secondary and cumulative effects on wetlands and terrestrial resources are expected to be minimal.

4.12.6 Analysis Methodology

A combination of analysis methodologies was employed to fully assess and qualify secondary and cumulative effects. Analysis of historic effects included research and review of published literature on the region and census information at the census tract level. Project team members with established expertise on local development were utilized to portray a rich and meaningful setting of the region. GIS mapping was obtained or created for the SCEA boundary area and was used to understand and document conditions. Potential changes in land use were studied with the aid of local and regional plans. Specifically, the Metropolitan Washington Council of Governments (MWCOG) has recently undertaken an extensive study of future land use in the region for its air conformity analyses. This study was a team effort involving MWCOG and local jurisdictions. The MWCOG land use projections were the basis of the current analysis. Local land use experts were engaged to further the understanding of potential development outside of that which was planned or programmed.

The secondary and cumulative effect analyses were based on data that was readily available and not necessarily based on a comprehensive data set. Therefore, some conclusions drawn from this analysis are qualitative. Below is a review of the methods used for this analysis.

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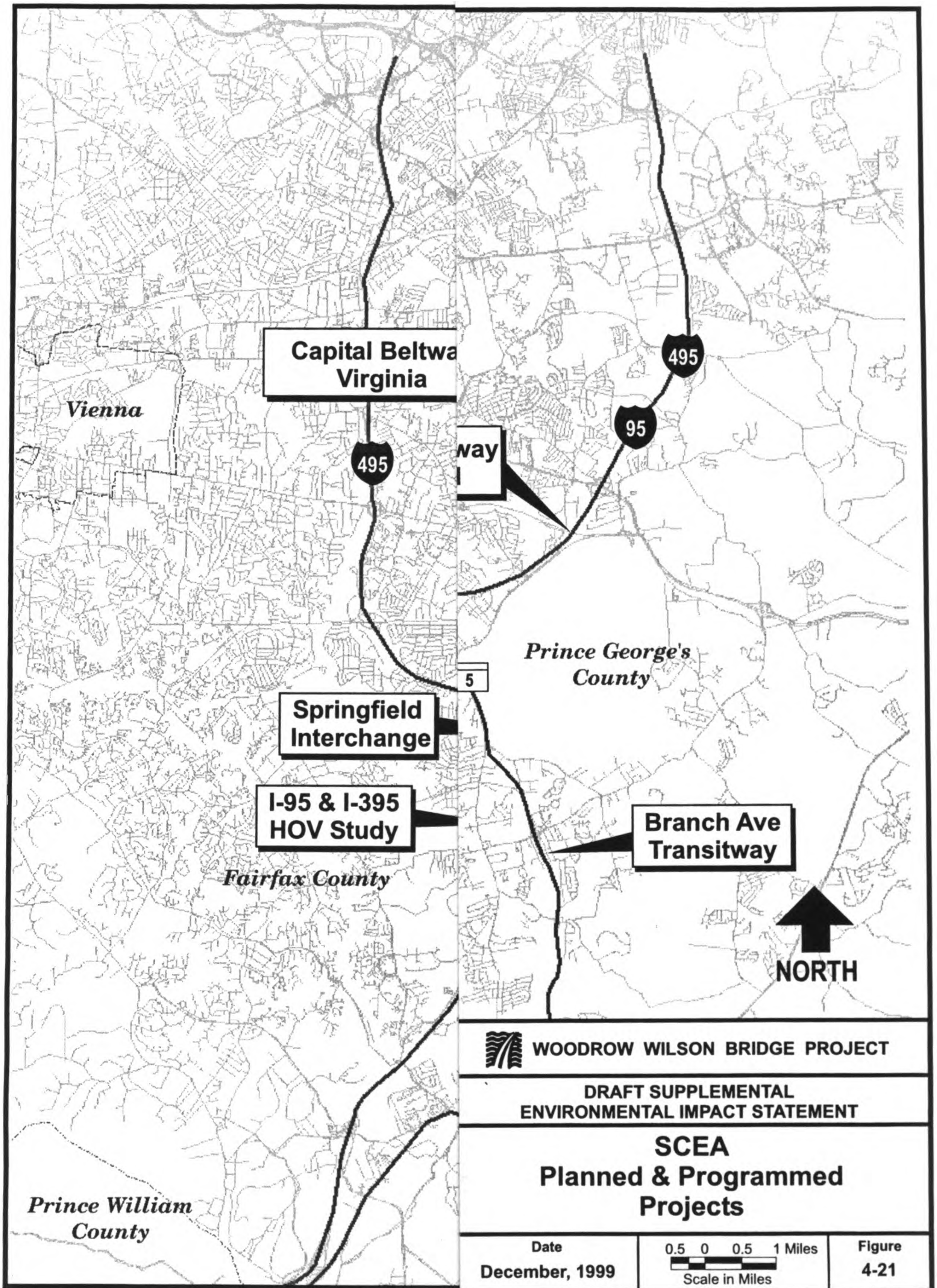

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

SCEA Planned & Programmed Projects

Date: December, 1999

Figure 4-21

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Trend analysis: Trend analysis was used to identify effects over time and to project future cumulative effects. Historic data was collected and compiled to understand past effects and the rate at which these effects occurred. This information was used to project future effects.

Interviews: Information from Federal, state, regional, and local agency staff not readily available in published documents was collected. This was especially helpful in critically reviewing potential and forecasted development.

Overlays: Overlays were used to combine land use projections with land use controls such as zoning, critical areas, and natural environmental constraints to create a reasonable, foreseeable, future scenario to analyze.

4.12.7 SCEA of the Socioeconomic Environment

Future Land Use and Development in the SCEA Boundary: Historic, existing and future land use in the SCEA boundary has been identified using state, county and regional data (see Figures 4-22 through 4-24), and by interviewing local planners. The data includes geographic information system databases on land use, natural resources and 1990 census information for Prince George's County in Maryland, for the District of Columbia, and for the Virginia jurisdictions of Alexandria, Arlington County, and Falls Church. Within the SCEA boundary, the primary land uses are urban and include residential, commercial/office, industrial/utility, mixed use and parklands. The land use discussion would focus primarily on the areas of traffic influence. The build-out date for the District of Columbia and for all Virginia jurisdictions is 2020.

Local planners have concluded through interviews that little to no change in the rate of development is expected as a result of the Woodrow Wilson Bridge project (Acquiro, Gabrielle, Arlington County; Fields, Paul, Prince George's County; Reineke-Wilt, Helen, Falls Church; Smith, Peter, City of Alexandria; Strunk, Charlie, and Wheeler, Sterling, Fairfax County; Personal Communication, November 1999). At most, the improved transportation facility may result in future zoning change requests to allow higher density development in areas not currently zoned for such development. Among the indirect impacts associated with the project is the potential for secondary development, although there are physical conditions and land use controls that limit this development within the region. The following section discusses the potential for changes in land use and development within the region.

Potential Land Use and Development: The total area of existing land uses in the SCEA boundary are listed in Table 4-44. As with the growth patterns of older metropolitan areas, growth was originally concentrated in the central city areas and then radiated outward over time. The same is true for the jurisdictions within the SCEA boundary, where the areas surrounding the bridge primarily contain older development. Due to the urban nature of the area and the small amounts of vacant or forested land available for development, most future development within the SCEA boundary will be increasingly characterized by redevelopment. Redevelopment involves new development in areas that have previously been developed, and generally consists of the removal and replacement of older structures. For the purpose of this analysis, local redevelopment areas have been described and local planners have identified areas in which redevelopment is likely to occur, as these areas will contain the highest concentration of new development.

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The City of Alexandria has no redevelopment programs, however, there are two major projects that are in the pre-construction phases within the City of Alexandria described in the "Other Projects" section called the Patent and Trademark Office and Potomac Yards. There are no redevelopment programs in Arlington County, but there are three areas within the boundary where redevelopment is concentrated. In Falls Church there are seven areas, each the size of one to three city street blocks, which have been designated as Mixed-Use Redevelopment Areas. Fairfax County has a program for redevelopment where there are several Commercial Revitalization projects, four of which are located within the SCEA boundary as listed in Table 4-45. There is one large area near Route 50 and Gallows Road called "Fairview Park" that is currently not a part of a redevelopment project, but is anticipated to be developed in the next several years.

Table 4-44: Land Use in the SCEA Boundary

Land Use[1]	Historic Land Use 1950 hectares (acres)	Existing Land Use 1999 hectares (acres)	Future Land Use 2020 hectares (acres)
Residential	21,114 (52,175)	19,053 (47,082)	18,484 (45,675)
Commercial/Office	436 (1,077)	2,289 (5,657)	2,041 (5,043)
Industrial	833 (2,058)	715 (1,768)	1,146 (2,832)
Mixed Use	not categorized	393 (972)	1,192 (2,945)
Agriculture/Rural Residential	not categorized	362 (895)	910 (2,248)
Forest	not categorized	3,232 (7,986)	not categorized
Parks, Open Space, Vacant, Public Facilities	4,989 (12,329)	4,717 (11,656)	7,842 (19,377)
Public and Semi Public	1,722 (4,254)	not categorized	not categorized
Barren[2]	not categorized	546 (1,350)	not categorized
Unzoned	3,123 (7,718)	not categorized	not categorized
Total[3]	32,217 (79,611)	31,666 (78,080)	31,614 (78,249)

Source: *Historic Land Use:* *National Capital Parks and Planning Commission, 1950*
Existing Land Use: *Maryland Office of Planning, District of Columbia Office of Planning, Falls Church Planning Department, Arlington Department of Community Planning and Development, Alexandria Department of Planning and Zoning, Fairfax County Department of Planning*
Future Land Use: *Washington Metropolitan Council of Governments*

Notes:
1. *The various data sources each identify specific land uses as differing categories.*
2. *All hectares (acreage) noted is located in Prince George's County.*
3. *Total hectares (acreage) may vary between historic, existing and future land uses due to inclusion of water resources in the totals, and landfill changes over time.*

Prince George's County has factored in the Woodrow Wilson Bridge improvements to all forecasts through the year 2020, and does not anticipate a change in the rate of development. Some areas within the SCEA boundary are currently built-out, including the Heights Planning Area. However, no redevelopment programs are planned at this time within the SCEA boundary. The *Maryland Smart Growth Areas Act* is described in Section 3.3.2. The Heights Planning Area has been designated a Priority Funding Area under this act. Designated Priority Funding Areas are within existing communities and in locally designated growth areas where the State and local governments want to encourage and support economic development and new growth. However, as stated previously, no change in the rate of development is anticipated in this area.

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There are no programs in any of the Northern Virginia jurisdictions to acquire land for conservation within the SCEA boundary. Any additions to parks and other land acquisition may occur at a small level. All water and sewer facilities would be able to accommodate the anticipated growth within the SCEA boundary.

As a result of redevelopment, construction resources would likely be imported from other regions. The condition of area resources may decline due to an increase in development density, which may result from an increasing demand for space and a decreasing amount of available acreage.

Table 4-45: Redevelopment Areas within the SCEA Boundary

Jurisdiction	Redevelopment Areas
City of Alexandria	None designated
Arlington County	Jefferson Davis Redevelopment Area
	Pentagon Center Site
	Four Mile Run/Shirlington Area
Falls Church	Seven Areas
Fairfax County	US 1 Corridor Revitalization
	Bailey's Crossroads at Columbia Pike, from the Arlington County line to south of Route 7
	Bailey's Crossroads at Columbia Pike, from Gallows Road to Route 236 (Annandale)
	Bailey's Crossroads on Route 7 from Seven Corners to Columbia Pike

Source: *Maryland National Capital Planning Commission, Falls Church Planning Department, Arlington Department of Community Planning and Development, Alexandria Department of Planning and Zoning, Fairfax County Department of Planning.*

Population: Table 4-46 shows the population for each jurisdiction within the SCEA boundary. A large number of people are moving from this portion of the District of Columbia. This area of Prince George's County is also showing a decrease in population, while the Virginia jurisdictions have been growing.

Existing Housing Units: An analysis of housing in the SCEA boundary was conducted. All census tracts within the SCEA boundary were identified and the number of units from 1990 and 1997 is shown in Table 4-47. There are 309,781 housing units in the SCEA boundary, 22,349 of which are vacant. Proposed housing development and the forecasted increase in development density are not dependent on Woodrow Wilson Bridge improvements.

Table 4-46 Population within the SCEA Boundary, by Jurisdiction

Jurisdiction	Census Tracts	1990 Population	1997 Population	Change in Population 1990-1997	Persons per square mile (1997)
District of Columbia	21	70,908	56,920	-20 percent	5,131
Prince George's County, MD	29	133,841	131,797	-2 percent	3,534
Fairfax County, VA	56	193,067	203,611	5 percent	4,306
Arlington, VA	40	170,936	175-937	3 percent	6,775
Alexandria, VA	38	111,183	118,327	6 percent	7,696
Falls Church, VA	8	9,578	9,862	3 percent	4,949
Total	**192**	**689,513**	**696,454**	**1 percent**	**5,010**

Source: U.S. Census Bureau.

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Table 4-47 Housing within the SCEA Boundary, by Jurisdiction

Jurisdiction	Census Tracts	1990 Housing Units	Percent Vacant Housing Units	Acreage	Housing Units per Acre
District of Columbia	21	29,052	15 percent	7,099	4.1
Prince George's County MD	29	52,407	5 percent	23,871	2.2
Fairfax County, VA	56	80,555	5 percent	30,261	2.7
Arlington, VA	40	84,847	7 percent	16,619	5.1
Alexandria, VA	38	58,252	9 percent	9,840	5.9
Falls Church, VA	8	4,668	10 percent	1,275	3.7
Total	**192**	**309,781**	**7 percent**	**88,966**	**3.5**

Source: *U.S. Census Bureau.*

Parklands: There are 136 local and regional parks in Virginia and 46 parks in Maryland within the SCEA boundary (See Table 4-48). There are three National Parks within the SCEA boundary. These parks are called Jones Point Park, which would be directly impacted by the improvements, Lyndon Baines Johnson Memorial Grove on the Potomac River, and the Frederick Douglas Natural Historic Site (NHS). The anticipated increase in density, which will occur regardless of the Woodrow Wilson Bridge improvements, may result in an increase in park usage and the annual number of park visitors.

Table 4-48: Parklands within the SCEA Boundary

Local and Regional Parks in Virginia		
Accotink Stream Valley Park	Four Mile Run Bike Trail	Monticello Woods Park
Alcova Park	Four Mile Run Park	Mount Jefferson Park
Allies Freek Park	Franconia	Mount Vernon District Park
Amberleigh Park	Gateway Regional Park	Mount Vernon Trail
Angel Park	George Washington Park	National Capital Area Park Hdq
Annandale Comm Park	Glencarlyn Park	National Capital Park Services
Backlick Park	Green Spring Farm Park	North Springfield Park
Backlick Run Stream Valley Park	Greenbrier Park	Ossian Hall Park
Backlick Stream Valley Park	Greenway Downs	Oak Hill Park
Barcroft Park	Groveton Heights Park	Oronco Bay Park
Belle Haven Park	Hidden Oaks Nature Center	Pine Spring Park
Berkley Park	Hollywood Road Park	Pinecrest

Table continued on next page.

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Table 4-48 (continued): Parklands within the SCEA Boundary

Local and Regional Parks in Virginia

Beulah Park	Holmes Run III Stream Valley Park	Pinecrest Park
Bluemont Junction Park	Holmes Run Park	Pohick Stream Valley
Bon Air Park	Holmes Run Stream Valley Park	Pomander Park
Bren Mar Park	Hooes Road Park	Ridgeview Park
Brook Valley Park	Hunter Village Park	Rolling Forest Park
Brookfield Park	Huntington Park	Round Tree Park
Broyhill Crest Park	Huntley Mansion Park	Rynex Nature Area
Bucknell Manor Park	Huntley Meadows Park	Shirley Park
Burgundy Park	Idylwood Park	Shirlington Park
Cameron Run Regional Park	Indian Run Stream Valley Park	Sleepy Hollow Park
Carlyle House Historic Park	JEB Stuart Park	Springfield Forest Park
Carrleigh Parkway	Jefferson District Park	Stevenson Park
Chambliss Park	Jefferson Manor Park	Stoneybrooke Park
Chinquapin Park	Jennie Dean Park	Tara Village Park
Clermont Natural Park	Jones Point Park	Trailside Park
Clermont Sch Site Park	Joseph Hensley Park	Tuckahoe Park
Colesanto Park	Lacey Woods Park	Turkeycock Run Stream Valley
Deerlick Park	Lady Bird Johnson Park	Upton Hill Regional Park
Doctors Br Park	Lafayette Sq	Wakefield Park
Dogue Creek Stream Park	Lake Accotnink Park	Washington and Old Dominion Railroad Regional Park
Dora Kelly Nature Park	Lee District Park	
Dowden Terr Park	Leewood Park	Waterfront Park
Dunn Loring Park	Lenclair Park	West Potomac Park
East Falls Church Park	Lillian Carey Park	West Springfield Park
East Potomac Park	Loftridge Park	Westover Playground
Edsall Nbhd Park	Lubber Run Park	White Oaks Park
Falls Church City Park	Luria Park	Wilburdale Park
Fitzhugh Park	Madison Manor Park	Windy Run Park
Flag Run Park	Madison Manor Playground	Winkler Botanical Preserve
Forrest Park	Manassas Gap Park	Woodlawn Park
Fort Scott	Manchester Lakes Park	YMCA (Alexandria)
Fort Ward	Marina Park	YMCA (Arlington Co)
Fort Willard	Mason District Park	
Founders	Mill Creek Park	

Local and Regional Parks in Maryland

Allentown Road Aquatic Facility	Glassmanor Park	North Barnaby Park/Aquatic Facility
Auth Village Park	Greenwood Manor Community Park	Oakcrest Park
Azaela Acres Park	Henson Creek Neighborhood Park	Owens Road Neighborhood Park
Barnaby Run Stream Valley Park	Henson Creek Stream Valley Park	Oxon Hill Farm
Belle Acres Playground	Henson Creek Trail	Oxon Run Parkway
Berkshire Neighborhood Park	Hill Road Park	Oxon Run Stream Valley Park
Betty Blume Neighborhood Park	Hunters Mill Community Park	Potomac River Waterfront Community Park
Branch Park	J. Franklin Bourne Aquatic Facility	
Brooke Road Neighborhood Park	Largo-Northampton Park	South Forestville Park
Cabin Bridge Park	Little Washington Neighborhood Park	Stanton Park
Camp Springs Park	Lynnalan Neighborhood Park	Suitland Bog Conservation Area
Dupont Heights Park	Marlow Heights Community Center	Suitland Community Park
Fairfield Knolls Neighborhood Park	Michael J. Polley Neighborhood Park	Suitland-District Heights Community Park
Forest Heights Neighborhood Park	Middleton Valley Neighborhood Park	
Fort Chaplin Park	Millwood Park	Tucker Road Park
Fort Mahan Park	North Barnaby Park	Tucker Road Park Ice Rink

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4.12.8 SCEA of the Natural Environment

Surface Water Quality

Background: Surface waters within the SCEA boundary include the tidal fresh portion of the Potomac River and its tributaries including the lower Anacostia River. The upper tidal Potomac River, as this portion of the River is generally called, stretches from the fall line at Chain Bridge to the vicinity of Marshall Hall in northwestern Charles County, Maryland and Mount Vernon in Virginia. The Potomac tributaries which fall within the SCEA boundary include Four Mile Run, Belle Haven, Cameron Run, Taylor Run, and Holmes Run in Virginia and Oxon Run, Henson Creek, and Broad Creek in Maryland.

Trends: Very little data is readily available on these tributary streams except for the Anacostia River. The tidal Potomac River, however, has a well-documented history of water quality degradation and has been the target of concern and clean-up efforts since the 1800s. Up until the 1900s, pollution concerns were largely seasonal or caused by periodic events. "During the 20th century, however, Washington D.C. and the surrounding suburbs experienced very rapid development and population growth. As regional population increased, so did the amount of untreated wastewater being directly discharged into the Potomac. As early as 1925, the U.S. Public Health Service declared the river unsafe for swimming due to elevated bacterial levels and danger of catching water-borne diseases. [By 1940, health concerns had prompted the construction of wastewater treatment plants so that] all of the region's wastewater [was] receiving primary treatment. Unfortunately, effluent volumes began exceeding the assimilative capacity of the river, and degradation of water quality accelerated" (MWCOG 1989).

In 1951, large-scale summer fish kills resulted from low dissolved oxygen levels, and the Washington Post referred to the river as "an open sewer" (ICPRB 1999). From 1950 to the 1970s the Potomac River became increasingly degraded as regional wastewater discharges increased, leading to swimming bans, low dissolved oxygen and "massive unsightly algae blooms" in large portions of the project area (MWCOG 1989). During this same period, federal, state and local governments began coordinated efforts to address the poor condition of the river including establishment of water quality standards and recommendations for treatment upgrades and increased capacity at regional wastewater treatment plants.

In the early 1970s following passage of the Clean Water Act, many of the point source water quality protections recommended during the 1950s and 1960s were in place or were planned for implementation. Over the next decade, those involved in the river recovery efforts began to see encouraging improvements in the river. In 1978, the Metropolitan Washington Council of Governments (MWCOG) reported that the "severe algal blooms resulting in noxious floating algae mats [had] not been observed in the upper Potomac estuary since the late 1960s." By 1979, a major change in the health of the river was illustrated through a rising interest in permitting some water contact sports in the Washington area. Only eight years earlier, the District of Columbia City Council had prohibited all such use of the Potomac and Anacostia Rivers (ICPRB 1999).

As treatment of wastewater continued to improve in the region during the 1980s, it became clear that the river was also being heavily influenced by non-point sources of degradation such as sedimentation and agricultural and urban runoff, largely from sources in the watershed upstream of

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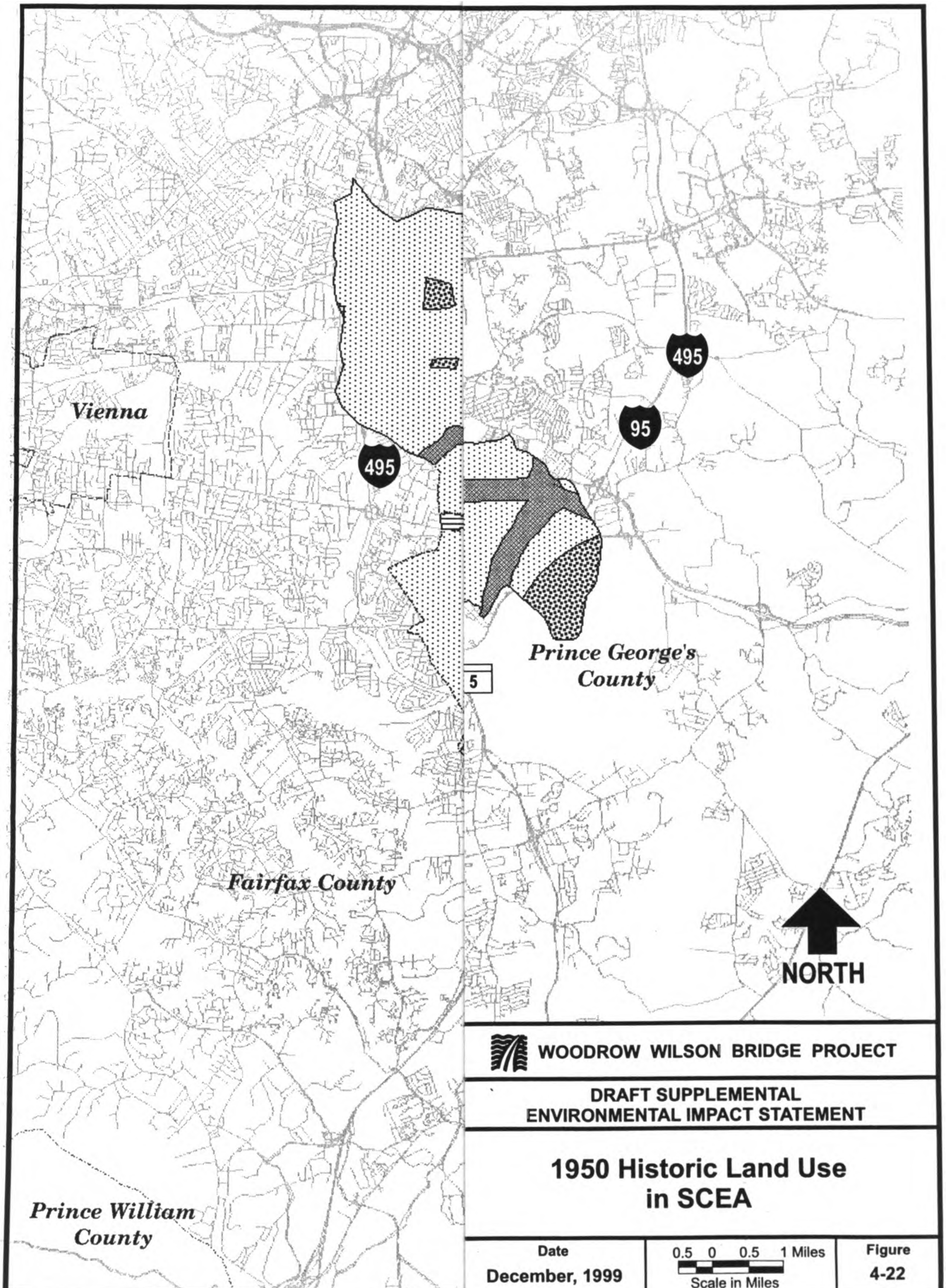

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

1950 Historic Land Use in SCEA

Date: December, 1999

Figure 4-22

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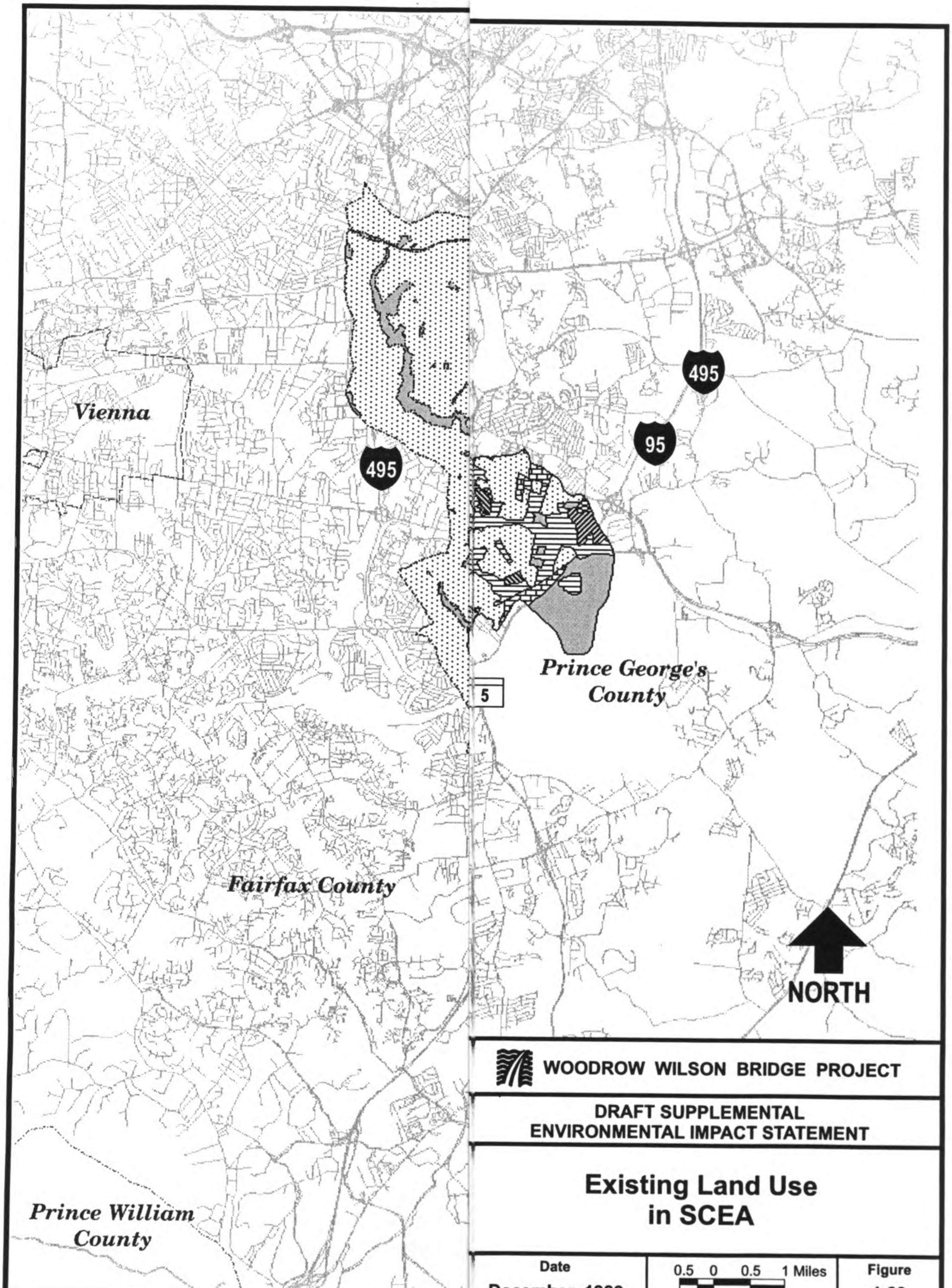

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Existing Land Use in SCEA

Date	0.5 0 0.5 1 Miles Scale in Miles	Figure
December, 1999		4-23

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the District of Columbia. "By 1986, point-source dischargers contributed less than 1 percent of suspended solids and only 8 percent of total phosphorous loads to the tidal Potomac. At the same time, non-point source nutrient runoff to the tidal Potomac was estimated at about 14-15 percent for total nitrogen and total phosphorous" (MWCOG 1989). Regional efforts to lower non-point source pollutant loading to the Potomac and the Chesapeake Bay have resulted in the implementation of sediment and erosion control, stormwater management and agricultural best management practices in much of the Potomac watershed.

Despite steady increases in population in the Potomac watershed, MWCOG reported an encouraging positive trend in overall water quality in the vicinity of the Woodrow Wilson Bridge in its 1993 publication, *Potomac River Quality 1990: Conditions and Trends in the Washington Metropolitan Area*. From 1983 to 1990, phosphorous and nitrogen levels declined at the bridge. During the same period, analysis of dissolved oxygen (DO) showed a slight downward trend, but DO remained consistently above state standards. Bacteria levels also continued to show improvement, although summer levels remained above those allowable for swimming. Downstream of the Woodrow Wilson Bridge, water quality improvements have not been quite as consistent, most likely due to less advanced wastewater treatment and increasing population. Despite persistent water quality problems, even downstream water quality in the lower estuary remains much improved over historic levels. Although many of the major water quality problems experienced over the last 40 years have been largely addressed, lingering problems such as toxic bioaccumulation of PCBs and chlordane in the Potomac fishery and ever-increasing population within the watershed, would continue to challenge water resource managers into the next century.

The lower Anacostia, which is located entirely within the District of Columbia, has shared in the Potomac's history of water quality problems but has not necessarily shared the Potomac's level of recovery. As stated by the USACOE in its feasibility report for restoring the Anacostia, "the point source solutions which were so vital to the resurgence of the Potomac estuary are not applicable to the non-point source pollution problems of the Anacostia Basin" (USACOE 1994). Recent monitoring in the river just outside the District of Columbia from 1986-1991 showed relatively high levels of nutrients, chlorophyll (evidence of algae blooms) and turbidity (MDNR 1996). The tidal portions within the District "experience low oxygen conditions (<5mg/l) as much as six months of the year." High sediment loads and bacteria levels have also been reported (MDNR 1996). Trace metals have been found in excess of water quality standards in a number of places in the watershed and "contamination by PCBs, polynuclear aromatic hydrocarbons, pesticides and heavy metals" (USACOE 1994) has also been documented.

No detailed assessment is available for Oxon Run and Broad and Henson Creeks in Maryland, however, MDNR's 1996 water quality report indicates some impairment in all of these systems, most likely due to urban and agricultural runoff. The tidal portion of Piscataway Creek was rated as fair, with seasonal algal blooms resulting in low DO and high pH levels.

Cameron Run, Four Mile Run, and Belle Haven are all located in heavily urban or suburban watersheds. Based on studies of watersheds with similar land use (MDNR 1996), the streams would be expected to have moderate to severely impaired water quality due to urban runoff and sedimentation. A 1974 study of Cameron Run reported "severe erosion and debris blockage[s]...throughout the watershed" (Parsons, Brinckerhoff, Quade & Douglas 1974). According to Fairfax County's *1998 Stream Water Quality Data Report*, lower Cameron Run exceeded Virginia's Water Quality standard for fecal coliform in all but one of the twenty samples

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taken during the year. Total phosphorous, nitrate, pH and DO were consistently within state standards. Fairfax County did not sample within the Belle Haven watershed, and data from Arlington County on Four Mile Run was not available.

Effects Analysis: Although the SCEA boundary is already relatively densely developed, future residential, commercial and industrial development and associated impervious areas within the boundary have the potential to negatively affect surface water quality. Potential negative effects from impervious surfaces are discussed in Section 4.7.2. In Virginia, the majority of the growth is projected to be in the form of redevelopment and limited infill projects on or between existing developed areas. In Maryland, larger areas of undeveloped land exist within the project area, with the largest areas being found along the MD 210 corridor. Many of these areas that are now in agriculture and forest are projected for residential development under long-range forecasts.

The conversion of open-space and forested areas to impervious areas or manicured landscapes would be expected to increase surface runoff and peak storm flows as well as introduce sediment and other pollutants into waterways. These effects would be somewhat mitigated by required compliance with water quality protection regulations administered by the Virginia Department of Conservation and Recreation (VDCR), the Virginia Department of Environmental Quality (VDEQ), the Maryland Department of the Environment (MDE) and the Maryland Chesapeake Bay Critical Area Commission. These regulations require reductions in runoff and pollutant loadings through the use of approved stormwater management and erosion and sediment control plans. Infill development is also likely to add to past and current water quality impacts, as it would further reduce the remaining natural areas in the project area available to filter and infiltrate runoff. Areas where redevelopment is expected would most likely have limited net impacts on water quality, as most of the conversion of impervious areas would have occurred during the original development of the land. In addition, new projects would be required to comply with current regulations to reduce water quality impacts wherever possible.

In addition to development proposed on land, there are also a number of projects currently underway within the Potomac River itself which could potentially affect water quality conditions in the SCEA boundary. The USACOE has begun dredge operations in portions of the Potomac River Federal Navigation Channel in Washington D.C. and Maryland. According to the USACOE's Environmental Assessment for the project (USACOE, 1999), the project will have minor, short-term effects on water quality from increased turbidity at the dredge and placement sites. Other dredging projects in the area include the Columbia Island Marina at Alexandria and the Washington Sailing Marina at Arlington, Virginia. Water quality impacts from these projects are also anticipated to be temporary increases in turbidity at the dredge location. All dredge material will be disposed of at an approved upland disposal site. All of these dredging projects will be completed by February 15, 2000, eight months prior to the earliest possible start of dredging activities for the Woodrow Wilson Bridge project. Because the impacts will be temporary, and will have dissipated by the time the bridge construction begins, the USACOE determined that all of the programmed dredge projects, including dredging activities for the Woodrow Wilson Bridge would not have a cumulative effect on water quality.

Some potential for future water quality improvement exists in the Virginia portion of the project area. New stream corridor parks or extensions of existing parks are planned. These areas may provide protected stream buffers and the potential for natural areas for filtering of runoff. In Maryland, stream corridor parks are also proposed, although it appears that more forested areas

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would be lost than new lands protected in parks. One of the greatest potential benefits to water quality in the future may be the large-scale restoration efforts on the Anacostia River. The USACOE has undertaken a project to restore wetlands in the tidal Anacostia River and provide watershed enhancement through stream restoration and stormwater wetland retrofit projects. Prince George's and Montgomery Counties are also implementing water quality retrofits in the watershed.

The potential positive and negative effects to water quality anticipated from future land use projections would occur independent of the Woodrow Wilson Bridge project. Consequently, secondary effects from the proposed action are not anticipated.

As discussed in Section 4.7.2, construction and maintenance of the Woodrow Wilson Bridge project would increase impervious areas within the project area by 43.3 hectares (107 acres) over the existing condition. This increase and the associated runoff from these areas have the potential to cumulatively effect the Potomac River and Cameron Run. In addition, impacts to wetlands and SAV, and disturbance of sediments during dredging required for construction of the bridge could reduce the nutrient uptake provided by vegetation, increase turbidity and release toxic contaminants into the water column. All studies on sediments to date have indicated that levels of toxic contaminants are below regulatory thresholds and will not pose a measurable threat to water quality. Increases in turbidity from construction of the bridge are expected, but will be limited to two four-month dredging periods that will occur two to three years apart.

Temporary effects during dredging will be minimized to the extent possible through the use of turbidity curtains and other best management practices. Adherence to sediment and erosion control and stormwater management regulations, as well as wetland permit requirements including mitigation, would also minimize direct impacts. In the context of recent trends showing improving water quality in the Potomac River, the current regulatory framework addressing point and non-point source pollution in the region and the efforts to minimize direct impacts of the project, cumulative impacts to water quality from the proposed project are expected to be minimal.

Floodplains

Background: Floodplains within the SCEA boundary are found along the Potomac and Anacostia Rivers and along the major Potomac tributaries, including Cameron Run, Four Mile Run, Henson Creek, Oxon Run, and Broad Creek.

Trends: Floodplain areas of the Potomac and its tributaries have been historically impacted by urban development. As far back as the early 1800s, dredging within the Potomac was conducted to create navigable channels. In the early 1900s, channel dredging and land reclamation increased, creating much of the current shoreline. It is widely known that a substantial portion of the District of Columbia was constructed on extensive wetlands "reclaimed" using dredge material from the River. These wetlands were located in low-lying areas that would have provided important velocity dissipation and storage of flood waters as the Potomac and its tributaries flowed into the Coastal Plain. Examples of these reclaimed areas are numerous within the SCEA boundary and include the Ronald Reagan Washington National Airport property, the Alexandria waterfront, large portions of the Anacostia riverfront, Rosalie Island, and Jones Point Park to name a few. The majority of the reclaimed areas were then built upon, adding to overall risk to life and property from flooding.

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Floodplains were altered further by a century of government flood control projects designed to protect the developed floodplain areas now threatened by flood waters. Flood control projects in the Anacostia River eliminated large areas of wetlands and bottomland hardwood forests that provided important ecological functions. Ironically, one of the main functions of these areas would have been providing flood storage. Similar projects were undertaken in Cameron Run, which the 1956 USGS quadrangle map of Alexandria shows as a widely meandering stream with a broad floodplain and associated wetlands. The historic floodplain of lower Cameron Run is now primarily a transportation corridor, with I-95/495 paralleling the stream channel. Industrial, commercial, and residential areas are also found in places that once contained broad wetlands and forests which would have helped to slow and absorb floodwaters.

Today, the once meandering channels of the Anacostia River, Cameron Run, and the lower portions of Four Mile Run and Holmes Run have been straightened and placed in rock-lined or concrete channels to insure efficient movement of potential floodwaters out of developed areas. The engineered channels which are kept free of vegetation have a wide array of negative effects on the ecology of the stream. The USACOE has documented a number of these effects in its design manual *Engineering and Design: Environmental Engineering for Flood Control Channels* (USACOE, 1989) and they include: removal of suitable habitat for aquatic organisms, loss of terrestrial habitat from clearing and maintenance of open channel areas, increased temperatures and photosynthesis potentially leading to lower dissolved oxygen and higher pH, channel instability, and disconnection with floodplain and wetlands areas.

Along Henson Creek and Oxon Run, encroachment has been less systematic. Some residential and commercial areas have been located within the broad 100-year floodplain of Henson Creek, but the floodplain itself has not been substantially altered except at perpendicular road crossings. The Oxon Run floodplain is less extensive than Henson Creek's and has seen slightly more encroachment by residential areas, however, many areas of functioning floodplain remain.

Effects Analysis: The long history of floodplain alterations in the SCEA boundary has eliminated or greatly reduced many of the valuable functions we now associate with floodplain areas. Floodwaters are moved through developed areas as quickly as possible with little opportunity for pollutant filtering or dissipation of velocities. Under the future development scenario, small infill and redevelopment is expected in Virginia, while both infill development and more extensive new development is anticipated in Maryland. All of these development activities are anticipated to occur regardless of the implementation of the Woodrow Wilson Bridge project.

Today, federal and state floodplain regulations and a wider appreciation for the valuable functions of floodplains and the dangers inherent in building on them, make it unlikely that past trends of floodplain encroachment would continue. In Virginia, the floodplains of Cameron Run and Four Mile Run have been limited in size by flood control projects. Any additional encroachment would be subject to Federal Emergency Management Regulations prohibiting a substantial increase in flood levels and local ordinances discouraging floodplain encroachment. Similar prohibitions would be in place for development along the Potomac River. In Maryland, federal and local regulations discouraging development in floodplains would apply, and any floodplain encroachment would also require authorization by the Maryland Department of the Environment under a Waterways Construction Permit. In addition, the future land use mapping shown in Figure 4-24 indicates that the majority of the Oxon Run and Henson Creek floodplains would be set aside as open space or parkland. Along the Anacostia, some positive changes to floodplain function are

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expected in the future due to the USACOE planned wetland restoration projects along the tidal river. The USACOE plans to restore 30.4 hectares (75 acres) of wetlands within Kingman Lake and along the tidal river. When complete, this project would increase the overall flood storage and function of these floodplain areas.

Due to the current regulatory framework and future plans to set floodplain areas aside, effects to floodplains under the future land use scenario are expected to be minimal. Secondary effects to floodplains from the Woodrow Wilson Bridge project are not expected.

As described in Section 4.7.3, the construction of the Woodrow Wilson Bridge would require 33.2 hectares (82 acres) of total floodplain encroachment. Along Cameron Run, flood elevations are expected to decrease slightly as a result of the project, despite 12.4 hectares (31 acres) of floodplain encroachment. This is due to wider and more efficient bridges and culverts that have been included in the project design. The remaining 20.8 hectares (51 acres) of floodplain impacts are within the floodplain of the Potomac River. Hydraulic models indicate that flood levels would not be substantially increased due to the encroachment. There would, however, be a loss in floodplain function as areas that were previously available for storage or dissipation of flood waters are filled.

In the context of the entire upper tidal Potomac River floodplain, the loss of function is relatively small. However, in conjunction with the successive loss of floodplain areas over the SCEA time frame, the project may make an incremental contribution to cumulative floodplain effects in the SCEA boundary. This effect will be minimized to some extent within the study area through the creation of tidal wetland mitigation sites that would enhance local floodplain function and to a greater degree at wetland mitigation sites outside of the SCEA boundary. It will be important, however, for regional decision-makers and regulators to continue to protect floodplain areas and look for restoration opportunities such as those currently planned by the USACOE in the Anacostia. This diligence in regulation and planning will help to minimize future cumulative effects and to enhance overall floodplain functions throughout the region.

Waters of the United States

Tidal Wetlands, Nontidal Wetlands and Tidal Mudflats

Background: Vegetated wetlands and tidal mudflats within the SCEA boundary include emergent, scrub-shrub and forested tidal wetlands and tidal mudflats of the Potomac and Anacostia Rivers and Hunting Creek. Nontidal wetlands in the SCEA boundary are mostly broad-leaved, deciduous, forested wetlands located in stream valleys, but some emergent and scrub-shrub wetlands are also present. Many of the wetlands have been greatly altered by human activity and land development leading to channelization, draining, removal of vegetation, and filling of these resources.

Trends: Impacts to wetlands of the Potomac and Anacostia Rivers have corresponded with the settlement of the Washington area as the Nation's capital. Some notable man-induced impacts include: the dredging, and later the complete filling, of Tyber Creek in the vicinity of the Mall; the dredging of gravel deposits from 1870 to 1936 at the current Ronald Reagan Washington National Airport; and the filling of a wetland area known as Kidwell's Meadow for the Washington Channel and Hains Point in 1881 (Tilp 1978). The MWCOG, in a 1991 report, stated that in the past century over 90 percent of the tidal wetlands of the Anacostia River were drained, filled, or destroyed (MWCOG 1991). In particular, the Kenilworth Marsh, a tidal wetland located along the Anacostia

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River in the District of Columbia was 120 hectares (300 acres) in size in 1927. The construction of a seawall in that area in the 1930s, channelization of the Anacostia River, and marsh filling at the adjacent Kenilworth Dump reduced the wetland to an area of 30.4 hectares (76 acres) in 1989. In the 1990s, portions of this wetland area were restored, resulting in an increase in wetland area and function.

The USACOE wrote in a study of the Anacostia River watershed that an area known as the Anacostia Flats was "reclaimed" in the early 1900s (USACOE 1994). These wetland areas were filled with dredge material from the channel in response to malaria outbreaks at Fort McNair. "Reclamation" during that period in this region typically referred to the filling of wetlands or open water habitat to provide dry uplands for development or flood protection. Also, areas along the Anacostia River upstream as far as Bladensburg were channelized to provide flood control and maintain navigation. These modifications resulted in the loss of extensive areas of wetland habitat. In fact, USACOE's research indicates that the tidal Anacostia River historically contained 1,040 hectares (2,600 acres) of emergent tidal wetlands (most commonly containing vast stands of wild rice) to Bladensburg. Over time, that area has been reduced to approximately 40 hectares (100 acres).

For areas within the Chesapeake Bay Watershed, the United States Fish and Wildlife Service (USFWS) has determined that Maryland experienced a net loss of 1,924 hectares (4,810 acres) of wetlands and Virginia experienced a net loss of 7,126 hectares (17,815 acres) of wetlands during the period 1982-1989 (Tiner et. al. 1994). The USFWS reported that from the mid-1950s to the late 1970s, about 9,600 hectares (24,000 acres) of wetlands were lost in Maryland and 25,200 hectares (63,000 acres) of wetlands were eliminated in Virginia (Tiner 1987). The causes of these losses include draining and clearing for agriculture, pond and lake construction, urban development, losses due to extractive industry impacts, and natural forces. In 1986, the USFWS determined that while the area of vegetated wetlands in Maryland and Virginia declined substantially since the mid-1950s, vast areas of freshwater ponds were created (Tiner and Finn 1986). In a 901.3 square kilometer (348-square mile) project area of Northern Virginia, the USFWS determined that between 1980-1981 and 1988-1991, over 50.8 hectares (127 acres) of wetlands were lost (Tiner and Foulis 1994). For the period 1981 to 1988-89, the USFWS determined that Prince George's County lost approximately 91.6 hectares (229 acres) of vegetated wetlands (Tiner and Foulis 1992).

According to Maryland Office of Planning (MOP) data, the area of wetlands within Prince George's County increased slightly from 1,329 hectares (3,324 acres) to 1,335 hectares (3,337 acres) from 1973 to 1990 (MOP 1991). This increase of approximately 5.2 hectares (13 acres) may be the result of a corresponding loss of agricultural lands reported during that period. The Virginia Institute of Marine Science reported that for the period 1991-1993, approximately 0.4 hectare (1.0 acre) of nontidal wetland impacts were permitted in the Coastal Plain area of Virginia and mitigation was not provided to compensate for these losses (Varnell et al. 1993). The Maryland Department of the Environment stated that within the Maryland portion of the SCEA boundary, 0.9 hectare (2.2 acres) of nontidal wetlands impacts were permitted, and 0.4 hectare (1.0 acre) of the impacts were compensated for through mitigation for the period 1991-1998, resulting in a net loss of 0.5 hectare (1.2 acres) of nontidal wetlands for that period (Walbeck 1999).

With the implementation of "no net loss" policies, Section 404 of the Clean Water Act, the Maryland Nontidal Wetlands Protection Act, the Maryland Tidal Wetlands Act, the Virginia State Water Control Law, and the Virginia Wetlands Act, wetland losses may be slowing and mitigation to offset impacts is more common than in the past.

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Effects Analysis: *The Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999* states that 8.3 hectares (20.6 acres) of wetlands and mudflats would be directly impacted by the proposed action. The average historical losses to wetlands total approximately 15.6 hectares (38.5 acres) per year in the combined Prince George's County and Northern Virginia areas. Future impacts to wetlands are anticipated from projected redevelopment and new development. However, the future trends of losses of wetland impacts within the SCEA boundary may be slowing due to the lack of large areas of developable property and current laws and regulations protecting wetlands and other waters of the United States.

Mitigation, in the form of wetland creation, restoration, and enhancement is proposed to the maximum practicable extent within the SCEA area. However, the complete area required for mitigation includes sites outside of the SCEA area but within the Potomac River watershed. Mitigation proposed within the watershed serves to offset the potential effects of wetland and mudflat conversion by providing similar functions as those impacted by the project. Therefore, considering the overall wetland impacts the proposed mitigation action would offset the negative effects and contribute to wetland and mudflat functions and values in the SCEA area.

The development of the proposed action is not anticipated to spur development in the SCEA boundary, because the majority of the area is proposed for development or is already developed. It is not anticipated that the development of the project in itself would cause secondary impacts to other wetland or stream resources in the area. The proposed project with the proposed mitigation is not anticipated to contribute adversely to the cumulative effects experienced by these resources.

Tidal Riverine/Open Water and Non-Tidal Riverine/Open Water

Background: Streams and rivers include the tidal freshwater rivers of the Potomac River, the Anacostia River, and Hunting Creek. The tidal and nontidal streams of the watersheds of Oxon Run, Broad Creek, Henson Creek, Four Mile Run, and Belle Haven are also within the SCEA boundary. Many of the streams have been greatly altered by human activity and land development leading to channelization, draining, removal of vegetation, and filling of these resources.

Trends: Impacts to open water habitats of the Potomac and Anacostia Rivers have corresponded with the settlement of the Washington area as the Nation's capital. Some notable man-induced impacts include: the dredging, and later the complete filling, of Tyber Creek in the vicinity of the Mall; the dredging of gravel deposits from 1870 to 1936 at the current Ronald Reagan Washington National Airport; and the filling of a wetland area known as Kidwell's Meadow for the Washington Channel and Hains Point in 1881 (Tilp 1978). The construction of a seawall in the Kenilworth Marsh area in the 1930s, channelization of the Anacostia River, and marsh filling at the adjacent Kenilworth Dump also resulted in changes to open water and riverine habitats.. Also, areas along the Anacostia River upstream as far as Bladensburg were channelized to provide flood control and maintain navigation. These modifications resulted in the loss of extensive areas of river habitat.

A comparison of United States Geological Survey (USGS) 1951 and 1983 topography maps for the Alexandria Quadrangle revealed that landscape modifications resulting in the loss of natural stream channels occurred during that period. A portion of Oxon Run was channelized; areas of Oxon Cove were filled for development; areas of Hunting Creek were altered; Cameron Run, Holmes Run, and Four Mile Run were channelized; and islands in Smoots Cove were altered. Although this review is

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for only one quadrangle, this analysis provides insight into trends of stream impacts for the larger SCEA boundary from available mapping. Also, large stream segments of the Cameron Run watershed are known to have been straightened, widened, and/or concrete lined (Parsons, Brinckerhoff, Quade, & Douglas, Inc. 1974 and 1975). Some of these modifications date back to the 1800s when railroad lines were constructed in the area. This data indicates a historical trend of losses of wetland area and natural stream channels that corresponds with the patterns of land development and human impact within the SCEA boundary. However, with the implementation of Section 404 of the Clean Water Act, the Maryland Tidal Wetlands Act, the Virginia State Water Control Law, and the Virginia Wetlands Act, riverine and open water losses may be slowing and mitigation to offset impacts is more common than in the past.

Effects Analysis: *The Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999* states that 4.8 hectares (11.1 acres) of riverine and open water areas would be directly impacted by the proposed action. Future impacts to riverine and open water habitats are anticipated from projected redevelopment and new development. However, the future trends of losses of these habitats within the SCEA boundary may be slowing due to the lack of large areas of developable property and current laws and regulations protecting Waters of the United States. Mitigation, in the form of stream blockage removal, providing shallow water nursery habitat, and restocking streams is proposed to the maximum practicable extent within the SCEA area. However, the complete area required for mitigation includes sites outside of the SCEA area but within the Potomac River watershed. Mitigation proposed within the watershed serves to offset the potential effects of open water conversion by providing similar functions as those impacted by the project. Although quantitative trends data for these resources is unavailable, it is anticipated that the proposed action will substantially contribute to riverine and open water habitats in the SCEA area.

The development of the proposed action is not anticipated to spur development in the SCEA boundary, because the majority of the area is proposed for development or is already developed. It is not anticipated that the development of the project in itself would cause secondary impacts to other wetland or stream resources in the area. The project's contribution to cumulative effects on these waters will be dependent upon the location of dredge disposal.

Tidal Vegetated Shallows (Submerged Aquatic Vegetation):

Background: Submerged Aquatic Vegetation (SAV) within the SCEA boundary is most commonly found in the shallower portions of water bodies where adequate light can penetrate the water for plant growth (USFWS undated). Water depths up to six feet are adequate for SAV growth. Also, SAV thrives in areas where water currents are gentle and the bottom of the water body is silty or sandy. For these reasons, SAV in the SCEA boundary is common in the shallow tidal portions of the Potomac River to Hains Point, the Anacostia River to East Capitol Street, Hunting Creek, Oxon Cove, Broad Creek, Four Mile Run, and Piscataway Creek (Orth et al. 1997). SAV can also be found in nontidal lakes of the project area, but data regarding the trends of SAV in these lakes was not readily available. SAV species have differing salt tolerances, and the majority of the SAV species present in the SCEA area are species adapted to tidal freshwater (i.e., low salinity) environments. Common SAV species include Eurasian watermilfoil, wild celery, coontail, naiads, water stargrass, and hydrilla.

Trends: Submerged Aquatic Vegetation populations can undergo natural fluctuations in abundance, location, and species composition in response to a number of factors, some of which are not fully

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understood (USFWS undated). In a 1916 survey of the Potomac River, diverse and widespread populations of SAV were found, but these populations began to decline in the 1920s and 1930s due to water quality impacts from sewage effluents to the river (MWCOG 1989). Although a general decline in SAV ensued, two notable infestations of non-native SAV led to an increase in SAV acreage.

The non-native water chestnut invaded large portions of the Potomac River in the mid-1900s. Approximately 4,000 hectares (10,000 acres) of the tidal freshwater Potomac was covered with this plant in 1950 (USACOE 1985). Mechanical harvesting was employed by the USACOE and the nuisance plant was mostly eradicated by the 1960s. Eurasian watermilfoil populations also grew dramatically during the 1950s and 1960s, displacing other species, but declined naturally by the late 1960s.

Despite the natural fluctuation of SAV populations, SAV in the Chesapeake Bay region dramatically declined during the 1960s and 1970s (USFWS undated). The USFWS stated that SAV abundance in the Chesapeake Bay region dropped by 66 percent during that period, from between 40,000 hectares (100,000 acres) and 120,000 hectares (300,000 acres) down to approximately 20,000 hectares (50,000 acres). It is generally thought that the loss of SAV during that period was due to a general decline in water quality from increased nutrient and sediment loads. Suspended sediments can cloud the water inhibiting the penetration of light to the plants, and nutrient pulses can cause algal blooms that block sunlight below the water surface.

These losses severely affected the tidal freshwater Potomac, with the Maryland Department of Natural Resources finding that SAV was not present between 1972 and 1976 (Orth et al. 1984). USGS reported very sparse populations of SAV in the area between 1978 and 1981. However, this trend was reversed with the introduction of the exotic plant, hydrilla, at Dyke Marsh in 1982. Its vigorous growth led to large mats of hydrilla with very few opportunities for the establishment of other species. Hydrilla coverage dramatically increased from four hectares (ten acres) at Dyke Marsh in 1982 to 240 hectares (600 acres) in 1984. From 1982 to 1986, the USGS estimated that SAV in the tidal freshwater Potomac increased from 0.4 hectare (1.0 acre) to 1,440 hectares (3,600 acres) (MWCOG 1989). In 1985, USGS's calculations revealed an increase from 593 hectares (1,482 acres) of SAV in 1984 to 1,555 hectares (3,888 acres) in 1985 (Orth et al. 1985). The rapid growth of hydrilla led to a mechanical harvesting program started in the late 1980s to maintain navigation channels.

In 1991, it was determined that the rapid spread of SAV in the tidal freshwater portion of the Potomac River led to the highest levels of SAV populations since the early 1900s. Although hydrilla was the primary contributor to this growth, other native SAV species also increased in abundance. This period of increased SAV abundance correlates with improvements at the Blue Plains Wastewater Treatment Plant and other area sewage treatment plants. During that time, total suspended solids and phosphorus loads from effluent discharge was substantially reduced leading to beneficial effects to water quality. In recent years, these hydrilla beds have become more diverse, and other species are becoming established. Recent estimates show that SAV area in the tidal freshwater Potomac totals 802 hectares (2,006 acres) (Orth et al. 1997). This data indicates that SAV abundance in the tidal freshwater Potomac is remaining steady or is increasing. It also appears that the diversity of SAV plants is increasing with native SAV being interspersed with the non-native hydrilla.

Effects Analysis: *The Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999* states that 12.8 hectares (31.70 acres) of

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Submerged Aquatic Vegetation would be directly impacted by the proposed action. When compared with the area of SAV in the tidal freshwater Potomac, approximately one percent of the SAV area would be impacted. Impacts to SAV may occur under the future land use scenario. The National Harbor project in particular is expected to effect SAV within Smoots Cove. However, current Federal and State regulations may help minimize overall losses of SAV habitat. In addition, due to natural fluctuations in SAV growth and the recent water quality enhancements in the Potomac River, the lost SAV area may be compensated by the further natural establishment of SAV elsewhere in the tidal freshwater zone of the Potomac. Therefore, the proposed loss of SAV area is not anticipated to substantially contribute to a cumulative negative impact to SAV beds within the SCEA boundary. Since proposed development is not dependent on the Woodrow Wilson Bridge improvements, it is not anticipated that the development of the project in itself would cause secondary impacts to SAV in the area. Furthermore, mitigation would be provided to offset these impacts in the form of new SAV establishment in portions of the Lower Potomac where SAV has been absent for many years. This mitigation, in concert with removal of fish blockages in Rock Creek and Northwest Branch would create habitat for anadromous fish species and may minimize any potential cumulative effects of SAV impacts as a result of this project.

Terrestrial Habitat/Species

Background: Land use within the SCEA boundary is largely in a developed condition. Remaining terrestrial habitats are found primarily on parklands, open space lands, golf courses, cemeteries, abandoned parcels, low density residential areas, and agricultural lands. Forest resources within the SCEA boundary are generally small, fragmented parcels often associated with riparian corridors. The largest areas of contiguous forest habitat occur within the lower portion of the Broad Creek watershed and adjacent to Oxon Cove in the Oxon Run watershed in Maryland. No large forests remain in the Virginia portion of the SCEA boundary. In Virginia, remnant forest occurs along riparian corridors in the Four Mile Run and Cameron Run watersheds and in the upland areas of Dyke Marsh within the Belle Haven watershed.

Although forests provide a wide range of human related products and services, they are also known to provide a variety of important ecological functions. In a recent publication on forest resources within the Chesapeake Bay watershed, the U. S. Department of Agriculture, Forest Service stated that "acre for acre, forests are the most beneficial land use in terms of water quality. Acting as a living filter, forests capture rainfall, regulate stormwater and streamflow, filter nutrients and sediment and stabilize soils." Forests also can retain up to 70 to 80 percent of atmospherically deposited nitrogen, providing an important sink for excess nutrients that would otherwise reach waterways. Forest habitats are essential for a wide variety of animals, birds, and plants, with riparian forests providing critical habitat for over half of the terrestrial wildlife species in the region (USDA 1996). Streamside forests are also important for aquatic organisms that use decaying organic matter and downed woody debris for shelter and that benefit from temperature regulation, and other water quality benefits provided by forests.

Many of the rare, threatened, and endangered (RTE) species recorded in Maryland and Virginia, including the bald eagle, need forested habitat for survival. In addition, considerable attention has recently been given to the dwindling populations of Forest Interior Dwelling Birds (FIDB). These species require large, contiguous, and undisturbed tracts of forest in which to sustain viable breeding populations, and are disappearing throughout the Mid-Atlantic region.

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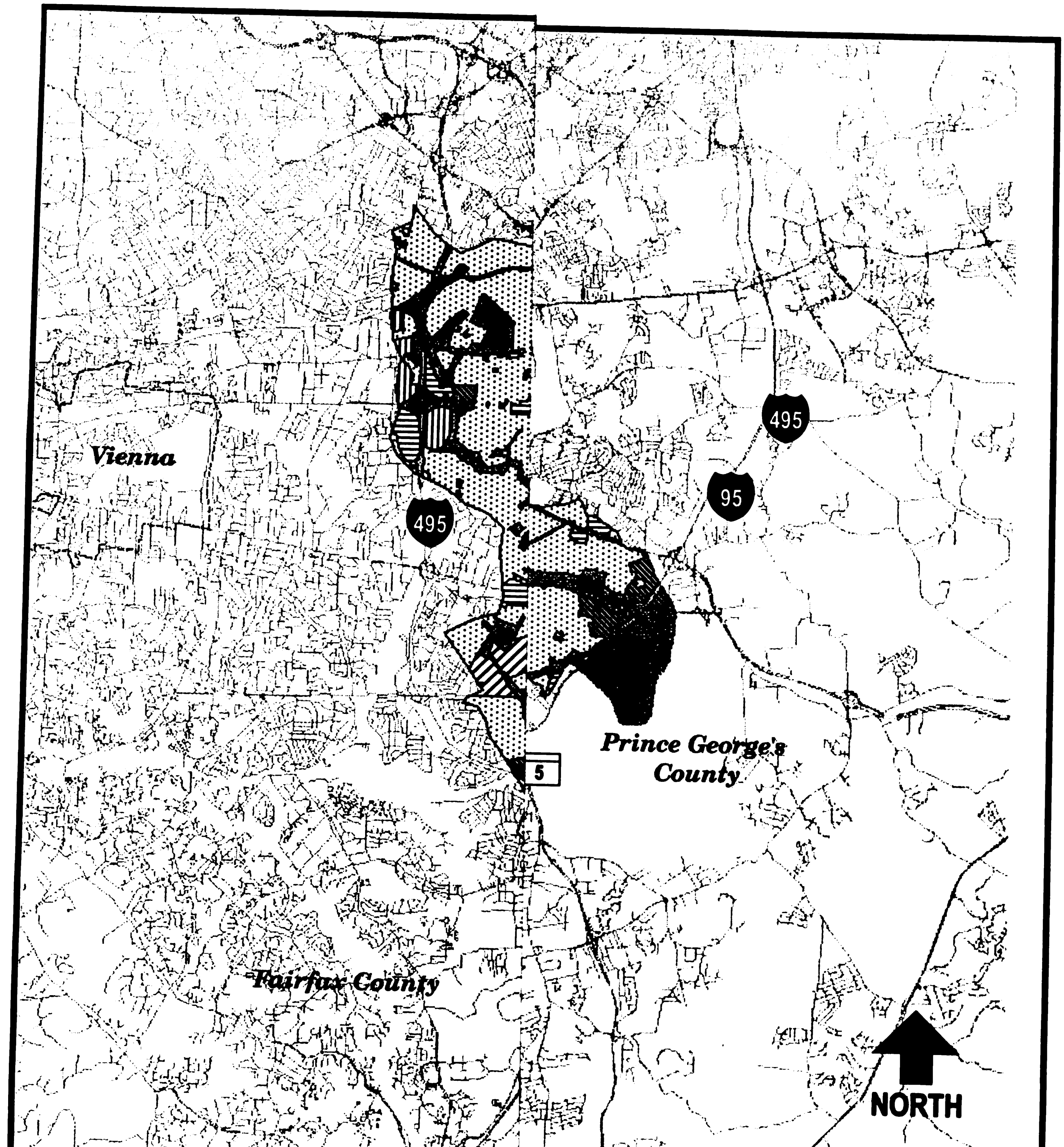

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

2020 Future Land Use in SCEA

Date	0.5 0 0.5 1 Miles Scale in Miles	Figure
December, 1999		4-24

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Non-forested terrestrial habitats also occur, including shrub, old field, and grassland (both managed and unmanaged). These habitats are also valuable for certain species of plants and wildlife that are adapted to these special conditions or that use these areas to disperse to other areas.

The agricultural land, forests, wetlands, and low-density, man-dominated environments within the SCEA boundary provide important habitat for a variety of wildlife. Urban and suburban environments would be expected to be populated primarily by highly adaptable mammal species such as mice, rats, squirrel, opossum, and raccoon, as well as opportunistic bird species such as sparrows, finches, starlings, doves, cardinals, robins, and other common "backyard" birds. Park/open space/vacant lands would most likely support these species as well as providing habitat for voles, shrew, rabbit, woodchuck, skunk, beaver, muskrat, fox, and deer. Numerous bird species that prefer edge and more open habitats would also be found in these areas, such as red-tailed hawk, sparrows, finches, doves, waxwings, wrens, and jays. The forested habitats, however, provide shelter for the greatest diversity of species as they can support many of the opportunistic species but also are essential to less adaptable species of mammals, reptiles, amphibians, and birds. In particular, large forested areas provide vital habitat for FIDB, as described above.

Trends: The USDA Forest Service analyzed forest trend data for the Chesapeake Bay region from the 1970s to 1995 (USDA 1996). Within the Potomac River region of Loudoun, Fairfax, and Prince William counties in Virginia and Montgomery and Prince George's counties in Maryland, seven percent of the forest was lost to urban development between 1985 and 1995. This amounted to about 2.9 thousand hectares (7.1 thousand acres) per year. In Maryland, substantial areas of forest exist only on undeveloped land in the lower Broad Creek watershed and adjacent to Oxon Cove in Maryland. Within the Prince George's County portion of the SCEA boundary, the Maryland Office of Planning (1991) found that 7.9 percent of the County's forests had been lost from 1973 to 1990, with almost two thirds of that loss (five percent) occurring from 1985 to 1990. Prince George's County forest cover data from the Maryland-National Capital Park and Planning Commission (M-NCPPC) show a different trend. Between 1965 and 1993 forest cover increased from 45.6 percent to 47.8 percent of the total land area of the county (John Markovich, M-NCPPC, 1999, personal communication). However, this discrepancy between the data presented by the Maryland Office of Planning and the M-NCPPC may be a result of a difference in the definition of forest. It is likely that M-NCPPC includes all areas of tree cover, including developed areas with street trees and park-like settings. The M-NCPPC data are further divided into Urban, Suburban, and Rural sectors. Forest gains between 1965 and 1993 are shown for the Urban and Rural sectors, while a decline was indicated in the Suburban sector. Urban forest cover gains are likely a result of the growth of trees within residential neighborhoods and formerly cleared commercial and industrial lots.

No specific information was available regarding forest trends within the District of Columbia portion of the Oxon Run watershed. However, a recent study conducted for the District by American Forests (1999) indicated a 64 percent decrease in "areas with heavy tree canopy (50 percent or greater tree cover)" between 1973 and 1997. This trend is primarily the result of infill development within the District that has occurred between Rock Creek Park and Oxon Hill Park. According to the satellite images for 1973 and 1997, minor losses of forest have occurred within the Oxon Run watershed portion of the District.

Forest losses in the Virginia portion of the SCEA boundary are even greater than has been observed in Maryland. In Virginia, the majority of the SCEA boundary lies within Fairfax County. According to a study conducted for the Fairfax County Urban Forestry Branch by American Forests

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(1999), between 1973 and 1997, there has been a 42 percent decline in the area of forest within Fairfax County. In this study, forest was identified as areas with greater than a 50 percent aerial cover of trees. According to the study, in 1973 dense forest comprised 47 percent of the total land area of the county. By 1997, forest cover comprised only 27 percent of the area. Other forest trend information for Fairfax County, provided by the Virginia Department of Forestry, indicated a 32 percent decrease in forest resources from 1957 to 1992. While no forest trends data are available for the specific watersheds of Four Mile Run, Cameron Run, and Belle Haven, losses in these urbanizing areas have been considerably greater than in the more rural portions of the county (Michael Knapp, Fairfax County Urban Forester, November 11, 1999, personal communication).

No specific trend information was available for an assessment of loss or gain of open habitats within the SCEA time frame. However, the trend would be expected to be similar to the conversion of forest resources to development within the region since 1950. Also, historic, existing, and future land use mapping is available for the SCEA boundary, presented in Figures 4-22 through 4-24. This information indicates changes in the coverage of lands identified as park/open space/vacant from 1950 to the projected year 2020. In Virginia, these lands have not changed appreciably from 1950 to present, occurring primarily along stream courses and on lands associated with Ronald Reagan Washington National Airport and Arlington National Cemetery. According to the future land use map, these park/open space/vacant lands are projected to increase in size along the stream corridors and in other newly designated areas.

In Maryland and the District of Columbia, the park/open space/vacant land use category has also not changed appreciably from 1950 to present. However, on the 1950 land use map much of the lower portion of the SCEA boundary is shown as unzoned. It is likely that much of that area was natural forest or scrub-shrub habitat, maintained grassland, or agricultural land. Today much of that area is converting to residential uses, and by 2020, it is expected to become residential or rural residential/agriculture. Wildlife habitat would likely persist in the areas zoned rural residential/agriculture, but would be expected to decline in those areas with higher density residential development.

Effects Analysis: Direct project-related impacts to forests in Virginia are estimated to be 8.5 hectares (20.9 acres). Trends in forest losses and fragmentation within the Virginia portion of the SCEA boundary would not be expected to increase appreciably under the foreseeable build-out scenario, as most larger blocks of forest habitat remaining are within protected parklands. Also, build-out in the Virginia portion of the SCEA boundary is primarily redevelopment and infilling on already disturbed land. Other remaining forest habitat occurs along the major tributaries to the Potomac River. These riparian corridors also receive some level of protection through regulations of the Chesapeake Bay Preservation Act. This 1988 Virginia legislative act mandates that local governments establish protection zones, identified as Chesapeake Bay Preservation Areas, around certain resources that if improperly developed could result in substantial damage to the water quality of the Chesapeake Bay and its tributaries. Within the SCEA boundary in Virginia, both Fairfax County and the City of Alexandria have identified areas of forested riparian habitat that connect to the Potomac River as Chesapeake Bay Preservation Areas. Within the portions of these areas designated as Resource Protection Areas, no tree clearing is allowed within 30.5 meters (100 feet) of the edge of the stream channel. Therefore, within the Virginia portion of the SCEA boundary cumulative impacts to forest resources are anticipated to be minimal.

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In the Maryland portion of the SCEA boundary, direct project-related forest impacts are estimated to be 31.5 hectares (77.8 acres). Although this is a large area of forest loss for a single project since the enactment of the Forest Conservation Act and Reforestation Law Natural Resource Article 5-103, it is minor when compared to the 616.4 hectares (1,523 acres) of forest lost per year in Prince George's County between 1985 and 1990 (Maryland Office of Planning 1991). These losses can be attributed primarily to development within the county, which has continued through the 1990s. While some of the development represents redevelopment or infilling, new development is also occurring within the more rural sectors of the county. The largest of these areas occurs northeast of Broad Creek Cove, just east and west of MD 210. Roads already bisect much of this area and residential development is occurring, threatening to further fragment forest resources. Figure 4-24, which indicates the potential, future land use within the SCEA boundary, verifies this potential loss of forest by identifying park/open space/vacant areas only along stream corridors in this southern Prince George's County area.

Since the late 1980s forest resources have been afforded protection through regulations of the Maryland Chesapeake Bay Critical Area Protection Law of 1984 and the Maryland Forest Conservation Act of 1991. Both of these regulations are state-mandated programs, administered at the county level. Critical Area regulations limit the amount of clearing permitted within 305 meters (1,000 feet) of tidal waters and require mitigation in the form of reforestation for impacts to forests. They also aim to preserve and/or create forested shoreline buffers within a 30.5-meter (100-foot) distance from tidal waters. The Maryland Forest Conservation Act applies to lands outside the Critical Area. The Act sets thresholds for forest conservation depending upon the zoning designation of the land. For every 0.4 hectare (1.0 acre) of forest cleared above the threshold 0.8 hectare (2.0 acres) of forest must be replaced. This provides a strong incentive for conservation of forest land. In addition, a percentage of non-forested lands must be planted with trees when they become developed. As a result of these restrictions on forest clearing and requirements for reforestation, forest losses have likely slowed or been reversed since 1990. Reforestation would also be required for impacts to forest resulting from the proposed action as noted in Chapter 2. This reforestation would help offset the forest impacts. It is not certain, however, that all of the area of reforestation required would be completed within the SCEA boundary, although it would likely be accomplished within Prince George's County. Therefore, forest impacts within the project area would likely contribute to cumulative forest losses in the SCEA boundary, but because of reforestation, would not contribute substantially to cumulative forest impacts in Prince George's County.

Since proposed development is not dependent on the Woodrow Wilson Bridge improvements, the development of the project in itself is not anticipated to cause secondary impacts to other forest resources in the area.

Impacts to wildlife are generally dependent on potential effects to their habitats. The greatest potential habitat loss would result from the conversion of forest/park/open space/vacant land to residential, commercial, or industrial uses. This type of conversion would favor more adaptable species. Consequently, populations of less adaptable species would be expected to decline while those that can successfully inhabit man-dominated environments would most likely increase. As described above in the discussion on forests, no secondary effects would result from the proposed action and minimal cumulative effects are anticipated.

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Loss of forest habitat would affect species that are particularly sensitive to disturbances of forest habitat including FIDB and many species of amphibians. Within the Maryland Chesapeake Bay Critical Area, FIDB habitat is designated as a Habitat Protection Area and is afforded some protection. However, with the exception of FIDB and RTE species, there are few other protections for wildlife. Wildlife habitat may receive some protection through forest conservation regulations and buffers to wetlands. These and other land use restrictions may slow the loss of crucial habitats for sensitive species, yet the quality of these habitats may still suffer from fragmentation, increased foot traffic in habitats adjacent to residential and commercial areas, and introduction of exotic and invasive species.

Aquatic Habitat/Species

Background: Aquatic habitat within the SCEA boundary is found within the Potomac River and the major and minor tributary streams that feed the Potomac River. These habitats include open water, bottom areas, and wetlands. Open water includes deep pools and channels as well as shallow areas near stream banks and in riffles. Benthic habitats include a range of substrates from rock, gravel, and sand in the headwater tributaries and the Potomac River at Little Falls to silts, muds, and organic matter within the slower moving tidal portions of the streams and rivers. The bottom is also comprised of varying amounts of debris such as undecomposed leaves, branches, logs, and manmade trash.

Trends: Historically, the upper Potomac River, within the SCEA boundary, has provided important habitat for a wide range of fish, macroinvertebrates, and bird species. Until the mid to late 1800s the Potomac still supported an excellent fishery, with over one hundred commercial fisheries in operation. "In the 1840s it was recorded that millions of herrings, and immense numbers of shad [were] annually caught, packed up in barrels, and thence distributed to every region of the United States" (MWCOG 1978). As many as 52 species of fish were reported from the area between 1875 and 1911, including six introduced species (MWCOG 1978). At least 22 fish species have been introduced into the Potomac River since that time, including the carp. Carp have probably been the most destructive introduced fish, out-competing commercial and recreational fishes because of its tolerance to pollution, uprooting SAV, and creating turbid water conditions which reduce spawning and nursery habitat for other species.

Aquatic insects and macroinvertebrates were also abundant during the early 1800s. The primary macroinvertebrates included the oligochaete worms and freshwater clams and mussels. "Amphipods.... were probably [also] dominant organisms" (MWCOG 1978) in the upper estuary system. Human-induced changes to the river began during this period with the dredging of the Georgetown Channel. Other dredging and filling operations were begun in the late 1800s and early 1900s. During this period, "Congress approved extension of the Washington, D. C. mall area and dredging of the tidal basin" (MWCOG 1978). These operations destroyed many of the bivalve habitats between Chain Bridge and Alexandria (MWCOG 1978). Other dredge and fill operations within the SCEA boundary include the creation of the Alexandria waterfront and Jones Point Park, the mining for gravel of Oxon Cove, Fox Ferry Cove, and Smoots Cove, and the formation of Rosalie Island and Dyke Marsh.

Waterfowl were plentiful in the Potomac estuary throughout the 19th century to at least 1925 (MWCOG 1978). The Potomac supported hundreds of thousands of diving ducks that fed on the abundant SAV in the shallows of the upper estuary. These shallows expanded during this period from

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heavy siltation running off adjacent farmland. The largest staging areas for waterfowl within the SCEA boundary during this time were reported to be in the vicinity of Alexandria, at Broad Creek, and near Mount Vernon, with canvasback, lesser scaup, greater scaup, and black duck comprising the majority of individuals (MWCOG 1978). Other water dependent bird species were also very abundant during this time period including the great blue heron, osprey and bald eagle, as were other vertebrates including the diamondback terrapin, snapping turtle, and painted turtle (MWCOG 1978). However, by the early 1900s many of the larger mammals associated with the Potomac River had become uncommon including river otter and beaver (MWCOG 1978).

By the mid-1960s commercial harvests of oysters and clams began to decline noticeably (MWCOG 1978). In 1969 "an official of the Federal Water Pollution Control Administration stated that the river was so low in dissolved oxygen in places that fish could not survive" (MWCOG 1978). By the mid to late 1970s "in the Potomac estuary in the vicinity of Washington, D. C., only the most pollution resistant species [of micro and macroinvertebrates could] be found. The diverse assemblage of pollution-sensitive mayflies found at the turn of the century [had] since disappeared. Fresh water mussels and snails survive[d] only in rare places. Even tubifex worms, considered highly tolerant of pollution and high organic loads, [were] rare in certain areas. A combination of water quality factors: severe loads of organic material, concentrations of heavy metals, low dissolved oxygen levels, and river bottom conditions described as a thick organic ooze are thought to have reduced benthic macroinvertebrates in this stretch of the Potomac" (MWCOG 1978). Discharges of chlorinated water from the Blue Plains Wastewater Treatment Plant was also cited as being potentially responsible for sparse populations of aquatic insects and macroinvertebrates in the upper estuary of the river. Elevated levels of chlorine in the water below the Blue Plains Wastewater Treatment Plant was also thought to be the cause of a large fish kill which occurred immediately downstream of treatment plant in 1974 (MWCOG 1978). Other fish kills were reported in the Washington Metropolitan Area between 1972 and 1976. Commercial catches of anadromous fish including striped bass, American shad, blueback herring, and alewives dropped drastically throughout the 1970s. It was believed that a combination of a loss of nursery habitat from heavy siltation, excess nutrients, absence of SAV, and toxic contamination contributed to these declines (MWCOG 1978).

Within the past twenty years the upper estuary portion of the Potomac River has begun to recover with the initiation of stricter controls on wastewater plant discharges and stormwater management and the advent of habitat restoration activities. The Blue Plains Wastewater Treatment Plant no longer discharges large quantities of chlorinated water into the river and improved stormwater management within the Washington Metropolitan Region has reduced the amount of sediment runoff into the system. As water quality has improved, rooted vascular plants (SAV) have become reestablished and expanded in the vicinity of the Woodrow Wilson Bridge. The diversity of these SAV beds has also improved. The invasive hydrilla and water milfoil still dominate the beds, but now share them with wild celery, water stargrass, naiads, waterweed, coontail, and pondweeds. The benthic community has also benefited from the improvements in water quality. Macroinvertebrate species such as the corbicula, an Asian clam consumed by many fish species including the endangered shortnose sturgeon, have become abundant in the SCEA portion of the upper Potomac River estuary (Jim Cummins, ICPRB, November 5, 1999 personal communication). Fish have also returned to the upper Potomac River system since the 1970s. Within the Anacostia River, fish diversity was shown to have improved between 1972 and 1989 (Cummins 1990). Anadromous fish capture data within the SCEA boundary indicate modest gains in alewife, white perch, and yellow perch numbers (Gibbons and Cummins, 1996). Wintering waterfowl numbers remain relatively low in the vicinity of the Bridge in recent years, as indicated from a recent study by Hatfield et al. (1994), from Audubon Christmas Bird

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Count data, and from USFWS and MDNR waterfowl surveys. The osprey and bald eagle which are highly dependent on aquatic resources have shown dramatic recoveries within the SCEA boundary since declines from DDT-related causes in the 1950s and 1960s. A statewide increase in osprey numbers of six percent from 1966 through 1989 was observed from Maryland Breeding Bird Survey data (Robbins and Blom, 1996).

Effects Analysis: The Woodrow Wilson Bridge project would not result in secondary effects to aquatic resources for reasons explained in previous sections addressing natural resources. However, direct effects to aquatic resources in the SCEA boundary could result from direct inputs of potential pollutants to the waterways from the constructed Bridge and planned interchange improvements. The planned use of Best Management Practices, such as stormwater management facilities, should help to reduce the direct discharge of pollutants to the waterways resulting from project-related improvements. Also, new development within the SCEA boundary would be subject to the numerous federal, state, and local regulations protecting water quality (see discussion on Surface Waters). In particular, any development in the Chesapeake Bay Critical Area would be subject to review by the Critical Area Commission. Critical Area regulations in Maryland require a ten percent reduction of pre-development runoff, the establishment of vegetated shoreline buffers, and limited clearing of any existing vegetation. Future development within the SCEA boundary would result in increases in inputs to area sewage treatment facilities, creating the potential for increased nutrient loads from point discharges. However, this is anticipated to be minimal, since considerable focus has been given to improving nutrient removal at facilities within the Potomac River watershed in recent years.

Cumulative effects from additional development in the SCEA boundary could contribute to setbacks in improved water quality and habitat. Construction of the National Harbor development would result in dredging of portions of Smoots Cove, disturbing benthic communities and fish spawning areas. Because of the National Harbor development, the shoreline of Smoots Cove has already been cleared of trees that were valuable foraging perches for osprey and bald eagles. Increases in pedestrian traffic in this area would further reduce the likelihood that osprey, bald eagle, herons, and waterfowl would use shoreline and cove areas. The creation of a bulkhead and other water dependent amenities along the shoreline of Smoots Cove would also impact SAV that currently exist along the shoreline.

The dredge projects currently proposed within the river also have the potential to add to cumulative effects to aquatic habitat. As described in the discussion on surface water quality, however, the majority of the effects are anticipated to be temporary and will be removed from dredging activities for the Woodrow Wilson Bridge by at least eight months. The permanent impacts anticipated for both the Woodrow Wilson Bridge and the other proposed projects is the loss of existing shallow water habitats in the dredge areas for the two marinas. Although the marina and Navigation Channel dredging projects have avoided all impacts to SAV, even unvegetated shallow water habitat can provide valuable habitat for benthic organisms, including micro- and macroinvertebrates. These invertebrate species attract foraging fish and wading birds. The permanent loss of this habitat will incrementally add to the cumulative effect to shallow water habitats in the SCEA boundary. Because the water quality impacts will be temporary, and will have dissipated by the time the bridge construction begins, and the bridge dredging will occur over two separate periods which will be at least four years apart, the cumulative effect on water quality is not expected to have a substantial permanent effect to the aquatic community.

While cumulative impacts to aquatic resources would be expected to occur from the Woodrow Wilson Bridge project, project mitigation in the form of fish blockage removal on tributaries of the Anacostia

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River, just outside the SCEA boundary, would help offset those impacts. Fish blockage removal on Northwest Branch, Rock Creek, Little Paint Branch, and Indian Creek are proposed as out-of-kind compensation for SAV impacts in the project area. Other projects are also planned that would help to improve the aquatic resources in the SCEA boundary. For example, to improve stocks of anadromous fish species in the upper Potomac and lower Anacostia Rivers, several fish blockages have been targeted for removal. One such blockage at Little Falls on the Potomac is presently being removed under the direction of the ICPRB. Fish passage in this area would allow species such as the alewife and blueback herring to proceed upriver, restoring historic spawning grounds. Fish stocking would also be used in conjunction with restoration of fish passage, to help restore numbers of anadromous fish to the Washington Metropolitan portion of the Potomac River. Another improvement project is underway on the Anacostia River. In the early 1990s, the USACOE determined that federal actions related to navigation and flood control directly degraded more than 1,052 hectares (2,600 acres) of wetland, 202 hectares (500 acres) of aquatic habitat, and 324 hectares (800 acres) of bottomland hardwoods. The USACOE along with Montgomery and Prince George's Counties, the District of Columbia, M-NCPPC, and the NPS undertook a feasibility study to identify restoration opportunities within the river. The study was completed in 1994 and recommended 13 sites for environmental restoration. The project was authorized in 1996 and would include the restoration of 32 hectares (80 acres) of wetlands and eight kilometers (five miles) of stream and the creation of 13 hectares (33 acres) of bottomland habitat within the Anacostia Basin. The project was initiated in July 1999 and is slated to continue through September 2001. Project monitoring would continue through September 2004. These improvements, in conjunction with federal, state, and local controls on water quality, should help to minimize the adverse cumulative effects of the Woodrow Wilson Bridge project on aquatic resources in the SCEA boundary.

Rare, Threatened, and Endangered Species

The federally threatened bald eagle nests within the SCEA boundary. In addition, the NMFS has indicated that the portion of the Potomac River within the SCEA boundary potentially supports the shortnose sturgeon, a federally endangered species. Biological Assessment reports were completed for both species (bald eagle, May 1999; shortnose sturgeon, November 1999) to assess potential impacts on the species from the proposed project.

Bald Eagle

Background/Trends: The bald eagle typically nests in forested areas near water, preferring to build their large nest in a tall tree that stands above the rest of the canopy. Eagles typically forage for fish and waterfowl over shallow rivers, streams, lakes, and bays. Hunting occurs from perches along the shoreline of waterways or from the air. Eagles choose nighttime roosts usually in large, accessible trees. Eagles are year round residents of the Chesapeake Bay region. In addition, non-breeding eagles from the northeastern United States occur regularly in the Chesapeake Bay area from late fall to early spring and non-breeding eagles from the southeastern United States are present in the area from spring to early fall.

Historically, bald eagles were extremely abundant in the Chesapeake Bay region, with estimates as high as 3,000 pairs (Fraser et al. 1996). However, after European settlement occurred, eagle numbers declined from deforestation and human persecution. By 1936, there were an estimated 600 pairs of eagles in the Chesapeake Bay area (Fraser et al. 1996). By the early 1970s that number had dropped to about 90 breeding pairs (Cline, 1990). From the 1950s to the 1970s a drastic decline in eagle

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numbers occurred as a result of habitat destruction and the effects of a build-up in the environment of organic pesticides and passage of the Endangered Species Act. Since banning of these pesticides in the mid 1970s, the number of nesting eagles and the number of fledged young has steadily increased. Between 1981 and 1990 the number of eagle breeding territories rose from 94 to 231 (Buehler et al. 1991). By 1992, the Chesapeake Bay population numbered about 250 breeding pairs (Fraser et al. 1996). This resulted in the downlisting of the species from endangered to threatened in 1993. Eagle numbers have continued to climb through the 1990s. By 1997, there were 434 occupied territories in the Chesapeake Bay area that resulted in the production of 1.5 fledged eaglets per active nest (SWCA 1998).

The bald eagle recovery plan for the Chesapeake Bay Region includes criteria for delisting when the eagle population reaches 300 to 400 nesting pairs with an average productivity of 1.1 eaglets per active nest sustained over a five year period (USFWS 1990). These criteria have now been met and the USFWS has officially proposed delisting of the species. A public notice was issued during the summer of 1999 and the comment period ended in October 1999.

While the bald eagle typically chooses territories along undeveloped shorelines, it has been observed that, in recent years with the overall increase in the number of breeding pairs, eagles are choosing nesting sites in more developed areas. These pairs likely represent eagles that have been forced into less desirable locations because other suitable nesting sites are already occupied. This is likely the case with the nesting eagle pair within Betty Blume Park, adjacent to the Woodrow Wilson Bridge. This pair established a nest in the winter of 1997/1998 near the edge of a woodlot within 0.4 kilometers (0.3 miles) of I-95/495 and within 190.5 meters (625 feet) of an existing building.

In addition to the nesting eagle pair, the Biological Assessment identified as many as 20 immature and adult wintering eagles using the SCEA boundary. These eagles are likely from nesting areas in the northeast and do not nest in the Chesapeake Bay area, but use the upper Potomac River area for varying lengths of time between October and March.

Effects Analysis: As discussed in the Biological Assessment for the bald eagle, indirect temporary impacts to the resident nesting pair could occur as a result of construction of the Woodrow Wilson Bridge project. Construction of the bridge and the highway interchanges in Maryland are projected to occur over a span of five or six years. Some staging of construction materials, construction vehicle traffic, and the actual construction of highway ramps is anticipated to occur on the National Harbor property within 200 to 400 meters (660 to 1,320 feet) from the nest. Also the proposed bridge spans and development of an active recreation park on Rosalie Island would result in the clearing of most of the trees on the island. These activities may affect nesting success and foraging patterns of the resident eagles. Because the resident eagle pair have to defend their nest site, they are less likely to be able to temporarily shift to other foraging areas outside the area disturbed by construction activities. Since Rosalie Island also represents the closest good foraging habitat to the nest, it is the place likely to be used first and most by recently fledged eaglets. During this construction phase on the island, assuming the adults were able to successfully nest, the fledged eaglets would likely have to shift their pattern of use some distance away from the nest area to the north (Fox Ferry or Oxon Cove) or south (southern end of Smoots Cove or Rosier Bluff). This would make the eaglets more vulnerable to predation and create an increased energy demand that may not be able to be met. Because the construction activities would not threaten the eagle nest, once the Bridge and interchange work is completed the adult eagles could return to the nest area. Observations of eagle behavior during the Biological Assessment field study indicated that the resident nesting pair and many migrant eagles

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have become accustomed to automobile traffic on the bridge and I-95/495 system. This acceptance of automobile traffic would be expected following completion of the new bridge and interchange improvements. However, the increased pedestrian traffic on Rosalie Island following its conversion to Queen Anne's Park would likely permanently limit the use of the island by foraging eagles, similar to what has occurred at Jones Point Park. During the 167 survey hours spent looking at eagles in the project area, no eagles were observed perched in the mature trees at Jones Point Park. Pedestrians actively use Jones Point Park year round.

In the context of the future build out scenario, including the National Harbor Development, the Woodrow Wilson Bridge project has the potential to contribute to cumulative effects to bald eagles in the project area. The National Harbor resort would feature 672,132 square meters (7,235,000 square feet) of hotels, restaurants, entertainment, retail, and office facilities. Construction of the proposed project and post-development human activities would occur within 50 meters (165 feet) of the active eagle nest in Betty Blume Park. Also, high rise buildings would be erected between the eagle nest and Smoots Cove, effectively blocking the eagle's unobstructed view of the Potomac River. These conditions would likely cause abandonment of the nest by the eagle pair. If the pair do abandon the current nest site there are potentially suitable alternative nest site locations within the SCEA boundary, primarily within Oxon Cove. Bald eagles have historically nested in Oxon Cove. Further cumulative effects could occur if additional shoreline habitat is cleared for development. During the Biological Assessment field study eagle use of developed shorelines was observed to be minimal. For reasons stated elsewhere in this section, no secondary effects to eagles are expected from the Woodrow Wilson Bridge project.

Shortnose Sturgeon

Background: The shortnose sturgeon historically ranged from the Saint John River in New Brunswick, Canada to the St. Johns River in Florida (Gilbert 1989. NMFS 1990, 1998). Along with its close relative the Atlantic sturgeon, shortnose sturgeon are classified as anadromous fish. However, the shortnose sturgeon seldom ventures into ocean waters (NMFS 1990). Instead it migrates from fresh water to brackish reaches of rivers. Sturgeon in general are large, long-lived fish with a mouth adapted for feeding on the bottom (NMFS 1990). "The shortnose sturgeon is the smallest of the three sturgeon species that occur in eastern North America, having a maximum known total length of 143 centimeters [(57.2 inches)] and weight of 23 kilograms [(50.7 pounds)]" (NMFS 1990). "Maximum known age is 67 years for females, but males seldom exceed 30 years of age" (NMFS 1990). The "age of maturation varies from north to south [through its range], due to a slower growth rate in the north" (NMFS 1990). From south to north the age of maturation ranges from about two to eleven years in males and six to thirteen years in females, and females generally do not spawn for the first five years after maturation (NMFS 1990). Shortnose sturgeon spend most of the year "in the slower moving riverine waters or nearshore marine waters, and [move] into faster moving fresh water areas to spawn" (NMFS 1990). In the Potomac River spawning likely would occur from March to May. Juvenile shortnose sturgeon possibly move back into slower brackish water in late summer, where they feed on benthic insects and crustaceans. Adults also likely remain in these slow tidal waters during the remainder of the year and feed primarily on mollusks. In the Potomac River corbicula are thought to be an important mollusk food source for shortnose sturgeon (Welsh et al. 1999).

Trends: Historical records of shortnose sturgeon in the Potomac River are few, as catches of this species were rarely separated from the more common Atlantic sturgeon. Sturgeons in general were

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once an abundant Chesapeake Bay resource. Sturgeons were prized by native Americans, and sturgeon caviar was the first substantial cash crop exported to Europe by the Colonists (Hildebrand and Schroeder 1928). Historical catches of sturgeon in the Potomac River were the highest in Maryland waters (Hildebrand and Schroeder 1928, Murawski and Pacheco 1977). By the latter part of the 19th century, however, the sturgeon fishery was in a sharp decline, and by the early part of the 20th century, the Chesapeake Bay sturgeon population had declined by 90 percent (Welsh et al. 1999). Declines were attributed to over fishing, habitat loss from river blockages, and poor water quality. Only eight historic records of shortnose sturgeon exist from Maryland, and most of those were from the upper Chesapeake Bay. However, records do exist for the Potomac River dating back to the late 1800s. Along the East Coast, sturgeon fisheries had declined by the 1950s, leading the USFWS to conclude that the shortnose sturgeon was all but eliminated from its former range. The shortnose sturgeon was placed on the original endangered species list by the USFWS in 1967. At that time the only viable population in the United States was known from the Hudson River.

A reward program was started by the NMFS in 1996 to assess the existing population of Atlantic sturgeon in Maryland waters. This program has resulted in the reporting of 29 shortnose sturgeon from the Chesapeake Bay. Two of these reports were from the Potomac River. One from Potomac Creek, a tributary to the Potomac River, and the other from the Potomac River near the mouth of the St. Mary's River (Welsh et al. 1999). The USFWS began a two-year gill net sampling effort in the Potomac River in 1998. The study is being conducted for the USACOE as part of Section 7 Endangered Species Act consultation with the NMFS on the proposed maintenance dredging for the Potomac River Federal Navigation Project. Within the SCEA boundary, sampling has been conducted below Little Falls. To date, no shortnose sturgeon have been caught.

Effects Analysis: For reasons stated elsewhere in this section, no secondary effects to shortnose sturgeon are expected from the Woodrow Wilson Bridge project. Cumulative effects on shortnose sturgeon potentially occurring within the SCEA boundary would result primarily from degradation of water quality or the direct disturbance of potential sturgeon habitat through shoreline development, dredging, or the placement of structures such as docks, that could occur from build-out within the SCEA boundary. Degradation of water quality could result in the loss of requisite food sources or nursery and spawning habitat. Though the potential for shortnose sturgeon presence within the project area is very low, several shortnose sturgeon habitat areas were identified, including the navigation channel, the adjacent side slopes, and the shallows containing the SAV beds. As mentioned previously in this document, existing federal, state, and local controls on water quality and development within the Chesapeake Bay Critical Area should help to minimize the potential impact to shortnose sturgeons and their habitat.

Mitigation for SAV impacts resulting from the Woodrow Wilson Bridge project may include removal of fish blockages on selected tributaries of the Anacostia River and Rock Creek, upstream of the project area, tidal wetland creation, and SAV planting. These improvements would enhance shortnose sturgeon habitat just upstream of the SCEA boundary. Another potential positive cumulative effect on shortnose sturgeon is occurring at Little Falls on the Potomac River and within the lower Anacostia River. It is likely that Little Falls is the nearest spawning area potentially used by the shortnose sturgeon. At Little Falls, efforts are underway to remove fish blockages. This presumably would open up additional shortnose sturgeon spawning areas above Little Falls. Within the Anacostia River, stream restoration efforts have begun as described above. These efforts include the removal of fish blockages and habitat improvements that could favor shortnose sturgeon

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and other anadromous fish species. The combined stream improvement projects would likely offset any cumulative habitat degradation resulting from the Woodrow Wilson Bridge project.

In addition to the two federally listed species already identified as occurring or potentially occurring in the SCEA boundary, other federal or state listed species possibly occur. Letters were sent to the Virginia department of Game an Inland Fisheries, Washington D.C. Natural Heritage Program, Maryland Department of Natural Resources, and USFWS requesting a RTE species review within the SCEA boundary. Correspondence is available for viewing in the Woodrow Wilson Project Office in Virginia. No responses were received in time for inclusion within the Woodrow Wilson Bridge 1999 Draft SEIS.

4.12.9 Air Quality

The project area is currently classified as a serious non-attainment area for Ozone (O_3) and a maintenance area for carbon monoxide (CO). The area is designated as being in attainment for all the other criteria pollutants including sulfur oxides (SOx), nitrogen oxides (NOx), ozone (O_3), lead (Pb), particulate matter sized 10 microns or less (PM_{10}), and particulate matter with a size of 2.5 microns or less ($PM_{2.5}$).

Since the project is located in an ozone non-attainment area, conformity to the State Implementation Plan (SIP) is determined through a regional air quality analysis performed on the Transportation Improvement Program (TIP) and Transportation Plan (TP) by the regional MPO, MWCOG. The regional model is based on land uses that include not only the Woodrow Wilson Bridge project but other major projects including those listed in the Section 4.12.5, and therefore accounts for potential cumulative effects.

4.12.10 Cultural Resources

Background: The National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA), along with other applicable Federal, State, and local legislation, provide the framework for the identification, evaluation/designation, treatment, and enhancement of cultural resources. For Federal actions, Section 106 of the National Historic Preservation Act (36 CFR Part 800) requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings.

As broadly defined, cultural resources include a wide range of historic properties. Under 36 CFR Part 800, "historic properties" are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places." The National Register is the nation's list of historic properties worthy of preservation, including those significant in American history, architecture, engineering, and culture. Properties that qualify for inclusion in the National Register must meet at least one of the following four National Register criteria:

Criterion A - Association with events that have made a significant contribution to the broad patterns of our history;

Criterion B – Association with the lives of persons significant in our past;

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Criterion C **–** Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and

Criterion D **–** Have yielded, or may be likely to yield, information important in prehistory or history.

Properties that qualify for the National Register must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. The term "eligible for inclusion in the National Register" includes properties formally determined eligible and all other properties that meet National Register listing criteria. In keeping with the NHPA and its implementing regulations, "historic property" refers only to resources that are 50 years of age or greater and are listed in or eligible for the National Register. For buildings and structures less that 50 years of age to be eligible for listing in the National Register, these resources must meet the National Register "special criteria considerations," as outlined in 36 CFR 60.4. National Historic Landmarks (NHLs) are defined as historic properties of outstanding national significance that have been specially designated by the Secretary of the Interior, in accordance with 36 CFR 65. Archaeological resources include prehistoric and historic terrestrial sites (including cemeteries), as well as underwater sites. Historic resources refer to buildings, structures, districts, and objects that meet the 50-year age criterion for inclusion in the National Register.

A total of 61 National Register-listed historic properties, including 53 sites and eight historic districts, are located within the SCEA boundary. These historic properties are listed in Table 4-49 and their locations illustrated in Figure 4-25.

Effects Analysis:

Local historic department staffs have stated that any development by the bridge would not be located within or near their respective historic sites and/or districts. They also indicated that the bridge would not influence the rate of loss for historic properties.

On a state level, the State Historic Preservation Offices in Virginia, Maryland, and the District of Columbia maintain state-based historic property registration programs. Importantly, each SHPO office also routinely prepares a state historic preservation plan that provide information about trends affecting historic properties. These documents provide data on proposed efforts to more fully identify, document, register, and enhance historic properties. These plans often include information about historic property rate of loss data, and include descriptions of efforts to partner with Federal, State, and local agencies and private non-profit organizations regarding preservation projects of importance.

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Table 4-49: Historic Properties within the SCEA Boundary

Jurisdiction	Department of the Interior Reference Numbers	Historic Site/District Name	Date Listed
Virginia			
Alexandria	66000913	Gadsby's Tavern	10-15-66
	66000928	Alexandria Historic District	11-13-66
	69000333	Carlyle House	11-12-69
	69000334	The Lyceum	5-27-69
	70000899	Christ Church	5-10-70
	73002202	Bank of Alexandria	6-4-73
	76002222	Llyod House	7-12-76
	78003146	Franklin and Armfield Office	6-2-78
	79003277	Lee-Fendall House	6-22-79
	80000352	Jones Point Lighthouse & D.C. South Cornerstone	5-19-80
	80004166	Protestant Episcopal Theological Seminary	11-17-80
	80004307	Old Dominion Bank Building	3-20-80
	81000079	Mount Vernon Memorial Highway	5-18-81
	82001796	Stabler-Leadbeater Apothecary Shop	11-24-82
	82004538	Fort Ward	8-26-82
	84003491	Alexandria City Hall	3-8-84
	85000987	St. Paul's Episcopal Church	5-9-85
	85003048	President Gerald R. Ford, Jr. House	12-17-85
	86001228	Robert E. Lee, Boyhood Home	6-5-86
	86003136	Bayne-Fowle House	11-6-86
	90002113	Fairfax-Moore House	1-17-91
	91000006	Southwest No.1 Boundary Marker, Original D.C.	2-1-91
	91000007	Southwest No.2 Boundary Marker, Original D.C.	2-1-91
	91000008	Southwest No.3 Boundary Marker, Original D.C.	2-1-91
	92001186	Town of Potomac	9-10-92
	92001275	Rosemont Historic District	9-24-92
	95000106	Alexandria National Cemetery	3-2-95
	99000146	Fairfax Historic District	2-22-99
Arlington	66000040	Arlington House (Robert E. Lee Memorial)	10-15-66
	72001380	Fort Myer Historic District	11-28-72
	72001381	The Glebe	2-23-72
	72001382	Quarters 1, Fort Myer	11-28-72
	75002014	Ball-Sellers House	7-17-75
	76002094	Benjamin Banneker:SW9 Intermediate Boundary	5-11-76
	76002095	Charles Richard Drew House	5-11-76
	79003027	Hume School	6-18-97
	80004170	Colonial Village	12-9-80
	80004170	Colonial Village	12-9-80
	86000151	U.S. Post Office, Arlington	2-7-86
	89000932	Pentagon Office Building Complex	7-27-89

Table continued on next page.

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Table 4-49: Historic Properties within the SCEA Boundary, continued

Jurisdiction	Department of the Interior Reference Numbers	Historic Site/District Name	Date Listed
Virginia			
Arlington	91000009	Southwest No.4 Boundary Marker, Original D.C.	2-1-91
	91000010	Southwest No.5 Boundary Marker, Original D.C.	2-1-91
	91000011	Southwest No.6 Boundary Marker, Original D.C.	2-1-91
	91000012	Southwest No.7 Boundary Marker, Original D.C.	2-1-91
	91000013	Southwest No.8 Boundary Marker, Original D.C.	2-1-91
	91000014	West Cornerstone	2-1-91
	93000833	Carlin Hall	8-12-93
	95000927	Cherrydale Volunteer Fire House	7-28-95
	95000928	Barcroft Community House	7-28-95
	97001111	Wash. Nat'l. Airport Terminal & South Hanger Line	9-12-97
	97001506	Calvert Manor	12-15-97
	98001649	Buckingham Historic District	1-21-98
	99000368	Fairlington Historic District	3-12-99
Falls Church	70000870	Falls Church	2-26-70
	73002210	Cherry Hill	7-26-73
	77001534	Birch House	10-26-77
	84000037	Mount Hope	10-4-84
Maryland			
Prince George's County	74002201	St. Ignatius Church	6-27-74
	74002202	St. John's Church	4-8-74
	78003117	Oxon Hill Manor	6-9-78
	80000673	Harmony Hall	6-6-80
Washington, District of Columbia			
District of Columbia	78000258	Kenilworth Aquatic Gardens	8-25-78

At a local level, the City of Alexandria maintains a sophisticated array of historic preservation programs that provides for ongoing study, identification, and protection of both historic standing structures and archaeological sites. These programs are primarily carried out by the following:

Historical Restoration and Preservation Commission – Established in 1962 by the Virginia Assembly, this commission was empowered to preserve and acquire historic buildings and easements in the City. A seven-member citizen panel carries out the work of the commission.

Board of Architectural Review – Similar to over 1,300 locally designated commissions across the country, this commission provides for the review of exterior changes to buildings in Old Town and the Parker Gray Historic District.

Archaeological Commission – This 14-member commission develops goals and priorities for the study of Alexandria's archaeological heritage, and works closely with citizens, government agencies, developers, and teachers to promote archaeology in the City.

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Historic Alexandria Resources Commission – This commission advises the City on the preservation of historic sites and buildings, artifacts, and records from loss or deterioration, and promotes citizen and tourist use of historic sites and the Torpedo Factory Art Center.

Complementing these city-administered programs are a variety of private, non-profit historic preservation-related private, non-profit organizations. Most notable is the Office of Historic Alexandria at 405 Cameron Street. This organization operates a number of historic sites, including Gadsby's Tavern Museum, the Lyceum, Alexandria Archaeology Museum, Fort Ward Museum, Friendship Firehouse, the Black History Resource Center, and the Torpedo Factory Arts Center, the Archives and Records Center.

Trends: An impressive array of national, state, and local historic preservation laws have positively affected the retention and reuse of many historic properties. The City of Alexandria's historic preservation successes have been nationally recognized, and the City's historic district is one of best preserved of its type in the United States. In addition, the City's Alexandria Archaeology program ensures that archeological heritage is considered through its review of development projects and building permits.

The City of Alexandria maintains historic preservation and archeological programs to protect the rich cultural resources within the city. They also have the most extensive protection programs among all jurisdictions within the SCEA boundary. Local historic department staffs also stated that any development by the bridge would not be located within or near their respective historic sites and/or districts. It was also indicated that the bridge would not influence the rate of loss for historic properties.

4.12.11 Secondary and Cumulative Effects Analysis Conclusions

Substantive secondary effects to natural resources from construction of the Woodrow Wilson Bridge project are not anticipated. Most development within the SCEA boundary is expected to occur regardless of the proposed action. Socioeconomic resources are not anticipated to be further affected by the replacement of the bridge.

Cumulative effects to natural resources are related to the direct impacts expected from construction of the bridge and the contribution of these incremental effects to the overall historical and future context of natural resource impacts in the secondary and cumulative effects analysis (SCEA) study area. Resources which could potentially feel cumulative effects include surface water quality, floodplains, wetlands and submerged aquatic vegetation (SAV), forests, aquatic habitat and rare, threatened and endangered species. These resources have all been historically impacted by development in the SCEA study area and will be further affected by the proposed project. Cumulative effects will be considerably reduced, however, by the mitigation efforts detailed for each resource in Section 4.7 of the document. In the context of the existing regulatory framework, restoration activities being undertaken in the study area by others and the planned mitigation activities for project impacts, overall cumulative effects to natural resources are expected to be minimal.

Federal, State, County and City agencies responsible for regulating effects to natural and cultural resources through permitting and approval processes, in conjunction with planning and zoning processes for Fairfax and Prince George's Counties and Alexandria, currently, would facilitate

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protection of natural and cultural resources. These planning and approval processes would help to minimize future cumulative effects in the area. Specific methods to further avoid and minimize cumulative effects to resources can be identified during the permitting and approval processes of individual projects. In addition, initiatives such as the Chesapeake Bay restoration effort and more localized projects have been launched throughout the region, to reverse or at least slow the past and future cumulative impacts to our region's natural resources.

4.13 Dredging and Dredged Material Placement

The 1997 FEIS listed an anticipated dredge quantity of 30,584 cubic meters (40,000 cubic yards (CY)). Since the production of the FEIS, development and refinements primarily related to constructability of the bridge have produced a revised dredge quantity of approximately 384,300 cubic meters (500,000 CY). The difference in quantities is attributable to the refinement of the required construction channels both north and south of the proposed bridge to facilitate construction of the proposed spans and demolition of the existing span. Advancement of the design to the 30 percent stage and completion of a document entitled "*Comparison of Construction Techniques, SAV Impacts and Dredge Quantities for Woodrow Wilson Bridge*" completed in September of 1999, led to the determination that cranes could only perform the necessary heavy lifts from beside the structure being constructed. The ability for crane barges and other equipment and vessels to pass one another within the construction channel is also required. This led to the design of the required 70.7-meter (232-foot) wide southern construction channel and the 22.9-meter (75-foot) wide northern channel. Also included in the revised dredging quantity is the addition of dredging required for bulkheads and access channels associated with construction staging areas, as well as dolphins (ship-collision protection features) built adjacent to the proposed bridge near the navigation channel. Increased knowledge of the river bottom has also led to the refinement of the required dredging depths required for the project for both the construction channel and the pier construction areas. The construction channels are required to be dredged in shallow areas along the breadth of the river to a depth of 2.7 meter (9 feet) below mean low water (MLW) for the construction channel and 3.3 meters (11 feet) below MLW for the pier construction areas. The construction channels will allow the Contractor to safely position cranes during heavy lifts, efficiently maneuver about the work area, minimize the probability of cranes fouling a pier or another crane, and provide for safe evacuation in the event of a severe storm or emergency.

The current anticipated schedule depicts two phases of dredging: 267,610 cubic meters (350,000 CY) to be dredged from mid fall of 2000 to mid winter of 2001, and 114,690 cubic meters (150,000 CY) to be dredged within the same seasonal window in 2004-2005 or 2005-2006 depending on construction of the proposed bridge spans. The exact time-of-year restriction is currently being negotiated with the agencies and will be adhered to during construction. The time-of-year restriction will be implemented to minimize impacts to a broad range of spawning and fish and other aquatic species.

The first phase includes approximately 267,610 cubic meters (350,000 CY) of dredged material, consisting of the construction channel dredging south of the new bridge and the dredging of an access channel and bulkhead area associated with a potential construction staging area site. The dredging would allow construction of the proposed eastbound span of the bridge and the partial construction of the westbound span of the bridge. The safest and most effective alternative includes the dredging of an area approximately 153 meters (510 feet) wide including the proposed bridge spans, two parallel and adjacent 30.5-meter (100-foot) wide crane barge channels to the south of the proposed bridge, and all required separations and slopes. 2.7-meters (9 feet) deep dredge channels at

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mean low water (MLW) with deeper areas required (3.3 meter (11-foot) dredge depth) for all proposed bridge piers are proposed. The use of 3:1 slopes for the access channels to be dredges should not require substantial maintenance dredging within the construction timeframe.

The second phase involves the dredging of a channel necessary to demolish the existing bridge and dredging under the existing bridge, once demolished, to facilitate the completion of the westbound span. The second phase also includes required dredging for dolphins (ship-collision structures to protect the bridge structure). Dredge quantities are proposed to total 114,690 cubic meters (150,000 CY). The second phase of dredging is to commence in the fall of 2004 or 2005, depending on the construction schedule, and comply with the time-of-year restriction.

The demolition channel would be 22.1 meters (72 feet 6 inches) wide with a depth of 2.7 meters (9 feet) MLW. This width includes the 15.2-meter (50-foot) demolition barge channel and necessary slopes. The dolphin dredging includes 14 protective ship collision dolphins.

In summary, the first phase (including the bridge piers, southern crane barge channel, and access/bulkhead dredging) totals approximately 267,610 cubic meters (350,000 cubic yards). The second phase (including the northern demolition barge channel, dredging under the existing bridge, and dolphin dredging) totals approximately 114,690 cubic meters (150,000 cubic yards). The total anticipated dredge quantity for the Woodrow Wilson Bridge project, including a 10 percent contingency added to all estimates is 382,300 cubic meters (500,000 cubic yards).

4.13.1 Dredging Technique

In an effort to minimize the potential for impact to aquatic species, it is anticipated that only mechanical (clamshell) dredging would be utilized, as opposed to hydraulic dredging. It is also more practical to use mechanical dredging due to the silty composition of the proposed dredged material. The clamshell operation would effectively drain a substantial portion of water allowing for a greater percentage of dredged material (less water) to be loaded into barges.

4.13.2 Dredging Impacts

Approximately 18.6 hectares (46 acres) of the Potomac River would need to be dredged to provide construction access for barges. Of these 18.6 hectares (46 acres), 12.8 hectares (31.7 acres) of dredging would take place within SAV beds. According to a survey recently completed by the Virginia Institute of Marine Science (VIMS) and the U.S. Geological Survey using VIMS aerial photography, SAV covers approximately 255 hectares (631 acres) within the project study area. It is primarily distributed in three distinct areas including two large beds adjacent to the bridge in the Potomac River and Smoots Cove. Hydrilla (*Hydrilla verticillata*), Eurasian watermilfoil (*Myriophyllum spicatum*), coontail (*Ceratophyllum demersum*), wild celery (*Vallisneria americana*), water stargrass (*Heteranthera dubia*), and two species of naiad (*Najas minor* and *Najas guadalupenisis)* comprise the relatively diverse SAV bed.

The predominantly mud and sand substrates of the river channel and channel slopes would be expected to support a benthic macroinvertebrate community dominated by freshwater forms such as oligochaetes (segmented worms), dipteran insects (e.g., chironomid midge larvae), and possibly gastropod and bivalve mollusks. In areas of coarser substrates, other more epifaunal forms may be present such as crawling or clinging types of insect larvae, amphipods, isopods, and hydroids. The

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greatest densities and diversities of the macroinvertebrate organisms would be expected in the shoal areas, particularly in association with the SAV beds. Therefore, dredging would permanently affect the macroinvertebrate species composition and abundance within the dredge areas. However, it is anticipated that recolonization by macroinvertebrates would occur within the dredged areas within one to two growing seasons, albeit at lower densities and diversity.

In consultation with federal, state, and local regulators, 8.0 hectares (20.0 acres) of SAV transplanting is proposed as mitigation to offset the unavoidable SAV impact. Also, it is anticipated that the successful establishment of SAV beds at the mitigation site will create habitat for macroinvebrates to offset temporary impacts associated with dredging. Removal of fish passage blockages is proposed as an additional mitigation measure to replace impacted functions by reopening historic spawning areas and habitat for anadromous and resident fish.

Increased turbidity and suspension of sediment is common with dredging, though the implementation of time-of-year restrictions will be utilized to minimize potential impact to spawning and migrating fish species. Turbidity and suspension of sediment influences on water quality is anticipated to be temporary in nature due to the limited work window.

4.13.3 Transport of Dredged Material

Dredged material would only be transported in barges of satisfactory condition to prevent loss of dredged material. Barges would not be permitted to be filled above the top of the sidewalls. This is to prevent loaded dredged material from shifting or splashing over the sides of the barge. Using these industry standard practices no major impacts are anticipated in association with the transport of dredged material to Poplar Island, Weanack Dredge Placement Site, or Norfolk Offshore Dredge Material Disposal Site (see 4.13.4 Alternatives Analysis of Dredged Material Placement Sites). If the Norfolk site is utilized, a Global Position System (GPS) tracking system will be implemented to track barges from the Chesapeake Bay Bridge Tunnel to the placement site and back to the Bridge/Tunnel. This is a requirement of Section 102 of the Marine Protection Research and Sanctuaries Act of 1972 to ensure that loaded barges are depositing dredged material in the correct location.

Panorama Landfill will require the use of a fleet of trucks to transport dredged material from an offloading area to Panorama Landfill. In order to comply with the time-of-year restriction for dredging, it is anticipated that approximately 3,058 cubic meters (4,000 cubic yards) per day (assuming a six-day work week) will be required, equating to approximately 400 round trips per day. The dump trucks would be travelling through a disproportionately high area of minority families, which is addressed in Section 4.3.5 Environmental Justice. An additional potential impact relating to transportation of dredged material is the potential for accidental spillage of dredged material from dump trucks while en route to Panorama Landfill. Spillage would be minimized by the implementation of industry practices, which include the use of fitted rubber gaskets and the use of adequate and properly functioning gate lock mechanisms. The rubber gaskets are fitted to the seam between the tailgate and dump body to create a water-tight seal. Gate-lock mechanisms will be checked regularly to insure proper operation. Though not anticipated, if an accidental spillage was to occur, the contractor would be required to remove the spilled material in a timely fashion. Construction impacts related to placement of dredged material at Panorama Landfill is included in Section F.7.3.

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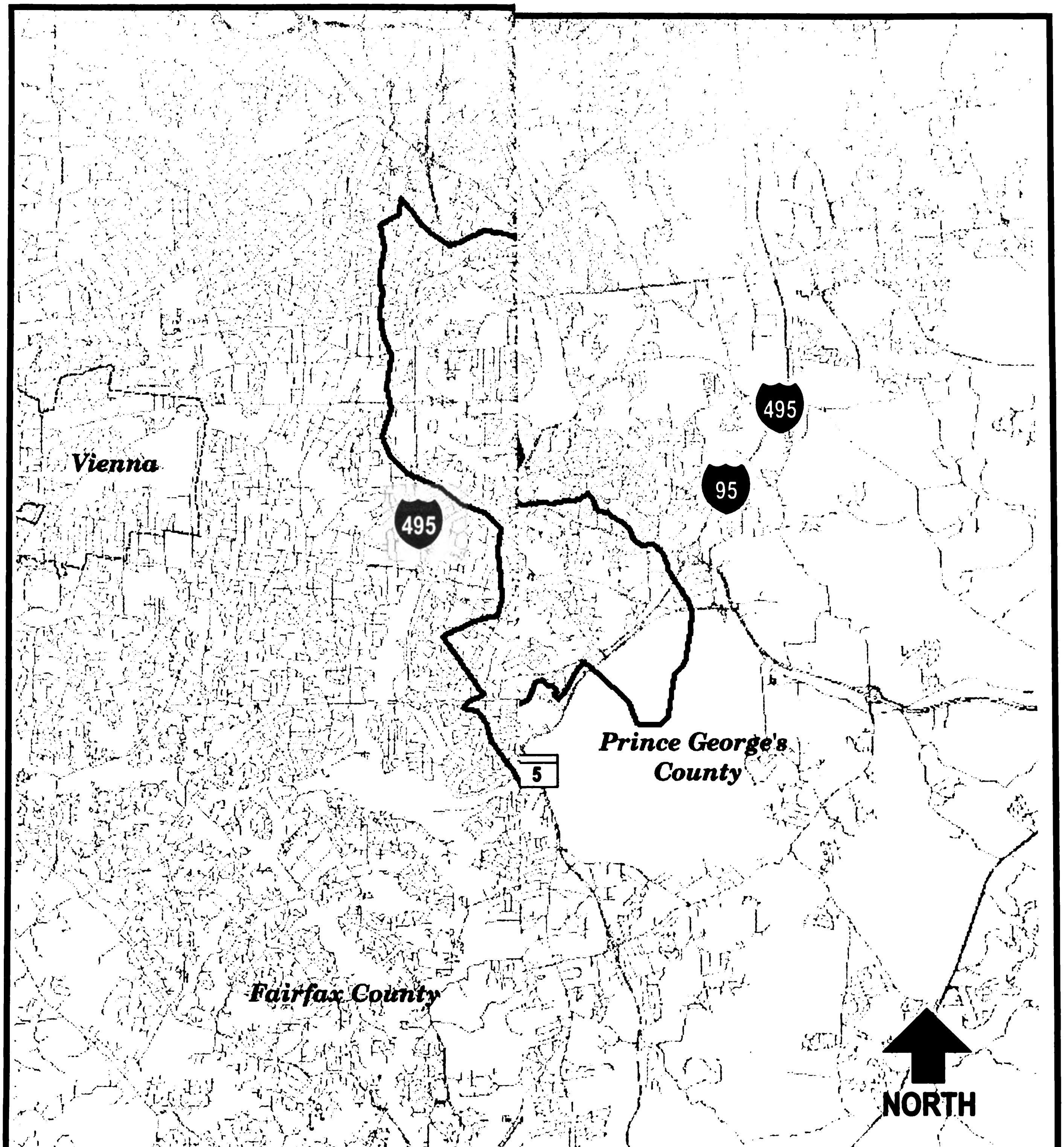

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

SCEA
National Historic Sites & Districts on the National Register

Date	0.5 0 0.5 1 Miles	Figure
December, 1999	Scale in Miles	4-25

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4.13.4 Alternatives Analysis of Dredged Material Placement Sites

An extensive alternatives analysis of over 20 potential dredge placement sites was conducted for the Woodrow Wilson Bridge project. The purpose of this section is to present a summary of the alternatives analysis to assure that the best placement option(s) of all the identified practicable alternatives is recommended. A summary of the potential impacts and outstanding issues associated with the four primary potential sites is summarized in Section 4.13.5. The alternatives are divided into Tier 1 through Tier 4 options. Tier 1 includes permitted landfills in which the material is placed within a dyked area and de-watered. Tier 2 sites are sites that are already on line, or will be on line by the time of project construction. These sites include beneficial use sites, overboard placement, existing island sites and upland sites. Tier 3 sites are overboard placement sites that are not yet permitted. Tier 4 sites are beneficial use sites that are not yet permitted. For each site, the environmental impact has been considered as well as the cost and practicability of the site.

Tier 1 Sites: Upland Placement Sites: Upland disposal sites were investigated in an effort to explore all potential alternatives to place dredged material from the Woodrow Wilson Bridge project. The close proximity of the proposed dredging to major commercial and industrial areas coupled with the relatively clean sediment, contributed to the establishment of three (3) potential upland disposal sites: Panorama Landfill, in Indian Head, Maryland; Browns Station Landfill, in Upper Marlboro, Maryland; and Hilltop Landfill, near Fort Belvoir, Virginia.

Panorama Landfill: Panorama Landfill is located approximately eight (8) road miles from the Woodrow Wilson Bridge project area, near the intersection of Indian Head Highway and Palmer Road. The Class III Landfill accepts rubble (i.e. soil, asphalt, and concrete) and dredged material. Panorama has recently accepted 42,818 cubic meters (56,000 CY) of dredged material from the USACOE Fort Washington Marina dredging project and will potentially accept in excess of 114,690 cubic meters (150,000 CY) of dredged material from other local projects, including dredging associated with the Anacostia River. The landfill has a capacity of over 3 million cubic meters (4 million CY).

Current owners/operators purchased the landfill five years ago. The landfill operates under an existing permit from Prince George's County Department of Environmental Resources, which was issued on November 16, 1998 and expires on November 16, 2003. The landfill operates year-round from 7:00 a.m. to 5:00 p.m., six days a week (closed on Sunday).

The landfill is located approximately 4.2 kilometers (2.6 miles) south of I-495 on MD 210 (Indian Head Highway) and 2.3 kilometers (1.4 miles) east of the intersection of MD 210 and Palmer Road. The dredged material from the project would likely be trucked from a temporary construction staging area located close to the bridge project, to the disposal site. The truck route is approximately 12.9 kilometers (8 miles). A possible construction method would include a clamshell crane to offload dredged material from full barges to waiting trucks. Two truck-loading pads, possibly with hoppers, could be constructed and a fleet of trucks will be used for continual off-loading and hauling. The contracted trucks would have gasket-sealed 9 cubic meter (12 CY) dump trucks (or equivalent) to ensure that loss of free liquid is minimized and to maximize the efficiency of the transfer of dredge material from barge to landfill. During the first phase of dredging, the requirement of 267,610 cubic meters (350,000 CY) to be disposed of within the four (4) month timeline necessitates the movement of 3,058 cubic meters (4,000 CY) per day. In order to accomplish this, it has been estimated that a fleet of 40 dump trucks with a capacity of at least 7.6

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cubic meters (10 CY) each will need to complete one round trip per hour over a course of five 10-hour days per week.

Panorama Landfill offers a permitted disposal site at a close proximity. However, a major disadvantage includes the possibility of trucking dredged material through residential areas of minority families, potentially giving rise to Environmental Justice issues. Additionally, the estimated volume of truck traffic would increase on local roads by 80 truck-trips (one way) per hour for 6 days a week, which presents another issue. This volume of trucks may congest a high-use area and resulting delays may impact the regulatory mandated dredging window from agency imposed time-of-year restrictions. Upland disposal poses the potential for accidental and incidental spillage of dredged material from dump trucks onto State, County, and local roadways as well as private property, prompting public perception issues.

Chemical analysis of dredged sediment in close proximity to the bridge has been completed and reported in the *"Potomac River Sediment Characterization for Proposed Dredging Areas"* which is available in the Woodrow Wilson Bridge Project Office in Alexandria, Virginia. This document indicates that the material is acceptable for upland disposal; however, comments received from the MDE indicate that limited additional testing is requested. Accordingly, the requested additional testing is underway and will be available prior to publication of the Final SEIS.

While the Panorama Landfill site is feasible, the time critical schedule may be disrupted due to limited truck capacity, traffic, and logistics, as the operation would likely be a daylight-only scenario. Aside from scheduling disadvantages, Environmental Justice issues are a concern. It is likely that only a portion of the dredged material from the first and/or second phase of dredging, if any, would be disposed of at Panorama Landfill.

Browns Station Landfill: Browns Station Landfill is located approximately 32 kilometers (20 miles) from the Woodrow Wilson Bridge project area in Upper Marlboro, Maryland. The Class V Sanitary Landfill has a capacity of 3.8 million cubic meters (5 million CY), accepts municipal solid waste, and has agreed to conditionally accept dredged material from the Woodrow Wilson Bridge project. The material must pass dryness standards as defined by the landfill. These requirements indicate that a dredged material drying area will be integral to the use of this site. In order to adequately dry dredged material, it had been estimated that each 581 cubic meters (760 CY) of dredged material would require 0.4 hectares (1 acre) of level, cleared upland, and six months of time. Therefore 267,610 cubic meters (350,000 CY) would require 186.2 hectares (460 acres) of level, cleared upland area. This would require locating an appropriate parcel, trucking dredged material to the parcel, spreading material at the prescribed ratio, reloading the material in six months, and hauling to Browns Station Landfill for disposal.

Browns Station Landfill offers a potential upland site for dried dredged material from the Woodrow Wilson Bridge project. Disadvantages include the impracticality of drying dredged material. The project does not include a suitable area for drying; therefore a site search would have to be conducted. An appropriate site, such as an agricultural field, may be remote and require a large fleet of trucks to not only deliver the material to be dried but to then deliver the material from the drying area to the landfill in six months. The expense, time, and level of effort required to load, unload, reload, and finally place the material at the landfill is extremely inefficient.

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Due to the impracticality of drying dredge material and the potential for dredging schedule delays due to hauling, Browns Station Landfill has been determined to be infeasible for the Woodrow Wilson Bridge project.

Hilltop Landfill: Hilltop Landfill is located south of Alexandria, Virginia, approximately 16 to19 kilometers (10 to12 miles) from the Woodrow Wilson Bridge project area. The facility is located at the intersection of Telegraph Road and Beulah Street, just north of Fort Belvoir. Likely trucking routes would be either Telegraph Road North to I-495 or Telegraph Road to Kings Highway to US 1 North to I-495, then across the Woodrow Wilson Bridge to the construction staging area.

Hilltop is an operational Class IV landfill that conditionally accepts dredged material. The material cannot contain free liquid and must be able to pass a paint-filter test to determine the wetness factor. As with Browns Station Landfill, this will require a dredged material drying area. This requirement precludes use of Hilltop Landfill for the same reasons stated previously.

The impracticality and inefficiency of drying large quantities of dredged material, as well as the potential project schedule delays and impact to communities due to trucking, excludes Hilltop Landfill from further consideration.

Tier 2 Sites: Approved Dredged Material Placement Sites

Approved dredged material placement sites demonstrate the greatest potential for successfully accepting dredged material from the Woodrow Wilson Bridge project. These sites differ from Tier 1 sites in that they are permitted specifically for placement of dredged material. The project has investigated these permitted Tier 2 sites and they include: Poplar Island Restoration Site, Norfolk Ocean Dredged Material Disposal Site, Weanack Dredged Material Disposal Site, Barren Island, Hart-Miller Islands, and Craney Island, Virginia.

Poplar Island: *Poplar Island Restoration Site* is a beneficial use project located in the upper Chesapeake Bay, about one-mile northwest of Tilghman, Talbot County, Maryland. The site is approximately 257 kilometers (160 miles) from the Woodrow Wilson Bridge project area. Poplar Island is being constructed in response to the need for dredged material placement sites for maintenance dredging of the Baltimore Harbor Shipping Channels.

The Poplar Island site consists of several islands surrounded by relatively shallow water. As discussed in the Poplar Island EIS, the historic coastline of the island depicts massive loss of land area on the islands due to erosion and rising sea level. The original design of the Poplar Island site included the restoration of the 1847 coastline which yields approximately 29 million cubic meters (38 million CY) of dredged material capacity. Design changes from the original will increase the capacity to approximately 29.8 million cubic meters (39 million CY), creating an excess of 765,000 to 1.1 million cubic meters (1 to 1.5 million CY). This capacity is sufficient to accept up to approximately 382,300 cubic meters (500,000 CY) of proposed dredging as part of the Woodrow Wilson Bridge project. This extra capacity may be considered for use for other projects such as maintenance dredging or new work projects.

Though the capacity is sufficient, a Section 217(b) agreement is required to authorize the placement of dredged material from the Woodrow Wilson Bridge project. This Section 217(b) agreement would be approved and executed by the Secretary of the Army and would state that the Secretary

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may permit the use of the facility if the Secretary determines that such use will not reduce the availability of the facility for project purposes. The 1997 FEIS was completed, satisfying environmental documentation requirements, however the USACOE has required a determination that the dredged material from the Woodrow Wilson Bridge will be compatible with other accepted dredged material from the Baltimore Harbor. Initial sampling and analysis of the Woodrow Wilson Bridge project sediment has indicated that the dredged material is compatible with dredged material from other sources to be placed at Poplar Island, though approval of Poplar Island is conditional upon receipt of satisfactory results from final testing which is currently being conducted. Final results will be included in the Final SEIS.

The positioning and loading of a 3,058 to 4,578-cubic meter (4,000 to 6,000-CY) barge is estimated to take one working day (well within schedule requirements). Barges transporting dredged material from the Woodrow Wilson Bridge project would be floated to the mouth of the Potomac then directed north approximately 97 kilometers (60 miles) to the site. The estimated time for tugboats to transport barges from Woodrow Wilson Bridge to Poplar Island is 24 hours. Once at the Poplar Island site, offloading would be the responsibility of the Woodrow Wilson Bridge project. Enough barges will be contracted to provide for continual dredging. Currently the site is under construction and will begin accepting dredged material in the fall of 2000, which is consistent with the Woodrow Wilson Bridge project schedule.

The Poplar Island site offers a permitted beneficial use site with adequate capacity for the placement of dredged material from the Woodrow Wilson Bridge project. Advantages included the existing permit, existing EIS, the on-going construction of the containment areas, the absence of impact to the community surrounding the Woodrow Wilson Bridge, the support of regulatory agencies, and the achievement of the project goal to provide a beneficial use site within Maryland. The disadvantages include the moderate distance from the site (approximately 257 kilometers) (160 miles)) and that the offloading is the responsibility of the Woodrow Wilson Bridge project.

The Poplar Island Facility would accommodate the constrained time schedule required by the project; no additional permits or construction would be necessary as no major impacts would be incurred beyond those identified in the Poplar Island EIS. Although the site has capacity to accommodate dredged material from the Woodrow Wilson Bridge project, the use of Poplar Island would be discouraged if other feasible and prudent disposal locations are identified. However, if other disposal sites prove to be impractical, the USACOE, Maryland Department of Transportation (MDOT), and MSHA have indicated that disposal of dredged material from the project could be accepted at Poplar Island if specific economic and chemical analysis provisions are followed. Chemical analysis of dredged sediment in close proximity to the bridge has been completed and reported in the *"Potomac River Sediment Characterization for Proposed Dredging Areas"* which is available in the Woodrow Wilson Bridge Project Office in Alexandria, Virginia. This document has been reviewed and approved by the USACOE.

Norfolk Ocean Dredged Material Disposal Site: The Norfolk Ocean Dredged Material Disposal site (ODMDS) was designated by the EPA pursuant to Section 102 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRS), as suitable for ocean disposal of dredged material. The site has a 994 million cubic meter (1.3 billion CY) capacity and is currently accepting dredged material from a variety of sources, totaling approximately 1.5 million cubic meters (2 million CY) per year. The primary source of dredged material is maintenance dredging in the Norfolk Harbor

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area. A Site Management and Monitoring Plan (SMMP) was prepared and signed by both EPA and the Norfolk District USACOE in 1998.

The Norfolk ODMDS is circular with a radius of 7.4 kilometers (4 nautical miles), and has an area of about 171 square kilometers (50 square nautical miles). Water depths vary from about 13 to 26 meters (43 to 85 feet). The bathymetry is gently sloping from west to east.

No specific disposal methods are required for this site. Disposal may be by hopper dredge, dump scow, or by pipeline discharge. The vessels used for dredged material disposal are required to operate under an approved verification plan. The verification plan includes an automated system that will record the horizontal location and draft condition of the disposal vessel from the time it passes the Chesapeake Bay Bridge tunnel outbound until the vessel passes the bridge-tunnel inbound. Vessel positioning shall be by differential global positioning system. For the Woodrow Wilson Bridge project, ocean-going barges equipped for bottom dumping will likely be utilized.

The SMMP suggests that beneficial use sites be considered prior to selecting the Norfolk ODMDS site, particularly if the material is suitable for beach nourishment. Dredged material associated with the Woodrow Wilson Bridge project is approximately 60 to 70% fine material, which is generally not considered suitable beach nourishment material.

A permit is required from the USACOE pursuant to Section 103 of the MPRS Act to utilize the site. The permitting will likely include a Section 103 Permit and an Essential Fish Habitat (EFH) Study. A draft EFH has been prepared and is currently under review by the National Marine Fisheries Service (NMFS). Comments and resolution of comments for the EFH are anticipated prior to the publication of the Final SEIS. The Section 103 Permit would be submitted to the Baltimore District USACOE and reviewed by EPA and VMRC. As part of the review, EPA requires that the dredged material to be placed at ODMDS be analyzed in accordance with the EPA/USACOE document entitled *"Evaluation of Dredged Material Proposed for Ocean Disposal"* otherwise known as "The Green Book." No seasonal restrictions to the placement of dredged material are imposed as part of the permit conditions to use the Norfolk ODMDS.

Disadvantages of the site include the requirement of an Essential Fish Habitat Study, potential section 103 Permit schedule conflicts and the requirement of ocean-going barges with bottom dumping capabilities. Bridge construction is scheduled to begin in October 2000, therefore, with the possibility that this option would not obtain the necessary permits, the project cannot count on ODMDS as the only alternative. Transporting quantities of dredged material long distances is most efficiently completed using large barges. The working depth of 2.7 meters (9 feet) does not permit the use of large barges within the dredge area currently planned. However, loading of smaller barges and transferring to larger ocean-going barges would be possible, although double handling of material is not efficient and requires additional manpower, equipment, and time.

Potential Section 103 Permit conflicts with the critical Woodrow Wilson Bridge project schedule precludes sole reliance of the Norfolk offshore site. Chemical analysis of dredged sediment in close proximity to the bridge has been completed and reported in the *"Potomac River Sediment Characterization for Proposed Dredging Areas"* which is available in the Woodrow Wilson Bridge Project Office in Alexandria, Virginia. However, additional testing is required to comply with "Green Book" criteria for disposal at this site. The testing is currently being completed and will be reviewed for approval by EPA. Results will be published in the Final SEIS. However, this will be

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considered for use in conjunction with other placement sites, if and when the Section 103 Permit is issued.

Weanack Dredged Material Placement Site: Weanack is a privately owned beneficial-use disposal site, located on the James River, approximately 418 kilometers (260 miles) from the Woodrow Wilson Bridge project area. The site contains dredged material placement areas in abandoned sediment ponds and borrow pits under a Virginia Department of Mines, Minerals and Energy (DMME) mining permit. The site capacity is approximately 764,600 cubic meters (1,000,000 CY).

Charles Carter is the land manager of Weanack, which is located on property owned by the Carter family's 324-hectare (800-acre) Shirley Plantation, in Charles City County, Virginia. The land adjacent to the dredged disposal site was mined for sand and gravel in the 1960's, leaving sedimentation ponds, borrow pits, and a large cove directly adjacent and hydrologically connected to the James River. In 1997, a 4.9-meter (16-foot) deep channel was dredged from the cove to the James River channel and a barge port was constructed to transfer a variety of materials from barges to trucks. The barge port facility includes adequate room for large ocean-going barges, a large crane barge, and 1.6 hectares (4 acres) of pavement for landside operations. A permit amendment was approved in 1998 authorizing dredged material placement on the upland portion of the mine reclamation area. This permit is through the DMME and authorizes the filling of large abandoned sedimentation ponds and borrow pits in a severely degraded area of the site. The estimated capacity for dredged material under the DMME permit is 382,300 to 764,600 cubic meters (500,000 to 1,000,000 CY). The Norfolk District USACOE has in recent years placed dredged material in the upland disposal areas adjacent to those proposed for placement of Woodrow Wilson Bridge material. The anticipated beneficial use of the site is restoration of historic productive agricultural fields.

The proposed actions include the use of large barges to transport material to the site. Once at the barge port, a small crane or hydraulic excavator could maneuver at least one large pump about and within the barge in order to pump the dredged material directly to the placement site, with assistance from a booster pump. The performance of the pump(s) will meet or exceed the required 3,058 cubic meters (4,000 CY) per day schedule. The offloading could also be accomplished using large clamshell cranes and a fleet of heavy-duty off-road dump trucks. A local Sediment and Erosion Control permit will be required and a permit regulating potential discharge may be required for the use of the Weanack Site.

The Weanack Dredged Material Placement site offers a permitted beneficial-use placement site. Advantages included adequate capacity, existing permits thereby reducing the potential for required studies, and existing barge port facilities. Disadvantages include the long distance (418 kilometers) (260 miles) from the Woodrow Wilson Bridge project area) and several issues that are currently being investigated, which include, but are not limited to, dewatering, material placement techniques, potential, and applicability of the existing permit. Currently, an assessment of potential Section 106 issues, engineering studies, and permit ramifications are being investigated. These issues will addressed within the Final SEIS.

Though the advantages to the site are evident, the remaining unresolved issues and their likely impact on the project schedule preclude sole reliance of the Weanack Site for the Woodrow Wilson Bridge project. However, Weanack remains to be considered as a potential dredge material

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placement area as coordination with the landowner is in progress. The final determination on the use of Weanack will be available for the Final SEIS.

Barren Island: Barren Island is located across from the mouth of the Patuxent River, in the Chesapeake Bay, approximately 249 kilometers (155 miles) from the Woodrow Wilson Bridge project area. The site is an active dredged material disposal site, approximately 40.5 hectares (100 acres) in size and considered beneficial use with a primary goal of marsh and seabird nesting habitat creation.

The Barren Island dredged placement project was started in 1984. Initial shoreline and fringe protection was provided by marsh planting while the use of geotubes was phased in for additional protection. As the sections of the site were filled, the surface of the dredged material was planted and oyster shell material was deposited on the island crest for nesting terns. The original estimated capacity was approximately 764,600 cubic meters (1 million CY), though a portion has been filled and the remainder may be committed to Baltimore District USACOE. The site primarily requires sandy dredged material due to the habitat type to be created and the vegetation that is to colonize the area.

Barren Island is a permitted beneficial-use dredged material placement, located at a moderate distance from the Woodrow Wilson Bridge project area. Disadvantages include potential lack of excess capacity, potential limited size, and potential incompatibility of the fine sediments from the Woodrow Wilson Bridge project with the Barren Island material requirements. Due to the existing limitations and disadvantages, the Barren Island site has been determined to be infeasible for the Woodrow Wilson Bridge project.

Hart-Miller Islands: Hart-Miller Islands are located in the Upper Chesapeake Bay, north of the mouth of the Patapsco River. The site is approximately 21 kilometers (13 miles) due east of Baltimore City, near the mouth of Back River in Baltimore County, and approximately 314 kilometers (195 miles) from the Woodrow Wilson Bridge project area. The 445 hectare (1,100-acre) site was constructed in the 1980s and has progressed from the connection of the two islands, to the filling of two cells using riprap containment dikes, to the establishment of wetlands and forest within the cells. Intensive monitoring has indicated considerable wildlife use, including nesting gulls. The proposed use of the site, when complete, is a recreational/habitat area.

The north cells of the facility have been raised to 13.4 meters (44 feet) to accommodate dredged material until Poplar Island is completed (anticipated to be fall of 2000). Hart-Miller accepts clean and contaminated silty sand material.

Though the Hart-Miller Islands facility is a permitted and active dredged material site, it is nearing capacity and committed to Baltimore Harbor maintenance dredging. These reasons, in addition to agency opposition, have rendered this site infeasible to the Woodrow Wilson Bridge project.

Craney Island: The Craney Island Disposal Site is located adjacent to the Norfolk shipping channel and connected to the mainland near Norfolk, Virginia. The site is approximately 290 kilometers (180 miles) south of the Woodrow Wilson Bridge project and is currently operational and permitted by the Norfolk District USACOE. The USACOE also maintains this several hundred-acre site, which primarily accepts material from the Norfolk Harbor.

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The site is contained and protected by a perimeter riprap dike that was originally constructed in the 1980's. Monitoring has indicated wildlife use as well as natural marsh and upland vegetation establishment within the contained area.

The Norfolk District USACOE indicated that the Craney Island site was not feasible for consideration as a potential dredge material placement area for the Woodrow Wilson Bridge project. Craney Island does not have adequate additional capacity for the Woodrow Wilson Bridge dredged material above and beyond the capacity, which is designated for material dredged in the Norfolk area. In addition, a law prohibits deposition of dredged material from outside the Hampton Roads area at the Craney Island site, and there is strong opposition to changing this law. Therefore, this option was excluded from consideration.

Tier 3 Sites: Non-Permitted Deep Hole Placement Sites

In an effort to review all available dredged material disposal areas, deep hole sites were investigated to determine feasibility. Based on agency opposition, evident in a letter from EPA contained in the Woodrow Wilson Bridge FEIS, potential environmental impact, and lack of permitted sites, all three deep hole sites (Route 301 Bridge site, Rappahannock Shoals site, and Gunston Cove site) were determined to be infeasible for the Woodrow Wilson Bridge project.

Deep Hole Disposal near the Route 301 Bridge: This potential placement site is located within the Potomac River in close proximity to the Route 301 Bridge within Maryland waters. Currently, there exist two (2) potential deep holes that could be used for open disposal, one upstream and one downstream of the bridge. The USACOE has initiated preliminary investigations at the site. These investigations include a sampling program conducted by the US Fish and Wildlife Service to evaluate the area for shortnose sturgeon habitat. To date the sampling program has not indicated the presence of this species at the test site. In order to further evaluate the potential of this site additional environmental studies are required and may include bathymetric surveys, benthic studies, river current analysis, sediment deposition modeling, essential fish habitat, and other pertinent studies. As with all deep hole disposal sites, an alternative site analysis is required as well as a public input process that will affect the approval schedule. In addition, regulatory and resource management agency opposition to the use of this site is anticipated. Due to the required studies and permit, agency opposition, and required public review, the Route 301 Bridge Deep Hole Disposal area has been determined to be infeasible for the Woodrow Wilson Bridge project.

Rappahannock Shoals: This site is located in the Chesapeake Bay east of the confluence of the Rappahannock River with the Bay, approximately 241 kilometers (140 miles) from the Woodrow Wilson Bridge project area. The site consists of a deep hole at the confluence of the Rappahannock River and the Chesapeake Bay. The site was previously investigated and permitted to accept dredged material from the Virginia portion of the Baltimore Channel dredging project. The USACOE prepared an environmental investigation document during the late 1980s and disposed of dredged material at the site during the early 1990s. Currently, no permit exists with the VMRC to place dredged material at Rappahannock Shoals; therefore, a 24-month permit process is anticipated, including a bathymetric analysis and habitat study. A discussion with VMRC staff discouraged the investigation of the site and noted that deep hole disposal is viewed as a low priority option for dredged material disposal and that an extensive alternatives analysis would have to determine Rappahannock Shoals to be the most suitable site. Interested agencies typically prefer beneficial use alternatives to create habitat, island creation, or upland placement, over deep hole

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placement. Additionally, disposal of dredged material from the State of Maryland in Virginia would require an inter-governmental agreement prior to approval.

Due to regulatory opposition and lengthy time requirements for necessary studies, the Rappahannock Shoals site has been eliminated from further consideration.

Gunston Cove: Gunston Cove is a deep hole located within the Potomac River east of Fort Belvoir in Fairfax County, Virginia, and approximately 52 kilometers (32 miles) from the Woodrow Wilson Bridge project. The site is the planned disposal site for an upcoming USACOE dredging project associated with the Potomac River navigation channel located in Alexandria, Virginia. The USACOE has undertaken biological assessments, benthic studies, and other studies to approve the site. Additionally, use of this site for disposal has gone through a public input process. The USACOE anticipates use of the site for the Potomac River Channel and preliminary indication shows that any available volume is allocated to the planned project.

This site is not approved for placement of dredged material other than the navigation projects mentioned above. As such, approvals would be required from the USACOE and the Virginia Marine Resources Commission to use the site for the bridge project. It is anticipated that the regulatory and resource agencies will oppose use of Gunston Cove, specifically U.S. Fish and Wildlife Service, who has expressed concern with using the site for the Woodrow Wilson Bridge project.

Though Gunston Cove is a proposed dredged material placement site, the lack of available or excess capacity for disposal of dredged material from the Woodrow Wilson Bridge project precludes the use of the site.

Tier 4 Sites: Non-Permitted Beneficial Use Disposal Sites

Tier 4 sites includes seven entries with varying stages of environmental studies, permitting, and facilities/containment. Some sites are at the conceptual level, whereas some sites have permits and active placement. The non-permitted sites include Bodkin Island, Smith Island, Holland Island, Belmont Bay, Craney Island off Hallowing Point, Dyke Marsh, and Farm Field placement.

Bodkin Island: Bodkin Island is a small island, just less than an acre in size, in Eastern Bay near the mouth of Crab Alley Bay, approximately 274 kilometers (170 miles) from the Woodrow Wilson Bridge project area. Wooden bulkheads and riprap revetments surround the island. Historically, it was the site of the highest black duck nesting density known in North America. Loss of quality brooding areas on and near the island as a result of erosion-related losses and increased development has adversely impacted populations on the island. Bodkin Island has decreased in size from approximately 20 hectares (50 acres) in 1847, to two islands totaling 1.8 hectares (4.5 acres) in 1953, and finally to a single island less than one acre today. A wooden bulkhead was constructed in 1984 around the perimeter of the island to prevent further loss due to erosion. More recently, riprap has been placed adjacent to the failing bulkhead on one side of the island to provide additional protection.

There is an opportunity to beneficially use dredged material to create upland nesting areas and brood habitat and to improve the existing nesting habitat for black ducks. It will also provide habitat for other waterfowl, including herons.

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The Bodkin Island restoration plan incorporates enlargement of the existing island to accommodate approximately 38,230 cubic meters (50,000 CY) of dredged material from maintenance dredging of the Chester River navigation channel. The design includes a combination of upland nesting habitat, high marsh zones, low marsh zones, and tidal pools. Due to cost considerations, geotextile tubes have been recommended as the preferred containment structure. A low geotextile tube constructed at the outer edge of the project would contain/protect a newly constructed marsh. A large geotextile tube (or two smaller stacked geotextile tubes) would be placed inland from the fringe marsh and back-filled to create the island. The material to be dredged from the Chester River is silt and clay.

The Bodkin Island restoration plan was approved for construction under the Corps of Engineer's Section 204 authority. However, it was not constructed due to a contractual problem associated with the Chester River dredging project.

The first phase of the dredging for the Woodrow Wilson Bridge project will generate approximately 267,610 cubic meters (350,000 CY) of dredged material, well in excess of the 38,230 cubic meters (50,000 CY) of capacity originally anticipated for the Bodkin Island project.

Though the Bodkin Island dredged placement area is approved and could potentially be expanded, the time required for construction and additional permitting is not compatible with the Woodrow Wilson Bridge project.

Smith Island: Smith Island is situated 19 kilometers (12 miles) west of Crisfield, Maryland. It is bounded to the east by Tangier Sound and to the west by the Chesapeake Bay. The island is approximately 3,238 hectares (8,000 acres) in area and is 12.9 kilometers (8 miles) long by 6.4 kilometers (4 miles) wide. Smith Island is approximately 209 kilometers (130 miles) from the Woodrow Wilson Bridge project.

A *Smith Island Environmental Restoration and Protection, Maryland Reconnaissance Report* was completed in May 1997. The next step in the process, the preparation of a Feasibility Report, is now underway. The following is information derived from the reconnaissance report and other information obtained during the study.

Smith Island is exposed to a long open water fetch from the west, southwest, and northwest. The western shoreline is 48 kilometers (30 miles) from the Virginia shoreline. The populated areas of the island are becoming more vulnerable as time progresses and the shoreline recedes closer to residents' homes.

The USACOE has identified four project areas and are conducting studies to determine the Federal interest at each. At Rhodes Point, potential projects include construction of single or twin jetties to protect the Federal navigation channel at Sheep Pen Gut. Shoreline stabilization and/or wetland creation are likely in conjunction with this project. Also in the Rhodes Point area, the Corps has twice previously placed dredged material behind geotextile tubes as part of maintenance of the Federal channels in the area to prevent erosion that was endangering the town. At this and other sites around the Chesapeake Bay, the USACOE has had mixed success with geotextile tubes. Due to the fine nature of the material from the Woodrow Wilson Bridge project, more expensive soil containment measures, such as stone sills, are warranted. A shoreline protection project at Tylerton includes bulkheading and nearshore breakwaters, and will not require, nor could it utilize, extra

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dredged material. Three coves along the north shore of the Martin Wildlife Refuge at the north end of the island are to be reconstructed and protected. Along the western shoreline of the Martin Wildlife Refuge, the USACOE is working with the US Fish and Wildlife Service and the State of Maryland to protect the shoreline from further erosion, and also to create additional wetland habitat. This project could utilize dredged material behind segmented breakwaters or stone sills to create tens of acres of salt marsh. Material could be placed elsewhere on the island such as in the Rhodes Point area to protect the town from potential storm damages and create valuable habitat.

Discussions are ongoing with the USACOE and resource management agencies about substituting dredged material from the Woodrow Wilson Bridge project for the material dredged off the western shoreline of the island. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service have both expressed concern regarding the placement of fine grain dredged material behind the breakwater. The agencies are concerned that storm waves that overtop the breakwater will erode the created marsh and sediments, resulting in failure of the project and deposition of material in the Bay, causing sedimentation over submerged aquatic beds and degradation of water quality. Completion of the feasibility study and environmental documentation, and construction of the containment structure would not be completed in time for the dredging required for construction of the Woodrow Wilson Bridge project.

The lack of completed environmental studies, the requirement for containment construction, and the opposition by agencies has rendered this site infeasible for the Woodrow Wilson Bridge project.

Holland Island: Holland Island is located approximately 209 kilometers (130 miles) south of the project area, just north of the confluence of the Potomac River and the Chesapeake Bay, on the Maryland Shore. The site is within the Holland Straits and is privately owned. Holland Island is a potential beneficial use site though no environmental studies, approvals for the placement of dredged material, or containment dikes exist.

Though the site is moderately close to the project area and may be a beneficial use site, it would require extensive studies, permitting, design, and construction before dredge material could be placed. An additional issue involves the ownership of created land, i.e., whether the land created would belong to the State or to the private property owner. Therefore, Holland Island has been determined to be incompatible with the dredging for the Woodrow Wilson Bridge project.

Belmont Bay: Belmont Bay is contiguous with the Occoquan Bay and occupies the northern border of the Mason Neck State Park. Although more than one location could be considered for the placement of dredged material, the restoration of Conrad Island appears to be a logical site. This would encompass an area of approximately 8 hectares (20 acres). Only limited information currently exists for this site; however, the proposal may include the construction of a breakwater and placement of dredged material behind the breakwater. The amount of available material placement as well as the appropriate location of the breakwater can only be determined once bathymetric surveys of the area are completed. However, based on topographic mapping of the area, it appears that the site could accommodate approximately 107,044 cubic meters (140,000 CY) of dredged material. This site is in a similar state of planning as the Craney Island off Hallowing Point site.

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Based on the limited environmental investigation completeness, lack of existing permits, and size limitations, this site has been eliminated from future consideration for the placement of dredged material associated with the Woodrow Wilson Bridge project.

Craney Island off Hallowing Point: This potential disposal site is located within the Potomac River upstream of the confluence of the Occoquan Bay with the Potomac River, offshore of the Mason Neck National Wildlife Refugee. The potential site is a large shallow bar with water depths ranging from 1 to 1.5 meters (3.3 to 4.9 feet) and could vary from approximately 8 to 20 hectares (20 acres to 50 acres) in size. Assuming an average depth of fill of 1.5 meters (5 feet) over a 12 hectare (30-acre) site to establish an average site elevation of 0.6 meters (2 feet) above sea level, as much as 191,150 cubic meters (250,000 CY) of dredged material could be placed at the site. This filling would require construction of a breakwater or other structure to contain the dredged material.

This site could be developed as a beneficial use site. However, consideration of the ecological impact of converting open water to wetlands would need to be carefully evaluated. It is expected that regulatory and resource management agencies will be concerned with potential impacts associated with the filling of shallow water habitat. Furthermore, only preliminary investigations have been conducted at the site and no formal environmental investigations have been undertaken. Therefore, Craney Island at Hallowing Point has been eliminated from further consideration because of limited anticipated capacity, lack of environmental permits, and containment structures.

Dyke Marsh: Dyke Marsh, owned by the National Park Service, is located along the Virginia shoreline immediately south of the Woodrow Wilson Bridge. The site has undergone several manmade alterations, including dredging of marsh and underlying sediment for sand and gravel in portions of the site, and the construction of dikes at the edge of the marsh to permit farming activities to take place. The marsh has also eroded severely over time due to natural forces.

The National Park Service has been mandated by Congress to restore Dyke Marsh. Although Congress was not specific as to the nature of the required restoration activities, reclamation of eroded marsh is understood to be Congress' intent. An Environmental Assessment was prepared in the early 1970s, which describes alternatives to restore Dyke Marsh.

Dyke Marsh is documented habitat for the least bittern. It is also a viable nesting area for the marsh wren. George Mason University has completed vegetative mapping of Dyke Marsh, and has conducted studies including benthics, toxics, and hydrologic modeling of the tidal gut within the site. The National Park Service has completed bathymetry of the site, and found that the open water areas are generally 3.7 to 4.6 meters (12 to 15 feet) deep.

The National Marine Fisheries Service (NMFS) has recommended that additional biological sampling be conducted if Dyke Marsh is to be considered for the placement of dredged material from the Woodrow Wilson Bridge project. NMFS would also recommend sampling at reference stations such as Smoots Cove. However, NMFS would be supportive of enhancing the Dyke Marsh habitat, such as improving the shoreline for the establishment of broad-leaved emergent wetland plants that would provide foraging habitat for fish.

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Additional studies, approvals, and construction necessary to use Dyke Marsh preclude the site from consideration for the Woodrow Wilson Bridge project.

Farm Field Placement: Farm field placement was considered and discussed by the designers and planners for the Woodrow Wilson Bridge project and the interested agencies, but was not developed due to numerous fatal flaws, considering the time constraints and location of the Woodrow Wilson Bridge project area. Major disadvantages include: political issues; negative public perception of hauling wet material long distances through commercial and residential areas en route to agricultural areas; substantial effort to locate, negotiate, and permit suitable farm fields; and exorbitant cost and effort to barge, offload, haul, spread, and maintain dredged material.

4.13.5 Primary Potential Dredge Placement Sites: Impacts and Outstanding Issues

A review of the Poplar Island EIS determined that the Woodrow Wilson Bridge dredged placement operation is identical to that described and anticipated within the Poplar Island Restoration EIS. Initial testing in accordance with the Inland Testing Manual for Dredged Material revealed no fatal flaws. Additional testing, currently being conducted, will determine if the sediment from Woodrow Wilson Bridge is compatible with Poplar Island. Although the site has capacity to accommodate dredged material from the Woodrow Wilson Bridge project, the use of Poplar Island would be discouraged if other feasible and prudent disposal locations are identified. However, if other disposal sites prove to be impractical, the USACOE, Maryland Department of Transportation (MDOT), and MSHA have indicated that disposal of dredged material from the project could be accepted at Poplar Island if specific economic and chemical analysis provisions are followed. The Decision Document and Section 217(b) Agreements are complete and ready for signature by the Baltimore District USACOE, MDOT, and MSHA should Poplar Island be selected as the only feasible and prudent disposal option.

The Norfolk Offshore Dredged Material Disposal site will require a Section 103 (Marine Protection Research and Sanctuaries Act of 1972) Permit which would require that the sediment is in compliance with the "Evaluation of Dredged Material Proposed for Ocean Disposal" document (also referred to as the "*Green Book*"). Sampling and analysis for the four tiered testing, which include bioassays, is currently underway and will be completed prior to publication of the FSEIS. At that time, if determined to be acceptable by both the Baltimore District USACOE and Region III EPA, it is anticipated that the Section 103 permit could be issued by the Baltimore District USACOE. An Essential Fish Habitat Study was also required as part of the approval process to determine impacts to EFH. The report indicated that only minor impacts are anticipated and the report has been submitted NMFS for review and approval. A determination as to the use of the Norfolk site will be made prior to construction.

Panorama Landfill is a permitted rubble landfill with the potential for accepting at least a portion of the dredged material for the Woodrow Wilson Bridge project. Limitations, as discussed in Section 4.13.3, include logistics of hauling material with a large fleet of heavy trucks on already congested roads (creating the potential for traffic and noise impacts) and the potential for Environmental Justice issues as trucks will be traveling through neighborhoods of disproportionately high numbers of minority families.

It is anticipated that Panorama Landfill may only receive a portion of the dredged material from the Woodrow Wilson Bridge project, at the most, due to the potential logistical complications interfering with the critical time schedule as well as Environmental Justice concerns.

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Weanack Dredged Material Placement Site currently maintains a Department of Mines, Minerals & Energy (DMME) permit through an ongoing mined land reclamation process. Additional permits, if necessary, will be acquired prior to acceptance of dredged material to the site. It is anticipated that a local sediment and erosion control and land disturbance permit will be required and a permit to regulate potential discharge of flow related to discharge may be necessary. Weanack has designed a conceptual plan and additional engineering will be required to be completed to insure the proper design of the containment structures.

Though Weanack is located adjacent to the Shirley Plantation (both owned by the Carter Family), the Virginia SHPO determined that a similar and adjacent project in 1995 would have no adverse effect upon the Shirley Plantation Property, which is listed on the National Register. The same determination is anticipated with the placement of Woodrow Wilson Bridge dredge as the project limits fall within the same mine reclamation area, considered to be disturbed. The placement of dredged material is anticipated to improve and restore the existing degraded condition. Groundwater is not anticipated to be impacted as the Woodrow Wilson Bridge sediment testing report was reviewed and approved by a Virginia Tech Soil Science professor linked to the site and specializing in mine reclamation. No wetlands are anticipated to be impacted by placement of material as Weanack has a jurisdictional determination for the area. This will be verified prior to construction. In addition, no noise, visual, or traffic impacts are anticipated as the offloading operation will be fully contained within Weanack property. Though the site continues to be developed as a placement site, at this time no substantial environmental or social impacts are anticipated as a result of placing dredged material at Weanack.

4.14 Methodology and Effects of Existing Bridge Removal

The current construction schedule for the proposed Woodrow Wilson Bridge includes demolition and removal of the existing bridge structure during 2004 and 2005. In general, the proposed southern span (outer loop) will be constructed first and traffic will be diverted to the new structure. Then, the existing bridge will be removed in order to gain access to build the northern proposed span (inner loop). The northern span and the existing bridge overlap near both the Maryland and Virginia shorelines, requiring the stated sequence.

The existing Woodrow Wilson Bridge is over 1,797.5 meters (5,897 feet) long and 30.5 meters (100 feet) wide connecting Oxen Hill, Maryland to Alexandria, Virginia. The 38-year old structure consists of 57 concrete piers supporting bridge spans ranging from 19 to 67.7 meters (62 to 222 feet) in length. The bascule span is supported by two large piers and flanked by fenders that extend channelward on both sides of the bridge. Each pier is lined with granite at the water interface and anchored by four columns set in a partially buried concrete footing (depending on location). Footing dimensions are similar for all supporting piers and are 28.6 meters long by 6.7 meters wide by 4.9 meters deep (94 feet long by 22 feet wide by 16 feet deep). The bascule piers (moveable span) are larger, measuring 30.5 meters long by 11.9 meters wide by 4.9 meters deep (100 feet long by 39 feet wide by 16 feet deep). All piers are reinforced with concrete supported on piles.

Preliminary plans incorporate a top-down approach for the removal of the existing bridge structure. An analysis of potential demolition techniques was conducted to compare environmental impacts, level of effort, and time requirements. In an effort to provide contractors with maximum flexibility, a specific demolition procedure has not been prescribed, rather an investigation of feasible techniques, of which one or a combination are anticipated to be utilized for demolition. In general,

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the demolition procedure would start with the removal of the bridge decking, followed by the steel superstructure, and then the pier superstructure (segment of piers above the mean high water level). These components are anticipated to be removed utilizing one or more of a variety of methods. These methods include hydroblasting (high-pressure water stream), hydraulic splitting (expandable hydraulic cylinder), hoe-ram demolition (mechanical shears and jaws), diamond saw cutting, and controlled explosive demolition. Minor, if any, environmental impacts are anticipated, as only small incidental inert material may fall from the work area into the Potomac River. In an effort to minimize debris falling into the river, suspended netting, skip pans held by cranes or booms just under the work area, and/or containment barges will be utilized.

Once the components above the waterline are removed, environmental impact becomes a critical issue for the remaining underwater components. The pier substructure and foundations pilings, as well as the bascule section can also be removed using hoe-ram demolition, hydraulic splitting, diamond saw cutting, and, in addition, expandable epoxy. However, each of these techniques are severely hampered or not feasible unless cofferdams are constructed to present a dry working environment. Building cofferdams at each pier foundation is time consuming and costly. As these techniques may not perform sufficiently to meet the demanding schedule, sole reliance upon them may be impractical. Anticipated impacts for each of these techniques are similar in that potential impacts include sediment suspension and disturbance to the river bottom incurred through the construction of the cofferdams. These potential impacts will be temporary in nature, as the cofferdams will be removed after demolition.

The alternative to building cofferdams at each pier foundation is the utilization of controlled underwater explosives. The use of explosives to demolish large structures is a specialized construction practice. The pier substructure, bascule, and foundation pilings are relatively inaccessible and removal with conventional techniques may require greater risks, costs, and time. Therefore, blasting may prove to be the most effective strategy to demolish these structures. Potential impacts associated with the use of underwater explosives are as follows.

Falling Debris: Falling debris represents a small potential for impact within the fish communities present. The work activity coupled with the relatively small areas associated with each pier reduces the potential for mortality or injury to fish.

Displaced Sediment: The resuspension of sediment due to underwater explosions and other related activities should not impact the fish habitat. The depositional rate of suspended sediments coupled with seasonal flows and fish avoidance behavior makes potential impacts relatively low. Since areas around the bridge and immediately downstream are not suitable spawning habitats, potential impacts to eggs and spawning areas are also very low. In addition, sediments around the footings will be removed for blasting, greatly reducing the intensity of mud waves and the potential for high sediment resuspension caused by explosions below the mudline.

Shock Wave Impacts: Underwater detonations of explosive charges represent point source disturbances affecting finite areas within aquatic environments. Because water is not easily compressed, shock waves from physical disturbances are transmitted before dissipation. Near area pressure gradients resulting from these shock waves released during explosions can affect aquatic species.

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Explosive detonation velocities are directly related to fish mortality and important in understanding the impact of blasting on fish (Teleki and Chamberlain 1978). As detonation velocities increase, the resultant pressure gradient along the wave increases, affecting the fish's ability to adjust to pressure changes. Fish organs, especially the swimbladder (an air filled organ that helps maintain buoyancy) can be deformed by quick changes in pressure resulting in internal injuries or mortality. Wright (1982) reported that an instantaneous change in pressure greater than 100 kiloPascals (14.5 pounds per square inch [psi]) in the swimbladder of fish was sufficient to cause injury or mortality. In general, juvenile fish are more sensitive than adults in areas outside the mortality zone of an explosion (Keevin, Personal Communication). These effects vary by species with fish lacking swimbladders or with small swimbladders that are more resistant to pressure changes (Goertner *et al.* 1994 cited in Keevin 1998).

NMFS stated in an agency coordination letter, dated December 15, 1998, that underwater blasting may potentially effect shortnose sturgeon, a federally endangered fish, which may exist in the action area. Correspondence is available for viewing in the Woodrow Wilson Project Office in Virginia. A Biological Assessment was completed for the shortnose sturgeon and the conclusion/findings indicate a very low potential for the presence for the shortnose sturgeon, though suitable habitat exists. With that, a three pronged approach to further avoid and minimize the potential for effects to shortnose sturgeon was developed including: time-of-year restrictions (underwater blasting is prohibited from February 15 to July 1); the requirement of a stringent blast design which, to the greatest extent possible, incorporates blast design techniques to minimize the shock wave(s) by using less charge and maximizing the efficiency of the blast; and the requirement of cofferdams at the bascule structure. The bascule pier requires additional precautions as the structure would require the largest charges and is adjacent to the navigation channel, an area of suitable habitat. This program is anticipated to minimize impact to a broad range of fish and other aquatic species, in addition to the shortnose sturgeon.

Indifferent to the method of demolition, cranes mounted on barges will be used to lift large pieces of debris from the river bottom. Impacts are expected to be minimal and include sedimentation from the disturbance of the river bottom as well as sediment from the debris. Impacts will be minimized by immediately placing debris into awaiting barges, prohibiting the washing of sediment from debris in the river, and avoidance of this action during the spring spawning period. Once the large pieces of debris are removed the area will be dredged in accordance with the dredging plan and applicable time-of-year restrictions, to complete the demolition process.

Approximately 30,500 cubic meters (40,000 cubic yards) of concrete (mostly reinforced) and 57 steel plate girder spans will be removed as part of the existing bridge demolition. The steel will be recycled or delivered to an appropriate scrap yard. The concrete, which is retrievable, will either be recycled or used to create or enhance artificial reefs, under the direction of the appropriate agencies. The smaller pieces left on the river bottom will be dredged as part of the second phase of dredging (see Section 4.13) and taken to the appropriate dredged material placement site.

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4.15 Relationship between Local Short-term uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

The short term uses of the environment associated with the Current Design Alternative 4A, include those typically found with highway, interchange, and bridge construction. Short term impacts associated with construction activities are described in Appendix F and include effects to the natural environment, traveling public, and socio-economic resources. These can be compared to the long term benefits of the project, such as improved mobility, increased safety, decreased congestion and delay, and increased tax revenue due to support of the project to future land use plans.

4.16 Unavoidable Adverse Impacts

Implementation of the Woodrow Wilson Bridge project would necessarily involve temporary and long term impacts to the natural and cultural environments. Temporary impacts are described in Appendix F. Long term impacts are described in preceding sections of this chapter. Those impacts that are unavoidable and adverse are summarized below. Mitigation, as feasible, for these impacts are included in the corresponding sections in this chapter.

The unavoidable and adverse impacts include the loss of or adverse affect to:

- 5.7 hectares (14.1 acres) of parklands/recreation areas
- 21.4 hectares (52.9 acres) of right-of-way
- 336 residential properties
- 23 business properties
- 1 non profit/federal property
- 636 residential noise impacts
- Overall increase in impervious surfaces
- Loss of valuable wetland functions (ground water recharge, filtering, floodplain storage, floodflow alteration, sediment/shoreline stabilization, sediment/toxicant retention, wildlife habitat, and fish/shellfish habitat
- 12.8 hectares (31.7 acres) of waters of the US including mudflats, vegetated and unvegetated wetland
- 40.0 hectares (98.7 acres) of forested areas
- 3 underwater archeological sites
- 3 historic sites
- several sites with documented or potential soil and/or groundwater contamination

4.17 Irreversible and Irretrievable Commitment of Resources

This section includes the irreversible and irretrievable commitments of resources, both natural and cultural, to construct the Current Design Alternative 4A. This involves the labor, materials and fiscal resources devoted to the project's construction. These resources are described in Section 4.15 of the 1997 FEIS and Appendix F of this document.

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Chapter 5

Comments and Coordination

5. Comments and Coordination

Following publication of the 1997 FEIS, the Woodrow Wilson Bridge project continued an extensive agency coordination and public involvement program focused on resolving design details for the Selected Alternative 4A. The following sections describe those groups, which were assembled, and the mechanisms involved in addressing specific resource and technical issues that have occurred since the publication of the 1997 FEIS.

5.1 Resource Agency and Group Composition Coordination

The combined environmental/regulatory process developed for the Woodrow Wilson Bridge Improvement Study continued following the completion of the 1997 FEIS. The following coordination groups were established and maintained and agency coordination meetings were held to discuss specific issues including, but not limited to, cultural resources, dredge disposal, waterway navigation, and replacement housing. Meeting minutes are available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

5.1.1 Interagency Coordination Group and Sponsoring Agencies

Twenty-five regulatory and resource agency members comprise the Interagency Coordination Group (ICG) in addition to Sponsoring Agency representatives. These members include representatives of the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Coast Guard, National Marine Fisheries, National Park Service, Virginia Department of Environmental Quality, Virginia Institute of marine Science, Virginia Marine Resources Commission Maryland Department of the Environment, Maryland Department of Natural Resources, City of Alexandria Health Department, District of Columbia Health Department, Prince George's County and Fairfax County Departments of the Environment, and others. This group met eleven times since it was initiated in June 1998. The ICG continues to review the project-wide permit requirements, avoidance and minimization alternatives, mitigation alternatives and proposals and permit conditions. This group addresses specific agency requirements associated with functional mitigation, approaches to documentation of threatened and endangered species, and forest and parkland elements. ICG meeting minutes are maintained and available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

5.1.2 Design Review Working Group

The Design Review Working Group (DRWG) is comprised of the Advisory Council on Historic Preservation, National Park Service, Virginia Department of Historic Resources, Maryland Historic Trust, District of Columbia State Historic Preservation Office, Maryland–National Capital Park and Planning Commission, City of Alexandria and Prince George's County. This group's establishment was based on stipulation I of the project's Memorandum of Agreement on Section 106 issues. The group was originally convened in April 1998 and has met to discuss project issues regarding the coordination of the Section 106 process. This group is charged with the review of design documents and implementation of treatment plans. They were also charged with the confirmation of compliance with Memorandum of Agreement Stipulations (MOA – included in Appendix D as part of the Record of Decision – signed in November 1997). DRWG meeting minutes are maintained and available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

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The DRWG also served as the Historic Resources Advisory Committee for the 1998 Bridge Design Competition, which was discussed in Section 1.2.3 of this document.

5.1.3 Environmental Management Group

The Environmental Management Group (EMG), comprised of environmental managers from the sponsoring agencies including staff of the FHWA Maryland and Virginia Divisions and Eastern Resource Center, Virginia Department of Transportation, Maryland State Highway Administration, District of Columbia Department of Public Works, as well as the U.S. Army Corps of Engineers and the Potomac Crossing Consultants, met regularly beginning in May, 1998. Their role has been to provide input, expertise, and policy direction to environmental issues. The EMG has responsibility for completion of the Draft Supplemental Environmental Impact Statement (Draft SEIS) and the Final Supplemental Environmental Impact Statement (Final SEIS). This group has discussed and reviewed potential aquatic mitigation sites including types of mitigation and treatment. They have guided the preparation of information in the appropriate documents and permit application for dredge and dredge disposal, parkland mitigation, Environmental Justice issues, Secondary and Cumulative Effects Analysis, and additional documentation regarding the coordination of the Section 106 process. EMG meeting minutes are maintained and available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

5.2 Technical Group Coordination

5.2.1 Virginia Technical Coordination Team

The Virginia Technical Coordination Team (TCT) consisted of the VDOT Project Manager and Bridge Engineer, FHWA Project Manager, FHWA Virginia Division, Fairfax County and City of Alexandria engineering staff. They met 12 times beginning in September 1998 and concluding in August 1999. This group was specifically charged with providing direction on the design elements, project features and policy issues associated with the design refinements for the Virginia portion of the project. They also reviewed the recommendations of the Stakeholder Participation Panels (see Section 5.3.1) in Virginia concerning the refinements to the Telegraph Road Interchange, the US 1 Interchange, Washington Street Deck and Jones Point Park.

The TCT forwarded nineteen (19) recommendations, in the form of Decision Chronicles, to the Chief Engineer, VDOT. These were sent periodically during the process with a final submission following the August 26, 1999 TCT meeting. The Decision Chronicles included an Organization Mission Statement, Transit Studies, Eisenhower Valley Access, Church Street ramp, Telegraph Road Interchange geometric changes in the northwest, northeast, and southwest quadrants of the interchange, ramps accessing Eisenhower Valley from the eastbound Capital Beltway, and the southern intersections on Telegraph Road. Other recommendations related to Telegraph Road included the pedestrian access across Telegraph Road at Huntington Avenue and the protected turn lanes at Huntington Avenue and Burgundy Village. Decision Chronicles at the US 1 interchange included the northbound to westbound Capital Beltway ramp, HOV signals at US 1, US 1/Franklin Street intersection modifications, and the southern intersections along US 1. Other recommendations included studies with recommendations in the vicinity of the WMATA bridge that crosses the Capital Beltway, pedestrian/bicycle connections at both Telegraph Road and US 1, and the Washington Street deck refinements. These recommendations, based on the approval of the VDOT Chief Engineer, were incorporated into the Current Design Alternative 4A, as presented,

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herein. TCT meeting minutes are maintained and available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

5.2.2 Transit Coordination

Since November 1998, nearly a dozen coordination meetings have been held between the Woodrow Wilson Bridge project staff and the Washington Metropolitan Area Transit Authority (WMATA) staff to assure engineering and policy compatibility during the early design phase of the Current Design Alternative 4A. Emphasis has been placed on not precluding an ultimate light or heavy rail transit facility within the scope of the Woodrow Wilson Bridge project. The major items that were resolved or are under study include:

- Vertical and horizontal alignment provisions for the Virginia landside approach to allow a connection with the existing Eisenhower station,
- Structural and geometrical provisions for the Potomac River Bridge deck, alignment and cross section to accommodate the future installation of rails,
- Vertical and horizontal alignment provisions for the Maryland landside approach consistent with MDOT's ongoing Capital Beltway study (study team includes WMATA),
- Coordination efforts with WMATA will continue as necessary throughout the design and construction phase.

WMATA coordination meeting minutes are maintained and available at the Woodrow Wilson Bridge Project Offices in Virginia and Maryland.

5.2.3 Other Coordination

Dredge and Dredged Material Disposal

Meetings have been held with the USACOE-Navigation Section, U.S. Coast Guard, Virginia Pilot Association and Robinson Terminal in order to review proposed modifications to the existing Potomac River navigation routes associated with the Current Design Alternative. These are documented in meeting minutes maintained and available in the Woodrow Wilson Bridge Project Office in Virginia.

Meetings have been held to discuss dredge and disposal with the USACOE – Baltimore and Norfolk Districts, Maryland Port Administration, Maryland Environmental Services and the Maryland Department of Transportation. These are documented in meeting minutes available in the Woodrow Wilson Bridge Project Office.

Summary of Activities Since Record of Decision

The following information briefly summarizes some of the activities of the various technical and regulatory groups involved with the progression of the design and design refinements, coordination on environmental and permit issues, and compliance issues related to the ROD. These groups include but are not limited to those discussed in Section 1.3 and others as they pertain to recommendations and design modifications made since the publication of the 1997 FEIS. Minutes

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of meetings for each of these referenced coordination meetings are available and can be viewed at the Woodrow Wilson Project Office in Alexandria, Virginia.

Additional coordination meetings and activities have occurred since signature of the ROD; however, they are too lengthy to mention here. A complete summary of activities log is maintained by the project and can be viewed at the Woodrow Wilson Project Office in Alexandria, Virginia.

March 19, 1998: Initial design phase meeting of the Section Design Consultants (SDC) for the US 1 and Telegraph Road Interchange contracts in Virginia.
April 2, 1998: Initial environmental commitment and Record of Decision tracking protocol meeting held with the US 1 SDC.
April 13, 1998: Initial meeting of the Design Review Working Group (Stipulation II.B of the MOA) to organize group functions and responsibilities.
May 1, 1998: Initial FHWA quarterly review meeting to address schedule, budget, and environmental activities critical to the timely replacement of the Woodrow Wilson Bridge.
May 26, 1998: Initial meeting of the Environmental Management Group to outline the group's role and discuss pertinent mitigation and compliance issues.
June 4, 1998: Initial meeting of the reconvened Interagency Coordination Group (ICG) to discuss regulatory and mitigation issues related to the Project.
June 11, 1998: Coordination meeting with staff of the National Capital Planning Commission (NCPC) to review the project status and schedules.
June 16, 1998: Local Elected Official breakfast meeting to update jurisdictions on project issues and discuss interchange modifications.
July 1, 1998: Coordination meeting with the National Park Service to discuss parklands and recreational resource issues and mitigation within Jones Point Park and Rosalie Island.
July 16, 1998: Working meeting of the GEC and the SDC's to discuss the Phase I compensatory wetland mitigation package and project impacts to aquatic resources.
August 6, 1998: Initial coordination meeting with staff of the Chesapeake Bay Critical Area Commission (CAC) to review the project status and schedules, specifically wetland mitigation elements.
August 11, 1998: EMG meeting to discuss mitigation site search progress and preparation of August 21, 1998 ICG meeting.
August 21, 1998: ICG meeting to discuss studies and investigation needed to support resubmission of the Section 404/10 permit application.
August 27, 1998: Coordination meeting with the City of Alexandria and National Park Service in reference to design activities for George Washington Memorial Parkway and Jones Point Park.
August 27, 1998: Initial design phase meeting of the Section Design Consultants (SDC) for the I-295 and MD 210 Interchange contracts in Maryland.
September 4, 1998: Coordination meeting with staff of the NCPC to prepare for October 1, 1998 presentation to the full Commission in accordance with preliminary review requirements.
September 24, 1998: Initial meeting of the Technical Coordination Team (TCT) with focus on organization and decision making processes, specifically use of Decision Papers.
October 1, 1998: Informational presentation to the NCPC to inquire on jurisdictional requirements associated with the project.
October 7, 1998: Coordination meeting with the USACOE to discuss the FEIS Alternative 4A location and potential aquatic resource affects.

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October 15, 1998: TCT meeting to accept and adopt role as lead group on geometric/engineering issues in Virginia, but the Sponsoring Agencies will make final decisions.
October 16, 1998: ICG meeting to continue discussions on wetland impacts and mitigation options which included a suggestion by EPA to investigate preservation as a mitigation option.
October 20, 1998: Initial of many field observations to study habits and habitat of the resident pair of bald eagles who are thought to nest within Betty Blume Park in Prince George's County.
October
October 27, 1998: ICG meeting at which USACOE and National Marine Fisheries Service (NMFS) indicated that fish passage restoration would be an element in mitigating SAV impacts.
November 16-18, 1998: Bridge Competition Selection Panel meetings and deliberations.
November 18, 1998: Elected Officials briefing of the results of the Bridge Competition Selection Panel results.
November 23, 1998: Meeting with NPS to discuss program development for improvements within Jones Point Park and the proposed Washington Street Urban Deck.
November 24, 1998: Initial meeting of the Sponsoring Agencies to discuss projectwide aesthetics and prepare displays and documentation for public information and coordination.
December 2, 1998: Initial of several meetings of the Virginia Stakeholder Participation Panel to assist in design concept development and interchange configurations.
December 9, 1998: FHWA quarterly review meeting to address schedule, budget, critical environmental activities associated with the project.
December 18, 1998: EMG meeting to discuss merits of fish blockage removal as an integral component of the project's conceptual mitigation plan.
December 21 1998: Coordination meeting with the USACOE to discuss critical project issues related to the selected bridge design and dredge requirements.
January 22, 1999: ICG meeting to discuss parkland mitigation, test boring program, and the wetland mitigation package.
February 2, 1999: Meeting during which the TCT agreed to proceed with the "not to preclude transit" studies that addressed the Capital Beltway mainline.
February 16, 1999: Coordination meeting with the NPS to discuss program approval for planned Jones Point Park, Urban Deck, and Rosalie Island mitigation concepts.
March 11, 1999: Meeting during which the TCT approved recommendation to maintain Church Street access.
March 11, 1999: ICG meeting to discuss conceptual wetland mitigation package and elimination of specific potential Maryland and Virginia mitigation sites.
March 16, 1999: FHWA quarterly review meeting to discuss overall project coordination, specific issues related to the USACOE, and TIP requirements.
March 23, 1999: Initial of several meeting of the Maryland Stakeholder Participation Panel to assist in design concept development and interchange configurations.
March 25, 1999: Initial design phase meeting of the Section Design Consultants (SDC) for the new Woodrow Wilson Bridge.
April 8, 1999: TCT meeting during which it was agreed to proceed with the transit studies that address the Metro extension on the Capital Beltway.
April 8, 1999: Formal preliminary design review presentation to the NCPC at which acceptance of the projectwide elements were endorsed.
May 6, 1999: ICG meeting that discussed construction activities and associated time of year restrictions and at which EPA recommended a detailed SCEA be completed for the project.
May 12, 1999: TCT meeting to addressed interchange configurations at Telegraph Road and US 1.
May 24, 1999: ICG Subgroup meeting to discuss in-kind SAV mitigation potential and priority.

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May 25, 1999: EMG meeting during which group recommended investigation of wetland banks to fulfill wetland mitigation requirements because of limited available sites.
May 26, 1999: Site visit by the Jones Point Park SPP to investigate design options and alternatives for the Jones Point Park mitigation proposal.
May 27, 1999: Coordination meeting of the project's regulatory agency fish passage working group to discuss priority of fish blockages within Maryland and the District of Columbia.
June 17, 1999: Coordination meeting with the CAC to discuss environmental issues related to the project.
June 21, 1999: EMG meeting to eliminate the Oxon Hill Children's Farm mitigation site and recommend acceptance of the FEIS Purpose and Need for the SEIS.
June 22, 1999: Presentation of the outline and basis of the Supplemental Environmental Impact Statement of Limited Scope to the MSHA Interagency Coordination Group.
June 28, 1999: Coordination meeting with the MDE to discuss schedule and content of the SEIS.
June 29, 1999: Local Elected Official breakfast meeting to update jurisdictions on project issues and schedule of the SEIS.
June 29, 1999: Coordination meeting with the VDEQ and VMRC to discuss schedule and content of the SEIS.
June 30, 1999: Coordination meeting with FEMA to discuss the preliminary results of the Potomac River hydrologic and hydraulic analysis.
June 30, 1999: Preliminary Field Inspection for the Telegraph Road Interchange.
July 8, 1999: TCT meeting which recommended acceptance of SPP recommendation chronicles relating to improvements in the Telegraph Road and US 1 interchanges.
July 16, 1999: ICG meeting that recommended elimination of Little Falls fish ladder project and time of year restrictions and application.
July 26, 1999: EMG meeting where FHWA reported that Maryland, Virginia, and the District of Columbia SHPO offices agreed to use the Section 106 Regulations issued in 1986 because of the existing MOA on the project. The ACHP concurred.
August 4, 1999: Preliminary Field Inspection for the US 1 interchange.
August 12, 1999: Coordination meeting with the NPS to discuss alternate access to the Oxon Hill Farm via MD 210 in lieu of Bald Eagle Road.
August 18, 1999: Coordination meeting with the ACOE related to dredge and dredge disposal issues including upland and in water disposal and beneficial use.
August 19, 1999: ICG meeting focusing on mitigation package and criteria change in respect to property owner interest and discussed "Early suburban community" consideration for Forest Heights and Burgundy Village communities.
August 20, 1999: ICG meeting focused on SEIS schedule and issues related to existing forests and project reforestation requirements.
August 26, 1999: The TCT recommended approval of SPP Recommendation Chronicles for additional Telegraph Road and US 1 interchange configuration revisions/pedestrian path options.
September 2, 1999: ICG Subgroup meeting to discuss bridge demolition alternatives and Rosalie Island pedestrian path options.
September 9, 1999: Preliminary Investigation design plan reviews for the MD 210 interchange.
September 10, 1999: DRWG bridge plan review meeting.
September 17, 1999: MDE Public Hearing for underwater archaeological investigations.
September 22, 1999: ICG meeting to discuss draft Joint Federal/State Permit Application and conceptual wetland mitigation plan.
September 28, 1999: Maryland SPP requested refinements at the MD 210 and I-295 interchanges to reduce adverse effects on local traffic and other issues.

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September 30, 1999: Preliminary Investigation design plan reviews for the I-295 interchange.
October 5, 1999: Coordination meeting with public interests to discuss potential revisions to the eliminated FEIS tunnel alignment option.
October 6, 1999: Coordination meeting with the USACOE to discuss the use of Poplar Island as a potential dredged material disposal site.
October 15, 1999: Joint sponsoring agency, USACOE, EPA SCEA scoping meeting.
October 29, 1999: Preliminary (30% complete) Design revision meeting of the DRWG to discuss Maryland interchanges.
November 18, 1999: Post Joint Federal/State Permit Application coordination meeting with the regulatory agencies.
November 30, 1999: FHWA quarterly review meeting focusing on discussions relating to the Draft SEIS, project schedules, and budget discussions.

5.3 Public Involvement

Proactive public involvement and outreach is a hallmark of the Woodrow Wilson Bridge project. The effort is based on these guiding principles:

- Strive for consensus decision-making and win-win outcomes
- Develop a thorough understanding among diverse audiences of project needs, goals, and objectives
- Seek out and utilize multiple means of communicating project news to officials, key groups, and the general public
- Develop design refinements with the stakeholders
- Focus on the best solution, not just environmental or agency compliance
- Be accessible, open, honest, and responsive

The goal is to provide for maximum access and participation in a manner that is consistent with project schedule and budget. The intent is to build a two-way conversation by communicating project information out to the general public, officials and others and by bringing a broad variety of perspectives into the project.

The Woodrow Wilson Bridge Project Offices serve as focal points for community-based work sessions, information dissemination, discussion periods. A Project Office located at 1800 Duke Street; Suite 200, Alexandria, Virginia was opened on May 15, 1998. A Project Office located at 6009 Oxon Hill Road, Suite 410, Oxon Hill, Maryland in the Constellation One Centre was opened on October 25, 1999.

Both Project Offices are working offices in which management and technical staff is located full time to progress the project. In addition, the offices are repositories for copies of the reports produced, graphical display boards, scale models, and records of the meetings and work sessions conducted as part of the project. The Project Offices are anticipated to be in operation through the construction of the project.

Since the publication of the 1997 FEIS, several means of public involvement and outreach have been utilized for the project. These include:

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- Open Houses conducted in June and November 1998 and June and December 1999.
- Two Public Scoping Workshop in September 1999 and two Public Open Houses in November 1999 afforded citizens additional opportunities to comment on the project.
- "*Fast Facts*" summarizing key issues of the project and resource papers.
- The *Connections* newsletters communicate project progress directly to interested members of the public. More than 6,000 citizens, 250 civic and business associations and 75 local, regional, state, and federal officials receive the newsletter.
- Stakeholder Participation Panels conducted in Virginia from December 1998 through June 1999 and in Maryland beginning in March 1999 and continuing to date.
- A project website ***www.wilsonbridge.com***, which debuted, as part of the design process, in November 1998, reaches a very broad audience, and provides both a wealth of background information and timely updates on key issues.
- Citizen Advisory Committee for the 1998 Bridge Design Competition.
- Work sessions and presentation requested by special groups through the Project's Speaker's Bureau.
- Briefings to local officials.
- Design Public Hearings will provide another forum in which members of the public can express their views on design elements as they are being further refined.

5.3.1 Stakeholder Participation Panels

As a continuation of the active public outreach established during the studies prior to the 1997 FEIS, it was determined that as the project moved forward into design, a more intense and interactive public process, known as the Stakeholder Participation Panels, would be initiated. The panels were advisory in nature and were composed of targeted membership representative of the community as a whole.

The purposes of the panels were three-fold:

- Identify the valued community characteristics;
- Define community based goals and guidelines for the final design; and
- Work with the designers/planners to co-develop concepts and proposed designs that enhance and preserve the natural environment, the built environment, and the social environment of the community according to the project design goals and guidelines.

In order to ensure a balanced representation, suggested membership criteria were developed. Selection of panel members was accomplished through a nomination process involving elected officials in each community or other relevant community leadership organizations such as the Chambers of Commerce, the Sierra Club, groups representing persons with disabilities, and bicycle interest groups. Panel members were selected by their nominators in part due to their ability and inclination to communicate news about the project to other interested parties in order to build wider understanding about project progress. The panels, working during the early stages of design, provided stakeholders with the opportunity to express their views and, as appropriate and feasible, have those perspectives reflected in the ultimate design of the project. Members of the general public were free to attend and observe stakeholder panel proceedings and had opportunity to provide brief comments at each work session. Four groups of between fifteen and twenty persons

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participated for approximately a six-month period. These groups were focused on the following locations:

- Telegraph Road Interchange
- US 1 Interchange/Washington Street Area/Urban Deck
- Jones Point Park
- Maryland I-295 and MD 210 Interchanges

The Virginia panel members met together at the initial meeting and again together at the culmination and completion of their work. Each individual agreed to report back to the groups that they represented and to share information that they learned and to bring to the Stakeholder Participation Panel issues of concern to their group. In addition, they were provided with a Working Notebook in which they added materials from the meetings or material that was sent prior to the meetings or as follow-up. Agendas of each of the meeting were placed on the project's website. Several radio interviews were conducted during the panel process in which the members were interviewed and information about upcoming meetings was described.

In Virginia, stakeholder panel recommendations were forwarded to the TCT for deliberation at monthly TCT meetings. From the description of the Decision Chronicles in Section 5.2.1, the breadth of the work done by the Stakeholder Participation Panels can be appreciated. The results of the Virginia panels, which met through June 1999, follow.

Of the thirteen recommendations forwarded from the Stakeholder Participation Panels that were recommended for approval by the TCT, project decision-makers deliberated on all of the Virginia panel recommendations except those that would require coordination with outside decision-making bodies. Of those recommendations within the purview of the TCT, ninety-two percent were approved, with two of these recommendations being partially approved. No recommendations were rejected.

Following the work done by the Virginia Stakeholder Panel Members that concluded in June 1999, participants were asked to complete a survey. Among the findings were:

- Thirty-two of the thirty-six respondents ranked their number one objective of the public involvement program "to permit direct citizen influence on the elements of the design process".
- By and large, the respondents felt that the objectives of the process had been accomplished.
- Eighty-three percent of the respondents agreed that their panel's membership was representative of community and stakeholder interests.
- When asked about the consensus building process, forty-seven percent indicated that they were "more willing to compromise on some points of the project design", while forty-two percent indicated that their views on project design had not changed as a result of the panel process.
- Only eight percent indicated that they were less willing to compromise on some points of the project design.
- Nearly sixty percent felt that they had influenced the design; just over thirty percent were unsure and only three individuals felt that they had no influence on the project.

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The Maryland Interchange Panel began meeting in April 1999 and is continuing to meet to resolve design details. In Maryland, the MSHA project manager was responsible for circulation of panel recommendations to appropriate individuals and decision-making bodies and for providing a response back to the panel. The panel participation has expanded to include many local citizens and representatives of large communities with an interest in the project. As a result of these extensive meetings, the Maryland SPP members recommended consideration of the following design refinements:

- Lengthening of several bridges over Oxon Hill Road to better accommodate pedestrians/bicyclists.
- Retention of a direct exit from the Outer Loop Capital Beltway near MD 210 to Oxon Hill Road.
- Elimination of some of the proposed traffic signals.
- Provision of a grade separation at the existing MD 210/Oxon Hill Road at-grade intersection.

These refinements were subsequently approved by MSHA and are now included in the Current Design Alternative 4A.

The SPP members have expressed an interest in being reconvened as the design continues. They are interested in participating in development in design of noise barriers, landscaping, lighting and signing.

A summary report is in the process of being produced for the Virginia Stakeholder Participation Panels and a similar one will be prepared for the Maryland Interchanges Panel. These will be available in the Woodrow Wilson Bridge Project Offices in Maryland and Virginia.

5.3.2 Work Sessions and Presentations Requested by Special Groups

Many special presentations have been requested since the release of the 1997 FEIS. These presentations were typically conducted at the host organization's site. Speaking engagements delivered between September 1997 and December 1999 have included:

- Eisenhower (VA) Partnership, November 1998 and June 1999
- Greater Washington Board of Trade, October 1998 and September 1999
- Old Town Alexandria Community Panel Discussion with Congressman Jim Moran, Coalition for a Sensible Bridge, October 1998
- Piscataway (MD) Homeowners Association, July 1999
- Herndon Chamber of Commerce, September 1998
- Alexandria Chamber of Commerce, several occasions
- Fairfax County Chamber of Commerce, November 1999
- Leadership Washington Tour and Briefing, January 1999
- Alexandria Rotary Club, December 1998
- Alexandria Optimists Club, January 1999
- Northern Virginia Building Industry Association, December 1998
- Northern Virginia Association of Realtors, December 1999

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- Fairfax County Board of Supervisors Town Hall, January 1999
- Alexandria Lions Club, July 1999
- Mt. Vernon Council of Civic Associations, June 1999
- New Alexandria Civic Association, June 1999
- Transportation Research Board, January 1999
- Century 21 Realtors, July 1999
- City of Alexandria 250th Anniversary Day, July 1999
- Alexandria Kiwanis, September 1999
- Society of American Military Engineers, September 1999
- Yates Garden Civic Association, September 1999
- Mt. Vernon Kiwanis, October 1999
- Prince George's County Chamber of Commerce, June 1999
- Fairfax County Transportation Summit, March 1999
- Maryland Society of Professional Engineers, June 1999
- The Natural Resources Leadership Institute through the NC State University – April 1999
- Federal Highway Administration "Ground Hog Shadow Day"– February 1999
- Howard University Summer Program – August 1999

Local Governments: To ensure that elected officials and their staffs are kept abreast of the project, a series of quarterly elected officials breakfast briefings have been conducted. A total of five meetings have been held to date. In the fall of 1999, a "Milestone Review Committee" was briefed on the project as it related to a possible re-study of the project to address the US District Court's ruling. This meeting superceded the quarterly breakfast meetings. Other meetings have been attended, at the request of elected officials, some of which have been public "Town Hall" meetings.

In addition, a September 1999 briefing was held for staff members from the U.S. Senate Environment and Public Works Committee and the U.S. House of Representatives Transportation and Infrastructure Committee. At least ten individual briefings for staff of the local congressional delegation have been conducted. Ongoing liaison with delegation staff continues.

The Virginia Senate Finance Committee was hosted in June 1998. The Maryland Senate Budget and Taxation Committee was briefed in September 1999.

Special Interest Groups or Organizations: A wide variety of special interest groups, both project proponents and opponents, have been cultivated to bring wider participation into the project and to bridge differences where they exist. The Coalition for a Sensible Bridge has visited the project office on repeated occasions and has been engaged in numerous joint media appearances.

5.3.3 Open Houses at the Project Offices

Since the 1997 FEIS, the project has been focused on preliminary design and refinements of the FEIS Alternative 4A through the SPP process. Open Houses were provided for general project updates and discussions.

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During 1998 and 1999, four Open Houses were held at the Project Office in Virginia. A typical agenda would begin at 7 PM, followed by a general overview of the project status and direction. Approximately 80-100 persons attended each of these Open Houses.

- **June 16, 1998** in the Project Office in Virginia – Design Alternative 4A including preliminary refinements.
- **November 19, 1998** in the Project Office in Virginia, focused on the Bridge Design Competition, which was completed in November 1998. Information pertaining to the Bridge Design Competition process and renderings of the winning entry were available for review. Informal group briefings were held at several times during the evening.
- **June 1999** in the Project Office in Virginia to discuss the current status of the design refinements recommended by the Stakeholder Participation Panels.
- **December 7, 1999** in the Project Office in Maryland to officially "open" the office for citizen involvement. Preceding this Open House, a press conference was held, attended by local elected officials.

5.3.4 Fact Sheets, Resource Papers and Newsletters

Since the September 1997 FEIS, the flow of public information has continued with multiple fact sheets, called *"Fast Facts"*, resource papers, *Connections* newsletters and a website. Newsletters have been mailed to over 6,500 persons. The mailing list comprised of individuals, businesses, community, civic and other organizations, libraries and others is continually updated. Printed material is also provided on the website.

"Fast Facts" topics have included: Project Organization, Project Office, Schedule, Issues such as funding, cost, physical condition of the bridge, traffic demand, public involvement, environmental and community and historic resources, safety, interchange design and Bridge Design Competition, Stakeholder Participation, and the additional Environmental Studies. These papers and other reports are available in the Project Offices in Maryland and Virginia. Since the 1997 FEIS, the Historic Resources and Identification Report, June 1998 has also been provided to the City of Alexandria Main Library. As reports are finalized, they will continue to be available and provided to the City library and the Prince George's County Oxon Hill library. Notification of availability will be provided on the website and in the Project's newsletter.

The *Connections* newsletters were distributed to the mailing list in Spring 1998, Fall 1998, Spring 1999, Summer 1999, and Winter 1999 and included similar topics as those contained in the Fast Facts.

5.3.5 Continued Public Involvement and Outreach

In addition to the structured elements of the program, the project has been responsive in the following areas:

- ➢ Milestones/Special Events are utilized to keep the public spotlight on project progress. The unveiling of the winning bridge design concept was a key milestone in which the project invited media and public attention. Similarly, the opening of project offices in both Virginia and Maryland afford quality opportunities to re-introduce the project to the public.

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- Regular Contact with Reporters keeps the media informed about the project and serves to communicate progress to the general public. A targeted media list and media kit has been developed. Ongoing one-on-one briefings with key transportation reporters and broad circulation of news releases/announcements result in placements that keep the public informed about the project. The project has achieved considerable success in gaining large and positive media placements on the radio, in newspapers, and in magazines. One notable example is the archeological dig at Freedmen's Cemetery, which created very positive media placements and goodwill among the community regarding the project.
- An active Speakers Bureau takes Wilson Bridge Project directly to key constituencies. Audiences include civic associations, citizens groups, chambers of commerce, professional associations and other groups with an interest in the project.

Public involvement will continue through design and construction. Public hearings on this document are an opportunity for review and comment on this Draft SEIS. The Public Hearings will use a two-part combined format of self-directed displays followed by a formal presentation and receipt of testimony at the same location. A recorder will be at each of the Hearings and a transcript will be prepared. The two hearings will be identical in format and will be publicly announced.

Following the Public Hearings and the receipt of public comment on the Draft SEIS, sponsoring agencies would assess the comments and direct revisions to complete Final SEIS. Definition of enhancement, mitigation and design refinements will continue through the intermediate and final design process. Public involvement during this period will include work sessions with SPP, Open Houses, special presentations, and publication of additional fact sheets, project newsletters and an updated website.

5.4 Correspondence and Coordination Summary

Agency coordination has been a critical component in the preparation of this Draft SEIS. This section of the document presents a brief compilation of key correspondence with agencies, public groups, and elected officials because a comprehensive listing of coordination activities associated with the Woodrow Wilson Bridge Project is beyond the scope of this document. The brief list included herein can be supplemented by correspondence information contained in the project office in Alexandria, Virginia. This information is available to the general public during weekly public hours or at scheduled appointments with the project staff. This documentation is arranged chronologically with a description of the topic copies of this correspondence.

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Table 5-1 Summary of Major Woodrow Wilson Bridge Project Correspondence and Coordination

Date	From	To	Subject
10/16/97	U.S. EPA	FHWA	Issues related to potential construction impacts of temporary and permanent duration.
2/2/98	U.S. EPA	USACOE	Recommendations for elements to be included in Final Mitigation Plans
4/10/98	Mt. Vernon Chapter of Daughters of the American Revolution	National Park Service	National Capital Region George Washington Memorial Parkway Agreement for Jones Point Park Lighthouse
5/28/98	USACOE	FHWA	Comments to the Woodrow Wilson Bridge Public Notice that require responses in advance of the Section 404 permit
6/11/98	M-NCP&PC	Woodrow Wilson Bridge Project Team	Conceptual review comments on the Rosalie Island deckover and parkland elements/linkages in Maryland
7/9/98	FHWA	USFWS	Request for information in reference to Rare, Threatened and Endangered Species Identification in Betty Blume Park, specifically nesting pair of Bald Eagles
9/11/98	USFWS	FHWA	Based on observations of Bald Eagle within close proximity to project limits, USFWS requested investigation of habitat associated with the Bald Eagle
10/14/98	Fairfax County Wetlands Board	Woodrow Wilson Bridge Project Team	Request for information and recommendations pertaining to the Woodrow Wilson Bridge project site search and selection of potential wetlands mitigation sites
10/22/98	NPS, National Capital Region, Cultural Landscape Inventory	NPS Superintendent, Rock Creek Park	Review of Preliminary Draft, Pierce Mill Cultural Landscape Inventory transmittal to other park professionals for comment by November 20, 1998
11/17/98	FHWA	National Park Service	National Park Service General Access Permit Requested for noninvasive evaluations of potential wetland mitigation sites and parklands
11/30/98	Woodrow Wilson Bridge Project Team	Agency Distribution	Letter response from MDNR Forest, Wildlife and Heritage Services pertaining to RTE at the wetland mitigation sites
12/14/98	Board of Supervisors, Mt. Vernon District – Alexandria	Assistant Secretary of Transportation Policy	Importance of Church Street Exit from Woodrow Wilson Bridge to Residents of Fairfax County
12/15/98	NMFS	FHWA	Woodrow Wilson Bridge project – Shortnose Sturgeon potential in the project area and measures to avoid adverse impacts to the species
1/26/99	MD Board of Public Works, Wetland Administration	FHWA	Woodrow Wilson Bridge project -Re: 99-NL-1068 Potomac River Prince George's County. Approval of test boring investigation program
2/2/99	M-NCP&PC	FHWA	Woodrow Wilson Bridge project -Permission for General Access to perform test boring investigation program– FPN: DPW-W013 (011) & DPB-M013 (010)
2/12/99	USACOE, Potomac Basin Section	Woodrow Wilson Bridge Project Team	Woodrow Wilson Bridge project-CENAB-OP-RP (Federal Highway Administration) 99-00278-3 – Test Boring Authorization
2/25/99	Fairfax County Board of Supervisors	VDOT	Woodrow Wilson Bridge project -Congestion Management Program

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Date	From	To	Subject
3/12/99	Woodrow Wilson Bridge Project Team	Agency Distribution	Woodrow Wilson Bridge project –Army Corps of Engineers Authorization for the Test Boring and Test Pile Program
3/16/99	VDOT	Fairfax County Board of Supervisors	Congestion Management/Intelligent Transportation System Program
3/31/99	Fairfax County Board of Supervisors	Honorable Shirley J. Ybarra	Woodrow Wilson Bridge project -US 1 Interchange ramp modification request through Stakeholder Participation Panel
4/1/99	Woodrow Wilson Bridge Project Team	National Park Service	General Access Permit request for Potomac River, Rosalie Island, and Jones Point Park
4/29/99	USACOE	FHWA	Wetland Delineation Information for Anacostia River Park, M-NCP&PC, Four Mile Run Park submitted for jurisdictional determination
5/25/99	National Park Service	Woodrow Wilson Bridge Project Team	Phase I Concept Wetland Mitigation Package comments
5/25/99	MDE	Woodrow Wilson Bridge Project Team	State Application Identifier: MD990318-0238 Project: Concept Mitigation Plan Queen Anne's Park
6/25/99	Woodrow Wilson Bridge Project Team	Commonwealth of Virginia	Construction Staging Sites, Environmental Assessment for Threatened/Endangered Species
6/30/99	Commonwealth of Virginia	Woodrow Wilson Bridge Project Team	Construction Staging Sites, Environmental Assessment for Threatened/Endangered Species
7/16/99	M-NCP&PC	Woodrow Wilson Bridge Project Team	Woodrow Wilson Bridge project-Comment on Rosalie Island Forest Stand Delineation
7/28/99	M-NCP&PC	Woodrow Wilson Bridge Project Team	Access Permit Request for Sligo Creek and Northwest Branch Stream Valley Parks for wetland mitigation site investigations
8/13/99	FHWA	VA SHPO (VDHR)	Request for clarity and concurrence on Determination of Eligibility for the two Virginia Shipbuilding Corporation Administration Buildings
8/13/99	NPS	Woodrow Wilson Bridge Project Team	Concurrence letter on Rosalie Island Forest Stand Delineation Report
8/23/99	Woodrow Wilson Bridge Project Team	USFWS	Information search request for rare, threatened and endangered species within potential wetland creation mitigation sites and potential construction staging areas.
8/23/99	Woodrow Wilson Bridge Project Team	MDNR	Information search request for rare, threatened and endangered species within potential wetland creation mitigation sites and potential construction staging areas.
9/1/99	USACOE, MDE	Public Distribution	Joint Public Notice for underwater archeology investigations-MDE/USACOE
9/7/99	MD SHPO (MD Historical Trust)	FHWA	Approval of underwater archeological investigation scope of work
9/9/99	FHWA	Keeper of the National Register	Request for Formal Determination of Eligibility Hunting Terrace Apartments
9/14/99	U.S. EPA	FHWA	EPA agreement to participate as cooperating agency for the SEIS
9/17/99	FHWA	USFWS	Initiation of formal consultation for the Bald Eagle Biological Assessment
9/21/99	Woodrow Wilson Bridge Project Team	D.C. Natural Heritage Program	Revised project limits; Rare, Threatened and Endangered Species Identification
9/29/99	National Park Service	FHWA	NPS agreement to participate as cooperating agency for the SEIS

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Date	From	To	Subject
9/29/99	USFWS	FHWA	USFWS agreement to participate as cooperating agency for the SEIS
9/30/99	National Park Service	Woodrow Wilson Bridge Project Team	Issuance of Archaeological Resource Protection Permit (ARPA) for archaeological investigations within Jones Point Park
10/1/99	M-NCP&PC	Woodrow Wilson Bridge Project Team	Forest Stand Delineation at Rosalie Island
10/6/99	USACOE	USACOE	Maryland Permits: Southern Section-Draft Phase 1 Conceptual Mitigation Plan Comments
10/13/99	MDE	FHWA	Private Wetland Permit Wetland Case No. 00-WP-324 for investigation of underwater archaeological investigations
10/13/99	MDE	FHWA	Maryland State Programmatic General Permit 00-0316 for investigation of underwater archaeological investigations
10/19/99	Keeper of National Register	FHWA	Concurrence on Not Eligible Determination of Eligibility for Hunting Terrace Apartments
10/19/99	USACOE	FHWA	September 7, 1999 delineation is accurate as described in materials submitted September 27, 1999. Verification valid for five years
10/19/99	Keeper of National Register	FHWA	Concurrence on Not Eligible Determination of Eligibility Notification Form for Hunting Towers Apartments
10/22/99	ACHP	FHWA	Design Review Working Group comments on preliminary (30%) design plans for the Woodrow Wilson Bridge
10/27/99	National Park Service	FHWA	Determination of Eligibility of Inclusion in the National Register of Historic Places re: Hunting Terrace Apartments-Not Eligible
11/8/99	MD SHPO (MD Historical Trust)	FHWA	Design Review Working Group comments on preliminary (30%) design plans for the Maryland Interchanges, Oxon Hill, Prince George's County
11/8/99	M-NCP&PC	FHWA	Preliminary (30%) design Review for the Potomac River Waterfront Park (Q88) a.k.a. Rosalie Island – Comments
11/8/99	MD SHPO (MD Historical Trust)	FHWA	Preliminary (30% complete) Plans for Maryland Interchange Comments as Requested
11/8/99	FHWA	VMRC	Submittal letter of the Joint Federal and State Permit Application in Virginia and the Phase I conceptual mitigation package
11/8/99	FHWA	USACOE	Submittal letter of the Joint Federal and State Permit Application in both Maryland and Virginia and the Phase I conceptual mitigation package
11/8/99	FHWA	MDE	Submittal letter of the Joint Federal and State Permit Application in Maryland and the Phase I conceptual mitigation package
11/9/99	FHWA	NMFS	Submission of Essential Fish Habitat Study for Norfolk Ocean Disposal Sites
11/9/99	Woodrow Wilson Bridge Project Team	USACOE, MDE, EPA,USFWS	Distribution of draft sediment characterization study for dredged materials
11/10/99	Woodrow Wilson Bridge Project Team	USACOE	Request for concurrence on jurisdictional determination of SAV limits
11/10/99	National Park Service	FHWA	Concurrence on DOE for Hunting Terrace

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Date	From	To	Subject
11/11/99	FHWA	MD SHPO (MD Historical Trust)	Submittal of the Historic Architectural Survey Report for Maryland – Expanded Area of Potential Effect
11/11/99	FHWA	District of Columbia SHPO	Submittal of the Historic Architectural Survey Report – Expanded Area of Potential Effect
11/11/99	FHWA	VA SHPO (VDHR)	Submittal of the Historic Architectural Survey Report for Virginia – Expanded Area of Potential Effect
11/16/99	FHWA	VA SHPO (VDHR)	Supplemental Effects Assessment
11/17/99	District of Columbia SHPO	FHWA	Concurrence with findings that expanded APE includes no additional properties within DC.
11/24/99	VA SHPO (VDHR)	FHWA	Concurrence on DOE for the VSBC administration and generator building
11/24/99	VA SHPO (VDHR)	Woodrow Wilson Bridge Project Team	Concurrence on contributing structures and agreement on the proposed HABS documentation plan for Virginia Shipbuilding Company Administration Building and Generator Building.
11/29/99	MD SHPO (MD Historical Trust)	FHWA	Expanded Area of Potential Effect-Oxon Hill and Forest Heights, Prince George's County, MD (Section 106 Review – FHWA)
11/29/99	MSHA	M-NCP&PC	MNCPPC property adjacent to the I-95/495/I-295 interchange
11/30/99	VA Department of Game and Inland Fisheries	Woodrow Wilson Bridge Project Team	Response to request for information concerning rare, threatened and endangered species within the SCEA Boundary. There were no documented occurrences of threatened or endangered species in this area.
12/02/99	MDE	Woodrow Wilson Bridge Project Team	Comment responses to sediment characterization report recommending additional chemical analysis if using upland disposal sites
12/10/99	FHWA	MD SHPO (MD Historical Trust)	Assessment of potential for wetland mitigation sites, construction staging areas and preliminary plans
12/13/99	FHWA	U.S. Coast Guard	Section 9 of Rivers and Harbors Act of 1899 Permit Application letter submitted
12/15/99	FHWA	National Park Service	Concurrence request on potential temporary impacts to Oxon Hill Children's Farm
12/16/99	FHWA	NMFS	Submitted the draft Biological Assessment for the Shortnose Sturgeon for review and comment and initiation of informal consultation
12/17/99	UFWS	FHWA	Request for extension to complete Biological Assessment for the Bald Eagle

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Chapter 6

List of Preparers

6. List of Preparers

This Draft SEIS was prepared by the FHWA while the VDOT, MSHA, and DC-DPW participated in the review, comment, and revision of the DSEIS.

The following Federal, State, and local agency staff have participated in the administration and direction of the Woodrow Wilson Bridge Project since the publication of the FEIS. For identification of individuals involved in the project prior to that date, reference the 1997 FEIS Chapter 6, List of Preparers.

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Kathleen Linehan, P.E.	Structural Engineer
Robert F. McCarty, P.E.	Field Operations Engineer
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Virginia Department of Transportation

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Earl T. Robb	State Environmental Administrator
J. Cooper Wamsley	Environmental Program Manager
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Maryland State Highway Administration

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District of Columbia Department of Public Works

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Maurice Keys	Environmental Program Coordinator

The following are the consultants involved in the preparation of this DSEIS and related technical reports and background studies.

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David R. Smith, PWS	Environmental Scientist	Coastal Resources, Inc.
Chuck Weinkam	Environmental Scientist	Coastal Resources, Inc.
Sarah A. Williamson	Environmental Specialist	Coastal Resources, Inc.
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James Lewis	Public Affairs Manager	Strat@comm
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Surbhi P. Ashton, P.E.	Transportation Analysis	Transcore
Navin Jain	Transportation Analysis	Transcore

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HNTB – Section Design Consultant – US 1 Interchange

Robert J. McDowell, P.E.	Project Manager

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Parsons Transportation Group - Section Design Consultant – Potomac River Bridge

Richard L. Cary-Brown	Project Manager
Michael W. Johnson	Area Manager

JMT/WRA Joint Venture - Section Design Consultant – I-295 Interchange

John H. Moeller, P.E.	Project Manager

KCI Technologies - Section Design Consultant – MD 210 Interchange

Stephen F. Drumm, P.E.	Project Manager

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Chapter 7

Distribution List

7. Distribution List

Copies of this Draft Supplemental Environmental Impact Statement have been distributed to the following:

7.1 Federal Agencies

Department of Agriculture
- Office of Secretary
- Natural Resources Conservation Service

Department of Commerce
- Office of the Secretary
- National Marine Fisheries Service, Habitat and Protected Resources
- National Oceanic & Atmospheric Administration
- Office of the Environment and Energy
- Patent and Trademark Office

Department of Health and Human Services
Department of Housing and Urban Development, District of Columbia Office
Department of Housing and Urban Development, Richmond, VA Office
Department of the Interior
- Office of the Secretary
- Office of Environmental Policy and Compliance
- Office of Environmental Project Review
- Fish and Wildlife Service, Chesapeake Bay Field Office
- Fish and Wildlife Service, Newton Corner, MA Field Office
- Fish and Wildlife Service, Virginia Field Office
- National Park Service – Mid-Atlantic Region

Department of Transportation
- Assistant Secretary for the Environment, Energy, and Safety
- Federal Transit Administration
- Federal Railroad Administration
- Federal Aviation Administration
- Coast Guard

Advisory Council on Historic Preservation, Eastern Division of Project Review
Army Corps of Engineers
Army Directorate of Public Works, Environmental and Natural Resources Division
Commission of Fine Arts
Council on Environmental Quality
Environmental Protection Agency
- Office of Environmental Programs
- NEPA Compliance Division

Federal Emergency Management Agency
National Capital Planning Commission

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7.2 State Agencies

7.2.1 Commonwealth of Virginia

Chesapeake Bay Local Assistance
Commission for the Arts
Department of Agriculture and Consumer Services
Department of Aviation
Department of Commerce
Department of Conservation and Recreation
- Division of Planning and Recreation Resources
- Division of Soil and Water Conservation
- State Parks Division
- Natural Heritage Program

Department of Economic Development
Department of Emergency Services
Department of Environmental Quality
- Air Division
- Water Division
- Waste Division
- Office of Environmental Impact Review

Department of Forestry
Department of Game and Inland Fisheries
Department of Health
Department of Historic Resources
Department of Housing and Community Development
Department of Mental Health and Mental Retardation and Substance Abuse Services
Department of Mines, Mineral and Energy
Department of Rail and Public Transportation
Shoreline Erosion Advisory Service
Virginia Institute of Marine Science
Virginia Marine Resources Commission
Virginia Outdoors Foundation

7.2.2 State of Maryland

State Clearinghouse Distribution
- Local Governments
- Maryland Office of Planning
- Department of Natural Resources
- Department of Budget and Fiscal Planning
- Department of General Services
- Department of Housing and Community Development
- Department of Education
- Department of Health and Mental Hygiene
- Interagency Committee for School Construction

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Department of Public Safety and Correctional Service
Office of the Governor
Maryland Historical Trust
Maryland State Department of Education, State Depository Distribution Center
Chesapeake Bay Critical Areas Commission
Maryland Department of Natural Resources
Environmental Review Unit
Maryland Department of the Environment
Water Management Administration
Technical & Regulatory Services Administration
Waste Management Administration
Maryland Department of Transportation
Office of the Secretary
Maryland Transportation Authority
Public Affairs
Office of Systems Planning and Evaluation
Office of General Counsel
Maryland Mass Transit Administration, Director of Planning
Maryland State Law Library
Legislative Reference Library, Library and Information Services Division
State Highway Administration - Internal
State Highway Administrator
Deputy Chief Engineer Highway Development
District Engineer
Highway Design Division
Bridge Design Division
Office of Environmental Design
Office of Planning & Preliminary Engineering
Project Planning Division
Regional & Intermodal Planning Division
Division of Relocation Assistance
Division of Acquisition Activities
Federal-Aid Section-Office of Real Estate
District Chief-Office of Real Estate
State Highway Administration Resource Center
Office of Equal Opportunity

7.2.3 District of Columbia

Department of Consumer and Regulatory Affairs, Director
Department of Public Works, Office on Energy, Director
Department of Housing and Community Development, Director
Department of Recreation and Parks, Director
Department of Health/Environmental Health Administration
Department of Consumer & Regulatory Affairs/Historic Preservation Office
Office of the Corporation Council, Environmental and Consumer Affairs

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Office of Intergovernmental Relations
Office of Planning and Development

7.3 Local and Regional

Anacostia Watershed Restoration Committee
City of Alexandria, Virginia
- Department of Planning and Community Development
- Department of Recreation, Parks and Cultural Activities
- Department of Transportation and Environmental Services
- Health Department
- Office of Archaeology
- Office of City Manager
- Office of Historic Alexandria
- Office of Housing
- Redevelopment and Housing Authority

DASH (Alexandria Transit Company)
Fairfax Connector
Fairfax County, Virginia
- Department of Environmental Management
- Department of Housing and Community Development
- Department of Public Works
- Department of Recreation and Community Services
- Office of Transportation
- Park Authority
- Planning Commission

Maryland-National Capital Park and Planning Commission
- Community Planning Division
- Executive Director's Office
- Park Planning and Development Division, Department of Parks and Recreation
- Department of Planning
- Transportation Planning and Public Facilities, Transportation Planning Division

Metropolitan Washington Airport Authority
Metropolitan Washington Council of Governments
Northern Virginia Planning District Commission
Northern Virginia Transportation Commission
Prince George's County, Maryland
- Board of Education
- Department of Highways and Bridges
- Department of Environmental Resources
- Department of Parks and Recreation
- Department of Public Works and Transportation

Tri-County Council of Southern Maryland
Virginia Railway Express
Washington Metropolitan Area Transit Authority

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7.4 Public Officials

Congressional Delegations
- Representative Thomas Davis, III - Virginia
- Representative James P. Moran - Virginia
- Representative Frank R. Wolf - Virginia
- Representative Wayne Gilchrist - Maryland
- Representative Steny Hoyer - Maryland
- Representative Constance Morella - Maryland
- Senator Charles S. Robb - Virginia
- Senator John Warner - Virginia
- Senator Barbara Mikulski - Maryland
- Senator Paul Sarbanes - Maryland
- Representative Eleanor Holmes Norton - District of Columbia

State Officials
- Governor Jim Gilmore - Virginia
- Governor Parris Glendening - Maryland

State Delegations - Virginia
- Senator Patricia S. Ticer, District 30
- Senator William C. Mims, District 33
- Senator Joseph V. Gartland, Jr., District 36
- Senator Jane H. Woods, District 34
- Senator Warren E. Barry, District 37
- Senator Richard L. Saslaw, District 35
- Senator Janet D. Howell, District 32
- Delegate Richard H. Black, District 32
- Delegate Joe T. May, District 33
- Delegate Vincent F. Callahan, Jr., District 34
- Delegate Jeannemarie Devolites, District 35
- Delegate Kenneth R. Plum, District 36
- Delegate John H. Rust, Jr., District 37
- Delegate Robert D. Hull, District 38
- Delegate Vivian Watts, District 39
- Delegate James K. O'Brien, Jr., District 40
- Delegate James H. Dillard, II, District 41
- Delegate David B. Albo, District 42
- Delegate Gladys B. Keating, District 43
- Delegate Linda T. Puller, District 44
- Delegate Marian Van Landingham, District 45
- Delegate James F. Almand, District 47
- Delegate Robert H. Brink, District 48
- Delegate James M. Scott, District 53
- Delegate Roger J. McClure, District 67

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State Delegations - Maryland
- Senator Gloria Lawlah, District 26
- Delegate Kerry A. Hill, District 26
- Delegate Obie Patterson, District 26
- Delegate David Valderrama, District 26

Local Officials
- Mayor Anthony A. Williams - District of Columbia
- Mayor Kerry J. Donley - Alexandria, VA
- Mayor Warren Adams - Forest Heights, MD

Alexandria City Council
- Mr. William C. Cleveland
- Mr. William D. Euille
- Ms. Redella S. Pepper
- Mr. Lonnie C. Rich
- Mr. David G. Speck
- Ms. Lois L. Walker

District of Columbia City Council
- Ms. Linda Cropp, Chairperson
- Ms. Sandy Allen, Ward 8
- Ms. Sharon Ambrose, Ward 6
- Mr. Harold Brazil, At-Large
- Mr. David Catania, At-Large
- Mr. Kevin P. Chavous, Ward 7
- Mr. Jack Evans, Ward 2
- Mr. Jim Graham, Ward 1
- Ms. Charlene Drew Jarvis, Ward 4
- Mr. Phil Mendelson, At-Large
- Mr. Vincent Orange, Ward 5
- Ms. Kathleen Patterson, Ward 3
- Ms. Carol Schwartz, At-Large

District of Columbia Financial Control Board
- Dr. Alice M. Rivlin - Chairperson
- Mr. Robert P. Watkins, III
- Mr. Eugene Kinlow
- Ms. Constance B. Newman
- Mr. Darius Mans

Fairfax County Board of Supervisors
- Ms. Katherine K. Hanley - Chairperson
- Mr. Gerald W. Hyland - Vice Chairperson
- Ms. Sharon Bulova
- Mr. Gerald E. Connolly
- Mr. Robert B. Dix, Jr.
- Mr. Michael R. Frey
- Ms. Penelope A. Gross
- Mr. Dana Kauffman

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Ms. Elaine McConnell
Mr. Stuart Mendelsohn
Prince George's County Council
Mr. Jim Estepp, District 7
Ms. Dorothy Bailey, Chairperson
Mr. Thomas R. Hendershot, District 3
Mr. Isaac Gourdine, District 8
Mr. Walter Maloney, District 1
Mr. Ronald Russell, District 6
Ms. Audrey Scott, District 4
Mr. Peter Shapiro, District 2
Mr. Marvin Wilson, District 5

7.5 Individuals/Organizations

Alexandria Sanitation Authority

Mr. Chris Bedford	Sierra Club Maryland Chapter
Mr. John Belshé	Friends of Jones Point
Mr. Jeff Blum	Citizen Action
Mr. James Boatner	Robinson Terminal Warehouse Corporation
Mr. Ben Jarratt Brown	All-Tunnel Alliance
Mr. Jeb Byrne	Friends of Dyke Marsh
Mr. Robert Calhoun	Sullivan & Worcester
Mr. Morgan Delaney	Historic Alexandria Foundation
Mr. Stan Fetter	Prince George's Civic Federation
Mr. John Fey	Environmental Recreation Committee of Mt. Vernon
Mr. David Howarth	Citizen
Ms. Betsy Keefe	Citizen
Ms. Leona Kemper	Daughters of the American Revolution
Ms. Elizabeth Merritt	National Trust for Historic Preservation
Mr. John Milliken	Venable, Baetjer and Howard
Mr. Robert Montague, III	Alexandria Historical Restoration & Preservation
Ms. Brenda Moorman	Sierra Club New Columbia Chapter
Mr. Jonas Neihardt	Old Town Civic Association
Ms. Patty Nicoson	Arlington County Department of Public Works
Mr. Russ Perkins	Citizen
Mr. Craig Potter	Citizen
Mr. Darrie Richards	Citizen
Mr. Peyton Robertson	Alexandria Environmental Policy Commission
Md. David A. Schoenwolf	Haley & Aldrich, Inc.
Mr. Charles Trozzo	Citizen
Mr. H. Hollis Wickman	Old Town/Hunting Creek Civic Association
Mr. Douglas K. Wood	Yates Garden Citizens Association
Mr. Jim Wright	Sierra Club – Virginia Chapter
Ms. Nancy N. Young	Citizen
Mr. Bert Ely	Coalition for a Sensible Bridge

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Chapter 8

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Chapter 9

Glossary

9. Glossary

106 — Section 106 of the National Historic Preservation Act

4(f) — Section 4(f) of the Department of Transportation Act of 1966

401 — Section 401 of the Clean Water Act - water quality certificate

404 — Section 404 of the Clean Water Act - permit for Waters of the U.S. (including wetlands)

AASHTO — American Association of State Highway Transportation Officials

ACHP — Advisory Council on Historic Preservation

Access Control — The restriction of direct access between a roadway and an immediate adjacent property. These restrictions generally are categorized as full control of access, partial control of access and access management.

Full control of access allows access to the highway facility via interchange only (i.e., no at-grade crossings), eliminates private driveway access.

Partial control of access allows access to the facility only from public roads (no private driveways) through intersections or interchanges.

Uncontrolled access limited only to safe locations dependent upon horizontal and vertical features of the facility. All crossroads, driveways, etc. may have points of ingress or egress to the facility.

Access Management limits and/or removes the number of points at which a vehicles may enter or exit a highway. Access management may include combining entrances and parking lots and adding service roads.

ADA — Americans with Disabilities Act

ADT — Average Daily Traffic - The total volume of auto and truck traffic passing a given point during a given time period (greater than one day and less than one year) in whole days, divided by the number of days in that time period. A commonly used measure of traffic flow.

APE — Area of Potential Effect

Aerial Photography — High resolution photographs taken from aircraft which are used to assess features in a study area, which are also used to produce topographic base maps of varying scales for alignment studies, engineering, and final design work.

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Affected Environment	The physical features, land area, or areas to be influenced, affected, or created by an alternative alignment under consideration; also includes various social and environmental factors and conditions pertinent to an area.
Alignment	The actual location of an existing or proposed highway.
Alternative	One of a number of specific transportation improvement proposals, alignments, options, design choices, etc., in a study. Following detailed analysis, one improvement alternative is selected for implementation.
Aquatic	Living or growing in or on the water.
AQCR	Air Quality Control Region
ARMA	Air and Radiation Management Administration (ARMA) of the Maryland Department of the Environment (MDE)
Avoidance Alternative	Any alignment proposal that has been developed, modified, shifted, or downsized specifically in order to avoid affecting one or more resources regarded as significant.
Best Management Practice (BMPs)	Measures to control the quantity and quality of stormwater leaving a drainage basin. Local and state jurisdictions have adopted BMPs to counteract physical development and construction activity that may concentrate stormwater or produce soil erosion.
BTU	British Thermal Units
CAAA	Clean Air Act Amendments of 1990 is federal legislation passed to change both federal and state approaches to regulating air quality, mandating programs to curb acid rain, urban air pollution, and toxic emissions. The CAAAs call for emission reduction measures in air quality non-attainment areas, including the consideration of transportation control measures (TCMs) as part of transportation improvement projects. Projects in non-attainment areas may not increase the number of vehicle miles traveled (VMTs): the number of cars on the roadways must be reduced by encouraging drivers to use mass transit, ride sharing, and car pooling.
CAL3QHC	California Line Source Emissions Model with Queuing and Highway Capacity Factors (Version 2)
CBPA	Chesapeake Bay Preservation Act
CBST	Capital Beltway Safety Team
C-D	collector-distributor roads

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CEQ Regulations	Directives issued by the Federal Council on Environmental Quality (40 CFR 1500-1508) that govern the development and issuance of environmental policy and procedure for federal aid actions by public agencies. The regulations contain definitions, spell out applicability and responsibilities, and mandate certain processes and procedures to be followed by state agencies that administer federally funded programs.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System is a compilation of sites EPA has investigated or is currently investigating for a release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act.
CFR	Code of Federal Regulations
cfs	cubic feet per second
Champion Tree	The largest tree of its species within the United States, the state, county, or municipality as determined by the Maryland Department of Natural Resources.
Clear Zone	The clear zone is the unobstructed, relatively flat area provided beyond the edge of the traveled way for the recovery of errant vehicles. The width of the clear zone is influenced by the traffic volumes, speed, and side slopes.
CLRP	Constrained Long Range Plan
cms	cubic meters per second
CMS	Congestion Management Strategies
Comment Period	Usually two weeks or longer during which a document (e.g., the Draft and Final Environmental Impact Statements) is reviewed by agencies and the public, who may submit verbal or written comments. It can be applicable to all types of engineering and environmental documents, which are circulated, as well as to formal presentations such as those which may be given by Transportation Department officials at a Public Hearing.
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
Commenting Agency	Agency responsible for reviewing and commenting on Environmental Impact Statements (EISs). Their comments are considered by the lead agency in the preparation of the Final EIS and Record of Decision.

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Conceptual Mitigation The early, generalized identification of design, operational, or construction measures that would minimize or avoid anticipated environmental consequences. Typically, conceptual mitigation ideas are discussed prior to the concluding stages of an environmental study, well before many of the ideas are further worked upon, refined, or committed.

Conformity The US Clean Air Act stipulates that any approved transportation project, plan, or program must conform to the State Implementation Plan (SIP), a document which prescribes procedures for the implementation, maintenance, and enforcement of primary and secondary pollutants.

Constraints More commonly described as 'environmental features'. Significant resources, facilities, or other features or study areas located in or adjacent to an existing or proposed transportation corridor that serve to restrain, restrict, or prevent the ready implementation of proposed transportation improvements in a given area; may include natural or physical resources, important structures, community facilities, or topographic features.

Cooperating Agency As defined in the Council of Environmental Quality's *Regulations for Implementing the Procedural Provisions of the NEPA*., Any organization other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in...[a] major Federal action significantly affecting the quality of the human environment. The CEQ emphasizes that agency cooperation should begin early in the NEPA process.

CPRMP Coordinated Potomac Regional Monitoring Program

CRDL Contract Required Detection Limit

CRMP Virginia Coastal Resources Management Program

CTP Consolidated Transportation Program

CWA Clean Water Act

CZM Coastal Zone Management

Cumulative Effects The sum of all direct, indirect, and secondary impacts resulting from a transportation improvement.

DAR Daughters of the American Revolution

dB decibels

dBA decibels (A-Weighted Scale)

DBH Diameter of trees at breast height (4.5 feet above the ground).

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DCDPW	District of Columbia Department of Public Works
DCERA	District of Columbia Environmental Regulation Administration and Environmental Control Division-Water Hygiene Branch
DCRA	Department of Consumer and Regulatory Affairs
DEIS	Draft Environmental Impact Statement
Design Criteria	Established state and municipal standards and procedures that guide the establishment of roadway layouts, alignments, geometry, and dimensions for specified types of highways in certain defined conditions. The principal design criteria for highways are traffic volume, design speed, the physical characteristics of vehicles, the classification of vehicles, and the percentage of various vehicle classification types that use the highway.
Design Hour Volume (DHV)	The percent of average daily traffic (ADT) generally accepted as criterion used in the geometric design of rural and urban highways. Ideally, the 30th highest hourly volume during a year, the DHV is commonly found to vary from 8 percent to 12 percent of the ADT.
Design Speed	The design speed is the maximum safe speed that can be maintained over a specified section of highway when conditions are so favorable that the design features of the highway govern. This speed correlates to the geometric features of a facility, such as curvature and sight distance, which govern safe vehicle operations. A design speed is selected for the proposed facilities prior to design. The speed limit and the operating speed should be less than the design speed.
Discharge	Stream flow, defined as the volume rate of flow of water and includes any sediment or other solids that may be dissolved or mixed with it.
DSEIS	Draft Supplemental Environmental Impact Statement
ECO	Employee Commute Options
Ecosystem	A functional system which includes the organisms of a total community together with their environment.
Endangered	An organism of very limited numbers that may be subject to extinction and is protected by law under the Endangered Species Act.
EIS	Environmental Impact Statement is a document that must be prepared for major federal actions significantly affecting the quality of the environment.
EO	Executive Order
EPA	U.S. Environmental Protection Agency

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ERNS	Emergency Response Notification System
ETC	Employee Transportation Coordinator
FA	Floodflow Alteration storage and desynchronization
FAA	Federal Aviation Administration
Fauna	The animal life of an area
FCWA	Fairfax County Water Authority
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHPM	Federal-Aid Highway Program Manual
FHWA	Federal Highway Administration
FIDB	Forest Interior Dwelling Bird
FIRM	Floodplain Insurance Rate Maps provided by the Federal Emergency Management Agency (FEMA).
Floodplain	A flat or nearly flat lowland that borders a stream and is covered by its waters at flood stage.
Flora	The plant life of an area.
FPPA	Farmland Protection Policy Act
F&SH	Fish and Shellfish Habitat
FTA	Federal Transit Administration
Geology	Science of the earth's crust and the arrangement and internal structure of rocks.
Gleying	The process by which wet soils develop a characteristic grey color through the reduction of iron and other elements.
Grade Separation	Bridge structure such as an underpass or overpass that vertically separates two or more intersecting roadways, thus permitting traffic to cross without interference.
GRH	Guaranteed Ride Home Program

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Groundwater	Naturally occurring water that moves through the earth's crust, usually at a depth of several feet to several hundred feet below the earth's surface.
GR/D	Groundwater recharge/discharge
GWMP	George Washington Memorial Parkway
Habitat	The physical natural environment, along with its characteristic array of organisms, in which a species lives and reproduces.
HABS	Historic American Building Survey
Hazardous Waste	Wastes identified by characteristics, sources, or specific substance as found in CFR 40 Chapter 261. A hazardous waste may: 1) cause or significantly contribute to an increase in mortality or morbidity in either an individual or the total population; and 2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed, or otherwise managed.
HC	hydrocarbons
HCM	Highway Capacity Manual
Housing of Last Resort	A Maryland SHA Program to re-house people who are displaced by right-of-way acquisition for highway projects when the cost to do so exceeds the limits of the Uniform Relocation Act. (See Appendix B.)
HOV	High Occupancy Vehicle
HUD	US Department of Housing and Urban Development
I-295	Interstate and route number
Impervious Surfaces	Any surface which cannot be penetrated freely by water.
I-D-O	Intense Development
IDL	Instrument Detection Limit
IL	Insertion Loss
IMTF	Interagency Mitigation Task Force
ISC3	Industrial Source Complex
ITM	EPA and ACOE Inland Testing Manual

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L-D-O Limited Development

L_{eq} equivalent sound level

$L_{eq}h$ equivalent sound level evaluated over a one-hour period

Levels of Service Levels of Service are a measure of the conditions under which a roadway operates as it accommodates various traffic volumes. Influencing factors include speed, travel time, traffic interruptions, maneuvering freedom, safety, driving comfort, economy, and the volume of traffic.

Levels of Service on expressways and freeways with uninterrupted flow conditions are ranked from A to F (best to worst) as follows:

Level A:	free traffic flow; low traffic volumes; high speeds
Level B:	stable traffic flow; some speed restrictions
Level C:	stable traffic flow; increasing traffic volumes;
Level D:	approaching unstable traffic flow; heavy traffic volumes; decreasing speeds
Level E:	high traffic volumes approaching roadway capacity; temporary delays; low speeds
Level F:	forced traffic flow at low speeds; high traffic volumes and densities; frequent delays

For interrupted flow conditions, such as major highways and arterials with traffic signals, the following Levels of Service apply:

Level A:	free traffic flow; no delay at traffic signals
Level B:	occasional delays at traffic signals
Level C:	increasing traffic volumes; moderate delays at traffic signals
Level D:	increasing traffic volumes; frequent delays at traffic signals; lower speeds
Level E:	high traffic volumes; signal backups almost to the previous light; low speeds
Level F:	forced traffic flow; successive backups between signals

LRST leaking underground storage tanks

M-NCPPC Maryland National Capital Park and Planning Commission

MARC Maryland Rail Commuter

MBSS Maryland Biological Stream Survey of MDNR Monitoring & Non-Tidal Assessment Division.

MDE Maryland Department of the Environment

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MDE/WMA	Maryland Department of the Environment's Water Management Administration
MDNR	Maryland Department of Natural Resources
MDOT	Maryland Department of Transportation
Median	The center portion of a divided highway separating opposing lanes of traffic.
MHT	Maryland Historical Trust
MGS	Maryland Geological Survey
MHW	mean high water
MIS	Major Investment Studies
Mitigation Measures	Specified design commitments made during the environmental evaluation and study process that serves to moderate or lessen impacts deriving from the proposed action. These measures may include planning and development commitments, environmental measures, right-of-way improvements, and agreements with resource or other agencies to effect construction or post construction action.
MLW	mean low water
MOA	Memorandum of Agreement
MOBILE5a	Mobile Emission Model (Version 5a)
MOE	Measure of Effectiveness
MOU	Memorandum of Understanding
MPRSA	Marine Protection, Research, and Sanctuaries Act of 1972
MSA	Metropolitan Statistical Area
MSHA	Maryland State Highway Administration
MSL	Mean Sea Level
MTA	Maryland Mass Transit Administration
MVMH	Mount Vernon Memorial Highway
MVT	Mount Vernon Trail

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MWCOG	Metropolitan Washington Council of Governments
NAC	Noise Abatement Criteria
NAWQA	National Water Quality Assessment Program
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act of 1969 establishes a legislative mandate to federal agencies to consider the environment in all major federal actions. The NEPA process involves the detailed study of alternatives and the evaluation of environmental impacts and mitigation measures.
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service (U.S. Department of Commerce)
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxide
NPL	National Priorities List
NPS	National Park Service
NR	Nutrient Removal/Retention/Transformation
NR	National Register - Cultural Resources (e.g., historic or archeological sites) which are on the National Register of Historic Places.
NRCS	Natural Resources Conservation Service
NRE	National Register Eligible - Cultural resources (e.g., historic or archeological sites) which are eligible for listing on the National Register of Historic Places
NRHP	National Register of Historic Places
NVTC	Northern Virginia Transportation Commission
NWI	National Wetland Inventory
O_3	Ozone
O-D	Origin-Destination

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Operating Speed The highest overall speed at which a driver can travel on a given highway under favorable weather conditions and under prevailing traffic conditions without exceeding the safe speed as determined by the design speed.

Option Alternative designs for a specific project location.

OPTIMA Optimizing Noise Barrier Design Model

Pb Lead

PE Production Export

Peak Hour Time when a highway carries its highest volume of traffic, usually the morning or evening 'rush' period when commuters travel to and from work.

PEM palustrine emergent wetlands

PFO palustrine forested wetlands

PM-10 particulate matter

POS Program Open Space

ppm parts per million

Project Limits The physical end points of a proposed project, usually designated at geographic or municipal boundaries, at intersections, at roadway segments where cross sections change, or at the beginning or end of numbered state traffic routes.

PRTC Potomac and Rappahannock Transportation Commission

PSS palustrine scrub-shrub wetlands

Public Hearing A meeting designed to afford the public the fullest opportunity to express support of or opposition to a transportation project in an open forum at which a verbatim record (transcript) of the proceeding is prepared.

Public Involvement Coordination events and informational materials geared at encouraging the public to participate in the Transportation Project Development Process. A successful Public Involvement Plan facilitates the exchange of information among project sponsors and outside groups and the general public, and may include meetings, surveys, committees, presentations, etc.

Public Meeting A meeting conducted by transportation officials designed to facilitate participation in the decision making process and to assist the public in gaining an informed view of a proposed project at any level of the Transportation Project Development Process. Also, such a gathering may be referred to as Public Information Meeting.

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PVF	Principal Valuable Functions
RCA	Resource Conservation Area
R-C-O	Resource Conservation
RCRA	Resource Conservation and Recovery Act program identifies and tracks hazardous wastes from the point of generation to the point of disposal.
REC	Recreation Consumptive and Non-Consumptive
RMA	Resource Management Area
Record of Decision (ROD)	A document prepared by the Division Office of the Federal Highway Administration that presents the basis for selecting a specific transportation proposal that has been evaluated through the various environmental and engineering studies of the Transportation Project Development Process. Typically, the Record of Decision (ROD) identifies the alternative selected in the Final EIS, the alternatives considered, measures to minimize harm, monitoring or enforcement programs, and itemized commitments and mitigation measures.
Riffle	Shallow rapids where water flows swiftly over completely or partially submerged obstructions to produce surface agitation.
Right-of-Way (ROW)	Land purchased by state and / or local jurisdictions that is used to accommodate construction, drainage, and proper maintenance of transportation or other public facilities.
Riparian	Pertaining to anything connected with or immediately adjacent to the banks of a stream.
RPA	Resource Protection Area
RST	Registered Underground Storage Tank List
RTE	Rare, threatened, or endangered plant and animal species.
SAPCB	State Air Pollution Control Board
SAV	submerged aquatic vegetation (vegetated shallows)
SCS	US Soil Conservation Service

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Section 106 Procedures	Derived from Section 106 of the National Historic Preservation Act of 1996 which governs the identification, evaluation, and protection of historical and archeological resources affected by state and federal transportation projects. Principal areas identified included required evaluations to determine the presence or absence of sites, the eligibility based on National Resister of Historic Places criteria and the significance and effect of a proposed project upon such site.
Shoulder	The portion of a highway adjacent and parallel to the traveled roadway for the accommodation of stopped vehicles for emergency use and for lateral support of the travel lanes; may or may not be fully paved.
SHPO	State Historic Preservation Officer
SICA	Signalized Intersection Capacity Analysis
Side Slope	The earth slope permissible outside of the roadway pavement in a given location, as a ratio of the horizontal to vertical measurement (2:1, 4:1, 6:1).
SIP	State Implementation Plan
Slope	The degree of deviation from horizontal, measured by rise/run for a particular distance.
S/NAAQS	State/National Ambient Air Quality Standards
SOV	Single Occupant Vehicle
Specimen Tree	A tree with greater than 30 inch Diameter at Breast Height (DBH) or at least 75 percent of the DBH of the state champion of that species.
SPP	Stakeholder Participation Panel
SS	Suspended Solids
S/SS	Sediment/Shoreline Stabilization
S/TR	Sediment/Toxicant Retention
STAMINA	Standard Method of Noise Analysis
Stream Relocation	The process involving the movement of a flowing stream from its present channel to a different channel.
STIP	State Transportation Improvement Program

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Study Area	A geographic area selected and defined at the outset of engineering or environmental evaluations, which is sufficiently adequate in size to address all pertinent project matters occurring within it.
System Linkage	Interconnection of roadway segments that comprise an overall transportation network. Also, a discussion of how a proposed project fits into the existing and future transportation system (network) and how it contributes to developing a sound transportation network in an area or region. The terms connector road, missing link, gap completion, circumferential link, or beltway segment are sometimes used to describe this concept.
TCM	Transportation Control Measures
TDM	Travel Demand Management
TERP	Transportation Emission Reduction Program
Terrestrial	Living or growing on land.
TIP	Transportation Improvement Program
TIPP	Transportation Institute for Public Policy
Title VI	Nondiscrimination Provision of the Civil Rights Act of 1964
TMP	Transportation Management Plans
TN	Total Nitrogen
TNM	FHWA Traffic Noise Model, Version 1.0
TOC	Total Organic Carbon
Topography	The configuration of the surface features of the region including relief, position of streams, lakes, roads, cities, etc.
TP	Total Phosphorous
TPB	National Capital Region Transportation Planning Board
TPH	Total Petroleum Hydrocarbons
TRI System	Toxic Release Inventory
TSCA	Toxic Substances Control Act

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TSM	Transportation System Management is a transportation alternative that seeks to reduce traffic congestion without altering the existing roadway. This alternative considers options such as improvements to the mass transit system, minor intersection improvements, and traffic management. These are other non-capital or low-capital intensive strategies that seek to reduce travel demand.
TSP	Total Suspended Particulate
USACOE	U.S. Army Corps of Engineers
USARTHQ	U.S. Army Reserve Training Headquarters
USCG	U.S. Coast Guard
USFWS	U.S. Fish & Wildlife Service
USGS	United States Geological Survey (Department of the Interior)
UNI	Uniqueness/Heritage
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
UST	Underground Storage Tank
v/c	volume/capacity
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDCR	Virginia Department of Conservation and Recreation, Division of Natural Heritage
VDOT	Virginia Department of Transportation
VHT	vehicle hours traveled
VIMS	Virginia Institute of Marine Science
VIS	Visual Quality/Aesthetics
VMRC	Virginia Marine Resources Commission

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VMT	vehicle miles of travel
VOC	Volatile Organic Compounds
VQ/A	Visual Quality and Aesthetics
VRE	Virginia Railway Express
VSS	Volatile Suspended Solids
Watershed	The area of land which drains to a particular body of water.
Wetlands	Lands that are inundated or saturated by surface or groundwater with a frequency and duration sufficient to support and, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.
WH	Wildlife Habitat
WMATA	Washington Metropolitan Area Transit Authority

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Chapter 10

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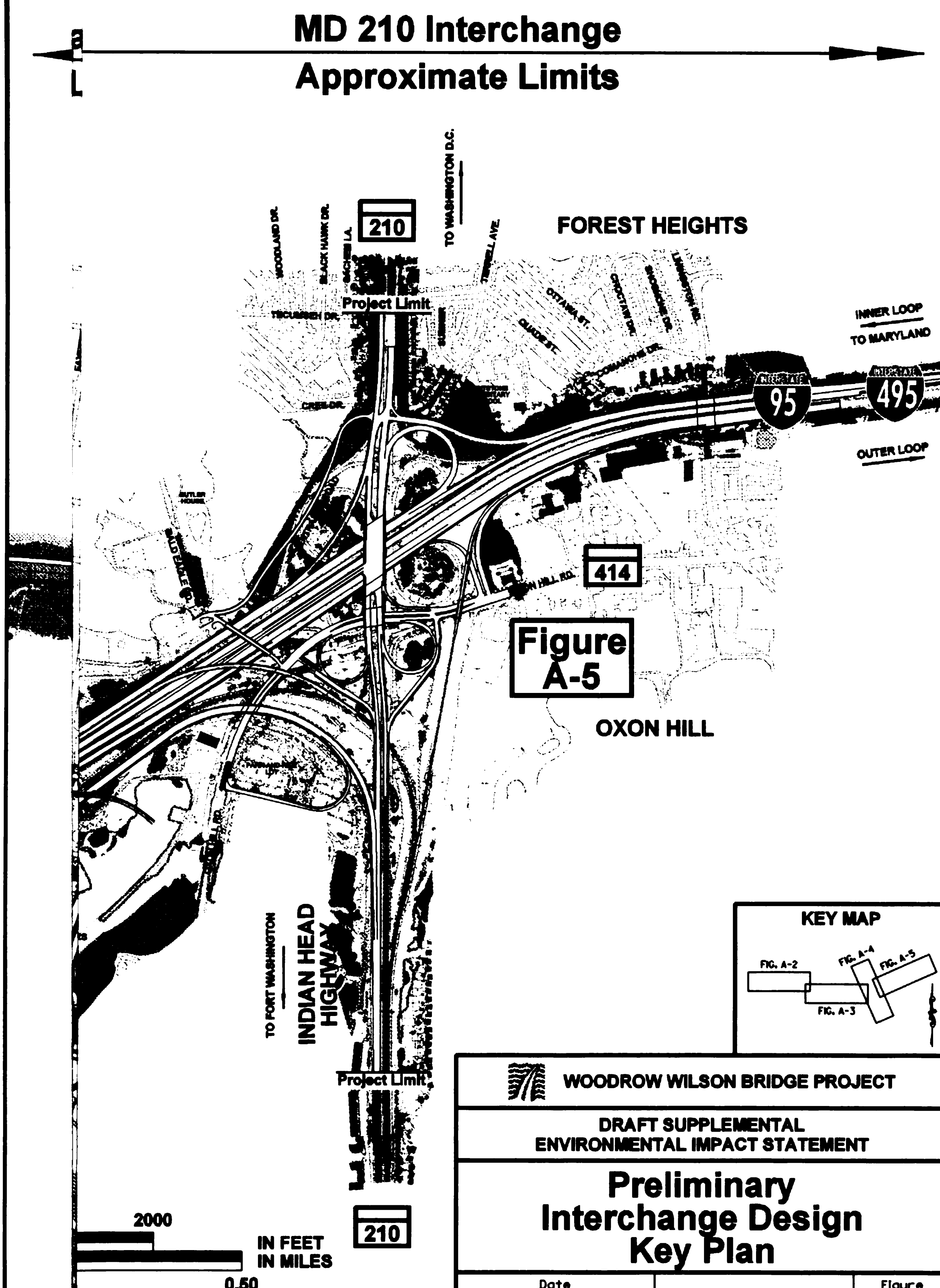
Appendix A

Plan Sheets for Current Design Alternative 4A



WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Preliminary Interchange Design Key Plan

Date		Figure
December, 1999	Scale As Shown	A-1

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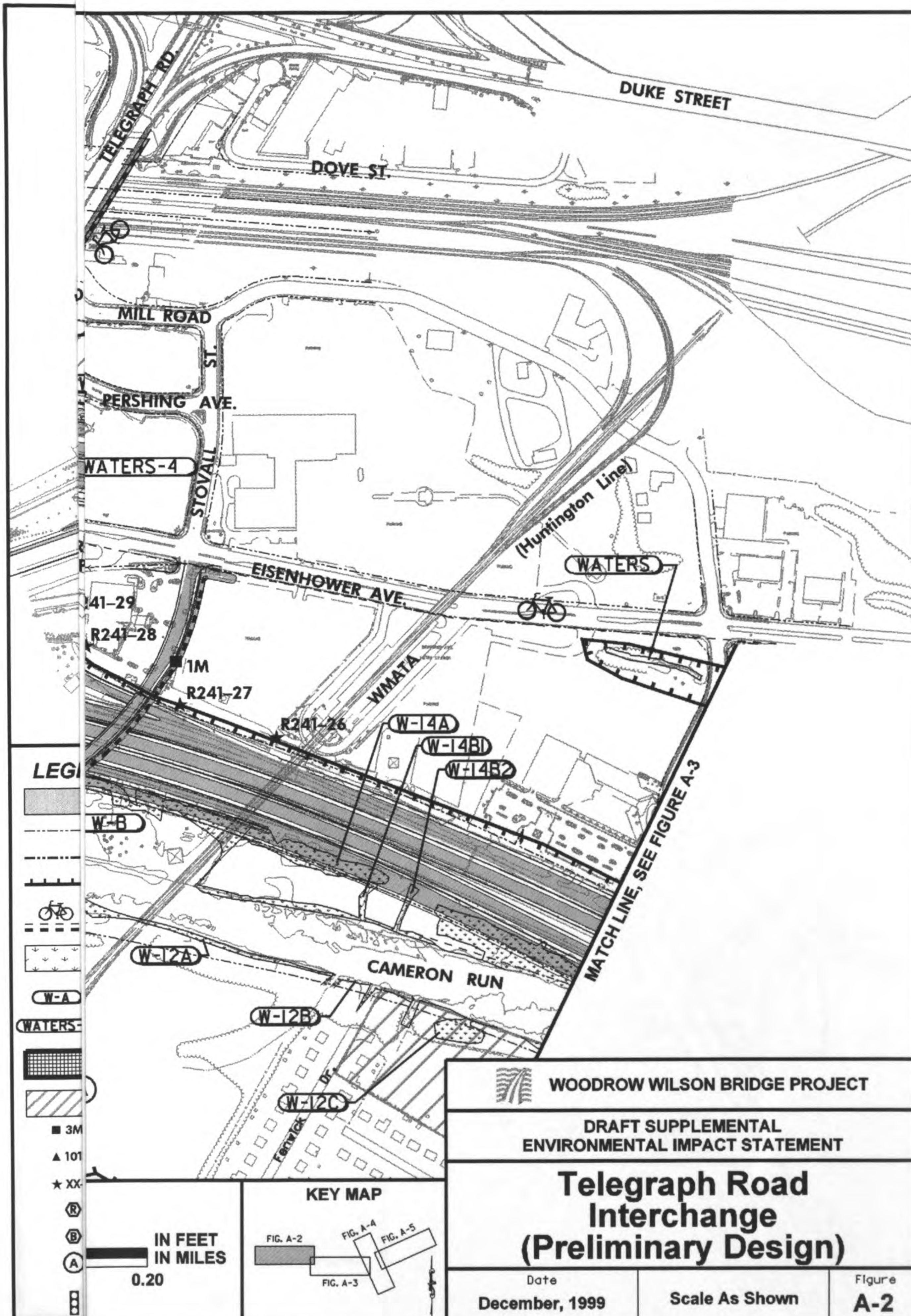

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

Telegraph Road Interchange (Preliminary Design)

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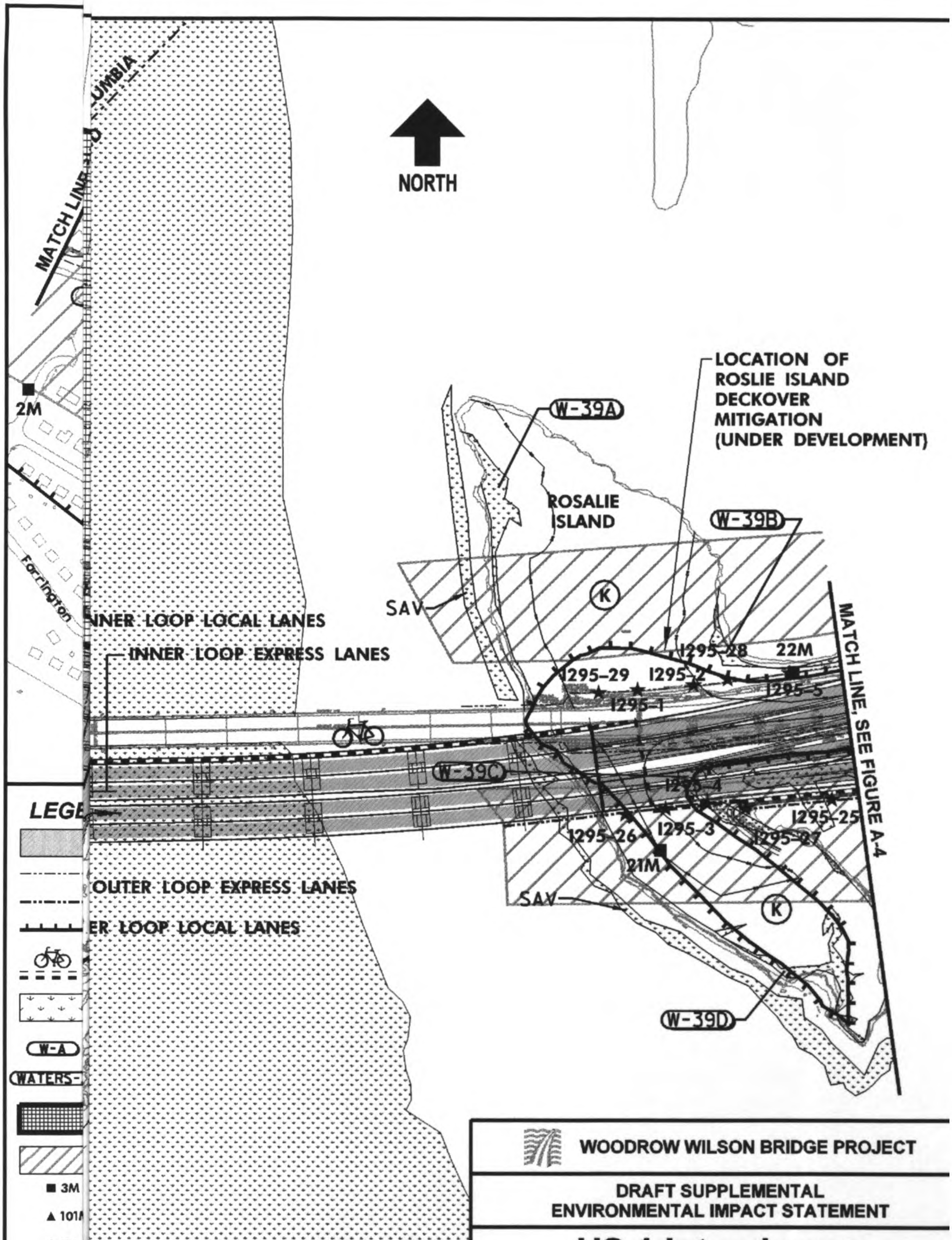

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

US 1 Interchange Potomac River Bridge (Preliminary Design)

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WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

I-295
Interchange
(Preliminary Design)

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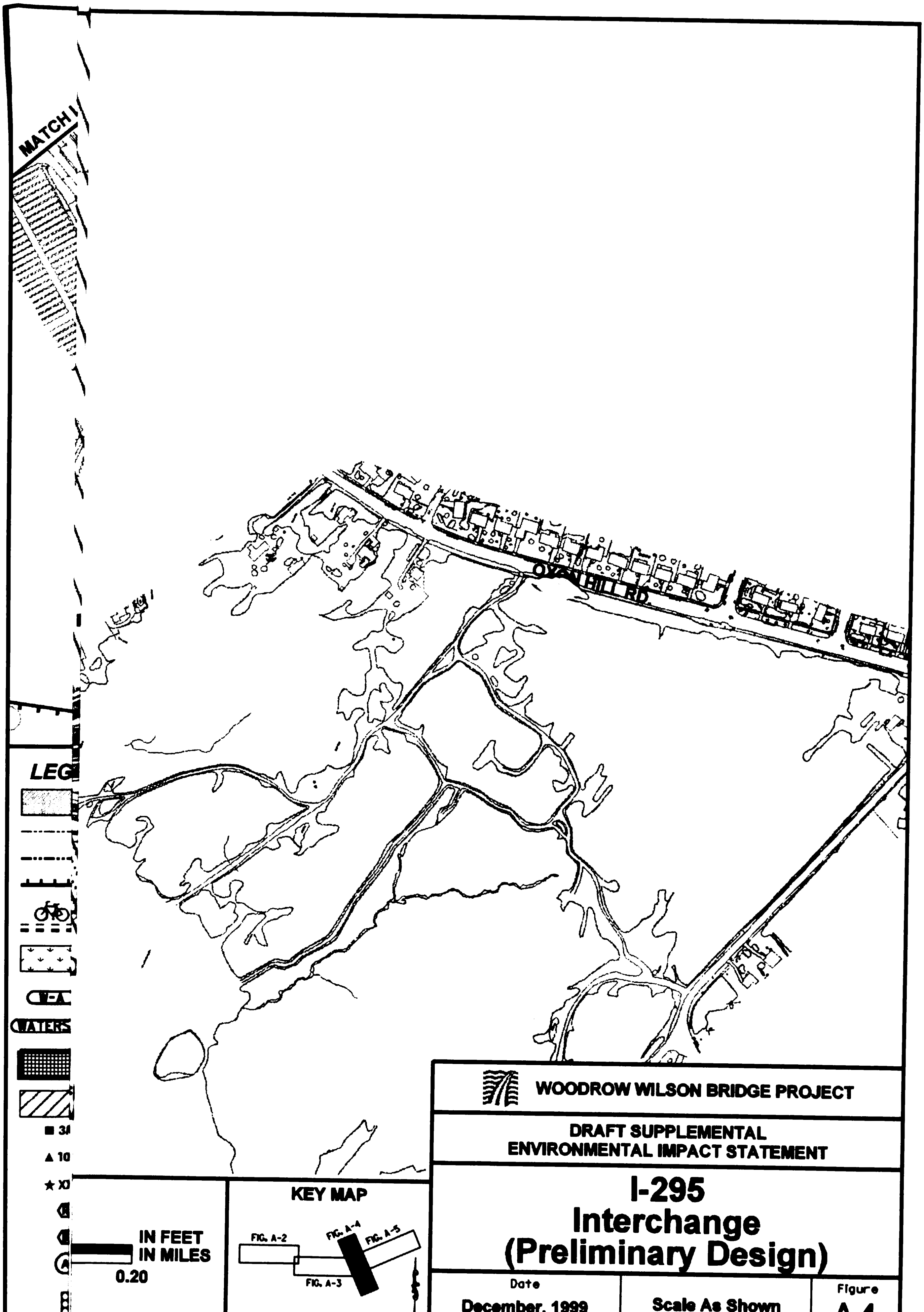

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
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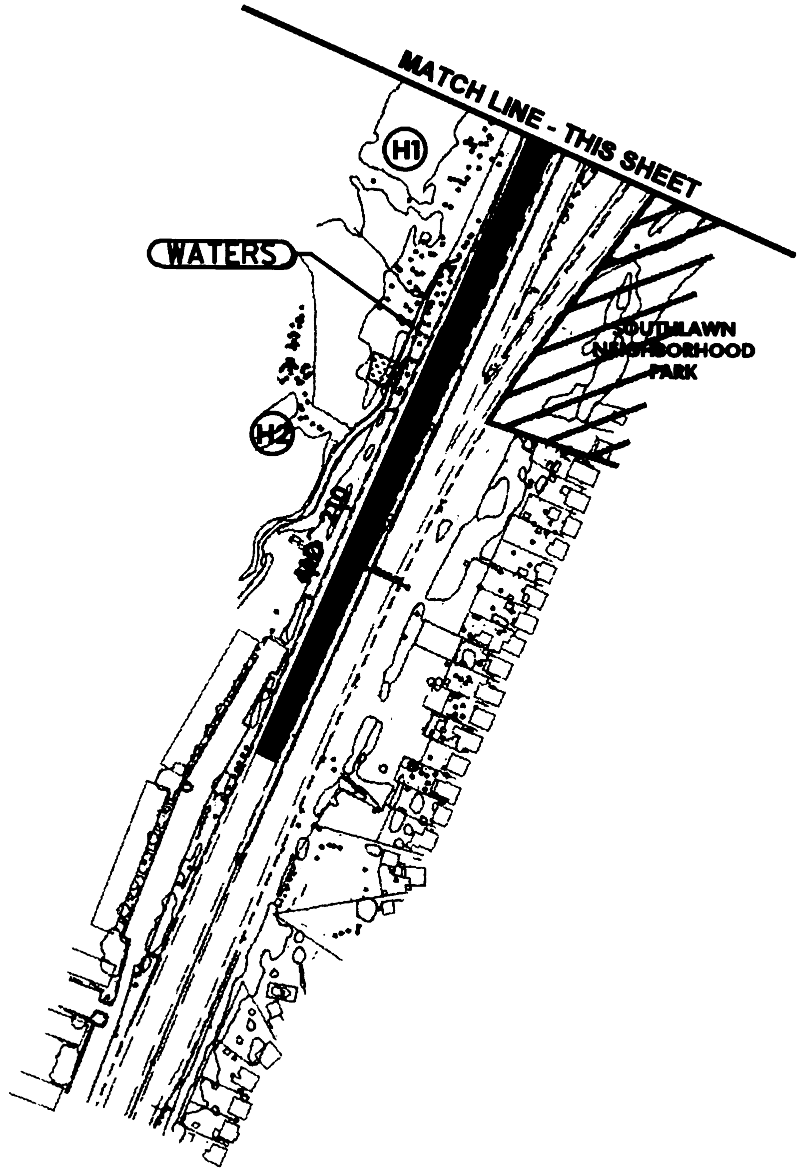

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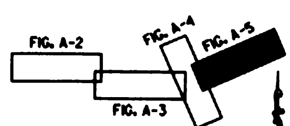
KEY MAP



WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

MD 210 Interchange (Preliminary Design)

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Appendix B

Aquatic Resources Conceptual Mitigation Plan

Summary of Aquatic Resources Conceptual Mitigation Plan

A Phase I Conceptual Mitigation Plan for impacts to aquatic resources, including submerged aquatic vegetation (SAV) and jurisdictional Waters of the United States, has been prepared to address the unavoidable impacts associated with the Woodrow Wilson Bridge project. Specific details related to mitigation site designs, existing features, environmental data, and other related information is included in the draft *Joint Federal/State Permit Application and Phase I Conceptual Mitigation Package* dated November 8, 1999. Mitigation requirements specified in this plan are based on the potential limit of disturbance for construction. Therefore, the mitigation plan represents a conservative estimate of mitigation that could be required for the Woodrow Wilson Bridge project.

The construction of this project will result in temporary impacts to Waters of the U.S., including open water, vegetated wetlands, and unvegetated tidal flats. Mitigation for these temporary impacts will be proposed as in-kind in-place and will be included with the roadway construction documents. The following temporary impacts are anticipated for this project:

- **Causeways** – Temporary causeways made of nonerodable materials will be used to allow construction of structures over wetlands. The causeways will be removed after construction.
- **Trestles** – Temporary construction trestles supported on piles will be used for construction of structures over water and tidal flats. Trestles will be removed after completion of construction. The use of trestles will maintain tidal and flood flows during the construction period.
- **Cofferdams** – Temporary cofferdams will be required to construct bridge footing in waters, tidal flats and wetlands.
- **Retaining Wall Temporary Construction Areas** – Retaining walls are used in this project to minimize permanent encroachment to Waters of the U.S. In order to construct the wall, a temporary construction zone is required along the length of the wall. After construction, the temporary construction zone will be restored.
- **Soil Consolidation Temporary Construction Areas** – To place portions of the new construction on fill, the under laying soil must be consolidated to remove excess water. Consolidation of the soil under fill sections prevents future slumping or subsidence due to unstable subsurface conditions. Soil consolidation entails placing excess fill material over the saturated soils to push the water out through a drain system. A stability berm is required on the water side of the soil consolidation area to prevent slope failure and spilling of fill material into adjacent wetlands or tidal flats. An 80 foot wide temporary construction area will be required in limited areas of the project to accommodate the soil consolidation and stability berms. This temporary construction area might encroach upon Waters of the U.S. Upon completion of the consolidation process, the excess fill and stability berms will be removed and the areas restored to pre-construction conditions.

Final mitigation requirements for temporary and permanent impacts will be determined through ongoing coordination with the regulatory agencies as final plans are prepared during the design phase of this project.

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The proposed mitigation for the permanent impacts associated with the project is listed below.

- 6.1 hectares (15.0 acres) tidal wetland enhancement
- 22.9 hectares (56.6 acres) tidal wetland creation
- 8.1 hectares (20.0) acres SAV creation
- 4.6 hectares (11.45 acres) nontidal wetland creation
- 0.4 hectare (1.0 acre) nontidal wetland enhancement
- 30.6 kilometers (19.0 miles) of stream restoration through fish blockage removal
- 0.8 hectare (2.0 acres) shallow water fish habitat and 365.8 meters (1,200 linear feet) of shoreline stabilization
- 0.04 hectare/145 meters (0.10 acre/475 linear feet) tidal streambank stabilization/ riparian buffer creation
- Hatchery restocking for three years in selected Anacostia River tributaries

The proposed mitigation requirements are divided between Maryland and Virginia based on the quantities and types of permanent impacts associated with each state. For each wetland mitigation site, a copy of the location map, and the conceptual wetland mitigation plans are provided. For the streams on which fish passage restoration is proposed, a copy of the location map, ground photographs, and the conceptual mitigation plans are provided.

Cultural Resources Investigation at Wetland Mitigation Sites

The FHWA has conducted an archaeological identification survey of a proposed wetland creation site in Charles County, Maryland. The creation site (WIC-1, the Earnshaw property) contained one small prehistoric lithic site. The survey involved background research on the prehistory and history of the parcel, followed by the systematic excavation of shovel tests across the area, and the placement of hand-dug excavation units within the small prehistoric site. FHWA determined that the archaeological site was not eligible for listing in the National Register of Historic Places. The FHWA is currently consulting with the Maryland SHPO on this eligibility determination. The FHWA also conducted an historic architectural survey of the proposed WIC-1 wetland creation site. The survey involved extensive historical research on the property and surrounding area, including a comprehensive title search. A field inventory of the property was also performed, following Maryland Historical Trust procedures and guidelines. The only historic resource in the site's area of potential effect (APE) was the Wakefield farmstead. FHWA determined that this property was not eligible for listing in the National Register of Historic Places given the extensive alterations and additions to the farmstead. The FHWA is currently consulting with the Maryland SHPO on this eligibility determination.

Three recently identified wetland mitigation sites in Maryland that may be used for the project were assessed for archaeological potential, in accordance with the terms of the MOA. Wetland sites Port Tobacco 1 (PTB-1), Port Tobacco 2 (PTB-2) and Helwig Farm (NAN-3) are considered likely to contain significant archaeological resources, and Phase 1 investigations will be undertaken if the sites are carried forward as part of the project.

The FHWA has determined that significant archaeological resources are unlikely to occur within the Anacostia East site (ANA-11), and that there are no standing historic resources within the site's

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APE. These determinations are being coordinated with the Maryland SHPO in accordance with the terms of the MOA. The Bevard Site has already been constructed, and all cultural resource compliance activities were completed prior to construction.

Several newly identified wetland mitigation sites in Maryland and in Virginia have not been evaluated in terms of potential to contain archaeological and historic architectural resources, in consultation with the Maryland and Virginia SHPOs, pursuant to the MOA. In Maryland, these include areas of SAV creation at the mouth of the Potomac River and Chesapeake Bay (LPR-1) in St. Mary's County; CAT-3, LBD T1-2, and BCR-2B in Prince George's County; and WIC-2, WIC-7, CUC-1, CUC-2, and MWC-2A in Charles County. In Virginia, these include, NCR-2, FMRP-1, BHA-1, BHA-2, CRU-3, FMR-1, FMR-2, POT-1, AQC-1, GCK-1, BHA-3, HPO-1, HPO-3, NOM-1, and HPO-4. The FHWA will conduct background research and field inspection of these sites to determine, in consultation with the SHPOs, whether or not these sites have the potential to contain National Register archaeological or historic architectural resources; and, if additional cultural resource investigations of these sites are required. These investigations will be conducted in accordance with the provisions of the MOA.

The North Fork Mitigation Bank is under construction, and all cultural resource compliance activities have been completed.

Cultural Resources Investigation at Fish Blockage Removal Sites

The FHWA assessed the archaeological potential of proposed fish passage improvements at mitigation sites within Rock Creek Park in the District of Columbia. These proposed improvements involve the removal of blockages crossing the creek, including those at Milkhouse Ford and Pierce Mill Dam. Rock Creek Park has been determined to be eligible for listing in the National Register as the Rock Creek Historic District, and there are several individual properties within the park that are individually listed in the National Register. The NPS and the FHWA have determined that, as currently designed, the proposed improvements will occur in locations that have been extensively disturbed or have no potential to contain intact archaeological resources; and that no archaeological identification survey is warranted. FHWA will consult with the District of Columbia State Historic Preservation Office on this determination.

In addition to assessing the archaeological potential of proposed fish passage improvements at mitigation sites within Rock Creek, FHWA also assessed historic buildings and structures within the park. In addition to Milkhouse Ford and Pierce Mill Dam, FHWA has determined that the active sewer line and rustic retaining walls at blockage RC7 are eligible for listing in the National Register of Historic Places. FHWA is currently consulting with the District of Columbia State Historic Preservation Office on this historic property evaluation.

Of the nine blockages proposed for removal or modification along Rock Creek, four are historic properties. These include Piece Mill Dam and Pierce Mill (at blockage RC3), Boulder Bridge (at blockage RC4), Milkhouse Ford (at blockage RC6), and the sewer line and rustic retaining walls at RC7. Implementation of the proposed fish passage improvements will result in an effect to these historic properties, but this effect will not be adverse. The FHWA will consult with the District of Columbia State Historic Preservation Office regarding its finding of no adverse effect. The FHWA

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has also initiated consultation with the National Park Service, which will continue under terms of Stipulation 6 of the MOA.

The FHWA also assessed the archaeological and historic architectural potential of blockage removal sites along Northwest Branch in Prince, George's County Maryland. The FHWA determined that significant archaeological resources are unlikely to occur within these sites, and that there are no standing historic resources within the sites' areas of potential effects. These determinations are being coordinated with the Maryland SHPO in accordance with the terms of the MOA.

Several newly identified mitigation sites in Maryland have yet to be evaluated in terms of potential to contain archaeological and historic architectural resources, in consultation with the Maryland SHPO, pursuant to the MOA. These include Indian Creek at Greenbelt Road, Lower Beaver Dam Creek, and Little Paint Branch in Prince George's County. The FHWA will conduct background research and field inspection of these locations to determine, in consultation with the Maryland SHPO, whether or not these areas have the potential to contain National Register archaeological or historic architectural resources; and if additional cultural resource investigations of these locations are required.

Hazardous Material Investigation at Wetland Mitigation Sites

The Anacostia East Site (ANA-11) in Hyattsville, Maryland is being considered for wetland enhancement along the Anacostia River immediately upstream from the Washington, D.C. boundary. Previous investigations have identified the presence of buried solid waste from undocumented landfill operations during the 1950's near the proposed wetland area. Chemical contaminants include petroleum hydrocarbons and fuel degradation byproducts, pesticides, and heavy metals in soil and groundwater. Planned assessment activities include characterization of groundwater quality entering the proposed wetland area to determine if future excavation would adversely impact the quality of the Anacostia River water.

The Hart Property (NCR-2) in Woodbridge, Virginia is being considered for construction of a wetland mitigation project along Neabsco Creek immediately east of US 1. The initial site investigation suggested possible contamination of the soils by petroleum hydrocarbon. Subsequent review of fill materials placed on site and detailed consideration of the laboratory analysis results indicated that no petroleum hydrocarbons had been released on site. The anomalous detections resulted from the use of finely ground bituminous pavement; derived from Virginia Department of Transportation (VDOT) improvements to US 1, as part of the site fill materials.

The Earnshaw Property (WIC-1) in Newburg, Maryland is under consideration for a wetland mitigation project along the south shore of Wicomico River, near the confluence of Allens Fresh Run. The Phase I Environmental Site Assessment (ESA) indicated that no environmental impediments exist at this site.

The Bevard Site (TCR-2) has already been constructed, and all hazardous material compliance activities had been completed prior to construction. Sites in Virginia such as BHA-1, BHA-2, BHA-

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3, CRU-3, FMR-1, FMR-2, and FMPR-1 were evaluated for hazardous materials in the 1997 FEIS. The 1997 FEIS indicated no environmental impediments exist at these sites.

Several newly identified wetland mitigation sites in Maryland and in Virginia have yet to be evaluated in terms of potential to contain hazardous materials. In Maryland, these include LPR-1 in St. Mary's County; CAT-3, LBD T1-2, and BCR-2B in Prince George's County; and WIC-2, WIC-7, CUC-1, CUC-2, NAN3, PTB-1, PTB-2, and MWC-2A in Charles County. In Virginia, these include POT-1, AQC-1, GCK-1, HPO-1, HPO-3, NOM-1, and HPO-4. The FHWA will conduct background research and field inspection of these sites to determine whether or not these sites have the potential to contain hazardous materials.

The North Fork Mitigation Bank is under construction, and all hazardous material studies have been completed.

Terrestrial Wildlife Investigation at Wetland Mitigation Sites

Agricultural lands represent the primary land use on the proposed wetland mitigation sites outside the project limits.

Open agricultural lands on the proposed mitigation sites provide some wildlife value, particularly those that occur in a mosaic landscape with scattered woodlots. While these areas do not provide all the requisite habitat needs for wildlife, certain bird and mammal species use these areas for foraging. Wildlife species that use these agricultural fields and field/woods edges are typically more common and widespread for species such as squirrels, groundhogs, deer, robins, doves, and various species of sparrows. Conversion of a portion of these fields to tidal wetlands would not significantly affect the overall population of these field/edge species.

Rare, Threatened and Endangered Species Investigation at Wetland Mitigation Sites

To determine potential RTE occurrence within the selected wetland mitigation sites in Virginia, a review request letter was sent to the Virginia Department of Game and Inland Fisheries (VDGIF). To determine potential RTE occurrence within the selected wetland mitigation sites in Maryland, a review request letter was sent to the Maryland Department of Natural Resources Wildlife and Heritage Division's National Heritage (MDNR).

For proposed site NAN-3, the Wildlife and Heritage Division's National Heritage database indicated a recently active bald eagle nest in the immediate vicinity. The bald eagle is listed as endangered by the state and as a threatened species by the federal government. Protection of endangered species habitat is required within the Chesapeake Bay Critical Area (COMAR 27.15.09.03). The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the chosen site is a previously disturbed and unforested agricultural field. Mitigation would be in the form of tidal emergent wetland creation along Nanjemoy Creek. If the mitigation site lies within the USFWS recommended eagle protection zones, appropriate time of year restrictions would be followed. There are also records for other species known to occur on or in the vicinity of the site. These

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include the endangered small-fruited agrimony (*Agrimonia microcarpa*), the highly rare small-flowered baby-blue-eyes (*Nemophila aphylla*), the threatened large-seeded forget-me-not (*Myosotis macrosperma*), and the threatened pale green orchid (*Platanthera flava*). All four species grow in forested wetland conditions. Because the site is an unforested agricultural field adjacent to Nanjemoy Creek, no disturbance to these plants or their habitat is anticipated. However, as a precaution, a survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

For proposed mitigation sites PTB-1 and PTB-2 the Wildlife and Heritage Division's database indicated that there were no records of RTE species on the project sites themselves. However, there is a record of the highly rare small-flowered baby-blues-eyes (*Nemophila aphylla*), within the vicinity of the proposed mitigation sites. Mitigation sites PTB-1 and PTB-2 are also proposed as tidal emergent wetland creation areas on existing agricultural fields bordering Goose Creek. This specie favors forested wetland areas and is not likely to occur within the agricultural field. However, a survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

For proposed mitigation sites CUC-1 and CUC-2 the Wildlife and Heritage Division's database indicated that there were no records of RTE species on the project sites themselves. However, there is a record of the Great Purple Hairstreak (*Atlides halesus*), a highly rare state species, known to occur within the vicinity of or on the proposed mitigation sites. A survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

The VDGIF also completed a review of the potential wetland mitigation sites in Virginia. In a letter dated December 13, 1999, they indicated that there were no currently documented threatened or endangered species at any of the mitigation sites. However, they did indicate that there were some species of note in the vicinity of some of the sites.

At mitigation site POT-1 the VDGIF database indicated that the federally threatened bald eagle was found to have nesting sites ranging from less than 1 mile from this site. The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the chosen site is maintained lawn.

At mitigation site AQC-1 the VDGIF database indicated that Aquia Creek in the vicinity of this site has been shown to contain the following anadromous fish species: Blueback Herring (*Alosa aestivalis*), Sea Lamprey (*Petromyzon marinus*), and American Shad (*Alosa sapidissima*). The proposed mitigation site will consist of tidal emergent wetland creation. This mitigation project will provide additional habitat for these fish species.

At mitigation site NCR-2 the VDGIF database indicated that a total of six collection sites of the federally threatened bald eagle within a two mile radius of the site. The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the site is currently a junkyard.

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At mitigation sites HPO-1 and HPO-3 the VDGIF database indicated a total of five collection sites of the federally threatened bald eagle two-mile or more away from the project site. In addition, two anadromous fish species occur in Belmont Bay and another tributary near the project site. These fish are the alewife (*Alosa pseudoharengus*) and striped bass (*Morone saxatilis*). The fish occur between one and two miles from the project site. The proposed mitigation at both these site will include shoreline stabilization and juvenile fish shallow water cover/forage ground.

No threatened or endangered species were identified within a two-mile radius of GCK-1 or NFK-1.

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Matrix of Preferred Mitigation (Tier 1) in Maryland

Impact / Type	Mitigation Proposed	Location
0.4 hectares 1.0 acres) Nontidal Wetlands	0.8 hectare (2.0 acres) Nontidal wetland creation	Bevard Advanced Mitigation Prince George's County
0.6 hectares (1.5 acres) Tidal Wetlands	1.7 hectares (4.2 acres) tidal wetland enhancement	Anacostia East (ANA11), Prince George's County
	0.6 hectare (1.6 acres) tidal wetland creation	Earnshaw property (WIC1), Charles County
12.8 hectares (31.7 acres) SAV 2.7 hectares (6.7 acres) Tidal Water	Fish Blockage Removal Removal of 19 blockages	Rock Creek, Montgomery County and D.C.
		Hatchery Restocking for three (3) years
		Indian Creek at Greenbelt Road, Prince George's County
		Little Paint Branch, Prince George's County
		Northwest Branch, Prince George's County
	12.1 hectares (30.0 acres) tidal wetland creation	Port Tobacco 1 (PTB1), Charles County
		Port Tobacco 2 (PTB2), Charles County
	4.4 hectares (10.8 acres) tidal wetland enhancement	Anacostia East (ANA11), Prince George's County
	8.1 hectares (20.0 acres) in-kind SAV creation at Lower Potomac River	Mouth of the Potomac River and Chesapeake Bay, St Mary's County

Total Mitigation in Maryland (Tier 1):

- 0.8 hectares (2.0 acres) nontidal wetland creation (forested)
- 12.7 hectares (31.6 acres) tidal wetland creation (emergent)
- 6.1 hectares (15.0 acres) tidal wetland enhancement
- 23.3 kilometers (14.5 miles) of stream restoration for anadromous fish habitat in Maryland waters and 7.2 kilometers (4.5 miles) in District of Columbia waters
- Hatchery restocking for three years in selected tributaries to the Anacostia River
- 8.1 hectares (20.0 acres) SAV creation

In addition to identification of preferred potential mitigation sites and formulation of a comprehensive conceptual compensatory wetland mitigation proposal (Tier 1), the sponsoring agencies have compiled a list of alternate potential mitigation sites (Tier 2). These Tier 2 sites are currently under further investigation and will be made available should the primary mitigation sites, Tier 1 prove to be infeasible. A Summary of Tier 2 sites are currently under review by the regulatory agencies with a brief summary included below:

Backup Mitigation in Maryland (Tier 2):

- 0.8 hectares (2.0 acres) nontidal wetland creation (forested)
- 12.9 hectares (32.0 acres) tidal wetland creation (emergent)
- 27.4 kilometers (17 miles) of stream restoration for anadromous fish habitat in Maryland waters
- Hatchery restocking for three years in selected tributaries to the Anacostia River
- 8.1 hectares (20.0 acres) SAV creation

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Complete/Incomplete Tasks at Preferred Mitigation Sites (Tier 1) in Maryland

Mitigation Site	Install monitoring wells	Conduct Topographic Survey	Cultural resources investigation	Hazardous material investigation	Property owner interested	Design stage	4 (f) Property	Wetland delineation	Property owner commitment	Comments
Bevard (TCR 2)	Yes	N/A	Yes	Yes	Yes	Completed	No	N/A	Yes	Already constructed, needs to be planted
Anacostia East (ANA 11)	Yes	No	Yes	On-going	Yes	Conceptual	No	Yes	Yes	Continued water quality sampling required to determine if upland contaminants will effect wetland enhancement area and Anacostia River
Earnshaw (WIC 1)	Yes	Yes	Yes	Yes	Undetermined	Conceptual	No	Yes	No	
Rock Creek	N/A	On-going	On-going	No	Yes	Conceptual	Yes	N/A	No	Coordination with NPS and DC SHPO on Pierce Mill Dam and Milkhouse Ford
Little Paint Branch	N/A	No	No	No	Yes	Conceptual	No	N/A	No	Water quality sampling required
Indian Creek at Greenbelt Road	N/A	No	No	No	Yes	Conceptual	No	N/A	No	Water quality sampling required
Northwest Branch	N/A	No	No	No	Yes	Conceptual	No	N/A	No	Water quality sampling required
Port Tobacco 1 (PTB1)	Yes		No	No	No	Conceptual	No	No	No	Property owner has notified the PCC that they are not interested in the use of their property for mitigation. The SHA R/W division will obtain court permission to enter the property
Port Tobacco 2 (PTB2)	Yes		No	No	Yes	Conceptual	No	No	No	

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Federal Highway Administration

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Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT LOCATION PLAN

Mitigation Site Location Map

Date : December 1999

Scale : 1" ~ 30 miles

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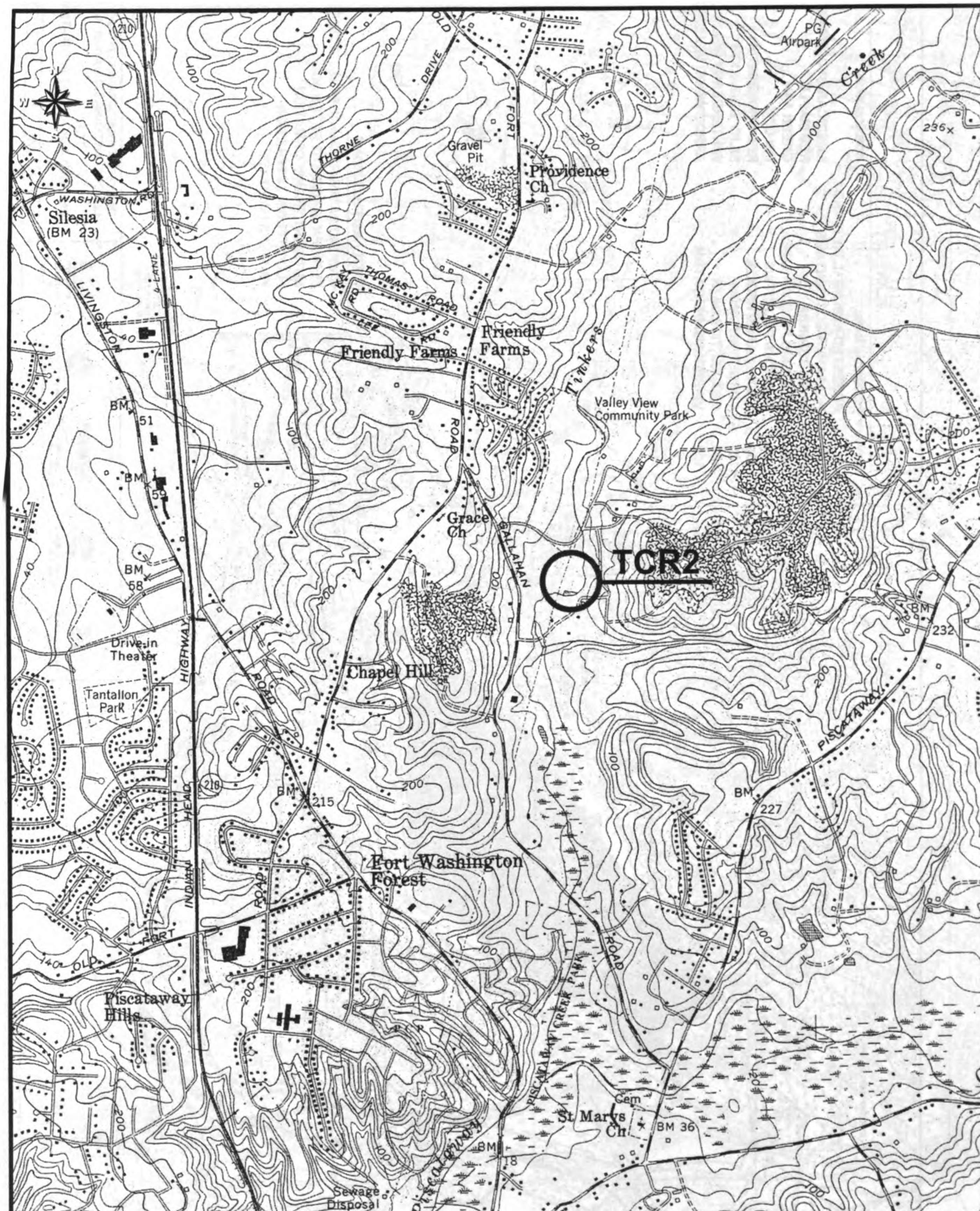

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

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WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Bevard Mitigation Site
SITE: TCR2

Date : December 1999

Scale : 1" = 2000'

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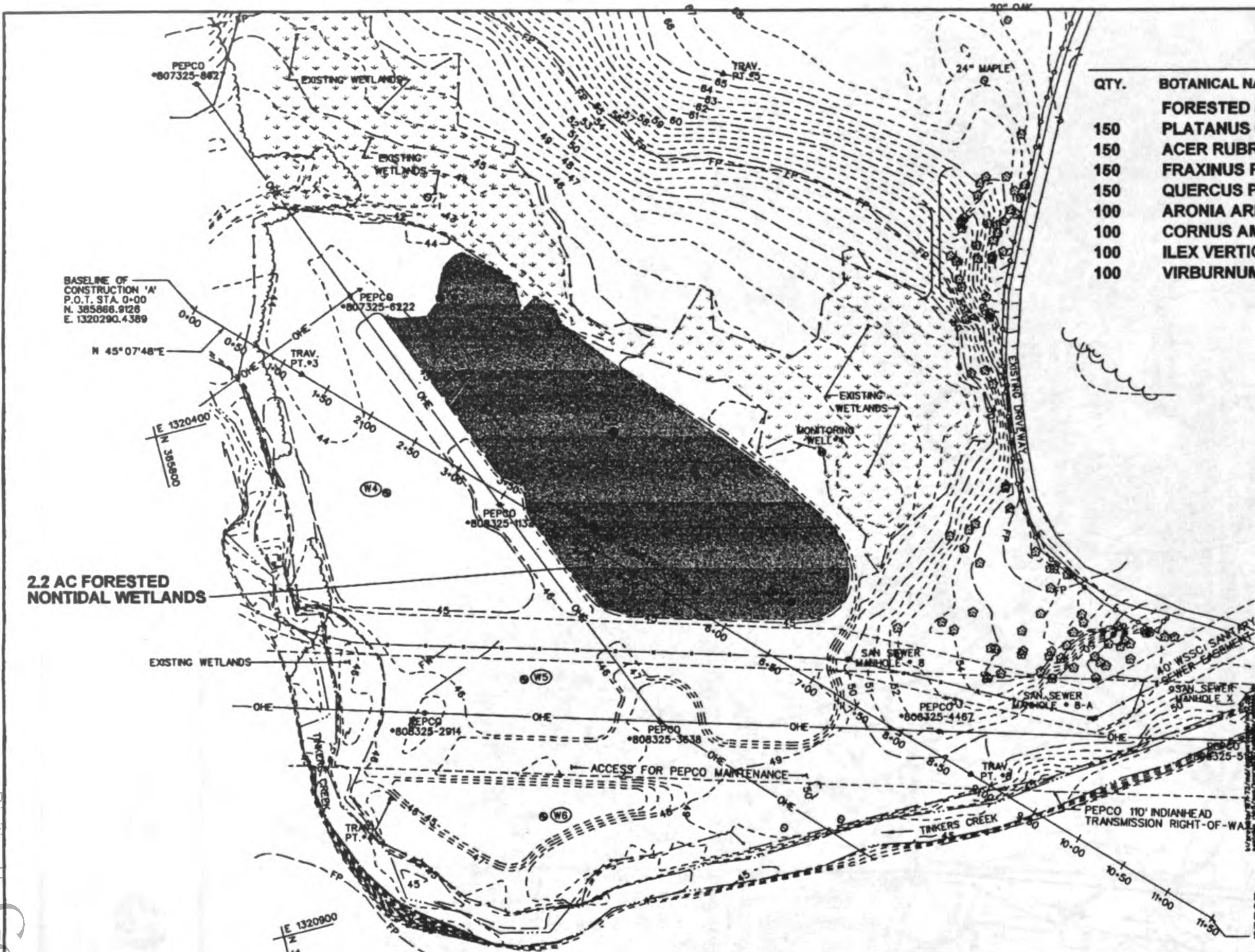

PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
	FORESTED NONTIDAL WETLAND	
150	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE
150	ACER RUBRUM	RED MAPLE
150	FRAXINUS PENSYLVANICA	GREEN ASH
150	QUERCUS PALUSTRIS	PIN OAK
100	ARONIA ARBUTIFOLIA	RED CHOKEBERRY
100	CORNUS AMOMUM	SILKY DOGWOOD
100	ILEX VERTICILLATA	WINTERBERRY HOLLY
100	VIRBURNUM DENTATUM	ARROWWOOD VIBURNUM

WETLAND FUNCTIONS

GROUNDWATER RECHARGE/DISCHARGE
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
FLOOD FLOW ALTERATION
WILDLIFE HABITAT

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WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
TCR 2
BEVARD ADVANCED MITIGATION

OCTOBER 1999 | SCALE: 1"=100'

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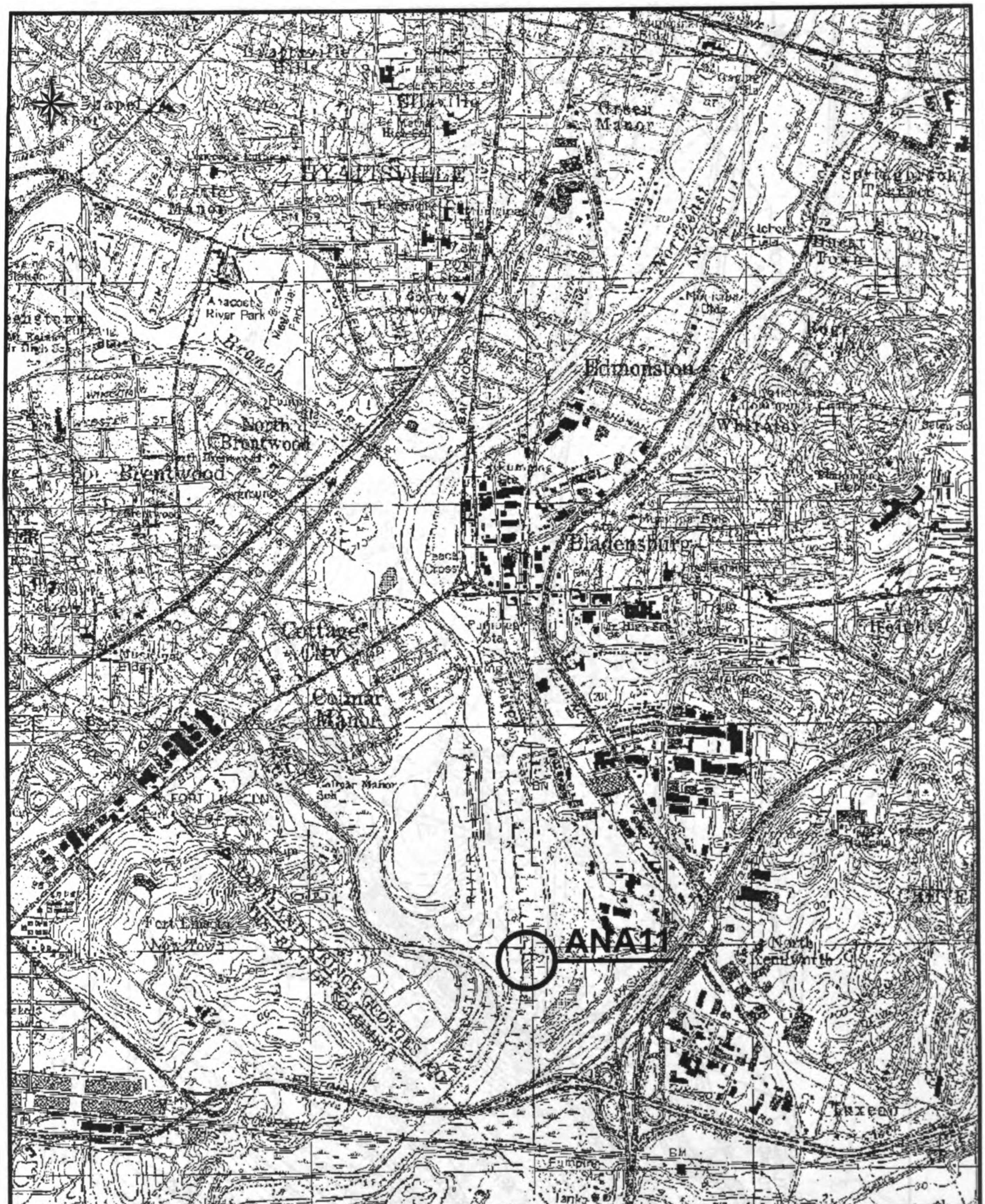

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Anacostia East
SITE: ANA11

Date : December 1999

Scale : 1" = 2000'

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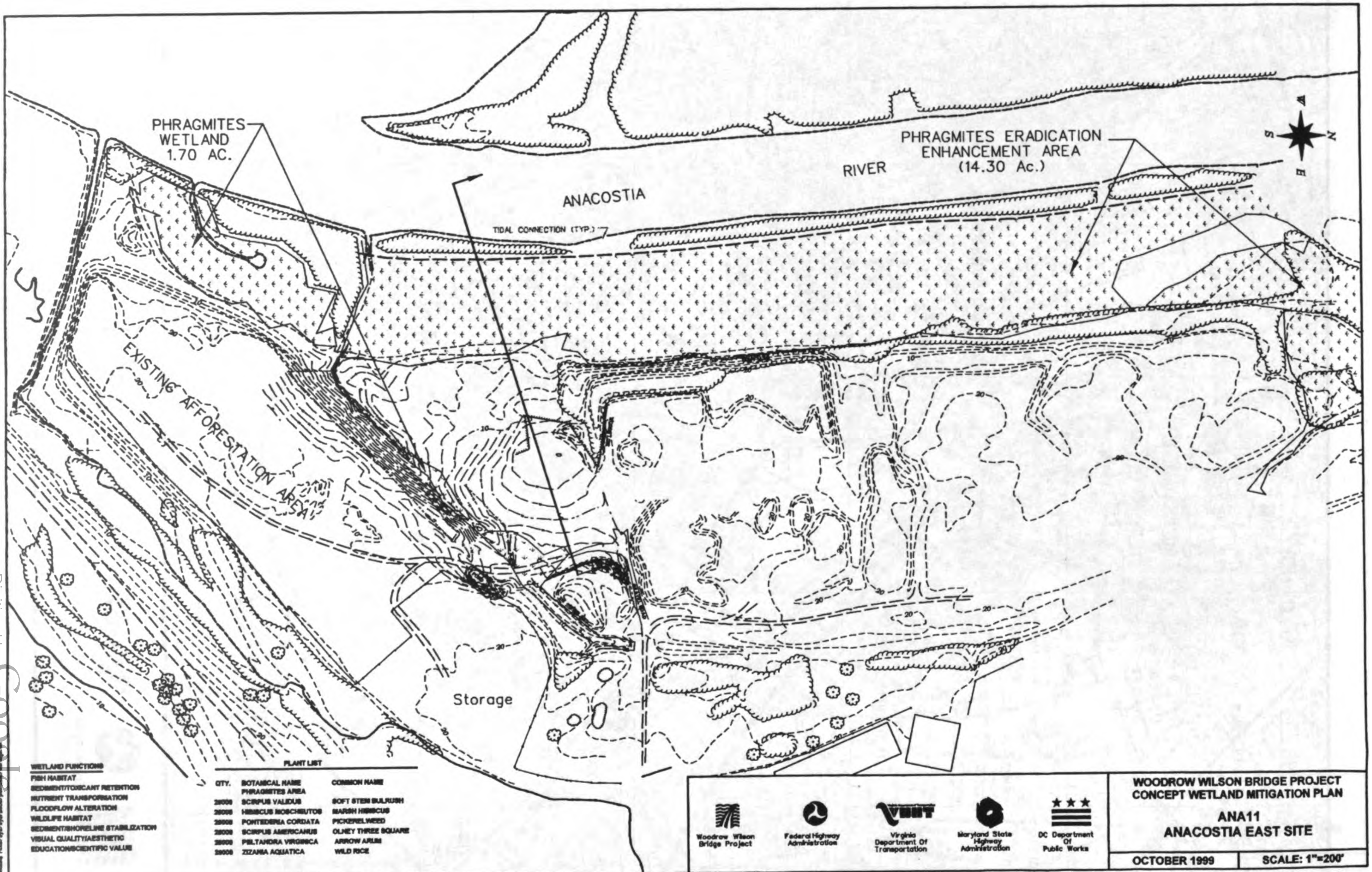

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Virginia Department of Transportation

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WOODROW WILSON BRIDGE PROJECT

LOCATION PLAN

Earnshaw Property

SITE: WIC1

Date : December 1999

Scale : 1" = 2000'

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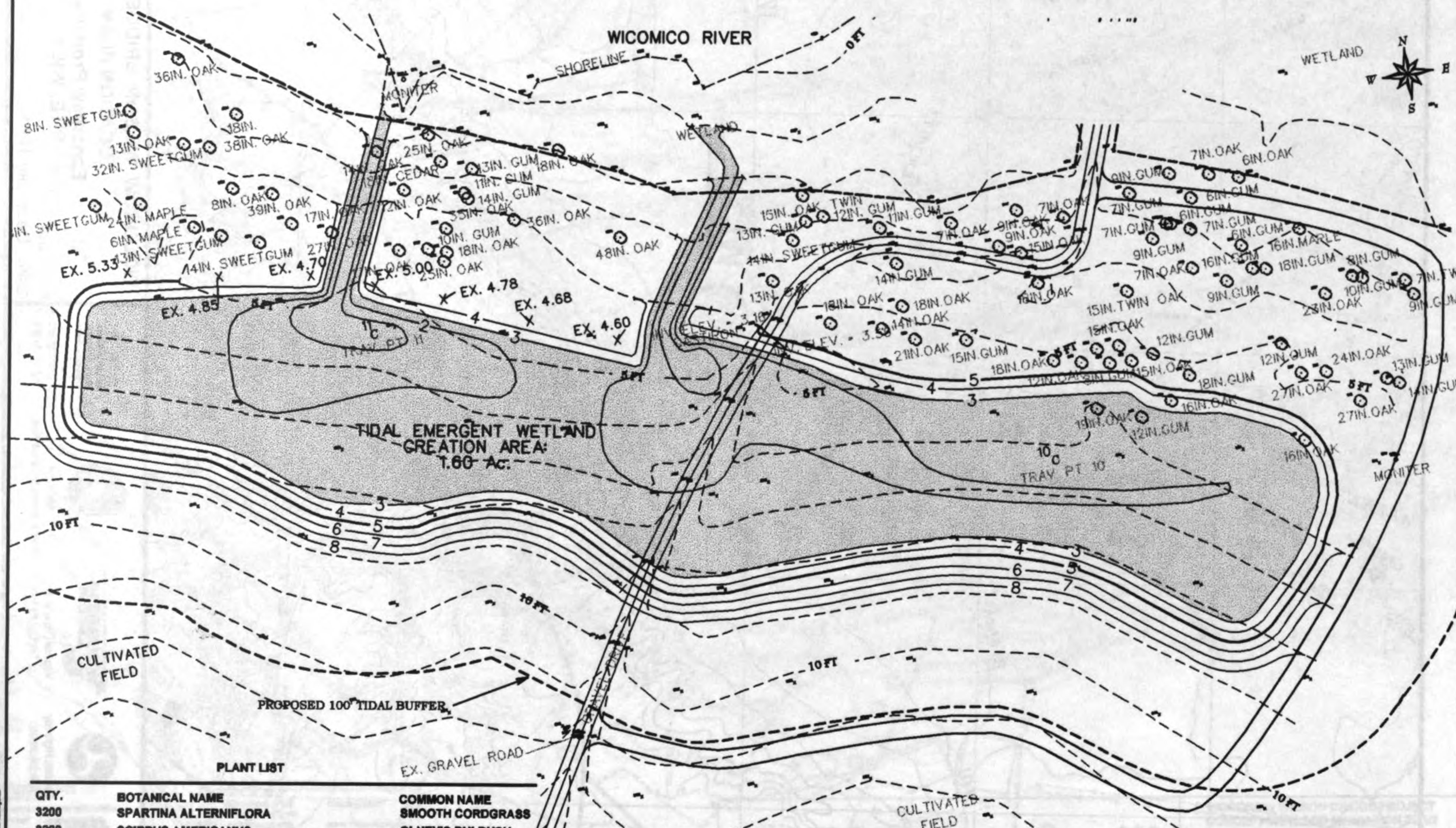
WETLAND FUNCTIONS

- SEDIMENT TOXICANT RETENTION
- NUTRIENT TRANSFORMATION
- WILDLIFE HABITAT
- FISH AND SHELLFISH HABITAT



PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
3200	SPARTINA ALTERNIFLORA	SMOOTH CORDGRASS
3200	SCIRPUS AMERICANUS	OLNEY'S BULRUSH
3200	PELTANDRA VIRGINICA	ARROW ARUM
3200	PONTEDERIA CORDATA	PICKERELWEED
3200	SPARTINA CYNOSUROIDES	BIG CORDGRASS

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WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
WIC 1
EARNSHAW PROPERTY

DECEMBER 1999 | SCALE: NTS

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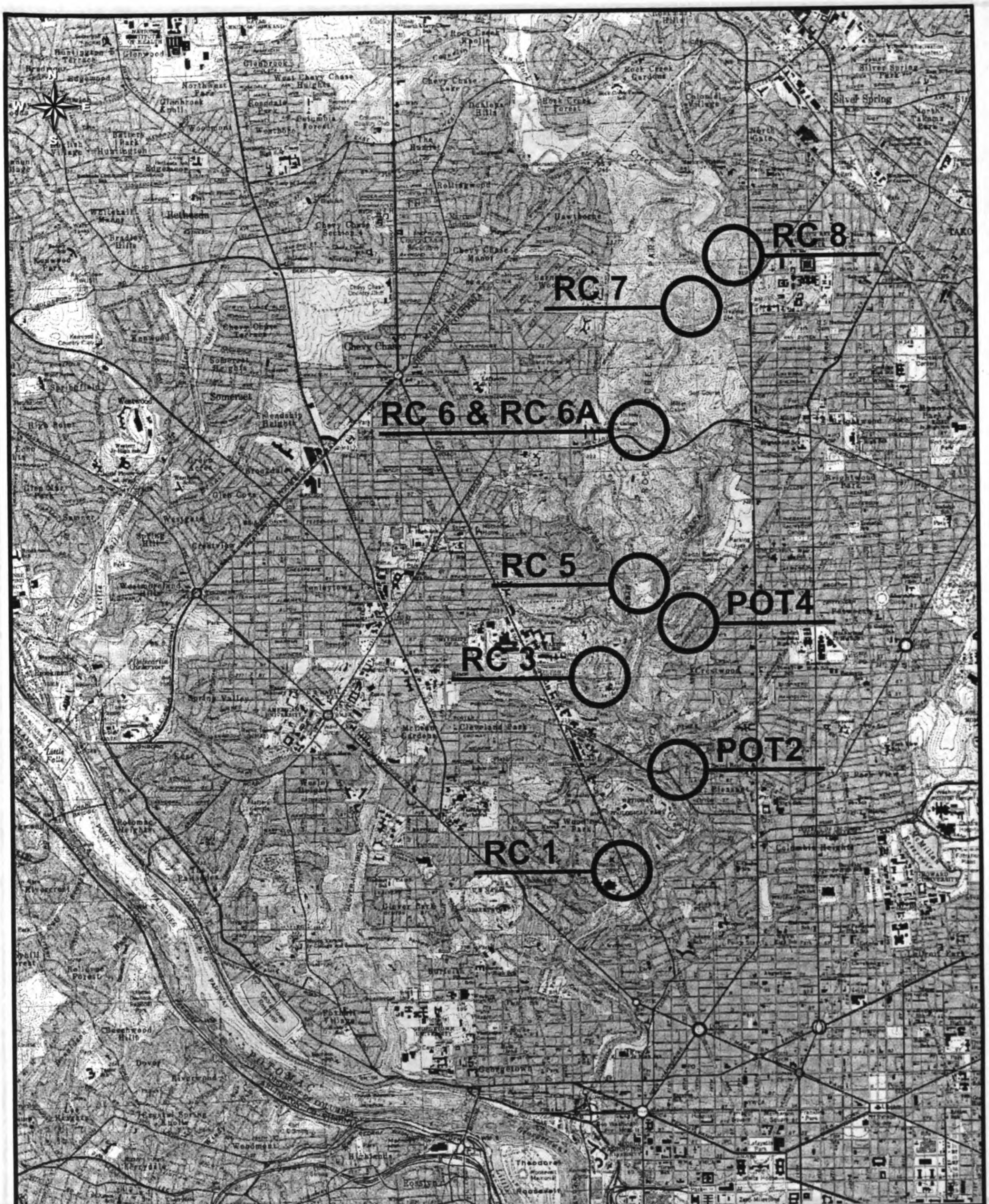

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN
Rock Creek Fish Passage Improvements
SITE: RC 1, RC 2, RC 3, RC 4, RC 5, RC 6, RC 6A, RC 7, RC 8

Date : December 1999 Scale : 1" = 2000'

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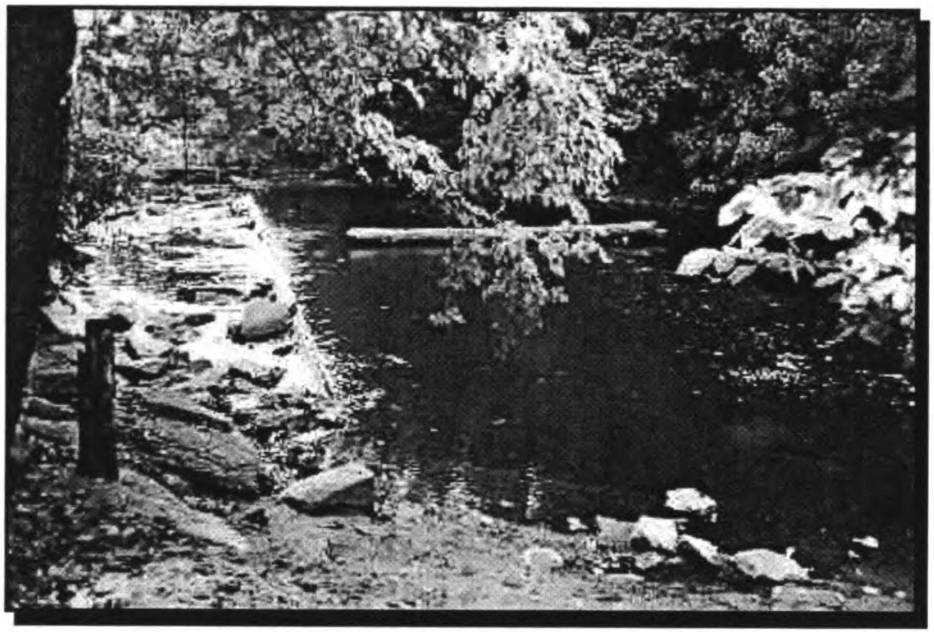

BLOCKAGE RC 1: Abandoned road ford

BLOCKAGE RC 2: Abandoned road ford

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Rock Creek Fish Passage Improvements

SITE: RC 1 & RC 2

December, 1999	**Not To Scale**

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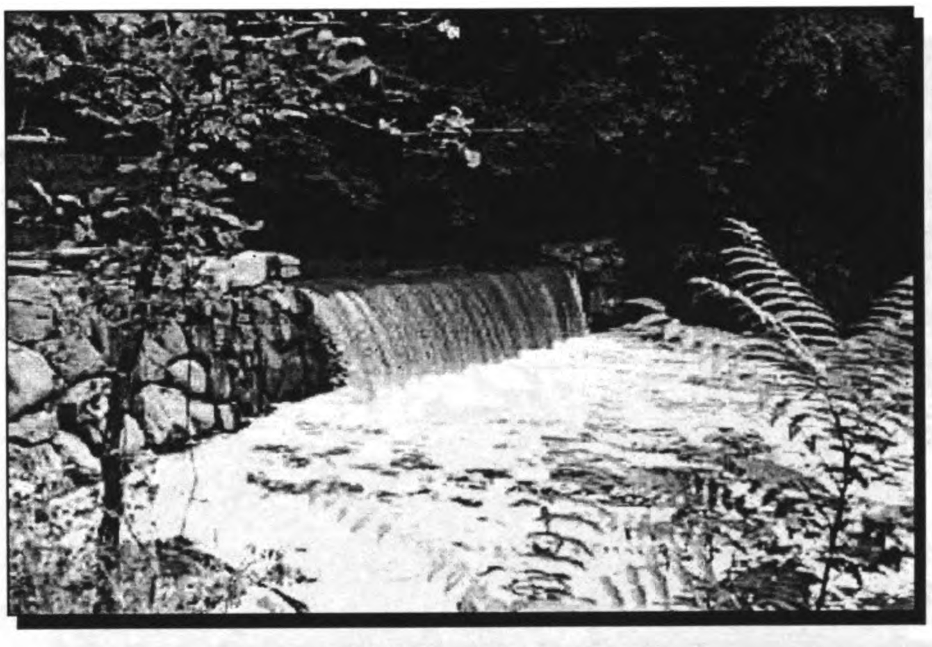

BLOCKAGE RC 3: Pierce Mill Dam

Federal Highway Administration

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Maryland State Highway Administration

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WOODROW WILSON BRIDGE PROJECT
Rock Creek Fish Passage Improvements

SITE: RC 3

December, 1999	Not To Scale

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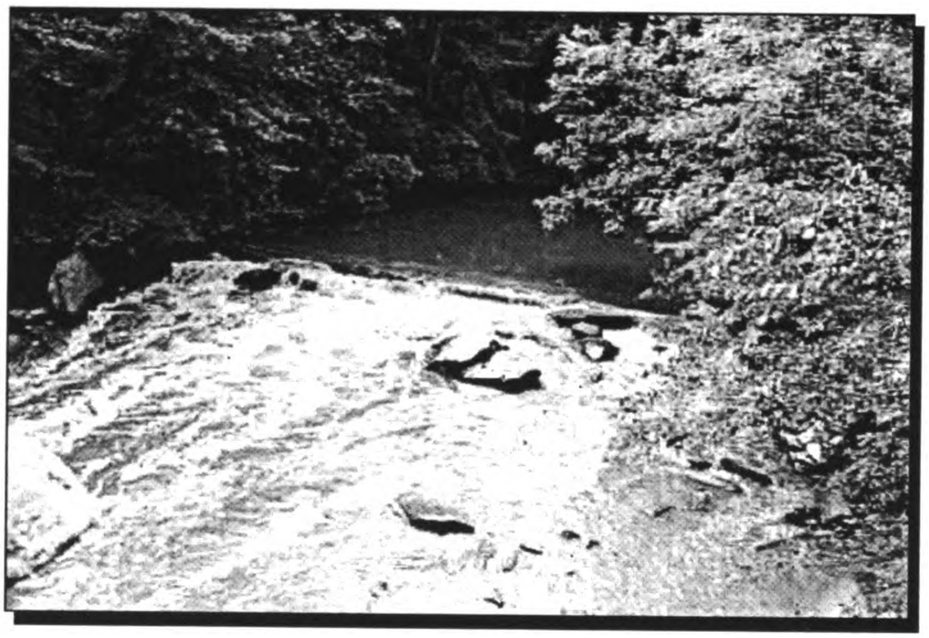

BLOCKAGE RC 4: Abandoned twenty-four (24)-inch, concrete encased, sanitary sewer line

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Rock Creek Fish Passage Improvements

SITE: RC 4

December, 1999	Not To Scale

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BLOCKAGE RC 5: Active fifty-four (54)-inch, concrete encased, sanitary sewer line

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT **Rock Creek Fish Passage Improvements** **SITE: RC 5**	
December, 1999	**Not To Scale**

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BLOCKAGE RC 6 AND RC 6A: Milkhouse Ford and an active sixty (60)-inch, concrete encased, sanitary sewer line located approximately fifty (50) feet upstream of the ford

Federal Highway Administration

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Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Rock Creek Fish Passage Improvements

SITE: RC 6 & RC 6A

December, 1999	Not To Scale

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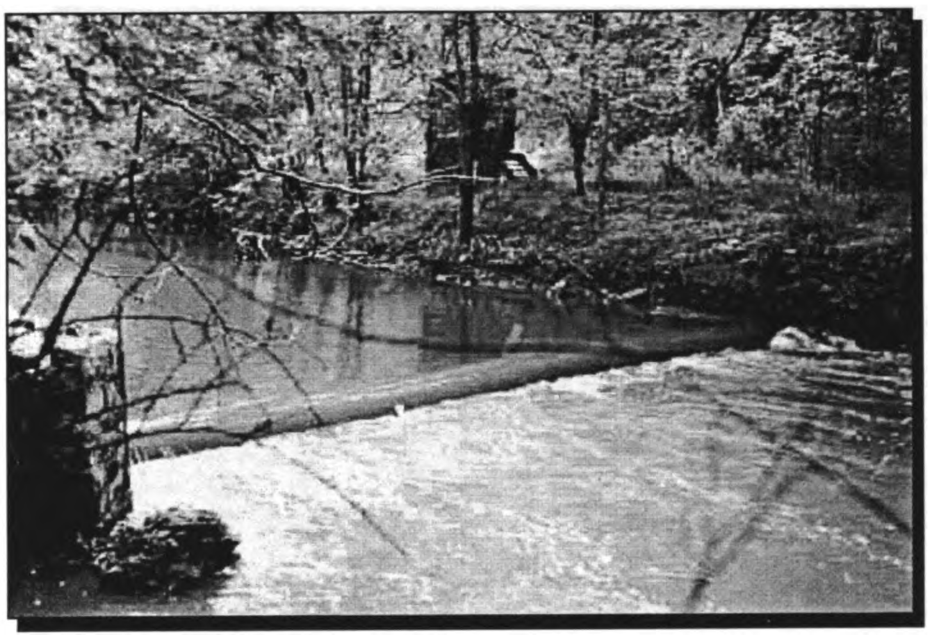

BLOCKAGE RC 7: Active twelve (12)-inch, concrete encased, sanitary sewer line

Federal Highway Administration; Virginia Department of Transportation; Maryland State Highway Administration; DC Department Of Public Works	**WOODROW WILSON BRIDGE PROJECT** **Rock Creek Fish Passage Improvements** **SITE: RC 7**
December, 1999	**Not To Scale**

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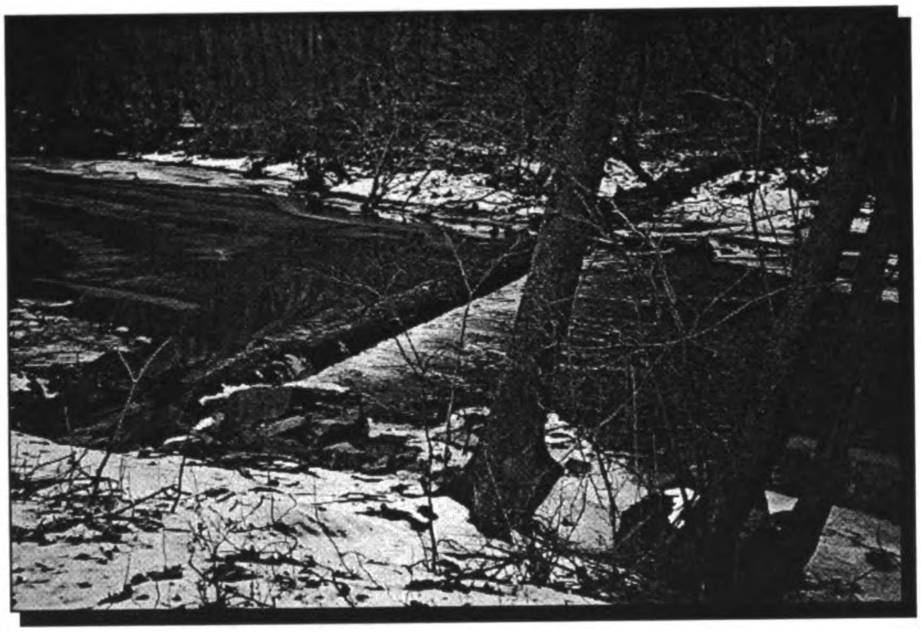

BLOCKAGE RC 8: Active thirty-six (36)-inch, concrete encased, sanitary sewer line

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Rock Creek Fish Passage Improvements

SITE: RC 8

December, 1999	Not To Scale

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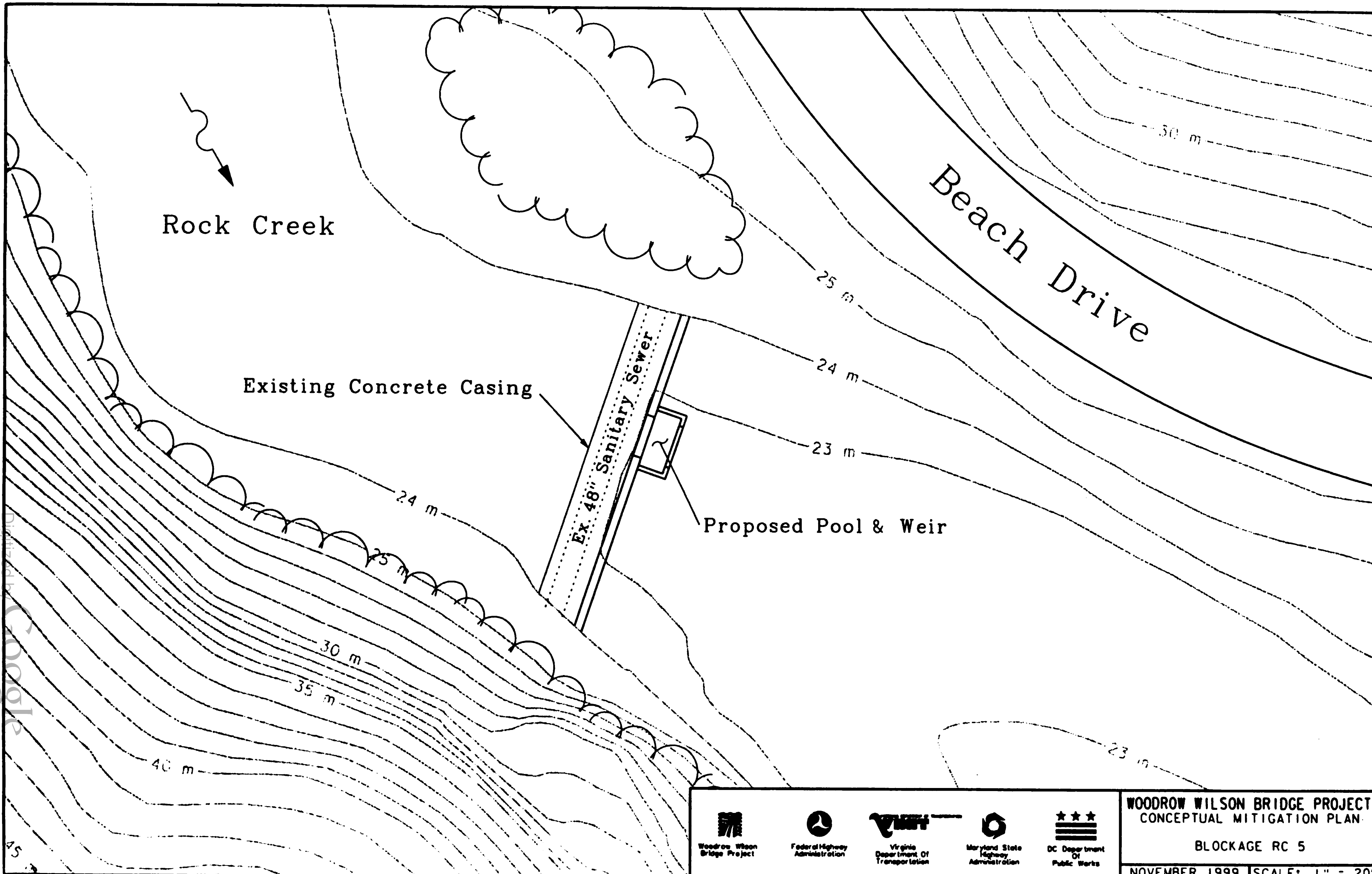

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE RC 5

NOVEMBER 1999 | SCALE: 1" = 20'

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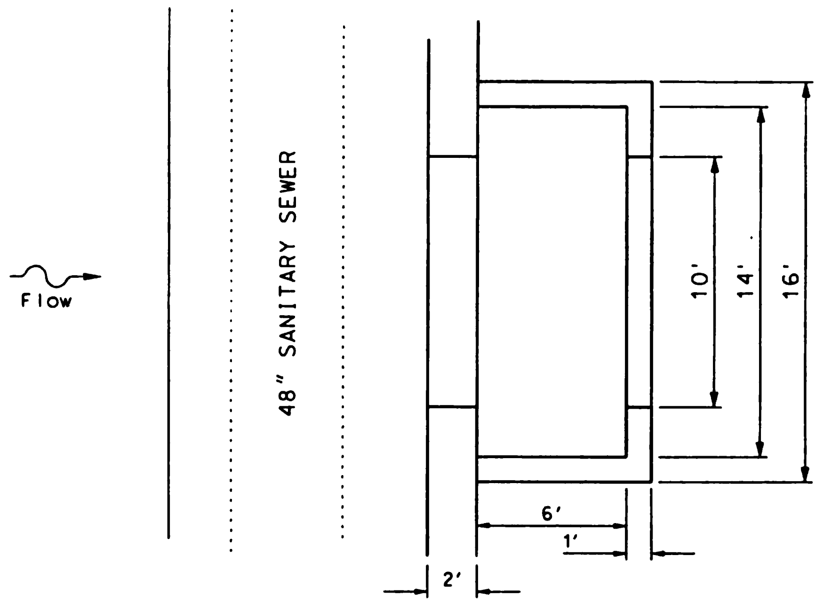
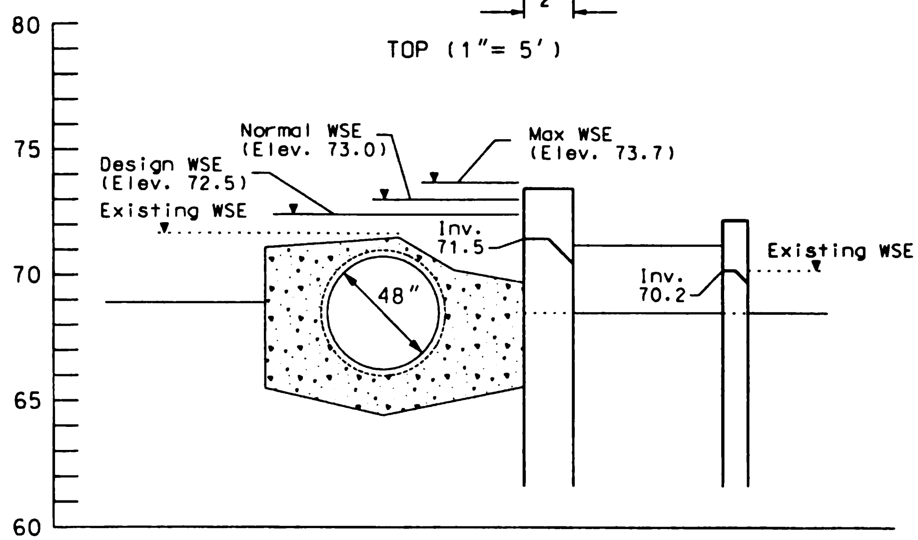
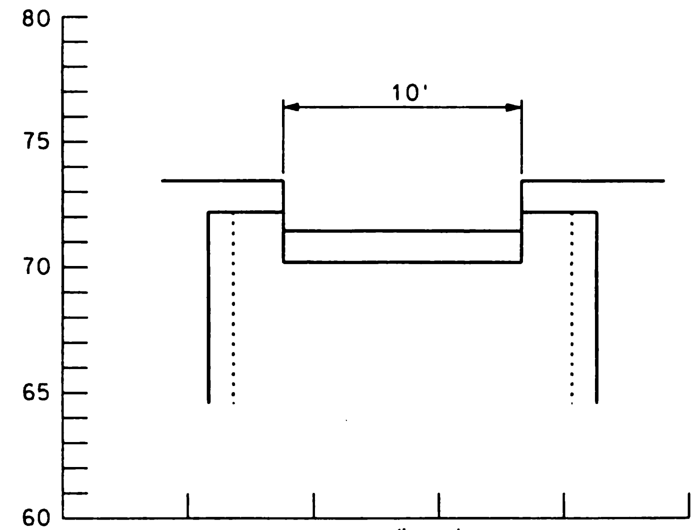


TOP (1"= 5')



X-SECTION (1"= 5')



FRONT (1"= 5')

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE RC 5

NOVEMBER 1999 | SCALE AS SHOWN

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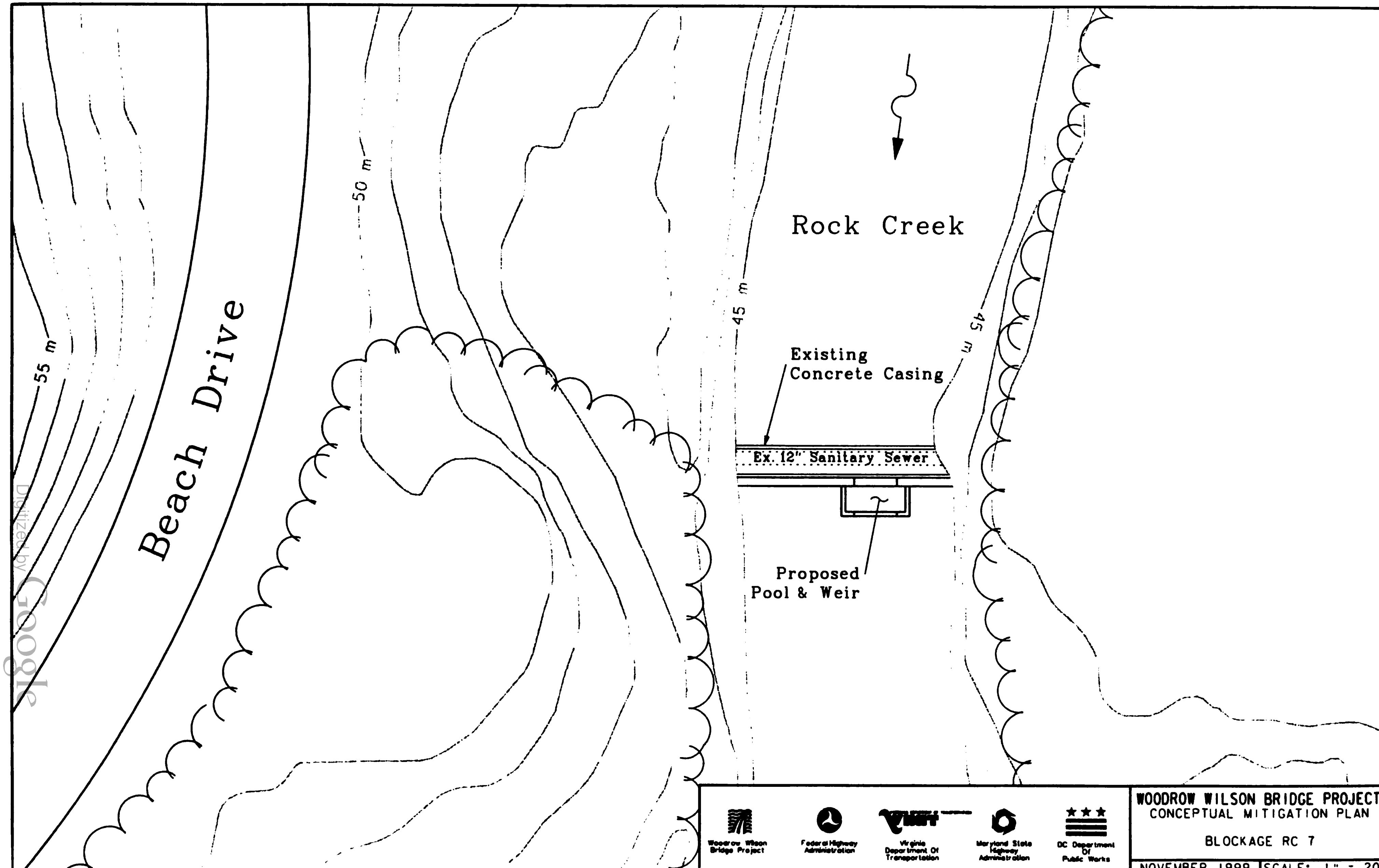

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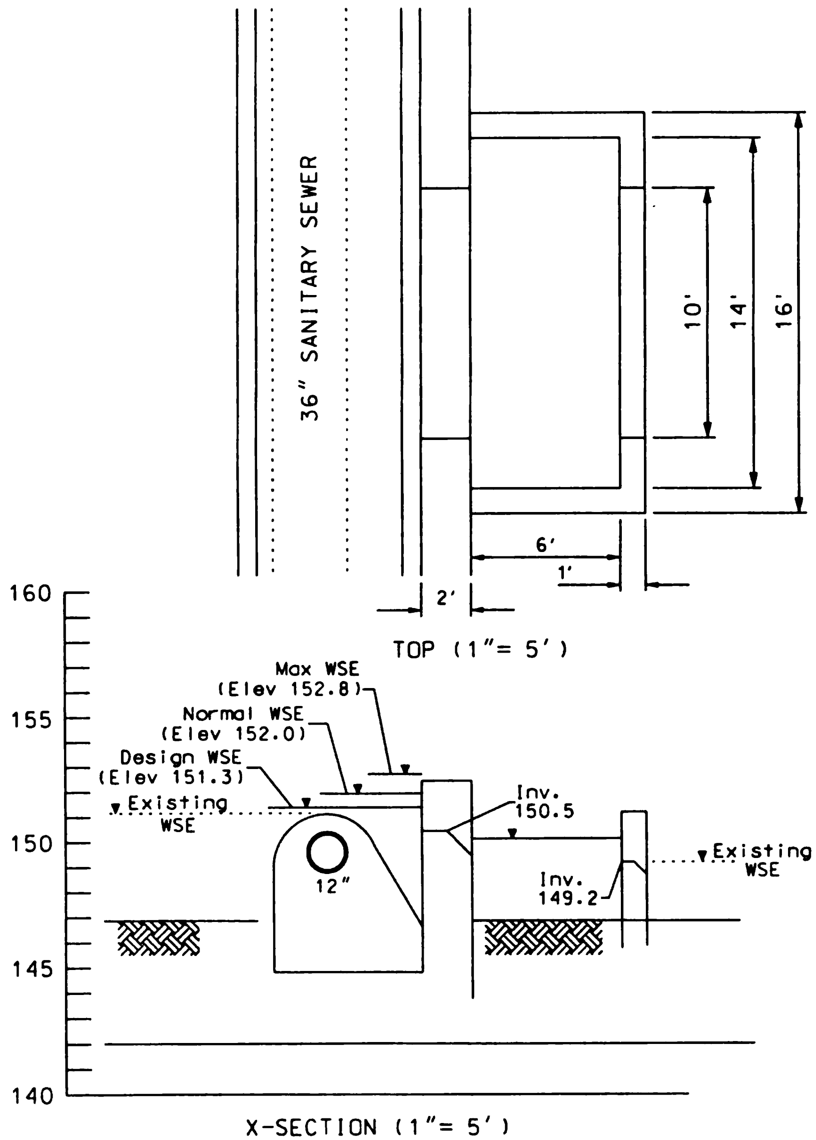

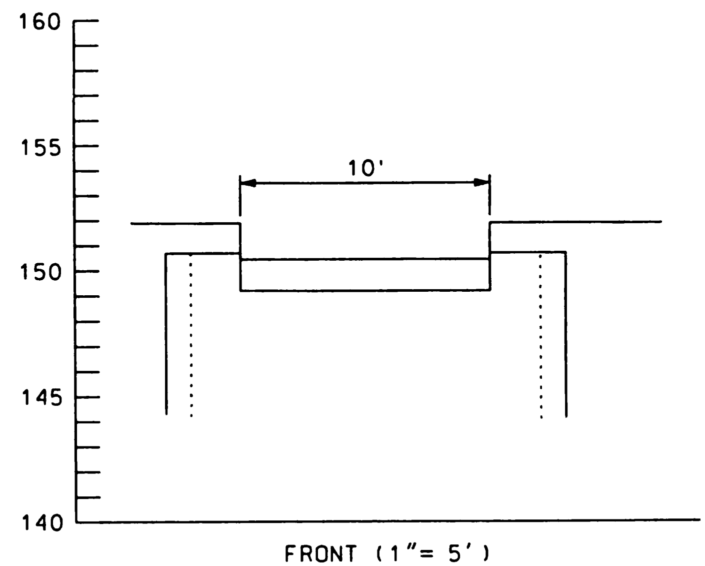

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE RC 7

NOVEMBER 1999 | SCALE AS SHOWN

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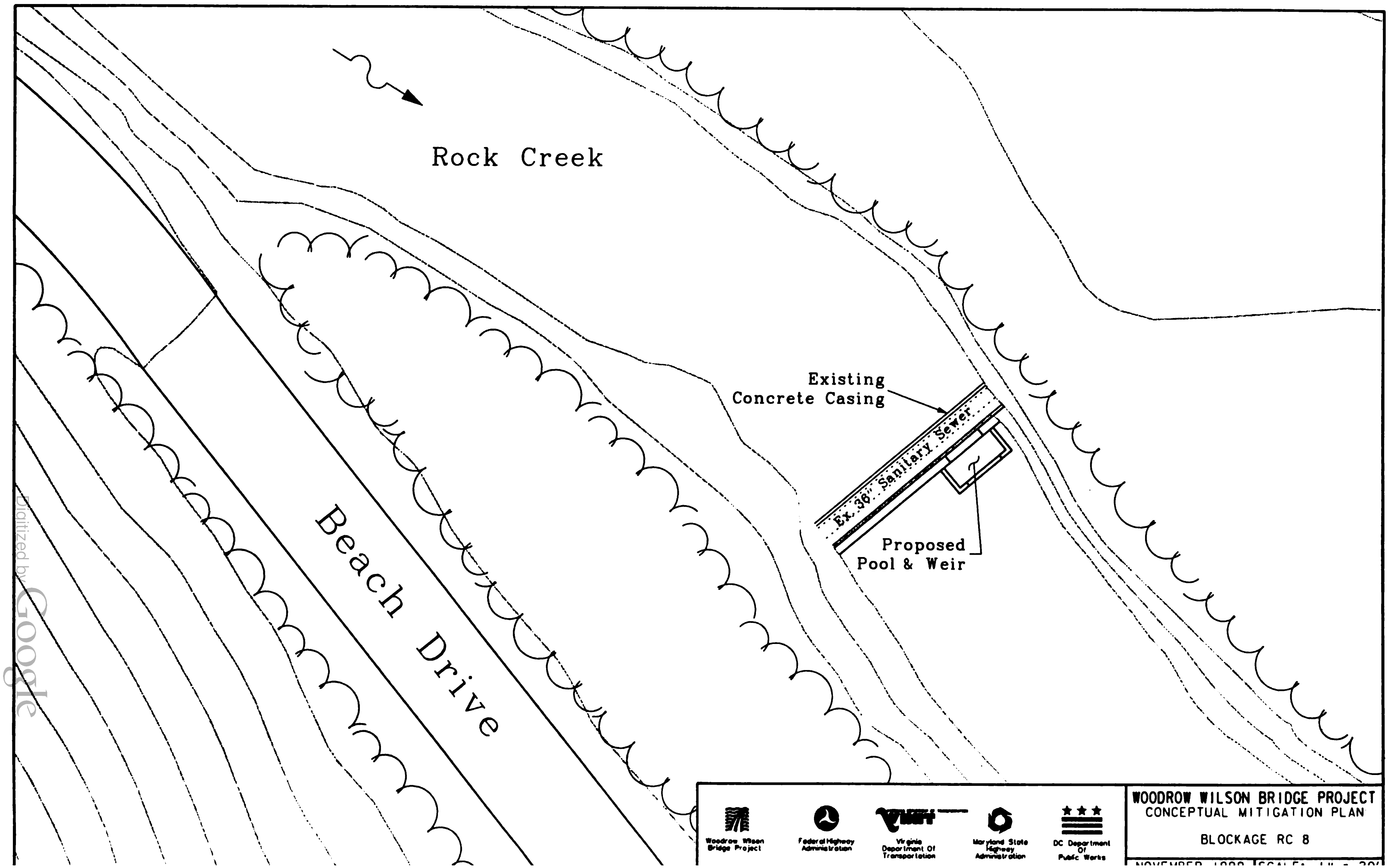

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE RC 8

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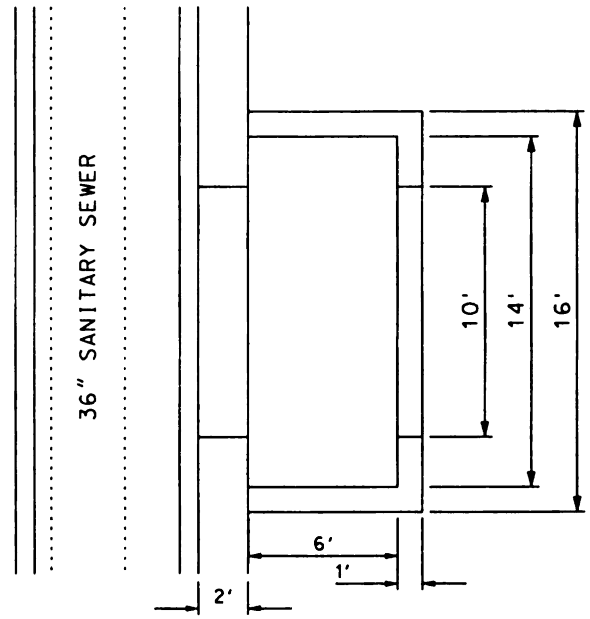

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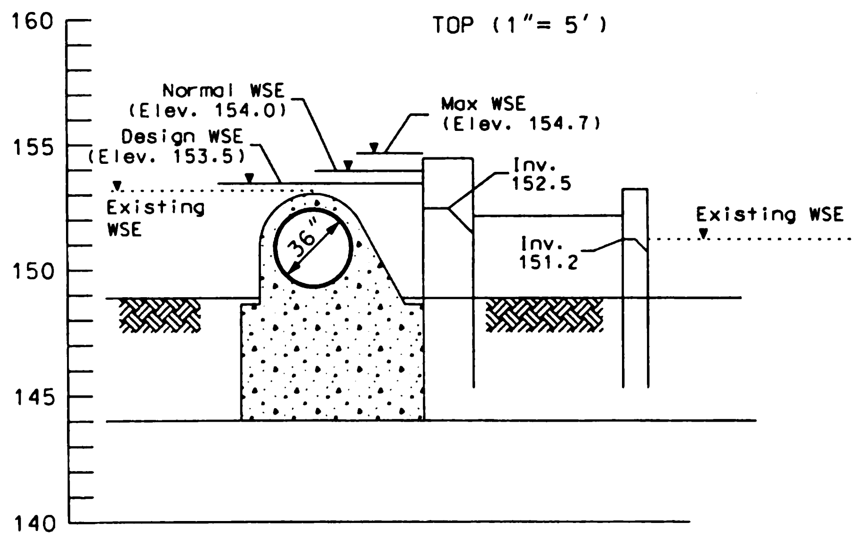
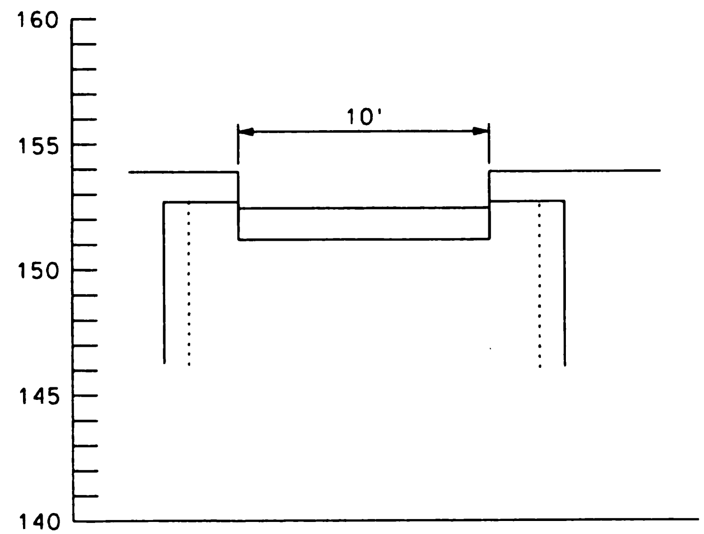


X-SECTION (1"= 5')



FRONT (1"= 5')

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE RC 8

NOVEMBER 1999 | SCALE AS SHOWN

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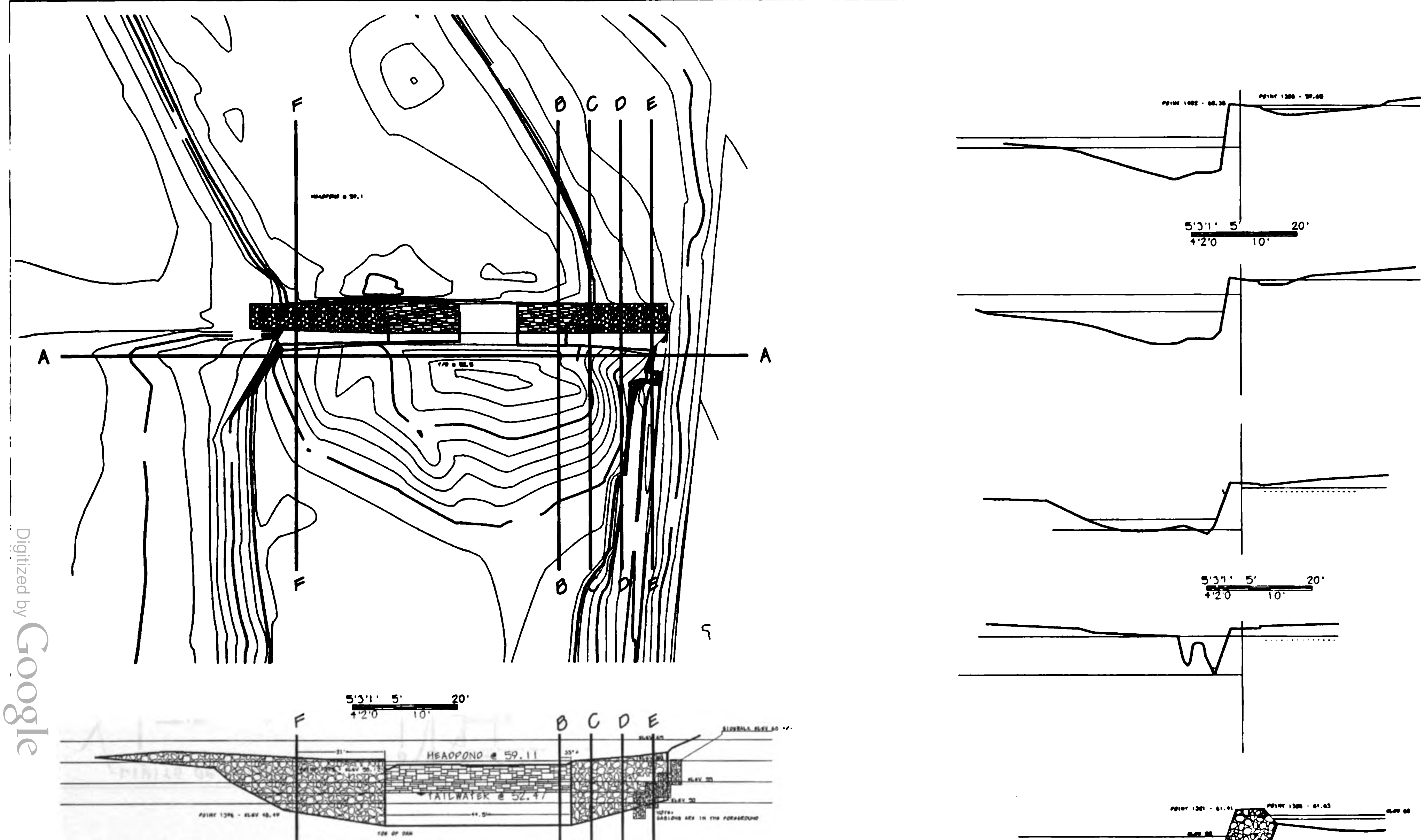
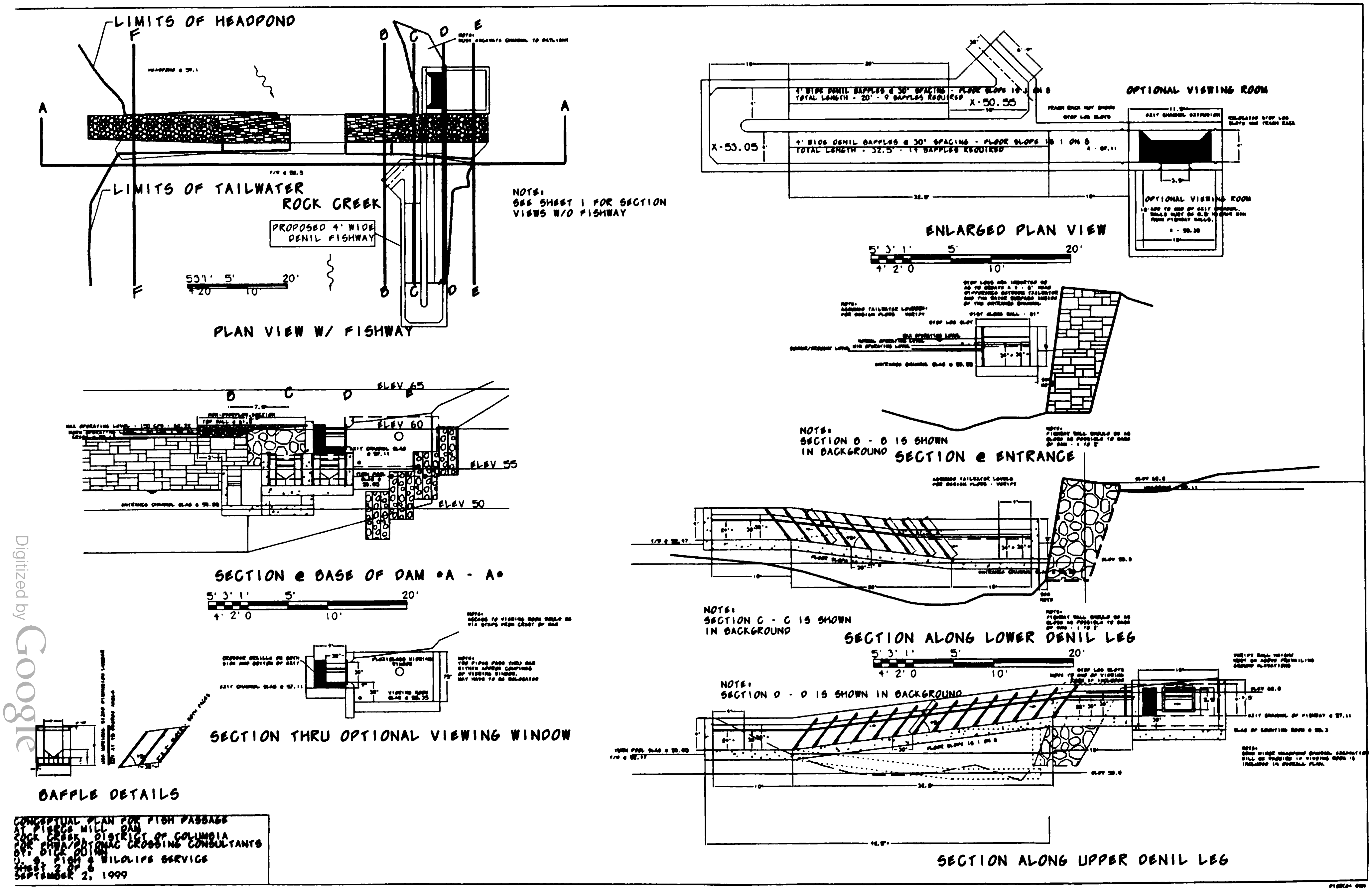


CONCEPTUAL PLAN FOR FISH PASSAGE
AT PIERCE MILL DAM
ROCK CREEK, DISTRICT OF COLUMBIA
FOR SPTA/POTOMAC CROSSING CONSULTANTS
BY: DICK QUINN
U.S. FISH & WILDLIFE SERVICE
SHEET 1 OF 6
SEPTEMBER 2, [illegible]



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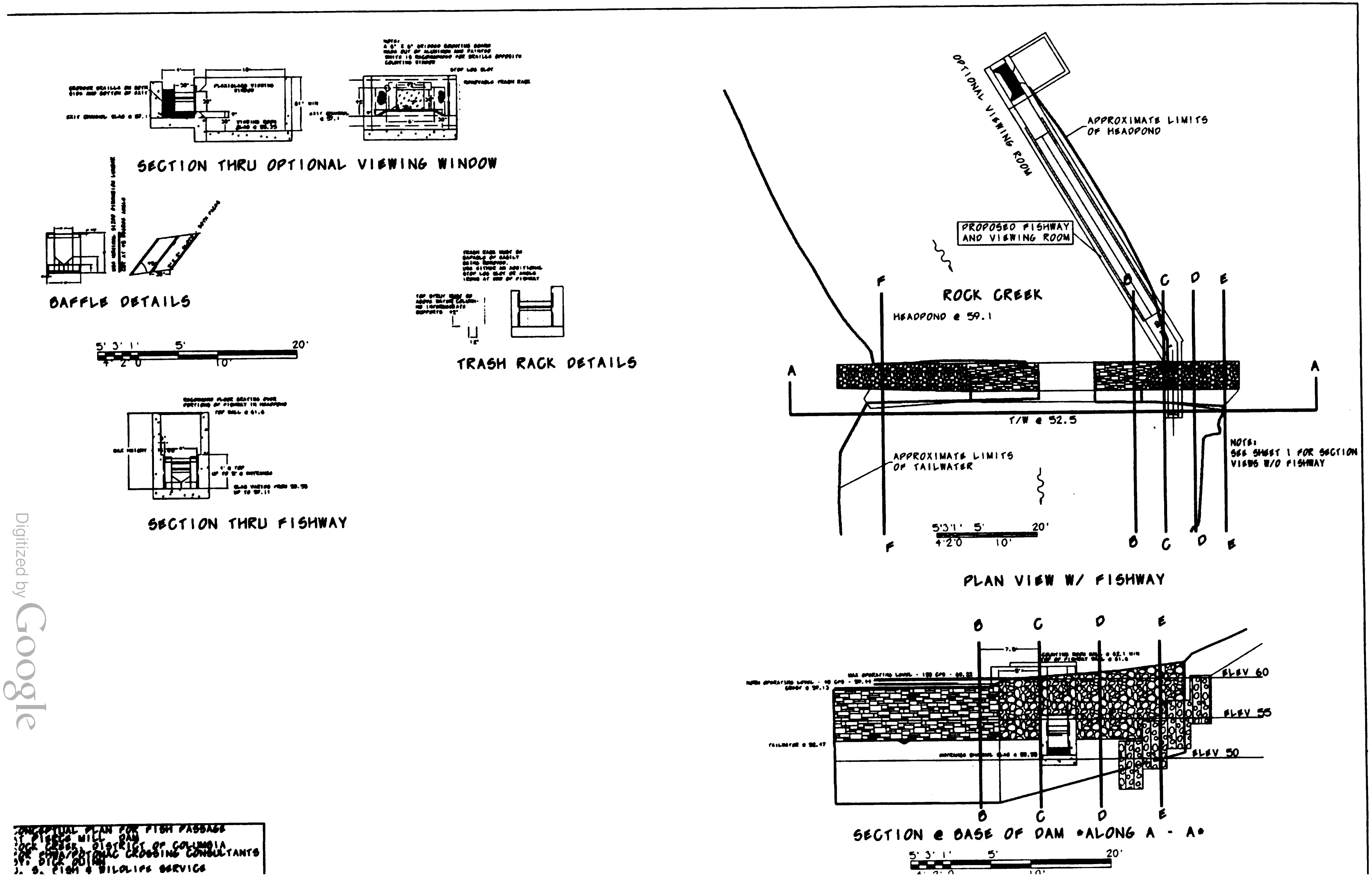
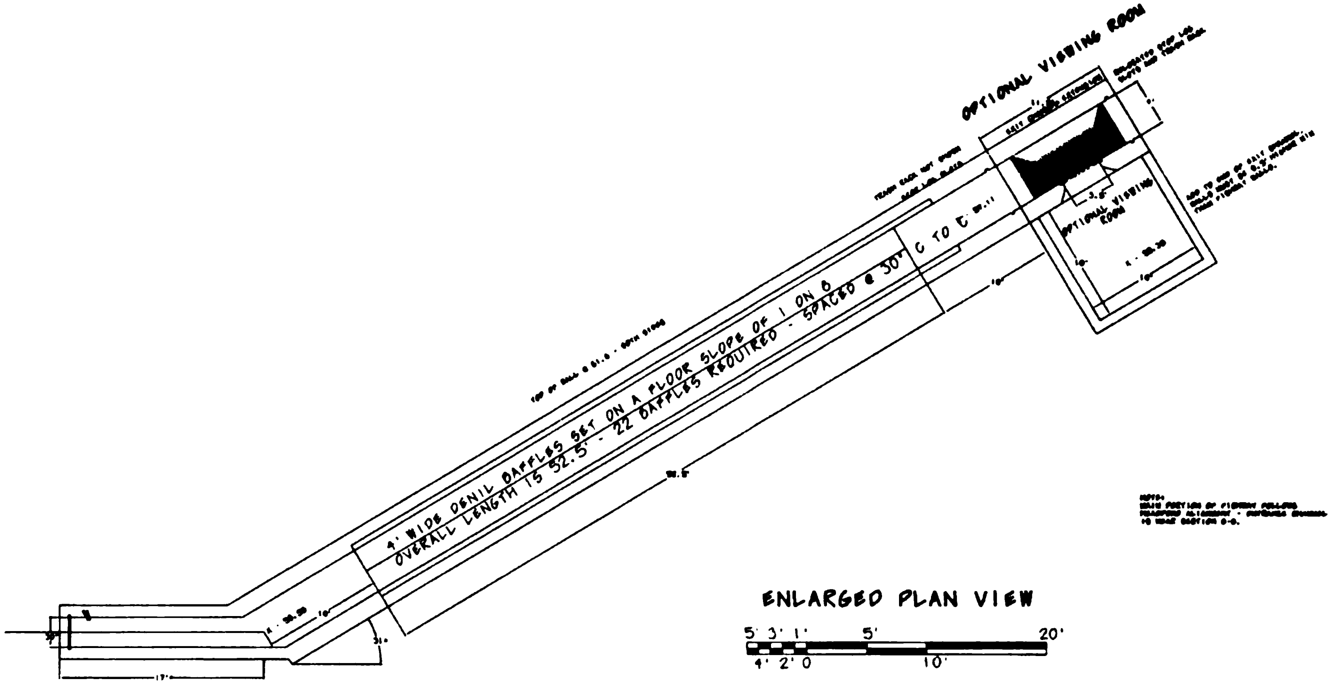
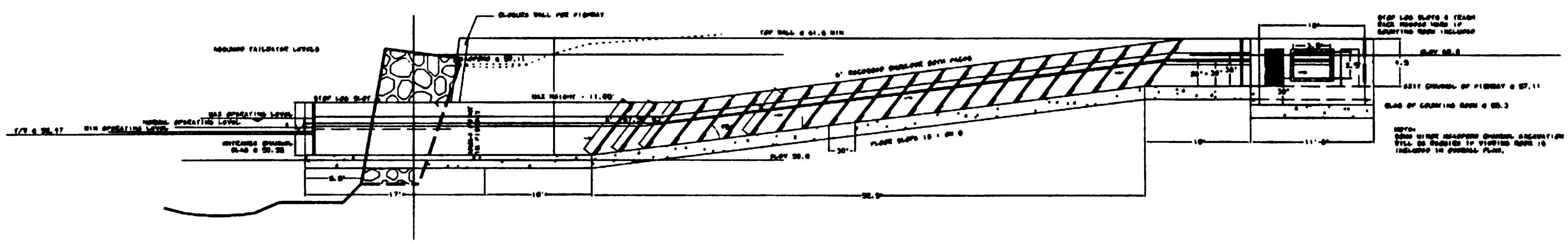

SECTION THRU OPTIONAL VIEWING WINDOW
BAFFLE DETAILS
TRASH RACK DETAILS
SECTION THRU FISHWAY
OPTIONAL VIEWING ROOM
APPROXIMATE LIMITS OF HEADPOND
PROPOSED FISHWAY AND VIEWING ROOM
ROCK CREEK
HEADPOND @ 59.1
T/W @ 52.5
APPROXIMATE LIMITS OF TAILWATER
NOTE: SEE SHEET 1 FOR SECTION VIEWS W/O FISHWAY
PLAN VIEW W/ FISHWAY
ELEV 60
ELEV 55
ELEV 50
SECTION @ BASE OF DAM "ALONG A - A"
PLAN FOR FISH PASSAGE
FISH & WILDLIFE SERVICE



ENLARGED PLAN VIEW

5' 3' 1' 5' 20'
4' 2' 0 10'



SECTION ALONG DENIL FISHWAY
ALONG SECTION C-C

5' 3' 1' 5' 20'
4' 2' 0 10'

CONCEPTUAL PLAN FOR FISH PASSAGE
AT PIERCE MILL DAM
ROCK CREEK, DISTRICT OF COLUMBIA
FOR CHWA/POTOMAC CROSSING CONSULTANTS
BY: DICK QUINN
U.S. FISH & WILDLIFE SERVICE
SHEET 2 OF 6
SEPTEMBER 2, 1999

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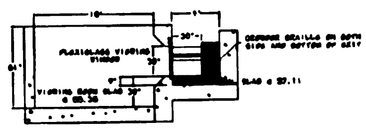
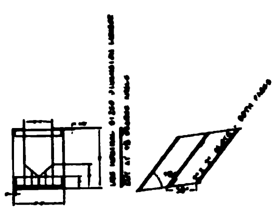
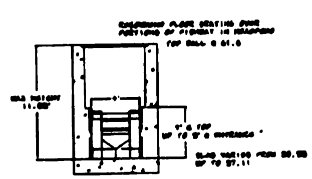


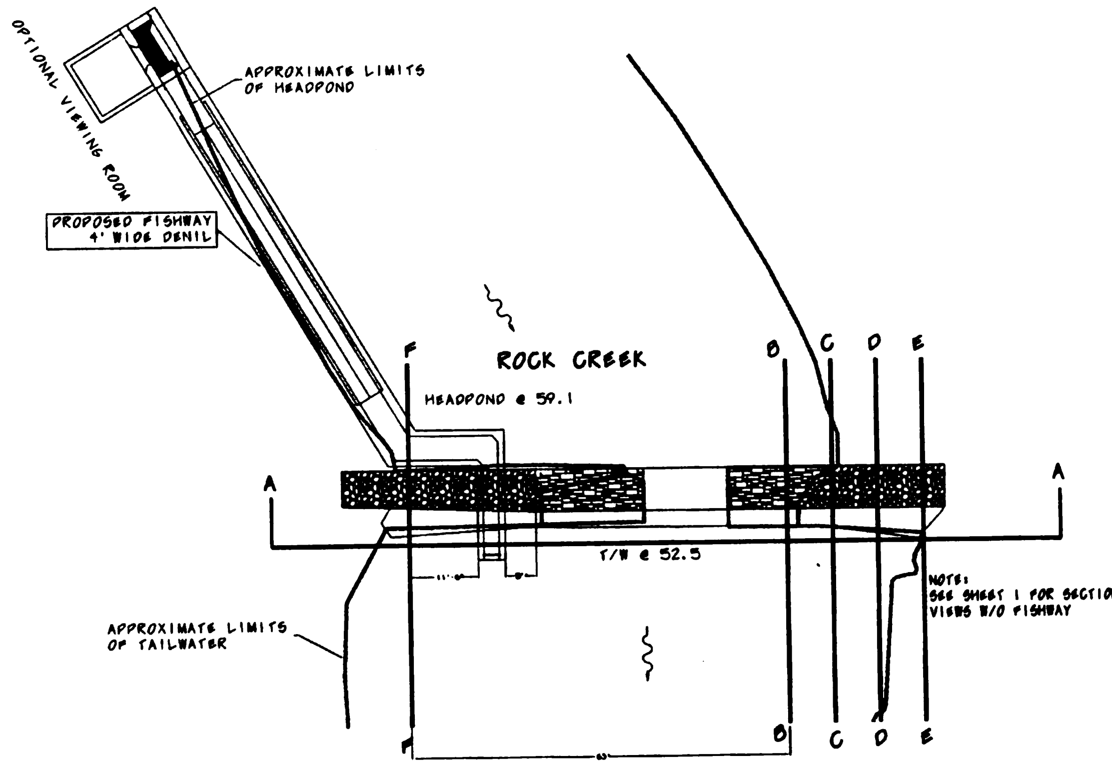
SECTION THRU OPTIONAL VIEWING WINDOW



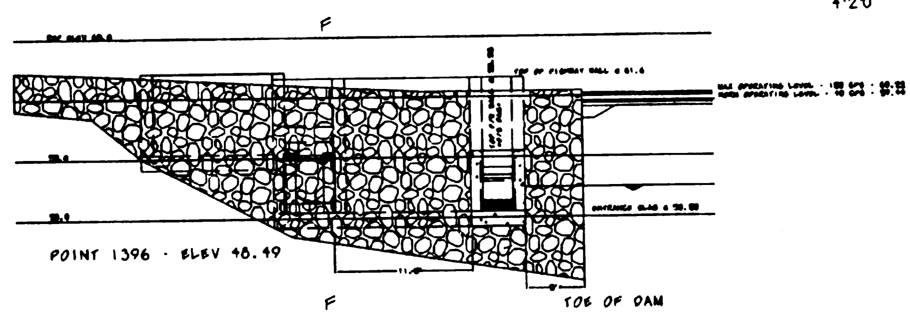
BAFFLE DETAILS



SECTION THRU FISHWAY

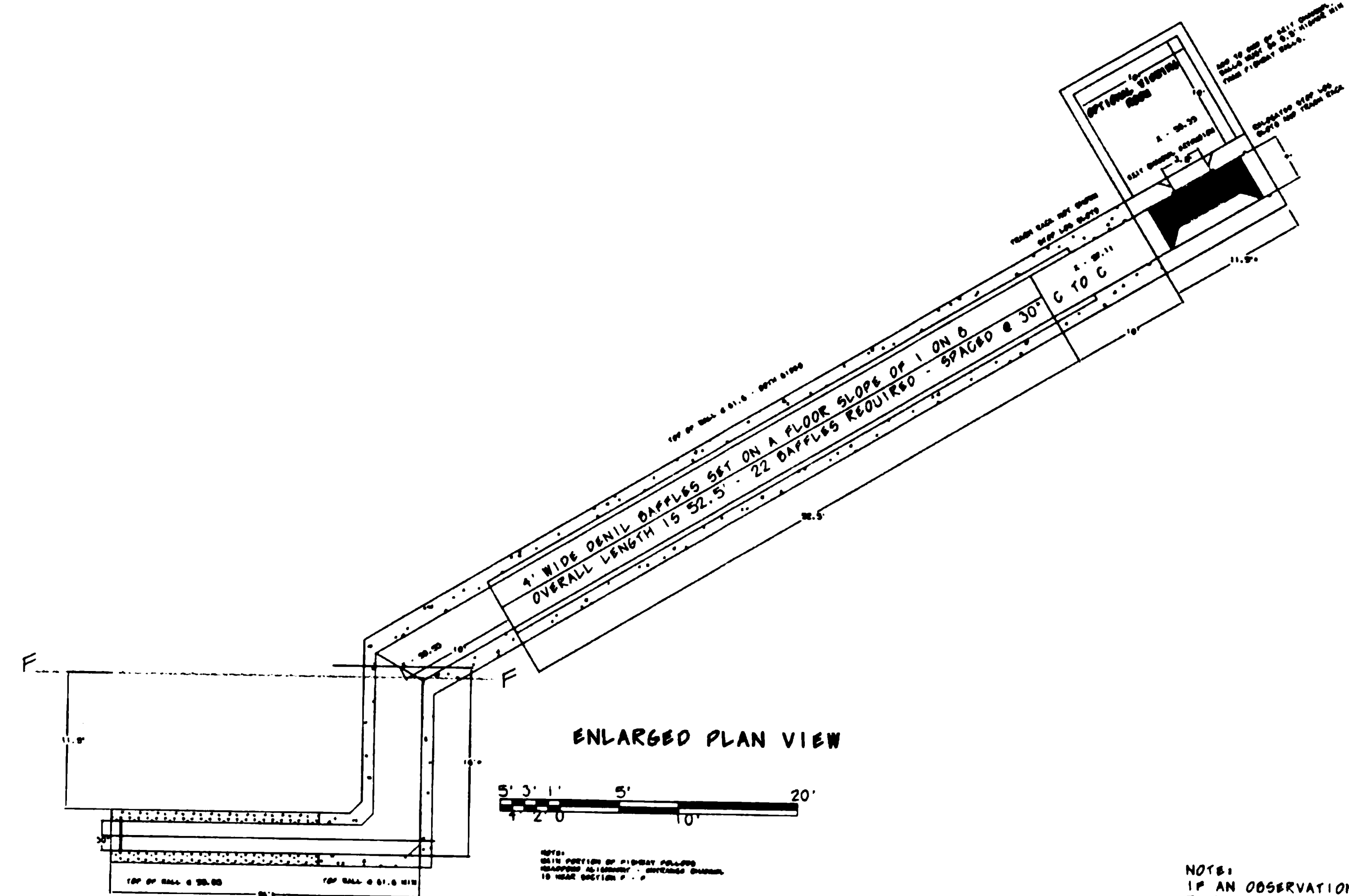


PLAN VIEW W/ FISHWAY



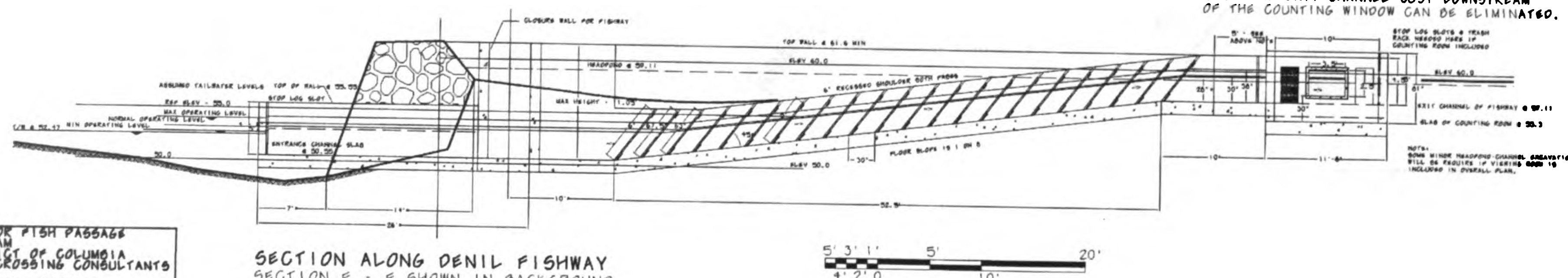
SECTION @ BASE OF DAM "ALONG A - A"

CONCEPTUAL PLAN FOR FISH PASSAGE
PIERCE MILL DAM
ROCK CREEK, DISTRICT OF COLUMBIA
CONSULTANTS
U.S. FISH & WILDLIFE SERVICE



ENLARGED PLAN VIEW

NOTE:
IF AN OBSERVATION WINDOW IS INCLUDED,
5' OF THE EXIT CHANNEL JUST DOWNSTREAM
OF THE COUNTING WINDOW CAN BE ELIMINATED.



SECTION ALONG DENIL FISHWAY
SECTION F - F SHOWN IN BACKGROUND

ONCEPTUAL PLAN FOR FISH PASSAGE
T PIERCE MILL DAM
OCK CREEK, DISTRICT OF COLUMBIA
OR FHWA/POTOMAC CROSSING CONSULTANTS
Y: DICK QUINN
. S. FISH & WILDLIFE SERVICE
HEET 6 OF 6
EPTEMBER 2, 1999

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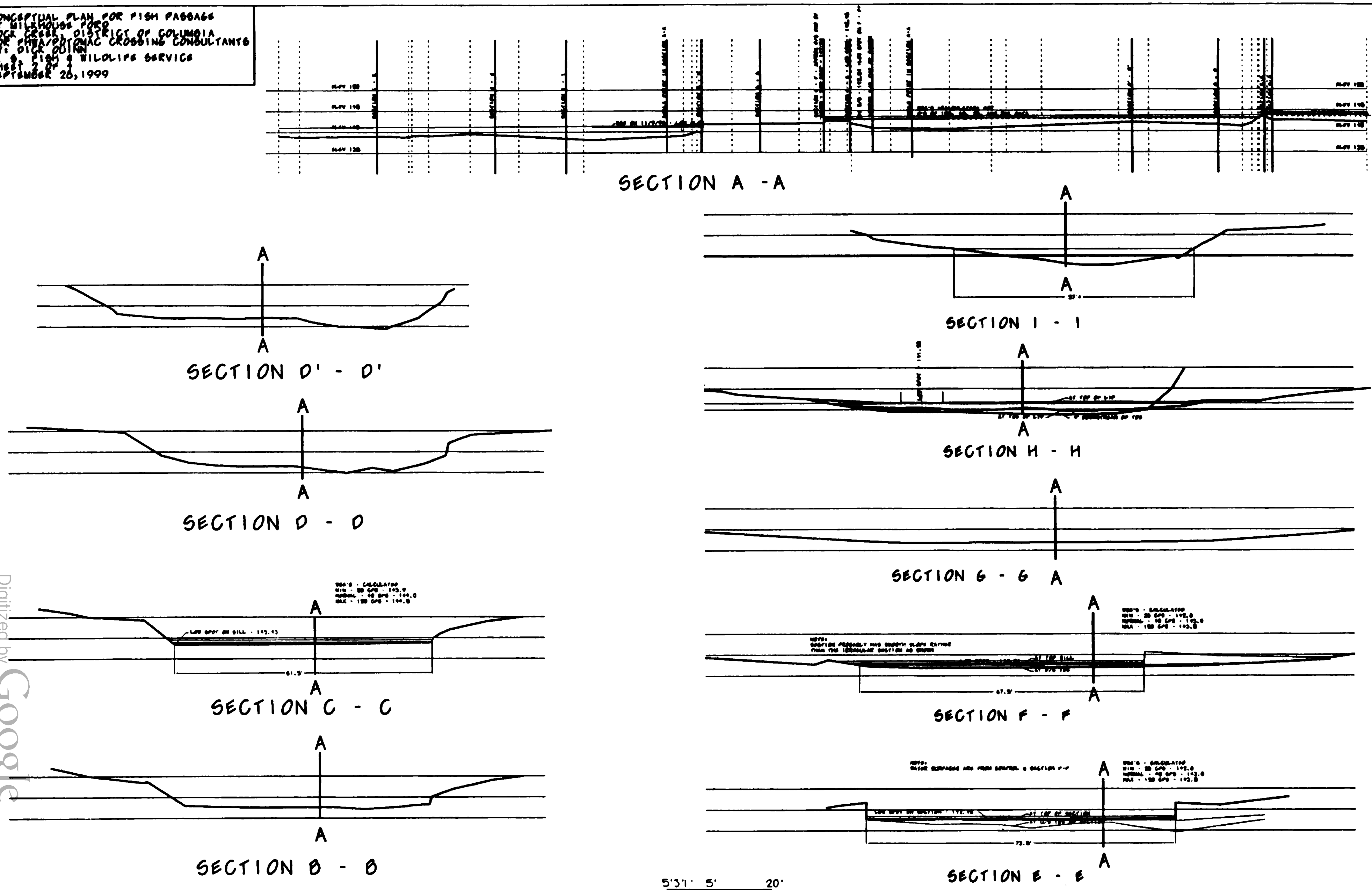
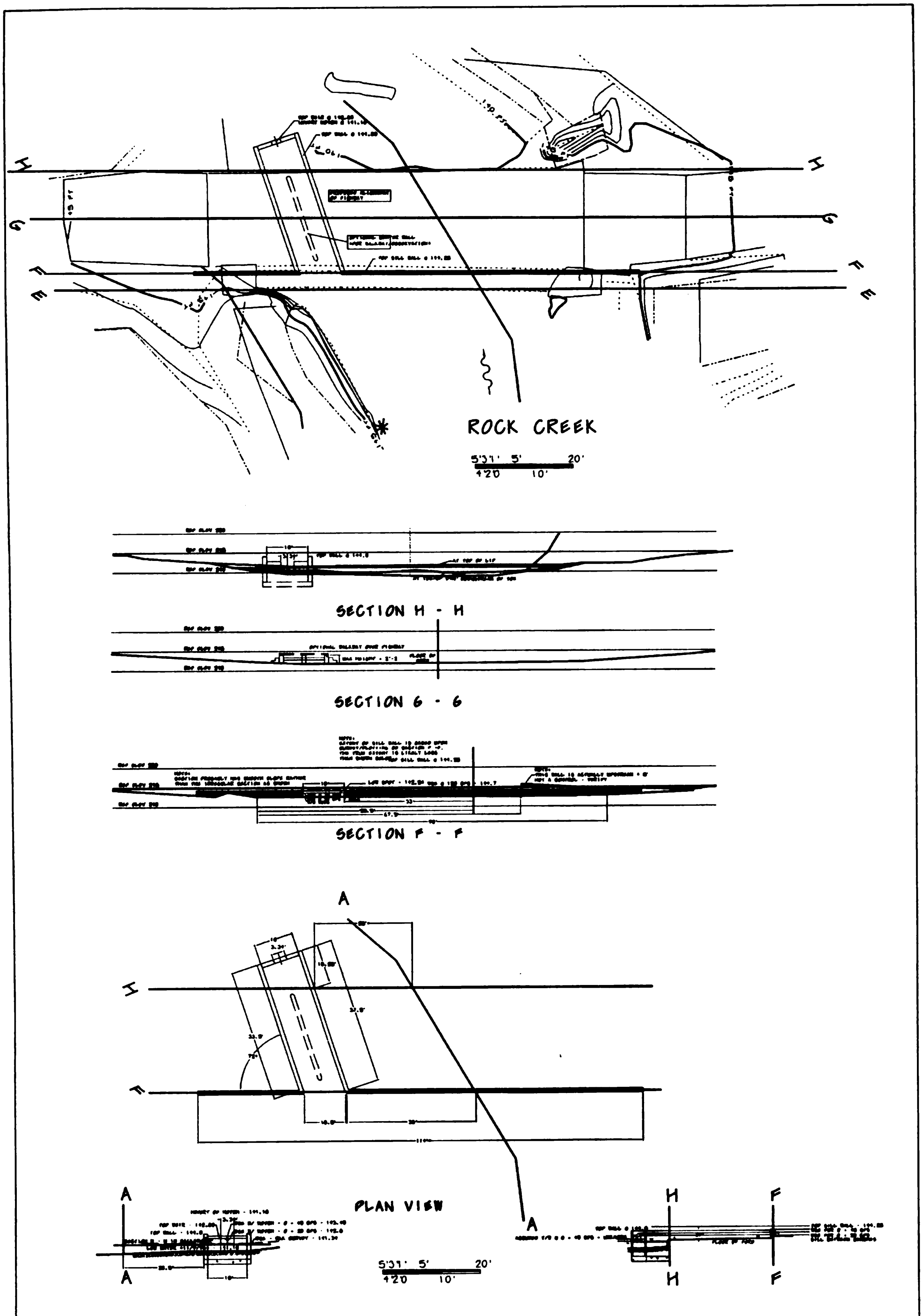
ONCEPTUAL PLAN FOR FISH PASSAGE
T MILKHOUSE FORD
OCK CREEK, DISTRICT OF COLUMBIA
OR FHWA/POTOMAC CROSSING CONSULTANTS
Y: DICK QUINN
. S. FISH & WILDLIFE SERVICE
HEET 2 OF 4
EPTEMBER 20, 1999

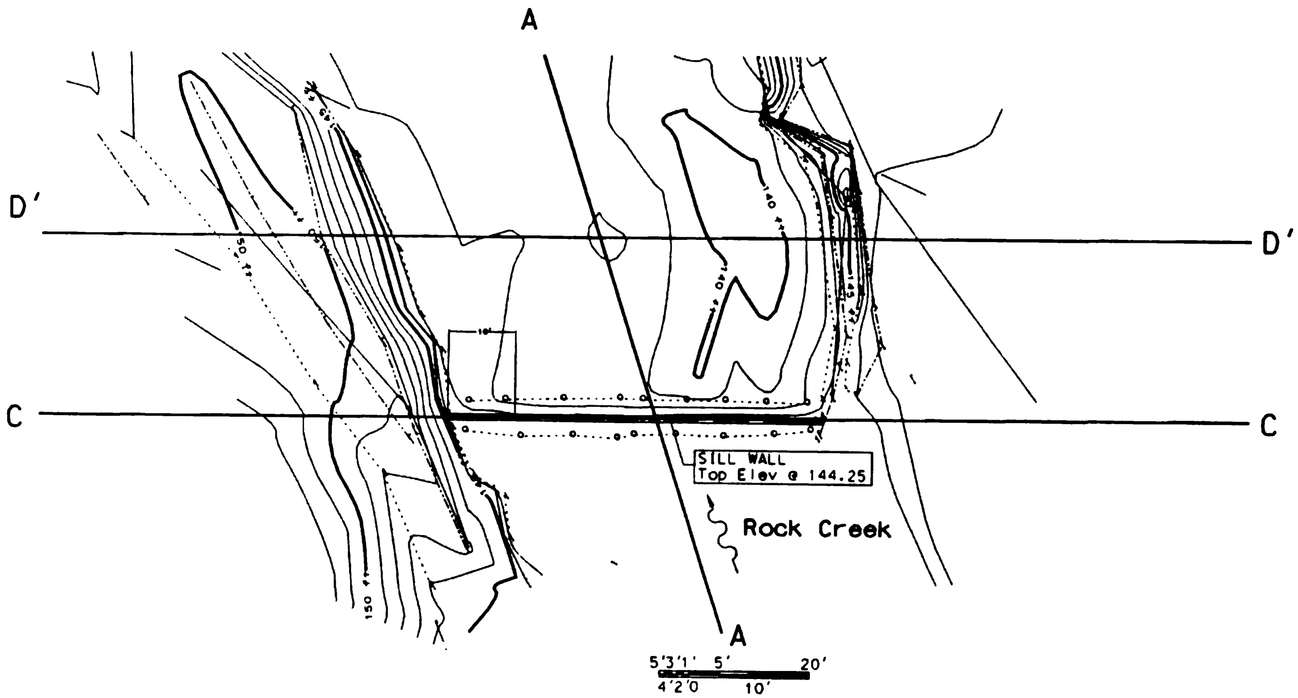


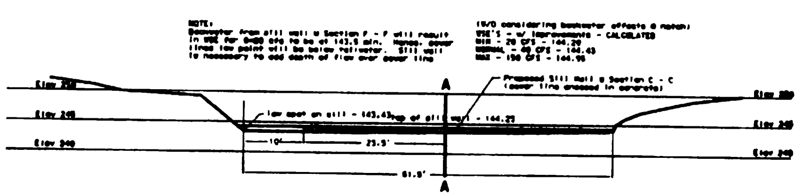


CONCEPTUAL PLAN FOR FISH PASSAGE
AT MILKHOUSE FORD
ROCK CREEK, DISTRICT OF COLUMBIA
FOR: STRA/POTOMAC CROSSING CONSULTANTS
BY: DICK QUINN
U.S. FISH & WILDLIFE SERVICE
SHEET 3 OF 3
OCTOBER 1, 1999

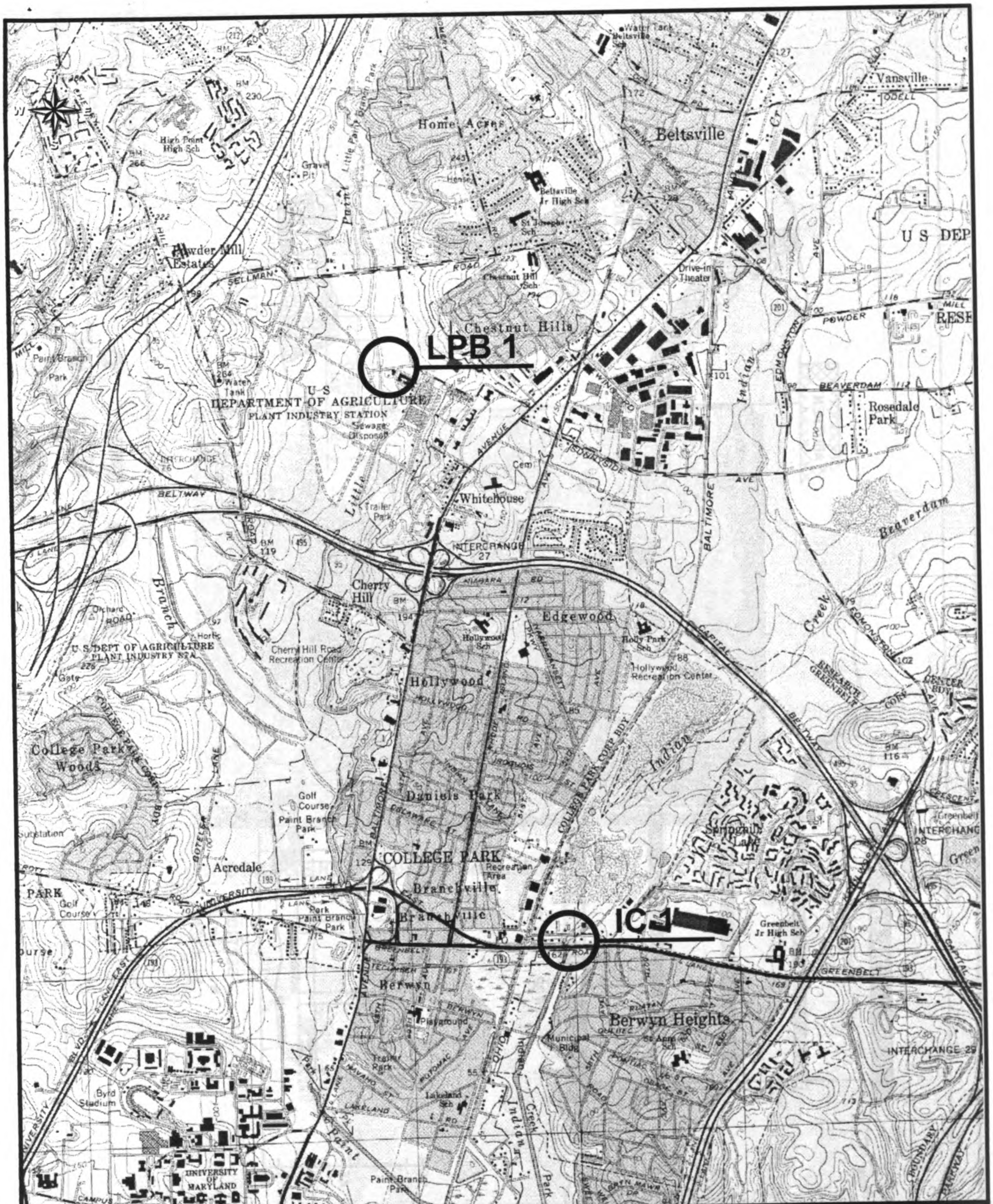
Digitized by Google

NCEPTUAL PLAN FOR FISH PASSAGE
' MILKHOUSE FORD
)CK CREEK, DISTRICT OF COLUMBIA
)R FHWA/POTOMAC CROSSING CONSULTANTS
': DICK QUINN
. S. FISH & WILDLIFE SERVICE
IEET 4 OF 4
:tober 1,1999





SECTION C - C



WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN
Litte Paint Branch Fish Passage Improvements
SITE: LPB 1

Date : December 1999

Scale : 1" = 2000'

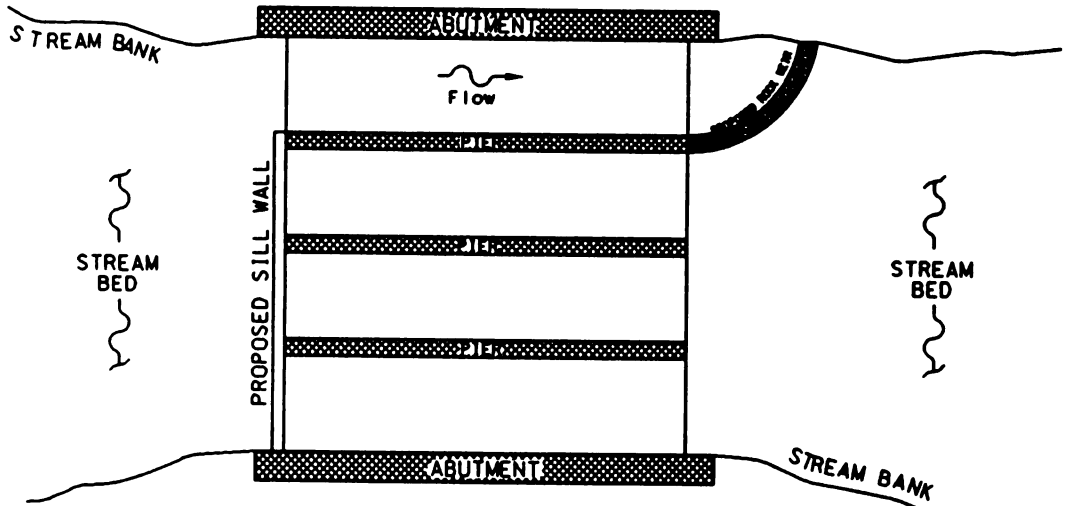
Federal Highway Administration

Virginia Department of Transportation

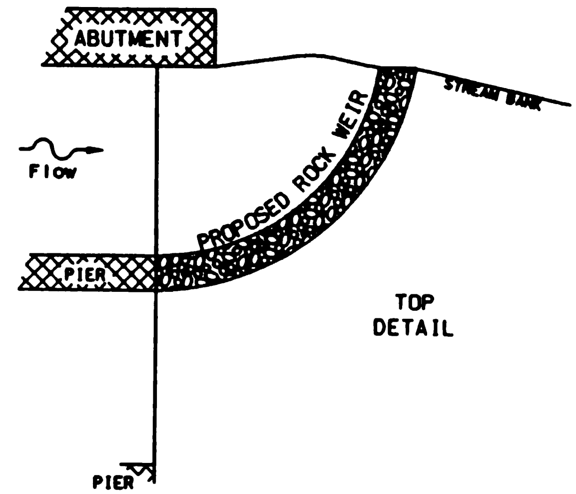
Maryland State Highway Administration

DC Department Of Public Works

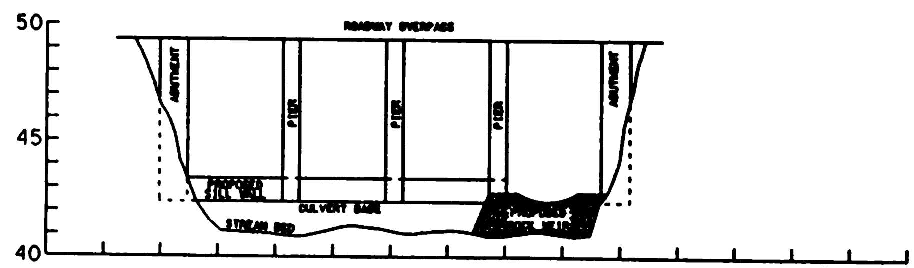
Digitized by Google



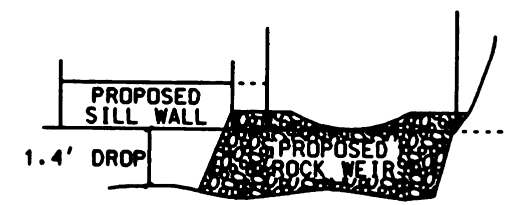
TOP (1"= 20')



TOP
DETAIL



SECTION
H: (1"= 20')
V: (1"=5')



SECTION
DETAIL

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department of Transportation | Maryland State Highway Administration | DC Department of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN
BLOCKAGE IC1

DECEMBER 1999 | SCALE : AS SHOWN

Digitized by Google

BLOCKAGE IC 1: Four cell box culvert

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

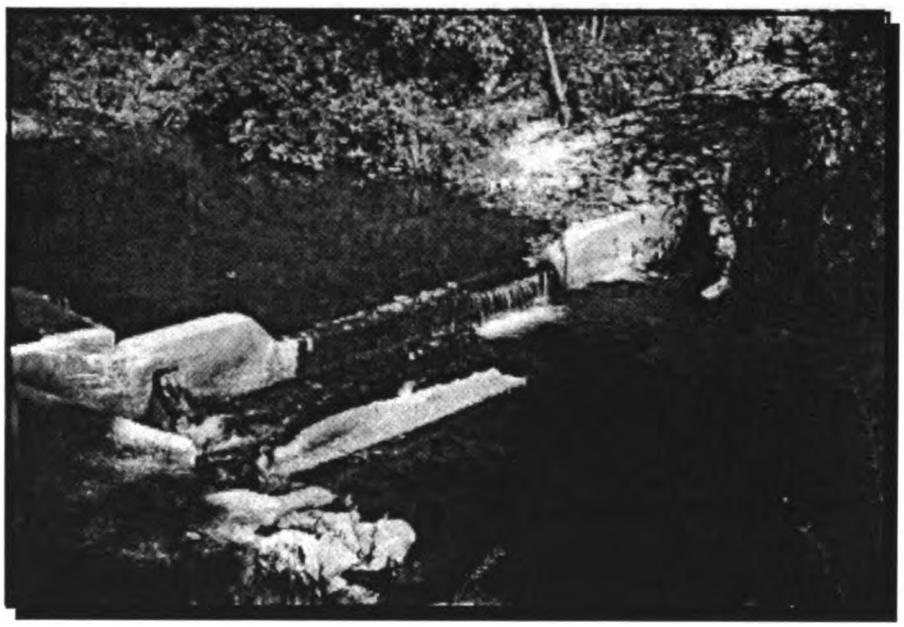
DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Indian Creek Fish Passage Improvements

SITE: IC 1

December, 1999	Not To Scale

Digitized by Google



BLOCKAGE LPB 1: Concrete weir

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT Little Paint Branch Fish Passage Improvements SITE: LPB 1		
December, 1999	Not To Scale	

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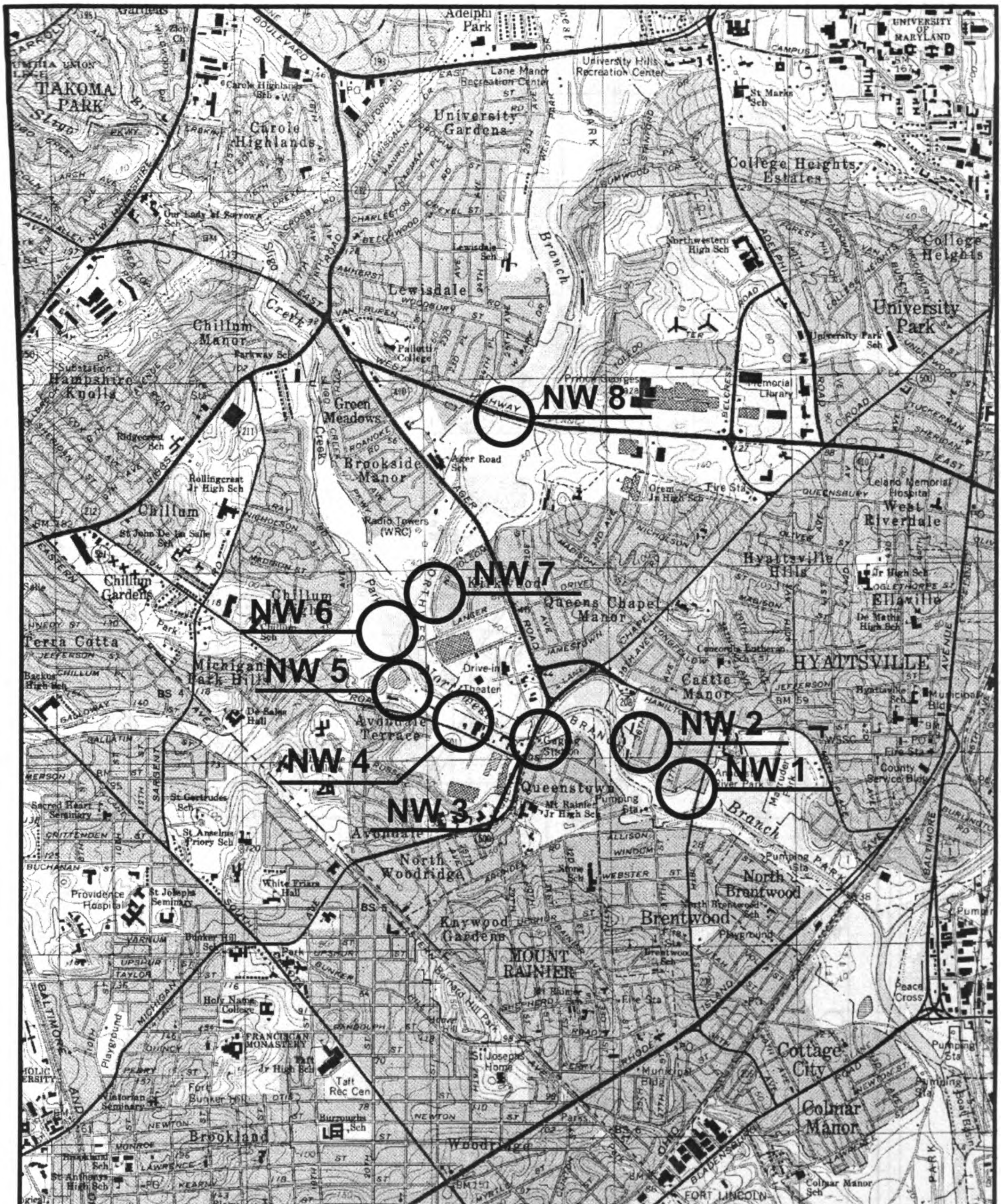


Federal Highway Administration

Virginia Department of Transportation

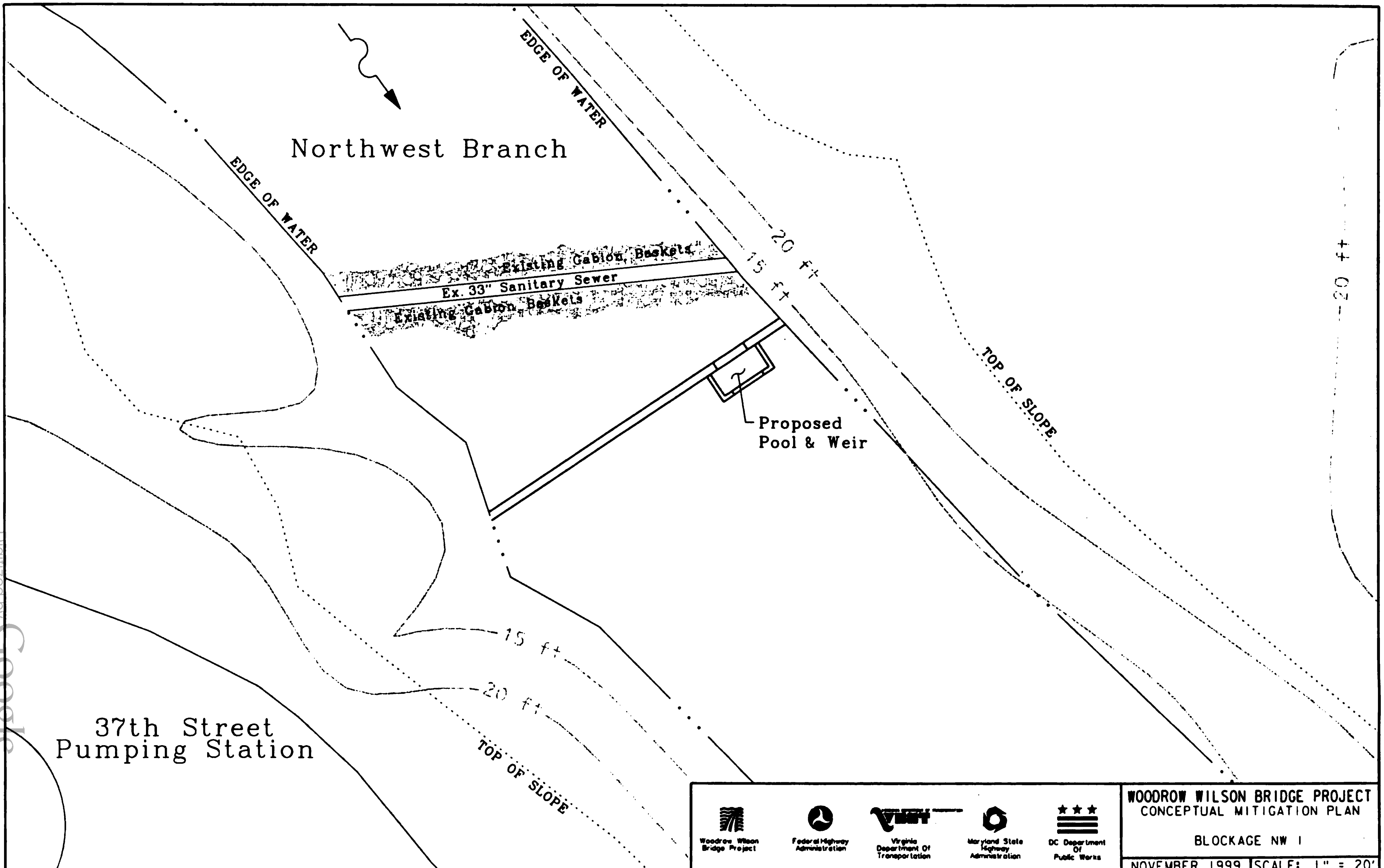
Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN
Northwest Branch Fish Passage Improvements
SITE: NW1, NW 2, NW 3, NW 4, NW 5, NW 6, NW 6A, NW 7, NW 8

Date : December 1999 Scale : 1" = 2000'

Digitized by Google



WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW 1

NOVEMBER 1999 | SCALE: 1" = 20'

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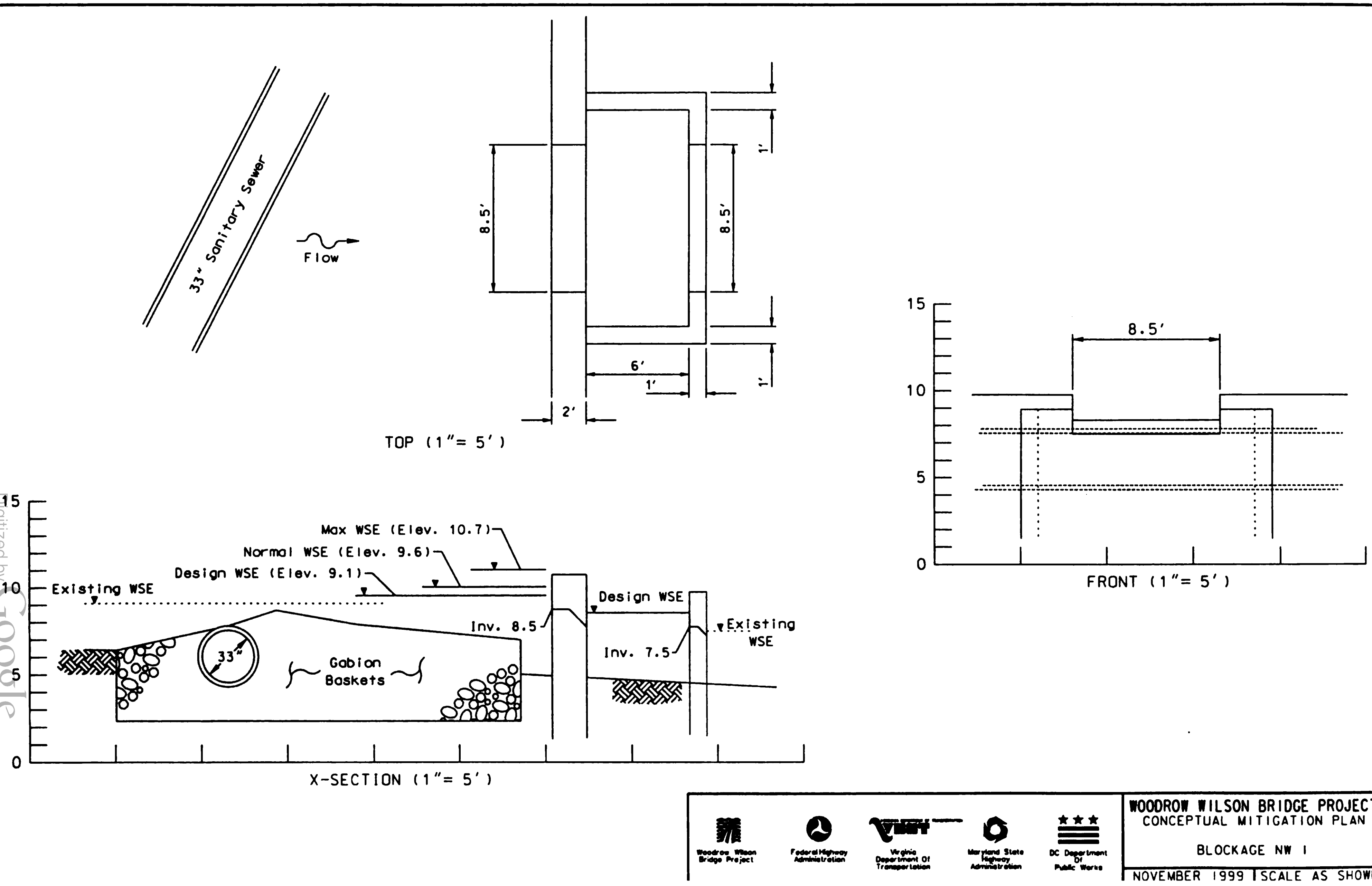
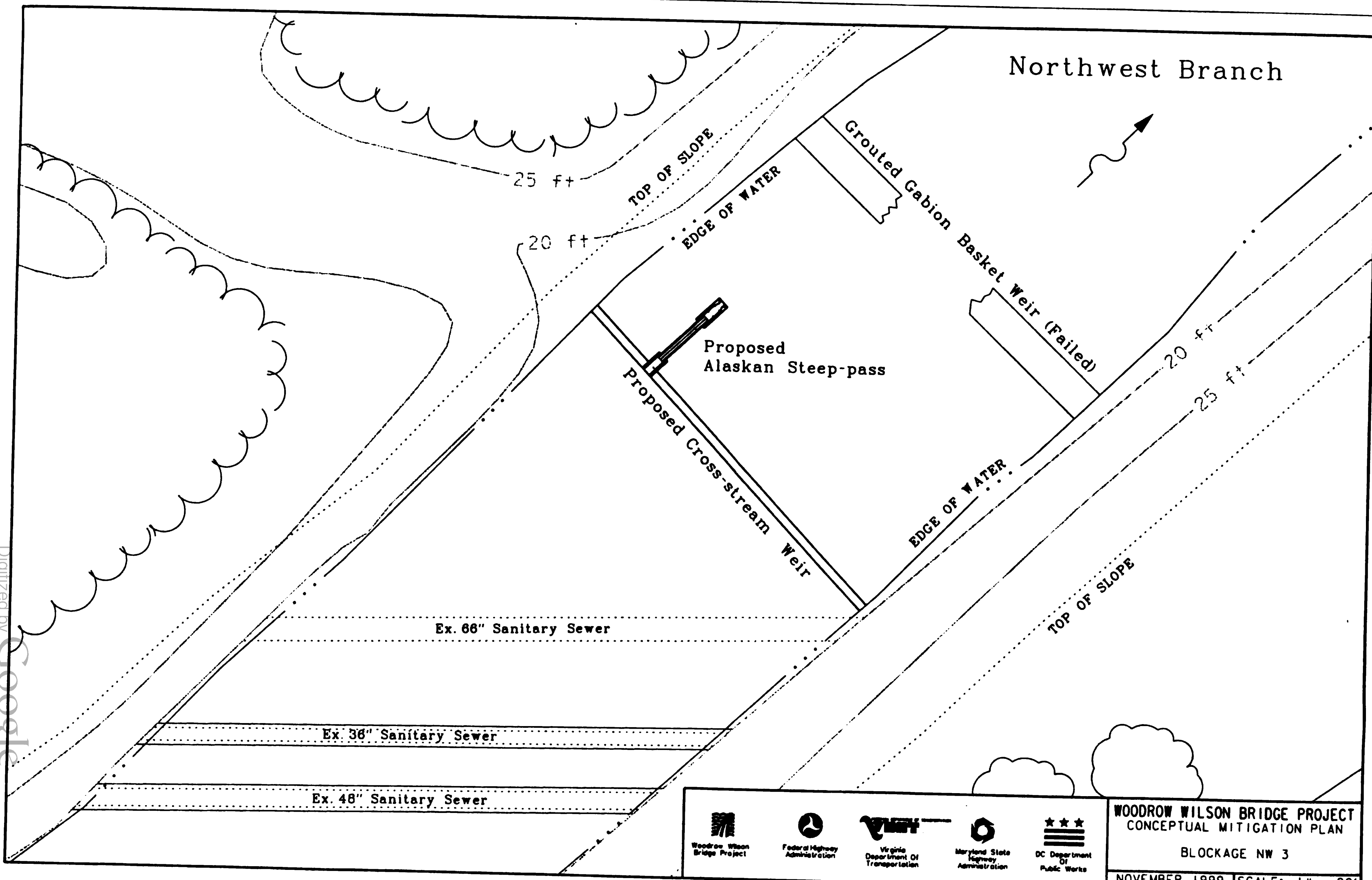


WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW I

NOVEMBER 1999 | SCALE AS SHOWN

Digitized by Google



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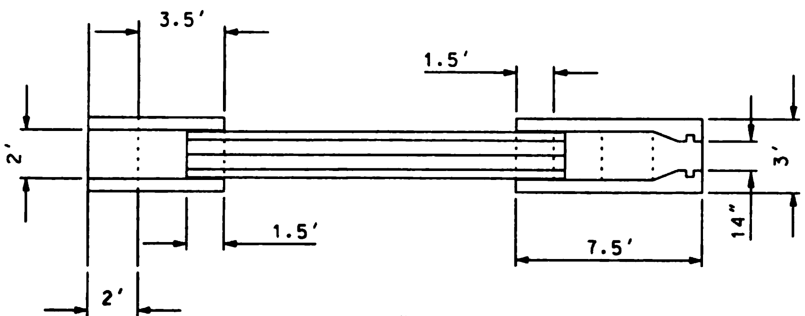
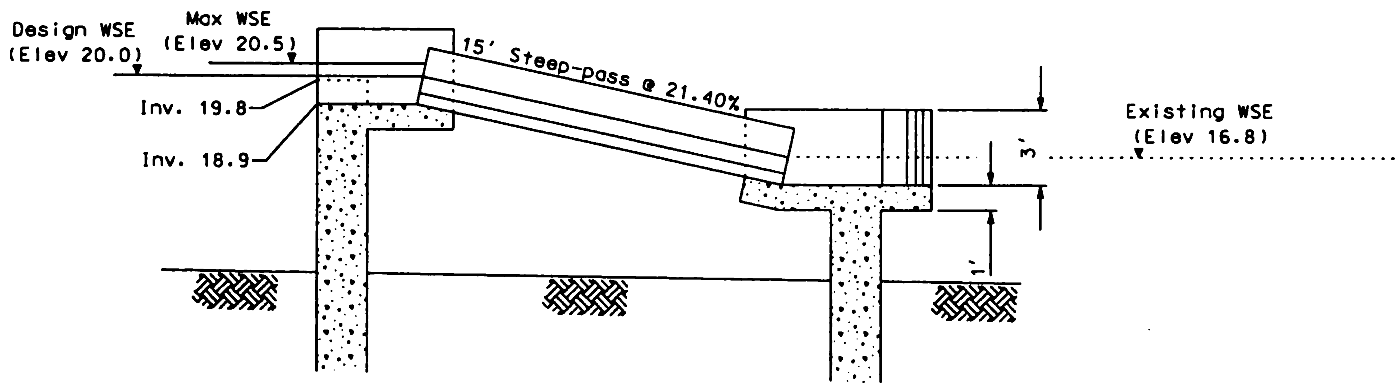
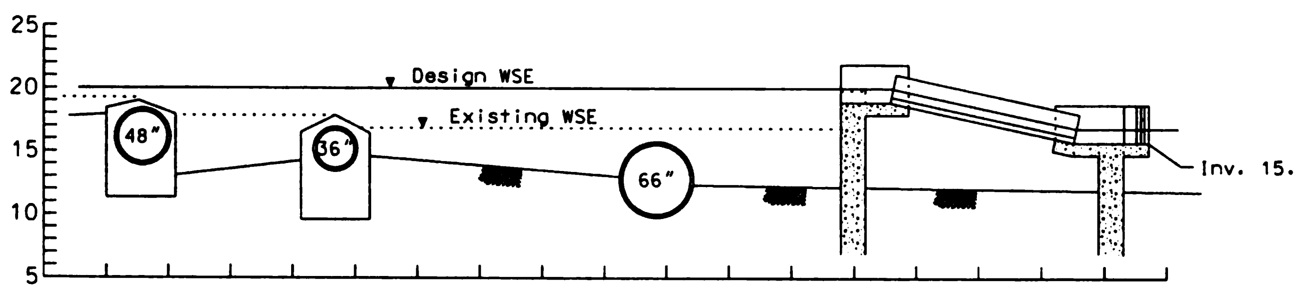


TOP (1"= 5')



DETAIL (1"= 5')



X-SECTION (1"= 10')

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW 3

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

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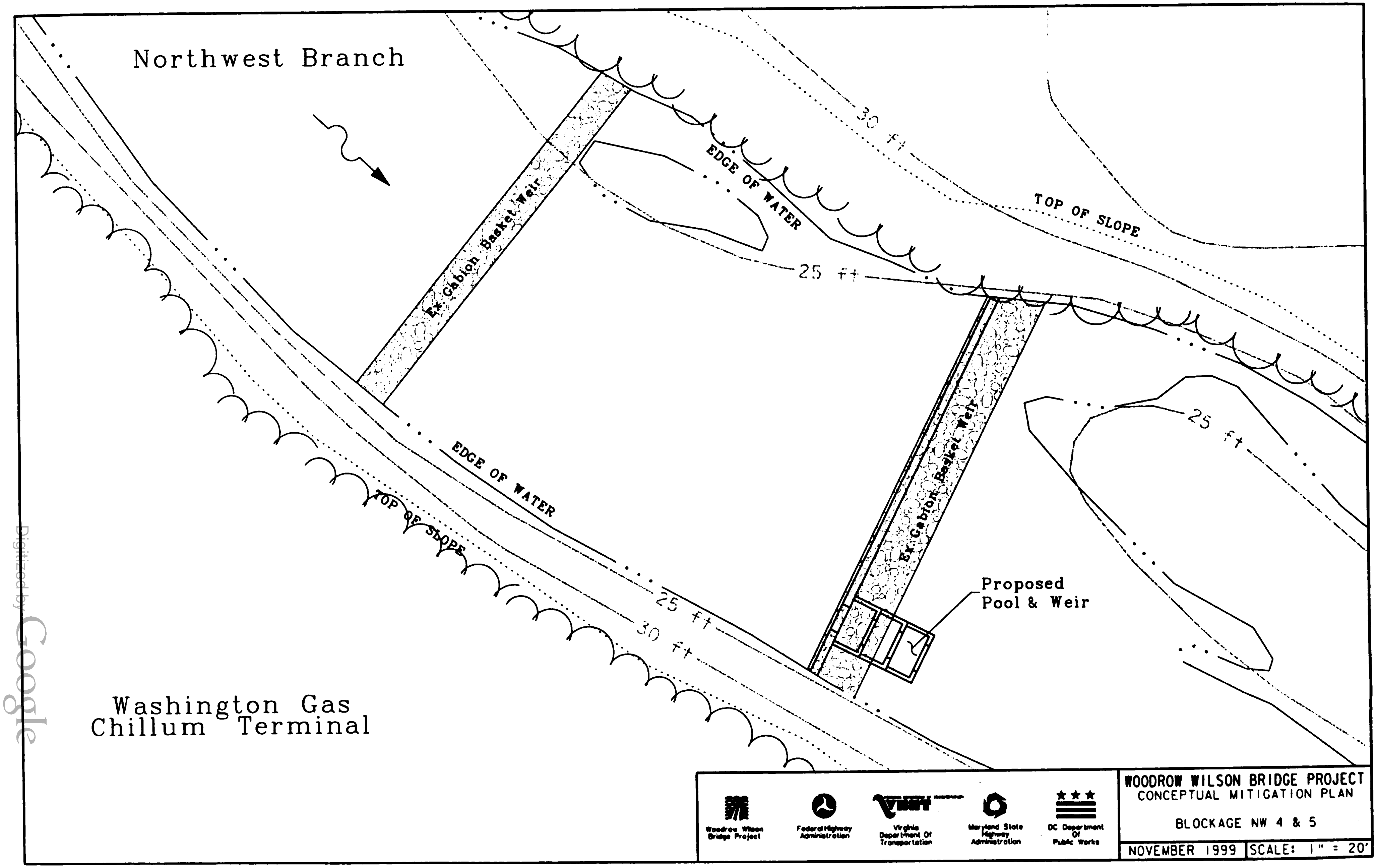
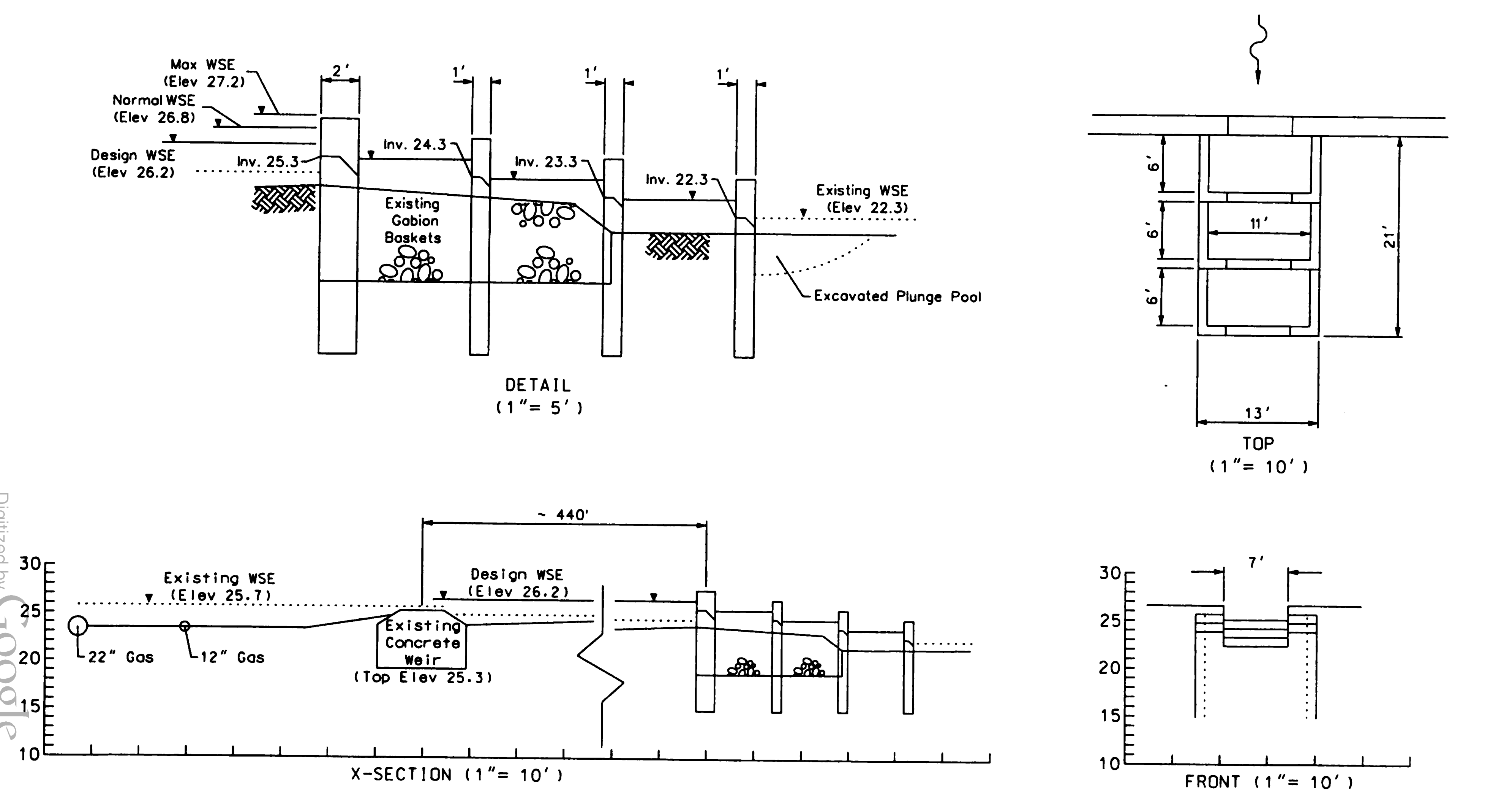
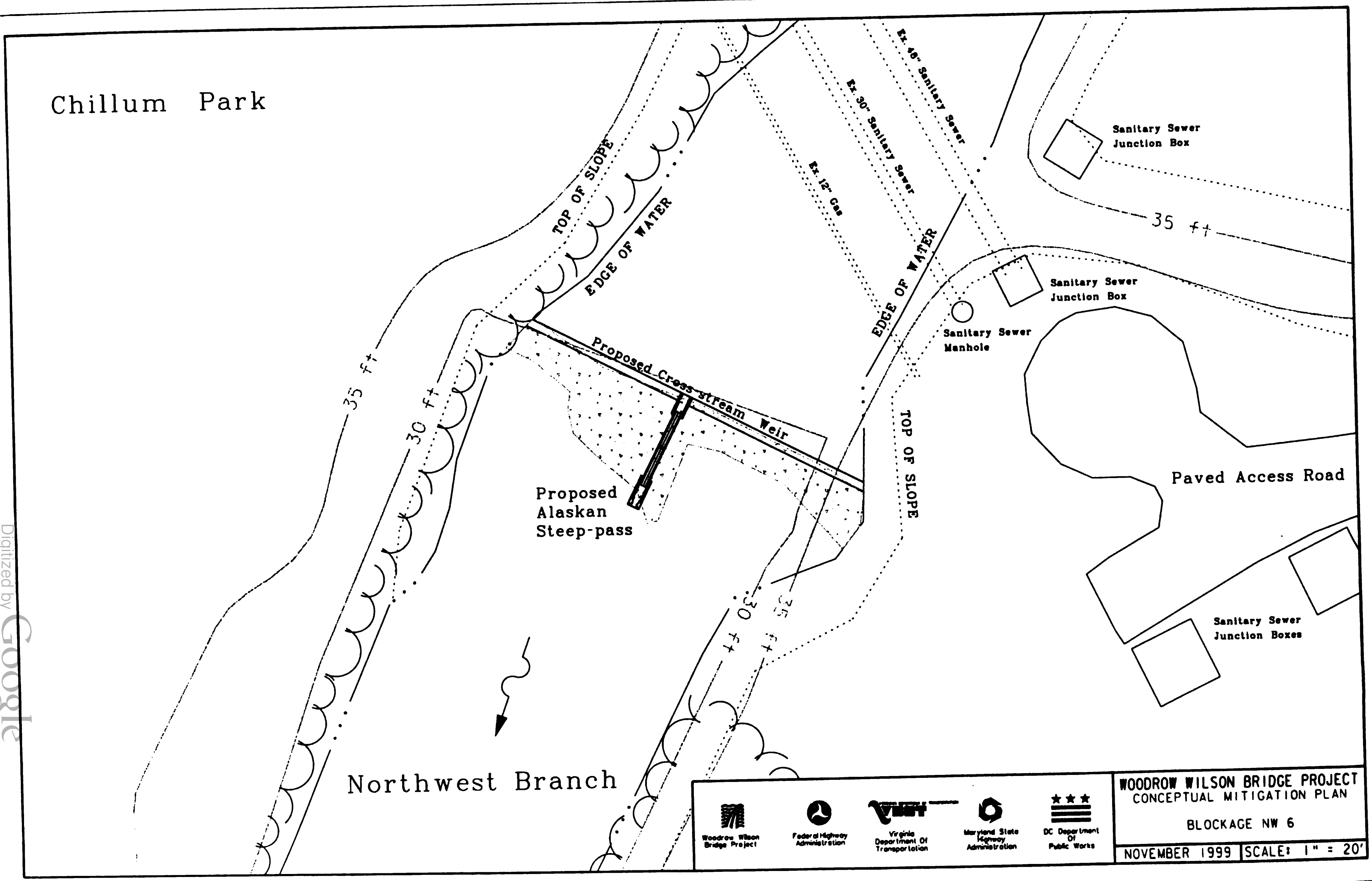

Northwest Branch
Ex Gabion Basket Weir
EDGE OF WATER
30 ft
TOP OF SLOPE
25 ft
Ex Gabion Basket Weir
EDGE OF WATER
TOP OF SLOPE
25 ft
30 ft
Proposed Pool & Weir
25 ft
Washington Gas Chillum Terminal
Woodrow Wilson Bridge Project
Federal Highway Administration
Virginia Department Of Transportation
Maryland State Highway Administration
DC Department Of Public Works
WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN
BLOCKAGE NW 4 & 5
NOVEMBER 1999
SCALE: 1" = 20'



WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW 4 & 5

Digitized by Google



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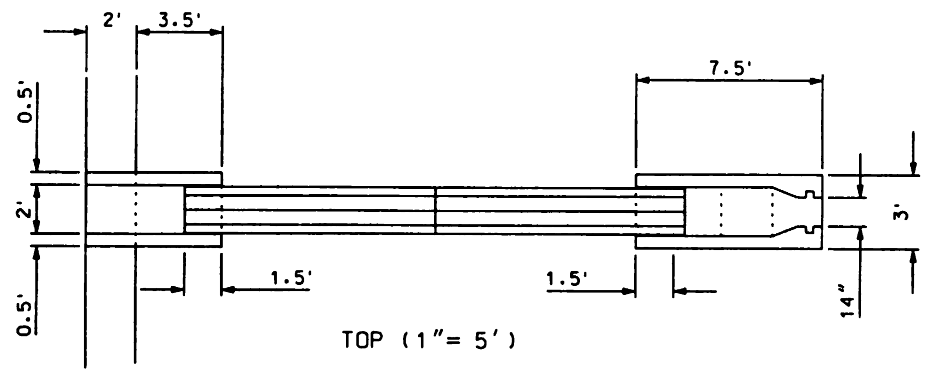
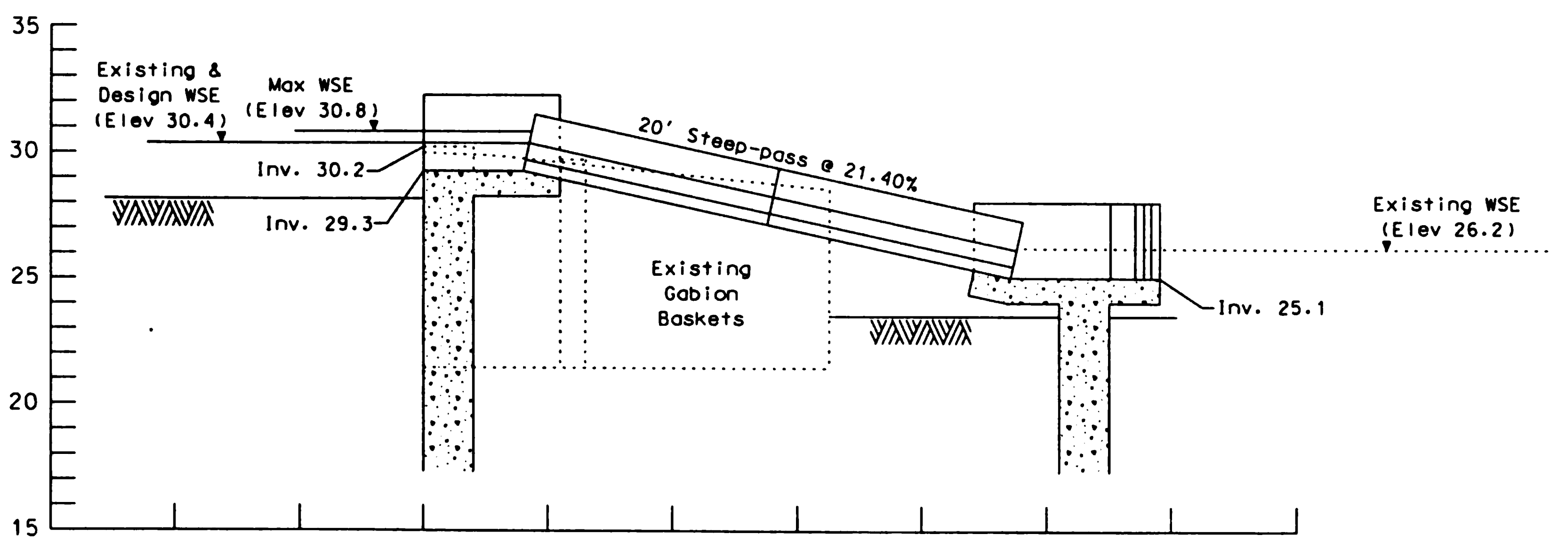


TOP (1"= 5')



X-SECTION (1"= 5')

Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW 6

NOVEMBER 1999 | SCALE AS SHOWN

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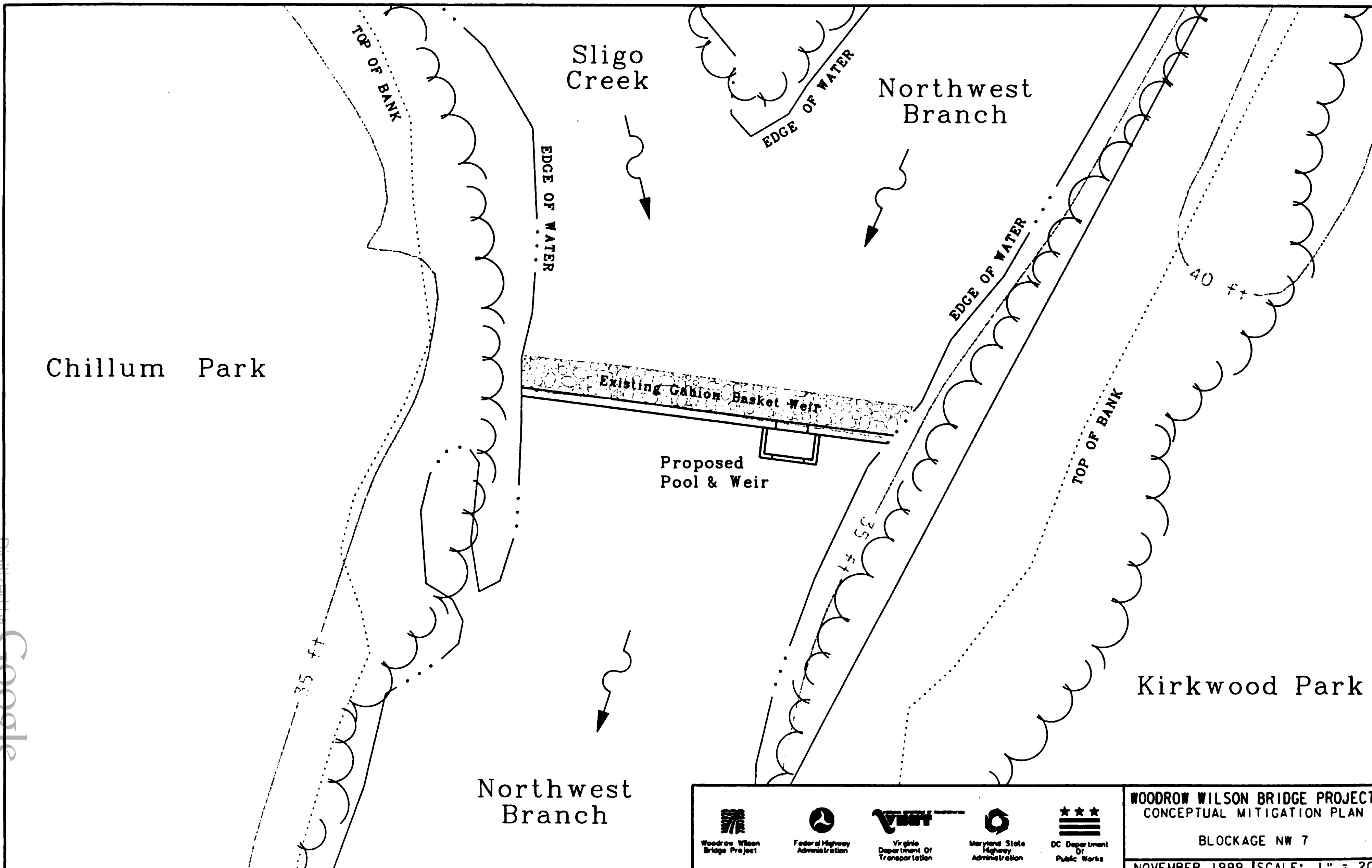
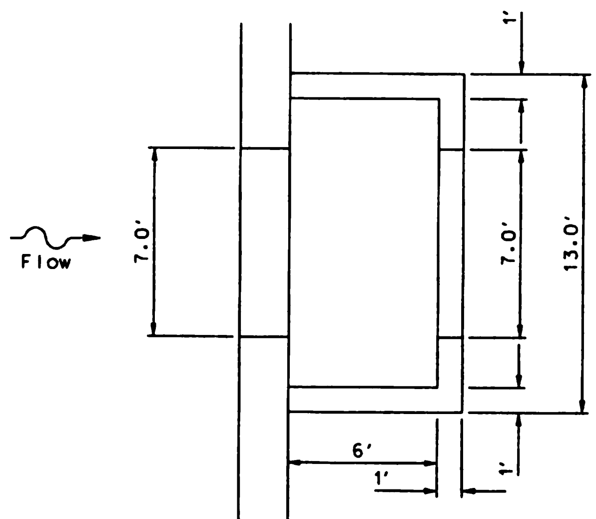


WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

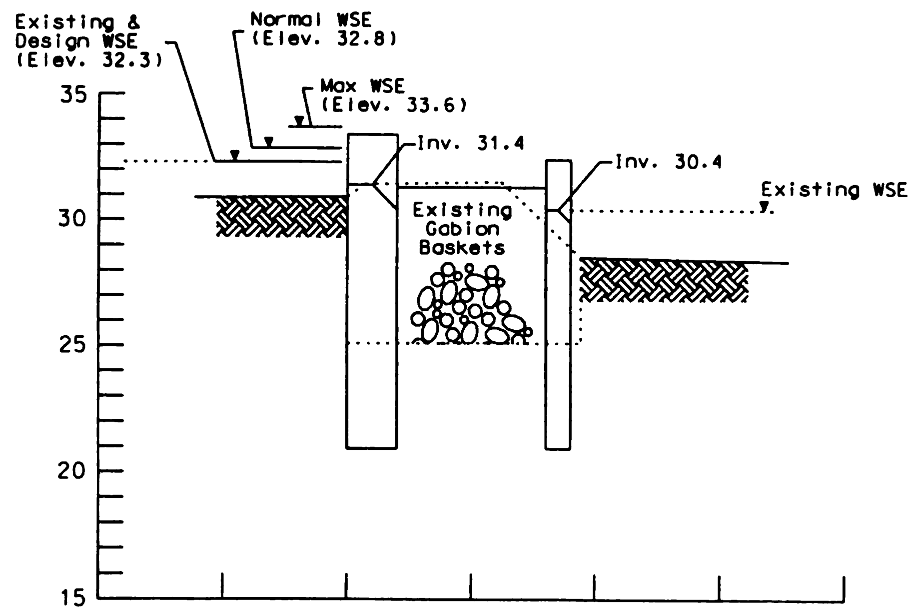
BLOCKAGE NW 7

NOVEMBER 1999 SCALE: 1" = 20'

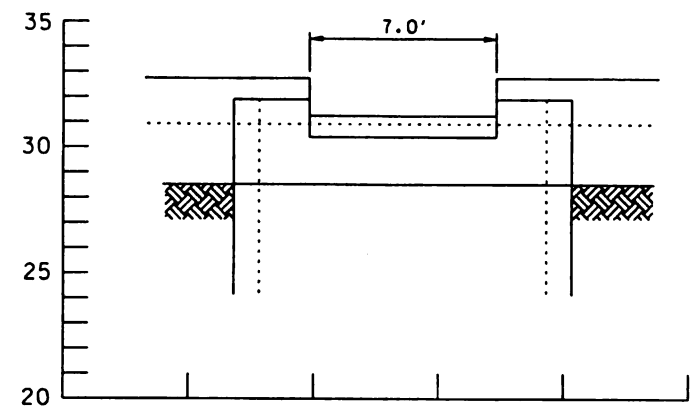
Digitized by Google



TOP (1"= 5')



X-SECTION (1"= 5')



FRONT (1"= 5')

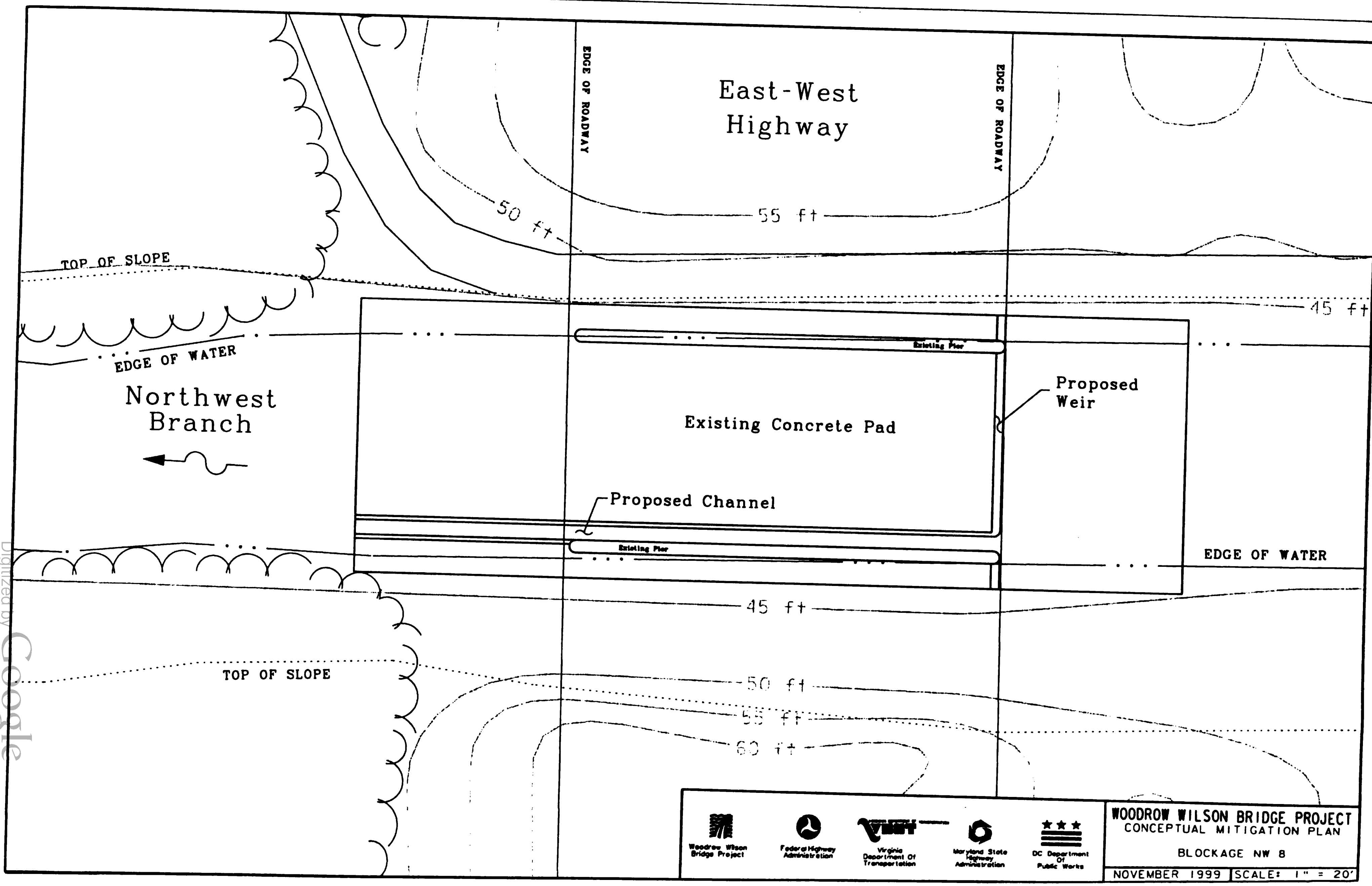
Woodrow Wilson Bridge Project | Federal Highway Administration | Virginia Department Of Transportation | Maryland State Highway Administration | DC Department Of Public Works

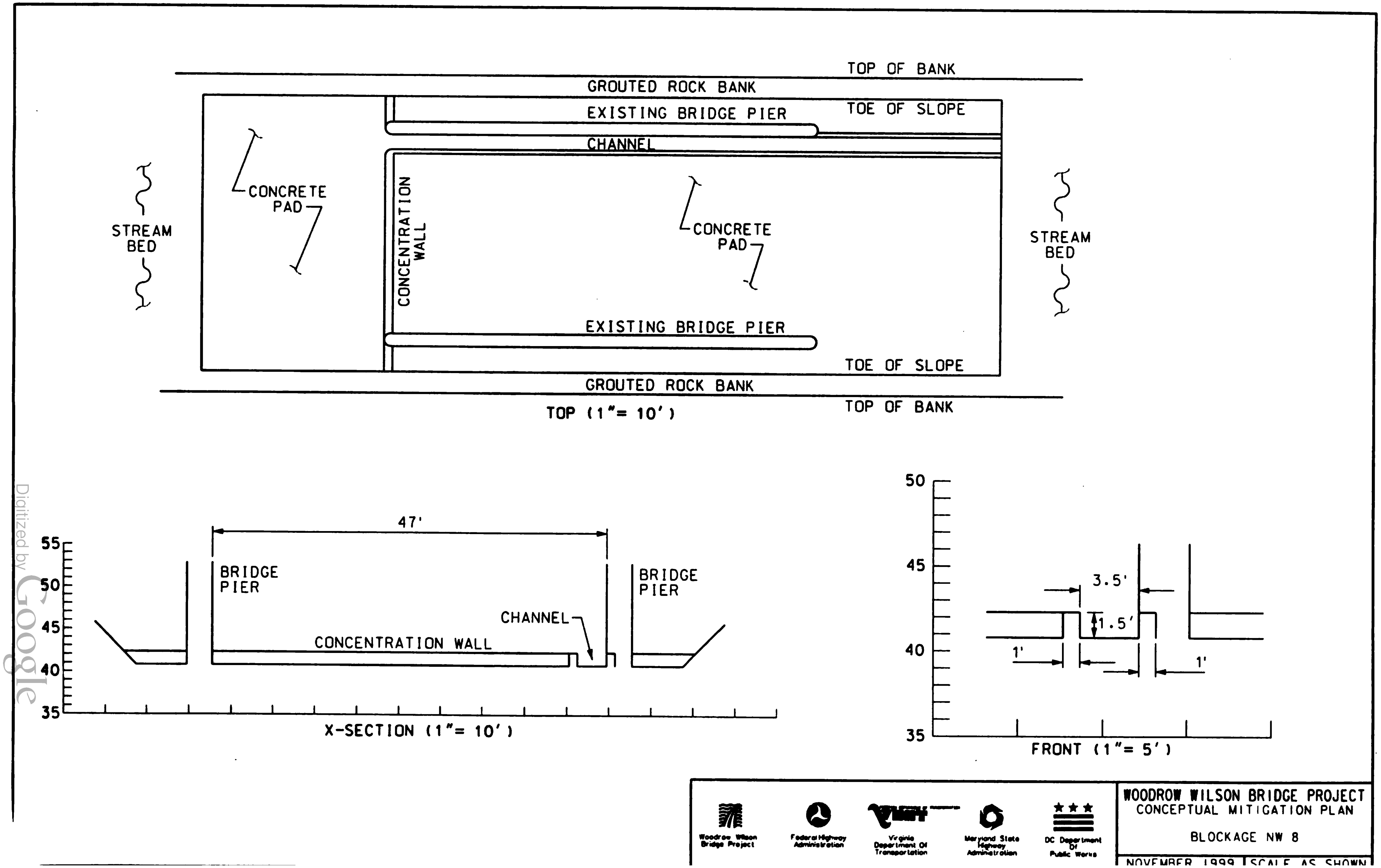
WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN

BLOCKAGE NW 7

NOVEMBER 1999 | SCALE AS SHOWN

Digitized by Google


East-West Highway
EDGE OF ROADWAY
EDGE OF ROADWAY
55 ft
50 ft
45 ft
TOP OF SLOPE
EDGE OF WATER
Northwest Branch
Existing Pier
Proposed Weir
Existing Concrete Pad
Proposed Channel
Existing Pier
EDGE OF WATER
45 ft
TOP OF SLOPE
50 ft
55 ft
60 ft
Woodrow Wilson Bridge Project
Federal Highway Administration
Virginia Department Of Transportation
Maryland State Highway Administration
DC Department Of Public Works
WOODROW WILSON BRIDGE PROJECT
CONCEPTUAL MITIGATION PLAN
BLOCKAGE NW 8
NOVEMBER 1999
SCALE: 1" = 20'



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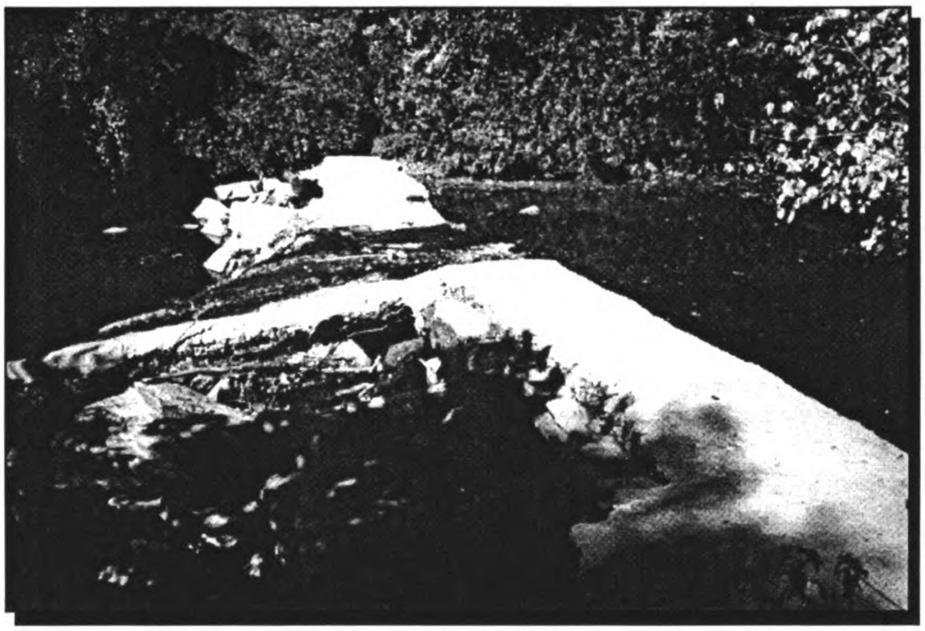

BLOCKAGE NW 6: Sheet-piles, large rock, and gabion baskets topped by a concrete spillway

Federal Highway Administration | Virginia Department of Transportation | Maryland State Highway Administration | DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
Northwest Branch Fish Passage Improvements

SITE: NW 6

December, 1999 | **Not To Scale**

Digitized by Google

BLOCKAGE NW 2: Gabion basket weir

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT **Northwest Branch Fish Passage Improvements** **SITE: NW 2**		
December, 1999	**Not To Scale**	

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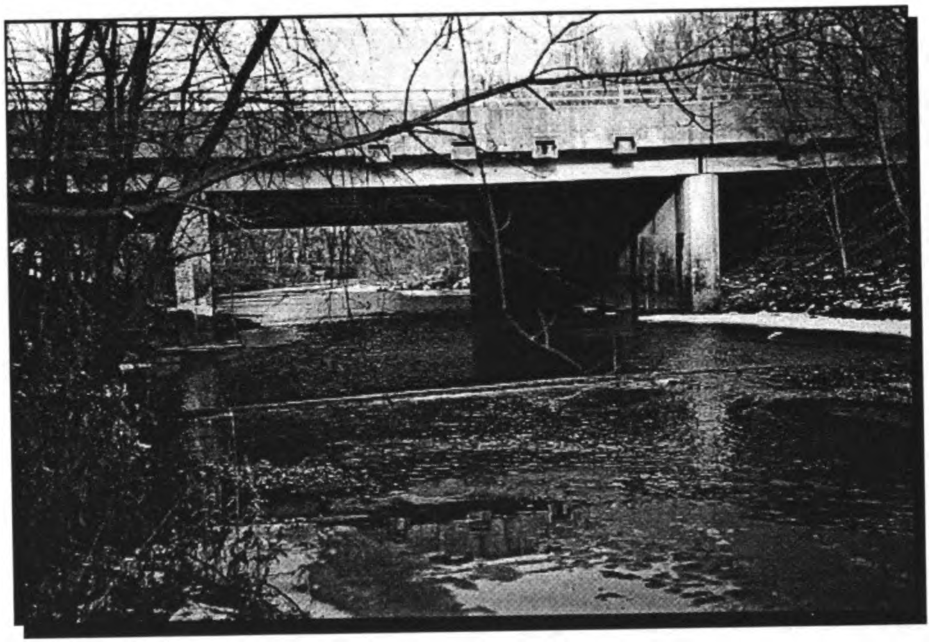


BLOCKAGE NW 8: 138-foot concrete channel beneath East-West Highway

Federal Highway Administration

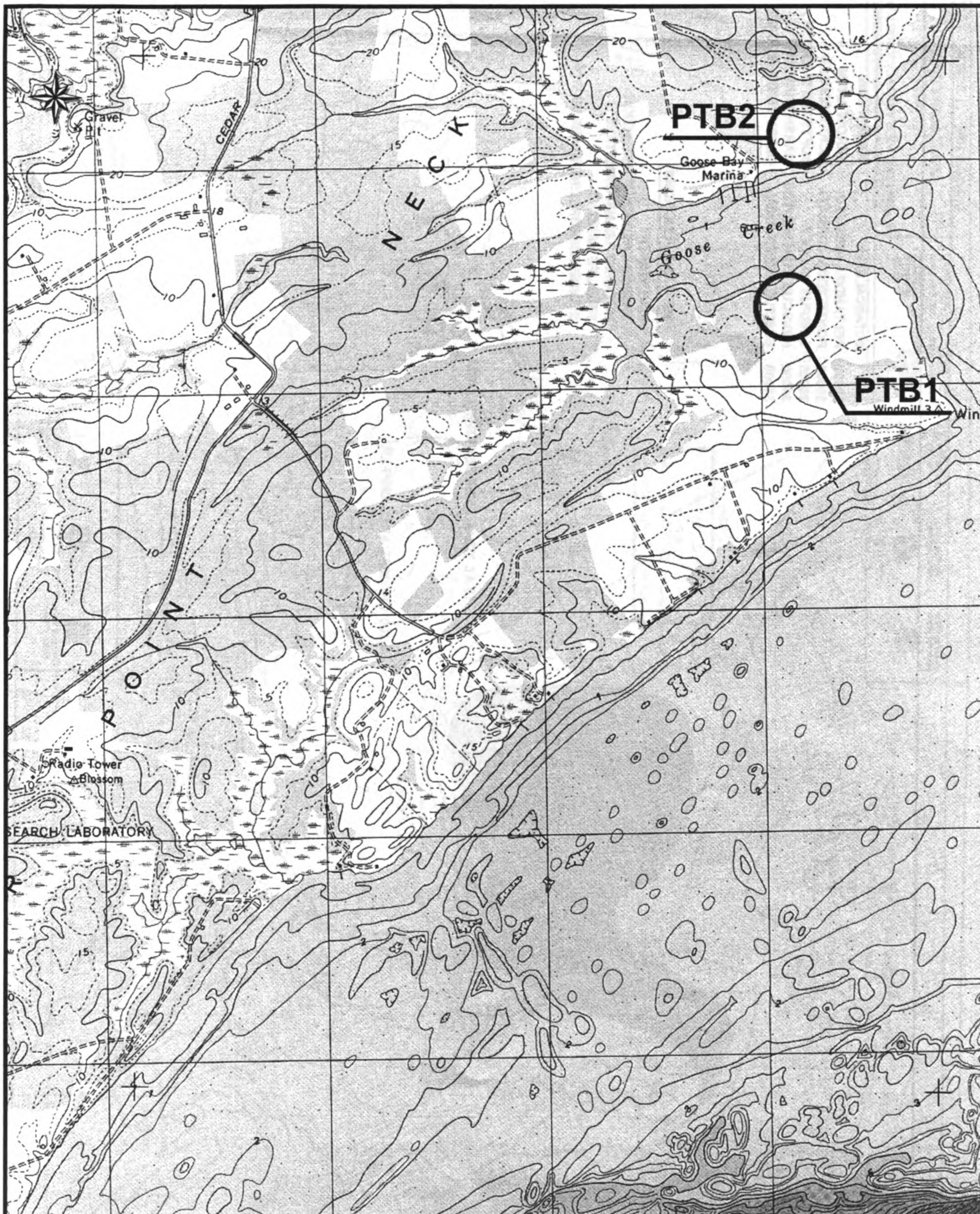
Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT **Northwest Branch Fish Passage Improvements** **SITE: NW 8**	
December, 1999	**Not To Scale**

Digitized by Google



Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

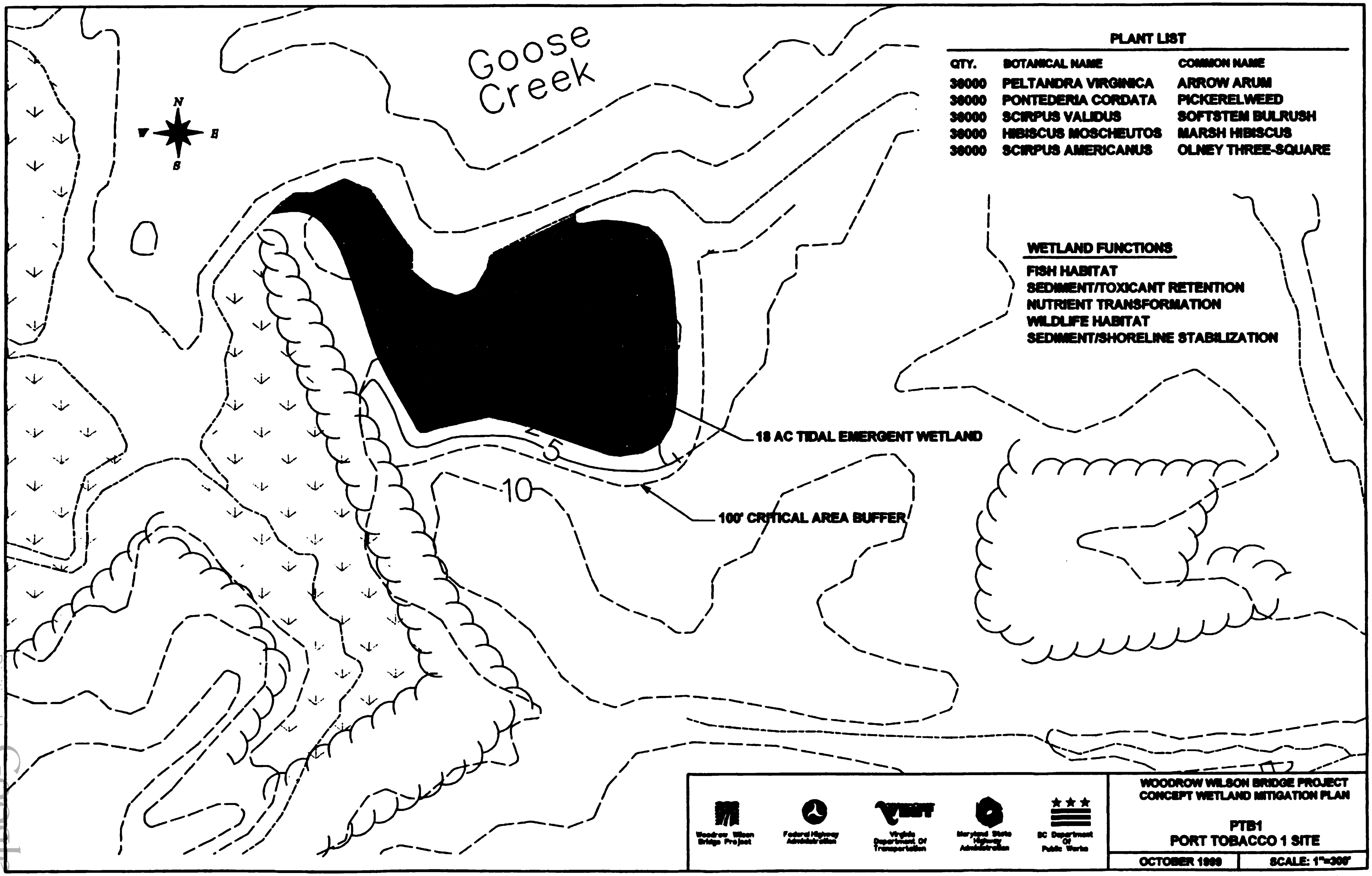
DC Department Of Public Works

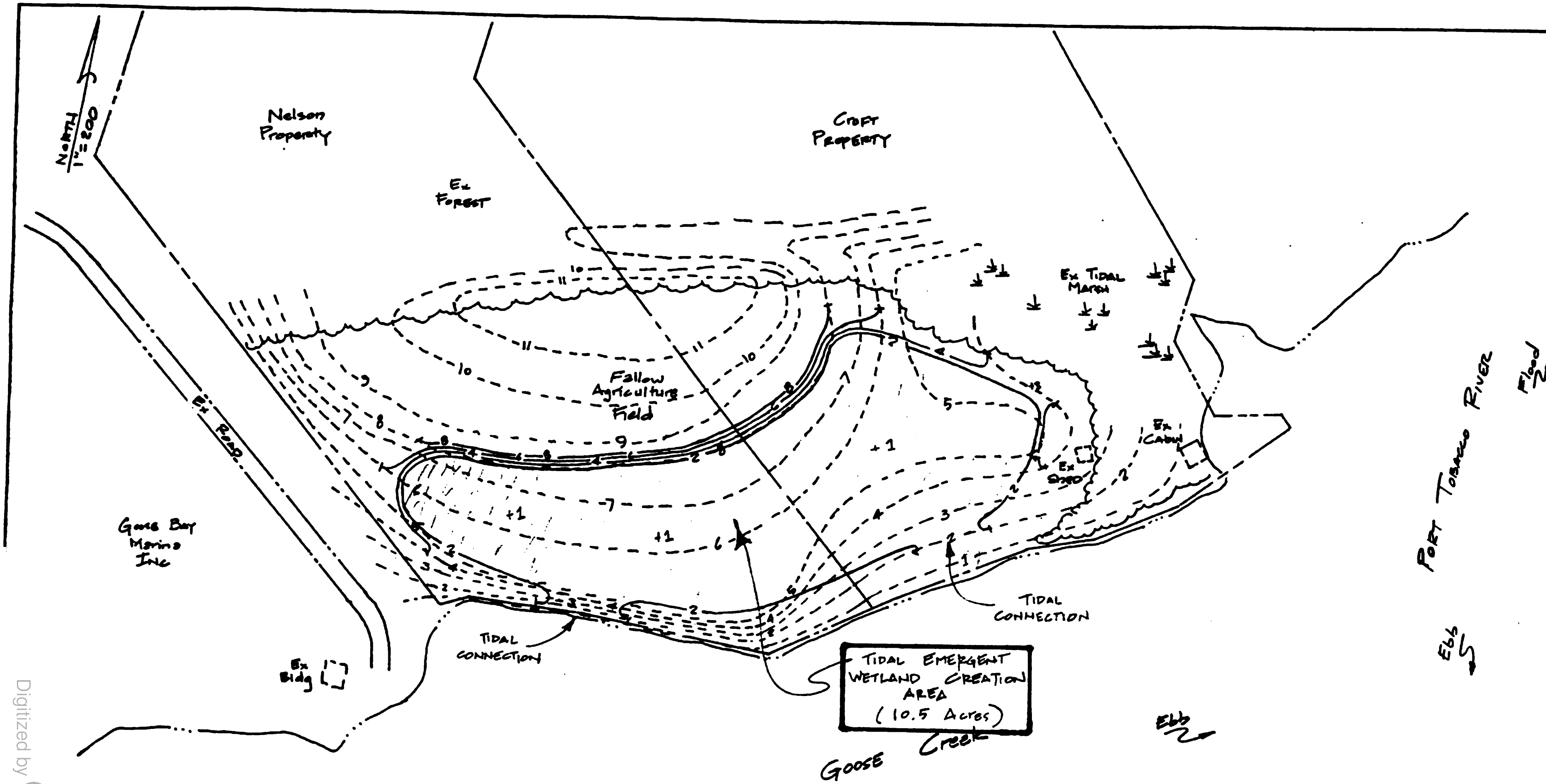
WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Goose Creek - Roman Catholic Clergy Property
SITE: PTB1

Date : December 1999 | Scale : 1" = 2000'

Digitized by Google


Goose Creek
N
E
S
W
18 AC TIDAL EMERGENT WETLAND
100' CRITICAL AREA BUFFER
5
10
PLANT LIST
QTY. BOTANICAL NAME COMMON NAME
36000 PELTANDRA VIRGINICA ARROW ARUM
36000 PONTEDERIA CORDATA PICKERELWEED
36000 SCIRPUS VALIDUS SOFTSTEM BULRUSH
36000 HIBISCUS MOSCHEUTOS MARSH HIBISCUS
36000 SCIRPUS AMERICANUS OLNEY THREE-SQUARE
WETLAND FUNCTIONS
FISH HABITAT
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
WILDLIFE HABITAT
SEDIMENT/SHORELINE STABILIZATION
Woodrow Wilson Bridge Project
Federal Highway Administration
Virginia Department Of Transportation
Maryland State Highway Administration
DC Department Of Public Works
WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
PTB1
PORT TOBACCO 1 SITE
OCTOBER 1999
SCALE: 1"=300'



WETLAND FUNCTIONS

- FISH HABITAT
- SEDIMENT/TOXICANT RETENTION
- NUTRIENT TRANSFORMATION
- SHORELINE STABILIZATION
- WILDLIFE HABITAT

PLANT LIST

QTY	BOTANICAL NAME	COMMON NAME
25,000	Peltandra virginica	arrow arum
25,000	Scirpus validus	soft stem bulrush
25,000	Hibiscus moscheutos	marsh hibiscus
25,000	Pontederia cordata	pickerelweed

Flood

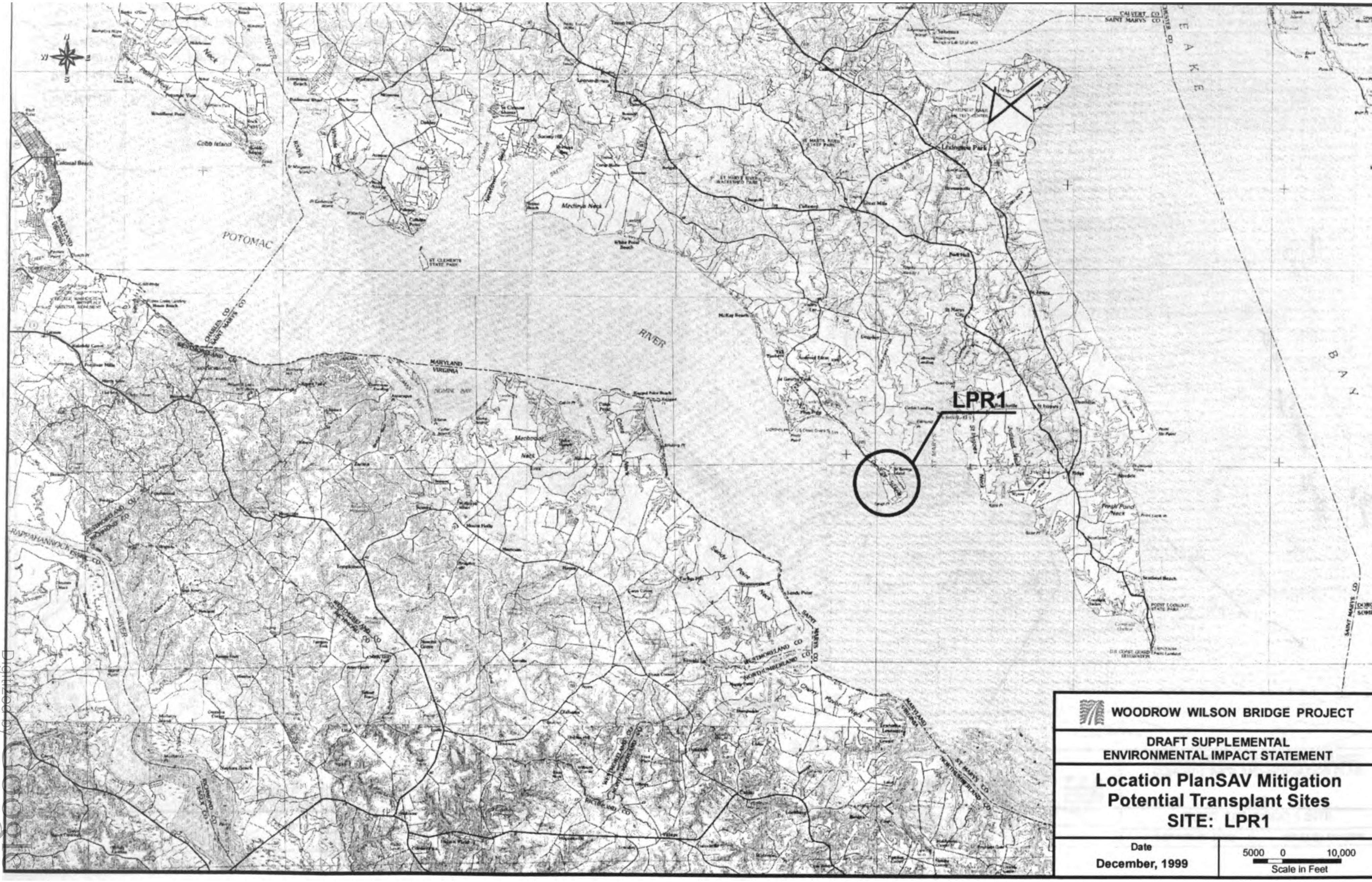
Woodrow Wilson Bridge Project — Federal Highway Administration — Virginia Department Of Transportation — Maryland State Highway Administration — DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN

PTB2
PORT TOBACCO 2 SITE

OCTOBER 1999 | SCALE: 1"=200'

Digitized by Google



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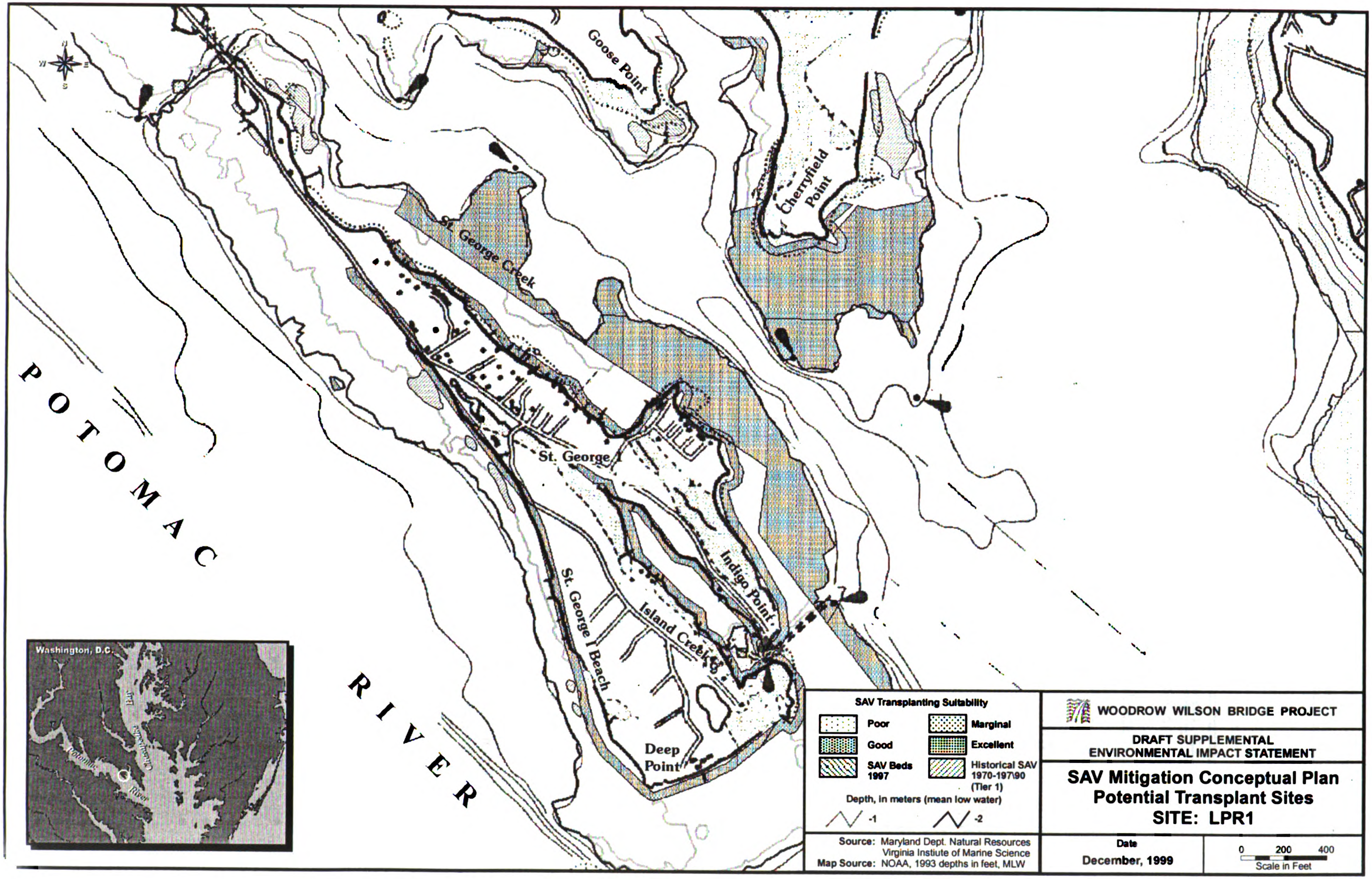

Source: Maryland Dept. Natural Resources
Virginia Institute of Marine Science
Map Source: NOAA, 1993 depths in feet, MLW

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT

SAV Mitigation Conceptual Plan
Potential Transplant Sites
SITE: LPR1

Date
December, 1999

Matrix of Preferred Mitigation (Tier 1) in Virginia

Impact / Type	Mitigation Proposed	Location
1.4 hectares (3.5 acres) Nontidal Wetlands and 1.0 hectares (2.5 acres) Nontidal Waters	2.9 hectares (7.1 acres) nontidal wetland creation 0.8 hectares (2.15 acres) nontidal wetland creation 0.4 hectares (1.0 acre) enhancement of nontidal phragmites marsh	North Fork Mitigation Bank (NFK1) Hart Property (NCR2) Four Mile Run Park (FMRP1)
5.5 hectares (13.5 acres) Tidal Wetlands	0.22 hectares (0.55 acre) tidal wetland creation 0.04 hectares/145 meters (0.10 acre/475 linear feet) tidal streambank stabilization/riparian buffer	Four Mile Run Park (FMRP1)
	0.18 hectares (0.45 acre) tidal wetland creation	Site behind Dodge dealer (BHA1)
	0.10 hectares (0.25 acre) tidal wetland creation	Site behind Hampton Inn (BHA2)
	0.63 hectares (1.55 acres) tidal wetland creation	Cameron Run 3 (CRU3)
	0.34 hectares (0.85 acre) tidal wetland creation	Hunting Terrace (FMR1)
	0.40 hectares (1.0 acre) tidal wetland creation	Hunting Towers (FMR2)
	0.80 hectares (2.15) acres tidal wetland creation	Whipsawasons Point (POT1)
	0.80 hectares (2.00 acres) tidal wetland creation	Aquia Harbour (AQC 1)
	6.4 hectares (15.85 acres) tidal wetland creation	Northumberland County (GCK 1)
	0.14 hectares (0.35 acre) tidal wetland creation	Devon Property (BHA3)
0.70 hectares (1.8 acres) Tidal Open Waters	0.40 hectares (1.0 acre) juvenile fish habitat (breakwater in shallow area along Occoquan Bay	Mason Neck National Wildlife Refuge (HPO1)
0.50 hectares (1.1 acres) Tidal Flats	0.40 hectares (1.0 acre) juvenile fish habitat (breakwater in shallow area along Occoquan Bay	Mason Neck State Park (Jammes Property) (HPO3)

Total Compensatory Mitigation in Virginia:

- 3.7 hectares (9.25 acres) nontidal wetland creation
- 0.4 hectares (1.0 acre) nontidal enhancement
- 0.04 hectares/145 meters (0.10 acre/475 linear feet) tidal streambank stabilization/riparian buffer creation
- 10.0 hectares (25.0 acres) tidal wetland creation
- 0.4 hectares (1.0 acre) shallow water fish habitat
- 0.4 hectares (1.0 acre) shallow water fish habitat

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In addition to identification of preferred potential mitigation sites and formulation of a comprehensive conceptual compensatory wetland mitigation proposal (Tier 1), the sponsoring agencies have compiled a list of alternate potential mitigation sites (Tier 2). These Tier 2 sites are currently under further investigation and will be made available should the primary mitigation sites, Tier 1 prove to be infeasible. A Summary of Tier 2 sites are currently under review by the regulatory agencies with a brief summary included below:

Backup Mitigation in Virginia (Tier 2):
Total Compensatory Mitigation in Virginia:

- 3.8 hectares (9.5 acres) nontidal wetland creation
- 0.40 hectares (1.0 acre) nontidal enhancement
- 0.04 hectares/145 meters (0.10 acres/475 lf) tidal streambank stabilization/riparian buffer creation
- 10.0 hectares (25.0 acres) tidal wetland creation
- 0.8 hectares (2.0 acres) shallow water fish habitat

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Complete/Incomplete Tasks at Preferred Mitigation Sites (Tier 1) in Virginia

Mitigation Site	Install monitoring wells	Conduct topographic survey	Cultural resources investigation	Hazardous material investigation	Property owner interested	Design stage	4(f) Property	Wetland delineation	Property owner commitment	Comments
North Fork Mitigation Bank (NFK1)	N/A	N/A	N/A	N/A	Yes	Completed	No	N/A	Yes	Under construction
Hart Property (NCR2)	Yes	No	No	Yes	Yes	Conceptual	No	Yes	No	
Four Mile Run Park (FMRP1)	Yes	Yes	No	No	Yes	Conceptual	Yes	Yes	No	
Site behind Dodge dealer (BHA1)	Yes	Yes	Yes	Yes	Yes	Conceptual	No	Yes	No	
Site behind Hampton Inn (BHA2)	Yes	Yes	Yes	Yes	Yes	Conceptual	No	Yes	No	
Cameron Run 3 (CRU3)	Yes	Yes	Yes	Yes	Yes	Conceptual	No	Yes	No	
Hunting Terrace (FMR1)	Yes	Yes	No	Yes	No	Conceptual	No	Yes	No	
Hunting Towers (FMR2)	Yes	Yes	No	Yes	No	Conceptual	No	Yes	No	
Whipsawason Point (POT1)	No	Yes	No	No	No	Conceptual	No	No	No	
Aquia Harbour (AQC 1)	No	No	No	No	Yes	Conceptual	No	No	No	
Northumberland County (GCK 1)	No	No	No	No	Yes	Conceptual	No	No	No	
Devon Property adjacent to the Hampton Inn Property (BHA3)	No	Yes	No	Yes	Yes	Conceptual	No	Yes	No	
Mason Neck National Wildlife Refuge (HPO1)	N/A	No	No	No	Unknown	Conceptual	Yes	N/A	No	
Mason Neck State Park (Jammes Property) (HPO3)	N/A	No	No	No	Yes	Conceptual	Yes	N/A	No	

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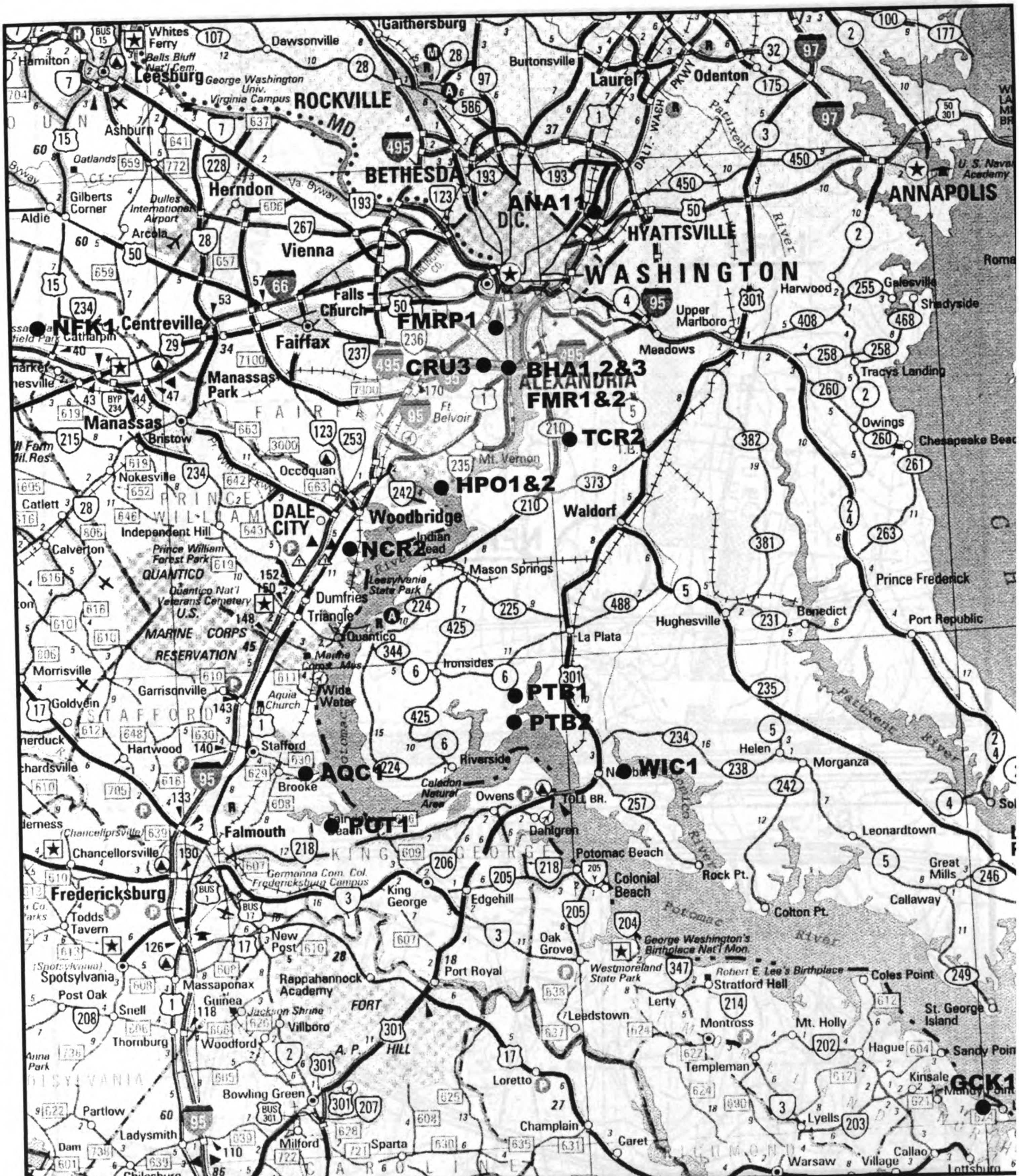

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT LOCATION PLAN

Mitigation Site Location Map

Date : December 1999

Scale : 1" ~ 30 mile

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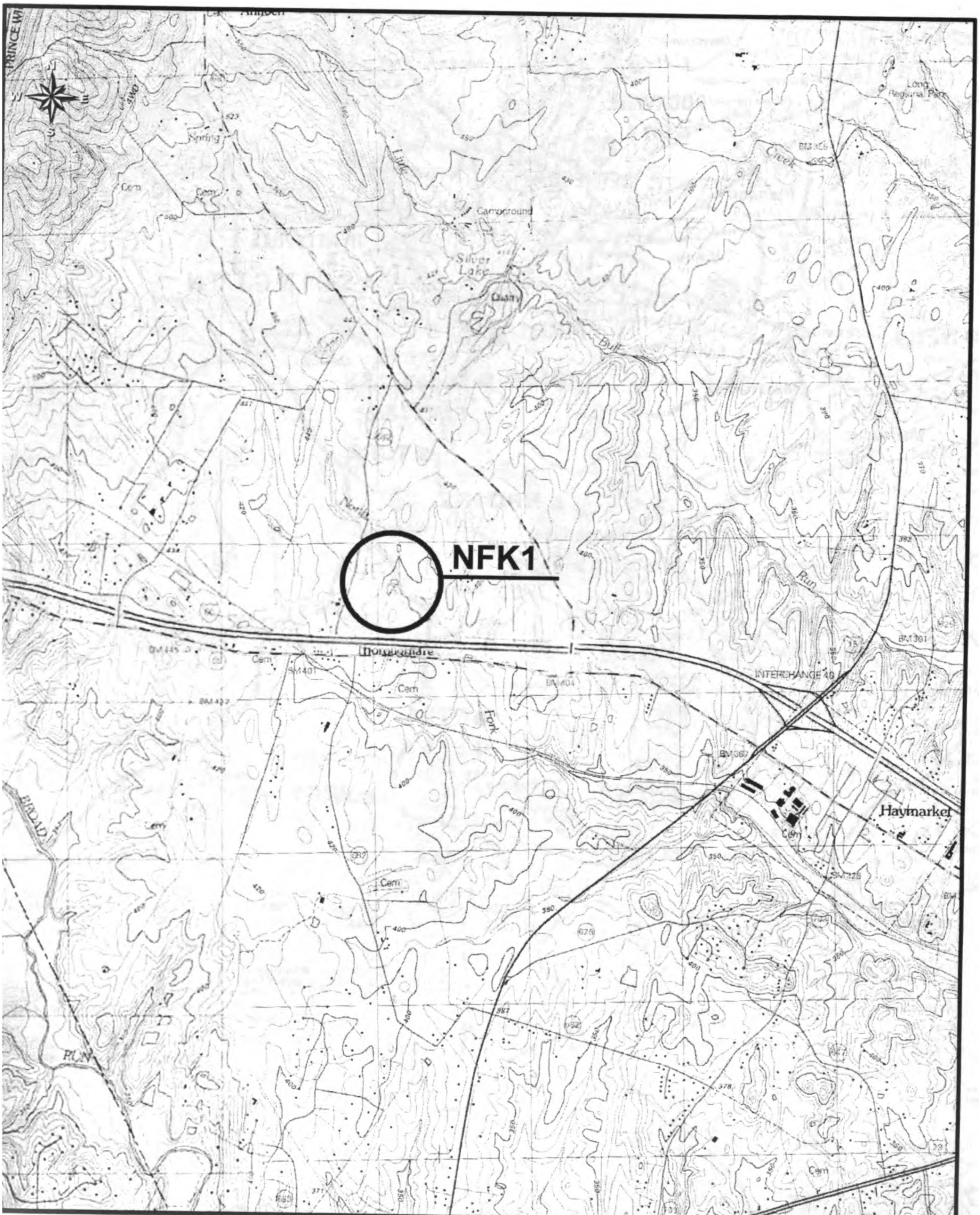

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

North Fork Wetlands Site

SITE: NFK1

Date : December 1999 Scale : 1" = 2000'

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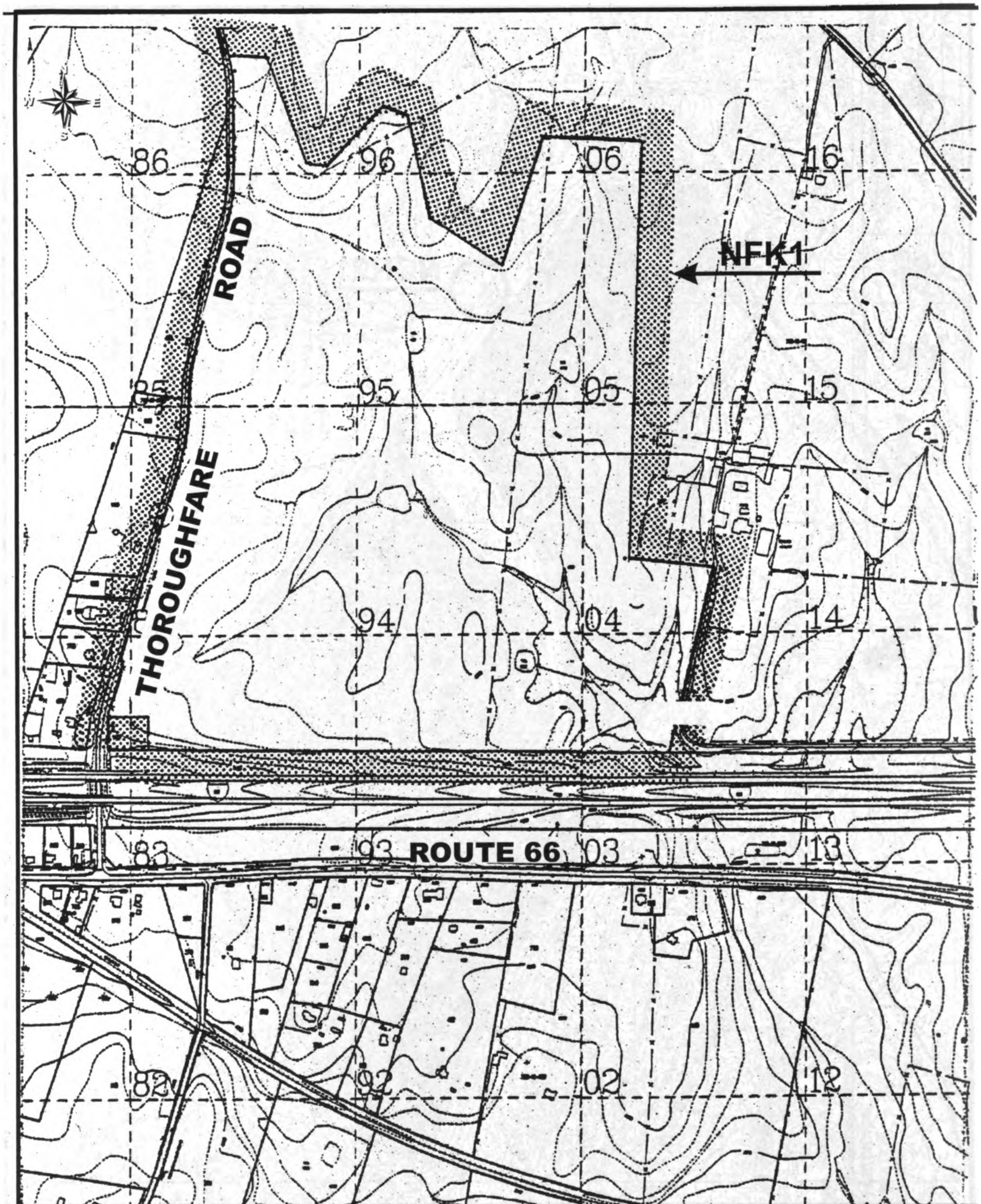

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
SITE PLAN
North Fork Wetlands Site
SITE: NFK1

Date : December 1999

Scale : 1" = 715'

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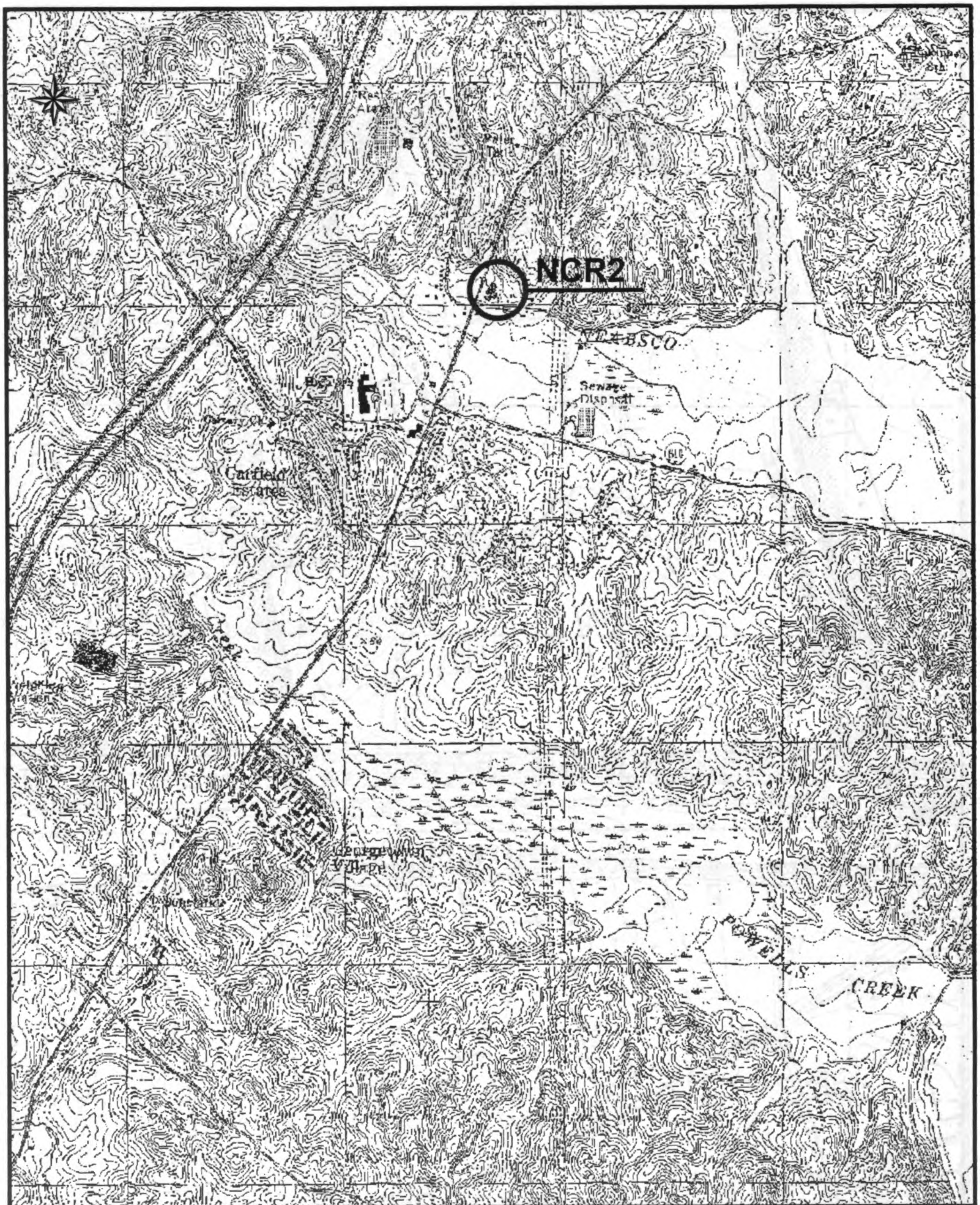

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

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WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Hart Property
SITE: NCR2

Date : December 1999

Scale : 1" = 2000'

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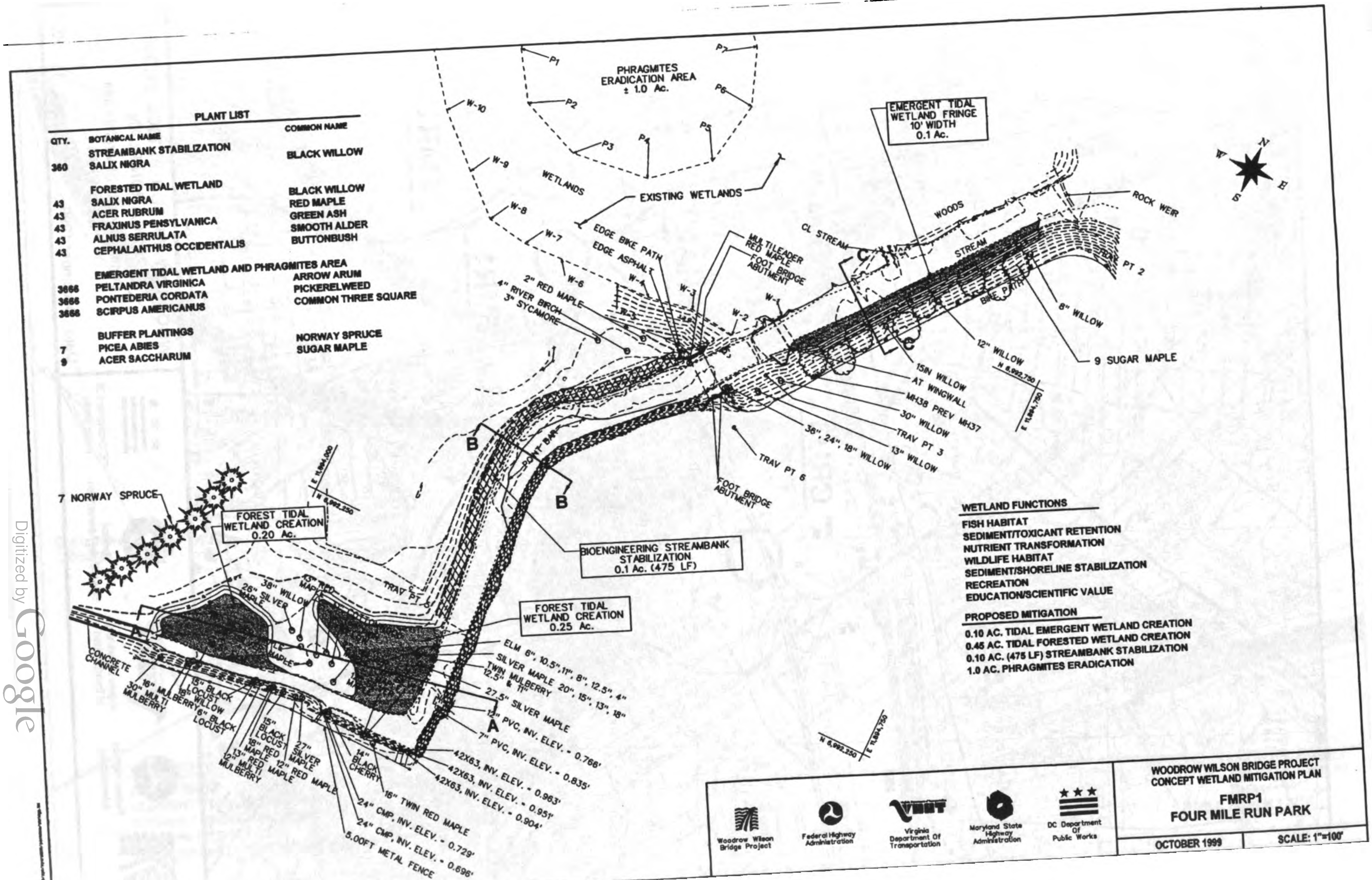

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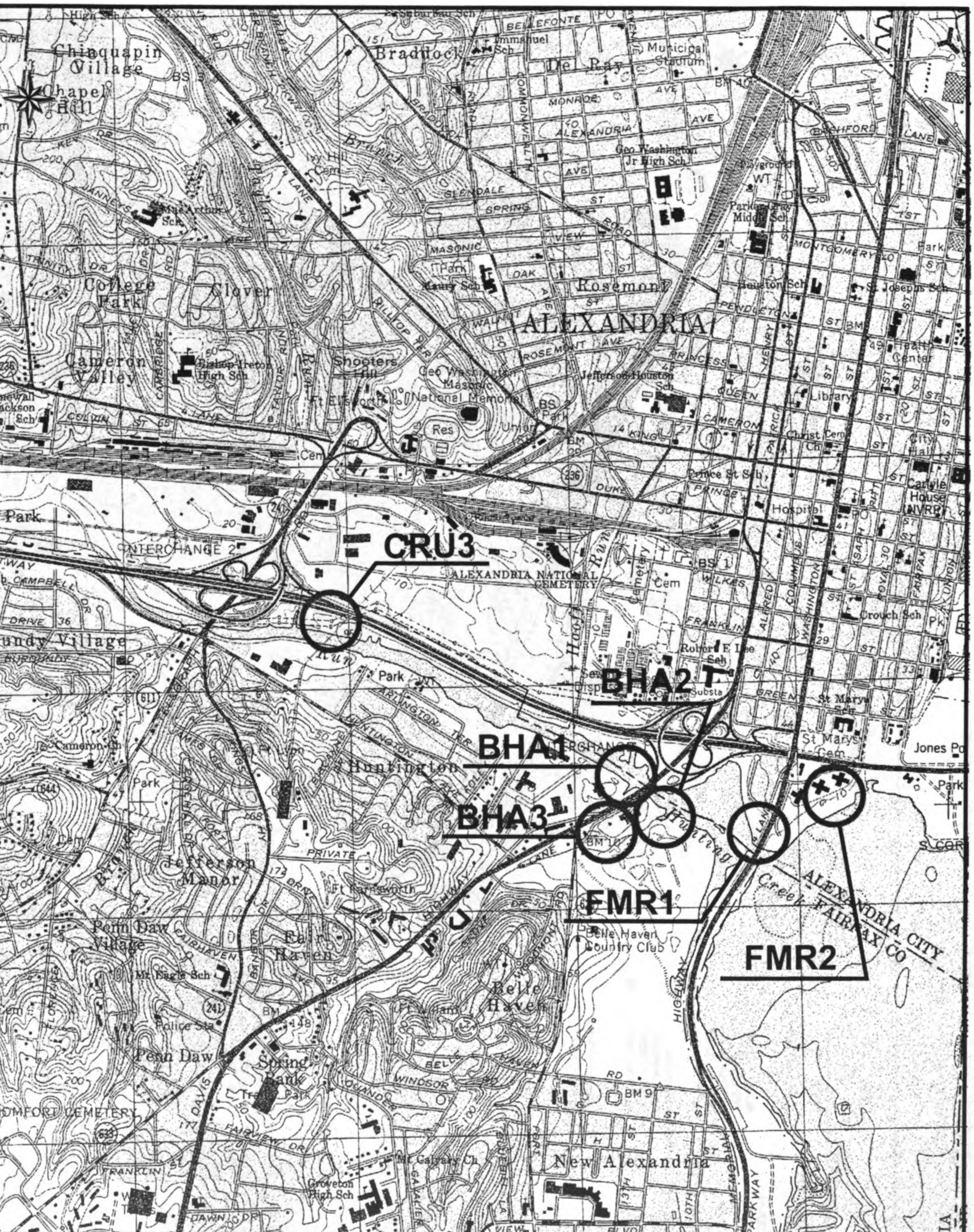

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN
Commonwealth of Virginia Site
SITE: BHA1

Date : December 1999

Scale : 1" = 2000'

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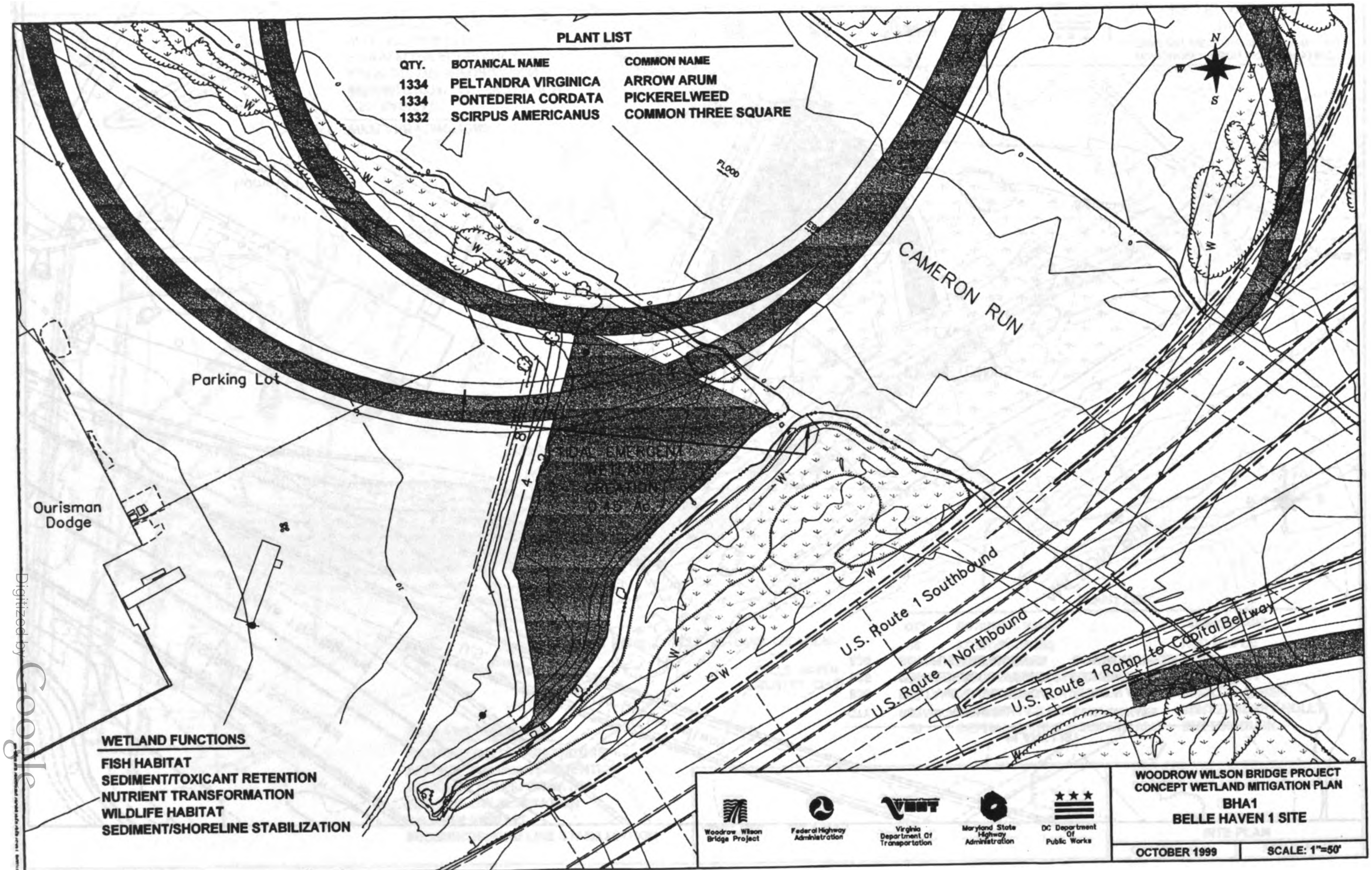

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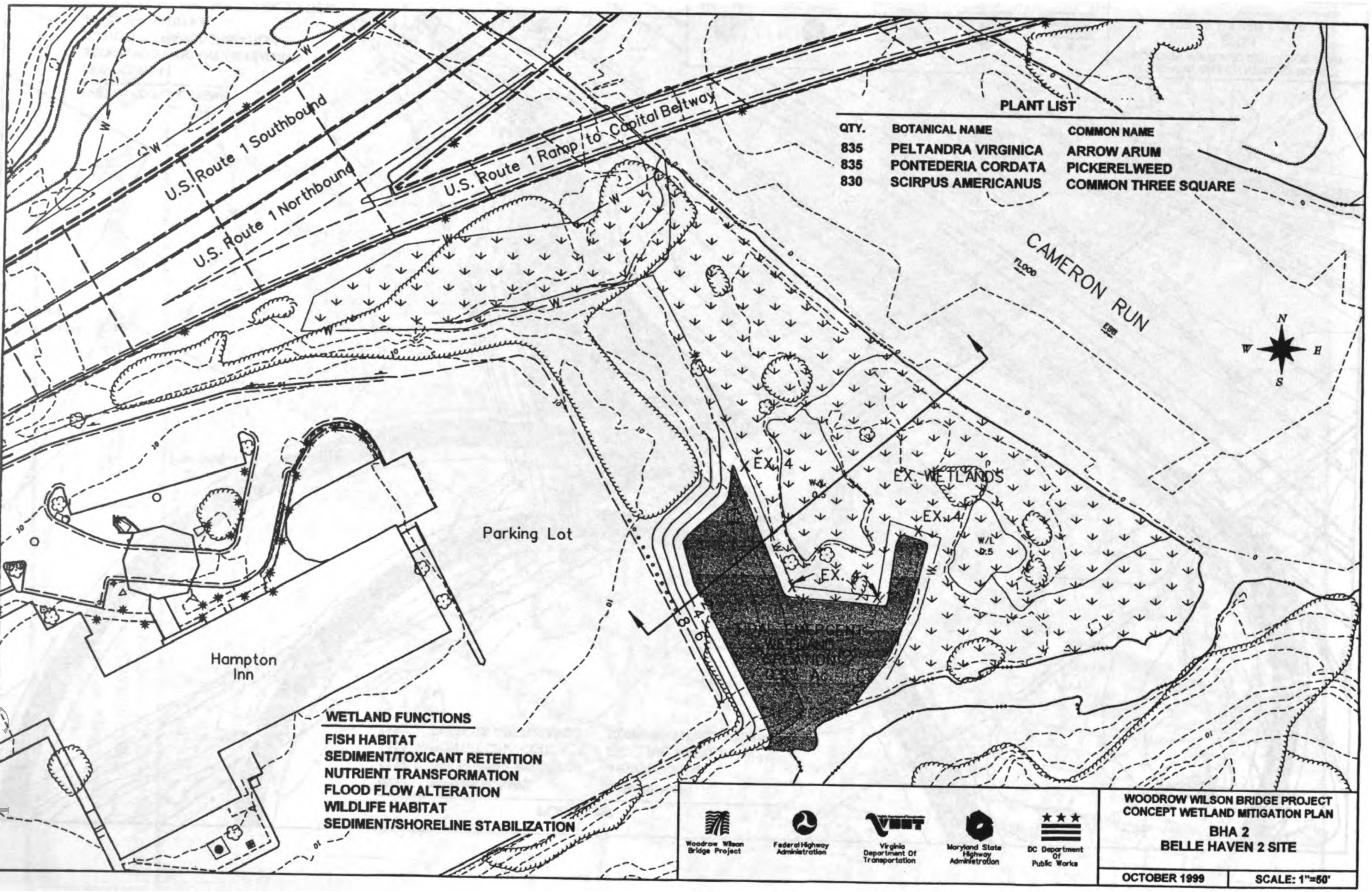

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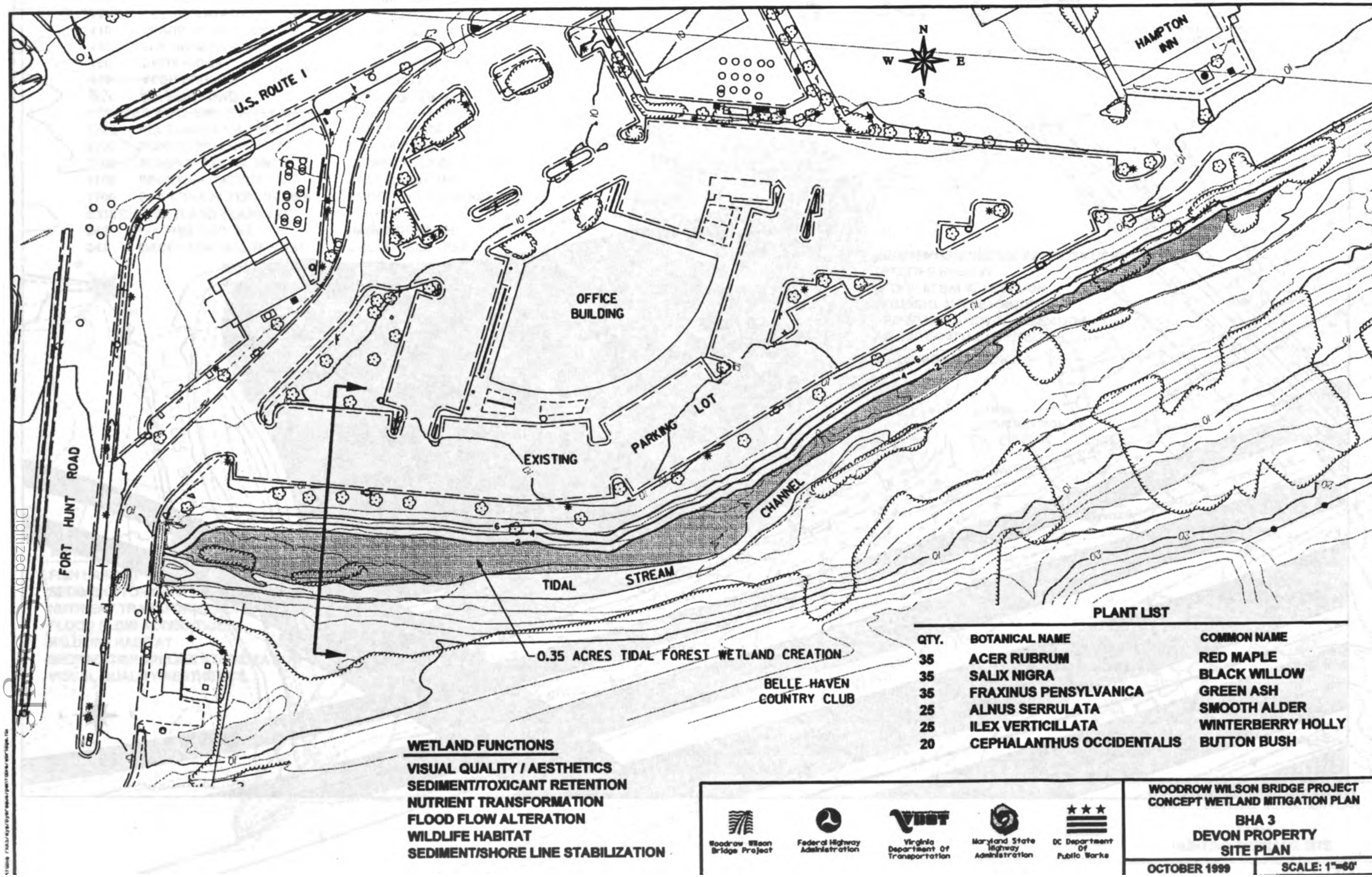

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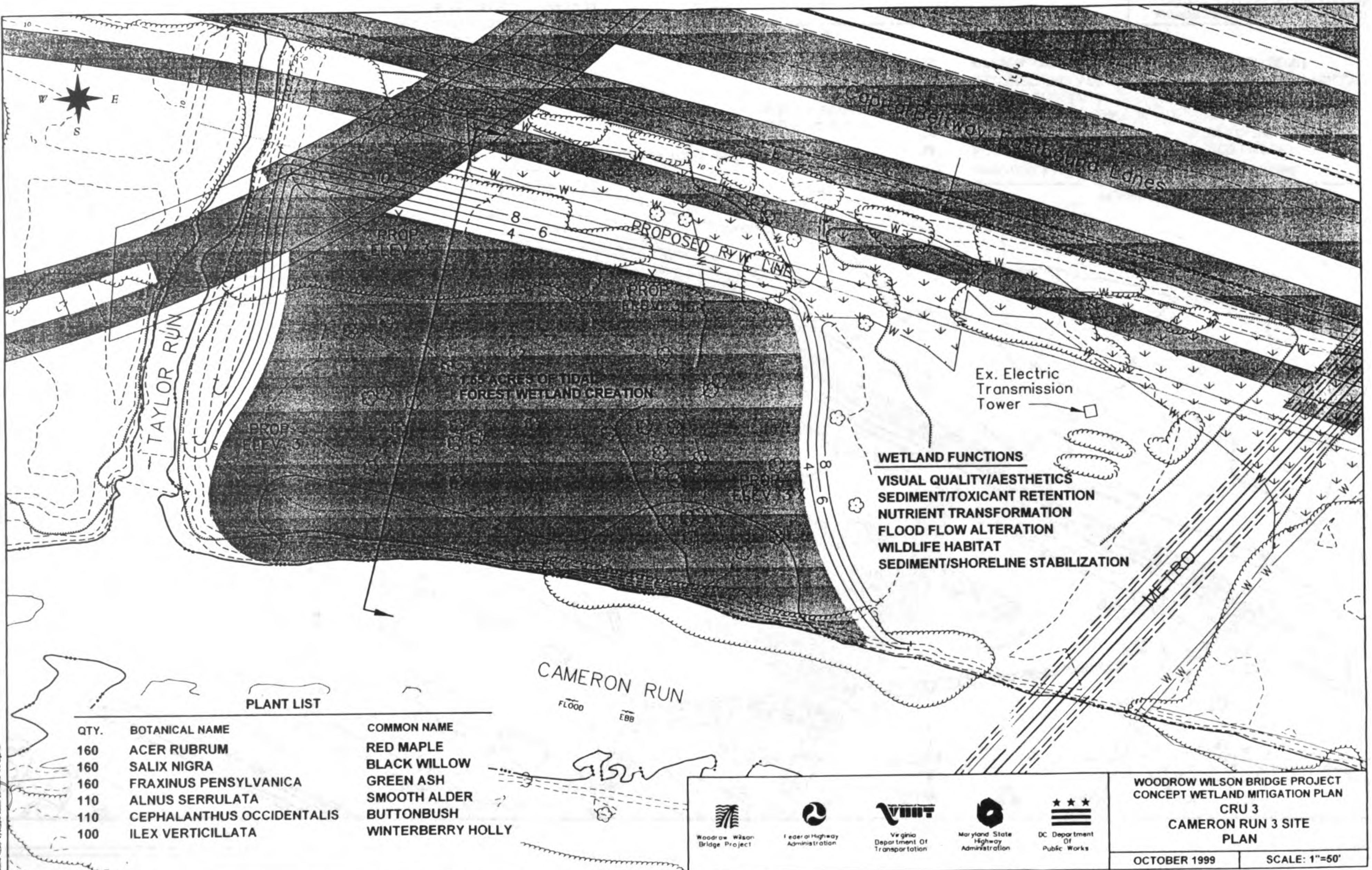

WETLAND FUNCTIONS

- VISUAL QUALITY/AESTHETICS
- SEDIMENT/TOXICANT RETENTION
- NUTRIENT TRANSFORMATION
- FLOOD FLOW ALTERATION
- WILDLIFE HABITAT
- SEDIMENT/SHORELINE STABILIZATION

PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
160	ACER RUBRUM	RED MAPLE
160	SALIX NIGRA	BLACK WILLOW
160	FRAXINUS PENSYLVANICA	GREEN ASH
110	ALNUS SERRULATA	SMOOTH ALDER
110	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH
100	ILEX VERTICILLATA	WINTERBERRY HOLLY

Woodrow Wilson Bridge Project · Federal Highway Administration · Virginia Department Of Transportation · Maryland State Highway Administration · DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
CRU 3
CAMERON RUN 3 SITE
PLAN

OCTOBER 1999 | SCALE: 1"=50'

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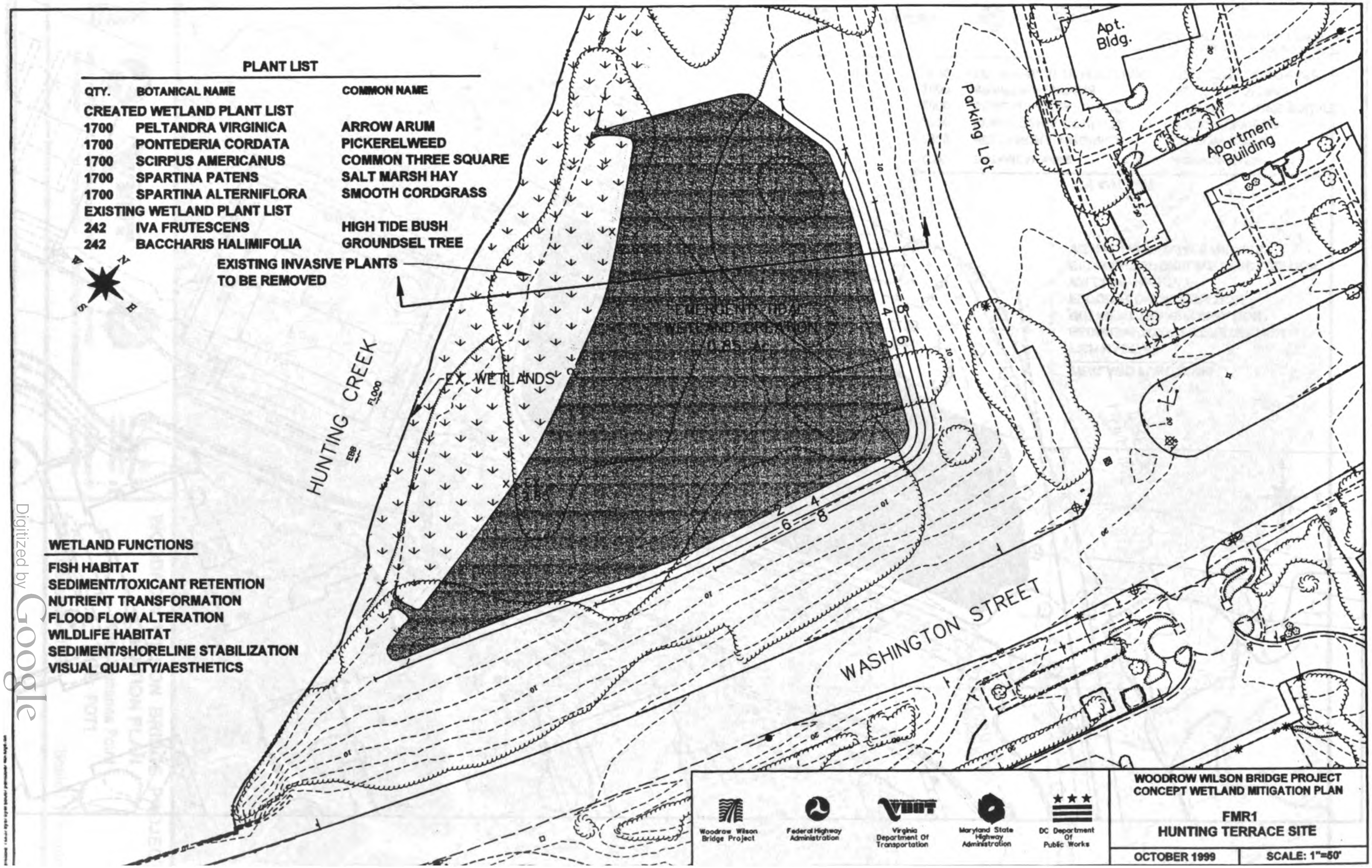

PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
CREATED WETLAND PLANT LIST		
1700	PELTANDRA VIRGINICA	ARROW ARUM
1700	PONTEDERIA CORDATA	PICKERELWEED
1700	SCIRPUS AMERICANUS	COMMON THREE SQUARE
1700	SPARTINA PATENS	SALT MARSH HAY
1700	SPARTINA ALTERNIFLORA	SMOOTH CORDGRASS
EXISTING WETLAND PLANT LIST		
242	IVA FRUTESCENS	HIGH TIDE BUSH
242	BACCHARIS HALIMIFOLIA	GROUNDSEL TREE

WETLAND FUNCTIONS

FISH HABITAT
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
FLOOD FLOW ALTERATION
WILDLIFE HABITAT
SEDIMENT/SHORELINE STABILIZATION
VISUAL QUALITY/AESTHETICS

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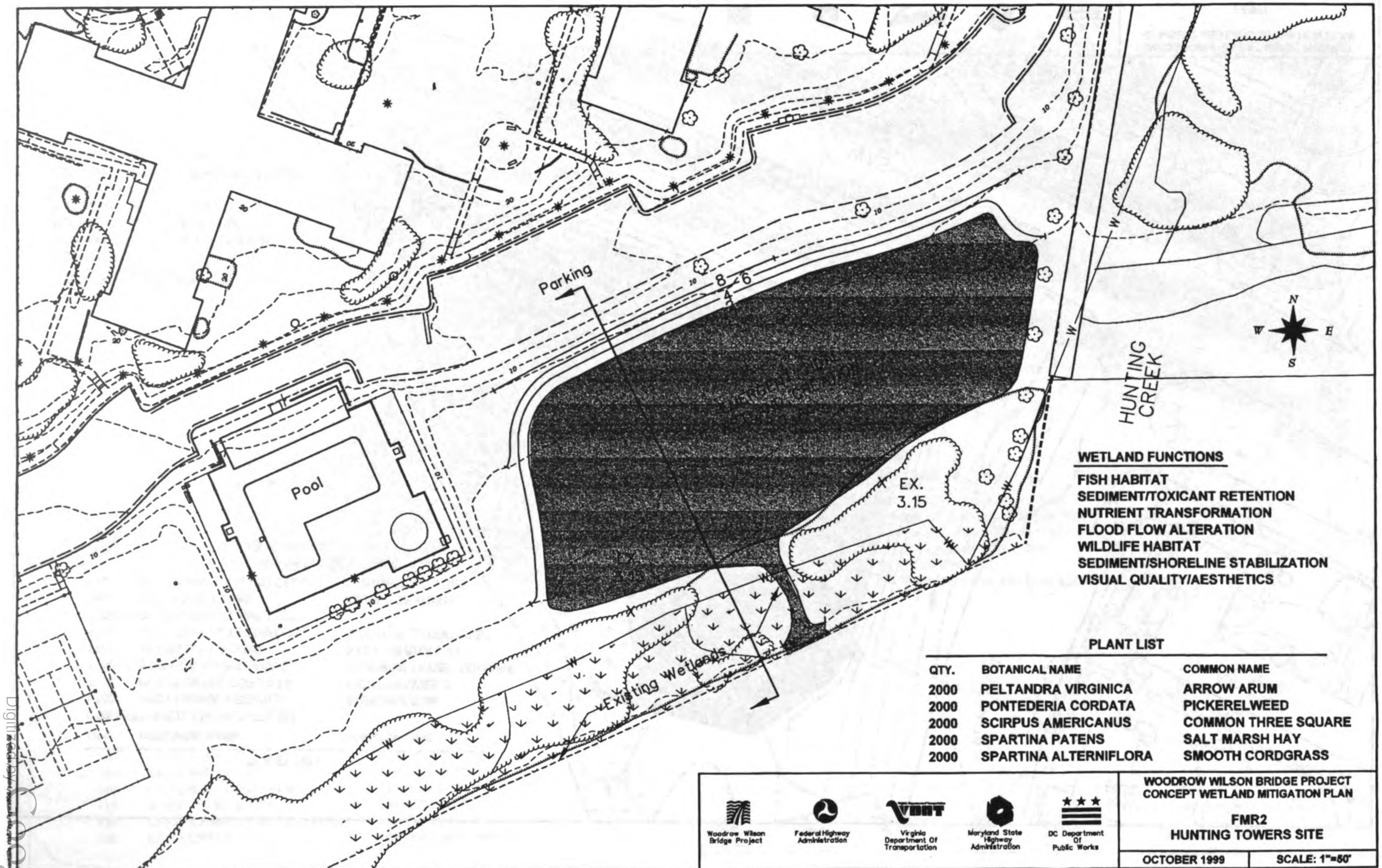
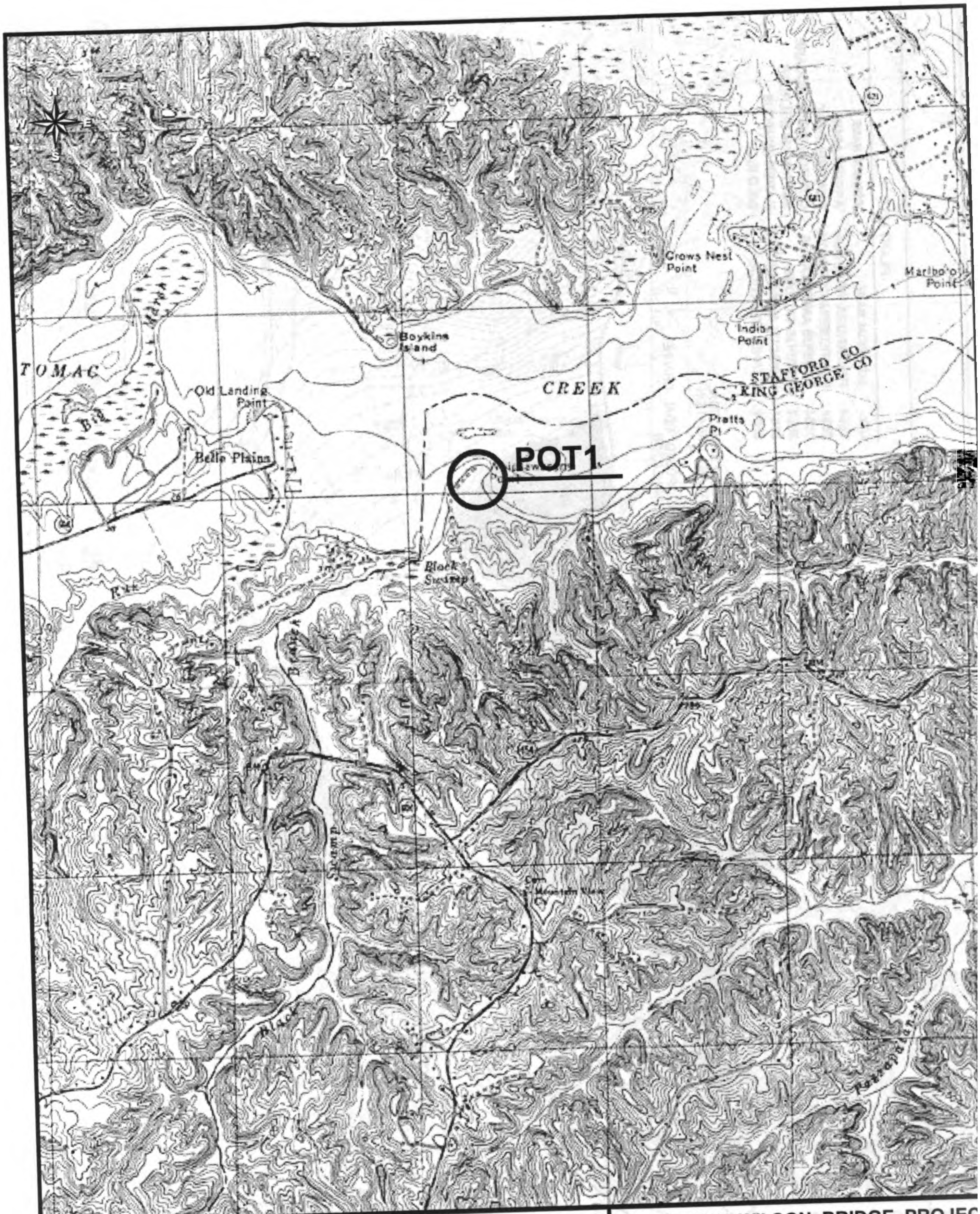


WETLAND FUNCTIONS

FISH HABITAT
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
FLOOD FLOW ALTERATION
WILDLIFE HABITAT
SEDIMENT/SHORELINE STABILIZATION
VISUAL QUALITY/AESTHETICS

PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
2000	PELTANDRA VIRGINICA	ARROW ARUM
2000	PONTEDERIA CORDATA	PICKERELWEED
2000	SCIRPUS AMERICANUS	COMMON THREE SQUARE
2000	SPARTINA PATENS	SALT MARSH HAY
2000	SPARTINA ALTERNIFLORA	SMOOTH CORDGRASS



Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJEC

LOCATION PLAN

Whipsawasons Point

SITE: POT1

Date : December 1999

Scale : 1" = 20

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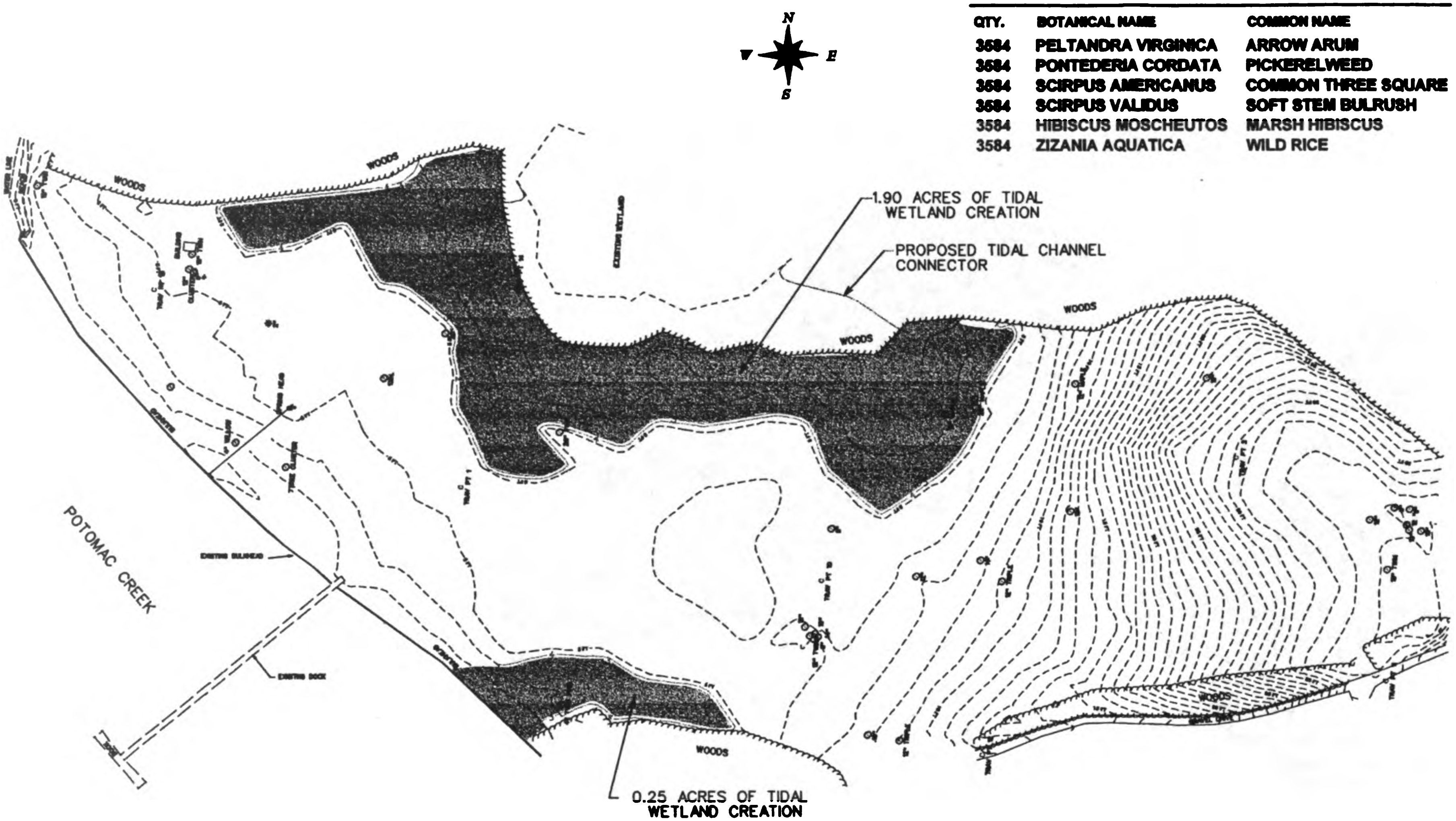
PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
3584	PELTANDRA VIRGINICA	ARROW ARUM
3584	PONTEDERIA CORDATA	PICKERELWEED
3584	SCIRPUS AMERICANUS	COMMON THREE SQUARE
3584	SCIRPUS VALIDUS	SOFT STEM BULRUSH
3584	HIBISCUS MOSCHEUTOS	MARSH HIBISCUS
3584	ZIZANIA AQUATICA	WILD RICE



WETLAND FUNCTIONS

FISH HABITAT
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
FLOOD FLOW ALTERATION
WILDLIFE HABITAT

WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
POT 1
WHIPSAWASON POINT

OCTOBER 1999 | SCALE: 1" = 100'

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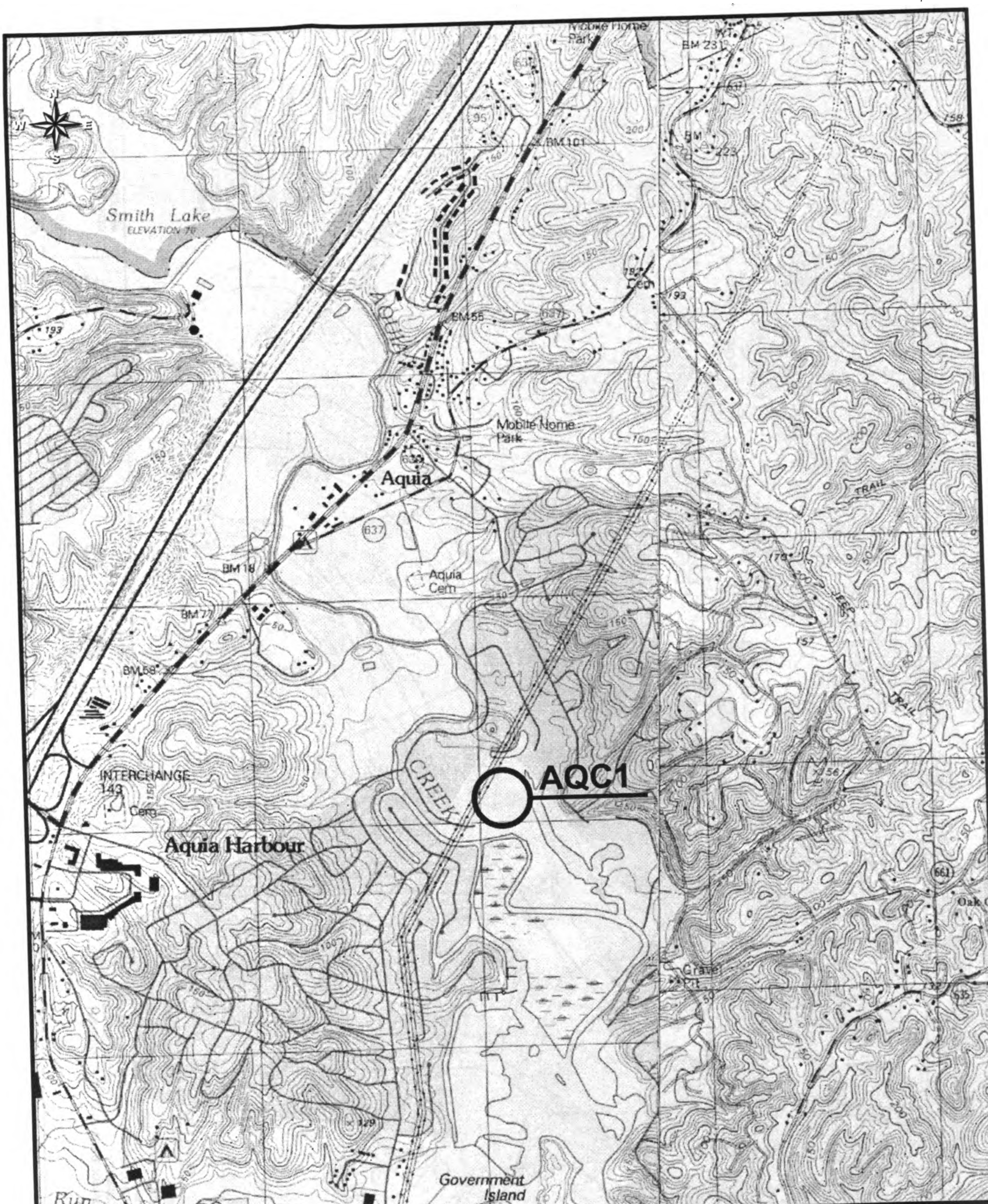

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Aquia Harbour at Delaware Drive
SITE: AQC1

Date : December 1999

Scale : 1" = 2000

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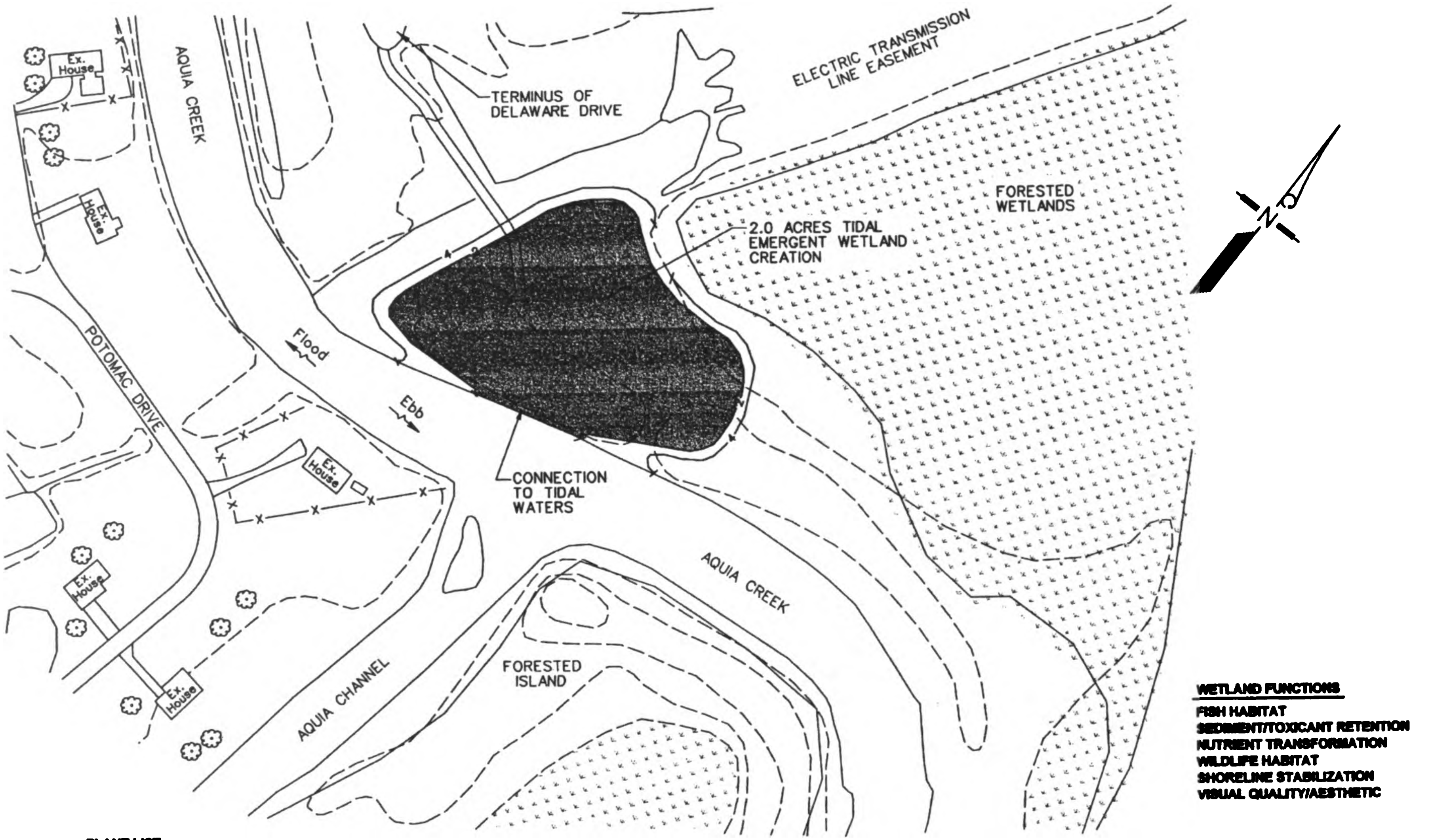

WETLAND FUNCTIONS

FISH HABITAT
SEDIMENT/TOXICANT RETENTION
NUTRIENT TRANSFORMATION
WILDLIFE HABITAT
SHORELINE STABILIZATION
VISUAL QUALITY/AESTHETIC

PLANT LIST

QTY.	BOTANICAL NAME	COMMON NAME
4000	DECODON VERTICILLATUS	SWAMP LOOSESTRIFE
4000	ACORUS CALAMUS	SWEET FLAG
4000	HIBISCUS MOSCHEUTOS	MARSH HIBISCUS
4000	PONTEDERIA CORDATA	PICKERELWEED
750	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH

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Federal Highway Administration
Virginia Department Of Transportation
Maryland State Highway Administration
DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN

AQC1
AQUIA HARBOR AT DELAWARE DR.

OCTOBER 1999 | SCALE: 1"=100'

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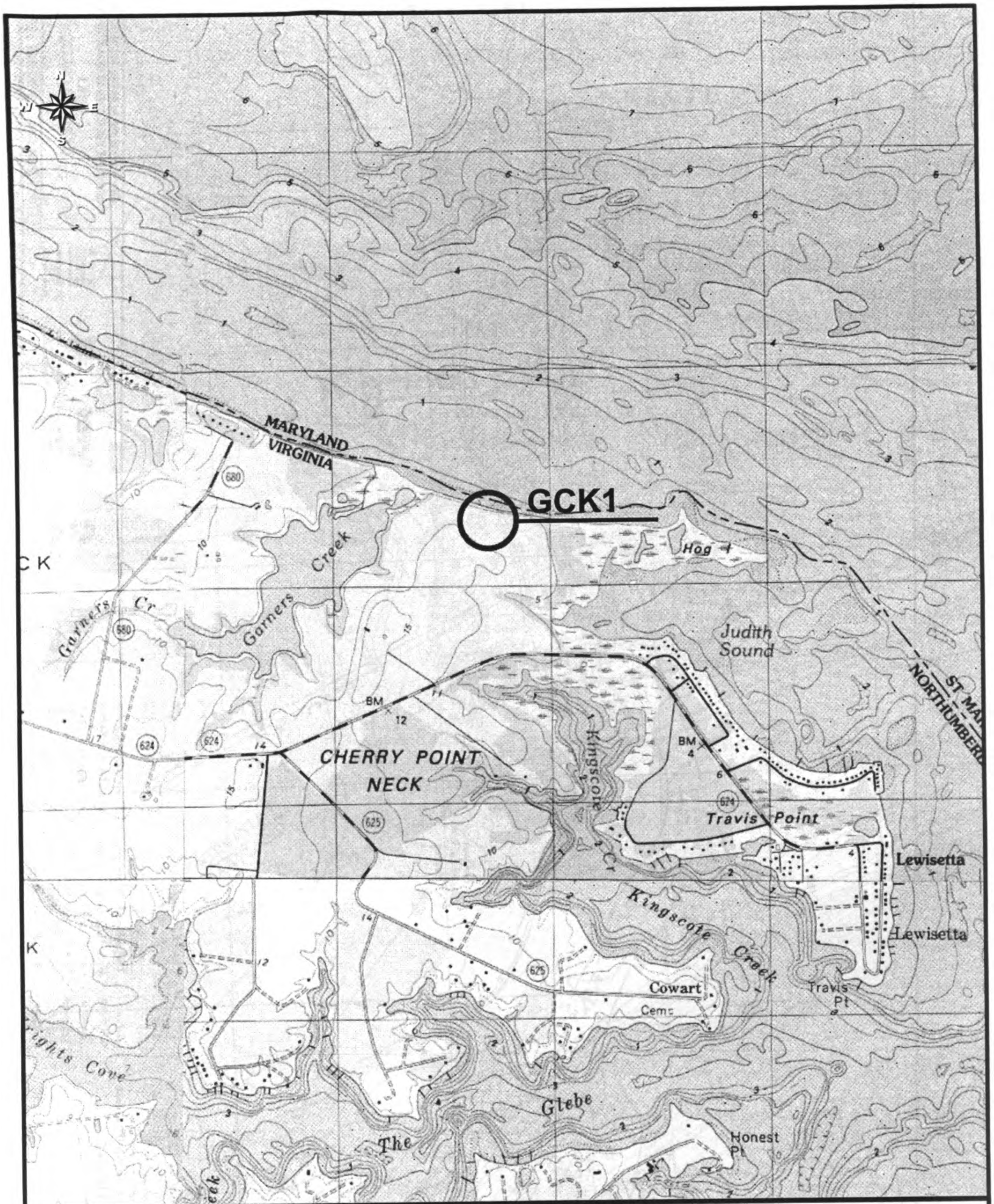

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Garners Creek
SITE: GCK1

Date : December 1999

Scale : 1" = 2000'

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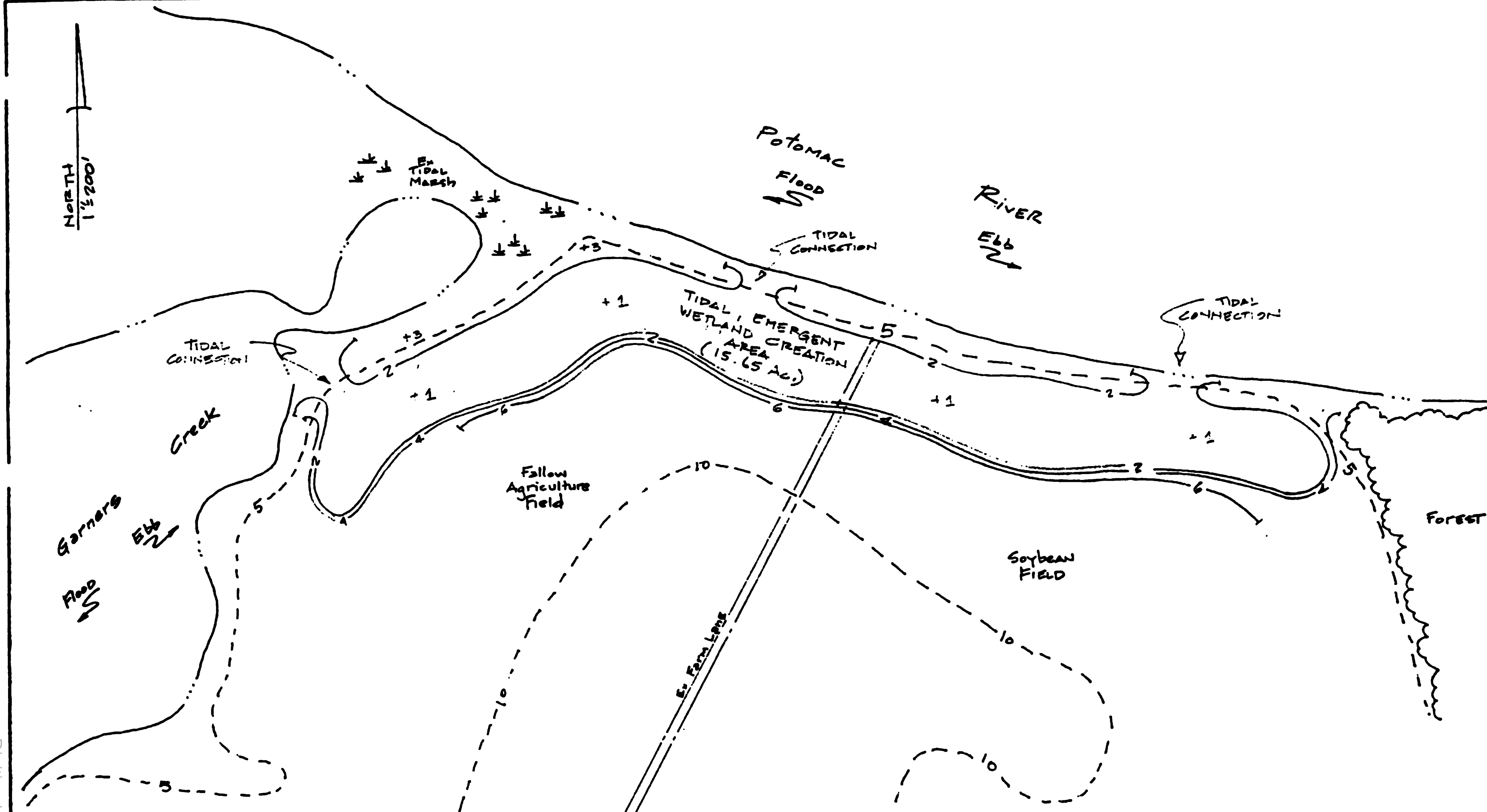

WETLAND FUNCTIONS

Sediment/Shoreline Stabilization
Fish and Shellfish Habitat
Wildlife Habitat

PLANT LIST

Qty	Botanical Name	Common Name
25,000	Spartina alterniflora	smooth cordgrass
20,000	Spartina patens	saltmeadow cordgrass
10,000	Spartina cynosuroides	big cordgrass
200	Iva frutescens	high tide bush
200	Baccharis halmifolia	groundsel tree

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WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
GCK1
GARNERS CREEK

OCTOBER 1999 | SCALE: 1"=200'

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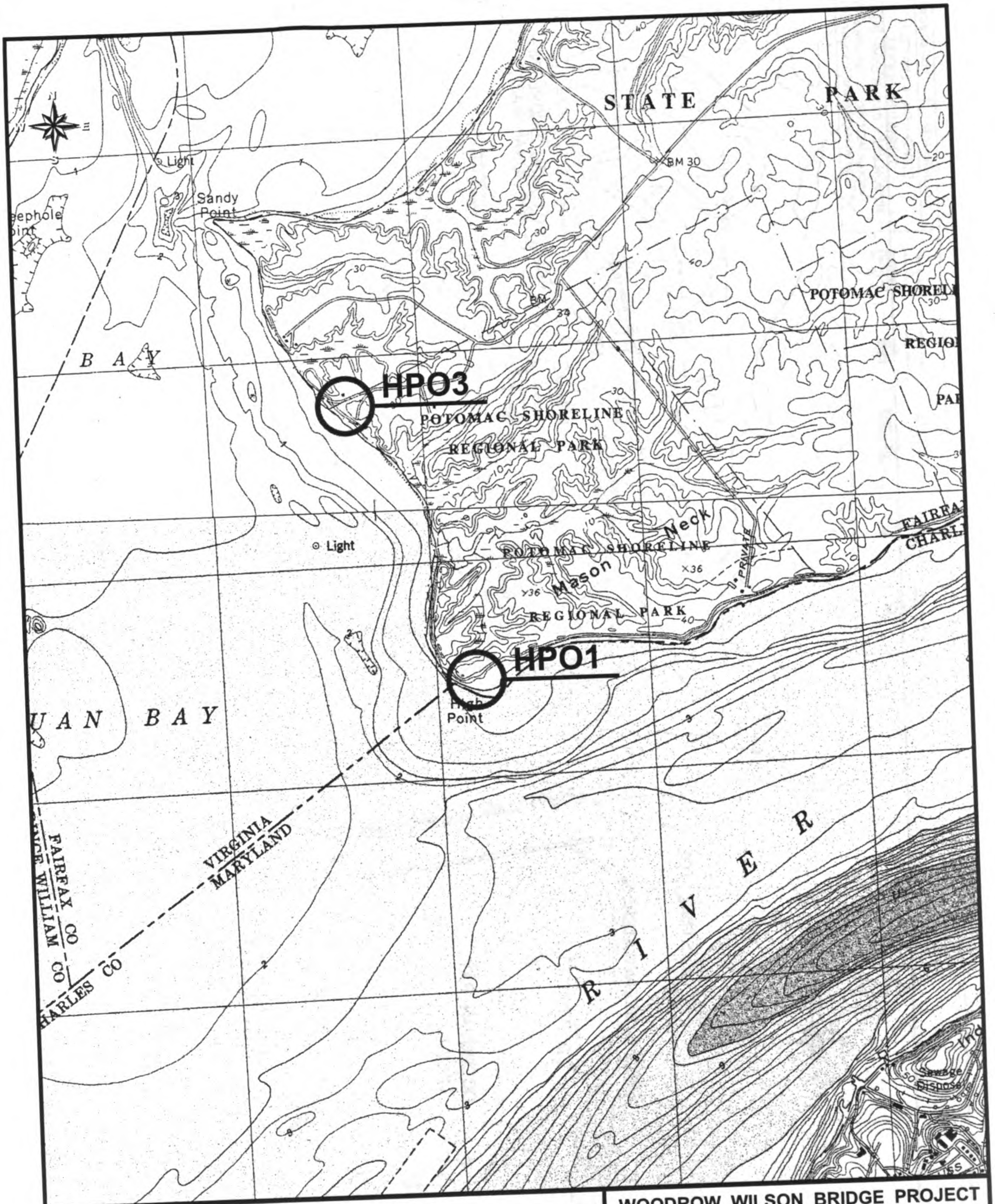

Federal Highway Administration

Virginia Department of Transportation

Maryland State Highway Administration

DC Department Of Public Works

WOODROW WILSON BRIDGE PROJECT
LOCATION PLAN

Mason Neck National Wildlife Refuge

SITE: HPO1

Date : December 1999

Scale : 1" = 2000'

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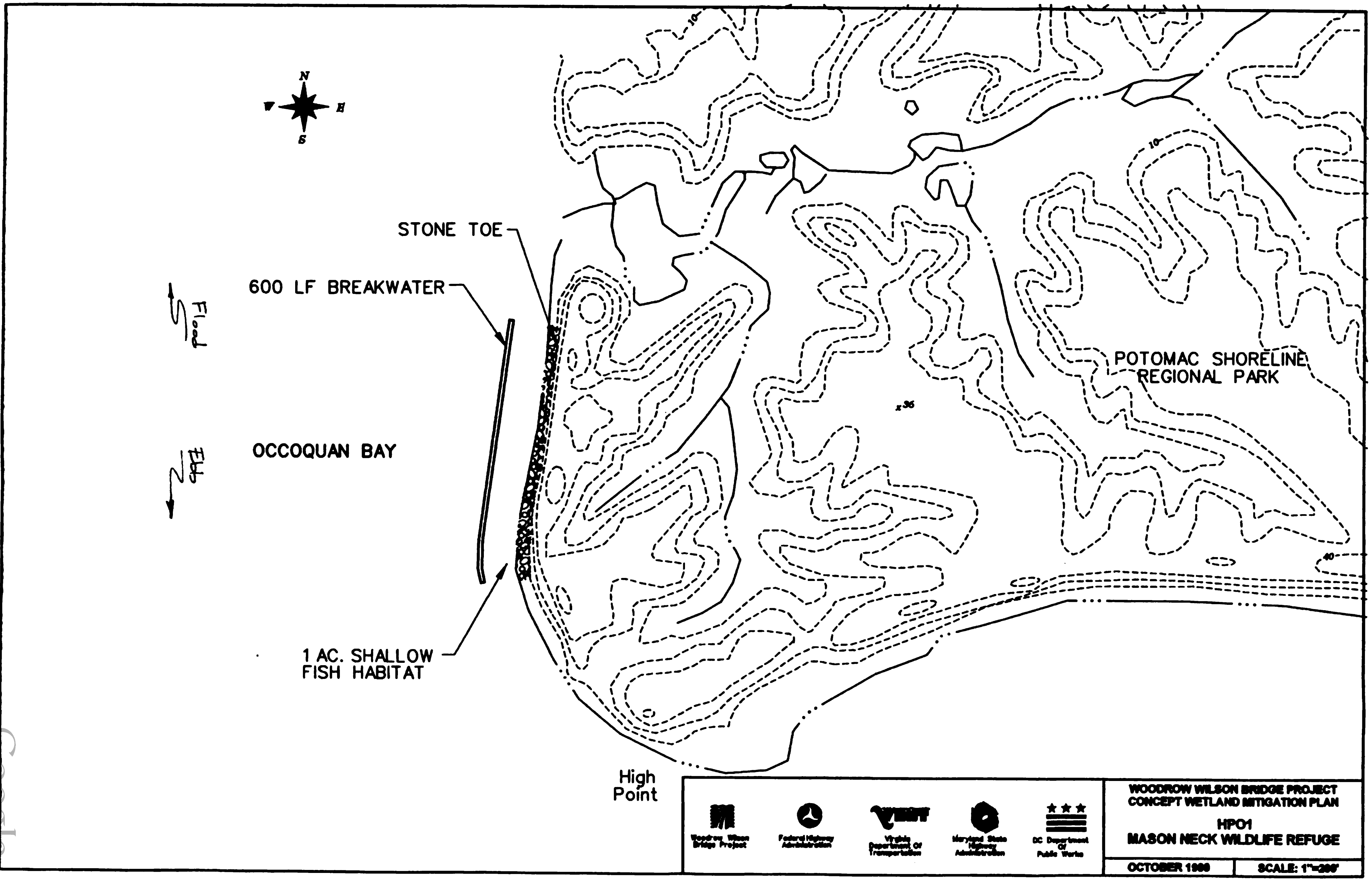
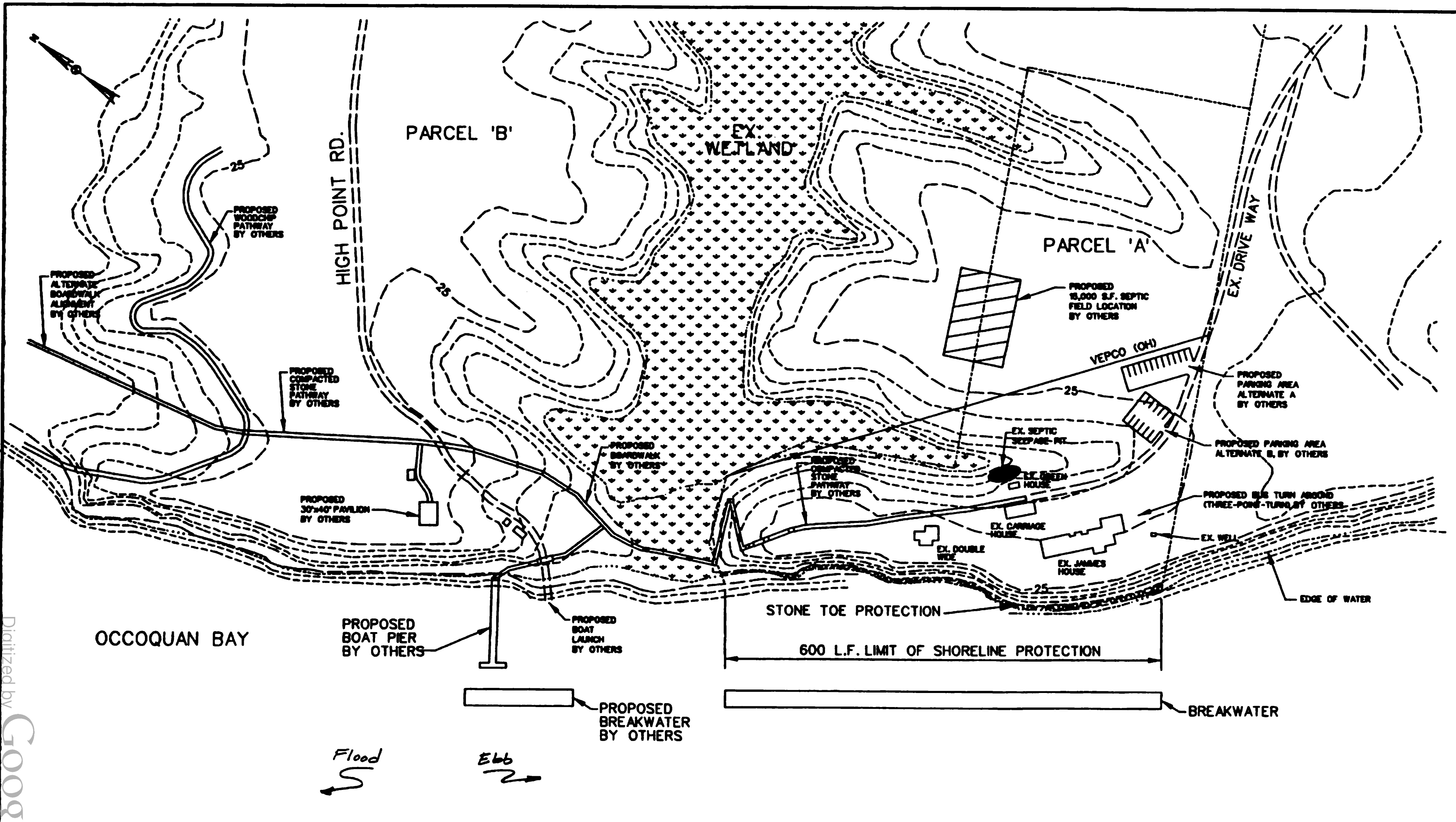

N
W
E
S
Flood
Ebb
STONE TOE
600 LF BREAKWATER
OCCOQUAN BAY
1 AC. SHALLOW
FISH HABITAT
High
Point
POTOMAC SHORELINE
REGIONAL PARK
10
10
40
x36
Woodrow Wilson
Bridge Project
Federal Highway
Administration
Virginia
Department Of
Transportation
Maryland State
Highway
Administration
DC Department
Of
Public Works
WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
HPO1
MASON NECK WILDLIFE REFUGE



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WOODROW WILSON BRIDGE PROJECT
CONCEPT WETLAND MITIGATION PLAN
MASON NECK STATE PARK (HPO3)
JAMMES PROPERTY
EDUCATIONAL FACILITY

OCTOBER 1999 | NOT TO SCALE

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Appendix C

Clean Water Act Section 404(b)(1) Evaluation

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Clean Water Act Section
40 CFR Part 230-Section 404(b)(1) Evaluation Documentation

Woodrow Wilson Bridge Project
Fairfax County, Virginia and Prince George's County, Maryland

Consistent with the requirement of Section 404 of the Clean Water Act of 1977, as amended, the following analysis addresses the requirements of the EPA Section 404(b)(1) guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230.1-230.77-Subparts B through H).

The Section 404(b)(1) guidelines are the substantive criteria used to evaluate discharges of dredged or fill material under Section 404 of the Clean Water Act. The purpose of the 404(b)(1) guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material. From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by the guidelines. The guiding principle is that degradation or destruction of special aquatic sites represents an irreversible loss of valuable resources.

I. PROJECT DESCRIPTION

A. Location

The project area spans the 12.1 km (7.5 mile) section along I-95/495, from west of Telegraph Road (VA 241) in Virginia to east of Indian Head Highway (MD 210) in Maryland. In addition, the project extends north along I-295 into the District of Columbia. The western portion of the corridor is located in Fairfax County and the City of Alexandria in Virginia. The side-by-side drawspan on the Woodrow Wilson Bridge is located in the southern tip of the District of Columbia; the eastern portion of the corridor is located in Prince George's County in Maryland.

B. General Description

Purpose and Need

The overall project purpose is to alleviate congestion, address safety concerns and structural conditions of the existing Woodrow Wilson Bridge and to provide an efficient and effective interstate transportation system in I-95/495 corridor south of Washington DC.

The first basic project purpose is the interstate crossing of the Potomac River. The second basic project purpose pertains to the highway interchange improvements, including Telegraph Road, US 1, I-295, and MD. 210. The purpose of the interchanges is to provide a safe highway, which will convey vehicular traffic from the bridge. The third basic project purpose includes providing recreation and park facilities for local residents and visitors.

The FHWA purpose and need for the Woodrow Wilson Bridge project has not substantially changed since the 1997 FEIS.

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Project History

The FEIS/Section (4f) Evaluation, signed in September 1997, identified the Preferred Alternative. A Record of Decision (ROD) was prepared which summarized the 1997 FEIS/Section (4f) Evaluation and added a List of Commitments, which are to be addressed during the project's design. This document, signed in November 1997, finalized the decision-making and National Environmental Policy Act requirements associated with the project. The ROD identified the Selected Alternative, Alternative 4A within an approximate five-mile corridor. The ROD also identified other features that will continue to be included in the design of the project.

A MOA, dated August 19, 1997, was signed which established a mechanism for oversight and enforcement of the commitments made to maintain the cultural heritage and integrity of its features are a part of the Record of Decision.

Design Refinements

Many design studies and refinements to FEIS Alternative 4A have been undertaken since November 1997. These refinements were developed as more detailed information was learned. In addition, a multi-layered organizational structure of the Woodrow Wilson Bridge project was developed to ensure participation by all stakeholders in an efficient and coordinated manner. These design refinements have been incorporated in the Current Design Alternative 4A.

FEIS Alternative 4A (1997 Selected Alternative)

The FEIS Alternative 4A was identified by the Coordination Committee in September 1996, as the alternative that best met the project's purpose and need, while minimizing environmental impacts.

The FEIS Alternative 4A consists of eight general use lanes to match the existing I-95/495, two HOV/express bus/transit lanes to match those under consideration for I-95/495, and two merging/diverging lanes to ease entering and exiting I-95/495, particularly between the US 1 and I-295 interchanges. The lanes will be configured in a divided express/local roadway system allowing for the physical separation of local and through traffic. The roadway section also includes shoulders in the express and local roadways. There will be no conversion of the shoulders in the future to add general-purpose lanes. The two HOV/express bus/transit lanes will be separated from the express lanes by a two-foot painted area. The HOV/express bus/transit lanes will not be opened until connecting HOV/express bus/transit systems are in place within Maryland and Virginia and will not be used as general purpose lanes except for incident/accident management and maintenance of traffic, where necessary, during construction and maintenance activities.

The FEIS Alternative 4A will replace the existing Woodrow Wilson Bridge with two new parallel drawbridges, one for eastbound traffic and the other for westbound traffic, constructed approximately 30 feet south of the existing Bridge. Each bridge will include four general use lanes, one HOV/express bus/transit lane and one merging/diverging lane. The drawbridges will be approximately 6,075 feet long, have a maximum grade of three percent, and have a 70-foot clearance over the navigational channel.

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The proposed bridge consists of spans ranging in length from 120 feet to 398 feet including a 366-foot bascule span over the main navigation channel of the Potomac River. The piers for this structure reflect a unique delta or V-shape with curved, vertically sloping pre-cast concrete legs connected at the top by a horizontal tie member, also of pre-cast concrete. The foundations for the piers consist of cast-in-place concrete footings constructed on steel pipe piles. The appearance and constructability of the bridge are predicated on setting the bottom of the pier footings some depth below the waterline of the river. In the shallower areas of the river, excavation of the river bottom will be required.

The typical cross section for the bridge has a total width of 249 feet with the eastbound bridge being 110 feet wide, the westbound bridge being 124 feet wide, and a 15-foot separation between the two bridges. The proposed elevation of the bottom of the foundation for these piers is -12.9 with the approximate elevation of the river bottom at elevation -2.05. The plan area of one of these footings occupies 4,802 square feet for the westbound bridge (98 feet by 49 feet) and 4,361 square feet for the eastbound bridge (89 feet by 49 feet).

The interchanges at Telegraph Road, US 1, I-295, and MD 210 will be reconstructed to allow for smoother traffic flow, increased access, and roadway widening. In addition, direct HOV access will be provided between US 1, I-295, MD 210, and I-95/495.

The interchange modifications included with the FEIS Alternative 4A at Telegraph Road will shift the current one-lane loop ramp from westbound I-95/495 to southbound Telegraph Road to accommodate the new I-95/495 roadway and will replace the other two existing loop ramps in the northeast and southwest quadrants with signalized left turn ramp movements. All interchange movements would be provided and would access the local lanes only. The two-lane directional connection from the eastbound I-95/495 to northbound Telegraph Road will be relocated slightly to the west and a direct ramp connection to Stovall Street will be included. The eastbound I-95/495 to northbound and southbound Telegraph Road ramp will be relocated to be in line with Kings Highway to improve traffic flow at both Kings Highway and Huntington Avenue. The movement from northbound Telegraph Road to the new directional ramp to Stovall Street is also provided.

The US 1 mainline will be shifted to the east as part of the interchange reconfiguration at that location. The current one-lane loop ramp from westbound I-95/495 to southbound US 1 will become a two-lane loop ramp to accommodate the projected traffic increases. The existing loop ramp in the northeast quadrant will be replaced by a signalized dual left-turn from northbound US 1 to the westbound I-95/495 local lanes and the existing loop ramp in the southeast quadrant will be shifted to accommodate I-95/495 roadway. The existing directional ramp from southbound US 1 to eastbound I-95/495 will be replaced with two loop ramps. A common two-lane exit from US 1 will cross over I-95/495 to provide one-lane access to both the local and express system in the southwest quadrant of the interchange. The ramps from northbound US 1 to I-95/495, westbound I-95/495 to northbound US 1 and Church Street, eastbound I-95/495 to southbound US 1 will all be reconstructed to accommodate the change to I-95/495 and other interchange ramps. Finally, direct connections will be provided between US 1 and the HOV lanes in the express lanes of I-95/495.

The alignment of I-295 will remain the same as existing with the interchange modifications with the preferred alternative. The existing loop ramp in the southwest quadrant will be replaced with a directional ramp and a new loop ramp will be added in the northwest quadrant for traffic from the

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eastbound local lanes of I-95/495 to southbound into National Harbor. The eastbound I-95/495 to northbound I-295 ramp will be designed to accommodate a southbound connection into National Harbor and new ramp connections will be provided from National Harbor to the eastbound and westbound local I-95/495 lanes. The other existing ramps will be reconstructed to accommodate the revised mainline and express/local system. A ramp from the eastbound I-95/495 express lane to the S-curve in the direction of MD 210 was added to the interchange. Finally, direct HOV connections to I-95/495 express lanes will be included to and from the west.

The interchange modifications at MD 210 will replace three of the existing loop ramps with other types of ramps. The northbound MD 210 to westbound I-95/495 loop ramp will be shifted and expanded to two lanes. The southbound MD 210 to eastbound I-95/495 movement will be via Oxon Hill Road and a new ramp joining the ramp from northbound MD 210. The existing westbound I-95/495 to southbound MD 210 loop ramp in the northwest quadrant will be replaced with a signalized two-lane left-turn ramp off the westbound I-95/495 to northbound MD 210 ramp. The existing eastbound I-95/495 to northbound MD 210 loop ramp in the southeast quadrant and the existing eastbound I-95/495 to Oxon Hill Road ramp in the southwest quadrant will be replaced with a ramp off of the southbound S-curve, through the park-and-ride lot that connects to Oxon Hill Road. A direct access ramp to the westbound I-95/495 express lanes from the northbound MD 210 S-curve have been added. Direct HOV connections to I-95/495 express lanes will be included to and from the west at the MD 210 bridge over I-95/495.

Discussions with the Coordination Committee and members of the Citizen's Interchange Work Group, as well as comments received at the Public Hearings, have led to suggested modifications to the interchange configurations at US 1 and MD 210. These suggestions include removing the proposed signalized ramp connections and providing more direct access.

Optional interchange modifications have been included with the preferred alternative to provide additional access to the Eisenhower Valley area in Virginia. The optional access between Eisenhower Valley and I-95/495 to the east towards US 1 and Maryland has been shown as an extension of I-95/495/US 1 interchange. The access ramps include two direct access ramps to and from the east.

FEIS Alternative 4A also includes provisions for several special design features, as follows:

- A deck will be constructed over I-95/495 in the area of Washington Street in the City of Alexandria providing opportunities for community enhancements, improving redevelopment potential, and re-connecting portions of southern Alexandria on either side of I-95/495.
- A deck will be constructed over I-95/495 on Rosalie Island in Prince George's County, providing opportunities to connect parkland on both sides of the existing bridge, as well as providing a connection for the proposed Potomac Heritage Trail and a location to enjoy vistas of the Potomac River.
- A 12-foot wide pedestrian/bicycle facility with appropriate safety offsets will be included on the new bridge and will connect to the existing/proposed trail systems in Virginia, Maryland, and the District of Columbia. The connections will be made via ramps tying into the Mount Vernon Trail in Virginia near the George Washington Memorial Parkway/Washington Street and the proposed Potomac Heritage Trail on Rosalie Island in Maryland.
- Conceptual mitigation plans have been developed to further enhance Jones Point Park and Rosalie Island to mitigate impacts the project has on those sites.

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- Wetland replacement or enhancement, noise barriers where reasonable and feasible, and landscaping are included.

The existing bridge will be used to maintain traffic during the construction of the new facility, after which it will be removed.

Current Design Alternative 4A

Refinements to the Preferred Alternative have been made that incorporate the details associated with the additional study in areas of environmental data, engineering and incorporation of public and Stakeholder Participation Panel comments. This includes a project area greater than five miles and expands the project limits on Telegraph Road, to the west, and I-295 and Maryland 210 to the north south and east of the FEIS project limits. This also includes elements of settlement of the City of Alexandria lawsuit: narrower Potomac River Bridge and the inclusion of Eisenhower Valley ramps to and from the east from the express lanes.

As design activities continued, working with the various stakeholders for the project, modifications to the preferred alternative have been introduced to meet future community, business, and environmental needs. In addition, several improvements have been introduced to improve the operations and safety of the proposed project. The lane configuration for the Current Design Alternative 4A remains the same as the FEIS Alternative 4A with the following modifications:

Telegraph Road
The interchange modifications included with the Current Design Alternative 4A at Telegraph Road would shift the current one-lane loop ramp from westbound I-95/495 to southbound Telegraph Road to accommodate the new I-95/495 roadway. The existing northeast, northwest, and southwest ramps will be improved to accommodate the movements to the new I-95/495 roadway. All interchange movements would be provided and would access the local lanes only. The two-lane directional connection from the eastbound I-95/495 to northbound Telegraph Road would be relocated slightly to the west and a direct ramp connection to Pershing Avenue would be included. The eastbound I-95/495 ramp (to southbound Telegraph Road and Huntington Avenue and North Kings Highway) would be split to align with North King's Highway and Huntington Avenue in order to improve traffic flow at both North King's Highway and Huntington Avenue. To accommodate this split, Burgundy Road would end at East Drive and East Drive would be extended to Telegraph Road at Lenore Lane. The movement from northbound Telegraph Road to the new directional ramp to Eisenhower Avenue at Stovall Street is also provided.

FEIS optional interchange modifications have been included with the Current Design Alternative 4A to provide additional access to the Eisenhower Valley area in Virginia. The optional access between Eisenhower Valley and I-95/495 to the east towards US 1 and Maryland has been shown as an extension of I-95/495/US 1 interchange. The access ramps include two direct access ramps to and from the east (serving only the express lanes).

US 1
US 1 mainline would be shifted to the east as part of the interchange reconfiguration at that location. The current one-lane loop ramp from westbound I-95/495 to southbound US 1 would become a two-lane loop ramp to accommodate the projected traffic increases. The existing loop ramp in the

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northeast quadrant would be replaced by a two lane directional connection from northbound US 1 to the westbound I-95/495 local and express lanes. The existing loop ramp in the southeast quadrant would be shifted to accommodate I-95/495 roadway. The existing directional ramp from southbound US 1 to the eastbound I-95/495 would be replaced with two loop ramps. This common two-lane exit from US 1 would cross over I-95/495 to provide one-lane access to both the local and express system in the southwest quadrant of the interchange. The ramps from northbound US 1 to the eastbound I-95/495, westbound I-95/495 to northbound US 1 and Church Street, and eastbound I-95/495 to southbound US 1 will all be reconstructed to accommodate the change to I-95/495 and other interchange ramps. Finally, direct connections will be provided between US 1 and the HOV lanes in the express lanes of I-95/495.

I-295 interchange

At the I-295 interchange, FEIS Alternative 4A proposed raising I-95/495 alignment approximately 6.1 to 9.1 meters (20 to 30 feet), in essence reversing the present "over/under" configuration. The Current Design Alternative 4A returns to the existing configuration, essentially keeping I-95/495 near its present vertical alignment and building elevated I-295 ramp connections. The majority of these ramp connections would remain the same as the interchange modifications proposed with the FEIS Alternative 4A. The existing loop ramp in the southwest quadrant would be replaced with a directional ramp. A new loop ramp would be added in the northwest quadrant to permit traffic from the westbound local lanes of I-95/495 to enter National Harbor. The eastbound I-95/495 to northbound I-295 ramp would be designed to accommodate a southbound connection from National Harbor. New ramp connections would be provided from National Harbor to the eastbound and westbound local I-95/495 lanes. Most of the ramp connections with National Harbor provide for movements to and from both the Waterfront and I-95/495 parcels. The southern limit of work at National Harbor would be the first intersection. The other existing ramps will be reconstructed to accommodate the revised mainline and express/local system. A ramp from the eastbound I-95/495 express lane to the S-curve towards the direction of MD 210 was added to the interchange. Finally, direct HOV connections between I-295 and the Woodrow Wilson Bridge/I-95/495 express lanes would be included.

MD 210 Interchange

The interchange modifications at MD 210 would replace three of the existing loop ramps with other types of ramps. The northbound MD 210 to westbound I-95/495 loop ramp would be shifted and expanded to two lanes. The southbound MD 210 to eastbound I-95/495 movement would be via Oxon Hill Road and a new ramp joining the northbound MD 210 ramp to the eastbound I-95/495 movement. The existing westbound I-95/495 to southbound MD 210 loop ramp in the northwest quadrant would be replaced with a signalized two-lane left-turn ramp off the westbound I-95/495, this movement will also accommodate the westbound I-95/495 to northbound MD 210 movement. The existing eastbound I-95/495 to northbound MD 210 loop ramp in the southeast quadrant and the existing eastbound I-95/495 to Oxon Hill Road ramp in the southwest quadrant would be replaced with a ramp off of the southbound S-curve (through the County's park-and-ride lot that connects to Oxon Hill Road) and a reconfigured exit ramp in the southeast quadrant from the local I-95/495 lanes to Oxon Hill Road (adjacent to the proposed entrance ramp discussed above). An alternative to the ramp connection shown with FEIS Alternative 4A from Southbound S-curve to Oxon Hill Road (identified as Ramp E-1 through Prince George's County's park-and-ride lot) is also being evaluated – the alternative ramp would swing further south around the IRS building on the Salubria development and then connect directly with Oxon Hill Road. A direct access ramp to the westbound I-95/495 express lanes from the northbound MD 210 S-curve has also been added. Because so many of the

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present loop ramp movements are being reconfigured, and must pass through the MD 210/Oxon Hill Road intersection, a grade separation is now proposed at this location. Essentially, Oxon Hill Road would be shifted north and depressed to approximately the elevation of I-95/495, passing under MD 210. Small loop ramps would then connect Oxon Hill Road to MD 210 in the southwest and southeast quadrants of this grade separation. Existing bridges over Oxon Hill Road east and west of MD 210 would also be replaced. Direct HOV connections to I-95/495 express lanes would be included to and from the west at the MD 210 bridge over I-95/495. Bald Eagle Road bridge would be reconstructed east of its existing location under this alternative. Based on discussion with NPS, this new bridge would only serve pedestrian and bridge traffic – a new "park driveway" connection to Oxon Hill Farm would be provided on MD 210 in the northwest quadrant of the MD 210/I-95/495 interchange.

SUBPART B: COMPLIANCE WITH THE GUIDELINES

The Section 404(b)(1) guidelines require that project planning and associated alternatives analysis demonstrate that there are no practicable alternatives which would result in fewer environmental impacts compared to the Current Design Alternative 4A. The development of alternatives for the Woodrow Wilson Bridge Project involved an extensive screening process, which recognized a wide range of natural and man-made resources. The presence of these resources influenced the location and proposed design of project alternatives.

II. WATER DEPENDENCY

The EPA 404(b)(1) Guidelines state that where a discharge activity is proposed for a special aquatic site that does not require access, proximity, or siting within the special aquatic site in question to fulfill its basic purpose, practicable alternatives that do not involve special aquatic sites are presumed to be available, unless clearly demonstrated otherwise.

The proposed project includes the replacement of the Woodrow Wilson bridge, modifications to the four highway interchanges described above, parks and recreation improvements at Jones Point Park, and Rosalie Island, and the creation of boardwalks and fishing piers within the park areas.

The first basic project purpose is the interstate crossing of the Potomac River. The purpose the bridge fulfills can only be met by crossing an aquatic site (i.e., the Potomac River). Therefore, the mainline bridge is classified as water dependent. Specific water dependent activities associated with the bridge construction include the construction the bridge infrastructure and the construction of bridge piers and piles in the Potomac River and demolition of the existing bridge.

The second basic project purpose pertains to the highway interchange improvements, including Telegraph Road, US 1, I-295, and MD. 210. The purpose of the interchange improvements is to provide a safe highway, which will convey vehicular traffic from the bridge. The highway interchange improvements are not considered water dependent.

The third basic project purpose includes providing recreation and park facilities for local residents and visitors. Jones Point Park and Rosalie Island are parkland mitigation for 4(f) impacts associated with the bridge. These areas will be designed to include passive uses such as hiking and active uses such as field sports. The parkland itself and the pathway network within the parks would not be

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considered water dependent. However, the proposed fishing piers and boardwalks through aquatic resources would be considered water dependent.

III. RESTRICTIONS ON DISCHARGE

A. Alternatives Analysis - Design Alternatives

The discharge of dredged or fill material in the aquatic ecosystem including wetlands, is not permitted if there is a practicable alternative that would have less adverse impact to the aquatic environment unless it has other significant environmental impacts. The provisions of the Section 404(b)(1) Guidelines require that alternative actions and locations be considered to avoid impacts to aquatic resources. The analysis must demonstrate that there is no practicable alternative to the proposed discharge of dredged or fill material that would have less adverse impact to the aquatic ecosystem. These alternatives are not considered practicable if they have other substantive adverse environmental consequences.

A three-year long alternatives development process resulted in the identification of five build alternatives for detailed study, along with two modified alternatives that were developed following the January 1996 SDEIS/Section 4(f) Evaluation. These seven build alternatives represented the most reasonable options to satisfy project transportation and environmental goals. Over 350 potential solutions, including the six alternatives contained in the 1991 DEIS, were narrowed to these seven build alternatives based on extensive agency and public comments, and regulatory requirements. These alternatives, located on alignments adjacent to and south of the existing I-95/495 alignment, included both bridge and tunnel crossings of the Potomac River. Other alignments were dismissed due to their potential for significant environmental and social impacts and their inability to satisfy the project's operational needs. Major transit improvements, high occupancy vehicle (HOV) lane implementation, and various other Transportation Systems Management (TSM) techniques were also evaluated as options to providing improved transportation operations. Each of these approaches would only slightly alleviate current congestion and would not solve projected future traffic congestion. Increased transit usage and HOV implementation were included as components of the traffic analyses for the development of these alternatives.

There were a number of alternatives developed for the possible alignments (current, southern, or split) and crossing types (tunnel, drawbridge, high bridge, or combination) for the Woodrow Wilson Bridge. This resulted in the identification of twelve "families" of river crossing options. One or more options were developed in each "family" resulting in 33 preliminary river crossing options. Other river crossing options were suggested and considered such as moving the navigational channel and building a system of locks in the Potomac River to lower ships traveling north of the Bridge. These options were determined not to be feasible due to constructibility problems and/or their impacts to the Potomac River and its surrounding ecosystem.

The range of crossing options was narrowed from 33 to seven alternatives and the "No-Build" Alternative.

The proposed build alternatives, presented in the January 1996 SDEIS/Section 4(f) Evaluation and the July 1996 SDEIS/Section 4(f) Evaluation, represent numerous iterations of refinements and modifications that sought to ensure adequate mobility, engineering feasibility, and environmental

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sensitivity. Each of the alternatives assumed an eight-lane I-95/495 with the addition of two HOV lanes, which is currently being studied as part of the regional transportation planning process. Although developed to accommodate the same transportation requirements, the alignment and/or structure of each alternative is unique.

The findings of the analysis demonstrates that there are no practicable alternatives that completely avoid aquatic impacts and still meet the purpose and need for the project. The seven alternatives identified in the 1997 FEIS Include:

- **Alternative 1: No Build**
  This alternative assumes that the existing six-lane Woodrow Wilson bridge and its surrounding roadway network will remain in place.

- **Alternative 2: Southern Alignment Tunnel**
  This alternative would replace the existing Woodrow Wilson bridge with a tunnel, for both eastbound and westbound traffic, constructed approximately 45.7 meters (150 feet) south of the existing bridge.

- **Alternative 3: Southern Alignment Drawbridge next to Tunnel**
  This alternative would replace the existing Woodrow Wilson bridge with a new drawbridge, built approximately 9 meters (30 feet) south of the existing bridge, and a new tunnel, constructed another 18 meters (60 feet) south of the new bridge.

- **Alternative 3A Modified: Southern Alignment High Bridge next to Tunnel**
  This alternative would replace the existing Woodrow Wilson bridge with a new six-lane high bridge, built approximately 64.0 meters (210 feet) south of the existing bridge, and a new six-lane tunnel, constructed 38.1 meters (125 feet) south of the new bridge.

- **Alternative 4A Modified: Southern High Bridge**
  This alternative would replace the existing Woodrow Wilson bridge with a twelve-lane bridge constructed approximately 64 meters (210 feet) south of the existing bridge.

- **Alternative 4B: Current Alignment Double-Deck Drawbridge**
  This alternative would replace the existing Woodrow Wilson bridge with a new double-deck swingspan drawbridge, for which both the upper and lower decks would swing open to allow the passage of marine vessels.

- **Alternative 5: Southern Alignment High Level Bridge**
  Immediately west of the US 1 interchange, the new alignment would shift to the south, crossing Cameron Run, and passing across the northern portion of the Belle Haven Country Club. It would then cross over the George Washington Memorial Parkway and continue across the Potomac River on a long sweeping curve approximately 762 meters (2,500 feet) south of the existing bridge at its farthest point. Alternative 5 rejoins the current alignment at I-295 and follows the existing Beltway to MD 210.

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- **Current Design Alternative 4A: Drawbridge South of the Current Alignment**
  The FEIS Preferred Alternative has been modified to incorporate safety issues, and enhance mobility in the corridor. This Alternative will replace the existing Woodrow Wilson bridge with two new parallel drawbridges, one for eastbound traffic and the other for westbound traffic, constructed approximately 30 feet south of the existing bridge.

Table 1 summarizes the alternative's impacts to aquatic sites based on current mapping of waters of the U.S., including vegetated wetlands, mud flats, and submerged aquatic vegetation.

Table 1: Summary of Impacts to Waters of the United States for each Alternative hectares (acres)

Description of Impact	2	3A	3A Modified	4A Modified	4B	5	Current 4A
Tidal Wetlands	6.4 (15.9)	5.6 (13.7)	6.7 (16.5)	6.9 (17.1)	5.3 (13.1)	5.1 (12.5)	6.1 (15.0)
Non-Tidal Wetlands	1.4 (3.5)	1.7 (4.2)	1.7 (4.2)	1.7 (4.2)	1.7 (4.2)	2.1 (5.3)	1.8 (4.5)
Tidal Open Water	15.1 (37.2)	8.5 (21.1)	8.5 (21.1)	3.4 (8.5)	2.4 (5.9)	4.9 (12.1)	3.4 (8.5)
Tidal Vegetated Shallows (SAV)	11.3 (28.0)	9.8 (24.3)	12.2 (30.2)	13.1 (32.4)	12.8 (31.7)	26.2 (64.7)	12.8 (31.7)
Non-Tidal Open Water	1.4 (2.6)	1.4 (2.6)	1.4 (2.6)	1.4 (2.6)	1.4 (2.6)	1.4 (2.6)	1.4 (2.6)
Tidal Mud Flats	0.40 (1.10)	0.40 (1.10)	0.40 (1.10)	0.40 (1.10)	0.40 (1.10)	0.40 (1.10)	0.40 (1.10)
Dredge Material	1,529,200 CM (2,000,000 CY)	1,177,484 CM (1,540,000 CY)	1,204,245 CM (1,575,000 CY)	439,645 CM (575,000 CY)	535,220 CM (700,000 CY)	756,954 CM (990,000 CY)	382,300 CM (500,000 CY)
Construction, Right of Way and Design Cost in 1997 Dollars	$2.75 -$3.56 Billion	$2.23 Billion	$2.29 Billion	$1.68 Billion	$1.64 Billion	$2.06 Billion	$1.59 Billion
Annual Operations and Maintenance Cost in 1997 Dollars	$26.4 Million	$17.8 Million	$17.5 Million	$10.7 Million	$11.0 Million	$10.7 Million	$11.0 Million

Comparison of Impacts

From the chart presented above the impacts to aquatic resources are similar in the following groupings of alternatives:

- Alternative 2
- Alternatives 3A, and 3A Modified
- Alternatives 4A Modified, 4B, and Current Design 4A
- Alternative 5

Alternative 2 was grouped separately because it has considerably higher impacts to tidal open water, requires more dredging, and is more costly than any other alternative. Alternatives 3A, and 3A Modified are grouped together because the impacts to aquatic resources, required dredging, and costs are similar. Alternatives 4A Modified, 4B, and Current 4A are grouped together because the impacts to aquatic resources, required dredging, and costs are similar. Alternative 5 was grouped separately because it has considerably higher impacts to SAV than any other alternative.

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Alternative 1: No-Build

This alternative assumed that the existing six-lane Woodrow Wilson Bridge and its surrounding roadway network would remain in place, with little or no refinement, except such repairs and maintenance work as is required to maintain the existing transportation network. No improvements would be made to the Bridge, its approaches or the interchanges at Telegraph Road, US 1, I-295, and MD 210. I-95/495 would remain four lanes in each direction, the existing Bridge would remain three lanes in each direction, and the drawspan (with a clearance of 15.2 meters (50 feet) over the navigation channel) would continue to open with the same frequency it does today. All other planned improvements that are included in the CLRP and approved by the TPB would be implemented throughout the metropolitan region.

Increasing traffic volumes would continue to hamper roadway operations and motorists would continue to experience delays. In addition, there would be no opportunities for improvements or enhancements to the surrounding neighborhoods or environment and there would be no provisions for future HOV, transit, or pedestrian/bicycle crossings of the Potomac River.

In a 1994 engineering study conducted by Hardesty and Hanover, the existing Woodrow Wilson Bridge was determined to require rehabilitation work due to structural deficiencies. The report concluded that continued deterioration of the Bridge would result in the eventual posting of weight restrictions, increased congestion and delays, continued repairs, and within ten years, the complete reconstruction or replacement of the Bridge.

The No-Build Alternative does not meet the project's purpose and need and after costly repairs, the Bridge would remain at six lanes. The cost of the complete reconstruction or replacement of the existing 6-lane bridge (approximately $324 million in 1997 dollars) was used as the basis of the cost comparison with the build alternatives.

Build Alternatives

The major difference among the build alternatives is in the type of proposed river crossing. Options considered included drawbridges with a vertical clearance of 21.3 meters (70 feet) over the navigational channel, tunnels, combination drawbridge/tunnels, and a high bridge with a vertical clearance of 41.1 meters (135 feet) at the navigational channel.

The estimated cost (in 1997 dollars) listed in the following descriptions of each alternative include: design, construction, right-of-way acquisition and relocation, where applicable; major utility adjustments; and potential mitigation measures.

Alternative 2: Current Alignment Tunnel

Alternative 2 starts at Telegraph Road and continues along the current Beltway alignment to MD 210. Beltway and interchange improvements would be the same as described for Current Design Alternative 4A, discussed later.

This alternative would replace the existing Woodrow Wilson Bridge with a tunnel, for both eastbound and westbound traffic, constructed approximately 45.7 meters (150 feet) south of the existing Bridge. The proposed tunnel would be 2,286 meters (7,500 feet) long, have a maximum grade of four percent,

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and contain four tunnel tubes consisting of three lanes each. Portals would be located immediately west of Washington Street in Virginia and on the west end of Rosalie Island in Maryland. Ventilation buildings would be located above each portal. Studies were also undertaken to minimize the visual intrusion of the ventilation buildings in Maryland and Virginia by placing a large portion of the buildings underground. The optional building locations considered were in Jones Point Park near the existing Army Reserve Building and on Rosalie Island.

Normally, shoulders are not provided in tunnels due to the considerable added expense. The provision of 2.4-meter (eight-foot) shoulders, however, is recommended in the tubes carrying the local lanes due to the high volume of weaving traffic between US 1 and I-295.

Alternative 2 was estimated to cost between $2.75 billion and $3.56 billion in 1997 dollars (depending on the provision of shoulders in the local lanes). Alternative 2 was not selected due to the following aquatic resource issues:

- Largest tidal open waters impacts (15.1 hectares-37.2 acres) of all the alternatives under consideration.
- Produced largest quantity of dredged material (1,529,200 CM-2,000,000 CY) of all the alternatives under consideration. This will result in increased impacts to aquatic organisms and habitat.
- The Potomac River will be divided into thirds to construct the tunnel, with cofferdams being placed around the work area in phases. The construction of the tunnel is estimated to take 2.5 years longer than the construction of the bridge alternatives.

The following reasons, not related to aquatic resources, were used by FHWA to eliminate Alternative 2 from consideration:

- Engineering and safety concerns associated with heavy weaving volumes in a tunnel.
- Trucks carrying hazardous materials would have to be rerouted off this main interstate corridor because volatile substances are not allowed within a tunnel. This could increase congestion and delays on the surrounding roadway systems.
- Precludes the pedestrian connection of Maryland parkland with Virginia parkland.
- The tunnel will need to be backfilled with material that has the ability to settle quickly. The material being dredged from the Potomac River will not be suitable because it consists of mostly fine material and because it would need to be dried prior to use. The project area does not include a suitable area for drying; therefore, a site search would have to be conducted. An appropriate site, such as an agricultural field, may be distant, requiring a large fleet of trucks to deliver the material to be dried and then to deliver the material from the drying area back to the Potomac River. The expense, time, and level of effort required to load, unload, reload, and finally place the material in the Potomac River is inefficient.
- Highest construction, right of way, and design cost of the build alternatives under consideration.
- Highest annual operations and maintenance cost of the build alternatives under consideration.

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Alternative 3A: Current Alignment Drawbridge next to Tunnel and Alternative 3A Modified: Current Alignment High Bridge Next to Tunnel

Alternatives 3A and 3A Modified starts at Telegraph Road and continues along the current Beltway alignment to MD 210. Beltway and interchange improvements would be the same as described for Current Design Alternative 4A. Shoulders would be provided throughout the corridor.

Alternative 3A would replace the existing Woodrow Wilson Bridge with a new drawbridge, built approximately 9 meters (30 feet) south of the existing Bridge, and a new tunnel, constructed another 18 meters (60 feet) south of the new bridge. The drawbridge would carry two lanes of local traffic and one merging/diverging lane in each direction. The tunnel would carry two lanes of express traffic and one HOV lane in each direction.

The proposed drawbridge would be 2,100 meters (6,890 feet) long, have a maximum grade of three percent, and have a 21.3-meter (70-foot) clearance over the navigational channel. The new tunnel would be 1,996 meters (6,550 feet) long, have a maximum grade of four percent, and contain two tunnel tubes. Portals would be located immediately east of Washington Street in Virginia and on the west end of Rosalie Island in Maryland. The deck-over would cover the Beltway (tunnel and upper roadway) from the ventilation building to west of Washington Street. Studies were also undertaken to minimize the visual intrusion of the ventilation buildings in Maryland and Virginia by placing a large portion of the buildings underground. The optional building locations considered were in Jones Point Park near the existing Army Reserve Building and on Rosalie Island.

Alternative 3A Modified would replace the existing Woodrow Wilson Bridge with a new six-lane high bridge, built approximately 64.0 meters (210 feet) south of the existing bridge, and a new six-lane tunnel, constructed 38.1 meters (125 feet) south of the new bridge. The bridge would carry two lanes of local traffic and one merging/diverging lane in each direction. The tunnel would carry two lanes of express traffic and one HOV lane in each direction. The bridge would be approximately 2,134 meters (7,000 feet) long, have a maximum grade of four percent, and have a 41.1-meter (135-foot) clearance over the navigational channel.

The major difference between Alternative 3A and Alternative 3A Modified is in the crossing of the Potomac River. Alternative 3A includes a moveable span bridge with a 21.3-meter (70-foot) clearance over the navigational channel, while Alternative 3A Modified includes a fixed bridge with a 41.1-meter (135-foot) clearance over the navigational channel. The 41.1-meter (135-foot) clearance and the overall high point of the bridge in Alternative 3A Modified is located approximately 76.2 meters (250 feet) east of the existing drawspan.

Full width shoulders and a pedestrian/bicycle facility would be provided over the drawbridge but would not be included in the tunnel. Alternative 3A was estimated to cost approximately $2.23 billion in 1997 dollars. Alternative 3A Modified was estimated to cost approximately $2.29 billion in 1997 dollars. Alternatives 3A and 3A Modified was not selected due to the following aquatic resource issues:

- Second largest tidal open waters impacts (8.5 hectares-21.1 acres) of all the alternatives under consideration.

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- Produced second largest quantity of dredge material (between 1,177,484 CM-1,540,000 CY and 1,204,245 CM-1,575,000 CY) of all the alternatives under consideration. This will result in increased impacts to aquatic organisms and habitat.
- The Potomac River will be divided into thirds to construct the tunnel, with cofferdams being placed around the work area in phases.

The following reasons, not related to aquatic resources, were used by FHWA to eliminate Alternatives 3A and 3A Modified from consideration:

- Engineering and Safety concerns associated with heavy weaving volumes in a tunnel.
- Trucks carrying hazardous materials would have to be rerouted to the local traffic lanes on the drawbridge because volatile substances are not allowed within a tunnel. This could increase congestion and delays of the local traffic on the drawbridge.
- The tunnel will need to be backfilled with material that has the ability to settle quickly. The material being dredged from the Potomac River will not be suitable because it consists of mostly fine material and because it would need to be dried prior to use. The project area does not include a suitable area for drying; therefore, a site search would have to be conducted. An appropriate site, such as an agricultural field, may be extremely distant, requiring a large fleet of trucks to deliver the material to be dried and then to deliver the material from the drying area back to the Potomac River. The expense, time, and level of effort required to load, unload, reload, and finally place the material in the Potomac River is extremely inefficient.
- Second highest costs of all of the build alternatives under consideration.
- Second highest annual maintenance and operations cost.
- Higher bridge in 3A Modified as compared to the drawbridge in 3A would result in additional visual impacts to historic Old Town Alexandria.
- Steeper grade on the bridge in 3A Modified as compared to the drawbridge in 3A would result in approximately 0.96 kilometer (one-half mile) of additional queue length in the local lanes on an average weekday. (vehicles tend to travel slower on the steeper grade, therefore, fewer vehicles pass over the bridge per hour)
- Steeper grade on the bridge in 3A Modified as compared to the drawbridge in 3A would result in a reduction in total vehicle capacity of approximately 400 vehicles per hour.

Alternative 4A Modified: Current Alignment High Bridge, Alternative 4B: Current Alignment Double-Deck Drawbridge, and Current Design Alternative 4A: Drawbridge South of the Current Alignment

Alternative 4A Modified, 4B, and Current Design Alternative 4A begins at Telegraph Road and follows the current Beltway alignment to MD 210.

Alternative 4A Modified would replace the existing Woodrow Wilson Bridge with a twelve-lane high bridge constructed approximately 64 meters (210 feet) south of the existing Bridge. In comparison, the Current Design Alternative 4A would replace the existing Woodrow Wilson Bridge with two new parallel drawbridges constructed approximately 9.1 meters (30 feet) south of the existing Bridge. The bridge would include four general use lanes, one HOV lane and one merging/diverging lane in each direction. Shoulders would be provided throughout the corridor and a pedestrian/bicycle facility would be included on the bridge.

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The major difference between Current Design Alternative 4A and Alternative 4A Modified is in the height of the crossing over the Potomac River. While Current Design Alternative 4A contains a moveable span with a 21.3-meter (70-foot) clearance over the navigational channel, Alternative 4A Modified contains a fixed bridge with a 41.1-meter (135-foot) clearance over the navigational channel. The 41.1-meter (135-foot) clearance and the overall high point of the bridge is located approximately 76.2 meters (250 feet) east of the existing drawspan. The bridge would be approximately 2,134 meters (7,000 feet) long, have a maximum grade of four percent, and have a 41.1-meter (135-foot) clearance over the navigational channel.

Alternative 4B would replace the existing Woodrow Wilson Bridge with a new double-deck swingspan drawbridge, for which both the upper and lower decks would swing open to allow the passage of marine vessels. This alternative would be constructed approximately 61 meters (200 feet) south of the existing Bridge to allow for construction of the swingspan in the open position. The upper level roadway of the bridge (approximately 7.5 meters-24.5 feet higher than the lower roadway) would carry two lanes of local traffic and one merging/diverging lane in each direction. The lower level would carry two lanes of express traffic and one HOV lane in each direction. Shoulders would be provided throughout the corridor and a pedestrian/bicycle facility would be included on the bridge.

The proposed bridge would be 2,591 meters (8,500 feet) long on the upper deck and 1,798 meters (5,900 feet) long on the lower deck, have a maximum grade of four percent, and have a 21.3-meter (70-foot) clearance over the navigational channel. Current Design Alternative 4A addresses existing and future roadway capacity constraints, safety, and structural deficiencies associated with the existing Woodrow Wilson Bridge, and enhances mobility in the corridor.

Alternative 4A Modified was estimated to cost approximately \$1.68 billion in 1997 dollars. Alternative 4B was estimated to cost approximately \$1.64 billion in 1997 dollars. Current Design Alternative 4A was estimated to cost approximately \$1.59 billion in 1997 dollars.

Alternative 4A Modified, 4B and the Current Design Alternative 4A have comparable similar aquatic resource impacts, costs, dredged material quantity produced, and are lower than the other alternatives. Other factors were used by FHWA in choosing the Current Design Alternative 4A. These factors are listed below.

- Higher bridge in 4A Modified and the Double-Deck Drawbridge in 4B compared to the drawbridge in Current Design Alternative 4A would result in additional visual impacts to historic Old Town Alexandria.
- Steeper grade on the bridge in 4A Modified and the Double-Deck Drawbridge in 4B compared to the drawbridge in Current Design Alternative 4A would result in approximately 0.96 kilometer (one-half mile) of additional queue length in the local lanes on an average weekday. (vehicles tend to travel slower on the steeper grade, therefore, fewer vehicles pass over the bridge per hour).
- Steeper grade on the bridge in 4A Modified and the Double-Deck Drawbridge in 4B compared to the drawbridge in Current Design Alternative 4A would result in a reduction in total vehicle capacity of approximately 400 vehicles per hour.
- The Current Design Alternative 4A received the highest level of public and interagency support.

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- The Current Design Alternative 4A would cause the least visual impacts from the City of Alexandria and Washington DC.
- The Current Design Alternative 4A is approximately 1 million dollars less expensive than Alternatives 4A Modified and 4B.

Alternative 5: Southern Alignment High Level Bridge

Alternative 5 would be located along the current Beltway alignment between Telegraph Road and west of US 1 and between I-295 and MD 210. Immediately west of the US 1 interchange, the new alignment would shift to the south, crossing Cameron Run, and passing across the northern portion of the Belle Haven Country Club. It would then cross over the George Washington Memorial Parkway and continue across the Potomac River on a long sweeping curve approximately 762 meters (2,500 feet) south of the existing Bridge at its farthest point. Alternative 5 rejoins the current alignment at I-295 and follows the existing I-95/495 to MD 210.

Alternative 5 would replace the existing Woodrow Wilson Bridge with a new high-level bridge without a movable span. Shoulders would be provided throughout the corridor and a pedestrian/bicycle facility would be included on the bridge.

The proposed bridge would be 3,670 meters (12,040 feet) long, have a maximum grade of four percent, and have a 41.1-meter (135-foot) clearance over the navigational channel. The curvilinear bridge alignment follows Cameron Run to Hunting Creek, crossing approximately 19.8 meters (65 feet) above the George Washington Memorial Parkway. Continuing east, the bridge passes 518.2 meters (1,700 feet) south of Jones Point and 762 meters (2,500 feet) south of the existing Woodrow Wilson Bridge. The new bridge would then curve northward to rejoin I-95/495 on the Maryland shore.

The interchanges at Telegraph Road, I-295 and MD 210 would be reconstructed for smoother traffic flow, increased access (including HOV) and roadway widening. The proposed interchange modifications at US 1 would be located approximately 335.3 meters (1,100 feet) south of the existing I-95/495 and the US 1 mainline would be shifted to the east for the proposed configuration. A two-lane loop ramp would be provided for the westbound I-95/495 to southbound US 1 movement. The northbound US 1 to westbound I-95/495 ramp would include a dual left-turn access from northbound US 1 joining the ramp from southbound US 1. This operation would be controlled by a traffic signal for the left turn on northbound US 1. Two loop ramp connections from southbound US 1 to eastbound I-95/495 would be provided, one to the local lanes and one to the express lanes. The ramps from northbound US 1 to I-95/495, westbound I-95/495 to northbound US 1 and Church Street, eastbound I-95/495 to southbound US 1 would all be reconstructed at the new location. Finally, direct connections would be provided between US 1 and the HOV lanes in the express lanes of I-95/495.

Alternative 5 was estimated to cost approximately $2.06 billion in 1997 dollars. Alternative 5 was not selected due to the following aquatic resource issues:

- The southern alignment of the bridge would result in slightly more tidal open waters impacts than Alternative 4A Modified, 4B, and Current Design Alternative 4A.
- This alternative will result in the highest amount of SAV impacts.

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- The southern alignment of the bridge would cross the Potomac River in the widest area. This would result in a larger structure and increased shading impacts of aquatic resources in Hunting Creek and Cameron Run.

The following reasons not related to aquatic resources were used by the FHWA to eliminate Alternative 5 from consideration:

- The southern alignment of the bridge would introduce a physical and visual intrusion into areas such as the Belle Haven Country Club and the City of Alexandria.
- The southern alignment bridge would pass over the George Washington Memorial Parkway in a natural area, which would cause a substantial physical and visual intrusion.
- Alternative 5 had the largest level of public opposition.
- Higher cost than Alternatives 4A Modified, 4B, and the Current Design Alternative 4A
- Steeper grade on the bridge compared to the drawbridge in Current Design Alternative 4A would result in approximately 0.96 kilometer (one-half mile) of additional queue length in the local lanes on an average weekday. (vehicles tend to travel slower on the steeper grade, therefore, fewer vehicles pass over the bridge per hour)
- Steeper grade on the bridge compared to the drawbridge in Current Design Alternative 4A would result in a reduction in total vehicle capacity of approximately 400 vehicles per hour.

B. Alternatives Analysis - Dredged Material Placement

Dredge disposal sites were evaluated and organized into 4 tiers. Tier 1 sites are approved upland disposal areas. The sites evaluated in Tier 1 include Panorama Landfill, Browns Station Landfill, and Hilltop Landfill. Panorama Landfill, located approximately 12.9 kilometers (8 miles) from the Woodrow Wilson Bridge project area, near the intersection of Indian Head Highway and Palmer Road was the only area deemed feasible under the Tier 1 study and included in the Section 404 permit application. Panorama Landfill is an approved upland placement site.

Tier 2 sites include permitted disposal areas. The sites evaluated in Tier 2 include Poplar Island, Craney Island, Norfolk Ocean Dredge Material Disposal Site, Weanack Dredge Disposal Site, and Hart Miller Island. Poplar Island, Norfolk Ocean Dredge Material Disposal Site, and Weanack Dredge Disposal Site, were retained for further consideration and evaluation and were included in the Section 404 permit application. All of these sites have already undergone a 404(b)(1) evaluation as part of a permit process or congressional authorization.

Tier 3 sites are non-permitted deep-hole areas. These sites include deep-hole disposal adjacent to the Route 301 bridge, Rappahannock Shoals, and Gunston Cove. Tier 3 sites have been dropped from consideration due to regulatory and resource management agency opposition.

Tier 4 sites are non-permitted beneficial use areas. These sites include Bodkin Island, Smith Island, Holland Island, Belmont Bay, Craney Island off Hallowing Point, Farm Field Placement, Barren Island, and Dyke Marsh. Timing would preclude these sites from being used for the first phase of dredged material placement.

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C. Alternatives Analysis – Bridge Construction Scenarios

Potomac Crossing Consultants (PCC) published the *Comparison of Construction Techniques, SAV Impacts, and Dredge Quantities for Woodrow Wilson Bridge* in September of 1999. This document identified and compared eight alternatives for completing the required dredging. The construction of Current Design Alternative 4A requires the dredging of approximately 382,300 cubic meters (500,000 cubic yards) over two seasons. The eight basic construction scenarios were evaluated by a team of construction professionals and engineers to develop a recommendation as to the most prudent approach to construction that could be devised at this early phase of design. Each of these scenarios were evaluated with respect to feasibility, SAV impacts, dredging requirements, safety implications, construction cost and schedule impacts associated with the bridge construction .

After careful consideration of all the feasible scenarios it was determined that Scenario 1 provides the safest, most efficient means of construction while minimizing the SAV impacts. The 64 meter (210-foot) wide channel provides for the safe positioning of the crane barges during heavy picks. The channels to the south and north of the new bridges provide for efficient maneuverability of the crane barges and minimizes the probability of one of the cranes fouling a pier or another crane. Both channels also provide for safe evacuation during a severe storm or other emergency.

While most of the scenarios discussed are possible, Scenario 1 provides the most efficient and effective method of meeting the critical timeframe associated with the Woodrow Wilson Bridge while balancing the impacts to the natural resources.

D. Alternatives Analysis – Construction Staging Areas

Due to the scope of this project, and the potential number of construction contracts, it is difficult to estimate the needs for each contractor. Normally, the contractor is responsible for selecting a construction staging area after the contract has been awarded and then acquiring any necessary permits for the site. Because of the limited number of feasible staging areas along the Potomac River, the regulatory agencies have requested that suitable sites be identified by the Federal Highway Administration (FHWA) and any environmental impacts associated with the recommended sites be included in the Section 404 permit application. This will ensure that all of the natural resource impacts associated with the construction staging areas are investigated and quantified.

The Potomac Crossing Consultants (PCC) identified sixteen potential construction-staging sites in a report, *Potential Construction Staging Areas,* dated December 1999; that may be utilized by contractors and federal/state construction personnel. Five of the potential sites are located in Virginia (Site A through D2); four of the sites are located in Maryland (Sites G1, H1, H2, I); and the remaining seven sites are located along the Potomac River (E1, E2, F, G2, J, K, L). None of the sites will result in aquatic resource impacts except G2. Utilization of site G2 would result in impacts to SAV.

SITE G2

This site is located south of the I-295 interchange, adjacent to the Potomac River and Smoots Cove. The 480-acre site has been cleared and graded and is planned for future commercial and residential development. Substantial improvements will be required to obtain a functional construction-staging site; however, the site will allow easy accessibility to the bridge via the river. The SAV impacts

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associated with this alternative are 0.8 hectares (1.9 acres). These impacts have been included in the Summary of Impacts to Waters of the United States for each Alternative table.

E. Compliance With Related Statutes

No discharge of dredge or fill material shall be permitted if it violates any of the following conditions:

1. State Water Quality Standards

The Maryland Department of the Environment-Water Management Administration, Virginia Department of Environmental Quality-Office of Water Resource Management, and the District of Columbia Department of Health - Environmental Regulation Administration have reviewed the proposed discharges for FEIS Alternative 4A for compliance with respective State Water Quality Standards. The Commonwealth of Virginia and the District of Columbia waived their authorization of the water quality certification to the US Army Corps of Engineers. The State of Maryland issued a Water Quality Certification that will expire December 1, 2000. The Maryland Certification authorizes the following impacts:

- Dredge an access/construction channel parallel to the existing bridge and to deposit approximately 15,292 cubic meters (20,000 CY) of dredged material at an approved existing permitted solid waste landfill located in Prince George's County.
- Fill 5.9 hectares (14.6 acres) of nontidal wetlands, tidal wetlands, submerged aquatic vegetation beds and open water in Maryland.

The Section 404 permit application, submitted November 8, 1999, provides detailed information on aquatic resource impacts. It is anticipated that the proposed subsequent operation of the highway and bridge facilities would not violate Maryland, Virginia, or District of Columbia water quality standards. Water quality modeling results show that the relative increase in impervious coverage and subsequent predicted pollutant loads will not cause an increase in stream concentrations of toxic heavy metals (lead, zinc, and copper) nutrients, and solids associated with regulatory or biological thresholds. Implementation of temporary and permanent stormwater Best Management Practices (BMPs) will be designed to meet National Pollution Discharge Elimination System (NPDES) requirements and the Chesapeake Bay Critical Area Act requirements.

The discharge of dredged and fill materials is not expected to contribute to degradation of waters of the United States.

The compensatory mitigation plan would require the acquisition of right-of-way for wetland mitigation sites. Phase I Environmental Site Assessments (ESA)have been conducted at some of the mitigation sites. Several newly identified wetland mitigation sites in Maryland and in Virginia have yet to be evaluated in terms of their potential to contain hazardous materials. The FHWA will conduct background research and field inspection of these sites to determine whether or not these sites have the potential to contain hazardous materials. The results of the ESAs conducted to date are described below.

The Anacostia East Site (ANA-11): in Hyattsville, Maryland is being considered for wetland enhancement along the Anacostia River immediately upstream from the Washington, D.C.

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boundary. Previous investigations have identified the presence of buried solid waste from undocumented landfill operations during the 1950's near the proposed wetland area. Chemical contaminants include petroleum hydrocarbons and fuel degradation byproducts, pesticides, and heavy metals in soil and groundwater. Planned assessment activities include characterization of groundwater quality entering the proposed wetland area to determine if future excavation would adversely impact the quality of the Anacostia River water.

The Hart Property (NCR-2): in Woodbridge, Virginia is being considered for construction of a wetland mitigation project along Neabsco Creek immediately east of US 1. The initial site investigation suggested possible contamination of the soils by petroleum hydrocarbon. Subsequent review of fill materials placed on site and detailed consideration of the laboratory analysis results indicated that no petroleum hydrocarbons had been released on site. The anomalous detections resulted from the use of finely ground bituminous pavement; derived from Virginia Department of Transportation (VDOT) improvements to US 1, as part of the site fill materials.

The Earnshaw Property (WIC-1): in Newburg, Maryland is under consideration for a wetland mitigation project along the south shore of Wicomico River, near the confluence of Allens Fresh Run. The Phase I Environmental Site Assessment (ESA) indicated that no environmental impediments exist at this site.

Other Mitigation Sites: The Bevard Site (TCR-2) has already been constructed, and all hazardous material compliance activities had been completed prior to construction. Sites in Virginia such as BHA-1, BHA-2, BHA-3, CRU-3, FMR-1, FMR-2, and FMPR-1 were evaluated for hazardous materials in the 1997 FEIS. The 1997 FEIS indicated no environmental impediments exist at these sites.

2. Clean Water Act Section 307

The proposed discharges under the Current Design Alternative 4A will not violate any applicable toxic effluent standards or prohibition under Section 307 of the Clean Water Act.

3. Endangered Species Act 1973

During the preparation and final approval phases of the 1997 FEIS, no Federal or State listed rare, threatened, or endangered (RTE) plant or animal species were identified within the project study area (FHWA, 1997). At a June 4, 1998 interagency coordination group meeting and in a follow-up letter dated September 11, 1998, the USFWS informed the FHWA that a pair of bald eagles (*Haliaeetus leucocephalus*), a federally listed species, had established a nest adjacent to the project study area. The USFWS and the NMFS also commented that shortnose sturgeon (*Acipenser brevirostrum*), another federally listed species, potentially occurs in the project study area. In response to these comments, a Biological Assessment was conducted for the bald eagle (Bald Eagle Biological Assessment, May 1999). The USFWS has conducted a survey to determine the presence of the shortnose sturgeon or shortnose sturgeon habitat. In addition, further consultation with Federal and State natural resource management agencies pursuant to Section 7 of the Endangered Species Act has recently been completed with respect to the presence of rare, threatened, or endangered plant and animal species within the expanded project areas.

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Bald Eagle: During the winter and spring of 1998 a pair of bald eagles established a nest and successfully raised two young in Betty Blume Park, just south of the Woodrow Wilson Bridge on the Maryland side of the Potomac River. A Biological Assessment of the bald eagle pair and on the wintering population of eagles occupying areas adjacent to the bridge was conducted to determine potential project-related effects on this protected species. Field work for the Biological Assessment was conducted between October 1998 and March 1999. A total of 167 survey hours were spent observing roosting, foraging, resting, and breeding behaviors of eagles along the Maryland and Virginia shorelines from Marbury Point north of the bridge to the mouth of Broad Creek south of the bridge. The Biological Assessment also included a detailed literature search and consultation with recognized experts on the species.

The resident nesting eagle pair was observed foraging from the Maryland shoreline north of the bridge, in Oxon Cove, and in Smoots Cove including Rosalie Island. The pair was also observed in and around the existing nest in Betty Blume Park engaged in pair bonding and breeding activities through early incubation. Wintering eagles were observed most frequently along the Maryland shoreline north of the bridge (including Oxon Cove), in Smoots Cove, and along the Virginia shoreline on the Hunting Creek mud flats.

The Biological Assessment report of the Bald Eagle was submitted to USFWS on May 7, 1999. On September 2, 1999 the USFWS informed the FHWA that formal consultation will be required under Section 7 of the Endangered Species Act and asked that FHWA send a letter requesting initiation of the process. A letter was sent by FHWA on September 22, 1999. The USFWS will have 90 days to review the project and conclude formal consultation followed by 45 days in which to render a biological opinion. At that time they will determine if the project constitutes a taking and if so what, if any, mitigation will be appropriate.

Potential impacts to the resident nesting pair consist primarily of temporary disturbance associated with temporary construction activities for the bridge and adjoining interchanges, which may affect nesting success and foraging patterns. The disturbance from anticipated regular use of Rosalie Island (future Queen Anne's Park) may affect nesting success, foraging patterns, and roosting.

Potential effects on wintering eagles consist primarily of temporary disturbance associated with temporary construction activities for the bridge and adjoining interchanges, which may affect foraging patterns. In addition, regular pedestrian use of future Queen Anne's Park on Rosalie Island could result in a permanent shift in foraging patterns away from the island, thereby reducing the overall carrying capacity of the Chesapeake Bay Region for wintering bald eagles.

Shortnose Sturgeon: In December 1998, NMFS wrote a letter to FHWA stating that the shortnose sturgeon (*Acipenser brevirostrum*) may be present in the project area. The USACOE, prior to receipt of this letter, began a two-year investigation of the shortnose sturgeon in the Potomac River. This study was initiated in October of 1997 and is being conducted for the USACOE by USFWS. Based on unpublished results of the study no shortnose sturgeon has been identified in the project area to date. The study has been extended for another year and the search area within the Potomac River has expanded.

Potential impact to the endangered shortnose sturgeon may result from the originally proposed hydraulic dredging and demolition of the existing bridge. This concern has led to the commitment for the use of mechanical dredge only. In addition, a Biological Assessment has been completed to

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determine the potential effects of using explosives to assist in removing the existing Woodrow Wilson Bridge.

Additional Coordination: Coordination with the USFWS regarding the potential occurrence of RTE species within or adjacent to proposed construction staging areas and the expanded project area began on August 23, 1999. To date, no response has been received from the USFWS.

Review of potential RTE occurrence within proposed construction staging areas and the expanded project area began in June 1999. In a letter dated June 30, 1999, Virginia Department of Game and Inland Fisheries (VDGIF) replied that there are no currently documented threatened or endangered species in the project area. VDGIF did indicate that several species of anadromous fish, including alewife (*Alosa pseudoharengus*), striped bass (*Morone saxatilis*), and blueback herring (*Alosa aestivalis*), were found near the project area. It is likely that these species use this area for spawning in the spring.

For the expanded project area in Maryland, coordination with the Maryland Department of Natural Resources began on August 23, 1999. To date, no information regarding RTE species within the Maryland portion of the expanded project area has been received.

To determine potential RTE occurrence within the selected wetland mitigation sites in Virginia, a review request letter was sent to theVDGIF. To determine potential RTE occurrence within the selected wetland mitigation sites in Maryland, a review request letter was sent to the Maryland Department of Natural Resources Wildlife and Heritage Division's National Heritage (MDNR).

For proposed site NAN-3, the Wildlife and Heritage Division's National Heritage database indicated a recently active bald eagle nest in the immediate vicinity. The bald eagle is listed as endangered by the state and as a threatened species by the federal government. Protection of endangered species habitat is required within the Chesapeake Bay Critical Area (COMAR 27.15.09.03). The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the chosen site is a previously disturbed and unforested agricultural field. Mitigation would be in the form of tidal emergent wetland creation along Nanjemoy Creek. If the mitigation site lies within the USFWS recommended eagle protection zones, appropriate time of year restrictions would be followed. There are also records for other species known to occur on or in the vicinity of the site. These include the endangered small-fruited agrimony (*Agrimonia microcarpa*), the highly rare small-flowered baby-blue-eyes (*Nemophila aphylla*), the threatened large-seeded forget-me-not (*Myosotis macrosperma*), and the threatened pale green orchid (*Platanthera flava*). All four species grow in forested wetland conditions. Because the site is an unforested agricultural field adjacent to Nanjemoy Creek, no disturbance to these plants or their habitat is anticipated. However, as a precaution, a survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

For proposed mitigation sites PTB-1 and PTB-2 the Wildlife and Heritage Division's database indicated that there were no records of RTE species on the project sites themselves. However, there is a record of the highly rare small-flowered baby-blues-eyes (*Nemophila aphylla*), within the vicinity of the proposed mitigation sites. Mitigation sites PTB-1 and PTB-2 are also proposed as tidal emergent wetland creation areas on existing agricultural fields bordering Goose Creek. This

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specie favors forested wetland areas and is not likely to occur within the agricultural field. However, a survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

For proposed mitigation sites CUC-1 and CUC-2 the Wildlife and Heritage Division's database indicated that there were no records of RTE species on the project sites themselves. However, there is a record of the Great Purple Hairstreak (*Atlides halesus*), a highly rare state species, known to occur within the vicinity of or on the proposed mitigation sites. A survey would be conducted of the site during the appropriate time of year to confirm the presence or absence of the species before construction.

The VDGIF also completed a review of the potential wetland mitigation sites in Virginia. In a letter dated December 13, 1999, they indicated that there were no currently documented threatened or endangered species at any of the mitigation sites. However, they did indicate that there were some species of note in the vicinity of some of the sites.

At mitigation site POT-1 the VDGIF database indicated that the federally threatened bald eagle was found to have nesting sites ranging from less than 1 mile from this site. The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the chosen site is maintained lawn.

At mitigation site AQC-1 the VDGIF database indicated that Aquia Creek in the vicinity of this site has been shown to contain the following anadromous fish species: Blueback Herring (*Alosa aestivalis*), Sea Lamprey (*Petromyzon marinus*), and American Shad (*Alosa sapidissima*). The proposed mitigation site will consist of tidal emergent wetland creation. This mitigation project will provide additional habitat for these fish species.

At mitigation site NCR-2 the VDGIF database indicated that a total of six collection sites of the federally threatened bald eagle within a two mile radius of the site. The specific protection measures would depend on site conditions, planned activities, nest history, and other factors. However, no direct impacts would occur to eagles or the nest tree from construction activities at the proposed mitigation site, as the site is currently a junkyard.

At mitigation sites HPO-1 and HPO-3 the VDGIF database indicated a total of five collection sites of the federally threatened bald eagle two-mile or more away from the project site. In addition, two anadromous fish species occur in Belmont Bay and another tributary near the project site. These fish are the alewife (*Alosa pseudoharengus*) and striped bass (*Morone saxatilis*). The fish occur between one and two miles from the project site. The proposed mitigation at both these site will include shoreline stabilization and juvenile fish shallow water cover/forage ground.

No threatened or endangered species were identified within a two-mile radius of GCK-1 or NFK-1.

The proposed discharges under the Current Design Alternative 4A will not jeopardize the continued existence of, destroy, or adversely modify the critical habitat of species under the Endangered Species Act of 1973, as amended.

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4. Marine Protection, Research, and Sanctuaries Act of 1972

The proposed discharges under Current Design Alternative 4A will not violate any requirements to protect any marine sanctuaries designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA). However, the placement of dredged material at the Norfolk Ocean Dredged Material Disposal Site will require an Essential Fish Habitat study pursuant to the Magneson-Stevenson Act which reauthorize the MPRSA, and use of this site will require a permit from the Corps of Engineers pursuant to Section 103 of the MPRSA.

F. Significant Degradation of Waters of the United States

The effects contributing to significant degradation considered individually or collectively, with special emphasis on the persistence and permanence of the effects, have been considered for this project, and are summarized as follows:

1. Significant Adverse Effects on Human Health and Welfare

The proposed discharges under Current Design Alternative 4A are not expected to have a significant adverse effect on human health and welfare.

2. Significant Adverse Effects on Life Stages of Aquatic Life

The proposed discharges under Current Design Alternative 4A are not expected to have a significant adverse effect on life stages of aquatic life. Time of year restrictions on in-water construction would be observed for spawning/nursery activities and growth cycles of anadromous fish and SAV respectively.

3. Significant Adverse Effects on Aquatic Ecosystems Diversity, Productivity, and Diversity

The proposed discharges under Current Design Alternative 4A are not expected to have a significant adverse effect on aquatic ecosystem diversity, productivity, or diversity.

4. Significant adverse Effects on Recreational, Aesthetic, and Economic Values

The proposed discharges under Current Design Alternative 4A are not expected to have a significant adverse effect on recreational, aesthetic, and economic values associated with Waters of the United States.

G. Avoidance and Minimization Measures

Due to the extent and nature of the aquatic resources in the project area only the No Build alternative completely avoids direct impacts to aquatic resources. However, the No Build Alternative does not meet the purpose and need for this project. Therefore, there are no practicable alternatives that completely avoid aquatic impacts.

Where possible, the Build alternatives were designed to avoid and minimize impacts to individual aquatic resources, including wetlands during preliminary design. During the design stages, various

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measures to avoid and minimize impacts to waters of the United States were investigated and used where feasible. These methods include: reducing typical sections, lowering ramp elevations to reduce fill slopes, reducing shoulder widths, limiting the shifting of I-95 in the Cameron Run area, combining noise walls and retaining walls to reduce footprint area, adjusting ramp alignments, bridging wetlands and streams, using 2:1 embankment slopes and retaining walls, use of structures as opposed to fill where feasible, reductions in the number of bridge piers and structural span piers, and pier design to reduce footprint, and replacing bridge piers at their existing locations.

The proposed discharges and other associated work incorporates appropriate and practicable steps to minimize adverse impacts of the discharge on the aquatic ecosystem through preliminary engineering. Also included are implementation of Best Management Practices (BMP's) to control erosion and sedimentation, implementation of stormwater management measures, and the disposal of dredge materials in an approved placement site.

Additional information with respect to compensatory mitigation can be found in the Aquatic Resources Conceptual Mitigation Plan.

IV. FACTUAL DETERMINATIONS

The potential short-term and long-term effects of the proposed discharge on the physical, chemical and biological components of the aquatic environment are determined to be as follows:

A. Physical Substrate Determinations

Substrate of Impacted Waters of the United States (including wetlands):

This project requires the placement of dredged and fill material in tidal wetlands and tidal and nontidal open-water wetlands. As such, the substrate on which the dredged and fill material will be placed will vary considerably. Following is a general description of the physical substrate for each of these wetland types.

<u>Nontidal Wetlands:</u> The substrate of the nontidal wetlands within the project area is variable. Of the 43 palustrine wetlands within the project area, 15 sites have a sandy loam substrate, 15 have a silt loam substrate, six have a clay loam substrate, one has a loam substrate, four have clay or gravelly clay substrates, one has a silty clay substrate, and one has disturbed soil as its substrate.

<u>Tidal Wetlands:</u> The substrate of the two tidal wetlands within the project area consist of loam and silt loam.

<u>Tidal and Nontidal Open-Water Wetlands:</u> The substrate of the tidal and nontidal open-water wetlands to the depths of any proposed excavation are silts.

The discharge of fill material for construction of the roadway and bridge improvements will consist of clean borrow, excavated earthen material from the surrounding landscape, clean stone, or man-made surfaces which will be placed as controlled fill over the existing substrate. The placement of the discharge will serve to elevate the bottom contours creating a controlled, compacted, dry substrate suited for the highway grade, bridge pier placement, and associated structures. Movement of the fill is not anticipated once placed and stabilized.

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Substrate of Potential Dredged Material Placement Sites:

The Joint Federal/State permit application identifies four primary sites that could be utilized for the placement of dredged material from the Woodrow Wilson Bridge project. The substrate of these sites is discussed below.

Panorama Landfill: The soils at Panorama Landfill have been highly disturbed. The dredged material from the Woodrow Wilson Bridge project would be placed within bermed areas to prevent the discharge of sediment laden water from discharging into adjacent receiving waters. The substrate on which the material would be placed is variable, and may consist of sand, gravel, silt, or clay.

Norfolk Ocean Dredged Material Disposal Site: The majority of this area consists of relic sediments (or reworked coastal deposits), which are those that are related to past conditions even though they lie at the surface of the ocean floor. The sediment consists mainly of fine sand and the gravel size fraction of sediment from the site consists mostly of shell fragments. Only dredged material that has been evaluated in accordance with EPA's Ocean Dumping Regulations and Criteria and found acceptable will be accepted for unrestricted disposal in the Norfolk ODMDS.

Poplar Island: The sediments at Poplar Island are typical of lowland sedimentary deposits and consist of gravel, sand, silt, and clay. The sediment to be used to construct the dikes is fine grained sand with some silt and clay lenses. The dredged material from navigation channels proposed for filling the site are likely to be silt, with some clay and fine sand. Likewise, the material dredged for construction of the Woodrow Wilson Bridge will be predominantly silt and is therefore compatible material.

The fine grained sand used to construct the containment dikes will be placed and shaped to avoid unnecessary loss of materials. When completed, the containment dikes will control movement of the dredged material placed in the site.

Weanack Dredge Disposal Site: This dredged material placement site is located in a permitted sand and gravel quarry on the James River. Dredged material from the Woodrow Wilson Bridge project would be placed within upland cells on highly disturbed soils. Excess water from the cells would drain to stilling basins, which would discharge to the James River.

All of these sites have been evaluated under other permits and do not require any additional 404 (b) (1) evaluations.

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B. Water Circulation, Fluctuation and Salinity Determinations

The proposed discharge of fill material for construction of the bridge (the bridge piers) is not expected to have a significant adverse effect on water current patterns, circulation including downstream flows, and normal water fluctuation. During normal flow, the navigational channel in the Potomac River at the bridge carries over 80 percent of the total discharge and the eastern channel approximately 10 to 15 percent, while the remainder of the total discharge of the river flows through the shallow water area. During high flow the navigational channel carries approximately 65 percent of the total discharge and the eastern channel approximately 20 percent with the remainder of the flow through the shallow water area. Because the western navigation channel would remain unaltered and modifications of the eastern channel will be kept to a minimum, the majority of river flows will remain unobstructed by bridge piers. Current Design Alternative 4A is not expected to have any long-term impacts to hydraulics in the project area or downstream.

The proposed discharge of fill material for construction of the bridge (the bridge piers) expected to have a significant adverse effect on water current patterns, circulation including downstream flows, and normal water fluctuation in Cameron Run. The historic floodplain of lower Cameron Run is now primarily a transportation corridor, with I-95/495 paralleling the stream channel. The implementation of a new bridge at Telegraph Road and U.S. 1 and culvert designs over Cameron Run, provide larger areas for flows to pass and better alignment, creating a more hydrologically efficient structure.

Wetland Fill Areas

The placement of fill in tidal and nontidal wetlands has been minimized, and it is not anticipated that the placement of such fill will appreciably affect water circulation or normal water fluctuation in adjacent waterways. All of the wetlands affected by the project are tidal and nontidal freshwater wetlands, and therefore impacts to salinity concentrations are not anticipated to occur.

Dredged Material Placement Sites

It is not anticipated that the placement of dredged material at any of the identified primary sites except Poplar Island will affect water circulation, normal water fluctuation, or salinity concentrations. For the Poplar Island Restoration project, impacts to current patterns and flow are documented in the 404(b)(1) Guidelines evaluation for that facility. Construction of the Poplar Island facility is expected to increase and train currents along the toe of the western dike, slightly increase the flow immediately to the east of Coaches Island, and substantially reduce flows through Poplar Harbor. It is also possible that the project may cause a very small increase in tidal flow through Knapp's Narrows and a commensurate decrease in sedimentation. All of these changes would be consistent with flow patterns in the vicinity of Poplar Island approximately 150 years ago. No adverse effects are expected from the placement of dredged material into the site.

Release of settled water from the Weanak and Panorama Landfill facilities may have a minor effect on water clarity or color of nearby waters. However, if one of these two sites is selected, erosion and sediment controls necessary to minimize this impact will need to be designed and implemented. It is not anticipated that water clarity or color will be affected at the Poplar Island facility outside of the designated mixing zone. Water clarity and color would be temporarily affected at the Norfolk Ocean Dredged Material Disposal site as dredged material is dumped from the barges.

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No impact to salinity concentrations is anticipated at any of the placement sites. A slight and also temporary increase in nutrients may occur at the placement site outfalls at Poplar Island, Weanak, or Panorama Landfill. No change in dissolved gas levels is expected in the receiving waters of the sites. A slight increase in nutrients may occur in the receiving waters of any of the sites. However, eutrofication is not expected to occur.

C. Suspended Particulate/Turbidity Determinations

Earthen discharges and in-stream excavation/dredging may initially increase water turbidity down gradient of the discharge site. The increase in turbidity would be temporary in nature and would be controlled through the incorporation of appropriate sediment and erosion control measures. Discharge involving dredging within cofferdams and pier placement may also increase water turbidity due to disturbance of bottom sediments. This would be mitigated by in-stream work restrictions (time of year restrictions for SAV and anadromous fish species) and is expected to be of short duration. The volume of suspended fine sediment is expected to be low and would not significantly alter the photosynthetic process in down gradient aquatic systems due to the temporary nature of the suspended fine sediment, short duration of the release, the control of the sediment through the use of Best Management Practices (BMP's), and time of year restrictions. The suspended material would be controlled and would not interfere with feeding habitats of any species and would not make contaminants available to organisms.

Suspended sediment and associated turbidity levels may increase during and immediately following the placement of dredged material at any of the four primary sites. Erosion and sediment control measures will be required at either the Weanak or Panorama Landfill sites to minimize the discharge of sediment into the receiving waters. For the Poplar Island site, return water and runoff will be closely monitored and controlled during and immediately after dredged material placement episodes to limit discharge of suspended sediment to acceptable levels. No change in suspended particulate concentrations or turbidity is expected outside the allowed mixing zone at Poplar Island. Likewise, elevated turbidity is anticipated and acceptable in the immediate vicinity of the dump site at the Norfolk Ocean Dredged Material Disposal Site.

D. Contaminant Determinations

River bottom sediment samples were collected from seven locations within the proposed dredging area along the proposed bridge footprint, two locations adjacent to the north side of the existing Woodrow Wilson Bridge, and two samples from the proposed construction staging area and access channel in Smoots Cove. River water samples were collected from two locations for background chemical analysis and for use in elutriate preparation.

Elutriate testing was performed using mixtures of sediment and river water to simulate the effects on the water column during hydraulic dredging and dredged material disposal. The sediment samples were also tested using the Toxicity Characteristic Leaching Procedure (TCLP) to simulate the reaction of the sediments to acidic landfill conditions following upland disposal.

The sediment and water samples were analyzed for Priority Pollutant List compounds, oil and grease, and specific contaminants of concern identified by the United States Army Corps of Engineers (USACE). The contaminants of concern include nutrients, PCB congeners, and Tributyl

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tin (TBT). The sediment samples were subjected to geotechnical analysis to determine the grain size distribution and the Atterberg Limits.

Hazardous or toxic organic chemicals were not detected in any of the sediment or water samples, with the exception of trace concentrations of TBT and PCB congeners. Traces of total cyanide (below the most restrictive RBC) were detected in every sediment sample and both water samples.

The modest concentrations of metals in the sediments appear to be present in relatively insoluble forms. Only aluminum, iron, nickel, and zinc yielded TCLP or elutriate extract concentrations higher than those in the ambient river water. Arsenic and cyanide concentrations in the extracts did not exceed those in the river water samples. Total sulfur was detected in 17 of the 22 sediment samples at concentrations ranging from 0.05 percent to 0.34 percent. Total sulfur was not detected in the river water samples or in the TCLP or elutriate extracts. Sulfur appears to be present in the sediment as relatively insoluble minerals.

The extracts contained somewhat higher concentrations of nutrients than the river water. TOC concentrations were greatly increased in the TCLP extract relative to the ambient river water. The sediments in the proposed dredging areas consist of organic silt and clay. These materials are more likely to disperse and raise turbidity in the surrounding water during hydraulic dredging than sandy sediments. The material is primarily composed of silt (67 percent) with smaller quantities of clay (16 percent) and sand-gravel (16 percent).

E. Aquatic Ecosystem and Organism Determinations

Chemical analysis shows that Potomac River sediment to be dredged is not contaminated. The material is primarily composed of silt (67 percent) with smaller quantities of clay (16 percent) and sand-gravel (16 percent). Material proposed to be discharged will be composed of both material derived from on-site grading activities and clean borrow material.

All dredging work will be conducted outside of the time of year restrictions to prevent impacts to fish and SAV habitat (October 15-February 15).

F. Potential Impacts on Special Aquatic Sites

Aquatic resources associated with the tidal Potomac River include unvegetated subtidal bottoms, intertidal flats, SAV, and emergent marshes. Intertidal mud flats, SAV, and emergent marshes are considered by the 404(b)(1) Guidelines as Special Aquatic Sites.

1. Sanctuaries and Refuges

No sanctuaries and refuges will be affected by the proposed discharges.

2. Wetlands

Nontidal and tidal wetlands, tidal mudflats, submerged aquatic vegetation, and tidal and nontidal open water areas will be impacted by the construction of Current Design Alternative 4A through filling, excavation, vegetation removal, utility relocations, park improvements, road crossings, culvert installation, and bridge/ramp constructions. The Current Design Alternative 4A would

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impact 6.1 hectares (15 acres) of tidal wetlands, 1.8 hectares (4.5 acres) of nontidal wetlands, 1.4 hectares (2.6 acres) of nontidal open waters, and 3.4 hectares (8.5 acres) of tidal open-water wetlands.

Table 2: Summary of Waters of the U.S. Impacts

Waters of the U.S. Type	Current Design Alternative 4A hectares (acres)
Tidal Wetlands	6.1 (15.0)
Non-Tidal Wetlands	1.8 (4.5)
Tidal Mud Flats	0.4 (1.1)
Tidal Riverine/Open Water	3.4 (8.5)
Tidal Vegetated Shallows (SAV)	12.8 (31.7)
Non-Tidal Riverine Open Water	1.4 (2.6)
TOTAL	**25.9 (63.4)**

The main tidal and nontidal wetland functions to be impacted by the proposed action include: floodflow alteration, sediment/shoreline stabilization, sediment/toxicant retention, and wildlife habitat. Riverine and open water functions that would be impacted by the proposed action include fish/shellfish habitat, floodflow alteration, and wildlife habitat.

During the design stages currently underway, various measures to avoid and minimize impacts to waters of the United States were investigated and used where feasible. These methods include: lowering ramp elevations to reduce fill slopes, reducing shoulder widths, limiting the shifting of I-95/495 in the Cameron Run area, combining noise walls and retaining walls to reduce footprint area, adjusting ramp alignments, bridging wetlands and streams, using 2:1 embankment slopes and retaining walls, and replacing bridge piers at their existing locations.

Mitigation to compensate for impacts to waters of the United States from the proposed action is proposed on-site and off-site. Typically, with projects of less complexity, available areas for in-kind mitigation adjacent to the project area can be obtained. However, due to the project's location within an urban region, most areas that are not already wetlands are existing forests, parkland, or are developed. It is not the project sponsor's policy to use properties with these types of land cover for wetland mitigation. Therefore, some wetland mitigation is proposed on vacant lands within the project area, but the available area for wetland mitigation in the project area is limited.

Because of these factors, the project sponsors have pursued mitigation options outside of the project area, but within the Potomac River watershed. Tidal mitigation sites have been pursued to the extent possible within the freshwater tidal Potomac, but some areas in the saltwater tidal zone have also been examined. Nontidal wetland mitigation sites have been investigated within the watersheds that drain to the tidal freshwater Potomac. Mitigation for open water impacts is proposed through removing fish passage barriers along Northwest Branch, Rock Creek, Little Paint Branch, and Indian Creek, and conducting hatchery restocking. Providing juvenile fish habitat in shallow waters at Occoquan Bay is also proposed as mitigation for impacts to open water and tidal mudflats. The removal of these barriers will replace impacted functions by reopening historic spawning areas and habitat for anadromous and resident fish.

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Some mitigation sites may require incidental impacts to small areas of existing wetlands to successfully implement the mitigation plan. Mitigation for these incidental impacts will be provided at the mitigation site where the impact occurs. Coordination with Federal, state, and local regulators and commenting agencies has been conducted during determination of these mitigation measures.

3. Mudflats

Tidal mud flats are present throughout the intertidal zones of the project area. The discharges associated with Current Design Alternative 4A would affect approximately 0.40 hectares (1.10 acres) of riverine mud flat through pier placement and fill material for road construction. Temporary impacts may result from erosion and sedimentation, causeways and trestles. Erosion and sediment control devices would be implemented to reduce secondary impacts associated with sedimentation. Temporary causeways made of nonerodable materials will be used to allow construction of structures over tidal flats. The causeways will be removed after construction. Temporary construction trestles supported on piles will be used for construction of structures over water and tidal flats. Trestles will be removed after completion of construction. The use of trestles will maintain tidal and flood flows during the construction period. Time of year restriction and Best Management Practices would be implemented to avoid impacts to life cycle requirements of aquatic species. Replacement of tidal flat habitat would occur as a component of the Aquatic Resources Conceptual Mitigation Plan.

4. Vegetated Shallows (SAV)

SAV covers approximately 255 hectares (631 acres) within the project area. It is primarily distributed in three distinct areas including two large beds adjacent to the bridge in the Potomac River in Smoots Cove, and Hunting Creek. Over the years, the non-native hydrilla (*Hydrilla verticillata*) has been replaced with a greater diversity of species adding to the overall value of the resource for aquatic organisms. Seven different species of SAV were observed during ground truthing within the project area in 1999.

Table 3: Submerged Aquatic Vegetation Species Observed Within the Potomac River SAV

Common Name	*Scientific Name*
Hydrilla	*Hydrilla verticillata*
Eurasian watermilfoil	*Myriophyllum spicatum*
Wild celery	*Vallisneria americana*
Coontail	*Ceratophyllum demersum*
Naiad	*Najas minor*
Naiad	*Najas guadalupensis*
Water stargrass	*Heteranthera dubia*

The predominantly mud and sand substrates of the river channel and channel slopes would be expected to support a benthic macroinvertebrate community dominated by freshwater forms such as oligochaetes (segmented worms), dipteran insects (e.g., chironomid midge larvae), and possibly

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gastropod and bivalve molluscs. In areas of coarser substrates, other more epifaunal forms may be present such as crawling or clinging types of insect larvae, amphipods, isopods, and hydroids.

Approximately 19 hectares (46 acres) of the Potomac River will need to be dredged to provide construction access for barges. Of these 19 hectares (46 acres), approximately 12.8 hectares (31.7 acres) of dredging will take place within SAV beds. The greatest densities and diversities of the macrovertebrate organisms would be expected in the shoal areas, particularly in association with the SAV beds. Therefore, dredging within these areas to a depth of 2.7 meters (9 feet) or greater at mean low water, will permanently affect the macroinvertebrate species composition and abundance within the dredge areas. However, it is anticipated that recolonization by macroinvertebrates will occur within the dredged areas within one to two growing seasons.

SAV provides fish and shellfish habitat, wildlife habitat, and water quality enhancement functions. Further study of access for barge mounted cranes, work boats, barges, and design of the bridge structure resulted in changes in impacts to SAV. A detailed discussion of the scenarios studied for construction of the bridge is presented in the Supplemental EIS, Appendix F, "Assessment of Potential Construction Effects."

In consultation with federal, state, and local regulators, 8 hectares (20 acres) of SAV transplanting is proposed as mitigation. In addition, removal of fish passage blockages and tidal wetland creation is proposed as mitigation measures to replace impacted functions by reopening historic spawning areas and habitat for anadromous and resident fish.

5. Coral Reefs

No Coral reefs will be affected by the proposed discharges.

6. Riffle and Pool Complexes

No riffle and pool complexes will be affected by the proposed discharges.

G. Potential Effects on Human Use Characteristics

1. Municipal and Private Water Supplies

Highway construction can reduce the effectiveness of aquifer recharge areas through direct conversion of pervious to impervious surfaces, increased runoff rates, and potential introduction of highway derived stormwater contaminants. Current Design Alternative 4A will require the construction of additional impervious surfaces. However, known groundwater recharge areas are located west of the project area and therefore it is not anticipated that there will be an impact to groundwater recharge areas by construction of Current Design Alternative 4A. With regard to the impact of the project on potable water supplies, community wells are known to exist in the project area south of I-95/495 and west of MD 210 and west of Oxon Hill Road. These wells in the vicinity of the project area are located in Potomac Vista, a small community with its own water system. The two within closest proximity to the project area can be found on Panorama Drive and are approximately 1,707 meters (5,600 feet) and 1,920 meters (6,300 feet) far away from the Woodrow Wilson Bridge. Besides these two wells there is Norbourne mobile home park, located east of

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Andrews Air Force Base and Bishop Byrne Council Home, located just on the DC/MD line that have their own water systems.

These wells will not be impacted by Current Design Alternative 4A. The project will not require deep subsurface excavation in proximity to local groundwater supplies. Undeveloped land throughout the project area currently provides for groundwater recharge, particularly in forested areas. Best Management Practices will be implemented to reduce potential short and long term construction impacts through the use of erosion and sediment controls specified in the Virginia Erosion and Sediment Control Handbook and MDE Erosion and Sediment Control Guidelines for State and Federal Projects.

2. Recreational and Commercial Fisheries

The proposed discharges will occur in the Potomac River, Smoots Cove, Cameron Run, and Hunting Creek, which provide recreational fishing opportunities that will continue both during and after construction. There are no commercial fisheries affected in the project area. Impacts to potential spawning/nursery areas such as SAV, would be compensated for through a combination of out-of-kind mitigation components including tidal wetland restoration/creation and fish blockage removal, and in-kind SAV planting outside the project area.

3. Water-Related Recreation

The proposed discharges would not affect long-term water-related recreation activities. Short-term impacts include reduced access to fishing locations during construction and reduced marine traffic access to these areas. Long-term impacts would include increased public waterfront and fishing access in the future Queen Anne's Park.

4. Aesthetics

The proposed discharges would have temporary visual impacts to jurisdictional wetlands during construction through the direct conversion of these areas. Some on-site wetland restoration is proposed for compensation of aesthetic impacts to tidal jurisdictional wetlands.

5. Mixing Zones

Mixing zones have been determined for the Poplar Island and Norfolk Dredged Material Disposal sites, and will be confined to the smallest practicable zone. Mixing zones have not been established for Panorama Landfill or Weanack Dredge Disposal Site. However, the discharge of sediment from these two sites will be regulated by local erosion and sediment control ordinances.

6. Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites and Similar Preserves

The following parks, recreation facilities, and historic sites are located within the project area of the Current Design Alternative 4A. A complete description and maps of these locations and facilities are contained in the 1997 FEIS/Section 4(f) Evaluation. Impacts to park land properties have been updated in the Supplemental Environmental Impact Statement, Section 4.3.2 Social Environment.

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Virginia:
- Lee Recreation Center
- George Washington Memorial Parkway/Mount Vernon Memorial Highway/Mount Vernon Trail
- Freedmen's (Contraband) Cemetery
- Alexandria Historic District/Jones Point Park/Jones Point Lighthouse/District of Columbia Cornerstone
- Virginia Bike Trails

Maryland:
- Queen Anne's Park (Future)
- Oxon Cove Park/Oxon Hill Farm
- Potomac Heritage Trail (Proposed)
- Butler House
- Flintstone Elementary School

7. Determination of Secondary and Cumulative Effects on the Aquatic Ecosystem

A detailed Secondary and Cumulative Effects Analysis has been prepared for the WWB Supplemental Environmental Impact Statement.

Water Quality

The majority of the potential positive and negative effects to water quality anticipated from future land use projections will occur independent of the Woodrow Wilson Bridge project. Consequently, secondary effects from the proposed action are not anticipated. Construction and maintenance of the Woodrow Wilson Bridge project will increase impervious areas within the project area by 43.3 hectares (107 acres). This increase and the associated runoff from these areas have the potential to add to existing cumulative effects to the Potomac River and Cameron Run. In addition, impacts to wetlands and SAV and disturbance of sediments during dredging required for construction could reduce the nutrient uptake provided by vegetation. Adherence to sediment and erosion control and stormwater management regulations, as well as wetland permit requirements including mitigation, would minimize direct impacts to the point that cumulative impacts to water quality from the proposed project would be expected to be minimal.

Waters of the United States

The Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999 states that 6.1 hectares (15 acres) of tidal wetlands, 1.8 hectares (4.5 acres) of nontidal wetlands, 0.4 hectares (1.1 acres) of tidal mudflats, 3.4 hectares (8.5 acres) of tidal open water, and 1.4 hectares (2.6 acres) of nontidal open water areas will be directly impacted by the proposed action. The average historical losses to wetlands total approximately 15.6 hectares (39 acres) of wetlands per year in the combined Prince Georges' County and Northern Virginia areas. Future impacts to wetlands are anticipated from projected redevelopment and new development in the Secondary and Cumulative Effects Analysis (SCEA) study area. However, the future trends of losses of wetland impacts in the SCEA area may be slowing due to the lack of large areas of developable property and current laws and regulations protecting waters of the United

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States. Therefore, considering the overall reduction in wetland impacts in the SCEA area, it is not anticipated that the proposed action would substantially contribute to the cumulative impacts to waters of the United States. Also, mitigation in the form of wetland creation, restoration, or enhancement in the Potomac River watershed will serve to offset the potential effects of wetland and open water conversion proposed by this project.

The development of the proposed action is not anticipated to spur development in the SCEA area, because the majority of the SCEA area is proposed for development or is already developed. It is not anticipated that the development of the project in itself will cause secondary impacts to other wetland or stream resources in the area.

Submerged Aquatic Vegetation

The Joint Federal/State Permit Application – Virginia and Maryland & Phase 1 Conceptual Mitigation Package dated November 8, 1999 states that 12.8 hectares (31.7 acres) of Submerged Aquatic Vegetation will be directly impacted by the proposed action. When compared with the area of SAV in the tidal freshwater Potomac, approximately 1 percent of the SAV area will be impacted. Impacts in the future to SAV from other actions are not anticipated, because water quality is forecasted to continue to improve. Also, due to natural fluctuations in SAV growth and the recent water quality enhancements in the Potomac River, the lost SAV area may be compensated by the further natural establishment of SAV elsewhere in the tidal freshwater zone of the Potomac. Therefore, the proposed loss of SAV area is not anticipated to substantially contribute to a cumulative negative impact to SAV beds in the SCEA area. Because the proposed action will not spur development in the majority of the SCEA area, or in the areas where SAV grows, it is not anticipated that the development of the project in itself will cause secondary impacts to SAV in the area. Furthermore, mitigation will be provided to offset these impacts in the form of new SAV establishment in portions of the Lower Potomac where SAV has been absent for many years. This mitigation, in concert with removal of fish blockages in Rock Creek and Northwest Branch will create habitat for anadromous fish species and may minimize any potential secondary and cumulative effects of SAV impacts proposed by this project.

Aquatic Habitat

The proposed action will not result in secondary effects to aquatic habitat. However, direct effects to aquatic habitat in the SCEA area could result from direct inputs of potential pollutants to the waterways from the constructed bridge and planned interchange improvements. The planned use of Best Management Practices, such as stormwater management facilities, should help to reduce the direct discharge of pollutants to the waterways resulting from project-related improvements. In addition, development within the SCEA area would be subject to the numerous federal, state, and local regulations protecting water quality. In particular, any development in the Chesapeake Bay Critical Area would be subject to review by the Critical Area Commission. Critical Area regulations in Maryland require a 10 percent reduction of pre-development runoff, the establishment of vegetated shoreline buffers, and limited clearing of any existing vegetation. Future development within the SCEA area will result in increases in inputs to area sewage treatment facilities, creating the potential for increased nutrient loads from point discharges. However, this is anticipated to be minimal, since considerable focus has been given to improving nutrient removal at facilities within the Potomac River watershed in recent years.

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Cumulative effects from additional development in the SCEA area could contribute to setbacks in improved water quality and habitat. Construction of the National Harbor development will result in dredging of portions of Smoot Cove, disturbing benthic communities and fish spawning areas. Also, the shoreline of Smoot Cove has already been cleared of trees that were valuable foraging perches for Osprey and Bald Eagles. Increases in pedestrian traffic in this area will further reduce the likelihood that Osprey, Bald Eagle, herons, and waterfowl will use shoreline and cove areas. The creation of a bulkhead and other water dependent amenities along the shoreline of Smoot Cove could also impact SAV that currently exist along the shoreline.

While cumulative impacts to aquatic habitat would be expected to occur from the Proposed action, project mitigation in the form of fish blockage removal on tributaries of the Anacostia River, just outside the SCEA area, will help offset those impacts. Fish blockage removal on the Northwest and Northeast Branches of the Anacostia River are proposed as out-of-kind compensation for SAV impacts in the project area. Other projects are also planned that would help to improve the aquatic habitat in the SCEA area. For example, to improve stocks of anadromous fish species in the upper Potomac and lower Anacostia Rivers, several fish blockages have been targeted for removal. One such blockage at Little Falls on the Potomac is presently being removed under the direction of the ICPRB. Fish passage in this area will allow species such as the alewife and blueback herring to proceed upriver, restoring historic spawning grounds. Fish stocking will also be used in conjunction with restoration of fish passage, to help restore numbers of anadromous fish to the Washington Metropolitan portion of the Potomac River.

Another improvement project is underway on the Anacostia River. In the early 1990's, the United States Army Corps of Engineers (USACOE) determined that federal actions related to navigation and flood control directly degraded more than 1,052 hectares (2,600 acres) of wetland, 202 hectares (500 acres) of aquatic habitat, and 324 hectares (800 acres) of bottomland hardwoods. The USACOE along with Montgomery and Prince Georges' Counties, the District of Columbia, M-NCPPC, and the NPS undertook a feasibility study to identify restoration opportunities within the river. The study was completed in 1994 and recommended 13 sites for environmental restoration. The project was authorized in 1996 and will include the restoration of 32 hectares (80 acres) of wetlands and eight kilometers (five miles) of stream and the creation of 13 hectares (33 acres) of bottomland habitat within the Anacostia Basin. The project was initiated in July 1999 and is slated to continue through September 2001. project monitoring will continue through September 2004. These improvements, in conjunction with federal, state, and local controls on water quality, should help to minimize the adverse cumulative effects of the Proposed action on aquatic habitat in the SCEA area.

No secondary effects to the Federally and State listed shortnose sturgeon are expected from the Proposed action. Cumulative effects on shortnose sturgeon potentially occurring within the SCEA area would result primarily from degradation of water quality or the direct disturbance of potential sturgeon habitat through shoreline development, dredging, or the placement of structures such as docks, that could occur from build-out within the SCEA area. Degradation of water quality could result in the loss of requisite food sources or nursery and spawning habitat. However, at present it is not known whether shortnose sturgeon or suitable shortnose sturgeon habitat exists in the SCEA area. As mentioned previously in this document, existing Federal, State, and local controls on water quality and development within the Chesapeake Bay Critical Area should help to minimize the potential impact to shortnose sturgeons and their habitat.

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I. Evaluation and Testing

1. General Evaluation of Dredged or Fill Material

The proposed discharges would be composed of clean borrow, excavated earthen material from the surrounding area. Approximately 382,300 cubic meters (500,000 cubic yards) of Potomac River sediments would be dredged for both pier and maintenance channel construction. Material would be placed at either a Panorama landfill, an approved upland solid waste disposal facility or at Poplar Island, Norfolk Ocean Disposal, or Weanack, previously permitted dredge disposal sites.

2. Chemical, Biological, and Physical Evaluation and Testing

Grain size and chemical analyses were conducted for volatile organic compounds, priority pollutant inorganics (metals), pesticides, PCBs, and total petroleum hydrocarbons (TPH). Chemical analyses show that Potomac River sediments in the project area not contaminated. Analytical test results for priority pollutant inorganics and TPH are provided in Section 3.7.4 of the FEIS/Section 4(f) Evaluation. The material is primarily composed of silt (67 percent) with smaller quantities of clay (16 percent) and sand-gravel (16 percent). The extraction site is free of chemical and biological pollutants; therefore, the material proposed for discharge is not likely to introduce, relocate, or increase contaminants. This determination is based upon the aquatic environment at the proposed disposal site and the availability of contaminants.

A permit is required from the USACOE pursuant to Section 103 of the MPRS Act to utilize the Norfolk Ocean Disposal site. The permitting would include a Section 103 Permit and an Essential Fish Habitat Study. The Section 103 Permit Application would be submitted to the Baltimore District USACOE and reviewed by the EPA. As part of the review, EPA requires that the dredged material be placed at Norfolk Ocean Disposal site to be analyzed in accordance with the EPA/USACOE document entitled "Evaluation of Dredged Material Proposed for Ocean Disposal" otherwise known as "The Green Book." Ongoing sampling is currently being conducted in order to comply with "The Green Book." No seasonal restrictions to the placement of dredged material are imposed as part of the permit conditions to use the Norfolk Ocean Disposal site.

VI. FINDINGS/COMPLIANCE/NONCOMPLIANCE FOR THE RESTRICTIONS ON DISCHARGE

In accordance with the guidelines promulgated by the Administrator of the Environmental Protection Agency pursuant to Section 404(b)(1) of the Clean Water Act (40CFR 230), the proposed sites for the discharge of dredged or fill material complies with the requirements of the guidelines with the inclusion of appropriate and practicable discharge conditions to minimize impacts upon the aquatic environment and ensure mitigation (40CFR 230.12(a)(2).

The following summarizes the findings of the compliance:

- The placement of dredged and fill material is expected to be in compliance with the State of Maryland, Commonwealth of Virginia, and District of Columbia water quality standards.
- The placement of dredged and fill material is not expected to violate the Toxic Effluent Standard of Section 307 of the Clean Water Act.

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- The placement of dredged and fill material will not affect threatened and endangered species pursuant to the Endangered Species Act of 1973, as amended. Rare, threatened, and endangered species are being coordinated with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service.
- No marine sanctuaries, as designated under the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA) will be affected by the placement of dredged and fill material. Should the placement of dredged material be proposed at the Norfolk Dredged Material Disposal Site, a Section 103 permit will be obtained as required by the MPRSA and an Essential Fish Habitat Study will be performed.
- The proposed placement of dredged and fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, fish, wildlife, and Special Aquatic Sites. Impacts to Special Aquatic Sites and other aquatic resources will be mitigated as per a plan approved by the Corps of Engineers, the Maryland Department of the Environment, Virginia Marine Resources Commission, Virginia Institute of Marine Sciences, and the Virginia Department of Environmental Quality.
- Appropriate steps to minimize potential impacts of the placement of dredged and fill material in the aquatic environment will be implemented.
- Based on the Guidelines, the proposed discharges of dredged and fill material is specified as complying with the inclusion of appropriate and practical conditions to minimize adverse effects to the aquatic environment.

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Appendix D

1997 Record of Decision

Attachment 1 - Memorandum of Agreement
Attachment 2 - Commitments / Considerations
Attachment 3 - Summary of Comments

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RECORD OF DECISION
FEDERAL HIGHWAY ADMINISTRATION
WOODROW WILSON BRIDGE IMPROVEMENT STUDY
I-95/I-495 FROM TELEGRAPH ROAD TO MD 210
City of Alexandria and Fairfax County, Virginia
Prince George's County, Maryland
District of Columbia

I. SELECTED ALTERNATIVE

The Selected Alternative, Alternative 4A (Current Alignment Side-by-Side Drawbridges), starts at Telegraph Road in Virginia and continues along the current Capital Beltway (I-95/I-495) alignment to MD 210 in Maryland. Each direction of the Beltway through this section, including the new Potomac River bridge, would be widened to include four general use lanes, one HOV/express bus/transit lane, and one merging/diverging lane between interchanges to ease entering and exiting the Beltway, particularly between the US 1 and I-295 interchanges. This has been referred to as the "8+2+2" section. The lanes would be configured in a divided express/local roadway system allowing for the physical separation of local and through traffic. The roadway section also includes shoulders in the express and local roadways. The two HOV/express bus/transit lanes would be separated from the express lanes by a 0.6-meter (two-foot) painted area. The HOV/express bus/transit lanes would not be opened until connecting HOV/express bus/transit systems are in place within Maryland and Virginia. Neither the shoulders nor the HOV/express bus/transit lanes would be used as general purpose lanes except for incident/accident management or for maintenance of traffic, where necessary, during construction and maintenance activities.

The Selected Alternative would replace the existing Woodrow Wilson Bridge with two new parallel drawbridges, one for eastbound traffic and the other for westbound traffic, constructed approximately 9.1 meters (30 feet) south of the existing Bridge. Each bridge would include four general use lanes, one HOV/express bus/transit lane and one merging/diverging lane. The drawbridges would be approximately 1,920 meters (6,300 feet) long, have a maximum grade of three percent, and have a 21.3-meter (70-foot) clearance over mean high water at the navigational channel. The interchanges at Telegraph Road, US 1, I-295, and MD 210 would be reconstructed to allow for smoother traffic flow, increased access, and roadway widening. In addition, direct HOV access would be provided between US 1, I-295, and MD 210 and the Beltway.

The Selected Alternative, as shown in the Final Environmental Impact Statement (FEIS)/Section 4(f) Evaluation, retains access to Washington Street (and the Mount Vernon Memorial Highway) via Church Street. However, during the project's final design phase, additional analyses will be conducted to determine whether or not to retain this exit and what effect any proposed change wold have on the City of Alexandria and Fairfax County. A final decision on inclusion of the exit in the project will be made after consultations between the Federal Highway Administration (FHWA), the

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Virginia Department of Transportation (VDOT), the National Park Service (NPS), and local governments.

Optional interchange modifications have been included in the Selected Alternative to provide additional access to the Eisenhower Valley area in Virginia. The optional access between Eisenhower Valley and the Beltway to the east towards US 1 and Maryland has been shown as an extension of the Beltway/US 1 interchange. The access ramps include two direct access ramps to and from the east. Although these ramps are being included as part of the Selected Alternative, a final decision as to their construction will be made during the design phase after consultations between the FHWA, VDOT, and local jurisdictions.

Selected Alternative 4A also includes provisions for several special design features, as follows:

- A deck would be constructed over the Beltway in the area of Washington Street in the City of Alexandria providing opportunities for community enhancements, improving redevelopment potential, and re-connecting portions of southern Alexandria on either side of the Beltway.

- A deck would be constructed over the Beltway on Rosalie Island in Prince George's County, providing opportunities to connect parkland on both sides of the existing bridge, as well as providing a connection for the proposed Potomac Heritage Trail and a location to enjoy vistas of the Potomac River.

- A 3.7-meter (12-foot) wide pedestrian/bicycle facility with appropriate safety offsets would be included on the new bridge and will connect to the existing/proposed trail systems in Virginia, Maryland, and the District of Columbia. The connections will be made via ramps tying into the Mount Vernon Trail in Virginia in the vicinity of the George Washington Memorial Parkway/Washington Street and the proposed Potomac Heritage Trail on Rosalie Island in Maryland.

- Conceptual mitigation plans have been developed to further enhance Jones Point Park and the future Queen Anne's Park and to mitigate impacts the project will have on those sites.

- Wetland replacement or enhancement, noise barriers where reasonable and feasible, and landscaping are also included.

These, as well as other mitigation measures and commitments are described in the FEIS/Section 4(f) Evaluation and are included in the attached checklist.

The existing bridge will be used to maintain traffic during the construction of the new facility, after which it will be removed. The Selected Alternative is described in greater detail in Chapter 2 and graphically depicted on Figure 2-2 of the FEIS/Section 4 (f) Evaluation.

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Alternative 4A was identified as the Selected Alternative because it is the alternative that best meets the project's purpose and need, while minimizing environmental impacts. This decision was based on an evaluation of the technical analyses conducting during the SDEIS process and substantial community and resource agency input. Alternative 4A is considered the environmentally preferred alternative and was named the Selected Alternative for a number of reasons including:

- Highest level of public and interagency support.
- Second lowest projected impacts to wetlands and special aquatic sites. The only alternative with fewer impacts was Alternative 4B (Current Alignment Double-Deck Bridge), which impacted approximately 1.2 fewer hectares (three fewer acres). However, Alternative 4B had decreased traffic service and additional visual impacts.
- Lowest total cost of all of the build alternatives.
- One of the highest levels of traffic service and total person carrying capacity.
- With the mitigation described in the Section 4(f) Evaluation, the least overall harm to Section 4(f) resources.

II. ALTERNATIVES CONSIDERED

A three-year long alternatives development process resulted in the identification of five build alternatives for detailed study, along with two modified alternatives that were developed following the January 1996 SDEIS/Section 4(f) Evaluation. These seven build alternatives represented the most reasonable options to satisfy project transportation and environmental goals. Over 350 potential wide-ranging solutions, including the six alternatives contained in the 1991 DEIS/Section 4(f) Evaluation, were narrowed to these seven build alternatives based on extensive agency and public comments, and regulatory requirements. These alternatives, located on alignments adjacent to and south of the existing I-95/I-495 alignment, included both bridge and tunnel crossings of the Potomac River. Other alignments were dismissed due to their potential for significant environmental and social impacts and their inability to satisfy the project's operational needs. Major transit improvements, high occupancy vehicle (HOV) lane implementation, and various other Transportation Systems Management (TSM) techniques were also evaluated as options to providing improved transportation operations. Each of these approaches would only slightly alleviate current congestion and would not solve projected future traffic congestion. Increased transit usage and HOV implementation were included as components of the traffic analyses for the development of the build alternatives.

The seven proposed build alternatives (five presented in the January 1996 SDEIS/Section 4(f) Evaluation and two presented in the July 1996 SDEIS/Section 4(f) Evaluation), represented numerous iterations of refinements and modifications that sought to ensure adequate mobility, engineering feasibility, and environmental sensitivity. Although developed to accommodate the same transportation requirements, the alignment and/or structure of each alternative is unique. Each of the build alternatives included provisions for several special design features including an urban deck in the vicinity of the Washington Street crossing of the Beltway, bicycle and pedestrian crossings (except for tunnels), and other enhancements, such as wetland replacement, landscaping and park

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improvements. The alternatives are described in more detail and shown graphically in Chapter 2 of the FEIS/Section 4(f) Evaluation.

In addition to the build alternatives, the No-Build (or no action) alternative was also evaluated. This alternative assumed the existing six-lane Woodrow Wilson Bridge and its surrounding roadway network would remain in place, with little or no refinement, except such repairs and maintenance work as is required to maintain the existing transportation network. Recent inspection studies have concluded that the Bridge will require complete reconstruction or replacement within seven years, even with the completion of ongoing maintenance and repairs.

III. SECTION 4(f) RESOURCES

Several Section 4(f) resources were identified in the project area as being potentially used by one or more of the proposed alternatives. These resources include a historic district, individual historic properties, and park/recreation areas.

Avoidance alternatives were identified and evaluated for each potential Section 4(f) impact. In some cases, the avoidance alternative was one of the other build alternatives. In other cases, the avoidance alternative consisted of modifications or shifts of portions of a build alternative to eliminate the encroachment. In general, measures to minimize harm include design features, enhancements, or other measures that would alleviate adverse effects on the Section 4(f) property, or that would help to assimilate the project into its setting.

As described in Chapter 2 of the FEIS/Section 4(f) Evaluation, the alternatives were developed and evaluated based on several factors including their ability to provide adequate traffic operations and safety. As such, the Selected Alternative includes an express/local roadway configuration with shoulders. Due to the high volume of traffic, especially weaving traffic between interchanges, it is essential that this configuration with the provision of shoulders be maintained. The express/local configuration provides for maximum throughput of traffic in the project area and provides for substantial safety improvements. The Selected Alternative also includes one HOV/express bus/transit lane in each direction. This is in support of the region's commitment towards increased HOV facilities and the need to address future demand in the Beltway corridor through some means other than traditional general use highway lanes. While the HOV/express bus/transit lanes would not be opened until connecting systems are in place within Maryland and Virginia, a project of this scale should not preclude the future implementation of mass transportation measures. Both Maryland and Virginia have recognized the need to provide additional capacity on the Beltway. Without the HOV/express bus/transit lanes, the region would be faced in the future with a situation similar to today - a bridge that is smaller than the rest of the Beltway. Therefore, changes to the typical section and lane configuration were not considered appropriate as measures to minimize harm.

Throughout the alternatives development process, however, the candidate build alternatives were developed to minimize, to the extent practicable, impacts to identified resources. These measures included the use of retaining walls to minimize grading, the use of structures as opposed to fill, a

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reduction in the number of bridge piers to minimize physical and visual impacts, and alignment shifts to reduce encroachment. Additional efforts will be made to minimize the total width, and resulting footprint impacts, of the roadway and interchange elements in the final design phase of the project.

In addition, design goals have been established for the Potomac River bridge included in the Selected Alternative. They were established with the goal of a high quality bridge design in mind. They include long spans to avoid the appearance of a forest of columns, appropriate pier placement to complement park uses and avoid impacts, a structure that encourages use of land under the bridge, and the encouragement of arch design in the tradition of other Potomac River Bridges. The Design Goals are described in more detail in Section 4.3.9 of the FEIS/Section 4(f) Evaluation and in the Section 106 Memorandum of Agreement (MOA).

The following discussion presents an overview of the conceptual mitigation plan developed for the Section 4(f) resources. These plans are conceptual and more specific mitigation measures will be developed in consultation with appropriate jurisdictions during the design phase.

Lee Recreation Center. The conceptual mitigation plan for the Lee Recreation Center includes the addition of landscaping to improve the buffer, or shield, between the Center and the Beltway, modification of the rear parking area to replace the parking spaces lost along US 1, and the addition of noise walls.

Freedmen's (Contraband) Cemetery. Due to the potential impacts to this archaeological resource, the temporary Washington Street bridge previously considered as part of the current alignment alternatives has been eliminated from the Selected Alternative. Instead, the Washington Street bridge will now be reconstructed in place without disturbing Washington Street or the gas station property. This roadway currently carries traffic and no modifications to the road bed are planned. Further, there is no evidence of any archaeological resources currently under Washington Street; therefore, it is unlikely any potential resources would be disturbed. In addition, because no additional right-of-way or temporary construction easements are required, those portions of the cemetery which may be under the existing gas station would not be affected. Consequently, the Woodrow Wilson Bridge project will have no impact on the Freedmen's Cemetery. Since construction of the Washington Street replacement bridge would not result in any ground disturbances on the cemetery site, there is no longer any Section 4(f) impact at this location.

George Washington Memorial Parkway (GWMP) / Mount Vernon Memorial Highway (MVMH) / Mount Vernon Trail. The existing Washington Street bridge over the Beltway is a conventional modern concrete bridge and its replacement would not detract from the character or integrity of the Parkway since this part of the Parkway is already urbanized and disturbed by the Beltway. With the construction of the Selected Alternative, visual impacts are expected to be enhanced by a proposed urban deck over the Beltway on both sides of the GWMP/MVMH. Rather than a view of the Beltway, the Parkway would be bordered by additional green space and recreational areas. This urban deck would also serve as a "buffer"

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to reduce potential noise impacts of the widened Beltway. The urban deck would also incorporate a continuation to the Mount Vernon Trail that would connect to a pedestrian/bicycle facility on the new bridge. The design of the deck, along with that of the deck on Rosalie Island in Prince George's County, would be that of a Gateway concept to both the local jurisdictions and States, the bridge itself, and the Nation's Capital.

Alexandria Historic District/Jones Point Park/Jones Point Lighthouse/District of Columbia Cornerstone. The conceptual mitigation/enhancement plan consists of park improvements, improvements along the shoreline, and historic preservation/interpretation, as follows:

The park improvements would include: realigning and improving the entrance drive to the park, landscaping the area between the entrance drive and the new bridge to soften the appearance of the structure, parking lot reconfiguration (the City's employee parking will be maintained), a park information site, unpaved trails, and other amenities such as bike racks and water fountains.

The shoreline improvements would include: bulkhead extension under the new bridges and shoreline stabilization near the District of Columbia Cornerstone.

The historic site enhancements would include interpretation at the historic shipways site, and historic markers for the Lighthouse and the DC Cornerstone. In addition, the urban deck over the Beltway on both sides of Washington Street would enhance the historic district. Rather than a view of the Beltway in that area, views would be of additional green space and recreational areas. This urban deck would also serve as a "buffer" to reduce potential noise impacts of the widened Beltway. The urban deck would also incorporate a continuation to the Mount Vernon Trail that would connect to a pedestrian/bicycle facility on the new bridge.

The Selected Alternative may have noise barriers implemented along the new bridge to reduce noise levels in the Park. A decision on constructing the barriers would not be made until more detailed analyses are conducted on the costs of the barriers relative to their benefits, the relative benefits of noise reduction versus other impacts of the barriers such as visual intrusion, and consideration of the opinions and desires of local residents and government representatives. Architectural and aesthetic treatments of the bridge structure will be developed in accordance with the design goals established for the project (see Section 4.3.9 of the FEIS/Section 4(f) Evaluation and the MOA), during the design phase in consultation with local officials and citizens.

The FHWA believes the impacts to Jones Point Park have been adequately identified based upon the level of design detail conducted to date and appropriate for this stage of project development, and that the conceptual mitigation plan incorporates all possible planning to minimize harm to the Section 4(f) resource. During final design, however, if it is determined that the conceptual mitigation plan does not fully compensate for the impacts to Jones Point

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Park, as well as for the loss of park property, additional mitigation measures in the form of replacement park property will be considered. This determination will be made in consultation with the National Park Service. Several potential sites have been identified by the NPS as a guide including property at south Dyke Marsh, Oxon Cove, Potomac Greens, Spout Run, and between Vernon View Drive and Lucia Lane. These properties could be acquired or placed in easement and could compensate for the loss of parkland or functional uses of parkland in the area.

Queen Anne's Park (Future). The conceptual mitigation plan consists of a deck over the Beltway on Rosalie Island, fishing piers, boardwalk and other park facilities such as benches and bicycle racks. The deck would provide connections to the Potomac Heritage Trail, Rosalie Island to the north and south of the bridge, and the pedestrian/bicycle facility on the new bridge and it would serve as an observation area providing views of the Potomac River. Monuments/plaques would be placed on the deck commemorating former President Woodrow Wilson. The design of the deck, along with that of the deck at Washington Street in the City of Alexandria, would be that of a Gateway concept to both the local jurisdictions and States, the bridge itself, and the Nation's Capital.

The FHWA believes the impacts to Queen Anne's Park have been adequately identified based upon the level of design detail conducted to date and appropriate for this stage of project development, and that the conceptual mitigation plans incorporates all possible planning to minimize harm to the Section 4(f) resource. During final design, however, if it is determined that the conceptual mitigation plan does not fully compensate for the impacts to the future Queen Anne's Park site, as well as for the loss of park property, additional measures in the form of replacement park property will be considered. This determination will be made in consultation with Prince George's County, the Maryland-National Capital Park and Planning Commission, and the National Park Service. Two potential replacement sites have been identified. One is a 26-acre parcel with Potomac River access. The other is a 10-acre parcel along Henson Creek. These properties could compensate for the loss of parkland or functional uses of parkland in Prince George's County and protect the two properties from future development.

Oxon Cove Park/Oxon Hill Farm. Measures to minimize the impacts to Oxon Cove Park include reducing the size of the encroachment by using structures rather than fill material and retaining walls to reduce the width of the fill area. Mitigation measures include the conceptual mitigation plan developed for the future Queen Anne's Park.

Potomac Heritage Trail (Proposed). Conceptual mitigation measures include the redesign/ realignment and construction of the proposed trail through the project area. A mitigation plan has been developed incorporating the Potomac Heritage Trail into the future Queen Anne's Park. The Potomac Heritage Trail would pass over the Beltway on the deck and would have a connection to the pedestrian/bicycle facility on the new bridge. The crossings would be designed to maintain vistas of the River and allow safe passage for pedestrians and bicyclists.

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Butler House. Based on a more accurate delineation of the historic boundaries of the Butler House property near Bald Eagle Road, none of the alternatives would now physically impact this resource. Further, there will be no substantial impairment to the historic qualities of the property due to the proximity of the Selected Alternative. Therefore, Selected Alternative 4A would not result in a Section 4(f) impact at this location. However, to ensure that there is no adverse visual effect to this historic property in Maryland, the FHWA will consult with the Maryland SHPO in the development of an appropriate landscaping plan as outlined in the MOA.

Flintstone Elementary School. The design of the proposed ramp in the northeast quadrant of the interchange between the Beltway and MD 210 has minimized the impacts to the school property by eliminating impacts to the recreational areas. Only 0.04 hectares (0.1 acres) of a wooded area is now required from the Flintstone Elementary School property. This will not impact the school playground or the outdoor recreation areas and, therefore, does not constitute a Section 4(f) impact. However, due to the proximity of the school to the Beltway, the FHWA has developed a conceptual enhancement plan for the school property. The plan calls for several amenities such as the addition of 0.7 hectares (1.7 acres) of land from the adjoining unused property currently owned by the MSHA, the regrading of a portion of the school grounds to provide for enhanced drainage and the addition of noise walls along the Beltway and off-ramp in the northeast quadrant of the interchange.

Based on the Section 4(f) assessment, it has been determined that there is no prudent or feasible alternative to the taking of lands from these Section 4(f) resources and that all possible planning to minimize harm to these resources has been incorporated into the project. The final Section 4(f) Evaluation was found to be legally sufficient by Regional Counsel on September 2, 1997. Selected Alternative 4A, with the mitigation outlined above and described in more detail in the Section 4(f) Evaluation, is the alternative with the least overall harm to Section 4(f) resources. The impacts from Selected Alternative 4A are less than or substantially similar to those of the other alternatives. At the same time, Alternative 4A provides the highest level of traffic service and has the lowest cost of the build alternatives.

IV. MEASURES TO MINIMIZE HARM

Throughout the alternatives development process, alternatives have been designed to minimize, to the extent practicable, impacts to identified resources. The measures incorporated into Selected Alternative 4A include:

- Use of retaining walls to minimize grading.
- Use of structures as opposed to fill.
- Reduction in the number of bridge piers.
- Pier design to reduce footprint.
- Alignment shifts to reduce encroachment.
- Aesthetic design to minimize visual impacts.

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Beyond these refinements, mitigation and enhancement measures have been proposed to offset the unavoidable impacts to the resources in the project area. Mitigation for impacts to cultural resources is outlined in the MOA which was fully executed on November 5, 1997. A draft MOA was circulated as Appendix E of the FEIS/Section 4(f) Evaluation. Several comments were received on the draft MOA and these comments were considered in drafting the final MOA prior to signature. The final executed MOA is included as Attachment 1. Additional mitigation and enhancement measures are described in the Section 4(f) Evaluation contained in Appendix D of the FEIS/Section 4(f) Evaluation.

Compensatory mitigation for both wetland and aquatic resources has been developed to achieve functional replacement. Additional information with respect to compensatory mitigation can be found in the Aquatic Resources Conceptual Mitigation Plan contained in Appendix A of the FEIS/Section 4(f) Evaluation.

Mitigation measures for park and recreation lands are outlined in the Section 4(f) Evaluation contained in Appendix D of the FEIS/Section 4(f) Evaluation.

The mitigation commitments and other considerations associated with the Selected Alternative have been consolidated into a single Commitments/Considerations list (Attachment 2) which will be provided to the General Engineering Consultant and the design and construction contractors for their use and reference to ensure that all mitigation commitments are incorporated into final design plans, and implemented during construction. It should be noted that this list is not necessarily all inclusive as it does not refer to all permits and clearances that are routinely obtained during the detailed design process and typically not addressed during the environmental review process.

The mitigation commitments outlined in the MOA, FEIS/Section 4(f) Evaluation, and included in the Commitments/Considerations list are hereby incorporated into this Record of Decision by reference.

V. MONITORING OR ENFORCEMENT PROGRAM

As part of the commitment to continue efforts to minimize impacts from the project, several monitoring and coordination efforts have been proposed as outlined in this Record of Decision (ROD), the FEIS/Section 4(f) Evaluation, and the MOA. Monitoring programs will consist primarily of those conditions of the Section 404 Permit with respect to wetlands and other aquatic resources (ex: wetland mitigation success). To ensure compliance with all appropriate Federal and State regulations, necessary permits will be obtained prior to construction. A Permit from the US Army Corps of Engineers for any work in waterways or wetland areas will satisfy the requirements of:

- Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403)
- Sections 401/404 of the Clean Water Act (33 USC 1344)
- Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 USC 1413)

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In addition, a Section 9 Permit (of the Rivers and Harbors Act) will be required from the US Coast Guard to construct or modify any bridge or causeway that affects navigation on the Potomac River.

The FEIS/Section 4(f) Evaluation served as the Corps' permit application. Other permits will be sought both during final design prior to construction.

The FHWA has assigned a full-time Project Manager to the Woodrow Wilson Bridge project. The Virginia Department of Transportation (VDOT), Maryland State Highway Administration (MSHA), and FHWA will be hiring a General Engineering Consultant (GEC) to oversee all design and construction activities associated with the project. The GEC will operate a local project office that will house their staff as well as FHWA's Project Manager and agency staff. The FHWA Project Manager, with assistance from the GEC and agency staff, will closely track environmental commitments and ensure their implementation. In addition, the GEC will maintain an open line of communication between the FHWA, VDOT, MSHA, design consultants, construction contractors, the public, and Federal, State, and local resource agencies.

VI. COMMENTS ON FINAL ENVIRONMENTAL IMPACT STATEMENT/SECTION 4(f) EVALUATION

The Notice of Availability of the FEIS/Section 4(f) Evaluation was first published in the *Federal Register* on September 12, 1997 with the period of availability ending on October 14, 1997. The FHWA decided to extend the period of availability and a second notice was published in the *Federal Register* on September 19, 1997 extending the period of availability to October 20, 1997. This resulted in a 38-day period of availability. Advertisements announcing the availability of the document were published in the *Washington Post* and the *Journal Newspapers (Alexandria, Fairfax, and Prince George's)*. The notices announced the availability of the FEIS/Section 4(f) Evaluation and the locations where copies of the document were available for public review, including the Woodrow Wilson Bridge Study & Design Center and over 20 local libraries. Copies of the FEIS/Section 4(f) Evaluation were also provided to those who received copies of either Supplemental DEIS/Section 4(f) Evaluation. A list of the specific agencies, organizations, and individuals to whom copies of the FEIS/Section 4(f) Evaluation were sent is contained in Chapter 7 of the FEIS.

A total of 21 comment letters were received on the FEIS/Section 4(f) Evaluation. Seven letters were received from Federal (two) and State (five) agencies, four letters from local agencies, one from a project Work Group representative, seven letters from special interest groups or organizations, and two letters from the general public. Three of these letters either acknowledged receipt of the FEIS or confirmed that previous comments had been adequately addressed in the FEIS. Only two of the comment letters were from agencies or individuals who had not commented on previous environmental documents on this project. All comments provided on the FEIS/Section 4(f) Evaluation have been summarized in Attachment 3 of this Record of Decision. The letters are included as part of the project files.

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- Alternatives with fewer than 12 lanes were not given adequate consideration by the FHWA
- The FHWA provided insufficient justification for HOV lanes
- Wetland mitigation should be done in the same jurisdiction where impacts would occur
- The FHWA provided only limited opportunities for public involvement during the environmental review process.

The FHWA considered these issues and all other pertinent factors while preparing the FEIS and found it to be legally sufficient. Other comments raised in the letters are related specifically to the FEIS/Section 4(f) Evaluation or are new comments which had not been previously raised. These comments are addressed below:

Mitigation Measures. Several public agencies requested that additional stipulations or mitigation measures be added to the Record of Decision (ROD) to address their specific concerns. The US Department of the Interior requested that specific replacement lands be acquired as mitigation for impacts to Jones Point Park and that they be identified in the ROD. Likewise, the US Environmental Protection Agency asked that the ROD outline specific mitigation measures to avoid, minimize and mitigate temporary construction impacts to aquatic resources. The Maryland Department of Environment–Waste Administration recommended the development of safety and contingency plans to deal with potential hazardous materials spills during construction. The Maryland Office of Planning encouraged the use of Best Management Practices if either Mattawoman or Piscataway Creek are used as off-site wetland mitigation areas. It also requested that perimeter fencing be added to the enhancement plan for Flintstone Elementary School to enhance safety. Virginia's Cheasapeake Bay Local Assistance Department recommended a correction to the FEIS description of the procedures necessary to comply with the Chesapeake Bay Preservation Area Designation and Management Regulations. A local agency, the Alexandria Sanitation Authority, provided information about the location of sewer pipes in the project area and requested that precautions to avoid service interruptions be taken during construction. Although some of the requested mitigation measures or commitments were identified in the FEIS/Section 4(f) Evaluation and others are usually part of the standard construction specifications used by each state, where appropriate, the FHWA has specifically incorporated these measures into the Commitments/Considerations list included in Attachment 2. A more detailed summary of these comments and responses are included in Attachment 3.

In addition, the City of Alexandria requested that a number of additional commitments and specific mitigation conditions be included in the ROD to compensate for the project's direct and indirect impacts to the City and its residents. Throughout the course of the development of this project, there has been extensive coordination with various representatives from the City, and the City has been represented on several study teams as well as the Coordination Committee. The FHWA believes that the many mitigation measures and commitments that have evolved through this ongoing dialogue and included in the FEIS/Section 4(f) Evaluation provide fair and adequate mitigation for impacts as well as enhancements that exceed

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minimum mitigation requirements. Some examples of these features include the urban deck and the donation of excess portions of right-of-way to the City following construction (in accordance with Commonwealth of Virginia procedures). Other items requested by the City in their FEIS/Section 4(f) Evaluation comment letter are new features which the FHWA believes would not be reasonable public expenditures or are requested for areas which are either not owned by the City or are not affected by the proposed project. Examples of features which have not been incorporated are the acquisition of the Mobil Oil gas station in the vicinity of the Freedmen's (Contraband) Cemetery, acquisition of the Old Town Yacht Basin, and certain additional features requested for parks and cultural resources. For several of the issues that appear to be of special concern to the City, however, the FHWA has attempted to address their concerns in this ROD and the Commitments/Considerations list. Examples of these issues include agreement to examine whether or not to retain the Church Street exit during final design as well as careful examination of the US 1 interchange to identify options to minimize its footprint without compromising safety and operations. A more detailed summary of the City's comments and responses to each comment are included in Attachment 3.

Work Group Testimony and Public Comments. Representatives from the Interchanges Work Group and two special interest groups (Friends of Jones Point and Citizens for the Southern Alignment Bridge) objected to the summarization of public comments and responses in FEIS/Section 4(f) Evaluation. They contend that individual comments were interpreted and synthesized by FHWA, thereby distorting their content and minimizing their importance. Both commentors suggested that public comments should have been addressed on a point-by-point basis.

Over 1,000 separate comment letters or oral testimony statements totaling more than 3,000 pages were received on the August 1991 DEIS/Section 4(f) Evaluation, the January 1996 SDEIS/Section 4(f) Evaluation, and the July 1996 SDEIS/Section 4(f) Evaluation. Given the volume of comments, the FHWA decided to summarize public comments, in accordance with the Council on Environmental Quality's regulations (see 40 CFR 1503.4(b)), rather than address each individual letter point-by-point. Each letter or oral statement received on one of the draft environmental impact statements was reviewed, analyzed for content, and specific comments were then incorporated into the summary. In all, the FEIS summarized 626 different public comments on a variety of issues related to the project's design and potential environmental impacts. For each comment which was summarized, the FHWA prepared a logical and reasoned response. To ensure that public comments on the various draft environmental documents were given adequately consideration, separate summaries were prepared for the August 1991 DEIS/Section 4(f) Evaluation, the January 1996 SDEIS/Section 4(f) Evaluation, and the July 1996 SDEIS/Section 4(f) Evaluation. A complete record of the comment letters and oral testimony, including the identification of specific comments, is included in the project files. Specific suggestions from the Interchanges Work Group included in their comments have been referenced in the Commitments/Considerations list in Attachment 2 for consideration during the design phase.

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Responses to the Public Comments. Four commentors (Alexandria League of Women Voters, Citizens for the Southern Alignment Bridge, Friends of Jones Point, and E.L. Tennyson) stated that the FHWA's responses did not adequately address their concerns or were provided too late in the environmental review process. In accordance with the FHWA's regulations (see 23 CFR 771.125(a)(1)), responses to any comments received on a draft environmental impact statement should be included in the FEIS. Due to unique circumstances in this case, three separate draft environmental impact statements were prepared. Thus, formal responses to public comments on each of the draft environmental impact statements were not presented until the publication of the FEIS/Section 4(f) Evaluation. The FEIS (see Appendix G) included the agency and public comments received on all three draft documents and the FHWA's responses. While some commentors believe that their concerns were not adequately addressed in the FEIS, the FHWA did provide concise, reasoned and logical responses to the comments received on each draft environmental impact statement. These responses were developed by the FHWA after a thorough review of the comments and an analysis of the substantive issues involved.

Consideration of Public Comments by the Coordination Committee. One commentor (Citizens for the Southern Alignment Bridge) stated that public comments were not considered or responded to prior to the Coordination Committee's identification of a preferred alternative for the bridge replacement. While comments were not formally responded to in writing, they were summarized and presented to the Coordination Committee during its deliberations. In addition, the Coordination Committee held a public comment period at the beginning of each of their meetings to allow interested citizens to address them directly.

Noise Impacts. Two commentors (Citizens for the Southern Alignment Bridge and Yates Gardens Citizens Association) contend that noise effects on local communities were not assessed properly and that impacts were understated in the FEIS/Section 4(f) Evaluation. The noise analysis in the FEIS did consider the effects on local communities and a revised noise assessment was conducted between the July 1996 SDEIS/Section 4(f) Evaluation and the FEIS/Section 4(f) Evaluation as a result of public comment. This analysis was completed for all alternatives to provide an accurate comparison. Finally, subsequent to the publication of the FEIS/Section 4(f) Evaluation and at the request of the Yates Gardens Citizens Association, the FHWA arranged a meeting between community representatives and project noise specialists. At that meeting, the noise specialists responded in detail to each of the community's concerns, which are listed in Attachment 3.

Historic Resources. Four commentors (Alexandria League of Women Voters, Friends of Jones Point, Andrea Ferster, et. al.[1], and the National Trust for Historic Preservation) stated

[1] As legal counsel, Ms. Ferster provided comments on behalf of the Alexandria Historical Restoration and Preservation Commission, Friends of Jones Point, Historic Alexandria Foundation, Old Town Civic Association, Old Town/Hunting Creek Civic Association and Yates Gardens Citizens Association.

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that the identification of historic resources in the project area is not yet complete and therefore neither the Section 106 nor the Section 4(f) processes are complete. Identification of resources eligible for or listed on the National Register of Historic Places within the Area of Potential Effect and assessments of effects to those resources has been completed as described in Sections 3.8 and 4.8 of the FEIS/Section 4(f) Evaluation. The Advisory Council on Historic Preservation, as well as the District of Columbia, Maryland, and Virginia State Historic Preservation Officers agree that identification efforts are complete. The Section 106 MOA was fully executed on November 5, 1997 and outlines treatment measures for adverse effects to historic and archaeological resources within the project area, as well as procedures for dealing with any unanticipated discoveries during construction. The MOA also includes a provision for a more detailed evaluation of the Alexandra Historic District. This evaluation is intended to provide a greater understanding of the setting, components, and characteristics of the Alexandra Historic District which can then be used to more sensitively develop appropriate treatment plans as specified in the MOA (See Attachment 1).

Section 4(f) Issues. Four commentors (Ferster, et. al., Friends of Jones Point, National Trust for Historic Preservation, and Old Town/Hunting Creek Civic Association) contend that the FEIS/Section 4(f) Evaluation is inadequate or incomplete because: a) the identification of historic resources in the project area has not been completed, b) the FHWA has not undertaken "all possible planning to minimize harm" to historic sites, c) the FHWA has made no attempt to narrow the footprint of the roadway through the Alexandria Historic District, d) the full range of impacts from Preferred Alternative 4A have not been evaluated, e) direct and indirect traffic impacts in the Alexandria Historic District have not been evaluated, and f) narrower, non-separated alternatives were not considered. The FHWA considered these issues and all other pertinent factors while preparing the Section 4(f) Evaluation, and determined that there are no feasible and prudent alternatives to the use of land from various 4(f) resources and that Selected Alternative 4A includes all possible planning to minimize harm. Accordingly, the final Section 4(f) Evaluation was found to be legally sufficient by Regional Counsel on September 2, 1997. Detailed responses to these comments are included in Attachment 3.

11-25-97
Date

David C. Lawton, P.E.
David C. Lawton, P.E., Director
Planning and Program Development
Region III

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Attachment 1

Memorandum of Agreement

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MEMORANDUM OF AGREEMENT
AMONG
THE FEDERAL HIGHWAY ADMINISTRATION,
NATIONAL PARK SERVICE,
ADVISORY COUNCIL ON HISTORIC PRESERVATION,
DISTRICT OF COLUMBIA STATE HISTORIC PRESERVATION OFFICER,
MARYLAND STATE HISTORIC PRESERVATION OFFICER, AND
VIRGINIA STATE HISTORIC PRESERVATION OFFICER,
REGARDING THE
WOODROW WILSON MEMORIAL BRIDGE PROJECT ON INTERSTATE 95/495
IN VIRGINIA, MARYLAND AND THE DISTRICT OF COLUMBIA
(Project No. FHWA-MD-VA-DC-EIS-91-01-F)

WHEREAS, the Federal Highway Administration (FHWA), in cooperation with the District of Columbia Department of Public Works (DCDPW), the Maryland State Highway Administration (MSHA) and the Virginia Department of Transportation (VDOT), is proposing to construct a replacement for the Woodrow Wilson Memorial Bridge, and Preferred Alternative 4A provides for two parallel drawspan bridges on the south side of the existing bridge with a clearance of 70 feet above the navigational channel of the Potomac River and other improvements and enhancements within the project corridor (the Project), as recommended by the Coordination Committee in September 1996, and as described in Attachment 1; and

WHEREAS, the *Woodrow Wilson Bridge Improvement Study Draft Environmental Impact Statement/Section 4(f) Evaluation* (issued August 1991), two *Woodrow Wilson Bridge Improvement Study Supplemental Draft Environmental Impact Statements/Section 4(f) Evaluations* (issued January and July 1996), the *Woodrow Wilson Bridge Improvement Study Final Environmental Impact Statement/Section 4(f) Evaluation* (FEIS) (issued August 1997), and supporting technical reports provide background information to this Memorandum of Agreement (MOA); and

WHEREAS, the National Park Service (NPS) owns in fee the property on both sides of the Potomac River which will contain the replacement Woodrow Wilson Bridge abutments and piers, and will undertake a transfer of jurisdiction to the FHWA of the footprint of the bridge, issue a permit for construction of the bridge, and issue an Archeological Resources Protection Act permit, all constituting Federal undertakings by the NPS; and

WHEREAS, the FHWA and the NPS, in consultation with the Advisory Council on Historic Preservation (ACHP) and the respective SHPOs, have determined that the Woodrow Wilson Memorial Bridge project will have an Adverse Effect on the following historic properties:

In Alexandria, Virginia:

(a) Alexandria Historic District, a National Historic Landmark;
(b) Alexandria Historic District (National Register-listed, Identification No. 100-21);
(c) Jones Point Lighthouse and District of Columbia South Cornerstone (National Register-listed, Identification No.100-116);

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(d) Two terrestrial archeological resources (Sites 44AX78 and 44AX165) located within Jones Point Park not yet evaluated for National Register eligibility, but considered eligible for the purposes of identification and preliminary determination of effect;

In Prince George's County, Maryland:

(e) Two underwater archeological resources (Targets 66-8 and 64-3) not yet evaluated for National Register eligibility, but considered eligible for the purposes of identification and preliminary determination of effect; and

WHEREAS, the Project will have an effect on the Mount Vernon Memorial Highway/George Washington Memorial Parkway (National Register-listed, Identification No. 29-218), hereafter referred to as the Mount Vernon Memorial Highway, in Alexandria, Virginia; and

WHEREAS, the Project may have an effect on the following historic properties

(a) Freedmen's (Contraband) Cemetery (Identification No. 44AX179);
(b) Oxon Hill Manor (National Register-listed, Identification No. PG 80-1);
(c) Fort Washington (National Register-listed, Identification No. PG 80-16);
(d) Hard Bargain Farm (National Register-eligible, Identification No. PG 83-2);
(e) Longview (National Register-eligible, Identification No. PG 83-3);
(f) Butler House (National Register-eligible, Identification No. PG 76A-14); and

WHEREAS, the Project may have an effect on additional properties, yet to be identified, that are eligible for inclusion in the National Register, as the result of activities related to implementation of the Project, including, but not limited to construction staging, dredge disposal, wetland mitigation, or other ancillary activities; and

WHEREAS, the FHWA and NPS have consulted with the SHPOs and ACHP pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act, as amended (16 USC 470f) and Section 110 of the same act (16 USC 470h-2(f)); and

WHEREAS, it is understood that this MOA is based upon review of conceptual designs as shown in the FEIS; and

WHEREAS, the National Register-listed Jones Point Lighthouse (owned by the NPS and preserved and maintained under a 25-year permit which expires April 10, 2016 by the Mount Vernon Chapter, National Society of the Daughters of the American Revolution), the District of Columbia South Cornerstone, and potentially eligible archeological resources are located within Jones Point Park, which is owned by the NPS and managed under a 25-year permit by the City of Alexandria until September 30, 2011; and

WHEREAS, for the purposes of this Agreement, jurisdiction for resources identified or referenced herein is defined as follows: in the District of Columbia, the District of Columbia SHPO; in

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Maryland, the Prince George's County Government or Maryland-National Capital Park and Planning Commission and the Maryland SHPO; on National Park Service land in Maryland, the Maryland SHPO and the NPS; in Fairfax County, Virginia, the Virginia SHPO, in Alexandria, Virginia, the City of Alexandria and the Virginia SHPO; and on National Park Service land in Virginia, the Virginia SHPO and the NPS; and

WHEREAS, Preferred Alternative 4A may be implemented by a bridge authority (Authority) established by the US Congress or the State Legislatures at a future date, and such Authority may be vested with, and bound by, responsibilities herein assigned to the FHWA, and/or State implementing agencies, and it is recognized that this MOA may be amended to clarify such responsibilities; and

WHEREAS, the FHWA, in carrying out the stipulations of this Agreement will coordinate with the DCDPW, the MSHA, and the VDOT, as appropriate; and

WHEREAS, the DCDPW, the MSHA, the VDOT, the Maryland-National Capital Park and Planning Commission (M-NCPPC), the Prince George's County Government, and the City of Alexandria, Virginia (a Certified Local Government) participated in the consultation and have been invited to concur in this MOA; and

WHEREAS, other interested parties, including the Alexandria Historical Restoration and Preservation Commission, the Daughters of the American Revolution, the Friends of Jones Point, the Historic Alexandria Foundation, the Old Town Civic Association, the Old Town/Hunting Creek Civic Association, the Yates Garden Civic Association, all in Alexandria, Virginia; the National Trust for Historic Preservation; and the US Army Directorate of Public Works, Fort Belvoir have been invited to participate in the consultation process and to review and comment on this MOA; and

WHEREAS, any rights and responsibilities assigned to a specific party herein shall be voided if that party does not sign the Agreement;

NOW, THEREFORE the FHWA, the NPS, the ACHP, the District of Columbia SHPO, the Maryland SHPO, and the Virginia SHPO agree that the Project will be implemented in accordance with the following stipulations in order to take into account the effect of the Project on historic properties.

STIPULATIONS

The FHWA will ensure that the following measures are carried out:

I. HISTORIC RESOURCES IDENTIFICATION & EVALUATION REPORT: ALEXANDRIA, VIRGINIA

The FHWA shall prepare a *Historic Resources Identification and Evaluation Report* for the APE in Alexandria, Virginia, as defined in April 1997. This report shall be prepared by qualified

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architectural historians and archaeologists meeting the Federal requirements outlined in 36 CFR Part 61, Appendix A. This report shall identify and evaluate the defining historic characteristics of the Alexandria Historic District within the APE.

1. For archeological resources, specific topics to be addressed in the report should include, but are not limited to: (a) a summary of known archeological resources, including areas already surveyed, (b) the potential for additional resources within the project area, based on historic and pre-historic context and cartographic data, and (c) a discussion of how the archeological resources do or do not contribute to the Alexandria Historic District. For historic architectural resources, specific topics to be addressed in the report should include, but are not limited to: (a) the historic street plan and circulation patterns, (b) development of the City of Alexandria as it pertains to this plan, (c) industrial development along the Potomac River waterfront, (d) open spaces and park lands, (e) building density (i.e., scale, massing, setback, etc.), and (f) a discussion of existing conditions (i.e., the current Capital Beltway and Woodrow Wilson Bridge). This report shall define the National Historic Landmark within the APE in Alexandria, Jones Point historic resources, and the Freedmen's (Contraband) Cemetery boundaries, and include a base map indicating the location of all historic resources, including archeological sites, within the APE in Alexandria.

2. This report shall be prepared in accordance with the Federal standards included in: *Archeology and Historic Preservation: Secretary of Interior's Standards and Guidelines* (48 FR 44716-44742), 36 CFR Part 79—*Curation of Federally-Owned and Administered Archeological Collections*, and where appropriate, the *Archeology Laboratory Manual* of the NPS Regional Archeology Program, National Capital Region. The report shall meet the Virginia SHPO's *Guidelines for Preparing Identification and Evaluation Reports for Submission Pursuant to Sections 106 and 110, National Historic Preservation Act, Environmental Impact Reports of State Agencies, Virginia Appropriations Act, 1992 Session Amendments* (June 1992), and comply with the Virginia SHPO's guidance document entitled *How to Use Historic Contexts in Virginia: A Guide for Survey, Registration, Protection, and Treatment Projects* (1991). This report shall also include the curriculum vitae (resumes) of each of the principal authors.

3. Within 90 calendar days of the execution of this Agreement, the NPS, the ACHP and the Virginia SHPO shall be notified of the status of this report and the progress made to date. Prior to final publication of this report, it shall be submitted for review and approval to the ACHP and the Virginia SHPO, and for review and comment to the City of Alexandria. Each of these parties shall be afforded an opportunity, not to exceed 30 calendar days, to provide comments on the report. If no comments are received within 30 calendar days of confirmed receipt, approval of the report may be assumed. This schedule will allow the results of the report to be taken into consideration during the design of Project elements.

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II. PROJECT DESIGN AND REVIEW

A. Design Goals

The design development process for the Project shall meet the following design goals to the maximum extent possible, as determined by the FHWA in consultation with the NPS, the DCDPW, the MSHA, the VDOT, and the Design Review Working Group defined in Section II.B of this Agreement:

1. The Bridge (Potomac River crossing) shall be a structure designed with high aesthetic values, deriving its form in relation to the monumental core of Washington, D.C., and shall be an asset to the Nation's capital and the surrounding region.

2. The concepts for the Bridge shall be based on arches in the tradition of notable Potomac River bridges (e.g., Key Bridge, Memorial Bridge).

3. The Bridge design shall employ span lengths which minimize the number of piers occurring in the viewshed of the Alexandria Historic District and other historic properties. Every effort will be made to minimize the footprint of the Project without adversely affecting safety and operations.

4. The Bridge design shall also include pier placement which maintains the park use areas in Jones Point Park and Rosalie Island Park, preserves views southward along Royal, Fairfax, and Lee Streets, and avoids terrestrial and underwater archeological areas to the maximum extent possible.

5. The Bridge design should encourage the use of lands under the bridge in Jones Point Park. For example, the structure could approach this goal by introducing and/or reflecting light into the area under the bridge.

6. The Bridge design should preserve or enhance views along the Potomac River toward the National Capital and the Alexandria Historic District.

7. The design of the Bridge and other Project elements shall take into account the City of Alexandria's *Design Guidelines of the Old and Alexandria Historic District and the Parker-Gray District* (1993). The Bridge design shall also respect the distinguishing historic characteristics of the Alexandria Historic District, as defined in the report prepared under Section I of this MOA.

8. The Bridge design shall include features appropriate to its status as a memorial to President Woodrow Wilson.

9. All practicable measures shall be taken to minimize the construction period of the Project.

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10. Construction impacts to historic and archeological resources shall be avoided or minimized to the extent possible. If possible, construction-related traffic in the City of Alexandria will be routed away from residential areas via South Street to minimize construction-related traffic through the residential areas north of the Capital Beltway.

11. The design of the Bridge and other Project elements shall take into account the historic plan for the Mount Vernon Memorial Highway, the NPS General Management Plan for the facility, the agreement between the NPS and the City of Alexandria for the management of Jones Point Park and resources therein by the City, the agreement with the Daughters of the American Revolution for the management of Jones Point Lighthouse, and effects on archeological resources.

12. The Project shall be designed to avoid all temporary and permanent impacts to the Freedmen's (Contraband) Cemetery.

B. Design Review Coordination

1. A Design Review Working Group, consisting of one representative from the NPS, the ACHP, the District of Columbia SHPO, the Maryland SHPO, the Virginia SHPO, the M-NCPPC, the Prince George's County Government, and the City of Alexandria shall be established prior to the initiation of the detailed design phase of the Project to provide comments to ensure that the Project design meets the stipulations outlined in this MOA.

2. The FHWA, and as appropriate, the DCDPW, the MSHA, the VDOT and Project design consultants shall meet with the Design Review Working Group prior to beginning the preliminary design phase to review the general design goals for the Project and specific treatment measures for adverse effects to historic resources. Subsequently, this Working Group will convene to review pertinent plans and specifications at the completion of preliminary design (30 percent), intermediate design (65 percent) and pre-final design (90/95 percent). This Working Group will be informed by the findings of the *Historic Resources Identification and Evaluation Report* and measures to minimize effects to historic resources will be incorporated into treatment plans, as appropriate. The FHWA will provide one set of plans and specifications to each member of the Working Group 30 calendar days prior to each milestone review meeting. Copies of these plans will also be available for review at the Woodrow Wilson Bridge Project Office in Alexandria, Virginia. The FHWA shall announce their availability to all parties to this Agreement.

3. The Design Review Working Group shall provide one set of written comments to the FHWA within 45 calendar days of receiving the design plans and specifications for each major milestone. Review comments from the Working Group will be incorporated into the design of specific Project elements to the maximum extent possible. Individual representatives in the Working Group may submit separate review comments and the

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FHWA may consider such comments in addition to the consensus comments of the Working Group.

4. The FHWA shall continue consultations with the Design Review Working Group throughout the detailed design phase as necessary to address review comments and other elements of project design such as materials, finish, lighting, etc.

III. IDENTIFICATION, EVALUATION, AND TREATMENT OF ARCHAEOLOGICAL RESOURCES

A. Identification

1. The FHWA shall ensure completion of terrestrial and underwater archeological identification efforts in areas where ground disturbance is expected and for which surveys have not been completed in accordance with applicable standards and guidelines in order to identify the presence of archeological resources potentially eligible for inclusion in the National Register. Due to its archeological potential, particular care and attention will be given to work conducted in the vicinity of the Freedmen's (Contraband) Cemetery. Additional identification efforts shall be conducted in a manner consistent with the standards and guidelines listed in Section VIII.B of this MOA.

   Scopes of Work for terrestrial or underwater archeological identifications shall be developed in consultation with the appropriate SHPO and concurring parties, as indicated by jurisdiction. Each SHPO shall be provided an opportunity, not to exceed 30 calendar days, to review and approve draft scopes of work. Concurring parties shall be provided an opportunity, not to exceed 30 calendar days, to review and comment on draft scopes of work. Archeological investigations on Federal lands shall require filing and receipt of an approved Application for Federal Permit under the Archeological Resources Protection Act (ARPA Permit).

2. Areas to be surveyed shall be jointly determined by consultation among the FHWA, the appropriate SHPO, and concurring parties, as indicated by jurisdiction. In determining areas to be surveyed, the FHWA will also solicit and consider comments from other known interested parties. At a minimum, these areas shall include the right-of-way, and all areas of construction activity that are unsurveyed and where ground disturbance may occur. Such additional identification efforts may be necessary at interchanges, wetland and other mitigation sites, dredge disposal sites, or construction staging areas. The extent of archeological work within land over which the NPS has jurisdiction shall be jointly determined by the NPS and the appropriate SHPO after considering the comments of other interested parties. The extent of archeological work on non-Federal lands will be determined by the appropriate SHPO, after considering the comments of other interested parties. The surveys shall be conducted in consultation with the appropriate SHPO and concurring parties, as indicated by jurisdiction.

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3. Each SHPO and the NPS, as appropriate, shall be afforded an opportunity, not to exceed 30 calendar days, to review and approve survey reports. Concurring parties shall be afforded an opportunity, not to exceed 30 calendar days, to review and comment on these survey reports. If no responses are received within 30 calendar days of confirmed receipt, concurrence may be assumed.

4. The results of archeological identification efforts will be shared with the Design Review Working Group on an on-going basis as the field work is completed. Identification of affected archeological resources will be initiated no later than the 30 percent design milestone and survey reports shall be completed before the 65 percent review is conducted by the Design Review Working Group.

B. Evaluation

1. Following completion of any surveys, the National Register eligibility of identified archeological resources shall be evaluated using the criteria outlined in National Register Bulletin 15, *Guidelines for Applying the National Register Criteria for Evaluation*, published by the NPS. Evaluation efforts shall be conducted in a manner consistent with the standards and guidelines listed in Section VIII.B of this MOA.

2. Each SHPO and the NPS, as appropriate, shall be afforded an opportunity, not to exceed 30 calendar days, to review and approve the evaluation reports. Concurring parties shall be afforded an opportunity, not to exceed 30 calendar days, to review and comment on these evaluation reports. If no comments are received within 30 calendar days of confirmed receipt, concurrence may be assumed.

C. Treatment

1. If any survey results in the identification of properties that are eligible for the National Register, the FHWA shall endeavor to avoid adverse effects. If avoidance is not possible, then an appropriate treatment plan, as described below, shall be developed and implemented to minimize or mitigate the adverse effects. All treatment plans shall be developed in consultation with the appropriate SHPO and concurring parties, as indicated by jurisdiction. Preparation of treatment plans shall be consistent with the standards and guidelines listed in Section VIII.B of this MOA.

2. Treatment plans shall include educational or interpretive programs about the significance, preservation and public interpretation of archeological resources. Such programs may include preparation of a brochure for public distribution, publication of scholarly articles, interpretive displays, site interpretation, museum exhibits, videos, or other interpretive/educational materials. Any treatment plan shall specify, at a minimum:

   a. Description of the property, properties, or portions of properties where treatment measures shall be carried out;

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b. Methods for site preservation/protection, such as controlled site burial or restricted access, or landscape restoration, as appropriate;
c. Description of any property, properties, or portions of properties that will be destroyed without treatment with justification for such action;
d. Research questions to be addressed through data recovery, with an explanation of their relevance and importance;
e. Mitigation efforts to be used, with an explanation of their relevance to the research questions;
f. Methods to be used in analysis, data management, and dissemination of data, including a schedule;
g. Methods to fulfill requirements for curation of recovered materials and records;
h. Methods to fulfill requirements for involving and educating the interested public;
i. Methods to fulfill requirements for disseminating results of the work to the interested public;
j. Methods to fulfill requirements for keeping local governments informed of the work and providing them an opportunity to participate; and
k. Proposed schedule for the submission of progress reports.

3. Treatment plans shall be prepared and submitted to each SHPO, as appropriate, for review and approval. Concurring parties to this Agreement, as appropriate, shall also be provided an opportunity to review and comment on proposed treatment plans. Treatment plans affecting NPS lands shall be jointly approved by the NPS and the appropriate SHPO. If comments on a proposed treatment plan are not provided to the FHWA within 30 calendar days of confirmed receipt, acceptance of the plan shall be assumed.

IV. TREATMENT OF HISTORIC ARCHITECTURAL RESOURCES

Treatment plans shall be prepared and implemented for each of the following properties, as well as for any additional resources identified under the provisions of Section IV.F, in consultation with the appropriate and concurring parties, as indicated by jurisdiction, to minimize or mitigate adverse effect to historic buildings, districts, and objects resulting from the Project. Proposed treatment plans, including enhancement measures deemed by the FHWA to be reasonable public expenditures, shall be provided to ACHP and each SHPO, as appropriate, for review and approval. Treatment plans shall also be provided to concurring parties, as appropriate, for review and comment. If comments on a proposed treatment plan are not provided to the FHWA within 30 calendar days of confirmed receipt, acceptance of the plan may be assumed.

Treatment plans shall include educational or interpretative programs on the significance, preservation and public interpretation of historic resources. Such programs may include preparation of a brochure for public distribution, publication of scholarly articles, interpretive displays, museum exhibits, educational videos, or other interpretive/educational materials. Treatments for effects to specific historic properties include the following:

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A. Alexandria Historic District (NHL and National Register)

1. The FHWA shall prepare and implement an appropriate system of permanent improvements, which shall include:

    a. An entry demarcation to the City of Alexandria and Alexandria Historic District at US Route 1 to clearly delineate the transition from the interstate highway and from Fairfax County into the historic district;
    b. Advisory signs on I-95/495 identifying exits to the Alexandria Historic District;
    c. Historical markers defining the boundaries of the Alexandria Historic District at Washington, Patrick, Henry, Duke and King Streets;
    d. An entry demarcation at Franklin Street, at its intersections with US Route 1 and with South Washington Street, to denote the entry to the historic waterfront and to Jones Point Park;
    e. Appropriate directional signage from major automobile and pedestrian/bicycle routes to indicate access routes to the historic waterfront and Jones Point Park.
    f. Historical marker for the Freedmen's (Contraband) Cemetery.

2. If adversely affected by the proposed construction, the FHWA shall restore or reconstruct historically appropriate fencing along the boundary of St. Mary's Cemetery where it is adjacent to Washington Street and I-95/495. Retaining walls adjacent to the cemetery shall be constructed of materials compatible with the historic character of the cemetery and the Alexandria Historic District. Designs for fencing and retaining walls shall be reviewed by the ACHP and Virginia SHPO, in consultation with the City of Alexandria, to ensure that the finish materials and architectural character are appropriate and compatible with the standards and guidelines outlined in Section VIII.B of this Agreement.

3. The FHWA shall avoid impacts to the Freedmen's (Contraband) Cemetery by constructing the replacement bridge for Washington Street over the Capital Beltway in place, two lanes at a time, instead of using a temporary bridge which would encroach upon the boundaries of the cemetery.

B. Jones Point Park, Jones Point Lighthouse and the District of Columbia South Cornerstone

In consultation with the NPS, the Virginia SHPO, and the City of Alexandria, the FHWA shall provide improvements within Jones Point Park to aid in the recognition of the historic past of the park and implement measures to preserve historic resources within the park that shall include:

a. Entrance signage, entry plantings or other appropriate improvements that convey the historic past of Jones Point Park.

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b. System of markers interpreting the history and significance of Jones Point, the Jones Point Lighthouse and the District of Columbia South Cornerstone within the park.
c. Interpretations of the historic land forms and activities/sites within Jones Point Park.
d. Stabilization, preservation and interpretation of the Virginia Shipbuilding Corporation shipways.
e. Maintenance of existing utility services to the Jones Point Lighthouse throughout the constuction period.
f. Maintenance of access routes to the Jones Point Lighthouse for maintenance and emergency vehicles throughout the construction period. Routes for public access will be provided to the extent that such routes are feasible, practical and safe. Public access may be temporarily restricted during the construction period.
g. Preparation of an historic structure report, in accordance with NPS guidelines contained in *National Register Bulletin 28 (Chapter 8: Management of Historic and Prehistoric Structures),* for the Jones Point Lighthouse to provide a baseline record of its condition at the start of construction.
h. Development of a condition report, in accordance with NPS guidelines contained in *National Register Bulletin 28 (Chapter 8: Management of Historic and Prehistoric Structures),* for the District of Columbia South Cornerstone.
i. Restoration of the lighthouse and grounds to the condition evidenced by the baseline record should the Jones Point Lighthouse deteriorate during the construction period to a degree in excess of normal wear and tear.
j. Riverbank treatments, seawall repair and landscaping along the boundary of the Jones Point Lighthouse and District of Columbia South Cornerstone site (approximately 200 feet) to provide appropriate public access and allow for long-term protection of the site.

C. Mount Vernon Memorial Highway

In consultation with the Virginia SHPO, the NPS, and the City of Alexandria, the FHWA shall develop a treatment plan for Project elements that avoids, minimizes or mitigates effects to the historic characteristics of the Mount Vernon Memorial Highway in the vicinity of the Washington Street Bridge. This treatment plan shall include the following:

a. A deck-over shall be constructed adjacent to Washington Street/Mount Vernon Memorial Highway as it crosses above I-95/495 to limit views of I-95/495 from the Memorial Highway.

b. The design for the deck-over shall include historically appropriate monumental light fixtures and signage to clearly indicate an entrance to the Alexandria Historic District for those traveling north on Mount Vernon Memorial Highway. The design shall also include an entrance to the Mount Vernon Memorial Highway for those traveling south toward Mount Vernon. Finally, the deck-over will be designed to be compatible with adjacent cemeteries.

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D. Oxon Hill Manor, Fort Washington, Hard Bargain Farm, and Longview

During final design phase, the FHWA will consult with the Maryland SHPO, NPS, appropriate concurring parties, and other interested parties to assess the Project's effects on Oxon Hill Manor, Fort Washington, Hard Bargain Farm, and Longview. If the FHWA determines in consultation with the above parties that the Project may have adverse visual effects to these historic properties, the FHWA shall develop and implement a treatment plan to avoid, minimize, or mitigate visual impacts. The treatment plan shall be prepared and implemented in accordance with the appropriate standards and guidelines listed in Section VIII.B of this MOA. The treatment plan for these properties shall be submitted to the Maryland SHPO and the NPS for review and approval. Concurring parties to this Agreement, as appropriate, shall also be provided an opportunity to review and comment on the proposed treatment plan. If comments on the proposed treatment plan are not provided to the FHWA within 30 calendar days of confirmed receipt, acceptance of the plan may be assumed.

E. Butler House

In consultation with the Maryland SHPO, the FHWA shall develop and implement an appropriate landscaping plan to ensure that the Project does not have adverse visual impacts to the Butler House. The FHWA shall submit the plan to the Maryland SHPO for review and comment prior to implementation. If the Maryland SHPO does not provide comments on the proposed landscaping plan within 30 calendar days, the FHWA may assume acceptance of the plan.

F. Unknown Effects to Historic Properties within the APE

If historic properties within the APE are later found to be affected by the construction or implementation of the Project, the FHWA shall endeavor to avoid adverse effects. If avoidance is not possible, then an appropriate treatment plan shall be developed to minimize or mitigate the adverse effect. Any treatment plan shall be developed in consultation with the appropriate SHPO and other parties, as indicated by jurisdiction. Preparation of treatment plans shall be consistent with the standards and guidelines listed in Section VIII.B of this MOA.

Treatment plans shall be prepared and submitted to the appropriate SHPO for review and approval. Concurring parties to this Agreement, as appropriate, shall also be provided an opportunity to review and comment on proposed treatment plans. Treatment plans affecting NPS lands shall be jointly approved by the NPS and the appropriate SHPO. If comments on a proposed treatment plan are not provided to the FHWA within 30 calendar days of confirmed receipt, acceptance of the plan shall be assumed.

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V. UNANTICIPATED DISCOVERIES OF ARCHAEOLOGICAL RESOURCES

A. In the event that previously unidentified archeological resources are discovered during ground disturbing activities with the APE, the FHWA shall halt all construction work involving subsurface disturbance in the area of the resource and in the surrounding area where further subsurface remains can reasonably be expected to occur. The FHWA shall immediately notify the appropriate SHPO and the NPS (for discoveries on NPS lands) of the discovery.

B. The FHWA, the NPS, and the appropriate SHPO, or an archeologist approved by them, shall immediately inspect the work site and determine the area and nature of the affected archeological resource. Construction work may then continue in the area outside the archeological resource as defined by the FHWA, the NPS (on NPS lands) and the appropriate SHPO, or their designated representative.

C. Within three working days of the original notification of discovery, the FHWA, in consultation with the appropriate SHPO and the NPS (for discoveries on NPS lands), shall determine the National Register eligibility of the resource.

D. If the resource is determined eligible for the National Register, the FHWA shall prepare a plan for its avoidance, protection, recovery of information, or destruction without data recovery. Such a plan shall be approved by the NPS and/or the appropriate SHPO prior to implementation.

E. Work in the affected area shall not proceed until either:

   1. The development and implementation of appropriate data recovery or other recommended mitigation measures, or

   2. The determination is made that the located remains are not eligible for inclusion on the National Register.

F. Any disputes over the evaluation or treatment of previously unidentified archeological resources will be resolved using the process provided in Section X. of this Agreement.

VI. ADDITIONAL HISTORIC PROPERTIES TO BE CONSIDERED

Prior to the selection of sites for construction staging, wetland mitigation, dredge disposal, or other ancillary activities associated with construction of the Project, the FHWA shall consult with the appropriate SHPO and concurring parties to determine the effect on historic properties. If indicated, the FHWA will undertake a survey adequate to identify and evaluate for National Register eligibility any historic properties which may be affected by these activities. In consultation with the appropriate SHPO, the FHWA shall apply the National Register criteria

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to each potentially eligible property identified in the survey(s). For each historic property identified, the FHWA, in consultation with the appropriate SHPO, shall then apply the Criteria of Effect and Adverse Effect (36 CFR Part 800.9), giving consideration to the views, if any, of interested parties.

If the effect is not adverse, the FHWA will obtain the SHPO's concurrence, and the action may proceed as proposed. If the SHPO does not concur, the action will be treated as an adverse effect. If the potential for an adverse effect to historic properties is found, the FHWA shall consult with the SHPO and other interested parties to seek ways to avoid or reduce the effects on historic properties by relocating or modifying the proposed action. If the avoidance of adverse effects proves to be infeasible or impractical, the FHWA, the appropriate SHPO, and other interested parties will consult to develop and implement a treatment plan consistent with Sections III and IV of this MOA, as appropriate.

VII. EXCESS AND ABANDONED RIGHT-OF-WAY

Should the Project result in excess right-of-way to be abandoned, the FHWA shall consult with the appropriate SHPO and concurring parties to determine whether the abandonment would have an effect on National Register-eligible resources. If consultations indicate the potential for historic resources to be affected, the SHPO and concurring parties shall then consult on appropriate treatment of the affected resources and disposition of the property.

VIII. PERFORMANCE STANDARDS

A. Professional Qualifications

The FHWA shall ensure that all cultural resource work carried out pursuant to this Agreement shall be carried out by or under the direct supervision of qualified individuals meeting, at a minimum, the appropriate federal qualifications presented in 36 CFR Part 61, Appendix A.

B. Standards and Guidelines

The FHWA, shall also ensure that all cultural resource work carried out pursuant to this Agreement shall be carried out in accordance with the following standards and guidelines, as applicable:

1. The Secretary of Interior: *Standards and Guidelines for Archeology and Historic Preservation* (1983) (48 FR 44716-44742).

2. Advisory Council on Historic Preservation: *Treatment of Archeological Properties: A Handbook* (1980).

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3. National Park Service: *The Archeological Survey: Methods and Uses* (1978), *The Archeological Resources Protection Act* (1979), National Register Bulletin 15—*Guidelines for Applying the National Register Criteria for Evaluation*, National Park Service Guideline No. 28—*Cultural Resource Management Guideline*, and the *Archeology Laboratory Manual* of the Regional Archeology Program, National Capital Region.

4. 16 USC 470aa - 470ll: *Archeological Resources Protection Act of 1979.*

5. 25 USC 3001 et. seq: *Native American Graves Protection and Repatriation Act.*

6. 36 CFR Part 79: *Curation of Federally-Owned and Administered Archeological Collections.*

7. Maryland Historical Trust: *Standards and Guidelines for Archeological Investigations in Maryland* (1994) and *Guidelines for Completing the Maryland Inventory of Historic Properties Form* (1991)

8. Maryland State Highway Administration: *Consultant Specifications for Archeological Services* (1992).

9. Virginia Department of Historic Resources: *Guidelines for Archaeological Survey in Virginia* (1995*), Guidelines for Preparing Identification and Evaluation Reports for Submission Pursuant to Sections 106 and 110, National Historic Preservation Act, Environmental Impact Reports of State Agencies, Virginia Appropriations Act, 1992 Session Amendments* (June 1992), *How to Use Historic Contexts in Virginia: A Guide for Survey, Registration, Protection, and Treatment Projects* (1991), *and State Standard Curation Guidelines* (1993).

10. City of Alexandria: *City of Alexandria Archaeological Standards* (January 1996); *Design Guidelines for the Old and Historic Alexandria District and Parker-Gray District* (May 1993).

C. Curation

1. In Maryland, the FHWA shall ensure that all materials resulting from work conducted in Maryland land or waters and non-NPS owned lands pursuant to this MOA are curated by the Maryland SHPO in accordance with 36 CFR Part 79 and the Maryland SHPO's *Standards and Guidelines for Archeological Investigations in Maryland* (1994). The FHWA and the NPS shall ensure that all materials and records, recovered and produced as a result of work conducted on NPS lands in Maryland, are curated at the NPS National Capital Region Museum Resource Center in Glenn Dale, Maryland in accordance with 36 CFR Part 79 and the *Archeology Laboratory Manual* of the NPS Regional

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Archeology Program, National Capital Region. The NPS shall provide access to these materials for study and exhibit in accordance with Federal law and NPS policy.

2. In Virginia, the FHWA shall ensure that all materials resulting from work conducted in Virginia land or waters and non-NPS owned lands pursuant to this MOA are curated in accordance with 36 CFR Part 79 and the Virginia SHPO's *State Standard Curation Guidelines* (1993). The FHWA will consult with the Virginia SHPO and the City of Alexandria to determine the appropriate repository for the materials to be curated. The FHWA and the NPS shall ensure that all materials and records, recovered and produced as a result of work conducted on NPS lands in Virginia, are curated at the NPS National Capital Region Museum Resource Center in Glenn Dale, Maryland in accordance with 36 CFR Part 79 and the *Archeology Laboratory Manual* of the NPS Regional Archeology Program, National Capital Region. The NPS shall provide access to these materials for study and exhibit in accordance with Federal law and NPS policy.

D. Distribution of Final Reports

The FHWA, in consultation with the appropriate SHPO, shall prepare sufficient copies of final reports completed pursuant to this Agreement for dissemination to the appropriate public libraries, educational institutions, and other repositories.

IX. PROGRESS REPORTS AND ALERTS

A. Progress Reports

Progress reports shall be submitted by the FHWA to the parties to this MOA every six months, or annually as appropriate, for the duration of the Project. The first progress report shall be distributed six months following execution of this Agreement, with subsequent reports following each six months thereafter until the Project is completed. The progress report shall identify steps initiated, underway, or completed for the most recent performance period and identify steps to be initiated, continued, or completed in the next two six month periods.

B. Progress Alerts

Progress alerts shall be issued by the FHWA to the parties to this MOA 30 days prior to anticipated decision points that would affect historic properties. These decision points include: initiation of construction activities; final selection of construction staging areas or ancillary activities associated with construction; and final selection of sites for dredge disposal or wetland mitigation. The progress alerts shall describe the pending action, summarize consultation completed or to be initiated regarding the pending action, and outline the agreed-upon conditions that have been completed or that would be initiated for the pending action.

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IX. AMENDMENT

If an alternative other than Preferred Alternative 4A, as described in Attachment 1, is selected for construction, or if the preferred alternative is substantially modified, the parties shall consult to consider the need to amend this Agreement. Any party to this MOA may request an amendment, whereupon the FHWA, the NPS, the ACHP, and the respective SHPOs shall consult in accordance with 36 CFR Part 800.5 (e)(5) to consider such an amendment.

X. DISPUTE RESOLUTION

A. Should the FHWA, the NPS, the ACHP, the District of Columbia SHPO, the Maryland SHPO, or the Virginia SHPO object in writing within 30 days of the receipt of any plans or actions proposed pursuant to this MOA, the FHWA shall take the objection into account and consult, as needed, within 10 days with the appropriate parties as respective to their responsibilities stipulated under this MOA to resolve the written objection. Copies of written objections shall be submitted simultaneously to all parties. Copies of FHWA's resolution shall also be provided to all parties.

B. If the FHWA determines that the objection cannot be resolved, the FHWA shall forward all documentation relevant to the dispute to the ACHP and request that the ACHP comment. Within 30 days of receipt of all pertinent documentation, the ACHP shall either:

1. Provide the FHWA with recommendations to take into account in reaching a final decision regarding the dispute; or

2. Notify the FHWA that it will comment pursuant to 36 CFR Part 800.6(b) and proceed to comment.

C. Any ACHP comment provided in response to such a request shall be taken into account by the FHWA, in accordance with 36 CFR Part 800.6(c)(2) with reference only to the subject of the dispute. The FHWA's responsibility to carry out all actions under this Agreement that are not subject to the dispute shall remain unchanged.

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Execution and implementation of this Memorandum of Agreement is evidence that the FHWA has afforded the ACHP an opportunity to comment on the Woodrow Wilson Memorial Bridge Project and its effects on historic properties, that the FHWA has taken into account the effects of the undertaking on historic properties.

FEDERAL HIGHWAY ADMINISTRATION

By: David C. Lawton — Date: 10-16-97

David C. Lawton
Director, Office of Planning and Program Development, Region 3

NATIONAL PARK SERVICE

By: Terry R. Carlstrom — Date: 10/31/97

Terry R. Carlstrom
Regional Director, National Capital Region

ADVISORY COUNCIL ON HISTORIC PRESERVATION

By: Cathryn B. Slater — Date: 11-5-97

Cathryn B. Slater
Chairman

DISTRICT OF COLUMBIA STATE HISTORIC PRESERVATION OFFICER

By: Hampton Cross — Date: 10/27/97

Hampton Cross
District of Columbia State Historic Preservation Officer

MARYLAND STATE HISTORIC PRESERVATION OFFICER

By: — Date: 10-22-97

J. Rodney Little
Maryland State Historic Preservation Officer

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: H. Alexander Wise, Jr. — Date: 10/29/97

H. Alexander Wise
Virginia State Historic Preservation Officer

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Attachment 1

PREFERRED ALTERNATIVE 4A
CURRENT ALIGNMENT SIDE-BY-SIDE DRAWBRIDGES

Preferred Alternative 4A (Current Alignment Side-by-Side Drawbridges) would consist of eight general use lanes to match the existing Beltway, two HOV/express bus/transit lanes to match those under consideration for the Beltway, and two merging/diverging lanes (one in each direction between the interchanges) to ease entering and exiting the Beltway, particularly on the River crossing between the US 1 and I-295 interchanges (see Figure 1). This has been referred to as the "8+2+2" section. The lanes would be configured in a divided express/local roadway system allowing for the physical separation of local and through traffic. The roadway section also includes shoulders in the express and local roadways. There will be no conversion of the shoulders in the future to add general purpose lanes. The two HOV/express bus/transit lanes would be separated from the express lanes by a 0.6-meter (two-foot) painted area. The HOV/express bus/transit lanes would not be opened until connecting HOV/express bus/transit systems are in place within Maryland and Virginia and would not be used as general purpose lanes except for incident/accident management and maintenance of traffic, where necessary.

Preferred Alternative 4A (Current Alignment Side-by-Side Drawbridges) would replace the existing Woodrow Wilson Bridge with two new parallel drawbridges, one for eastbound traffic and the other for westbound traffic, constructed approximately 9.1 meters (30 feet) south of the existing Bridge. Each bridge would include four general use lanes, one HOV/express bus/transit lane and one merging/diverging lane. The drawbridges would be approximately 1,920 meters (6,300 feet) long, have a maximum grade of three percent, and have a 21.3-meter (70-foot) clearance over the navigational channel. The interchanges at Telegraph Road, US 1, I-295, and MD 210 would be reconstructed to allow for smoother traffic flow, increased access, and roadway widening. In addition, direct HOV access would be provided between US 1, I-295, MD 210, and the Beltway. Figure 2 illustrates the alignment and interchange configurations for Preferred Alternative 4A.

The bridge in this alternative could have a moveable barrier between the local and express lanes. This barrier would not be operated on a daily basis, but as a temporary condition for maintenance activities (such as re-decking or repairs) or major incidents. It would also allow for maximum flexibility in the use of the structure. If the balance of traffic between the local and express lanes changes in the future, the barrier could be moved and the lane configuration changed to accommodate traffic demands more efficiently.

The interchange modifications included with the preferred alternative at Telegraph Road would shift the current one-lane loop ramp from westbound Beltway to southbound Telegraph Road to accommodate the new Beltway roadway and would replace the other two existing loop ramps in the northeast and southwest quadrants with signalized left turn ramp movements. All interchange movements would be provided and would access the local lanes only. The two-lane directional connection from the eastbound Beltway to northbound Telegraph Road would be relocated slightly to the west and a direct ramp connection to Stovall Street would be included. The eastbound Beltway to northbound and southbound Telegraph Road ramp would be relocated to be in line with Kings Highway to improve traffic flow at both Kings Highway and Huntington Avenue. The movement from northbound Telegraph Road to the new directional ramp to Stovall Street is also provided.

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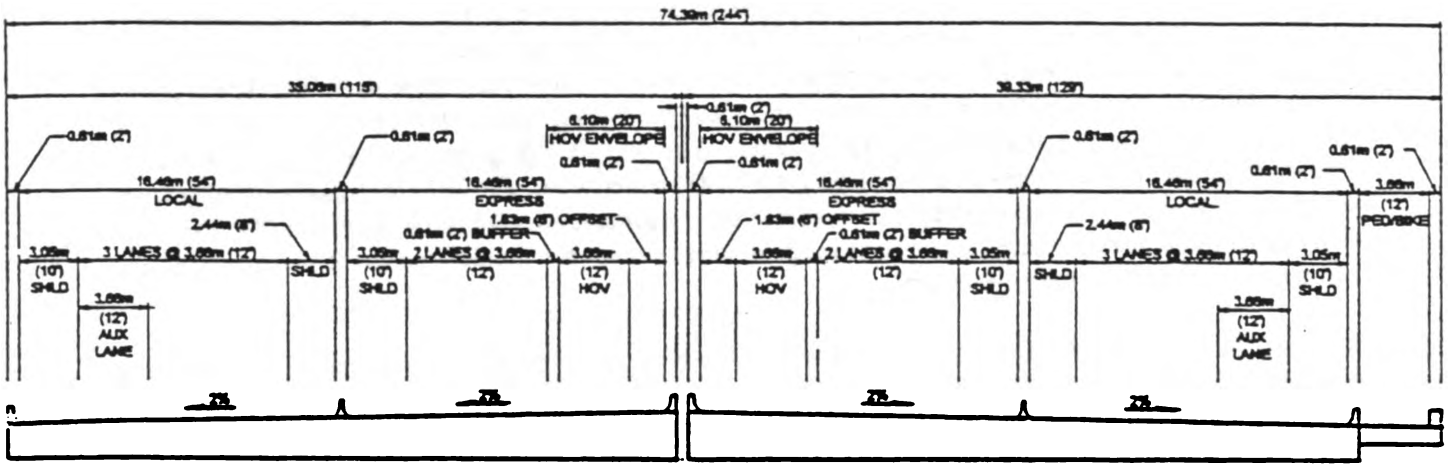

NOTE:

THESE DIMENSIONS ARE FOR THE PURPOSE OF DETERMINING COST ESTIMATES AND ENVIRONMENTAL IMPACTS, AND ARE SUBJECT TO CHANGE DURING THE FINAL DESIGN PHASE

WOODROW WILSON BRIDGE
IMPROVEMENT STUDY

Preferred Alternative 4A
Typical Section

N.T.S.	FIGURE 1	N.T.S.

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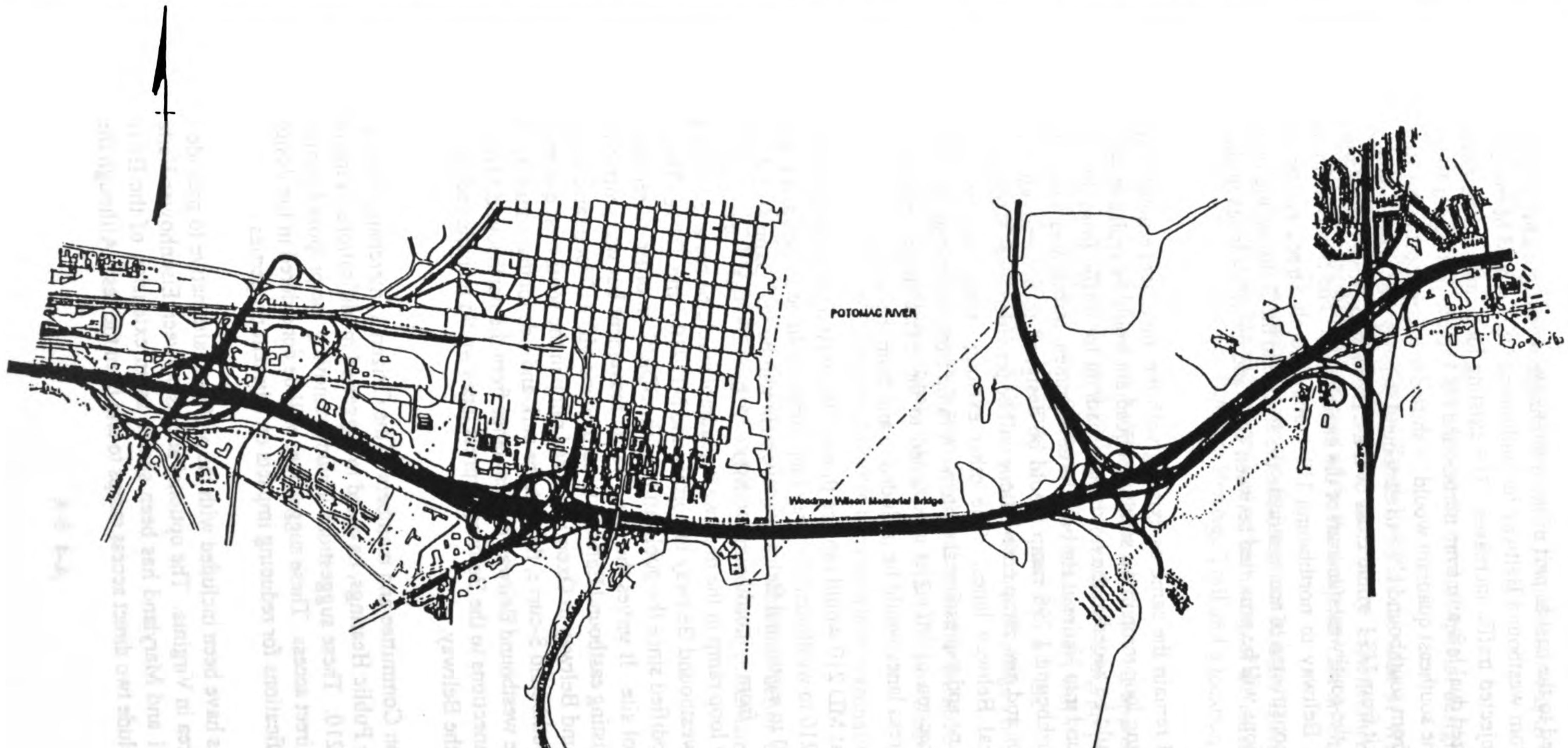

WOODROW WILSON BRIDGE
IMPROVEMENT STUDY

Preferred Alternative 4A
Current Alignment
Side-by-Side Drawbridges

N.T.S.	FIGURE 2	N.T.S.

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US 1 mainline would be shifted to the east as part of the interchange reconfiguration at that location. The current one-lane loop ramp from westbound Beltway to southbound US 1 would become a two-lane loop ramp to accommodate the projected traffic increases. The existing loop ramp in the northeast quadrant would be replaced by a signalized dual left-turn from northbound US 1 to the westbound Beltway local lanes and the existing loop ramp in the southeast quadrant would be shifted to accommodate the Beltway roadway. The existing directional ramp from southbound US 1 to eastbound Beltway would be replaced with two loop ramps. A common two-lane exit from US 1 would cross over the Beltway to provide one-lane access to both the local and express system in the southwest quadrant of the interchange. The ramps from northbound US 1 to the Beltway, westbound Beltway to northbound US 1 and Church Street, eastbound Beltway to southbound US 1 will all be reconstructed to accommodate the change to the Beltway and other interchange ramps. Finally, direct connections will be provided between US 1 and the HOV lanes in the express lanes of the Beltway.

The alignment of I-295 would remain the same as existing with the interchange modifications with the preferred alternative. The existing loop ramp in the southwest quadrant would be replaced with a directional ramp and a new loop ramp would be added in the northwest quadrant for traffic from the eastbound local lanes of the Beltway to southbound into National Harbor (the development formerly known as PortAmerica). The eastbound Beltway to northbound I-295 ramp would be designed to accommodate a southbound connection into National Harbor and new ramp connections will be provided from National Harbor to the eastbound and westbound local Beltway lanes. The other existing ramps will be reconstructed to accommodate the revised mainline and express/local system. A ramp from the eastbound Beltway express lane to the S-curve on the direction of MD 210 was added to the interchange. Finally, direct HOV connections to the Beltway express lanes would be included to and from the west.

The interchange modifications at MD 210 would replace three of the existing loop ramps with other types of ramps. The northbound MD 210 to westbound Beltway loop ramp would be shifted and expanded to two lanes. The southbound MD 210 to eastbound Beltway movement will be via Oxon Hill Road and a new ramp joining the ramp from northbound MD 210. The existing westbound Beltway to southbound MD 210 loop ramp in the northwest quadrant would be replaced with a signalized two-lane left-turn ramp off the westbound Beltway to northbound MD 210 ramp. [Note: The ramp off the westbound Beltway has been modified since the publication of the SDEIS in order to reduce the impacts to the adjacent elementary school site. It serves the same traffic movement but was shifted closer to the mainline of the Beltway.] The existing eastbound Beltway to northbound MD 210 loop ramp in the southeast quadrant and the existing eastbound Beltway to Oxon Hill Road ramp in the southwest quadrant would be replaced with a ramp off of the southbound S-curve, through the park-and-ride lot that connects to Oxon Hill Road. A direct access ramp to the westbound Beltway express lanes from the northbound MD 210 S-curve has been added. Direct HOV connections to the Beltway express lanes would be included to and from the west at the MD 210 bridge over the Beltway.

Discussions with the Coordination Committee and members of the Citizen's Interchange Work Group, as well as comments received at the Public Hearings, have led to suggested modifications to the interchange configurations at US 1 and MD 210. These suggestions include removing the proposed signalized ramp connections and providing more direct access. These suggestions will be considered in the design phase of the project, as well as other modifications for reducing impacts on adjacent properties.

Optional interchange modifications have been included with the preferred alternative to provide additional access to the Eisenhower Valley area in Virginia. The optional access between Eisenhower Valley and the Beltway to the east towards US 1 and Maryland has been shown as an extension of the Beltway/US 1 interchange. The access ramps include two direct access ramps to and from the east. Although these ramps

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are being included as part of the preferred alternative, a final decision as to their construction will be made during the design phase.

Preferred Alternative 4A also includes provisions for several special design features, as follows:

- A deck would be constructed over the Beltway in the area of Washington Street in the City of Alexandria providing opportunities for community enhancements, improving redevelopment potential, and re-connecting portions of southern Alexandria on either side of the Beltway.

- A deck would be constructed over the Beltway on Rosalie Island in Prince George's County, providing opportunities to connect parkland on both sides of the existing bridge, as well as providing a connection for the proposed Potomac Heritage Trail and a location to enjoy vistas of the Potomac River.

- A 3.7-meter (12-foot) wide pedestrian/bicycle facility with appropriate safety offsets would be included on the new bridge and will connect to the existing/proposed trail systems in Virginia, Maryland, and the District of Columbia. The connections will be made via ramps tying into the Mount Vernon Trail in Virginia in the vicinity of the George Washington Memorial Parkway/Washington Street and the proposed Potomac Heritage Trail on Rosalie Island in Maryland.

- Conceptual mitigation plans have been developed to further enhance Jones Point Park and the future Queen Anne's Park and to mitigate impacts the project has on those sites.

- Wetland replacement or enhancement, noise barriers where reasonable and feasible, and landscaping are also included.

The existing bridge will be used to maintain traffic during the construction of the new facility, after which it will be removed. Preferred Alternative 4A is estimated to cost approximately $1.59 billion (1997 dollars).

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Attachment 2

Commitments/Considerations

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Water Resources

	Reference
Span Potomac River floodplain.	Appendix G, p 21
Design structures so that any increase in the backwater surface elevation would be 0.3 meter (1 foot) or less.	Appendix G, p 21
Submit application for a Coast Guard Bridge Permit after ROD.	Appendix G, p 23
Prepare a Stormwater Management Plan.	Appendix G, p 65
Prepare a detailed hydraulics and hydrology study.	Appendix G, p 66
Develop and implement a Sediment and Erosion Control Plan.	Chap 4, p 79 & 91 App G, p 75 & 265
Design facility to accommodate peak flows associated with 2, 10, and 100-year storms.	Appendix G, p 96
Coordinate with the Fairfax County Department of Public Works regarding sanitary sewers during design and construction, as appropriate.	Appendix G, p 96
Follow measures outlined in Aquatic Resources Conceptual Mitigation Plan including appropriate coordination concerning on-site and off-site mitigation. Mitigation site development will be completed in accordance with Federal, State, and local requirements with respect to implementation of Best Management Practices.	Chap 4, p 97 to 108 App G, p 185 & 411 Appendix A
Incorporate measures to avoid and minimize impacts to the aquatic environment as part of the design.	Appendix G, p 165
Coordinate refinement of impact locations and acreages with the COE during final design in an effort to further minimize impacts.	Appendix A, p 6
Conduct supplemental evaluations and monitoring of potential mitigation sites and proceed with design and acquisition of sites determined to have greatest potential.	Appendix A, p 27
The delineation of Waters of the US is valid through May 15, 2002. Delineation of Submerged Aquatic Vegetation is valid through December 31, 1999. If construction has not commenced by this date, a new jurisdictional determination will be required.	Chap 3, p 56 Figure 3-19
Follow mitigation ratios and requirements as agreed upon at the May 28, 1997 interagency coordination meeting.	Chap 4, p 93 & 94 Appendix A
Work with environmental resource agencies to establish time of year restrictions on in-water construction.	Chap 4, p 89, 90, 118 Appendix B, p 10

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Cultural Resources

	Reference
Conduct further investigation of two submerged archeological targets (66-8 an 64-3) during final design as outlined in the MOA.	App G, p 47 & 52
Conduct appropriate coordination and prepare documentation relative to construction staging areas and wetland mitigation sites.	Chap 4, p 92 & 152 MOA
Avoid impacts to the Freedmen's (Contraband) Cemetery during construction.	Appendix D, p 5 Figure D-4
Meet all requirements of MOA.	MOA

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Park and Recreation Resources

	Reference
Unused portions of land that are currently under the existing bridge in Jones Point Park will be incorporated into the park. In addition, land under the new bridge will be incorporated into the park.	Appendix G, p 51 Appendix D, p 50 Figure D-37
Follow mitigation measures outlined in Section 4(f) Evaluation and continue coordination, as necessary.	Appendix D Appendix G, p 185
Maintain fishing piers in Jones Point Park.	Chap 4, p 92 Appendix G, p 196
Determine specific features and functions of the Washington Street urban deck in consultation with the City of Alexandria, National Park Service, and National Capital Planning Commission.	Appendix G, p 447 Figure D-36
Follow conceptual mitigation plan for the Lee Recreation Center outlined in the Section 4(f) Evaluation.	Appendix D, p 46 Figure D-35
Follow conceptual mitigation plan for the George Washington Memorial Parkway (urban deck) as outlined in the Section 4(f) Evaluation.	Appendix D, p 48 Figure D-36
Follow conceptual mitigation plan for the Alexandria Historic District/Jones Point Park/Jones Point Lighthouse and District of Columbia South Cornerstone as outlined in the Section 4(f) Evaluation.	Appendix D, p 50 Figure D-37
Maintain bicycle trail connection at the south end of Payne Street.	Appendix D, p 50
Follow conceptual mitigation plan for Queen Anne's Park, Oxon Cove Park, and the Potomac Heritage Trail as outlined in the Section 4(f) Evaluation.	App D, p 52 & 53 Figure D-39
Follow conceptual enhancement plan for the Flintstone Elementary School as outlined in the Section 4(f) Evaluation.	Appendix D, p 12 Figure D-10
Conduct appropriate coordination and prepare documentation relative to construction staging areas and wetland mitigation sites.	Chap 4, p 92 & 152

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Design

	Reference
Typical section consists of eight general use lanes, two HOV/express bus/transit lanes, and two merging/diverging lanes.	Chap 2, p 2 Figure 2-1
Roadway will be divided into an express/local system. Shoulders are provided in both the express and local lanes.	Chap 2, p 2 Figure 2-1
HOV/express bus/transit lanes will not open until connecting systems are in place within Maryland and Virginia.	Chap 2, p 2
Neither the shoulders nor the HOV/express bus/transit lanes will be used as general purpose lanes except for incident/accident management or maintenance of traffic.	Chap 2, p 2
The existing Woodrow Wilson Bridge will be replaced with two new parallel drawbridges with a 21.3-meter (70-foot) clearance over the navigational channel. The existing bridge will be removed upon completion of the new bridge.	Chap 2, p 3 & 6
Interchange modifications will be considered during the design phase to reduce impacts on adjacent properties, remove signalized ramp connections, and provide more direct access.	Chap 2, p 5 Interchange Work Group Comments
The new bridge should not exceed the obstruction standard for air traffic of 82.3 meters (270 feet) above mean sea level.	Chap 4, p 27
Use Design Goals in developing final design for Potomac River Bridge.	Chap 4, p 55 Appendix G, p 164 MOA
Retain City of Alexandria employee parking under new bridge in Jones Point Park.	App G, p 168 & 447
Conduct additional analyses and coordination with FHWA, VDOT, and local governments to determine whether or not to retain the Church Street ramp.	App G, p 171, 344, 448, 525, and 539
Notify National Geodetic Survey concerning control monuments which would be disturbed/destroyed during construction.	Appendix G, p 194
Consult with COE prior to construction to review proposed staging areas and identify supplemental mitigation, if required.	Chap 4, p 152 Appendix G, p 223
Provide full access to National Harbor from I-295 and Beltway as part of the project. Direct access to the westbound Beltway is also included.	Appendix G, p 261 Figure 2-2

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Design (cont.)

Provide full pedestrian/bicycle access across the Potomac River with connections to existing/proposed trails.	Appendix G, p 312
Evaluate proposals for improving pedestrian/bicycle movement across the Beltway in the vicinity of the project interchanges.	App G, p 312 & 536
Make final determination on the optional access from Eisenhower Valley to/from the eastbound Beltway during design after consultations between the FHWA, VDOT, and the City of Alexandria.	Chap 2, p 6 App G, p 344 & 446 Figure 2-2
Evaluate the proposed interchange improvements to try to reduce the size and impacts without compromising safety and traffic operations.	Appendix G, p 345
Coordinate with the appropriate agencies including the SHPOs, ACHP, NPS, Commission of Fine Arts, NCPC, local jurisdictions, and community on the design (visual) of the bridge.	App G, p 65 & 387
Continue coordination with US Fish & Wildlife and NPS during final design and construction.	Appendix G, p 405
Consult with local jurisdictions and organizations during the development of a maintenance of traffic plan for both pedestrians and bicyclists.	Chap 4, p 150
Develop a maintenance of traffic plan (traffic).	Chap 4, p 150
Design HOV/express bus/transit lane on bridge to accommodate a potential future rail transit facility by establishment of certain design parameters.	Chap 2, p 54
Establish guidelines to ensure that the spacing of piers and other landside features would allow for either conversion of the HOV/express bus/transit lane or other future construction of a separate rail line.	Chap 2, p 54
Consider the use of a moveable barrier between the local and express lanes on the bridge to allow for maximum flexibility. This barrier would not operate on a daily basis, but for maintenance or major incidents or to better balance long-term shifts in the split of local and express traffic.	Chap 2, p 3
Include landscaping throughout the corridor.	Chap 2, p 6

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Noise Impacts

	Reference
Prepare a construction noise study to identify projected noise levels associated with particular construction activities.	Chap 4, p 151 App G, p 65 & 539
Coordinate with local communities on the final decisions on the locations and design of noise barriers. Considerations should include community and visual impacts and consultation with the NPS, SHPOs, local jurisdictions, and other appropriate agencies.	Chap 4, p 71 & 74 App G, p 89, 164, 527 & 539 Figure 4-16
Construct noise barriers as part of the mitigation/enhancement plans at the Lee Recreation Center and Flintstone Elementary School.	Appendix G, p 89 Appendix D
Construct noise barriers at beginning of construction phase, where possible, to help mitigate construction-related impacts on the surrounding communities.	ROD

Air Impacts

	Reference
If funding does not require tolls, a new conformity determination would be required.	Chap 4, p 62
When the HOV/express bus/transit lanes are opened, a new conformity determination would be required.	Chap 4, p 62

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Wastes (Construction and Hazardous)

	Reference
Manage construction wastes in accordance with applicable Federal, State, and local guidelines.	Appendix G, p 82
Investigate potential hazardous waste sites within Federal, State, and local guidelines. Coordinate remediation with appropriate agencies.	Chap 4, p 140 Appendix G, p 83
Coordinate all underground storage tank issues in Virginia with the appropriate regional office of Virginia DEQ.	Appendix G, p 269

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Right-of-Way and Relocation

	Reference
Excess portions of right-of-way in the City of Alexandria will be made available to the City at no cost, in accordance with the laws of the Commonwealth of Virginia.	Chap 4, p 48 App G, p 91, 203 & 447
All acquisitions of real property and all relocations (residential and business) will be in accordance with the Uniform Act.	Chap 4, p 39
All acquisitions of right-of-way and all relocations will be in accordance with each State's right-of-way acquisition and relocation assistance programs.	Chap 4, p 40 Appendix H
The project will comply with Title VI of the Civil Rights Act of 1964.	Chap 4, p 40
No right-of-way will be acquired from St. Mary's Cemetery, the Mobil Station at the corner of Church and Washington streets (Freedmen's (Contraband) Cemetery), or from the public areas of the Oxon Cove Farm.	Chap 4, p 38 App D, p 5 & 37 ROD

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Permits/Applications

	Reference
Submit FAA Form 7460-1 to obtain FAR Part 77 compliance. Updated forms will be submitted throughout design until construction commences.	App G, p 97 & 183
Upon final approval of project, submit appropriate form to the Maryland State Clearinghouse.	Appendix G, p 425
Submit a Section 9 Permit (Rivers and Harbors Act of 1899) to the US Coast Guard.	Appendix G, p 26
Submit Maryland and Virginia Joint Permit Applications.	Appendix A, p 27
Comply with the Virginia Chesapeake Bay Preservation Area Designation and Management Regulations.	Chap 4, p 120 ROD Regulations
Obtain Coastal Zone Consistency Determination.	Chap 4, p 119
Obtain Section 404 Permit and Section 401 Certification.	Appendix A

It should be noted that this list is not necessarily all inclusive as it does not refer to all permits and clearances that are routinely obtained during the detailed design process and typically not addressed during the environmental review process.

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Construction

	Reference
Maintain maritime access during construction. Notify users prior to any short periods of construction in the channel.	App G, p 196 & 401
Take measures to control pest and vermin infestation in surrounding areas during construction.	Appendix G, p 205
Dispose of dredge material in currently-permitted solid waste and/or refuse disposal site, if not used for beneficial purposes. Use of deep holes in the Potomac River is not an option.	Chap 4, p 111 App G, p 219 & 393
Use of pesticides will be done in accordance with all applicable Federal, State, and local regulations.	Appendix G, p 263
Comply with seasonal restrictions on the use of cut-back asphalt, if applicable. Add appropriate wording to bid documents.	Appendix G, p 267
Observe time of year restrictions on in-water construction for spawning/ nursery activities of anadromous fish and SAV growth.	Chap 4, p 89, 90, 118 Appendix B, p 10
Actions taken to minimize adverse effects related to sediment dispersion will be consistent with EPA Section 404(b)(1) guidelines.	Chap 4, p 110 Appendix B
Measures will be employed to minimize disturbance to terrestrial habitat/species.	Chap 4, p 117
Forested habitat impacts in Maryland will be mitigated in accordance with Maryland's Reforestation Law.	Chap 4, p 117
Use signs, as appropriate, to provide notice of road closures, detours, etc.	Chap 4, p 150
Post signs in the project area with the phone number of a hotline people can call about project-related activities.	Chap 4, p 150
Take measures to reduce fugitive dust and other emissions.	Chap 4, p 151
Removal of the existing bridge is expected to be accomplished with minimal impacts to water quality and is not expected to require blasting. Materials will be disposed of at an approved/permitted off-site upland location.	Chap 4, p 151 & 152
Insure that construction documents allow FHWA to retain ownership of the two Woodrow Wilson medallions on the sides of the tower (and other features, as appropriate) of the existing bridge.	ROD

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Attachment 3

Summary of Comments
Final Environmental Impact Statement/Section 4(f) Evaluation
August 1997

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WOODROW WILSON BRIDGE IMPROVEMENT STUDY
SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

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WOODROW WILSON BRIDGE IMPROVEMENT STUDY

SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	*FHWA Response*
FEDERAL AGENCIES	
U.S. Department of the Interior (10/9/97)	
• Concurrence with Preferred Alternative 4A was conditional upon the identification of replacement lands to mitigate for impacts to Jones Point Park; FEIS did not identify replacement parcels. Requested that Record of Decision (ROD) identify specific replacement lands to be acquired to compensate for property takings from Jones Point Park.	The potential for replacement lands as mitigation for impacts to Jones Point Park is discussed in Section III of the ROD.
U.S. Environmental Protection Agency — Region III (10/16/97)	
• FEIS did not provide quantitative estimates of temporary construction impacts to wetlands and aquatic resources or outline mitigation for these impacts. Requested that the ROD stipulate specific measures to avoid, minimize and mitigate for temporary construction impacts associated with this project.	The Aquatic Resources Conceptual Mitigation Plan contained in Appendix A of the FEIS/Section 4(f) Evaluation included measures to address construction-related impacts. Although construction staging areas and methods have not yet been finalized, the FEIS did include estimates of dredge quantities and wetland impacts (see Section 4.7.4). Attachment 2 of the ROD includes a number of commitments/considerations to address potential impacts to aquatic resources. Other types of construction impacts were discussed in Section 4.13 of the FEIS/Section 4(f) Evaluation.
• Further review of the FEIS underway to determine if previous concerns regarding air quality conformity have been addressed. Additional comments will be provided, if necessary.	No additional comments on air quality conformity were received from the US Environmental Protection Agency.
MARYLAND AGENCIES	
Maryland Department of the Environment — Waste Management Administration (9/24/97)	
• FEIS adequately addressed previous comments on draft EIS documents.	Comment noted.
• Recommended development of safety and contingency plans to address procedures for dealing with hazardous materials spills or contamination during construction.	Compliance with Federal, State, and local laws or regulations concerning hazardous materials is required in the standard construction specifications used by each state. The General Engineering Consultant (GEC) will be responsible for complying with procedures and policies to address hazardous materials spills and coordinate clean-up of any contamination with the appropriate government authorities.

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WOODROW WILSON BRIDGE IMPROVEMENT STUDY

SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	*FHWA Response*
Maryland Office of Planning — State Clearinghouse (9/17/97)	
• Notified the FHWA that the Maryland Intergovernmental Review and Coordination process has been initiated.	Comments resulting from the Maryland Intergovernmental Review and Coordination process were provided in a follow-up letter on October 20, 1997. Responses to those comments are provided below.
Maryland Office of Planning — State Clearinghouse (10/20/97)	
• Maryland Department of Business and Economic Development noted that the current number of annual drawbridge openings will adversely affect traffic flow and questioned whether there are plans to mitigate this problem.	Comment addressed in Section 4.2.7 of the FEIS; construction of Preferred Alternative 4A would reduce the annual number of drawbridge openings by 70 percent (from 220 to 65).
• Maryland Department of Business and Economic Development noted that the proposed bridge replacement will operate at capacity within planning horizon for the project.	Comment addressed in the FEIS. See response to Public Comment 36 on the 1991 DEIS (page G-134).
• Maryland Office of Planning recommended that Best Management Practices be used if Mattawoman Creek or Piscataway Creek (both listed as Areas of Critical State Concern) are selected as off-site wetland mitigation areas.	Comment noted. As noted in the Commitments/Considerations list in Attachment 2 of the ROD, Best Management Practices will be used at all mitigation sites to avoid or minimize impacts.
• Maryland Office of Planning recommended that mitigation plans for Flintstone Elementary School include perimeter fencing to restrict the movement of school students and enhance safety.	A noise barrier or fencing will be provided along the Beltway and MD 210 ramp right-of-way as part of the Woodrow Wilson Bridge project; existing fencing around the rest of the school property will be maintained.
VIRGINIA AGENCIES	
Virginia Chesapeake Bay Local Assistance Department (10/1/97)	
• FEIS incorrectly states procedures necessary to comply with the Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC10-20 et. seq.). Requested clarification and correct explanation of regulatory requirements.	The FHWA believes that these issues are fully addressed in the FEIS (see Sections 4.7.2, 4.7.7, and Appendix A). Compliance with this regulation has also been included in the Commitments/Considerations list provided in Attachment 2 of the ROD. A copy of the regulation will be forwarded to the General Engineering Consultant for review and use during the design and construction phases of the project.
Virginia Department of Environmental Quality (10/20/97)	
• FEIS adequately addressed previous comments on draft EIS documents. The Department has no objections to the proposed project provided that it is constructed in accordance with all applicable Federal, State, and local regulations.	Comment noted.

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Commentor/Comment(s)	*FHWA Response*
LOCAL AGENCIES	
City of Alexandria – Mayor's Office (10/20/97)	
• City continues to oppose the construction of Preferred Alternative 4A. Recommends reconsideration of a 10-lane bridge replacement alternative.	Comment addressed in the FEIS. See responses to Comments 1 and 6 (pages G-443 and G-445) from the City's September 12, 1996 letter and Comments 2 (page G-454) and 48 (page G-489) from the City's September 19, 1996 letter on the July 1996 SDEIS. These comments superseded the City's previous comments on this topic.
• Acknowledged that Preferred Alternative 4A would likely be approved by the FHWA; requested a number of detailed and specific mitigation commitments or conditions be included in the ROD to compensate for the project's direct and indirect impacts to the City of Alexandria and its residents. The ROD should:	Specific comments from the City of Alexandria are addressed below.
a. Define the project it is approving and stipulate that any revisions or alterations to the project be approved by FHWA and subject to new environmental analyses.	The location and general design concept for Selected Alternative 4A is described in Section I of the ROD. Any changes to the scope of the project as described would be subject to the FHWA's environmental reevaluation process (see 23 CFR 771.129(c)) to determine if the FEIS/Section 4(f) Evaluation and the ROD remain valid.
b. State that the Project will be constructed in a continuous, uninterrupted manner; construction of different segments at different times should be prohibited.	The project will be constructed in the most timely and cost-effective manner possible, depending upon the availability of funding, resources, and the ability to safely maintain traffic operations.
c. Place a limitation on the width of the bridge (excluding separations between elements) to no more than 200 feet, limit the total number of lanes to 12, and prevent any future expansion of the crossing.	Selected Alternative 4A provides for no more than 12 travel lanes as described in Section I of the ROD. While the FHWA is committed to examining options to minimize the width of the project without compromising safety and operations during the final design phase, a limitation on the exact bridge width cannot be made at this time.
d. Limit the number of lanes within Alexandria approaching the crossing to 10 lanes and prevent future expansion of capacity within Alexandria beyond 10 lanes. Maximum width of the project within Alexandria should not exceed 250 feet at its widest point.	Approaches to the bridge must be 12 lanes wide to provide lane continuity, ensure safety, and maintain traffic operations throughout the project corridor. While the FHWA is committed to examining options to minimize the width of the project without compromising safety and operations during the final design phase, a limitation on the exact width of the bridge approaches cannot be made at this time.
e. Prohibit the northern footprint of the project from encroaching any farther north than the existing Beltway.	Selected Alternative 4A will be designed within the existing right-of-way where possible. Although additional right-of-way is expected to be required, Selected Alternative 4A was developed to strike a balance between impacts on local community and sensitive environmental resources.

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Commentor/Comment(s)	FHWA Response
f. State that every effort will be made to minimize the footprint of the improved US 1 interchange and takings from Lee Recreation Center should be avoided, if possible. Decisions on the final design of the US 1 interchange shall be made in consultation with community residents and members of the designated Local Working Group (see item "m" below).	The FHWA is committed to examining options to minimize the width of the project, including the interchanges, without compromising safety and operations during the final design phase. In particular, the proposed design of the US 1 interchange will be carefully examined due to community concerns. Opportunities for additional public involvement will be provided during the design phase. Measures to minimize or avoid impacts to the Lee Recreation Center were outlined in the FEIS/Section 4(f) Evaluation and are included in Section III of the ROD.
g. State the HOV/express bus/transit lanes are to be used exclusively for high-occupancy or transit vehicles and will not be converted to general use lanes in the future.	Selected Alternative 4A, as described in Section I of the ROD includes two dedicated HOV/express bus/transit lanes (one in each direction).
h. Stipulate that if tolls are necessary, no toll facilities will be constructed in Virginia.	Comment addressed in the FEIS. See response to Comment 12 (page G-446) from the City's September 12, 1996 letter.
i. State that the design and construction of the urban deck will be in accordance with the City of Alexandria plans, be consistent with architectural character of the George Washington Memorial Parkway, an include historically-appropriate signage and lighting the Washington Street approaches. Further, the ROD should stipulate that the City will determine the future use of the deck and any facilities to be constructed, that special measures will be taken to reduce air quality and noise impacts at the ends of the "deck tunnel" and monitor future levels of air pollution and noise, and provide the City an easement for maintenance of the deck.	The ROD includes provisions for future coordination with the City, as well as the National Park Service and the National Capital Planning Commission, on the design of the urban deck (see Attachment 2). Although no adverse impacts are anticipated, measures to further minimize air and/or noise emissions from the urban deck will be considered during final design. The FHWA does not intend to implement an air or noise monitoring program in the vicinity of the urban deck. There is an existing air quality monitoring station located in the City in accordance with the US Environmental Protection Agency's (EPA) guidelines. If the City of Alexandria desires, they may request the EPA to establish an additional monitoring station closer to the project area.
j. Confirm that the Telegraph Road interchange improvements will provide direct access to Stovall Street.	Access to Stovall Street is included in Selected Alternative 4A as described in Section 2.2 of the FEIS/Section 4(f) Evaluation.
k. Provide direct access in both directions to Eisenhower Avenue as part of the proposed project.	As described in Section 2.2 of the FEIS/Section 4(f) Evaluation, improvements to the Telegraph Road interchange will provide westbound access to/from the Eisenhower Valley via Stovall Street. As described in Section I of the ROD, although eastbound access was included as part of Selected Alternative 4A, a final decision on whether the necessary interchange modifications are to be constructed will be made during the final design phase.
l. State that the Church Street ramp will be closed and that traffic bound for the George Washington Memorial Parkway will be routed via US 1 and Franklin or Gibbon Street.	As outlined in Section I of the ROD, the decision whether or not to retain the Church Street exit will be made during the final design phase.

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WOODROW WILSON BRIDGE IMPROVEMENT STUDY
SUMMARY OF COMMENTS

SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	*FHWA Response*
m. Provide for the establishment of a Virginia-based "Local Working Group" of municipal officials, citizens, and business interests which meet periodically to review project plans, provide a forum for transmitting community concerns to FHWA, and develop detailed mitigation plans.	A public involvement program which will provide opportunities for review and input is planned for the final design phase. The FHWA, in cooperation with the General Engineering Consultant, will be developing and implementing this public involvement program.
n. Require the preparation of a Construction Impact Mitigation Plan to address construction impacts on the City, including: "protection zones around known historic and archaeological sites (including sites in Jones Point Park), installation of noise barriers at the earliest possible time, prohibition of truck traffic on residential streets, maintenance of access to Jones Point Lighthouse, and maintenance of City parking spaces within Jones Point Park. Construction Impact Mitigation Plan should be developed in consultation with the recommended Local Working Group.	The FHWA does not intend to prepare a Construction Impact Mitigation Plan for this project. Measures to avoid impact or minimize harm during the construction period are included in this ROD (see Attachment 2). Additional measures are outlined in the Section 106 Memorandum of Agreement and the Section 4(f) Evaluation. Early implementation of planned mitigation measures, such as noise barriers, will be achieved where possible. Other recommended mitigation measures, such as the prohibition of truck traffic on local streets, are outside the authority of the FHWA.
o. Confirm that mitigation measures planned for Lee Recreation Center and that all possible avoidance options will be considered during final design.	Measures to minimize or avoid impacts to the Lee Recreation Center were outlined in the FEIS/Section 4(f) Evaluation and are included in Section III of the ROD.
p. Require that prior to any disturbance of Washington Street in the vicinity of the Freedmen's (Contraband) Cemetery, remote sensing should be undertaken to determine the extent of burials in that portion of the street to be disturbed. Further, the ROD should specify that the FHWA will acquire the Mobil Oil gas station on the site of the cemetery and the parcel immediately to the west and then develop these lands into a public "gateway" park for the Alexandria Historic District which would be conveyed to the City following the completion of the project.	The replacement bridge for Washington Street over the Capital Beltway included in Selected Alternative 4A has been redesigned to avoid impacts to the Freedmen's (Contraband) Cemetery. The new bridge will be constructed in place (two lanes at a time) within the existing right-of-way rather than using a temporary bridge along the western edge of Washington Street. Because, no subsurface disturbance will occur on Washington Street or the Mobil gas station property, the FHWA does not intend to purchase the gas station or the adjacent property. However, the FHWA encourages the City of Alexandria to make use of the extensive research on the Freedmen's Cemetery site conducted as part of the Woodrow Wilson Bridge Improvement Study to determine how best to interpret or memorialize the site.
q. State that the mitigation plan in the FEIS for Jones Point Park is preliminary and will be finalized during final design in consultation with the City of Alexandria, the National Park Service and the recommended Local Working Group. Further, specific mitigation measures should be expanded to include: landscaping and bulkhead/shoreline improvements along the entire park perimeter, development and implementation of an interpretive center and program for the park's history, clean-up and restoration of the Old Town Yacht Basin (to address temporary access impacts), maintenance of City employee parking, and maintenance of garden plots within the park.	The final mitigation plan for Jones Point Park, developed in consultation with the National Park Service and City of Alexandria, will include the elements outlined in Section III of the ROD: park improvements, shoreline improvements under the new bridges and near the District of Columbia cornerstone, and historic preservation or interpretation enhancements. Both the existing City employee parking and garden plots will be retained. Other requested improvements are above and beyond reasonable mitigation measures or are not related to the project's impacts on park resources.

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Commentor/Comment(s)	*FHWA Response*
r. Provide for the monitoring of air quality in the City of Alexandria before, during and after construction of the project, and require mitigation of conditions which exceed the pre-construction baseline; this monitoring should continue for period of 10 years following completion of the project. Also, the Construction Impact Mitigation Plan recommended by the City should specifically address air quality impacts from construction activities.	The FHWA does not intend to conduct air quality monitoring in the project area following construction. There is an existing air quality monitoring station located in the City in accordance with the US Environmental Protection Agency's (EPA) guidelines. If the City of Alexandria desires, they may request the EPA to establish an additional monitoring station closer to the project area.
s. Provide for the monitoring of noise levels in the City of Alexandria before, during and after construction of the project, and require mitigation of conditions which exceed the pre-construction baseline; this monitoring should continue for period of 10 years following completion of the project. Also, the Construction Impact Mitigation Plan recommended by the City should specifically address noise impacts from construction activities. Further, the ROD should state that the most stringent and protective noise impact criteria be used in determining the need for noise abatement, that the hours of construction activity follow the Alexandria City Code, and that materials to reduce noise be used in that portion of the project with the City of Alexandria.	During the final design phase, the FHWA will prepare a construction noise study to analyze the potential noise impacts of specific construction activities. The results of this study, as well as the City's noise ordinance, will be used to develop noise guidelines and mitigation measures for construction activities. The FHWA does not intend to monitor noise in the project area following construction.
• Analysis of project's impacts on the historic and archaeological resources of the City of Alexandria is deficient and inadequate.	A Memorandum of Agreement between the FHWA, the National Park Service, the Advisory Council on Historic Preservation, and the District of Columbia, Maryland and Virginia State Historic Preservation Officers which outlines mitigation measures for impacts to historic and archaeological resources was fully executed on November 5, 1997. By carrying out the terms of this Agreement, the FHWA will fulfill its responsibilities under Section 106 of the National Historic Preservation Act and the Advisory Council's regulations (36 CFR 800).
City of Alexandria – Sanitation Authority (10/20/97)	
• Existing City of Alexandria sewer pipes may be affected by the proposed project; requested that precautions be taken to avoid service interruptions during construction.	The FHWA will forward the information provided to the project's General Engineering Consultant (GEC). The GEC will be responsible for future coordination with local utilities.
Fairfax County Office of Transportation (10/9/97)	
• Encouraged timely implementation of Preferred Alternative 4A.	Comment noted.
Fairfax County Wetlands Board (10/17/97)	
• Requested that the FHWA adopt a final mitigation plan to replace Fairfax County and Virginia wetland losses in those jurisdictions.	Comment addressed in the FEIS. As outlined in the Aquatic Resources Conceptual Mitigation Plan included as Appendix of the FEIS/Section 4(f) Evaluation , every effort has been made to replace wetland losses in the state where they would occur. A final mitigation plan will be developed as part of the permitting process.

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SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	***FHWA Response***
WORK GROUPS	
Interchanges Work Group (10/17/97)	
• Work Group testimony and comments should have been presented in their entirety, rather than summarized with other public comments.	Comment discussed in Section VI of the ROD.
INTEREST GROUPS, CIVIC ASSOCIATIONS & ADVOCACY ORGANIZATIONS	
Alexandria League of Women Voters (10/20/97)	
• Responses to public comments not provided until FEIS; the FHWA has not engaged in a productive dialogue with the public.	Comment addressed in the FEIS. See responses to Public Comment 12 on the 1991 DEIS (page G-127), Public Comments 14 to 16 on the January 1996 SDEIS (page G-327), and Public Comment 5 on the July 1996 SDEIS (page G-512).
• Identification of historic and archaeological resources and assessment of impacts is incomplete.	The identification of cultural resources has been completed as discussed in Section VI of the ROD.
• Opposed to 12-lane bridge replacement; other alternatives not given adequate consideration.	Comment addressed in the FEIS. See responses to Public Comments 38, 39, and 40 on the 1991 DEIS (pages G-135 to G-137), Public Comments 56 to 63 on the January 1996 SDEIS (pages G-338 to G-340), and Public Comments 36, 37, 39, 42, 43, and 44 on the July 1996 SDEIS (page G-519 to G-522).
Citizens for the Southern Alignment Bridge (10/15/97)	
• Objected to the summarization of public comments and responses in FEIS. Felt that individual public comments were interpreted and synthesized by FHWA, thereby distorting their content and minimizing their importance. Suggested that all public comments should be addressed on a point-by-point basis.	Comment discussed in Section VI of the ROD.
• Not satisfied with specific responses to comments; believes that responses were vague, general and dismissive.	Comment discussed in Section VI of the ROD.
• Selection of Preferred Alternative 4A was made before FHWA responded to public comments on the 1991 DEIS, January 1996 SDEIS, and July 1996 SDEIS.	Comment discussed in Section VI of the ROD.
• Negative impacts of the project will disproportionately affect Alexandria and many community concerns have not yet been addressed (e.g., 10-lane bridge proposals, impacts to historic/archaeological resources, Church Street exit).	Comment addressed in the FEIS/Section 4(f) Evaluation. See responses to Public Comments 205 and 206 on the January 1996 SDEIS (page G-374), and Public Comments 2 and 127 on the July 1996 SDEIS (pages G-511 and G-544).

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Commentor/Comment(s)	*FHWA Response*
• Revised assessment of noise impacts understates the number of housing units affected by Preferred Alternative 4A and provides an inaccurate comparison with other alternatives.	A revised noise assessment was conducted as a result of public comment. As outlined in Section 4.5 of the FEIS, this revised assessment was completed for all alternatives to provide an accurate comparison.
• Wetland impacts for Alternative 5 were grossly overstated in the January 1996 SDEIS; detailed wetlands information available for Preferred Alternative 4A should have been used in evaluating all of the bridge replacement alternatives.	Comment addressed in the FEIS/Section 4(f) Evaluation. A discussion of wetland impact assessment techniques is provided in Section IV of the Aquatic Resources Conceptual Mitigation Plan (Appendix A); this issue is also addressed in the response to Public Comment 175 on the January 1996 SDEIS (page G-367).
• FEIS is incomplete and that NEPA requirements have not been satisfied.	The FEIS/Section 4(f) Evaluation complies with the National Environmental Policy Act (NEPA), the Council of Environmental Quality's regulations on NEPA (40 CFR 1500, et. seq.), and the FHWA's environmental regulations (23 CFR 771). It has been determined to be legally sufficient by the FHWA.
Andrea Ferster, Counsel for the Alexandria Historical Restoration and Preservation Commission, Friends of Jones Point, Historic Alexandria Foundation, Old Town Civic Association, Old Town/Hunting Creek Civic Association, and Yates Gardens Citizens Association (10/20/97)	
• Section 4(f) Evaluation is fatally flawed because it fails to give adequate consideration to narrower, non-separated bridge replacement alternatives (i.e., 10-lane options) as a means of minimizing harm to the Alexandria Historic District and other Section 4(f) protected resources.	Measures to minimize harm to Section 4(f) resources were discussed in Section D.5 of the FEIS/4(f) Evaluation and are addressed in Section IV of the ROD.
• FEIS is inadequate under NEPA because it fails to take the required "hard look" at the impacts of alternatives to Preferred Alternative 4A.	The FEIS/Section 4(f) Evaluation complies with the National Environmental Policy Act (NEPA), the Council of Environmental Quality's regulations on NEPA (40 CFR 1500, et. seq.), and the FHWA's environmental regulations (23 CFR 771). It has been determined to be legally sufficient by the FHWA. The FEIS/Section 4(f) Evaluation assesses the potential impacts from all candidate build alternatives included in January 1996 and July 1996 SDEIS/Section 4(f) Evaluations (see Chapter 4).
• FEIS/Section 4(f) Evaluation fails to evaluate the full range of impacts on Section 4(f) properties that may be directly affected by the Preferred Alternative 4A because identification of historic properties has not been completed.	The identification of cultural resources has been completed as discussed in Section VI of the ROD.

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SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	***FHWA Response***
• FEIS/Section 4(f) Evaluation fails to acknowledge indirect impacts (i.e., traffic) on Section 4(f) properties from Preferred Alternative 4A.	Extensive analysis of traffic impacts in the City of Alexandria from Selected Alternative 4A was conducted and reported in the FEIS/Section 4(f) Evaluation (see Section 4.2.3); additional analysis of the traffic impacts on cultural resources was included in Section 4.8.1 of the FEIS. The FHWA concluded that traffic conditions within the City would be no worse with any of the build alternatives than under the No-Build scenario. Because the Section 4(f) Evaluation only addressed impacts and there are no adverse traffic impacts in Alexandria from Selected Alternative 4A, they are not discussed in the 4(f) Evaluation.
• Construction of 12-lane bridge which includes HOV lanes lacks "independent utility" because there are no HOV lanes on the roadway on both sides of the crossing, nor are there approved plans to add such capacity.	Comment addressed in the FEIS/Section 4(f) Evaluation. See responses to Public Comments 113, 116, and 119 on the January 1996 SDEIS (pages G-352 to G-353), and Public Comment 86 on the July 1996 SDEIS (page G-534). Additional information on this issue was also provided in Section 2.3.5 of the FEIS.
• Safety considerations are not a sufficient basis for rejecting non-separated alternatives which could reduce the footprint of the bridge and associated interchanges. Reduced cross-sections are appropriate in "constrained" environments.	The need for a separated roadway section and the selection of an "express/local" system was discussed in the FEIS/Section 4(f) Evaluation (see Sections 2.2 and 2.3.6).
Friends of Jones Point (10/7/97)	
• Objected to the summarization of public comments and responses in FEIS. Felt that individual public comments were interpreted and synthesized by FHWA, thereby distorting their content and minimizing their importance. Suggested that all public comments should be addressed on a point-by-point basis.	Comment discussed in Section VI of the ROD.
• Work Group testimony and comments should have been presented in their entirety, rather than summarized with other public comments.	Comment discussed in Section VI of the ROD.
• Not satisfied with specific responses to comments; believes that responses did not address stated concerns.	Comment discussed in Section VI of the ROD.
• Identification of historic resources in the project area and assessment of impacts is not complete.	The identification of cultural resources has been completed as discussed in Section VI of the ROD.
• Full range of alternatives have not been evaluated as required by CEQ and NEPA regulations.	Comment addressed in the FEIS. See responses to Public Comments 205 and 206 on the 1991 DEIS (pages G-125 to G-126) and Public Comment 3 on the January 1996 SDEIS (page G-323).
• An alternative which complies with Section 4(f) requirements has not been developed.	Comment addressed in the FEIS. See responses to Comments 42 through 47 (pages G-486 to G-488) from the City of Alexandria's September 12, 1996 letter on the July 1996 SDEIS.

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SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	*FHWA Response*
• Opposed to Preferred Alternative 4A ; would prefer (in order): 8-lane bridge or tunnel, 10-lane bridge, and unspecified alternative which would route I-95 away from Alexandria.	Comment addressed in the FEIS. See responses to Public Comments 38,39, 40, and 61 on the 1991 DEIS (pages G-135 to 136 and G-140), Public Comments 58, 60, 61, 62, 73, and 94 on the January 1996 SDEIS (pages G-339 to 340, G-342, and G-347, respectively), and Public Comments 37,42,43,44, 56, and 69 on the July 1996 SDEIS (page G-521 to 523, G-252, and G-528, respectively).
National Trust for Historic Preservation (10/20/97)	
• Section 4(f) determination cannot be made until identification of historic properties is completed.	The identification of cultural resources has been completed as discussed in Section VI of the ROD.
• Contends that the FHWA did not comply with the Section 4(f) requirement to use "all possible planning to minimize harm" to historic sites. No evidence of any effort to narrow the footprint of the proposed roadway through the Alexandria Historic District.	Measures to minimize harm to Section 4(f) resources were discussed in Section D.5 of the FEIS/4(f) Evaluation and are addressed in Section IV of the ROD.
• FEIS and Section 4(f) Evaluation does not consider the indirect and cumulative effects of increased traffic within the Alexandria Historic District; comprehensive study should be conducted to document "before and after" traffic conditions.	Extensive analysis of traffic impacts in the City of Alexandria from Selected Alternative 4A was conducted and reported in the FEIS/Section 4(f) Evaluation (see Section 4.2.3); additional analysis of the traffic impacts on cultural resources was included in Section 4.8.1 of the FEIS. The FHWA concluded that traffic conditions within the City would be no worse with any of the build alternatives than under the No-Build scenario. Because the Section 4(f) Evaluation only addressed impacts and there are no adverse traffic impacts in Alexandria from Selected Alternative 4A, they are not discussed in the 4(f) Evaluation.
Old Town/Hunting Creek Civic Association (10/18/97)	
• Public input on the project was not sought by the FHWA; limited information provided to residents of Alexandria affected by the project.	Comment addressed in the FEIS/Section 4(f) Evaluation. See responses to Public Comment 12 on the 1991 DEIS (page G-127), Public Comments 14 to 16 on the January 1996 SDEIS (page G-327), and Public Comment 5 on the July 1996 SDEIS (page G-512).
• FEIS did not adequately consider reasonable and feasible alternatives to Preferred Alternative 4A (e.g., 10-lane option, Alternative 5).	Comment addressed in the FEIS. See responses to Public Comments 38, 39, and 40 on the 1991 DEIS (pages G-135 to 137), Public Comments 56 to 63 on the January 1996 SDEIS (pages G-338 to 340), and Public Comments 36, 37, 39, 42, 43, and 44 on the July 1996 SDEIS (page G-519 to 522).
• Preferred Alternative 4A was chosen in September 1996 without critical information required by various environmental laws (e.g., Section 106 of NHPA and Section 4(f) of DOT Act)	Information on impacts to 4(f) and Section 106 resources needed to identify a preferred alternative was made available to the Coordination Committee prior to their decision. Since that time, additional coordination and evaluation of impacts has been conducted to determine the appropriate mitigation measures to be included in the FEIS/Section 4(f) Evaluation, the MOA, and the ROD.

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SUMMARY OF COMMENTS ON THE FINAL ENVIRONMENTAL IMPACT STATEMENT/4(f) EVALUATION (AUGUST 1997)

Commentor/Comment(s)	*FHWA Response*
• Scope of project has not changed since initiation of the environmental review process; only 12-lane alternatives were given serious consideration.	Comment addressed in the FEIS. See responses to Public Comments 38, 39, and 40 on the 1991 DEIS (pages G-135 to 137), Public Comments 56 to 63 on the January 1996 SDEIS (pages G-338 to 340), and Public Comments 36,37,39,42,43, and 44 on the July 1996 SDEIS (page G-519-522).
Yates Gardens Citizens Association (10/20/97)	
• Concerned about noise pollution and effects on community. FHWA did not take noise measurements or estimate impacts at the Yates Gardens community. Deleterious effects of noise on public health not addressed in FEIS.	Comment discussed in Section VI of the ROD.
• Increased lighting for new roadway (and urban deck) will permanently alter the visual environment.	The location and type of lighting to be provided as part of Selected Alternative 4A will be determined during final design. Any decisions about urban deck lighting will be made in consultation with the City of Alexandria, National Park Service, and the National Capital Planning Commission as specified in the Commitments/Considerations list included in the ROD (see Attachment 2).
• FHWA has not adequately assessed the level of noise pollution that will be created by the urban deck.	Comment discussed in Section VI of the ROD.
• FEIS does not discuss "state of the art" mitigation measures for noise impacts such as road surfacing materials which cut traffic noise.	Comment discussed in Section VI of the ROD.
• Activity category for Yates Garden area used in FHWA's Noise Assessment Criteria should be changed from Category B to Category A.	Comment discussed in Section VI of the ROD.
CITIZENS	
Ellen Pickering (10/20/97)	
• Supports construction of Alternative 5 (Southern Alignment High Bridge).	Comment addressed in the FEIS/Section 4(f) Evaluation. See responses to Public Comment 38 on the January 1996 SDEIS (page G-333) and Public Comment 20 on the July 1996 SDEIS (page G-516).

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Commentor/Comment(s)	*FHWA Response*
E.L. Tennyson	
• Analysis of transit alternatives presented in the FEIS was inaccurate and distorted the findings of the Transit Work Group.	Comment addressed in the FEIS/Section 4(f) Evaluation. See responses to Public Comment 123, 127, 131, and 133 on the January 1996 SDEIS (pages G-354 to G-358) and Public Comment 89, 91, and 150 on the July 1996 SDEIS (pages G-534 to G-535 and G-549).
• Responses to agency and public comments on transit issues should be clarified or corrected.	Comment discussed in Section VI of the ROD.

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Appendix E

Memorandum of Agreement Progress Reports

Memorandum of Agreement Progress Reports

The Federal Highway Administration (FHWA), in conjunction with the Advisory Council on Historic Preservation (ACHP), the National Park Service (NPS), and the State Historic Preservation Officers (SHPOs) in the District of Columbia, Maryland and Virginia, prepared a Section 106 Memorandum of Agreement (MOA) pursuant to the requirements outlined in 36 CFR Part 800.5(e)(4). This MOA represents the results of extensive consultation between the FHWA, the ACHP, the NPS, the respective SHPOs, the D.C. Department of Public Works, the Maryland State Highway Administration, the Virginia Department of Transportation, the Maryland-National Capital Park and Planning Commission, the Prince George's County Government, the City of Alexandria, Virginia, the Alexandria Historical Restoration and Preservation Commission, the Daughters of the American Revolution, the Friends of Jones Point Park, the Historic Alexandria Foundation, the Old Town Civic Association, the Old Town/Hunting Creek Civic Association, the Yates Garden Civic Association, all in Alexandria, Virginia; the National Trust for Historic Preservation; and the U.S. Army Directorate of Public Works–Fort Belvoir on cultural resource issues associated with the Woodrow Wilson Bridge Project. These agencies and interested civic organizations assisted in drafting the MOA and provided numerous suggestions, which were incorporated into the MOA language. The MOA substantially addresses comments and concerns identified during the Section 106 consultation process.

The MOA identifies cultural resources with Adverse Effects from Selected Alternative 4A, and includes stipulations for treatment that will avoid, reduce, or mitigate these effects. The MOA also provides for future consultation in those cases where determinations of effect could not be made at the time. The MOA stipulates that further consultation will occur when the project (especially the bridge) design has sufficiently evolved, and that additional cultural resource investigations will be undertaken as appropriate. Treatment measures may include design changes to avoid or lessen impacts, data recovery, educational or interpretive programs about the significance or preservation of cultural resources, public displays, and/or other measures as detailed in the MOA.

The MOA was submitted to the ACHP, NPS, the respective SHPOs, concurring parties, and consulting parties for a 30-day review period beginning on August 20, 1997. The final, signed MOA was included with the Record of Decision (ROD) for this project signed November 25, 1997. As stipulated in the MOA, after the Record of Decision is issued, the FHWA continued on-going coordination on cultural resource issues with the appropriate Federal and State agencies, as well as local governments, through the completion of the Section 106 process.

Since publication of the FEIS/Section 4(f) Evaluation for this project in September 1997, the FHWA's historic preservation responsibilities under Section 106 of the National Historic Preservation Act have been fulfilled through execution of the MOA in October 1997. This MOA was signed by officials of FHWA, the NPS, the ACHP, the SHPOs of Maryland, Virginia and the District of Columbia, as well as representatives of a number of concurring parties, including the Maryland State Highway Administration, the Virginia Department of Transportation, the City of Alexandria, the Maryland-National Capital Park and Planning Commission, Prince George's County, and the Mount Vernon Chapter of the Daughters of the American Revolution. Execution and implementation of this MOA is evidence that FHWA has afforded the ACHP an opportunity to comment on the Woodrow Wilson Bridge Project and its effects on historic properties, and that the FHWA has taken into account the effects of this undertaking on historic properties. A copy of the MOA is included in Appendix D, as Attachment 1 of the 1997 Record of Decision.

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Since the execution of the MOA, the FHWA has proceeded to implement stipulations of the MOA. Stipulation I, development of the *Historic Resources Identification and Evaluation Report, Alexandria, Virginia* has been completed. Stipulation II on the Project Design and Review is on-going, involving review and consultation with the Project's Design Review Working Group. FHWA is also continuing to implement the remaining stipulations of the MOA, which address such issues as the identification, evaluation and treatment of archaeological resources; treatment of historic architectural resources; unanticipated discoveries of archaeological resources; and additional historic properties to considered. Specific actions taken in the implementation of the MOA stipulations have been detailed in bi-annual progress reports developed by FHWA and submitted to the parties to the MOA. These progress reports were generated pursuant to Stipulation XI A of the MOA. Copies of all of the progress reports generated to date are included in this appendix.

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PROGRESS REPORT NO. 2

WOODROW WILSON BRIDGE REPLACEMENT PROJECT

PURSUANT TO STIPULATION IX.A

Of The

MEMORANDUM OF AGREEMENT

Prepared by:

Federal Highway Administration, Region 3
10 South Howard Street
Suite 4000
Baltimore, Maryland 21201

November 1998

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Woodrow Wilson Bridge Replacement Project
Stipulation IX.A – Project Progress Report 2
November 1998

During the second six (6) month period following the execution of the Memorandum of Agreement (MOA) for the Woodrow Wilson Bridge Replacement Project, the following steps were initiated and completed by the Federal Highway Administration (FHWA):

- ✓ The Design Review Working Group (DRWG) met with the Section Design Consultants (SDCs) to review the general design goals for the project, before actual design work began (Stipulation II, B of the MOA).

- ✓ The *Historic Resource Identification and Evaluation Report* on the Alexandria Historic District was finalized. The DRWG used the findings of the report in its introductory meetings with the individual section design consultants. The report was transmitted to the SDCs responsible for project elements in Alexandria so the report's findings could be taken into consideration during the development of design plans (Stipulation II, A of the MOA).

- ✓ At the September 14, 1998 meeting of the DRWG, it was determined that further definition of the boundaries of the Freedman's Cemetery (44AX179) in Alexandria, Virginia was necessary. Previous geophysical investigations of the cemetery examined only the eastern portions of the property, as access was denied to areas west of the Mobile Gas Station, located at the corner of Washington Street and Columbus Street. Identification of potential impacts to the are required as part of the design analysis of the Church Street exit associated with the preferred alternative. A scope of work for this additional geophysical survey was developed and submitted to the Virginia Department of Historic Resources (VDHR) and the City of Alexandria, pursuant to Stipulation III A of the MOA.

Steps to be initiated, continued, or completed in the next two six month period will be as follows:

NOVEMBER 1998 TO APRIL 1999

- ➡ The additional geophysical survey of the Freedman's cemetery will be conducted, and a report on the work will be submitted to the VDHR and the City of Alexandria for review and approval. Once approved, the report will be made available to the Design Review Working Group and the Virginia SDCs.

- ➡ The first design plan submittal to the DRWG (at the completion of preliminary design - 30 percent), will take place within this six month period. This submittal is anticipated for the Virginia Interchanges (Telegraph Road and Route 1) (Stipulation II, B of the MOA). FHWA will determine, in consultation with the VDHR and concurring parties, areas that may need to be subjected to an identification and/or evaluation archaeological survey(s), based on the preliminary design submittals (Stipulation III, A and B).

- ➡ A design plan submittal to the DRWG (completion of preliminary design), will take

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place within this six month period. This submittal would be for the Maryland Interchanges (I-295 and MD 210) (Stipulation II, B of the MOA). FHWA will determine, in consultation with the MHT and concurring parties, any areas subject to archaeological identification and/or evaluation or historic architectural survey(s), based on the preliminary design submittals (Stipulation III, A and B).

- ➡ FHWA will develop a scope of work for conducting an identification archaeological survey and historic architectural inventory of four proposed wetland creation sites in Maryland (Stipulation III, A and B). The scope of work will be submitted to the Maryland Historical Trust (MHT) for review. Once approved, the survey and inventory will be performed, and a report on this work will be submitted to the MHT for review.

- ➡ FHWA will begin development of conceptual treatment plans for the following historic resources: Alexandria Historic District, Jones Point Park (and Jones Point Park Lighthouse and District of Columbia South Cornerstone), and Mount Vernon Memorial Highway (Stipulation IV, A, B, and C). Work will also begin on the conceptual plans for the Maryland resources: Oxon Hill Manor, Fort Washington, Hard Bargain Farm, Longview, Oxon Cove Farm, and the Butler House (Stipulation IV, D), and

- ➡ Any other activities not currently identified.

MAY 1999 TO OCTOBER 1999

- ➢ FHWA will finalize the conceptual treatment plans for resources in Virginia as follows: Alexandria Historic District, Jones Point Park (and Jones Point Park Lighthouse and District of Columbia South Cornerstone). The FHWA will also finalize conceptual treatments for Maryland historic resources as follows: Mount Vernon Memorial Highway (Stipulation IV, A, B, and C); and Oxon Hill Manor, Fort Washington, Hard Bargain Farm, Longview, Oxon Cove Farm, and the Butler House (Stipulation IV, D).

- ➢ Any other activities not currently identified.

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PROGRESS REPORT NUMBER 3

WOODROW WILSON BRIDGE PROJECT

PURSUANT TO STIPULATION IX.A

OF THE

MEMORANDUM OF AGREEMENT

Prepared by

Federal Highway Administration, Region 3
Woodrow Wilson Bridge Project Office
1800 Duke Street, Suite 200
Alexandria, Virginia 22314

May 1999

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During the third six (6) month period following the execution of the Memorandum of Agreement (MOA) for the Woodrow Wilson Bridge Project, the following steps were initiated and completed by the Federal Highway Administration (FHWA):

- ✓ Parkland and recreational resource design plans (10%) were presented to the Design Review Working Group (DRWG) on March 29, 1999. The DRWG approved the design plans.

- ✓ The Maryland Interchange Line and Grade Submittal (10%) was presented to the DRWG for review.

- ✓ Completed additional geophysical survey of VDOT property within the potential boundaries of the Freedman's Cemetery in Alexandria, Virginia. Developed scope of work for initial archaeological testing of Cemetery in order to determine site's soil stratigraphy before stripping of portions of site to define Cemetery limits. Subsequently, completed initial archaeological testing effort within investigation area. Located six (6) possible graves in western portion of property and two (2) possible graves in the southeastern corner of VDOT's property (in the vicinity of the Mobile station and Washington Street).

- ✓ FHWA completed a scope of work for conducting an identification archaeological survey and historic architectural inventory of two proposed wetland creation sites in Maryland (Stipulation III, A and B). The scope of work has been submitted to the Maryland Historical Trust (MHT) for review. Once approved, the survey and inventory will be performed, and a report on this work will be submitted to the MHT for review.

- ✓ Developing scopes of work for archaeological and historic architectural investigations of Virginia wetland creation sites, and additional Maryland sites, in addition to scopes for proposed fish passage improvement sites along Rock Creek, Sligo Creek, and North Branch, in Maryland and Washington, D.C.

- ✓ Developing scopes of work for archaeological investigations at two (2) underwater sites located in the Potomac River.

- ✓ Developing scopes of work for investigations at the following resources:
  - ➡ Historic Structure Report of Jones Point Lighthouse,
  - ➡ Condition Report for D.C. Cornerstone,
  - ➡ Treatment Plans for Lighthouse, Cornerstone, Virginia Shipbuilding Corporation site, and
  - ➡ Effects Evaluation Report for removal of blockages for fish within Rock Creek Park.

Steps to be initiated, continued, or completed in the next two six month period will be as follows:

MAY, 1999 TO OCTOBER, 1999

- ✓ The thirty (30) percent preliminary design plan submittal to the DRWG will take place within this six

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month period. This submittal would be for the Virginia and Maryland interchanges. FHWA will determine, in consultation with the VDHR, MHT and concurring parties, areas that may need to be subjected to an identification and/or evaluation archaeological survey(s), based on the preliminary design submittals (Stipulation III, A and B).

✓ Conduct the identification archaeological survey and historic architectural inventory of two proposed wetland creation sites in Maryland (Stipulation III, A and B).

✓ Complete the archaeological investigations of the Freedman's Cemetery, defining the Cemetery boundaries within VDOT property.

✓ Initiate investigations to recommend eligibility of Hunting Terrace.

✓ Complete scoping efforts and initiate archaeological and historic architectural investigations of Virginia wetland creation sites, and additional Maryland sites, in addition to scopes for proposed fish passage improvement sites along Rock Creek, Sligo Creek, and North Branch, in Maryland and Washington, D.C.

✓ Complete scoping efforts and initiate archaeological investigations at two (2) underwater sites located in the Potomac River.

✓ Complete scoping efforts and initiate the following investigations:
- ➡ Historic Structure Report of Jones Point Lighthouse,
- ➡ Condition Report for D.C. Cornerstone,
- ➡ Treatment Plans for Lighthouse, Cornerstone, Virginia Shipbuilding Corporation site, and
- ➡ Effects Evaluation Report for removal of blockages for fish within Rock Creek Park.

NOVEMBER, 1999 TO APRIL, 2000

✓ Conduct archaeological and historic architectural investigations of Virginia wetland creation sites, and additional Maryland sites, in addition to proposed fish passage improvement sites along Rock Creek, Sligo Creek, and North Branch, in Maryland and Washington, D.C.

✓ Complete development of the following:
- ➡ Historic Structure Report of Jones Point Lighthouse,
- ➡ Condition Report for D.C. Cornerstone,
- ➡ Treatment Plans for Lighthouse, Cornerstone, Virginia Shipbuilding Corporation site, and
- ➡ Effects Evaluation Report for removal of blockages for fish within Rock Creek Park.

✓ Complete recommendation of eligibility determination for Hunting Terrace.

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PROGRESS REPORT NUMBER 4

WOODROW WILSON BRIDGE PROJECT

PURSUANT TO STIPULATION IX.A

OF THE

MEMORANDUM OF AGREEMENT

Prepared by

Federal Highway Administration
Woodrow Wilson Bridge Project Office
1800 Duke Street, Suite 200
Alexandria, Virginia 22314

November 1999

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During the fourth six (6) period following the execution of the Memorandum of Agreement for the Woodrow Wilson Bridge Project, the following steps were initiated and completed by the Federal Highway Administration (FHWA):

✓ The Design Review Working Group (DRWG) reviewed the preliminary design (30% Complete) plans for the two (2) Maryland Interchanges and for the new Woodrow Wilson Bridge. Comments were forwarded to the appropriate Section Design Consultants (SDCs).

✓ Conducted an archaeological identification survey and historic architectural inventory of one proposed wetland creation site in Maryland (Earnshaw Property). Report under review by the Maryland State Highway Administration (MDSHA).

✓ Initiated an archaeological identification survey of revised area of potential effect (APE) within Maryland portion of project. The APE was revised due to project limits extensions and design refinements associated with the Maryland 210 and I-295 interchanges. Results of the investigation will be included within the project's supplemental EIS.

✓ Conducted historic architectural identification and evaluation survey of revised APE within Maryland and Virginia portions of project. APE revised due to changes in the design of the Route 210, I-295, Route 1, and Telegraph Road interchanges. Report submitted to Virginia Department of Historic Resources, Maryland Historical Trust, and Washington, D.C. State Historic Preservation Officer.

✓ Completed and submitted a formal Determination of Eligibility for Hunting Terrace. The Keeper of the National Register determined that this property is not eligible for listing on the National Register.

✓ Initiated archaeological investigations of the Freedman's Cemetery, defining the Cemetery's southern and western boundaries within VDOT property. To date, evidence of approximately forty (40) potential grave shafts have been identified.

✓ Initiated archaeological and historic architectural assessments of proposed fish passage improvement sites along Rock Creek, Anacostia River, and Northwest Branch, Maryland. Coordination on this issue will be completed with the NPS.

✓ Initiated and completed Phase I underwater archaeological surveys within proposed dredge locations adjacent to Bridge and within proposed channel dredge locations within Smoots Cove. Findings of investigation will be included in with the underwater archaeology finding report to be completed in early 2000.

✓ Completed scopes of work which are under review by the appropriate agencies in accordance with the MOA for:
- ➢ Historic Structure Report of Jones Point Lighthouse,
- ➢ Condition Report for D.C. Cornerstone, and
- ➢ Treatment Plans for Lighthouse and Cornerstone. Scopes under agency review.

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Steps to be initiated, continued, or completed in the next two six month period will be as follows:

November, 1999 to April, 2000

- The DRWG will review the preliminary design plans (30% complete) for the two (2) Virginia interchanges.
- The DRWG will review intermediate design plans (65% complete) for the new Woodrow Wilson Bridge.
- Complete archaeological investigations of the Freedman's Cemetery, defining the Cemetery's southern and western boundaries within VDOT property. Complete final report and coordinate approval with the appropriate agencies.
- Conduct and complete Phase II underwater archaeological evaluations of potentially significant targets within the revised APE.
- Conduct and complete archaeological identification and evaluation efforts within all archaeological sites in Jones Point Park, including the Virginia Shipbuilding Company site.
- Conduct and complete Historic American Building Survey documentation of the Virginia Shipbuilding Company Administration Building and the power plant building in Jones Point Park.
- Complete effects evaluation of proposed stream blockage removal program within Rock Creek Park, Washington, D.C.
- Conduct and complete archaeological and historic architectural inventory and evaluations of proposed wetland creation sites and staging sites in Virginia and Maryland, as such sites are identified.

April 2000 to September 2000

- The DRWG will review the intermediate design plans (65% complete) design plans for the two (2) Virginia and Maryland interchanges.
- The DRWG will review the final design plans for the new Woodrow Wilson Bridge.
- Complete treatment plans for all National Register-eligible archaeological sites in Jones Point Park.
- Complete and document the following studies and investigations:
  - Historic Structure Report of Jones Point Lighthouse,
  - Condition Report for D.C. Cornerstone, and
  - Treatment Plans for Lighthouse and Cornerstone.

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Appendix F

Construction Impacts

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Construction Impacts

F.1 Introduction

Identifying and addressing construction impacts of the Woodrow Wilson Bridge Project is important to inform potentially affected resources and parties and to minimize impacts during the construction period. This section describes briefly what has been preliminarily investigated in the identification of potential construction staging areas and possible impacts associated with them. Due to the nature of the unknowns associated with the contractor's role in the construction of the project, the intent is to provide an overview of these potential issues, yet allow the flexibility for the contractors to take full advantage of their opportunities. The Sponsoring Agencies are committed to the development of construction mitigation programs that will involve community and agency input and will minimize, to the extent possible, impacts during the entire construction period.

The construction of the new Woodrow Wilson Bridge and reconstruction of the four interchanges (MD 210 and I-295 in Maryland and US 1 and Telegraph Road in Virginia) will involve varying types, levels and durations of construction related impacts. These activities will temporarily affect natural environmental resources, physical environmental resources, the local community, and the traveling public. Chapter 4 of this document describes environmental impacts that are permanent in nature. This section is intended to provide a description of only those impacts that are expected to occur during construction.

Although construction related impacts are acknowledged to be temporary in nature, the multi-year construction period for this project, the sensitivity of the physical and natural environments nearby and the project's overall complexity necessitates an examination through identification of a more comprehensive and timely description of these impacts. The basis for this discussion is the Current Design Alternative 4A provided in Chapter 2, Section 2.1.3.

The design of the bridge and interchanges included in Current Design Alternative 4A are now at a preliminary stage beyond the conceptual design stage presented in the 1997 FEIS. The following discussion describes the types of construction activities, which may occur, where they might occur, and, generally, how the activities would overlap during the multi-year construction period anticipated for the project. Ultimately, the contractor(s) will determine how construction activities occur, but an estimation of these activities is provided in this section to identify and discuss potential impacts associated with construction activities.

The information provided in this section is based on approximately 20-30 percent complete design status and is subject to change as more detailed engineering is conducted. Again, this report was prepared because the 1997 FEIS was considered to be less than 10 percent design, and the knowledge gained during the refinement process has led to somewhat more detailed information now being available. The discussions concerning construction staging areas and movement of materials over existing roadways and on the Potomac River are subject to further evaluation as the design process continues, and after the actual construction process is underway as individual contractors will require flexibility in developing their own construction staging areas, phasing, access and logistics. Impacts associated with contractor proposals not assessed in this document will be re-evaluated to address NEPA regulations and will be subject to all applicable regulatory approvals and permitting requirements, such as 1997 VDOT Road and Bridge Specifications 107.14 and the Code of Maryland Regulations.

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Finally, successful mitigation of construction related activities involves a close working relationship with the Sponsoring Agencies and affected parties to inform, solicit input and jointly develop cost effective mitigation measures for potential impacts. The implementation of mitigation measures and the monitoring of the measures' success will be an ongoing process throughout construction. Environmental monitoring programs will be instituted based on discussions with the affected parties, weighing of cost implications and consideration of alternative approaches. Approaches to the sequence of operations, scheduling, contractor incentives to minimize impacts, maintenance of traffic, access, excavation, blasting and demolition procedures, dust control, noise control and contractor oversight procedures are measures that may be further developed as part of this cooperative effort as design continues. Innovative approaches and the concept of meeting agreed-upon-criteria or thresholds will be considered rather than simply meeting a set of generic program commitments. This will encourage innovation, yet allow for flexibility for contractors to identify and justify less obtrusive and disruptive methods.

F.2 Purpose

The purpose of this section is to provide a general understanding of the types of construction activities that may be associated with this project and impacts that may occur and to initiate the coordination process with affected parties. The project's well-established stakeholder and public information programs will be utilized to its fullest extent prior to and during construction to:

- provide general information on construction activities to the extent they are known at this time,
- solicit input from affected parties, and
- develop effective minimization and mitigation measures, where feasible.

F.3 Assessment Approach

To the extent possible, an assessment has been developed based on knowledge of Current Design Alternative 4A. While a mitigation plan or series of plans are not able to be developed, an identification of potential mitigation measures from other major construction projects have been identified as a basis upon which further development will take place. Several elements will be under consideration when the mitigation plan or series of plans are developed, such as:

- The design completion of design.
- Contractors are selected.
- Construction methods are determined.
- Greater understanding of impacts and their quantification occurs.
- The project works closely with affected and concerned parties.

F.4 Construction Components/General Phasing Plans

To more fully understand and describe potential construction related impacts at this level of design development, a general sequencing of construction activities by packages or temporal clusters, has been identified. This sequencing is provided to allow for a greater understanding of potentially overlapping activities that would necessarily have greater, or more intensive effects than non-

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overlapping events. As more activities occur simultaneously across the 12-kilometer (7.5-mile) corridor, there will be a commensurate increase in the number of workers and facilities needed to support these activities and workers. Table F.1, found later in this section, identifies construction activity "clusters"; it is not intended as a construction schedule. The actual construction schedule depends on funding availability, the provision for unforeseen events that could delay certain activities, the time to secure permits and other approvals, as well as necessary maintenance of traffic provisions.

At this time, the project schedule proposes completion of all construction activities by late 2006/2007. However, it should be recognized that this end date could be extended in the future due to funding considerations, additional litigation, or other factors. In that case, the impacts would be of the same type described in this document, but they may be less concentrated and dispersed over a longer period.

Any consideration of construction related impacts must begin with an understanding of the types of construction that will occur. Chapter 2 of this document provides a detailed summary of the Current Design Alternative 4A, side-by-side drawbridges, including a bascule span with a total of eight general use lanes, two HOV/express bus/transit lanes and two merging/diverging lanes, known as the 8+2+2 configuration. The interchanges at Telegraph Road, US 1, I-295 and MD 210 are to be reconstructed to facilitate safer traffic flow and improve access. In addition, direct HOV access will be provided between US 1, I-295, MD 210 and the Beltway.

For the proposed project, the existing Woodrow Wilson Bridge and the four interchanges, including connections between these components, will be reconstructed in their entirety. The preliminary plan for sequencing construction at each of the interchanges is to construct each independently from the "outside" to the "inside" as the project progresses. This allows for the fulfillment of an overall project goal: to maintain the existing number of through lanes during the construction period. This requires constructing the new outer loop bridge and mainline Beltway outside the existing alignment, shifting the six-lane, two directional traffic to the new outer loop bridge, then demolishing the existing bridge and constructing the inner sections of the mainline Beltway interchanges and completing the westbound bridge.

A comprehensive listing of the construction components is provided later in this section, but the summary of the current proposed sequence of construction is as follows:

1. Begin construction access, dredging and foundations in Potomac River by Fall, 2000.
2. Begin construction of Woodrow Wilson Bridge (outer loop) superstructure by 2001-2002.
3. Begin I-295, US 1 and MD 210 interchanges by 2001-2002.
4. Begin Telegraph Road interchange by 2002-2003.
5. Complete Woodrow Wilson Bridge outer loop by 2004-2005.
6. Demolish existing Woodrow Wilson Bridge and complete inner loop by 2006-2007.
7. Complete all interchanges by 2006-2007.

The Maryland interchanges may begin earlier than the Virginia interchanges due to ease of right-of-way acquisition in Maryland as compared to the negotiation and relocation process that will occur for the Hunting Towers and Hunting Terrace properties and the number of relocations involved. However, the construction of the US 1 interchange needs to begin approximately the same time as the Maryland interchanges. The levels of construction activity, associated movements of materials

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and workers, as well as potential effects overall, generally follow a bell curve. The middle 2-3 years of construction will experience the greatest activity with preceding years steadily increasing and following years steadily decreasing as the project gears up after contractor notice to proceed and begins to slow down some time after the new outer loop bridge is open to traffic on toward completion of the entire project.

The following table illustrates potential construction "clustering" and describes activities that may occur individually as well as in conjunction with other activities. At the bottom of the table is a preliminary estimate of potential numbers of workers based on total estimated construction costs and the assumption that roughly one-half of the costs will be for labor. Because a detailed construction activity plan can not be developed at this time, the numbers shown can vary greatly, depending on the types of construction contracts, amount of contract in labor costs, and the contractor.

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Cluster A	Cluster B	r F	Cluster G
Woodrow Wilson Bridge: Mobilization Dredging Pile Driving	**Woodrow Wilson Brid** Mobilization Dredging Pile Driving Foundation Construction Substructure Constructio	**ridge:** uction truction ridge	**Woodrow Wilson Bridge:** Superstructure Construction Dredging Paving/Signing and Lighting Demolition of Old Bridge
	I- 295: Mobilization Utility Work & Permits Earthwork and Drainage Pile Driving Foundation Construction	age tion action truction ll Const	**I- 295:** Paving Signing and Lighting Landscaping
	MD 210: Mobilization Utility Work & Permits Earthwork and Drainage Pile Driving Foundation Construction Noise/Retaining Wall Const.	age ction ruction	
	US 1: Demolition of Hunting Towers/other structures Utility Work & Permits Earthwork and Drainage Pile Driving Foundation Construction	its (if required) age ction ruction	**US 1:** Superstructure Construction Paving Signing and Lighting Landscaping
		ments	**Telegraph Road:** Bridge Widening Paving Signing/Lighting/Landscaping
100-150 Potential Workers	**600-900 Potential Workers**	**Workers**	**800-1200 Potential Workers**

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F.5 Staging Areas

Construction staging areas are additional areas where construction related impacts to the environment might occur. Normally at the Environmental Impact Statement stage of a project, actual construction staging areas have not been identified, let alone finalized. This project has taken extraordinary steps to attempt to identify potential staging areas during the planning and design phases. Preliminary staging areas have been identified due to the limited number of potential sites that appear available and include seventeen sites collectively in the District of Columbia, Virginia and Maryland, as documented in the "Final Potential Construction Staging Areas Report December 1999" prepared for the project. It is possible that not all, or even none of these sites will be used. To the greatest extent possible, construction staging will occur in the existing or proposed right-of-way. The seventeen sites are listed in Table F.2, below and are shown in Figure 1.

Table F.2 Construction Staging Areas

Potential Construction Staging Area Site/Land Use	Location
A Commercial	City of Alexandria, Virginia
B Industrial	City of Alexandria, Virginia
C Commercial	City of Alexandria, Virginia
D1 Commercial	City of Alexandria, Virginia
D2 Commercial	City of Alexandria, Virginia
E1 Residential	City of Alexandria, Virginia
E2 Park	City of Alexandria, Virginia
F1 National Park	City of Alexandria, Virginia
F2 National Park	City of Alexandria, Virginia
G1 Commercial	Prince George's County, Maryland
G2 Commercial and Residential	Prince George's County, Maryland
H1 Industrial	Prince George's County, Maryland
H2 Industrial	Prince George's County, Maryland
I Industrial	Prince George's County, Maryland
J Commercial and Park	City of Alexandria, Virginia
K Commercial and Public Park	Prince George's County, Maryland
L Waste Water Treatment Plant	Washington, DC

Some of these sites are separate from the project and others assume usage of lands within the project right-of-way. One of these locations, Jones Point Park, has been identified and evaluated in the Section 4(f) evaluation issued in November 1997 as part of the FEIS. If this site or Queen Anne's Park is used for staging, the use will be temporary, as defined in FHWA's Section 4(f) regulations (23 CFR 771.135) so as not to result in any additional permanent Section 4(f) impacts. If a contractor proposes any other Section 4(f) resource as a potential staging area, it must first be approved by FHWA in accordance with the Section 4(f) regulations and in coordination with the resource owner and appropriate SHPO, if applicable. Archeological investigations will be needed if either Site H-2 or Site K is chosen for construction staging in accordance with the MOA.

As is typical in all highway projects, the contractors investigate and determine their own staging area locations based on their knowledge of the area, potential links to other projects they may be constructing, efficiency of operations and a number of other factors which may be unknown at the current stage of design of this project. Contractors will typically make maximum use of areas

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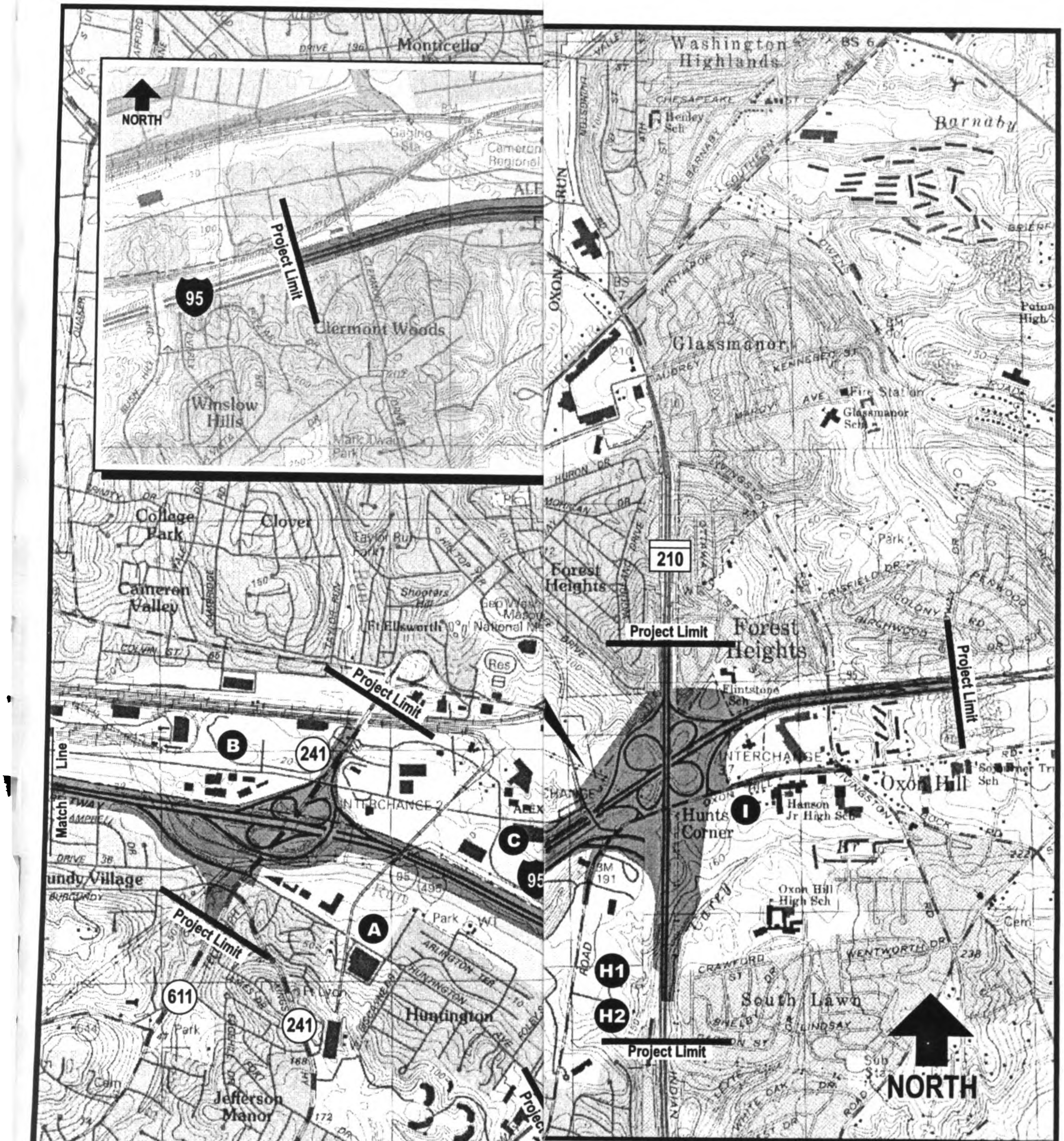

WOODROW WILSON BRIDGE PROJECT

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Potential Construction Staging Sites

Date		Figure
December, 1999	0 1000 2000 Scale in Feet	F-1

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within the existing or proposed right-of-way for a project. The contractor is responsible for obtaining any necessary permits and approvals for use of any other sites. During early stages of the development of this document, the regulatory agencies recommended early identification of potential staging sites due to the limited number available and the sensitivity of nearby resources. The final Potential Construction Staging Area Report was prepared and issued in December 1999 to assess possible staging area locations. Although the exact number and locations of staging sites ultimately used can not be determined at this time, it is possible to provide a summary of the activities that may occur in the construction staging areas. As an example, bridge and highway projects require the storage of sometimes many types of construction materials, including, but not limited to, precast concrete elements, piling, formwork, reinforcing steel, structural steel, gravel and stone, pipe, earthwork and topsoil, deck forms, maintenance of traffic materials (signs, barrels, etc.), and areas for tools and construction equipment maintenance, as well as employee parking and field offices. On site concrete batch plants may be utilized for processing concrete for the bridges and roadway pavements and appurtenances of the overall facility. The concrete batch plants may be land based or floating plants. Associated with either plant would be the handling and storage of the various raw materials.

F.6 Dredging

Due to the knowledge of the type of main bridge that will be constructed, the dredging operation associated with the bridge can be described in summary form at this stage. Dredging is an important element of the project and details are included in Chapter 4 of this document and the joint Federal/State permit application submitted to the US Army Corps of Engineers in November, 1999. Limited to the time period from October 15 to February 15, in any given construction year, the dredging will require the use of a clam shell type machine or mechanical operation on a floating barge to excavate river bottom material and deposit it on a barge for later transfer to one of several land and/or water disposal sites under consideration. At this time, it appears unlikely that solely land-based sites will be used for disposal of dredged material. Due to the use of land based sites, activities would involve triple handling of material barge–to-truck-to-landfill and would likely require substantial removal of water, either prior to, or after final placement. FHWA continues to search for additional upland sites and others may be identified by FHWA or the contractor(s). More information on dredge disposal can be found in Chapter 4 of this document. As with the selection of construction staging areas, FHWA will not approve any dredge disposal site protected under Section 4(f) without conducting a new Section 4(f) evaluation, if called for under the 4(f) regulations.

F.7 Environmental Effects

F.7.1 Affected Environment

The affected environment of the construction of this project will be extended beyond the local natural environment resources and nearby communities. It will also include the private and commercial traveling public both locally and beyond the project area. Preliminary investigation has indicated that there may be larger areas affected due to regional or long-haul trips associated with the construction, mitigation or hauling of materials associated with construction or mitigation.

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F.7.2 Categories of Temporary Construction Period Environmental Effects

Chapter 4 of this document provides a discussion of long-term environmental impacts of the Woodrow Wilson Bridge Project by category and location, such as (but not limited to) wetlands, water resources, energy and others. The following discussion of short-term construction related impacts is also provided by category, but is limited to those major categories where construction impacts are likely to be of greatest concern for this project. Specific locations of these impacts are not yet quantifiable, but general locations where these impacts are likely to occur are identified to inform the reader about potential effects.

Federal law mandates a competitive bidding process for federal-aid highway projects. A component of competitive bidding is the determination of the construction method. The following is a summary description of the potential impacts during the construction period and potential mitigation measures that could be applied, as necessary. Detailed impacts and mitigation measures, however, can not be quantified at this time because information on specific construction methods to be implemented by contractors and therefore the precise mitigation that will be required is impossible to determine at this time.

The following discussion of specific topics includes incorporation of many assumptions. As more information is known in the design process, assumptions could change thereby affecting many of the following descriptions of impacts and mitigation. The purpose of these sections, therefore is to indicate a basis for the issues to be initially discussed.

F.7.3 Traffic

Construction Impacts: Haul vehicles are usually destined to staging areas to store equipment and materials for the construction site. These staging areas are accessed via existing streets to the extent feasible. In some cases, special temporary construction haul roads are built to relieve local streets from such traffic. Seventeen potential staging areas have been identified within close proximity to the project. Individual contractors may elect to use one or more of these sites or identify others. At least one of the staging areas will likely be along the Potomac River to support/supply barges needed for in-water operations. Another may include concrete batch plant(s), if needed. These staging areas are essential but may generate temporary impacts such as dust, noise and equipment and emissions. Construction staging areas are identified and discussed in Section F.5 of this appendix and in the Final Construction Staging Report.

The hauling of construction materials to and from the construction zone has the potential to impact traffic and residents along major arterials and local streets. Concrete may be delivered in a fleet of ready-mix trucks or aggregate, sand and cement could be delivered to an on-site batch plant in fewer trucks or combinations of these. Such impacts could include increased traffic, noise, vibration and air quality. More substantial impacts could occur on certain local streets not normally used by larger vehicles. The most intense use of local streets will be during delivery of materials such as reinforcing steel and redi-mix concrete as well as large equipment. It is probable that the Woodrow Wilson Bridge's piling, structural steel girders and pre-cast concrete bridge substructure sections will be delivered via the Potomac River and other navigable waterways and that aggregates and redi-mix concrete for the bridge itself could be supplied to the project via the Potomac River, thereby reducing traffic impacts on some local streets.

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Since barging is likely for removal of dredged materials from the Potomac River, landside traffic impacts for this operation should be minimal. If the Panorama Landfill is used for disposal of dredged material, there will be an increase in truck traffic on local streets accessing the landfill. The magnitude of that increase cannot be determined at this time. A potential site for construction staging is the proposed National Harbor site south of the Beltway in Prince George's County, Maryland. Coordination with the developer of this site will be necessary as the anticipated construction period for the Woodrow Wilson Bridge project and the National Harbor site are likely to occur simultaneously. Traffic impacts should be minimal in this presently undeveloped area, although traffic impacts may increase if both of these projects advance into heavy construction at the same time and require similar construction staging access routes. Coordination with National Harbor will continue during the construction period so as to maintain access through the area.

Lane shifts can be expected during construction, usually in off-peak hours, to deliver materials and equipment and to accommodate adjacent construction activities. Construction is a potentially dangerous activity for workers on the job and for the traveling public. Occasional lane closures contribute to increased accident potential in construction zones. While these are standard conditions for most highway construction projects, the safety of workers and the traveling public is a major issue and will be addressed in the Maintenance of Traffic plans and any revisions proposed by the contractor.

The construction access, dredging and bridge construction activities in the Potomac River have the potential to affect commercial and pleasure vessels passing through the construction zone. Commercial and other large vessels are restricted to the existing navigation channel that runs alongside the Virginia shore. It is expected that the navigation channel may need to be temporarily closed for short durations during installation of the bridge superstructure girders and for other construction purposes. However, interruption of marine traffic will be minimized to the greatest extent feasible and construction plans will be coordinated with the Coast Guard and all appropriate navigational interests. Discussions with the Coast Guard and other navigational interests will continue during final design and during construction to develop construction site and staging area water access plans.

Construction workers often travel to a work site in their own vehicle. Many need their vehicle to transfer tools and other equipment to and from the site. Others may work shifts that begin or end at times when public transportation is not available.

The bridge construction will require tall crane booms. The Potomac River is under a flight approach corridor to Reagan National Airport. The Federal Aviation Administration requires a permit for use of tall structures in such zones, to provide for safety in affected air space. Accordingly, coordination of construction plans with the FAA must also take place before the contractors begin operations.

Construction would temporarily alter existing bicycle traffic in Jones Point Park, portions of the Mt. Vernon Trail and other Virginia bicycle trails. No such impact is expected on the Maryland side since there is no bikeway in the construction zone.

As construction activities increase they will become more visible, especially on the new river crossing, which may cause temporary traffic impacts. Curious drivers often slow down to view the

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work. This "rubbernecking", which is typical at many construction sites, increases the potential for accidents as fast moving traffic comes upon traffic that has slowed down to view the construction.

Potential Traffic Mitigative Measures: The Project's NHPA MOA established an ongoing working group that addresses issues pertaining to historic resources during the design and construction. The group includes representatives from all agencies with jurisdiction over historic resources in the bi-state/District of Columbia project area. Any proposed significant use of local streets through the Alexandria Historic District will be coordinated and reviewed by the City and the Working Group.

A conceptual Maintenance of Traffic (MOT) Plan has been developed at this stage of the planning and environmental process. This MOT will be revised as more construction details are developed as part of the subsequent design process. It is expected that contract specifications will require contractors to develop detailed MOT plans for each specific contract. Implementation of these plans will provide for maintaining flow of traffic through the construction zone, to the extent feasible.

To address required traffic issues affected by construction of the project, a Congestion Management System (CMS) plan is being developed. This plan will include such measures as Intelligent Transportation Systems (ITS), static and variable message signage, traffic demand reduction strategies and detours. An incident management program will be developed as part of the CMS to minimize potential conflicts during construction. In addition, Transportation Demand Management (TDM) strategies, which involve providing alternatives to single driver and regional through trip travel and directing traffic around construction sites where possible, will be implemented during the construction period.

Construction workers will be encouraged to park their cars at designated remote lots and to use the METRO and other public transit to access the construction area. Contractors may provide worker transportation to and from offsite parking facilities. This will minimize impacts to local residents and businesses, especially in Alexandria. A shuttle bus service may be established for construction workers between specific points, such as Metro Stations or park and ride facilities and the construction zone.

A public information program will be developed to inform the public about construction phasing, lane closings, and construction activities and what they can expect to see. Notices to mariners will be issued and coordinated with the U.S. Coast Guard to provide for marine safety during work in the Potomac River. The FAA will be informed about the height of equipment to be used on the project under the flight approach zone under its Alteration of Air Space Permit program.

Bicycle trail access within the project area in Virginia will be maintained to the greatest extent possible throughout construction. A plan to achieve this will be developed during the design process in conjunction with bicycle advocacy groups in the area.

F.7.4 Socio-economic and Other Impacts

Construction Impacts: Portions of several parks with recreation resources will be used for the project as identified in the 1997 Section 4(f) Evaluation. The potential for temporarily impairing the intended use of these parks during construction varies, depending on the site's location near or

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in the construction zone. The most affected are the existing Jones Point Park in Alexandria, the Mount Vernon Trail, and the Virginia Bike Trails. Of particular concern is the maintenance of access to the south side of Jones Point Park during construction. The majority of the historical features and recreational uses within Jones Point Park occur on the southern portion. The existing bridge and the proposed bridge, both on overhead structure, divide the park. FHWA has committed to maintain access to the south portions of Jones Point Park throughout construction, to the greatest extent possible without endangering the safety of park visitors. A fishing pier will be preserved during construction for active use. Two existing soccer fields on the south side of the Park will be maintained, although some alterations/adjustments may be required. The fields may need to be reconfigured and relocated within the park. The proposed Queen Anne's Park is not developed; therefore there will be no construction impacts to active park users at this site. There will be a temporary displacement of the Mount Vernon Trail in Jones Point Park and along South Street and displacement of the Virginia Bike Trail adjacent to the Beltway in the vicinity of the US 1interchange. Certain walking trails and access to the DC Cornerstone and Jones Point Lighthouse will be maintained. No construction impacts are anticipated at Betty Blume Park, in Maryland.

Unique impacts to minority groups, the elderly and handicapped are not expected. However, if used, Panorama Landfill will require the use of a fleet of trucks to transport dredged material from an offloading area to Panorama Landfill. In order to comply with the time-of-year restriction for dredging, it is anticipated that approximately 3,058 cubic meters (4,000 cubic yards) per day (assuming a six-day work week) will be required, equating to approximately 400 round trips per day. The dump trucks would be travelling through a disproportionately high area of minority families, which is addressed in Section 4.3.5 Environmental Justice.

Visual impacts during construction are expected. Large pieces of construction equipment, barges, cranes and completed sections of the river bridge and the four interchanges will be highly visible from the highway and from communities near the project. The most dramatic views will be from the south, (e.g., the Mount Vernon Parkway), as the new bridge advances across the river, higher than the existing bridge with larger "delta" shaped piers to support a wider deck. Existing developments, resources and communities, such as Forest Heights and Oxon Hill Farm, Maryland, the proposed National Harbor site, City of Alexandria, Virginia, and Hunting Towers could experience temporary visual impacts due to construction activities.

The project is also near four schools, Flintstone Elementary, Cameron Elementary, Oxon Hill High School and the St. Mary's Elementary School. Another building on the grounds of the former Hanson Junior High School on Oxon Hill Road, is currently being partially used as a holding school until decisions are made concerning its future usage. It's expected that access to these schools will not be affected by construction and that any other impacts will be negligible since the schools are not within the construction zone. Freedmen's Cemetery and St. Mary's Cemetery in Alexandria are adjacent to the project and will be protected during construction as indicated in Chapter 4 of this document.

Potential Mitigative Measures: The construction of visual and/or noise barriers could be considered at certain locations where the construction is directly adjacent to a community facility. For example, noise barriers that may be constructed adjacent to the Lee Recreation Center or Flintstone School, if constructed early, would also function as noise and visual barriers for construction related impacts. Erection of temporary sheeting/screening to shield construction work from view can also be used to lessen the potential for accidents caused by distracted drivers.

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Potential vibration impacts can be monitored during construction to protect structures, particularly historic buildings.

Access to all active parklands and historic sites within or near the construction zone will be maintained, to the greatest extent possible without endangering the safety of visitors. In addition, access to all businesses will be maintained at all times. Both of these issues will be addressed in the Maintenance Of Traffic plan. Off-street parking will be maintained for businesses and residents. Directional lighting, lighting that is focused on the activity only, can be used to provide temporary lighting on the project during construction, if nighttime construction is required.

F.7.5 Air Quality

Construction Impacts: Minor air quality impacts could result from the use of construction equipment such as power generators, pile-driving equipment and from vehicles moving around the construction area. In addition, some fugitive dust might be released due to demolition, materials handling, and other construction operations. As the north Hunting Towers building and Hunting Terrace buildings are demolished, asbestos may have to be removed from the building. Odors can be released from dredge materials depending on atmospheric conditions during that operation, common to dredging operations and are temporary in nature as the sediment is removed by barge from the site.

Potential Mitigative Measures: The treatment of unpaved roadways, excavation areas and routes for construction vehicles will reduce fugitive dust emissions and can be noted in the bid documents. Truck wheels can be washed before leaving the construction activity site. In addition, local streets that are used by construction vehicles can be cleaned on a regular basis and/or as needed. Demolition will be controlled by protective curtains and cages or other temporary structures to contain any associated emissions. Asbestos abatement is subject to federal laws, will be mitigated according to EPA regulations and is not expected to be a major issue.. Any asbestos removed from the buildings prior to demolition will be handled by certified technicians and disposed of in acceptable landfills. Odor treatment, if needed, may consist of lime or other chemicals that will neutralize nuisance level odors in sediments dredged from the site.

Consideration will be given to requiring construction equipment to be fitted with oxidation catalysts, particulate filters, or both. These devices filter out and break down harmful emissions of hydrocarbons, particulate matter and carbon monoxide. Equipment that can be fitted with such devices includes backhoes, front end loaders, excavators, cranes and air compressors. Finally, air quality monitoring will be conducted during construction to make certain that federally regulated pollutant levels, including those for lead paint, are not exceeded during that activity. Existing monitoring sites already exist in Alexandria. The City and EPA may establish additional sites.

F.7.6 Noise

Construction Impacts: Noise can be expected from a number of sources including pile driving, movement of trucks to and from the site, demolition of structures, truck back-up alarms, excavation and grading, erection of structures, paving and other typical highway construction activities. Pile driving is likely to be perceived as the most substantial of the noise sources on the project as a whole as it is noise that is repetitive and generally not experienced by the public. Depending on atmospheric conditions, pile driving noise resulting from construction of bridge foundations may be

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heard across the Potomac River and other waterways and within the local jurisdictions. Augured foundation holes, a quieter method, were determined infeasible due to the weak soil conditions that exist. Vibration from pile driving, demolition and large vehicles over roadways could also present perceived effects to the public living and working nearby construction areas.

Potential Mitigative Measures: There are numerous jurisdictional noise codes and ordinances including the following: Annotated Code of Maryland-Title 3; MD Department of the Environment Code of Maryland Regulations, Title 26, Subtitle 03, Chapter 3; Prince George's County Annotated Code, Subtitle 19, Division 2a; Annotated Code of Virginia, City of Alexandria Noise Regulations; and the County Code of Fairfax County, Virginia, Chapter 108.1. The project will work cooperatively with the affected communities to develop a suitable project noise control plan for the major noise generating activities (pile driving, demolition, and reconstruction) that will be experienced by communities beyond the activity source.

The contract specifications will contain a construction noise control plan to regulate and control construction noise. Working with the contractors, guidance will be provided on the time of day, maximum levels of allowed noise, and types of equipment that must be fitted with mitigative devices (mufflers/silencers), enclosed, or directed to certain locations of staging areas or construction sites to further address impacts.

Potential mitigation may include use of strobes or lower decibel truck back-up devices, particularly if used in the evening hours or other times where there is a heightened sensitivity to noise. In addition, time of day restrictions may be applied as needed to reduce noise impacts on sensitive receptors. The public will be advised to close windows during particular times of construction since windows can reduce noise levels

As noted under Section F.7.4 Socioeconomic and Other Impacts, The construction of visual and/or noise barriers could be considered at certain locations where the construction is directly adjacent to a facility. For example, the noise barriers that may be constructed adjacent to the Lee Recreation Center or Flintstone Elementary School, if constructed early, would also function as a noise and visual barrier for construction related impacts. Noise neutralization devices may be employed when necessary to counter noise impacts of equipment. Certain noise generators could be enclosed or the contractor could use quieter equipment during construction. In addition, a monitoring program could be employed to make certain that local and project wide noise standards are not exceeded during construction activities and that the public has a specified complaint procedure.

F.7.7 Natural Environment

Construction Impacts: Dewatering of certain sites for construction as well as related subsidence might occur at certain areas with soft soils, such as the US 1 interchange. In addition, erosion may be generated by removal of vegetative cover in some areas. The Cameron Run floodplain capacity may be affected during construction and submerged aquatic vegetation in the river may be affected from construction access and dredging. Construction and subsequent removal of cofferdams can pose temporary effects to water quality and aquatic species due to increased turbidity. Erosion can also be a potential impact as soils on the shore are disturbed during construction not only along the Potomac River but along Cameron Run. Dredging will not change the area of open water, but the water depths will be different than what currently exists today. This would affect fish habitat in the immediate area. Construction channel dredging is not anticipated to affect nontidal or tidal

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vegetated wetlands. Dredging also has the potential to release sediments and associated toxic substances into the water. Substances known which may accumulate in the bottom sediments in portions of the upper tidal Potomac River include metals, polychlorinated biphenyls (PCBs) and poly nuclear aromatic hydrocarbons (PAHs). All studies conducted to date indicate that these substances are well below EPA regulation thresholds.

The shortnose sturgeon and the bald eagle are endangered species that have been observed or may reside in the construction zone area. Other wildlife and their habitats will also need to be protected during construction as is feasible.

Temporary impacts to wetlands and waters of the US from construction related activities are anticipated along Cameron Run and for demolition of the existing bridge. During demolition of the bridge, there is the potential for bridge materials, some containing lead paint, to inadvertently fall into the river. Finally, tree removal is anticipated by project wide construction. During construction at Queen Anne's Park and Jones Point Park, a number of trees must be removed in order to implement the mitigation plans for the parks.

Potential Mitigative Measures: The affected floodplains would continue to function as temporary culverts or drains in the floodplain would be installed to allow movement of water from one end of the floodplain to another. Treatment of dewatering discharge would be subject to applicable state and federal regulations concerning quality, quantity and disposal. Trucks transporting dredged materials to upland sites can be required in the bid documents to have sealed beds to prevent leakage on local roads and streets during transport. Silt fences and other sedimentation controls would be employed at construction sites to stop the flow of newly exposed soils into the water and would be employed according to Maryland, Virginia and EPA Section 404(b)(1) guidelines. These measures will be especially important along the Potomac River, along Cameron Run and any land areas used for staging near water resources. Any areas of temporary impacts along Cameron Run will be regraded and revegetated to stabilize soils. Strict adherence to sediment and erosion control plans approved by the Maryland Department of the Environment and the Virginia Department of Conservation and Recreation will occur.

In addition, depending on the nesting habits of the bald eagle and fish spawning locations, impacts can be controlled by limiting construction activities to certain times of the year when these species are most vulnerable. FHWA is coordinating with the USFWS and NMFS on these issues. A fish warning device could also be employed to startle fish, including the shortnose sturgeon, if any exist in the project area, away from any demolition sites underwater. This has been successfully used on other projects such as the Central Artery/Tunnel project in Boston Harbor. Other potential methods include blast design techniques and dewatered cofferdams on the bascule piers and foundations. The bald eagle is expected to be mobile and leave the site to avoid construction activities and is, therefore, not expected to be substantially affected during the construction period. Coordination with USFWS is ongoing.

After in-water construction is complete, turbidity levels are expected to quickly return to normal levels. Turbidity curtains and are another method that can be used to minimize water quality effects. These ongoing effects will be monitored by project staff. River protection netting may be employed where feasible to protect the Potomac River from bridge decking materials that could fall into the river. For pier removal, saw cutting and removal of piers in pieces could greatly minimize the potential for material to fall into the river. Many of the other elements of the existing Woodrow

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Wilson Bridge, decking and girders, can be removed in pieces, also minimizing the potential for stray pieces falling into the water. Protection of designated trees outside of the necessary work zones from construction equipment will occur by taping off areas at their drip lines, at a minimum, and reforestation will offset the loss of trees during construction of the project, particularly at Rosalie Island.

Construction impacts to SAVs could be minimized in areas where bottom sediments will not be disturbed, by limiting in-water specified construction activities during sensitive growth periods of SAV plants and driving sheet piles instead of using 3:1 slopes, if found feasible and cost effective.

F.7.8 Cultural Resources Impacts

Construction Impacts: The FHWA has conducted archaeological and historic architectural assessments of the proposed construction staging areas in Maryland. These assessments involved background research on each site and a field inspection in order to determine current conditions and whether or not historic architectural resources were present within the area of potential effect (APE) of each site. The FHWA determined that site G-1 had already been subjected to an archaeological survey and that no further archaeological investigations are warranted. Due to the temporary nature of the construction staging area and based on previous historic surveys in the area, the FHWA determined that the use of G-1 will also have no effect on standing historic resources. Site G2 has also been subjected to intensive archeological identification studies; therefore, no further archeological identification studies are warranted. However, further cultural resource investigations are pending at the National Harbor property. The following National Register eligible and potentially National Register eligible sites will be avoided by any construction staging activities for the Project: 18PR366, 18PR367, 18PR368, 18PR370, and 18PR376. Due to the temporary nature of construction staging areas and based on the previous historic surveys of the vicinity, no historic standing structures will be impacted by the use of G2.

Site H-1 and Site I have been extensively impacted by grading, and no standing structures are present within the properties' APE. The FHWA has determined that no further cultural resource work is warranted at Site H-1 and Site I.

Site H-2 is considered to have a high potential to contain significant historic archeological resources. Prehistoric archeological resources may also be present, based on the site's topographic setting near a stream. A Phase I archeological survey will be required for all well-drained, undisturbed parts of Site H-2. In terms of historic architectural resources, H-2 is the location of Salubria, an early 19th century farmstead (PG: 80-2). This property was determined not eligible for listing in the National Register in prior coordination with the Maryland SHPO. Based on this coordination and due to the temporary nature of construction staging areas, no historic standing structures will be impacted by the use of this parcel for construction staging.

Site K, Rosalie Island on the Potomac shoreline, was heavily disturbed by mechanized equipment, and there are no historic architectural resources on the island. Therefore, based on prior disturbance, the FHWA has determined that significant terrestrial archeological resources are unlikely to be present. Several underwater targets (potential underwater archaeological sites) were identified along the eastern shore of Rosalie Island. Those south of the Woodrow Wilson Bridge were surveyed by FHWA and determined to be ineligible for the National Register. Those north of

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the bridge are potentially eligible, and have been discussed in Section 3.8. FHWA will demarcate the area of these northern underwater sites, and place them off limits for access during construction.

Other construction staging areas will be within SHA right-of-way along the Beltway and within existing interchanges. These areas are judged to have no potential to contain significant archeological resources due to prior disturbance. Further, due to the temporary nature of construction staging areas and based on the previous historic surveys of the vicinity, no historic standing structures will be impacted by the use of these previously cleared parcels for construction staging.

The FHWA is consulting with the Maryland SHPO on these determinations for all of the above construction staging areas, pursuant to the MOA.

FHWA will conduct an archaeological and historic architectural assessment of newly identified construction staging areas within Virginia and Washington, D.C.. The sites in Virginia include Sites A, B, C, D1, D2, E1, E2, F1, F2, and J. The one site in Washington, D.C. is Site L, currently a wastewater treatment plant. FHWA will conduct background research and field inspection of these sites to determine, in consultation with the Virginia and Washington, D.C. SHPOs, whether or not these sites have the potential to contain National Register archaeological or historic architectural resources; and, if additional cultural resource investigations of these sites are required.

Some of the proposed staging areas in Alexandria are within the boundaries of the Alexandria Historic District. Properties within the district could be subject to increased truck traffic, which may be perceived as causing vibration impacts on the structures. However, ground vibrations from construction activities rarely reach the levels that can damage structures, but can achieve the noticeable range in buildings very close to a construction site. Pile drivers generally cause the highest vibration levels, compared to other types of equipment. Detailed information on the proposed construction methods, the specific construction activity, types of equipment, and characteristics of underlying soils, will be used to develop any vibration monitoring program. The FHWA will consult with the Virginia SHPO and the City of Alexandria on the development of such a program.

Potential Mitigative Measures: Regular monitoring of historic properties identified in the MOA, in addition to any newly identified properties resulting from further investigations of the above referenced staging sites, will be conducted to make certain that no damage occurs during construction and that access to historic properties, such as Oxon Hill Children's Farm in Maryland and Jones Point Park and other sites in Alexandria, are maintained, to the greatest extent feasible, without endangering the public safety. As noted in the MOA, access will be maintained throughout the construction period for maintenance and emergency vehicles. Public access to the National Register-listed Jones Point Lighthouse, in Alexandria, will be maintained. Utility service will be maintained to the lighthouse. In addition, a public education program to work with the owners and interested parties concerning these properties will provide an understanding of perceived issues.

F.8 Summary

With the early identification of a construction schedule and potential construction staging areas, this document has initiated the investigation of potential construction impacts. Federal law mandates a competitive bid process for federal-aid highway projects and therefore allows for the contractor to

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determine the construction method to be implemented. This section has identified particular issues that have become important as the refinements to the 1997 FEIS Alternative 4A have been developed to become the Current Design Alternative. While recognizing these issues, however, it does not assume that these are the only issues or impacts. Identification will continue to be more defined as the design and ultimately construction processes are completed.

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