III. EXISTING ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This chapter provides information about the existing socioeconomic, historic and environmental resources and the potential effects that would be expected to occur with the implementation of one of the Alternates Retained for Detailed Study (ARDS). The No-Build Alternate is retained as it provides a baseline by which all environmental impacts of the ARDS are compared.

Environmental impacts with or without the bicycle/pedestrian (bike/ped) path option are similar; however, there is an additional cost for construction as well as for maintenance of the bike/ped path (please refer to ***Table S-1*** for additional information regarding cost estimates for all alternates, with and without bike/ped path options). The resources with greater differences in impacts between the alternates with and without bike/ped path options have been noted. In addition to the bike/ped path options, open road tolling is an element of each of the alternates (including the No-Build).

A. SOCIOECONOMIC RESOURCES AND LAND USE

A socioeconomic inventory was conducted as part of the Nice Bridge Improvement Project. This inventory included the identification of social, economic, and land use resources located within the study area, specifically demographics; communities; community facilities; environmental justice; visual quality; employment; and land use. For more detailed information please refer to the *Nice Bridge Improvement Project Socioeconomic and Land Use Technical Report* located on the attached CD.

1. Demographics

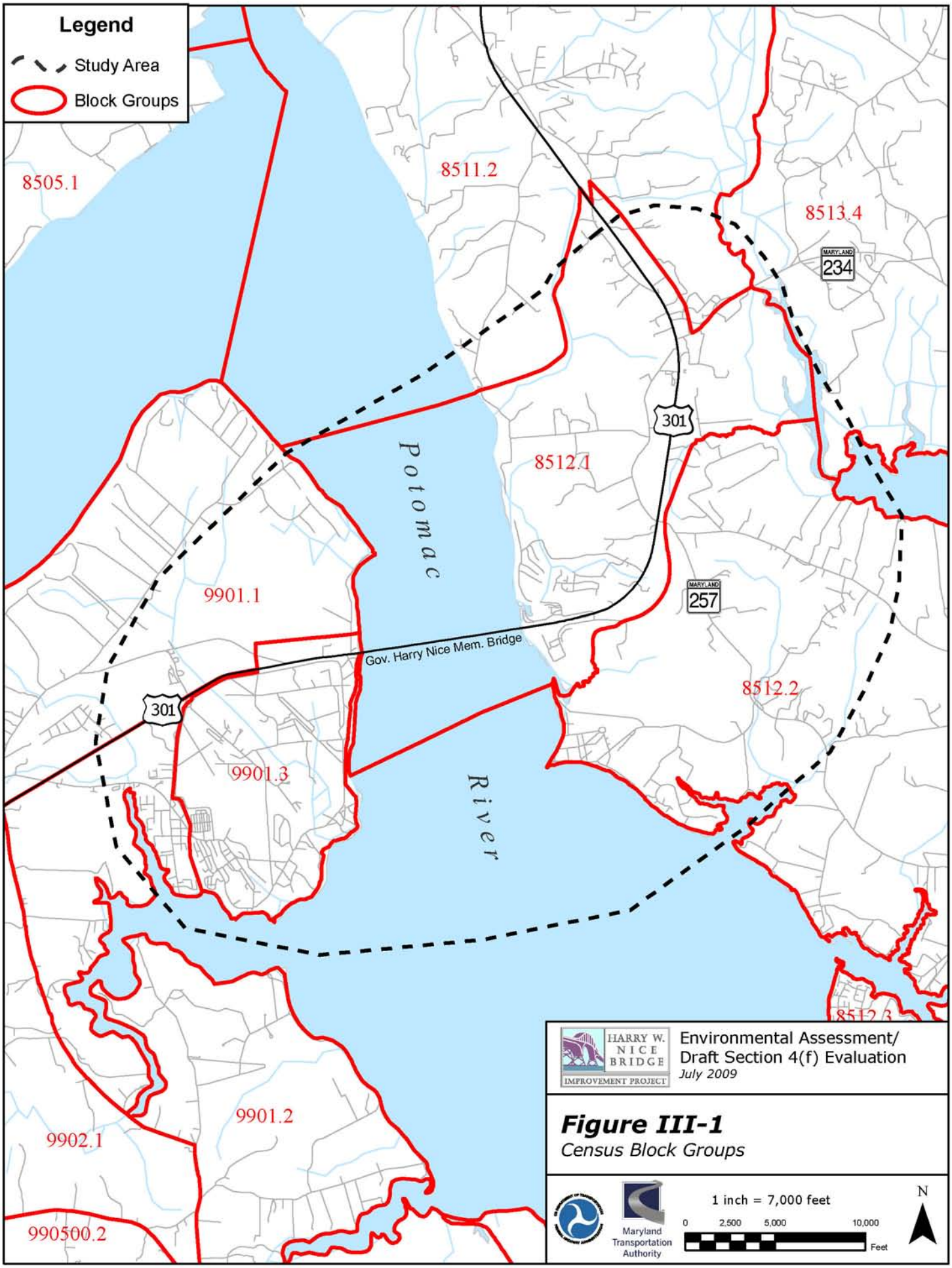
Data regarding population, race, economics, and other demographics, which are available through the United States Census Bureau's *Census 2000,* were compiled and evaluated. Data were collected at the block group level. The census tracts and block groups that encompass the study area are listed in ***Table III-1*** and depicted on ***Figure III-1***.

Table III-1: *Census Tracts and Block Groups within the Study Area*

Census Tracts	Block Groups
Charles County, Maryland	
8511	2
8512	1, 2
8513	4
King George County, Virginia	
9901	1, 2, 3

Source: US Census Bureau, 2000

Table III-2 shows the population statistics for Charles County, King George County, and the study area. According to the US Census, the predominant race within Charles County, King George County, and the study area is Caucasian (69-79 percent). Of the minorities, the largest portion of the population is African American (26 percent, 19 percent, and 17 percent respectively). The percentage of the population over the age of 65 is 7.8 percent in Charles


Legend
Study Area
Block Groups
8505.1
8511.2
8513.4
8512.1
8512.2
9901.1
9901.3
9901.2
9902.1
990500.2
Potomac
River
Gov. Harry Nice Mem. Bridge
301
301
MARYLAND 234
MARYLAND 257
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-1
Census Block Groups
Maryland Transportation Authority
1 inch = 7,000 feet
0 2,500 5,000 10,000
Feet
N

County, 9.6 percent in King George County, and 9.0 percent within the study area. The percentage of the population over the age of five with one or more disabilities reported is 12 percent in Charles County, 13 percent in King George County, and 14 percent within the study area.

Table III-2: *Population Statistics for Charles County, King George County, and the Study Area*

	Charles County, Maryland		King George County, Virginia		Study Area	
Total Population	120,546		16,448		11,038	
Population over the age of 65	7.8%		9.6%		9.0%	
Population with disabilities (over 5 years)	12%		13%		14%	
Racial Distribution	**Total**	**Percent**	**Total**	**Percent**	**Total**	**Percent**
Caucasian	82,587	69%	13,055	79%	8,717	79%
African-American	31,411	26%	3,148	19%	1,917	17%
American Indian/Alaskan Native	907	1%	80	1%	71	<1%
Asian/Pacific Islander	2,262	2%	181	1%	102	<1%
Other	869	1%	76	1%	79	<1%
Two or More Races	2,510	2%	263	2%	152	1%
Total Minorities	37,959	31%	3,748	23%	2,321	21%
Population of Hispanic Origin[1]	2,722	2%	301	2%	215	2%

Source: US Census Bureau, 2000

[1] *Population of Hispanic origin can be of any race.*

2. Communities and Community Facilities

Summary: No residential displacements are anticipated under any of the alternates. The community facilities adjacent to the Nice Bridge and US 301 include: Barnesfield Park, Dahlgren Wayside Park, the Potomac Gateway Welcome Center, Aqua-Land Marina and Campground, and Naval Support Facility (NSF) Dahlgren. These facilities may be impacted by a build alternate.

a. Existing Conditions

Communities

Communities and neighborhoods exist in a variety of different scales in and surrounding the Nice Bridge. These include the larger unincorporated areas such as Newburg, Maryland and Dahlgren, Virginia as well as individual residential developments of varying size. The residential communities are generally composed of single family homes, although apartment and townhome developments are present.

The Charles County portion of the study area includes the communities of Newburg and Morgantown. The Newburg community is comprised of numerous neighborhoods and residential areas, including: Aqua-Land, Cliffton on the Potomac, Ravens Crest, Popes Creek, and Allens Fresh. The Morgantown community is located southeast of US 301, and is comprised of the Wayside, Morgantown, and Waverly Point neighborhoods.

The Virginia portion of the study area includes the Dahlgren community. This community includes small shops and community services, and numerous residential neighborhoods,

including: Park Bridge on the Potomac (off Roseland Road), King George on the Potomac, Westbury, Monmouth Woods, Monmouth Village, Chatham Village, Mallards Landing, and Dahlgren Harbor Apartments.

Community Facilities

Community facilities and services located within or serving the study area include: public parks and recreational facilities, educational facilities, religious institutions, emergency services, health care facilities, military facilities, libraries, community recreation centers, government buildings, and public transportation. ***Figures III-2A and 2B*** depict the locations of the community facilities and services within and near the study area. Community facilities located adjacent to the Nice Bridge include:

- Barnesfield Park;
- Dahlgren Wayside Park;
- the Potomac Gateway Welcome Center;
- Aqua-Land Marina and Campground; and
- Naval Support Facility (NSF) Dahlgren.

The land located north of US 301 adjacent to the Potomac River in Virginia provides public park and recreational opportunities at three facilities: Dahlgren Wayside Park, Barnesfield Park and the Potomac Gateway Center. These facilities are owned by King George County and are operated by the King George County Department of Parks and Recreation.

Aqua-Land Marina is a full-service marina servicing large power boats and sailing vessels. The privately-owned marina offers beach access, a boat ramp, rental boats, and a campground for recreational vehicles.

NSF Dahlgren is located in King George County, south of US 301. It was established in 1918 to proof and test naval weaponry for fleet use. The role of the NSF Dahlgren has expanded to include research, development, and test and evaluation operations critical to the defense of sailors, ships, facilities, and infrastructure. It now has a land area of 4,300 acres that includes several miles of Potomac River shoreline and a 20-mile downriver range for projectile testing.

The Morgantown Generating Station is located on 427 acres south of US 301 on the Potomac River in Charles County. The station converts coal and oil into electricity and serves approximately 1.5 million homes.

The Nice Bridge Administration Building is located adjacent to the toll plaza and houses the administrative offices and police operations. The Nice Bridge Maintenance Building is located east of the toll plaza. This building served as the original administration building for the Potomac River Bridge, and currently serves as the center for Nice Bridge maintenance operations and personnel. The Maintenance Building (also referred to as the historic Potomac River Bridge Administration Building) is eligible for the National Register as a contributing resource to the historic Nice Bridge. The maintenance building is further discussed in ***Chapter V***.

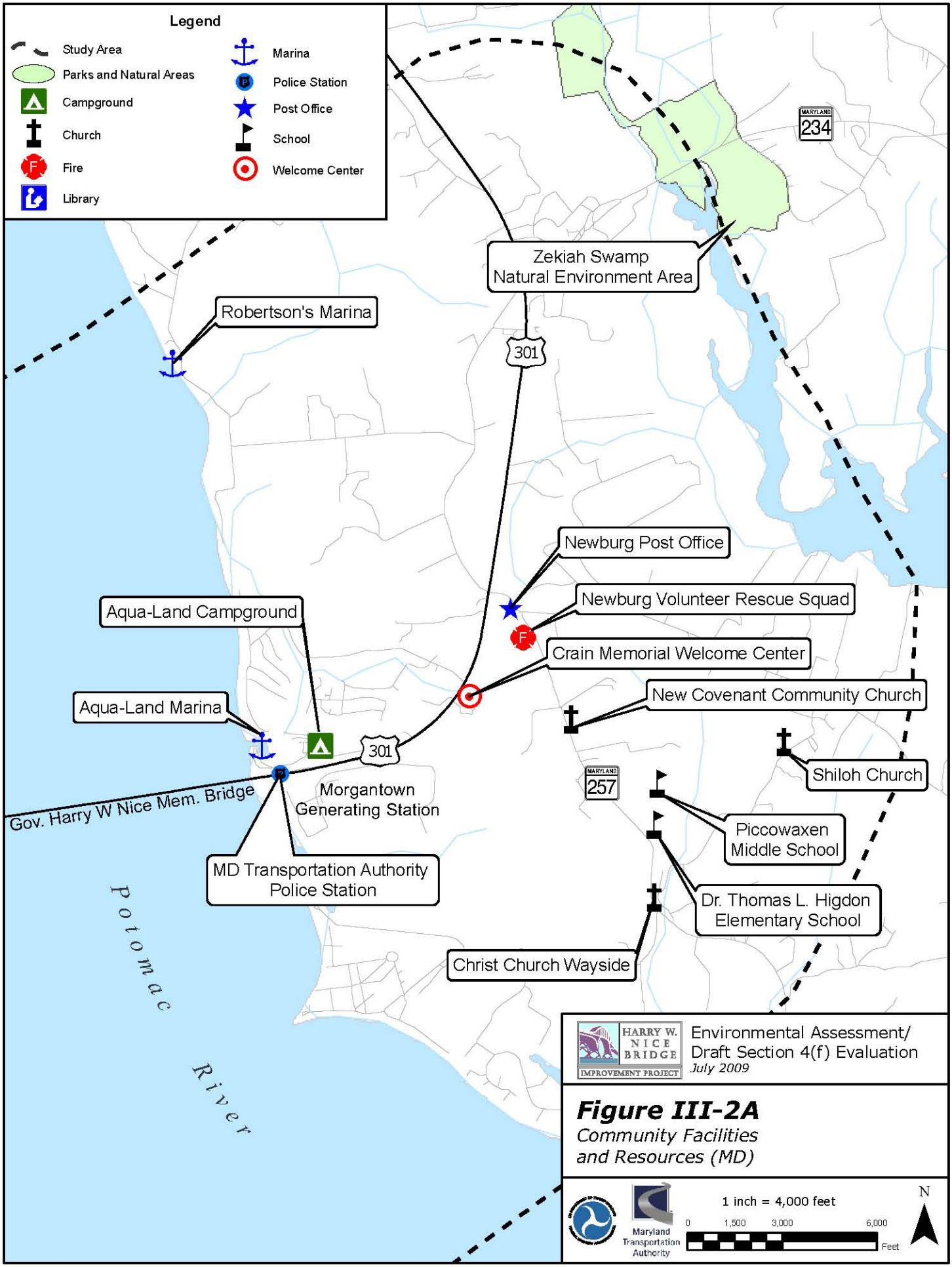

Legend
Study Area
Parks and Natural Areas
Campground
Church
Fire
Library
Marina
Police Station
Post Office
School
Welcome Center
Zekiah Swamp
Natural Environment Area
MARYLAND
234
Robertson's Marina
301
Newburg Post Office
Newburg Volunteer Rescue Squad
Aqua-Land Campground
Crain Memorial Welcome Center
Aqua-Land Marina
New Covenant Community Church
301
Shiloh Church
MARYLAND
257
Morgantown
Generating Station
Gov. Harry W Nice Mem. Bridge
Piccowaxen
Middle School
MD Transportation Authority
Police Station
Dr. Thomas L. Higdon
Elementary School
Christ Church Wayside
Potomac
River
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
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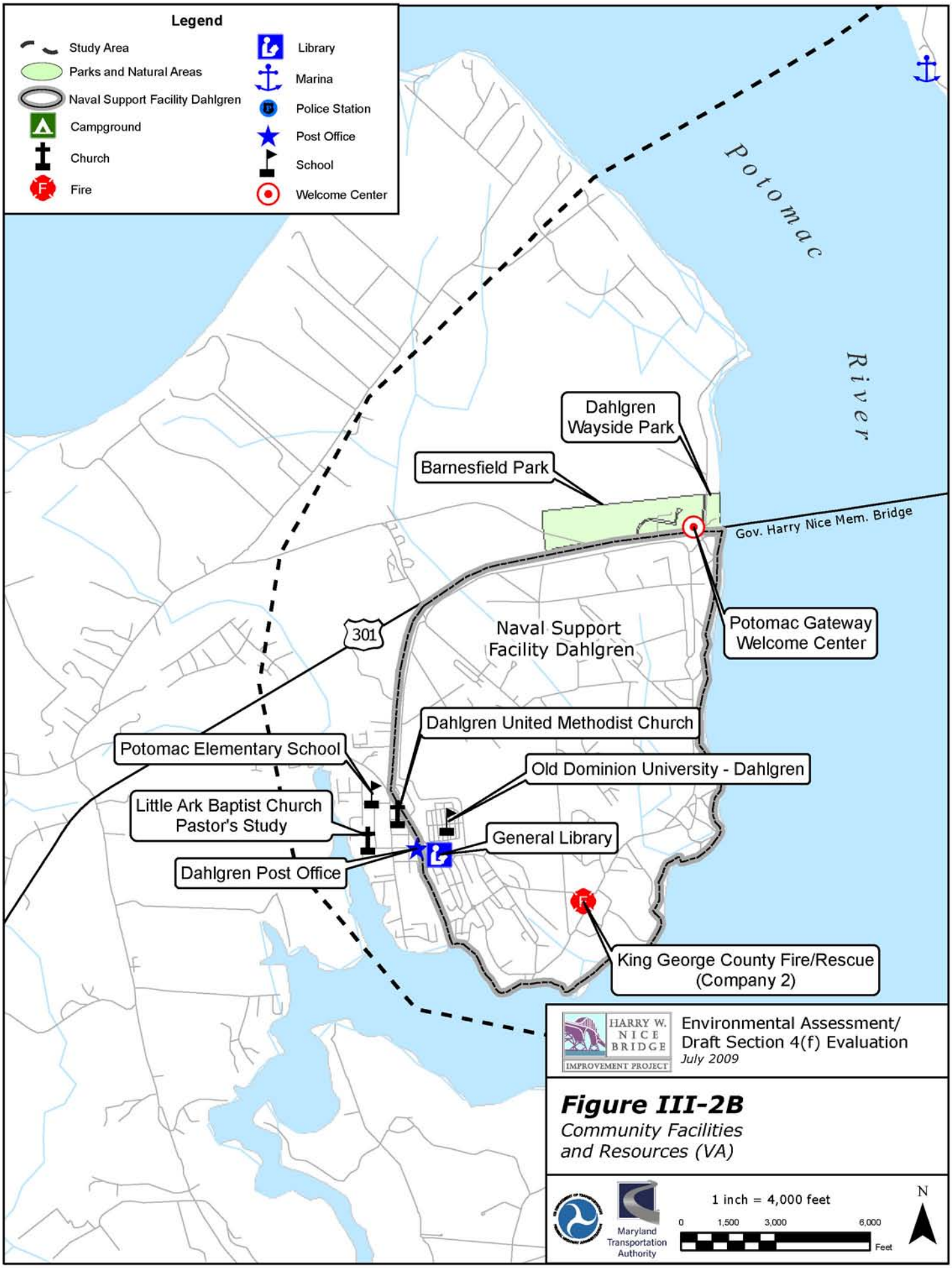
Figure III-2A
Community Facilities
and Resources (MD)
Maryland
Transportation
Authority
1 inch = 4,000 feet
0
1,500
3,000
6,000
Feet
N


Legend
Study Area
Parks and Natural Areas
Naval Support Facility Dahlgren
Campground
Church
Fire
Library
Marina
Police Station
Post Office
School
Welcome Center
Potomac River
Dahlgren Wayside Park
Barnesfield Park
Gov. Harry Nice Mem. Bridge
Potomac Gateway Welcome Center
301
Naval Support Facility Dahlgren
Dahlgren United Methodist Church
Potomac Elementary School
Old Dominion University - Dahlgren
Little Ark Baptist Church Pastor's Study
General Library
Dahlgren Post Office
King George County Fire/Rescue (Company 2)
HARRY W. NICE BRIDGE IMPROVEMENT PROJECT
Environmental Assessment/ Draft Section 4(f) Evaluation
July 2009
Figure III-2B
Community Facilities and Resources (VA)
Maryland Transportation Authority
1 inch = 4,000 feet
0 1,500 3,000 6,000
Feet
N

b. Potential Effects

Communities

Table III-3 summarizes the business and residential property impacts that would result from each of the proposed alternates. These impacts would result from the proposed roadway widening and realignment.

Table III-3: *Property Acquisitions by Alternate, Without (and With) Bike/Ped Path Options*

Resource	Unit	Alt. 1- No Build	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Business Displacements	no.	0	0	0	0	0	0	0
Institutional Displacements[1]	no.	0	1	1	2	2	1	2
Residential Displacements	no.	0	0	0	0	0	0	0
Business Right-of-Way[2]	acres	0	0	0	7.0	7.0	0	7.6(8.5)
Federal Right-of-Way[3]	acres	0	3.1(3.3)	3.1	0	0	3.7	0
Residential Right-of-Way	acres	0	0	0	0	0	0	0
Low-Income/Minority Populations	no.	0	0	0	1	1	0	1

[1] Institutional displacements include the Naval Support Facility Dahlgren, Nice Bridge Campus Facilities and Potomac Gateway Welcome Center.
[2] Business right-of-way (ROW) impacts consist of impacts to the Aqua-Land Marina and Campground.
[3] Federal ROW impacts are to the Naval Support Facility Dahlgren.

No residential displacements are anticipated under any of the alternates. However, the No-Build Alternate would ultimately affect the mobility in the study area by failing to address traffic capacity concerns, and the resulting traffic delays would make travel within the study area increasingly difficult and time consuming. In addition, quality of life for study area residents, and health and safety concerns related to emergency response times (police, fire, and emergency services) would be affected. The long term effects of this alternate may be more severe, as it is expected that the Nice Bridge will require major rehabilitation in the 2015–2020 time frame, which could result in long term bridge closures and delays.

Institutional displacements include the NSF Dahlgren, Nice Bridge Campus Facilities and the Potomac Gateway Welcome Center. Alternates 2, 3, and 6 would impact NSF Dahlgren property. Alternates 4, 5, and 7 would impact the Authority-owned Nice Bridge Campus Facilities and the Potomac Gateway Welcome Center in Virginia.

The build alternates with a northern bridge alignment (Alternates 4, 5, and 7) would impact the Aqua-Land Maria and Campground, as linear strip takes of right-of-way (ROW) would be required from this property (business ROW). Therefore, the long-term and short-term residents of the campground would have the southbound lanes of US 301 closer to their homes.

Private property owners affected by displacement or ROW acquisition will receive relocation assistance in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended* (Uniform Act) (***Appendix C***). All property owners with ROW

acquisition or easements obtained would be compensated according to the Uniform Act and paid fair market value for the affected property. Sufficient properties are available on the market to accommodate any persons displaced by this project.

For more detailed information regarding community impacts, please refer to the *Nice Bridge Improvement Project Socioeconomic and Land Use Technical Report* located on the attached CD.

Community Facilities

Effects on local community facilities are measured by direct impacts (acquisition of property) and other impacts (changes in proximity, usage or access). Temporary impacts to traffic operations are possible to all community facilities and services as a result of construction activities associated with the various build alternates. However, these impacts would be temporary and mitigated by a maintenance of traffic plan developed prior to construction. Because the build alternates propose a new bridge that is offset from the existing bridge, it is expected that the existing bridge could remain open throughout the majority of construction activities, thus minimizing impacts to community resources.

In general, Alternate 1 (No-Build) would result in the greatest impact to community facilities by requiring extended periods of bridge closure for expected rehabilitation activities in the 2015 to 2020 timeframe. Alternate 1 would negatively affect emergency response times and the usage of community resources through delays caused by vehicle accidents, wide load transport, or other traffic-related delays.

The build alternates would improve the ease of travel between Maryland and Virginia for travelers in the area and emergency vehicles responding to calls across state lines. However, temporary detours or delays could affect emergency response times while a new bridge is under construction. Coordination efforts with state, county, and local emergency services are ongoing and will continue throughout the Nice Bridge Improvement Project. To date, the Authority has received responses from the Charles County Department of Emergency Services, Charles County Sheriff's Office, Maryland State Police, King George County Department of Emergency Services, and Virginia State Police, who all offer general support to the build alternates (***Appendix B***).

Alternate 1 (No-Build) would not impact Barnesfield Park, Dahlgren Wayside Park or the Potomac Welcome Center. The alignments south of the existing Nice Bridge (Alternates 2, 3, and 6) would not result in impacts to the park facilities. Alternate 7 would result in the most impacts (approximately 6.5 acres). For more information on impacts to the parks and recreational facilities in the project area please refer to ***Chapter V, Draft Section 4(f) Evaluation***.

The build alternates with a northern bridge alignment (Alternates 4, 5, and 7) would impact the Aqua-Land Marina and Campground property but not its facilities.

Impacts to NSF Dahlgren property are not anticipated under Alternates 1, 4, 5, and 7. Alternates 2, 3 and 6 which propose a new bridge south of the existing Nice Bridge, would impact the NSF

Dahlgren. Approximately 3.1 acres of ROW would be required from the NSF Dahlgren under Alternates 2 and 3. Alternate 2 with the bicycle/pedestrian path option would require 3.3 acres from NSF Dahlgren. Alternate 6 would require 3.7 acres of ROW from the NSF Dahlgren, as the four-lane bridge alternate includes the largest footprint for construction. The proposed ROW requirements would impact the fenced security clear zone established around NSF Dahlgren Building 1480. According to the April 3, 2009 letter from the Department of Navy, Naval Support Activity South Potomac (***Appendix B***), "Any relocation of the existing installation perimeter fence line south of its current position will significantly reduce the safe standoff distance for nine major operational, test and administrative facilities and approximately 1,300 employees who work in this area of the installation. Special facilities and equipment critical to the Navy's mission may not be encroached upon and are not able to be replicated or relocated at NSF Dahlgren." Alternates 2, 3, and 6 would also place construction equipment and workers closer to the NSF Dahlgren fenceline and property, creating substantial security concerns.

There would be no effect to the Morgantown Generating Plant from any of the alternates.

Impacts are anticipated to the Nice Bridge Administration Building and the Maintenance Building owned by the Authority. Alternates 4, 6, and 7 would displace both buildings; however Alternates 2, 3 and 6 would require minor ROW from the frontage of both buildings.

Section 6(f)

In 1985, the King George County Department of Parks and Recreation (DPR) received $240,000 from the federal Land and Water Conservation Fund (LWCF) to improve ballfields, utilities, concessions, restrooms, playgrounds, parking, landscaping, and other support facilities at Barnesfield Park. As a result, Barnesfield Park is protected under Section 6(f) of the LWCF Act (16 USC 460). Coordination with DPR, the Virginia Department of Conservation and Recreation (VA DCR), and the National Park Service (NPS) confirmed Barnesfield Park's Section 6(f) protection status (please refer to ***Appendix H***).

The implementing regulations of Section 6(f) state that "once an area has been funded with LWCF assistance, it is continually maintained in public recreation use unless the NPS approves substitution property of reasonably equivalent usefulness and location and of at least equal fair market value" (36 CFR 59.3). There are several prerequisites for conversion of Section 6(f) property to other uses, including:

- All practical alternatives to the proposed conversion have been evaluated;
- The fair market value of the property to be converted has been established and the property proposed for substitution is of at least equal fair market value;
- The property proposed for replacement is of reasonably equivalent usefulness and location as that being converted;
- The property proposed for substitution meets the eligibility requirements for LWCF assisted acquisition; and
- In the case of assisted sites which are partially rather than wholly converted, the impact of the converted portion on the remainder shall be considered.

Alternates 4, 5, and 7 would result in conversion of land in Barnesfield Park from recreational to transportation use. Depending on the alternate, the impacts would range between 0.4 acre and 2.1 acres. The impacts would be in a wooded area of the park and would not affect the ballfields, playground, concessions, or other park facilities.

The alternates would have impacts that are less than five acres or 10 percent of the total park area. Therefore, per the *LWCF State Assistance Program Manual* (NPS, 2008), they may qualify as "small conversions" if the proposed replacement property is contiguous to Barnesfield Park. A small conversion would involve a simplified conversion request document. The appropriate level of conversion request would be determined after the most appropriate replacement property has been identified.

The Authority will continue to coordinate with DPR, VA DCR and NPS regarding the potential conversion of part of Barnesfield Park. If appropriate, the Authority and DPR would submit a request for land conversion document to NPS through VA DCR. Any mitigation measures must be found to be satisfactory to VA DCR and NPS before the land conversion would be approved.

3. Environmental Justice

Summary: One potential environmental justice community was identified, adjacent to the Nice Bridge, the Aqua-Land Campground, with temporary and permanent low-income residents. Alternates 4, 5, and 7 would result in the southbound lanes of US 301 being closer to the campground. These alternates would not result in any displacements or greater noise impacts. Therefore, none of the alternates are expected to result in a disproportionately high and adverse effects to environmental justice populations.

Executive Order (EO) 12898, "Federal Actions to Address the Environmental Justice in Minority and Low-Income Populations," was signed on February 11, 1994. The EO requires the assessment of disproportionately high and adverse human health and environmental effects on minority and low-income populations resulting from proposed federal actions. The EO reaffirms the provisions of Title VI of the Civil Rights Act of 1964 and related statutes, emphasizing the incorporation of those provisions with existing planning and environmental processes. EO 12898 adds low-income households to the list of populations that should be investigated to ensure that they are not excluded from the benefits of the project or subjected to discrimination caused by federal programs, policies, and activities. Executive Order 12898 defines minority persons as:

- African American- a person having origins in any of the black racial groups of Africa;
- Hispanic- a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture origin, regardless of race;
- Asian American- a person having origins in any of the original peoples of the Far East, South East Asia, the Indian subcontinent, or the Pacific Islands; and
- American Indian and Alaskan Native- a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.

"Low-income" applies to individuals whose median household income is at or below the income level set by the Department of Health and Human Services (DHHS) poverty guidelines. The poverty guidelines issued by the DHHS are abstracted from the original poverty thresholds updated each year by the US Census Bureau. In 1999, the year from which the most recent US Census income data are based, the poverty level was $8,240 for the first person and $2,820 for each additional person.

a. Minority Populations

As identified through the US Census data in ***Table III-2***, approximately 21 percent of the study area population is part of a minority group. This is below the average for Charles County (31 percent) and King George County (23 percent). Census Tract 8512, Block Group 2 (Maryland) has the highest minority population at 32 percent. This block group is located south/southeast of US 301. Census Tract 8513, Block Group 4 has the lowest minority population at 9 percent, located at the northeastern edge of the study area in Maryland.

b. Low-income Populations

The median household income for the study area ($49,849) is similar to that of King George County ($49,882), and less than that of Charles County ($62,199) (***Table III-4***). Approximately 6.4 percent of the study area reported income in 1999 below the poverty level. The study area average of population in poverty is greater than that of Charles County (5.4 percent) and King George County (5.8 percent).

Table III-4: *Household Income and Poverty Data*

Charles County, Maryland	$62,199	6,518	5.4%
King George County, Virginia	$49,882	917	5.8%
Study Area (average)	$49,849	707	6.4%
Census Tract 8511, BG 2	$50,625	142	14.9%
Census Tract 8512, BG 1	$47,417	8	0.8%
Census Tract 8512, BG 2	$39,219	66	5.4%
Census Tract 8513, BG 3	$72,742	238	6.6%
Census Tract 9901, BG 1	$49,961	97	5.8%
Census Tract 9901, BG 2	$48,594	110	7.1%
Census Tract 9901, BG 3	$40,385	46	4.6%

Source: US Census Bureau, 2000

The block group with the highest percentage of persons living below the poverty level is Census Tract 8511, Block Group 2 (Maryland) (***Figure III-1***), where 14.9 percent of the population lives below the poverty level. This block group is located along the northern edge of the study area. Census Tract 8512, Block Group 1, located immediately north of US 301 in Maryland, has the lowest population in poverty at 0.8 percent.

c. Additional Sources

In addition to Census data, further research was conducted through phone interviews with county planners in Charles and King George Counties. County planners were contacted regarding the locations of populations of minority or low-income persons that may exist within the delineated census blocks. In Charles County, one historically African-American and low-income community was identified on the eastern edge of the study area (Census Tract 8512, Block Group 2). In King George County, a cluster of homes were identified as potential low-income and/or minority households within the vicinity of the NSF Dahlgren, south of US 301 (Census Tract 9901, Block Group 2).

Although not specifically identified by Charles County planners, field reviews of the study area as well as public outreach have identified the Aqua-Land Campground as a low-income population (Census Tract 8512, Block Group 1). Many temporary or permanent residents at the campground are either unemployed or work sporadically.

For additional information regarding minority and low-income populations within the study area, please refer to the *Nice Bridge Improvement Project Socioeconomic and Land Use Technical Report* located on the attached CD.

d. Potential Effects on Environmental Justice

Based on the information provided by US Census data, Charles and King George Counties, field reviews conducted by the Authority, and the minimal community and residential impacts anticipated with each of the ARDS, none of the proposed alternates are expected to result in a disproportionately high and adverse effect to environmental justice populations. With the exception of the Aqua-Land Campground, none of these areas are located within the proposed limits of disturbance for any of the proposed alternates. The build alternates with a northern bridge alignment (Alternates 4, 5, and 7) would impact the Aqua-Land Marina and Campground property by moving the southbound lanes of US 301 closer to residents than the existing US 301 alignment. These alternates would not result in any displacements or noise impacts. Therefore, none of the alternates are expected to result in disproportionately high and adverse effects to environmental justice populations.

e. Title VI Statement

It is the policy of the Authority 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, or physical or mental handicap in all the Authority program projects funded in whole or in part by the Federal Highway Administration (FHWA). The Authority will not discriminate in highway planning, highway design, highway construction, right-of-way acquisitions, or the provision of relocation advisory assistance. This policy has been incorporated in all levels of the transportation planning process to ensure that proper consideration may be given to the social, economic and environmental effects of all transportation projects. Alleged discriminatory actions should be addressed for investigation to the Equal Opportunity and Diversity Division, to the attention of Mr. Louis Jones, Chief, Equal Opportunity and Diversity Division, Maryland Transportation Authority, 2310 Broening Highway, Suite 150, Baltimore, MD 21224.

4. Visual Quality

Summary: The addition of a new bridge with any of the build alternates would change the visual characteristics of the surrounding area. The new bridge could alter or partially obstruct views of the existing Nice Bridge from upstream or downstream portions of the Potomac River depending on the alternate location. The aesthetic characteristics of a new bridge and grade of a new bridge including the roadway grade would likely differ from the existing Nice Bridge.

The US 301 highway is a four-lane roadway with a median of varying sizes. The study area within Charles County contains residential areas surrounded by forest, and the Morgantown Generating Power Plant immediately south of the existing Nice Bridge. Some agricultural land is present in this area, as well. The residents located along the Potomac River and on high terrain can see the Nice Bridge, while those located further from the water have an obstructed view. Within King George County, views from NSF Dahlgren, residential subdivisions, and parkland are largely blocked from view with the exception of residents located along Roseland Road.

The Nice Bridge is a metal cantilever bridge, meaning that it was constructed using horizontal supports in the middle of the bridge, rather than supports at the ends. The bridge has a vertical clearance of 135 feet over the main ship channel of the Potomac River. The main span of the channel forms the highest point in the roadway, with 3.75 percent grade approaches. The bridge is a dominant feature in the visual landscape and is visible from a distance of several miles both up and downstream. The photos below illustrate the views of the Nice Bridge from the Maryland and Virginia shorelines and residential areas upstream.

Photo III-1:View of Nice Bridge from Aqua-Land Marina and Campground, in Charles County, Maryland, looking southwest.

Photo III-2: View of Nice Bridge from Roseland Road, in King George County, Virginia, looking southeast with the Morgantown Generating Station in the background.

The bridge and approach roadway characteristics would remain the same under Alternate 1 (No-Build), while each of the build alternates would alter the visual landscape by constructing a new bridge. The proposed typical section of the new bridge is the same for Alternates 2 and 4, which would provide a new two-lane bridge while maintaining the existing bridge. Alternates 3 and 5 would also have similar typical sections, as each would include the construction of two new two-

lane bridges (one in each direction), with one span replacing the existing bridge. Alternates 6 and 7 also propose a similar typical section, each including constructing a new four-lane bridge and taking the existing bridge out of service.

The addition of a new bridge would change the visual characteristics of the surrounding community. Although specific views would vary from property to property, the new bridge could alter or partially obstruct views of the existing Nice Bridge from upstream or downstream portions of the Potomac River since the grade of a new bridge would differ from the existing Nice Bridge.

Aesthetic treatments for a new Nice Bridge would be considered during bridge design if a build alternate is selected. If one of the build alternates is selected, aesthetic treatments could be incorporated into the ultimate design of the bridge to make it more visually pleasing to adjacent homes, businesses, and roadway commuters, and more consistent with the overall visual setting of the surrounding communities.

5. Economic Environment

Summary: The No-Build Alternate would affect local and regional business activities because of increased congestion and longer travel times for individuals that use the Nice Bridge, as well as decreased mobility on the regional roadway network that would not support planned economic growth in the region. The proposed build alternates would benefit local and regional business activity by reducing traffic delays and improving mobility. Alternates 4, 5, and 7 could adversely affect operations at NSF Dahlgren, a major employer in the region.

The following is a discussion of the economic environment within and adjacent to the Nice Bridge study area. For more detailed information, please refer to the Nice *Bridge Improvement Project Socioeconomic and Land Use Technical Report* located on the attached CD.

a. Employment Characteristics

Table III-5 shows median household, median family, and per capita income data for Charles County, King George County, and the study area. Within the study area, these characteristics are very similar to that of King George County, while lower than Charles County.

Table III-5: *Income Characteristics*

Characteristic	Charles County	King George County	Study Area[2]
Median Household Income (1999)[1]	$62,199	$49,822	$49,849
Median Family Income (1999)[1]	$67,602	$55,160	$55,901
Per Capita Income (1999)	$24,285	$21,562	$21,484

Source: US Census Bureau, 2000

[1] A household is defined by the US Census as a place (structure) where one or more persons reside on a regular basis. A family is defined as two or more persons related by birth, marriage, or legal adoption that occupy a place on a regular basis.

[2] Figures shown were determined by calculating the average of the Median Household Income or Median Family Income values for each census tract in the study area.

Based on US Census 2000 data, of the employed residents of Charles County, approximately 71 percent were employed within the State of Maryland (40.2 percent of those employed in Charles County, and 30.8 percent commuting to another Maryland county for work). Of the employed residents of King George County, approximately 88.1 percent worked within the Commonwealth of Virginia, with 54 percent working in King George County, and 34.1 percent commuting to another Virginia county for work. Approximately 84.3 percent of the residents within the study are employed in their home state of Maryland or Virginia, with 60.4 percent working within their county of residence, and 23.9 percent commuting to another county for work.

The top industries in Charles County, King George County, and the study area are presented in ***Table III-6***, along with unemployment rates.

Table III-6: *Employment Characteristics*

Characteristic	Charles County	King George County	Study Area
Primary Occupations of Residents	• Public Administration (18%) • Educational, Health, and Social Services (16%) • Retail Trade (12%) • Professional, Scientific, Management (11%) • Other (43%)	• Public Administration (21%) • Professional, Scientific, Management (13%) • Retail Trade (12%) • Other (54%)	• Public Administration (15%) • Retail Trade (13 %) • Educational, Health, and Social Services (18%) • Other (54%)
Percent of Labor Force Unemployed	2.3%	2.7%	2.3%

Source: 2000 Census Data

Two major employers in the area are NSF Dahlgren (over 1,300 employees) and the Morgantown Generating Plan (199 employees).

b. Effects on Local and Regional Business Activity

Alternate 1 (No-Build) would have a negative effect on local and regional business activities as increased congestion would lead to longer travel times for individuals that use the Nice Bridge. Travel demands in this area are expected to exceed the current capacity of the bridge by 2030, which would result in longer peak travel periods due to a lack of nearby options for crossing the Potomac River. The decreased mobility on the regional roadway network would not support planned economic growth in the region, and as a result, a decrease in the rate of new business development may occur. The No-Build Alternate would also affect existing businesses as increased traffic and congestion could limit the geographic base of a particular business, and customers could look to other more convenient options. Congestion and bridge closures for maintenance operations expected under the No-Build Alternate would also make commercial transport less predictable.

All of the proposed build alternates would benefit local and regional business activity by reducing traffic delays and improving mobility throughout the region. The improved mobility would support economic growth by maintaining the ability of residents and travelers along

US 301 to support local businesses, and make the area more desirable for future business ventures. The proposed improvements would also create more predictable travel times, which would benefit commercial transport fleets and freight delivery services.

Congestion and delays caused by Alternate 1 would affect operations at NSF Dahlgren by hindering transport of material critical to the facility and travel for employees who work there. Alternates 2, 3, and 6 would encroach upon the NSF Dahlgren property. The April 3, 2009 letter from the Department of Navy, Naval Support Activity South Potomac (***Appendix B***), states these alternates would be a "substantial and direct impact on NSF Dahlgren community and facilities…and the approximately 1,300 employees who work in this area of the installation."

Alternates 4, 5, and 7 would impact the Aqua-Land Marina and Campground, located immediately north of US 301 and the Nice Bridge in Charles County, but this impact would consist of a linear ROW strip take parallel to US 301, impacting an open gravel parking area. No buildings or structures on the Aqua-Land property would be impacted by the proposed alternates.

6. Land Use

Summary: The build alternates would result in the conversion of institutional, commercial, forested, and parkland to transportation use. However, the overall land use in the study area would not substantially change because the project is within an existing transportation corridor.

a. Existing and Future Land Use

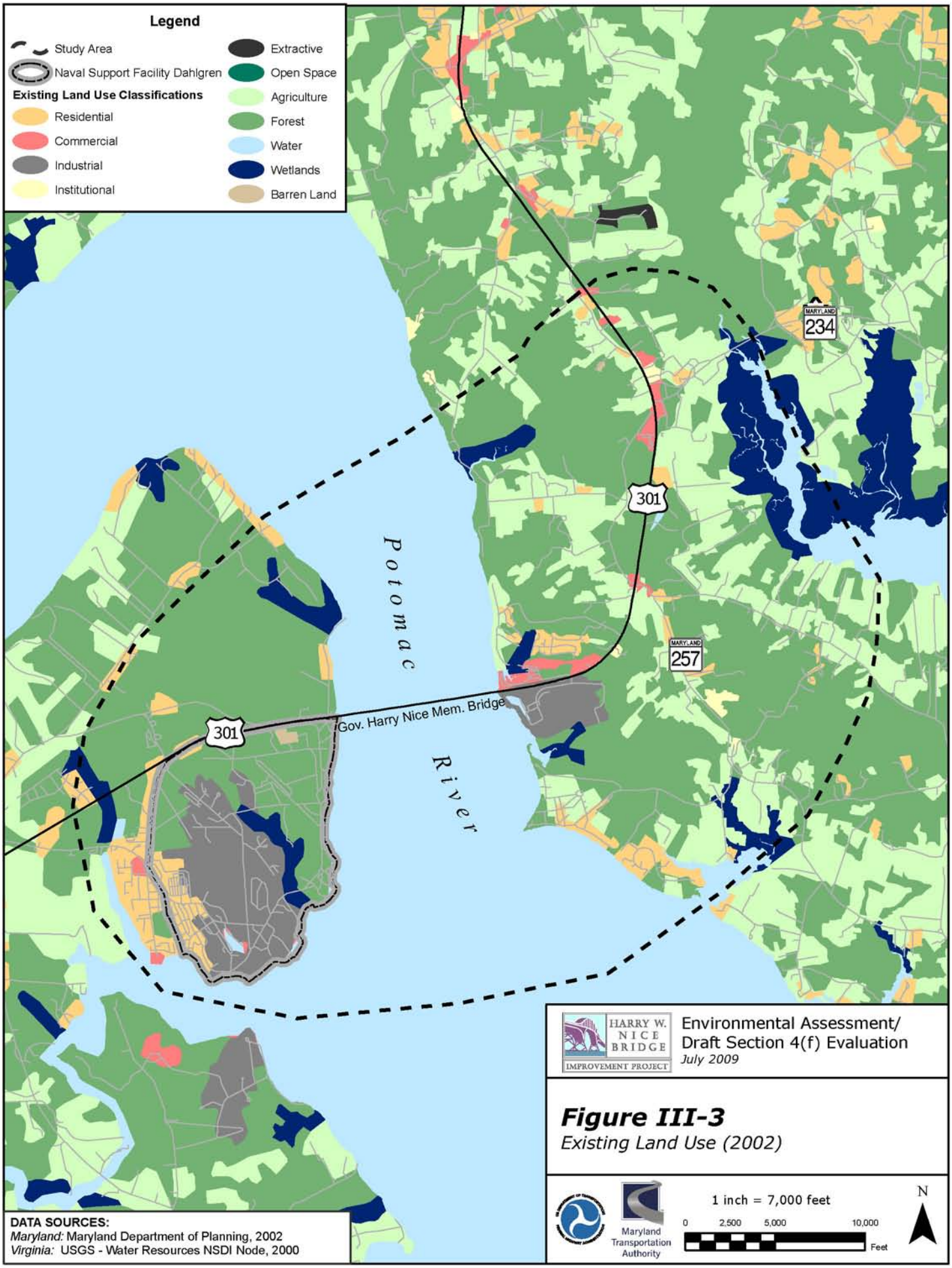
The existing land use for the study area was determined using land use/land cover maps generated by the Maryland Department of Planning (MDP) and King George County (***Figure III-3***). The study area encompasses approximately 16,981 acres of land, not including the Potomac River or other water bodies (***Table III-7***).

Table III-7: *Existing Study Area Land Use*

Land use Category	Acres	Percent
Forest	9,155	53.9%
Agriculture	3,537	20.8%
Industrial	1,432	8.4%
Wetlands	1,410	8.3%
Residential	1,150	6.8%
Commercial	215	1.3%
Institutional	82	0.5%
Total	16,981	100.0%

Source: MDP/King George County Mapping, 2002

The *2006 Charles County Comprehensive Plan* discusses the land use implementation strategies for the Maryland portion of the study area. According to this plan, US 301 is designated as a Highway Corridor District. This designation protects and improves the visual appearance along key highway corridors and ensures that buffering, landscaping, lighting, signage, and proposed structure are consistent and of a quality that contributes to the character of Charles County.


Legend
Study Area
Naval Support Facility Dahlgren
Existing Land Use Classifications
Residential
Commercial
Industrial
Institutional
Extractive
Open Space
Agriculture
Forest
Water
Wetlands
Barren Land
Potomac River
Gov. Harry Nice Mem. Bridge
301
301
MARYLAND 234
MARYLAND 257
DATA SOURCES:
Maryland: Maryland Department of Planning, 2002
Virginia: USGS - Water Resources NSDI Node, 2000
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-3
Existing Land Use (2002)
Maryland Transportation Authority
1 inch = 7,000 feet
0 2,500 5,000 10,000
Feet
N

South of US 301, future land use in the vicinity of the Nice Bridge is designated as an Employment and Industrial Park District. This designation reserves areas for development of employment or industrial clusters or parks. These districts are intended to provide locations for additional, upgraded, and diverse job opportunities for county residents. North of US 301, future land use in the vicinity of the Nice Bridge is designated as a Commercial and Business District. These districts are identified as areas where future commercial development should occur, typically in areas adjacent to existing commercial areas and major roads. Other portions of the study area in Charles County are designated as Agricultural Conservation Districts, where the County seeks to preserve the agricultural industry and land base necessary to support it. These districts are designed to prevent scattered, uncontrolled development over areas of open countryside.

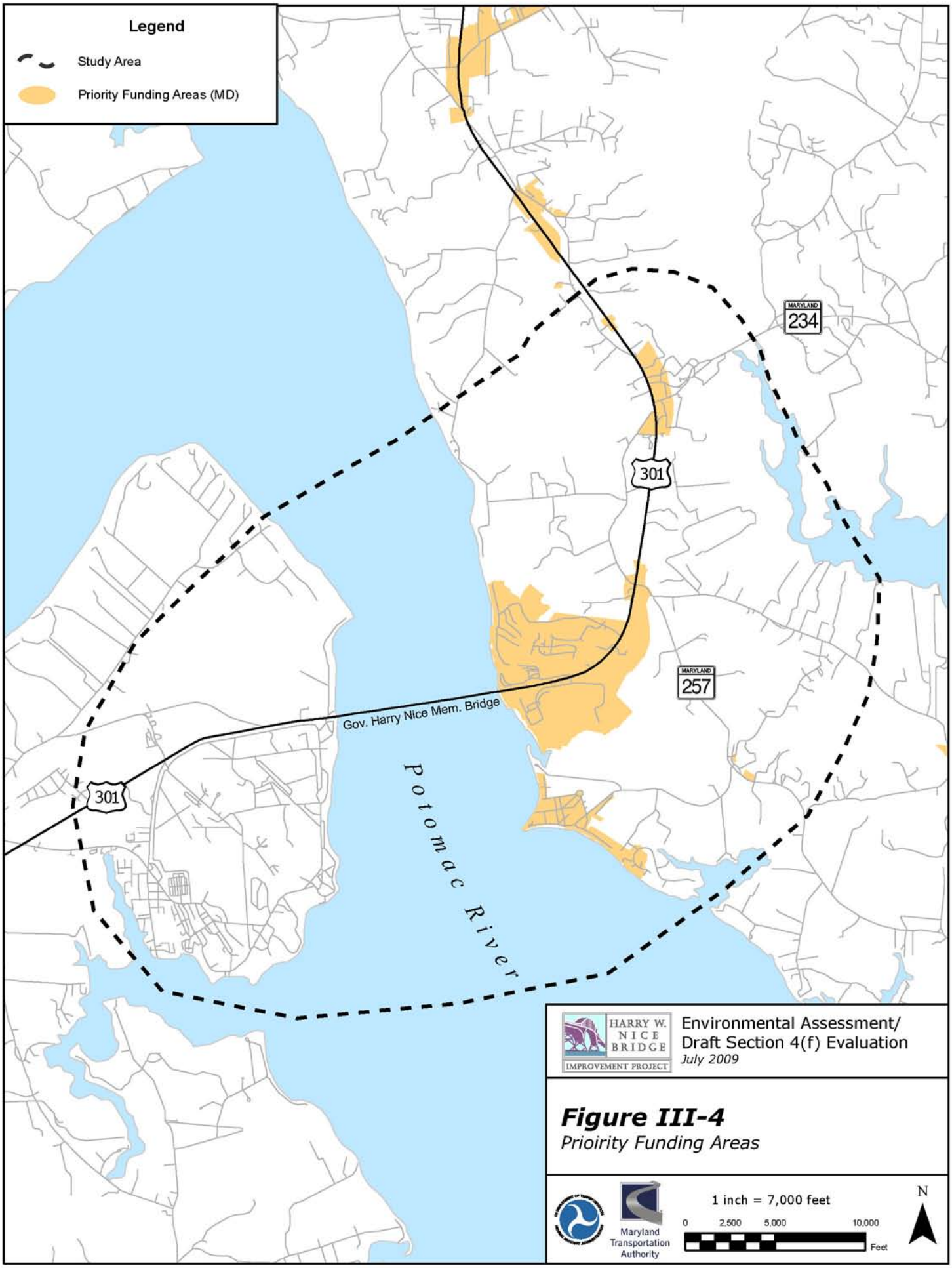
In the Virginia portion of the study area, the *King George County 2006 Comprehensive Plan* identifies the portions of the County within the study area as a mix of Rural Agricultural Districts and Retail Commercial Districts. Rural Agricultural Districts are intended to recognize the rural character of the County where a mixture of agricultural and low-density uses occur, and to permit additional development of a similar type, while closely controlling those activities that might be disruptive to farming and rural living. Generally, public water and sewer services are not planned for these districts. Retail Commercial Districts are intended to recognize existing light commercial uses, and to provide an opportunity to expand these and other retail opportunities within the county.

The 1997 Maryland General Assembly passed legislation known as the "Smart Growth and Neighborhood Conservation Act" (Smart Growth). Smart Growth directs the State of Maryland to target programs and funding to support established communities and locally designated growth areas, and to protect rural areas. A component of the Smart Growth legislation, the Priority Funding Areas (PFA) Act, provides a geographic focus for the State's investment in growth-related infrastructure by requiring all counties to identify and map PFAs that comply with the legislation. The remaining components complement this geographic focus by targeting specific State resources to preserve land outside PFAs, to encourage growth inside PFAs, and to ensure that existing communities continue to provide a high quality of life for their residents.

While the entire Nice Bridge study area is not located within a state-certified PFA, the proposed limits of disturbance in Maryland for each of the build alternates are located within a PFA (***Figure III-4***). Therefore, the project is consistent with the PFA law.

b. Potential Effects on Land Use

Alternate 1 (No-Build) would result in no change of land use within the study area. The build alternates would result in the conversion of commercial, forested, and parkland to transportation use, refer to ***Table S-1*** and ***Table III-3***. However, the overall land use in the study area would not be substantially affected because all changes in land use that would result from the build alternates would occur within an existing transportation corridor. None of the build alternates would affect local development patterns because they would not result in new access within the corridor. The build alternates would support planned growth and redevelopment within the corridor by accommodating projected traffic volume increases.


Legend
Study Area
Priority Funding Areas (MD)
MARYLAND
234
301
MARYLAND
257
Gov. Harry Nice Mem. Bridge
301
Potomac River
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-4
Prioirity Funding Areas
Maryland Transportation Authority
1 inch = 7,000 feet
0 2,500 5,000 10,000
Feet
N

B. HISTORIC PROPERTIES

Summary: The only historic structure that may be adversely affected by the project is the Nice Bridge, which includes the Potomac River Bridge Administration Building. There are no historic structures located in Virginia which may be affected by the project. Two archeological sites were identified in the Phase IA survey that warrant further investigation: the Barnesfield Plantation mansion and the Hooe family cemetery.

Historic properties include historic structures and archeological sites protected under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. Section 106 requires that prior to approval of a project by a federal agency, the agency must consider the project's effects on any district, site, building, structure, or object that is included on or eligible for inclusion in the National Register of Historic Places (NRHP).

Historic property surveys were conducted in accordance with the NHPA 36 Code of Federal Regulations (CFR) Part 800 – Protection of Historic Properties; EO 11593 – Protection and Enhancement of the Cultural Environment; and relevant guidelines from the Maryland Historical Trust (MHT) and the Virginia Department of Historic Resources (VA DHR).

Pursuant to Section 106, resources listed, eligible, or potentially eligible for the NRHP within the Area of Potential Effect (APE) have been identified and evaluated. Measures to minimize or mitigate adverse effects must be developed in consultation with the State Historic Preservation Officer (SHPO) and other interested parties and may be memorialized in a Memorandum of Agreement (MOA).

Six Section 106 consulting parties have accepted an invitation to participate on the project. These include: Charles County Department of Planning and Growth Management, Northern Neck of Virginia Historical Society, Maryland Commission on Indian Affairs, King George County Planning Commission, the Town of Colonial Beach, and Mr. David Rose.

1. Historic Structures

a. Description of Historic Structures

There are four resources within the Area of Potential Effect (APE) that are eligible for listing on the NRHP:

- Governor Harry W. Nice Memorial Bridge (CH-376);
- Lee Graves site (CH-181);
- Marshall's Rest (CH 140); and
- Raven's Crest (CH-164).

Based on preliminary evaluation of properties and potential effect, only the Nice Bridge may be adversely affected by the project. There are no historic structures located in Virginia which may be affected by the project.

In 2001, the Nice Bridge (CH-376) was determined eligible for listing in the National Register under Criterion A for its significance as a physical representation of Maryland's Primary Bridge Program. The Potomac River Bridge Administration Building (CH-376), which currently houses maintenance service offices for the Authority, is eligible for listing on the National Register under Criterion A as a contributing resource to the Nice Bridge. The Potomac River Bridge Administration Building was erected in 1940 to house the administration, security, maintenance, and toll facilities for the Nice Bridge.

Four separate historic districts within the Naval Surface Warfare Center, Dahlgren Laboratory (VA DHR ID# 048-0104) were previously determined eligible for listing on the National Register in 1994 under National Register Criterion A for its association with military history, and Criterion C for distinctive architecture. A reassessment of resources associated with NSF Dahlgren located to the south of US 301 is currently being undertaken by NSF Dahlgren staff. Based on available information, there are no significant historic structures or archeological sites that would be affected by the project. The Authority will continue to coordinate with NSF Dahlgren staff regarding potential effects to historic districts at the facility.

Additional information regarding historic structures within the study area can be found in the *Nice Bridge Improvement Project Determination of Eligibility Report for Maryland* and *Historic Resources Survey and Identification Report for Virginia* located on the attached CD.

b. Effects to Historic Structures

The effects to the Nice Bridge and associated Administration Building from each alternate are described below. It is likely that no other historic resources would be adversely affected by any of the proposed alternates.

Under the No-Build Alternate, the existing Nice Bridge (CH-376) would undergo minor short-term improvements as part of normal maintenance and safety operations, as well as scheduled rehabilitation in the 2015 – 2020 year timeframe. Rehabilitation of the bridge would include full deck replacement, complete cleaning and painting of bridge steel, and any repairs that may be needed to the super or substructure elements. Over time, these improvements may result in an adverse effect to the historic characteristics of the Nice Bridge.

Alternates 2 and 4 would include rehabilitating the existing Nice Bridge similar to the improvements required under Alternate 1; therefore it is likely that there would be an adverse effect to the Nice Bridge structure over time. Alternate 2 would also require approximately 0.1 acre of land from the historic boundary of the Administration Building; however, because there would be no impacts to the character defining features of the historic building, it is likely that there would be no adverse effect to the Nice Bridge property per Section 106 from Alternate 2. However, the realignment of US 301 approach roadway to the north under Alternate 4 would require the contributing Administration Building to be demolished, likely resulting in an overall adverse effect under this alternate.

Alternates 3 and 5 would include a new two-lane parallel bridge, and replacement of the existing Nice Bridge with a new structure. These activities would likely cause an adverse effect to the Nice Bridge. There likely would be 0.1 acre of impact to the Administration Building historic boundary.

Under Alternates 6 or 7, the construction of a new four-lane bridge parallel to the existing structure would occur. With these alternates, there are two scenarios for impacts to the Nice Bridge. Under the first scenario, the existing Nice Bridge would be taken out of service and then demolished, resulting in an adverse effect. Under the second scenario, the existing bridge would be taken out of service but would remain standing. Initially this scenario would likely result in no adverse effect to the historic character-defining features of the bridge. Over time, however, it would be an unreasonable public expenditure to maintain the bridge since it would serve no transportation function, and in the long term the structure would deteriorate. Thus, it is assumed (as a worst-case condition) for Alternates 6 and 7, this scenario would eventually result in an adverse effect on historic integrity through neglect. Alternate 6 would also require approximately 0.1 acre of land from the historic boundary of the Administration Building under both scenarios. With Alternate 7, the Administration Building would be demolished likely resulting in a permanent use of the historic property.

Although a formal effects determination has not been made, it is likely that all the alternates, including the No-Build, would result in an adverse effect to the Nice Bridge and/or the Administration Building.

2. Archeological Resources

Phase IA Archeological Assessments were conducted for both Maryland and Virginia. A formal Area of Potential Effects (APE) for archeological resources has not yet been determined for the Nice Bridge project. Therefore, for the purposes of the Phase IA background investigation and developing the historic context, a 2 to 2.5-mile radius around the proposed limits of disturbance of the alternates was used to review previous archeological surveys and identify previously recorded archeological sites.

a. Description of Archeological Resources

A total of 68 previously recorded resources were identified. In Maryland, a review of MHT files revealed that there are 34 previously identified archeological sites located within the 2-mile radius of the proposed limits of disturbance; no archeological resources were previously recorded within the 2-mile radius. In Virginia, VA DHR files revealed an additional 34 previously identified archeological sites located within a 2.5-mile radius of the limits of disturbance; one of these archeological resources (44KG171) was previously recorded within the study area.

Site 44KG171 is the site of the Barnesfield Plantation mansion and was originally within the area that is currently in Dahlgren Wayside Park. The original structure was built in the early eighteenth century (ca. 1715) and eventually burned by Union troops in 1861. Phase I archeological investigations in 1998 resulted in the recovery of over 700 artifacts, with the assemblage including both domestic and architectural materials. A variety of historic features were also encountered during this survey. These features ranged from brick architectural

foundations and a possible walkway to deeper and as yet undetermined features, possibly representing former wells, privies, or trash pits associated with the Barnesfield Mansion complex.

Although not a previously recorded archeological site, the location of the former Hooe family cemetery is also within the study area. The location of the cemetery space is thought to be east of the Roseland Road/US 301 intersection. Although the cemetery was relocated in the 1940s, it cannot be determined with full certainty that all of the individuals were disinterred. As such, there is the possibility that there are extant human remains still located at the site.

The Phase IA Archeological Assessment has also identified a variety of pre-contact (archeological remains of indigenous societies before contact with Europeans and resulting written records) and historic resources within and around the study area. Given the abundance of previously recorded prehistoric sites within a 2.5-mile radius, the probability that additional resources exist within the study area is considered high. This assessment is based on an evaluation of the physical characteristics of known site locations and the delineation of such settings within the study area.

b. Potential Effects

Based on the findings of the Phase IA Archeological Assessment, a full Phase I Archeological Survey is being conducted. Because the exact location and boundaries of the previously recorded sites are not fully defined, additional archeological investigations are necessary to determine if these or any other archeological resources may be impacted by the project. Although a formal effects determination has not been made, it is likely that all the alternates, including the No-Build, would result in an adverse effect to the Nice Bridge and/or the Administration Building. The Phase I survey is identifying whether there are archeological deposits within the project's limits of disturbance which require further, more detailed studies. If appropriate, these detailed investigations would involve a Phase II survey (following identification of a preferred alternative) to determine the extent and character of archeological sites that may be eligible for the National Register.

Coordination with NSF Dahlgren indicates there is the potential for unexploded ordnances (UXOs) in portions of the study area. Land-based archeology and UXO investigations will begin Summer 2009; however, investigations in the open water of the Potomac River will be initiated prior to construction, should a build alternate be selected. Additional information regarding archeological resources within the study area can be found in the *Nice Bridge Improvement Project Phase IA Archeological Assessments for Maryland and Virginia* located on the attached CD.

C. NATURAL ENVIRONMENTAL RESOURCES

This section presents the natural environmental resources in the study area. The specific resources considered include: physiography/topography and geology; soils; waters of the US including wetlands; surface water and water quality; floodplains; shoreline erosion; groundwater;

aquatic habitat/wildlife; terrestrial habitat/wildlife; rare, threatened and endangered species; unique and sensitive areas; and critical area.

The discussion of the above resources within the study area includes:

- Summary: a review of the resource, results of the analysis by alternate, and any mitigation or follow-up that is required; this information is present in a text box for quick reference;
- Existing Conditions: environmental resources as they currently exists in the study area;
- Potential Impacts: analysis results, by resource, for the various alternates; and
- Avoidance, Minimization and Mitigation Measures: a preliminary discussion of potential mitigation measures for those impacts that are unavoidable.

1. Physiography/Topography and Geology

Summary: Elevation within the study area ranges from one foot to 130 feet (Maryland portion) and one foot to 25 feet (Virginia portion). The depths of the Potomac River range from one to 15 feet along the shorelines and up to 80 feet in the shipping channel. No effects to the geology in the study area are anticipated with any of the alternates. Minimal impacts and/or changes to topography are anticipated in the study area with any of the build alternates. A sediment and erosion control plan in accordance with Maryland and Virginia laws will be prepared prior to construction.

a. Existing Conditions

The study area is located entirely within the Coastal Plain Physiographical Province, and consists of nearly level, gently rolling and steep topography. Areas within the immediate vicinity of the existing Nice Bridge (both in Maryland and Virginia) are nearly level, with the majority of the higher elevations located north of US 301. Elevation within the study area ranges from one foot to 130 feet in the Maryland portion and one foot to 25 feet in the Virginia portion.

One geologic formation, the Calvert Formation (Tc), is located within the Maryland portion of the study area. The Calvert Formation consists of two members, Plum Point Marls and Fairhaven, which are mostly made up of inter-bedded dark fine-grained argillaceous sand, sandy clay, shell beds, and local silica-cemented sandstones. Other geologic units located within the Maryland side of the study area include Upland deposits (Qtu) of gravel and sand, and some silt and Lowland deposits (QI) of gravel, sand, silt and clay.

Coordination with the Virginia Department of Mines, Minerals and Energy - Division of Mineral Resources (VA DMME) indicates that the Virginia portion of the study area is principally underlain by unconsolidated silt, clay, sand, and gravel of the Sedgefield member of the Tabb formation. A recent study suggests that this formation has the potential to become acidic upon exposure at the surface, creating low pH runoff and causing premature failure of concrete and metal structures.

According to the *NOAA Potomac River: Lower Cedar Point to Mattawoman Creek Datum*, the depths of the Potomac River along the Maryland shoreline range from one to 15 feet. Similarly, depths along the Virginia shore are approximately four feet, increasing to depths of 15 feet as it slopes closer to the channel. Greater depths of ten to 15 feet are common closer to the shipping

channel on the eastern portion of the Potomac, with some depths reaching 80 feet. The substrate of the Potomac River channel and side slopes consist of "firmer muds and clays of moderate to high compaction, locally mixed with sand and other deposits" (Lippson et al. 1979, folio map 3).

b. Potential Effects

No effects to the geology in the study area are anticipated with the No-Build or build alternates. Other impacts could include an increase in erosion and acid runoff due to surface exposure in Virginia. The exposure of acidic conditions may result in negative effects to surface water quality and aquatic life. However, these potential impacts would be minimal as the majority of earthmoving would involve fill materials with limited cutting and excavation. Coordination with the VA DMME regarding the effect of existing geology on the build alternates will continue throughout the project design process.

Impacts to physiography/topography are not anticipated with the No-Build Alternate. Changes to topography are anticipated in the study area with any of the build alternates. If dredging activities are necessary for the construction of a new bridge, permanent changes would occur to the morphology (i.e., form and structure) of the Potomac River bottom, thereby affecting bathymetry (i.e., water depths) in the study area.

The build alternates could potentially affect the local topography from the earthmoving required along the shoreline and/or in the Potomac River, as well as the construction of earth berms to support roadway approaches. In addition, unpredictable changes in micro-topography could result in minor localized changes in shallow groundwater movement. These effects should be minimal and would be offset by proposed stormwater management (SWM) facilities.

c. Avoidance, Minimization and Mitigation Measures

A Erosion and Sediment Control Plan (ESCP) would include measures to prevent erosion in highly susceptible areas. It would be prepared and implemented in accordance with Maryland Department of the Environment (MDE) regulations. Sedimentation into streams would be controlled through the use of sediment traps and basins. In Virginia, construction of a new bridge, approach fills and site grading, will be conducted in accordance with Virginia Erosion and Sediment Control Law and Regulations (Title 10.1, Chapter 5, Article 4).

2. Soils

Summary: There are Prime Farmland Soils and Soils of Statewide Importance within the study area. The build alternates would displace Prime Farmland Soils and Soils of Statewide Importance in Virginia through erosion and sedimentation. Alternate 6 has the least amount of impacts with 4.6 acres, while Alternate 7 impacts has the largest (8.2 acres). Coordination with the Natural Resources Conservation Service will continue throughout the project regarding effects to Prime Farmland and Statewide Important Soils. A sediment and erosion control plan in accordance with Maryland and Virginia laws will be prepared prior to construction.

a. Existing Conditions

There are 35 soil series and 78 mapping units within the Nice Bridge study area. Additional information regarding the soil types found within the study area can be found in the *Nice Bridge Improvement Project Natural Environmental Technical Report* located on the attached CD.

Prime Farmland Soils are defined as "having the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops" (NRCS 1984). Soils of Statewide Importance are defined as "having early Prime Farmland quality and that economically produce high yields of crops when treated and managed according to acceptable methods" (NRCS 1984). ***Figure III-5*** illustrates the soil mapping units within the immediate vicinity of the build alternates.

b. Potential Effects

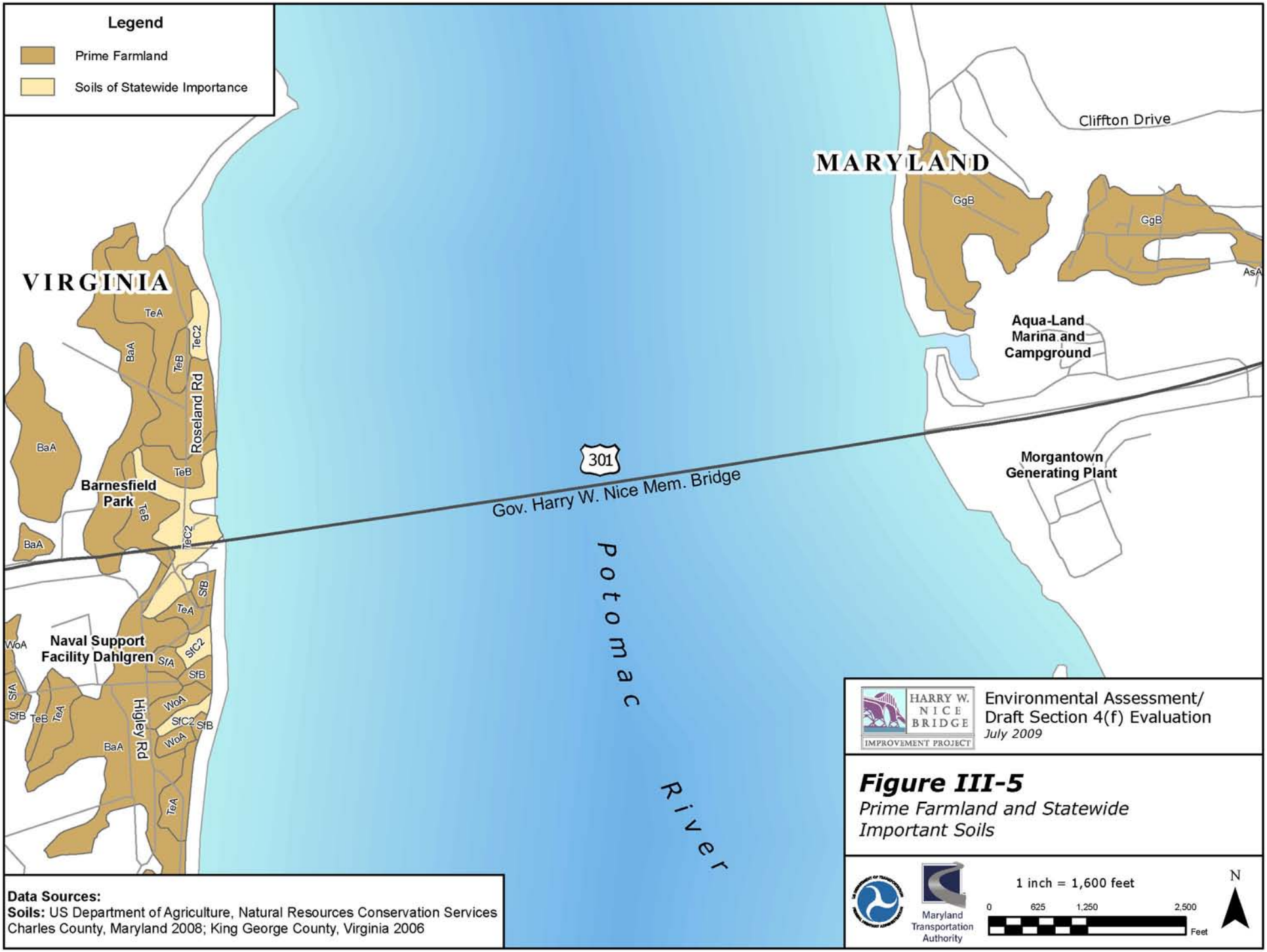
The No-Build Alternate would not result in any additional erosion and sedimentation. All of the build alternates would affect soils through earthmoving primarily by erosion and subsequent sedimentation and spoil storage during the construction phase. Each of the build alternates would impact Prime Farmland Soils and Soils of Statewide Importance in the Virginia portion of the study area only. Alternate 7 (both with and without the bicycle/pedestrian path option) would have the largest impact Prime Farmland and Soils of Statewide Importance with 8.2 acres. Alternates 6 would impact the least amount of Prime Farmland/Soils of Statewide Importance (approximately 4.6 acres for both with and without the bicycle/pedestrian path option). Please refer to ***Appendix H***, for the AD 1006 form submitted to Natural Resources Conservation Service (NRCS), pursuant to Farmland Protection Policy Act (FPPA).

Any erosion would be primarily caused by removal of existing vegetation, leading to increased exposure of soils to weather and runoff potential. Sites where surface water causes erosion, particularly along Potomac River shorelines, would have the greatest potential for erosion and sedimentation.

c. Avoidance Minimization and Mitigation Measures

Construction of any of the build alternates would require consideration of certain soils, such as unstable or erodible soils, to determine compatibility with roadway and bridge construction. In addition, an ESCP would be developed and administered in order to minimize the soil erosion associated with unstable and erodible soils. In Maryland, the ESCP would be prepared during final design in accordance with the guidelines provided by MDE. It would include erosion and sediment control devices such as sediment traps, silt fences, sedimentation basins, interception channels, or seeding and mulching to minimize the impacts of soil erosion. Pre-design permeability testing would be needed within the vicinity of the roadway approaches to determine the effectiveness of infiltration as a SWM technique.

In Virginia, the ESCP will be prepared in accordance with VA DCR Erosion and Sediment Control (ESC) Handbook which outlines basic ESC concepts, ESC measure design, installation and maintenance, plan review procedures and administrative guidelines to support compliance with the appropriate ESC laws and regulations. The plan will also be developed to comply with King George County ESC requirements.


Legend
Prime Farmland
Soils of Statewide Importance
MARYLAND
VIRGINIA
Cliffton Drive
GgB
GgB
AsA
Aqua-Land Marina and Campground
Morgantown Generating Plant
301
Gov. Harry W. Nice Mem. Bridge
Potomac River
Roseland Rd
Barnesfield Park
Naval Support Facility Dahlgren
Higley Rd
TeA
BaA
TeB
TeC2
SfB
SfA
SfC2
WoA
Data Sources:
Soils: US Department of Agriculture, Natural Resources Conservation Services Charles County, Maryland 2008; King George County, Virginia 2006
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-5
Prime Farmland and Statewide Important Soils
Maryland Transportation Authority
1 inch = 1,600 feet
0
625
1,250
2,500
Feet
N

3. Waters of the US including Wetlands

Summary: Any of the build alternates would result in impacts to Waters of the US, wetlands and tidal open water. The total stream impacts range from 2,420 to 3,663 linear feet. The total wetland impacts range from 0.1 to 0.7 acre. Tidal open water impacts to the Potomac River would result from dredging and installing bridge piers. Coordination, approvals, and permits will continue with USACE, US Coast Guard, MD DNR, MDE, VDEQ, and VMRC. In accordance with the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources, a Compensatory Mitigation Plan (CMP) has been prepared, please refer to Appendix D.

a. Existing Conditions

Wetland identification and delineation efforts for the project were conducted within 250 feet of the centerline for each build alternate in accordance with the *US Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y-87-1* (US Army Corp of Engineers Waterways Experiment Station, 1987). The wetland delineations for the Maryland and Virginia portions of the study area were conducted in November 2005 and December 2007, respectively. A portion of the Maryland delineation was initially conducted separate from the Nice Bridge Improvement Project, as part of the Nice Bridge Toll Plaza Improvement Study. The identified wetlands in the Maryland portion of the study area were reviewed by the regulatory agencies in 2006 and a Jurisdictional Determination (JD) was issued.

On June 2, 2008, the USACE provided an approved JD on the wetlands and Waters of the US (WUS) in the Virginia portion of the study area that are included in the *Governor Harry W. Nice Memorial Bridge Improvement Project Wetland Delineation* which is located on the attached CD.

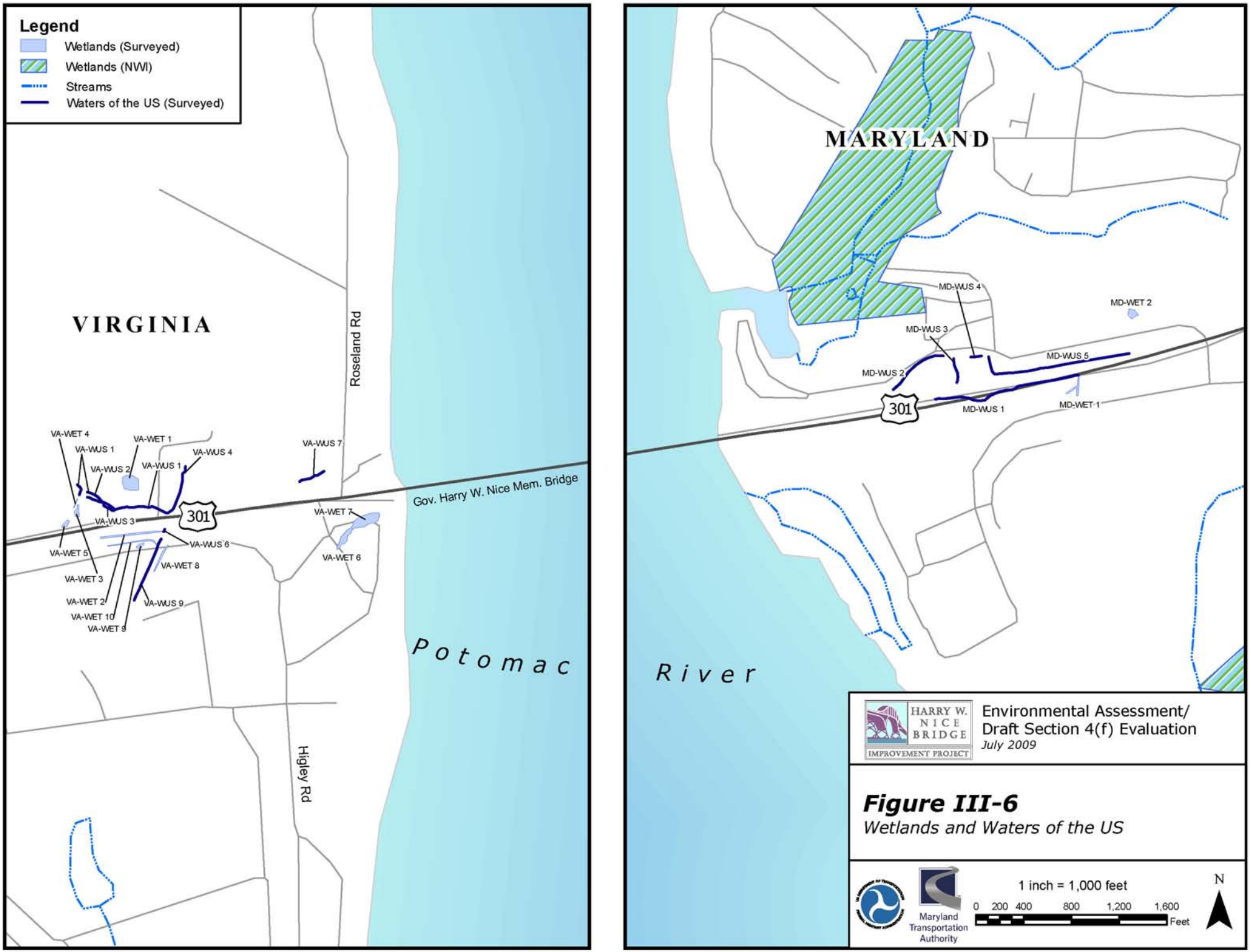
Maryland

A total of seven wetlands or waterways are located within the Maryland portion of the Nice Bridge study area (***Figure III-6 and Appendix D***). Five of the systems are classified as WUS, specifically as ephemeral drainage ditches. Two systems are classified as a vegetated wetland, one palustrine forested and one palustrine emergent. The mainstem of the Potomac River, not included as part of the Maryland November 2005 delineation, is also considered a tidal open water resource within the study area.

Virginia

A total of 17 wetlands or waterways are located within the Virginia portion of the Nice Bridge study area (***Figure III-6 and Appendix A***). The majority of the wetlands or waterways are located near the entrance to Barnesfield Park or within the NSF Dahlgren property. Seven of the 17 systems are classified as WUS and are either ephemeral or intermittent stream channels. There are ten vegetated wetland systems with five classified as palustrine forested, four as palustrine emergent, and one as estuarine emergent.

The US Department of Navy provided detail on one particular wetland system within NSF Dahlgren property, the “Kitts Marsh” wetland, located in the northeast corner of the facility. This two-tiered wetland was constructed in the late 1990s to improve water quality and enhance


Legend
Wetlands (Surveyed)
Wetlands (NWI)
Streams
Waters of the US (Surveyed)
VIRGINIA
MARYLAND
Roseland Rd
Higley Rd
Gov. Harry W. Nice Mem. Bridge
301
Potomac River
VA-WET 1
VA-WET 2
VA-WET 3
VA-WET 4
VA-WET 5
VA-WET 6
VA-WET 7
VA-WET 8
VA-WET 9
VA-WET 10
VA-WUS 1
VA-WUS 2
VA-WUS 3
VA-WUS 4
VA-WUS 6
VA-WUS 7
VA-WUS 9
MD-WET 1
MD-WET 2
MD-WUS 1
MD-WUS 2
MD-WUS 3
MD-WUS 4
MD-WUS 5
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-6
Wetlands and Waters of the US
Maryland Transportation Authority
1 inch = 1,000 feet
0 200 400 800 1,200 1,600
Feet
N

wildlife habitat. Additional stormwater management features have been constructed above Kitts Marsh that now provide enhanced treatment of stormwater originating from a portion of NSF Dahlgren. Approximately 45 percent of that acreage is impervious surface. Kitts Marsh offers a valuable source of habitat and provides a vegetated visual buffer and wildlife viewing area for base employees. In addition, Kitts Marsh serves as an outdoor classroom where NSF Dahlgren staff instructs local students on water quality and habitat management.

b. Potential Effects

Impacts to WUS, including wetlands, are shown for each of the alternates in ***Table III-8***. Alternate 1 (No-Build) would not impact any WUS or wetlands. The anticipated WUS and wetland impacts from the build alternates would result from dredging, placing pilings in the Potomac River, fill needed for roadway embankments, and construction of bridge abutments. Additional activities that may impact WUS and wetlands include stormwater management and temporary construction-related activities.

Table III-8: *Impacts to Wetlands and Waters Within the Study Area Without (and With) Bike/Ped Path Options*

State	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Stream (WUS) Impacts (linear feet)							
MD	0	2,390 (2,390)	2,390 (2,390)	3,370 (3,370)	3,370 (3,370)	2,370 (2,370)	3,370 (3,370)
VA	0	90 (90)	110 (110)	270 (270)	300 (300)	50 (50)	300 (300)
Total	**0**	**2,480 (2,480)**	**2,500 (2,500)**	**3,640 (3,640)**	**3,670 (3,670)**	**2,420 (2,420)**	**3,670 (3,670)**
Wetland Impacts (acres)							
MD	0	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)
VA	0	0.6 (0.6)	0.6 (0.6)	0 (0)	0.1 (0.1)	0.6 (0.6)	0 (0)
Total	**0**	**0.7 (0.7)**	**0.7 (0.7)**	**0.1 (0.1)**	**0.2 (0.2)**	**0.7 (0.7)**	**0.1 (0.1)**
Tidal Open Water Impacts: Potomac River (acres)							
Piers	0	0.3 (0.4)	0.7 (0.7)	0.3 (0.4)	0. 7 (0.7)	0.5 (0.6)	0.5 (0.6)
Dredging	0	61 (62)	85 (88)	62 (63)	85 (89)	67 (68)	65 (67)

The anticipated permanent tidal open water impacts to the Potomac River bed from installation of bridge piers are estimated to range from 0.3 acre (0.4 acre with bike/ped path option) with Alternates 2 and 4 to 0.7 acre (with and without bike/ped path option) with Alternates 3 and 5. Tidal open water impacts anticipated with dredging the Potomac River range from 61 acres (62 acres with bike option) under Alternate 2 to 85 acres (89 with the bike/ped path option) under Alternate 5. The Kitts Marsh wetland (within NSF Dahlgren) would be negatively impacted by Alternates 2, 3 and 6.

c. Avoidance, Minimization, and Mitigation Measures

In accordance with federal and state regulations, avoidance and minimization measures to reduce impacts to wetlands and other WUS are being implemented. During final design, the construction methods and the temporary impacts of construction and demolition (if needed) would be determined. Temporary impacts could result from the following activities: clearing for

a ten to twenty acre staging area near the river, a dredge material disposal site, transport of demolition and dredge material by barge or truck, cofferdams, a barge berthing/loading area along the shoreline, temporary construction haul roads, and utility relocations. The temporary impacts would be quantified in the various permit applications. These efforts will continue once a preferred alternate has been identified to further avoid and minimize impacts.

Impacts to the Potomac River would require a Maryland tidal license/permit and would need to be presented to the State Board of Public Works. Since the Potomac River is considered a navigable waterbody, permitting would require compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act and would require a US Coast Guard Permit. Impacts to Maryland nontidal and/or tidal wetlands may require a Maryland Nontidal Wetlands Permit, a Section 401 Water Quality Certificate, a Waterway Construction Permit from the MDE, a Section 404 permit from the USACE for the discharge of dredged or fill material into WUS, including wetlands. Impacts to Virginia nontidal and/or tidal wetlands may require Virginia Water Protection Permit, a Section 401 Water Quality Certificate, a Virginia Marine Resources Permit, a Section 404 permit from the USACE.

In accordance with the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (33 U.S.C 332), the Authority prepared a Compensatory Mitigation Plan (CMP) (***Appendix D***). The CMP identifies appropriate sites for mitigation in Maryland, and proposes use of a bank site in Virginia. The CMP includes a monitoring plan and management plan for the Maryland site to ensure regulatory requirements are met for mitigation site success.

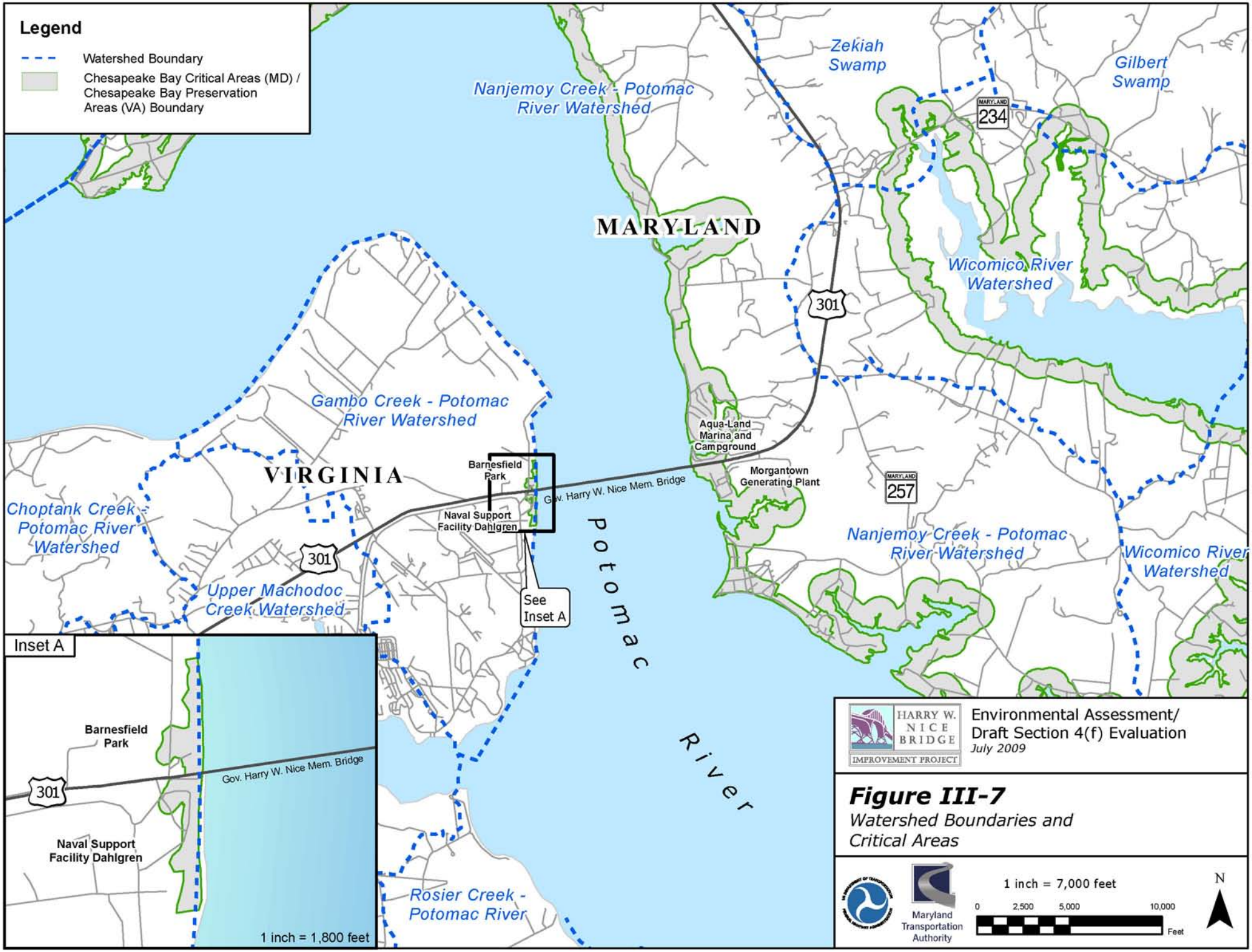
4. Surface Water and Water Quality

Summary: All of the build alternates have the potential to affect the surface water quality in the study area. Construction impacts may include increased turbidity due to sedimentation from erosion or dredging activities, pollution from disturbed sediments, and runoff from impervious surfaces. As the project progresses through planning and design, minimization measures will be further evaluated.

a. Existing Conditions

The Lower Potomac River Watershed (Federal HUC 02070011) drains the entire study area. The Lower Potomac River Watershed includes the tidal reach of the Potomac River Basin, extending from Little Falls near Chain Bridge in Washington, DC to the Potomac River's mouth at the Chesapeake Bay. In the Maryland subwatershed Nanjemoy Creek and the subwatershed Gambo Creek in Virginia are in the immediate vicinity of the Nice Bridge (***Figure III-7***). This section describes the general watershed characteristics, water quality, Total Maximum Daily Loads (TMDL), and other surface water characteristics within the Lower Potomac River Watershed.

MDE established standards for several stream water quality parameters based on their use classification (Code of Maryland Regulations (COMAR) 26.08.02.03-3 - *Water Quality*). The Potomac River is classified as Use II (supports estuarine and marine aquatic life and shellfish harvesting), and all tributaries from the Potomac River in Maryland are classified as Use I (water contact recreation and protection of aquatic life).


Legend
Watershed Boundary
Chesapeake Bay Critical Areas (MD) / Chesapeake Bay Preservation Areas (VA) Boundary
Zekiah Swamp
Gilbert Swamp
Nanjemoy Creek - Potomac River Watershed
MARYLAND
234
Wicomico River Watershed
301
Gambo Creek - Potomac River Watershed
Aqua-Land Marina and Campground
VIRGINIA
Barnesfield Park
Gov. Harry W. Nice Mem. Bridge
Morgantown Generating Plant
257
Choptank Creek - Potomac River Watershed
Naval Support Facility Dahlgren
Nanjemoy Creek - Potomac River Watershed
Wicomico River Watershed
301
Upper Machodoc Creek Watershed
See Inset A
Potomac River
Inset A
Barnesfield Park
Gov. Harry W. Nice Mem. Bridge
301
Naval Support Facility Dahlgren
Rosier Creek - Potomac River
1 inch = 1,800 feet
HARRY W. NICE BRIDGE IMPROVEMENT PROJECT
Environmental Assessment/ Draft Section 4(f) Evaluation
July 2009
Figure III-7
Watershed Boundaries and Critical Areas
Maryland Transportation Authority
1 inch = 7,000 feet
0 2,500 5,000 10,000
Feet
N

A Total Maximum Daily Loads (TMDL) is an estimate of the maximum amount of a pollutant, from point and non-point sources, that a waterbody can absorb without violating ambient water quality standards (MDE 2007). Both Maryland and Virginia have placed portions of the tidal Potomac River on their 303(d) Impaired Waters Lists, in compliance with the US Environmental Protection Agency (US EPA) Clean Water Act (CWA), for polychlorinated biphenyl (PCB) contamination. In some cases, PCB concentrations in the Potomac River and its tributaries exceeded state standards and requiring fish advisories to be issued.

The Virginia Department of Environmental Quality (VA DEQ) is in the process of developing bacterial TMDLs for three impairments. Gambo Creek subwatershed was identified in the 1998 303(d) list with these impairments.

A Tributary Strategy Team was appointed by Maryland Department of Natural Resources (MD DNR) for all of Maryland's watersheds, including the Potomac River, to help achieve reductions in nitrogen, phosphorus, and sediment to the Chesapeake Bay and its tributaries. This strategy team establishes nutrient criteria and goals for the Potomac River and its tributaries. Several water quality monitoring sites are located within the vicinity of the Nice Bridge study area, including one monthly fixed station at the existing Nice Bridge (Maryland).

According to the Maryland-designated Wild Scenic Rivers List, the Potomac River is only partially listed (within Montgomery and Frederick Counties only). Therefore, there are no wild or scenic rivers or their tributaries located within the study area.

b. Potential Effects

Alternate 1, the No-Build Alternate, is expected to have no effect on the surface water quality within the Lower Potomac River Watershed. All of the build alternates have the potential to affect the surface water quality in the study area with construction of a new bridge and roadway approaches. Construction impacts may include increased turbidity due to sedimentation from erosion or dredging activities, pollution from disturbed sediments, and runoff from impervious surfaces. Impacts to water quality during dredging and in-water demolition could include a temporary increase in turbidity, and potential release of nutrients and contaminants from bottom sediments. Several sources of PCB are associated with roadways within the Lower Potomac River Watershed, but these are minimal and incorporated into the TMDL plan for urban stormwater sources of PCB. A summary of the water quality monitoring results can be found in the *Nice Bridge Improvement Project Natural Environmental Technical Report* located on the attached CD.

c. Avoidance and Minimization Measures

Avoidance is not possible due to the width of the Potomac River. As the project progresses through planning and design, minimization measures will be further evaluated. Minimization efforts for the Potomac River and adjacent streams will address both direct and indirect impacts. Water quality minimization measures will primarily focus on modifications to dredging, bridge construction, and demolition activities. Minimization techniques for direct effects on waters may

include:

- Steeper roadway embankments;
- Fewer pilings (i.e., longer spans);
- Stormwater management controls;
- Erosion and sediment control procedures; and,
- Implementation of Best Management Practices (BMPs).

For Class I surface waters, in-stream work may not be conducted from March 1 through June 15, inclusive, during any year. Long-term impacts to water quality will be minimized to the extent possible through the use of MDE and VA DCR approved SWM plans.

5. Floodplains

Summary: The 100-year floodplains in the study area are along the Potomac River and adjacent tributaries. The build alternates have the potential to impact floodplains, with Alternates 4, 5 and 7 having the most impacts. Any construction within the 100-year floodplain would require a permit from the Maryland Department of Environment and coordination with the Virginia Department of Conservation and Recreation.

a. Existing Conditions

The 100-year floodplains were identified within 1,000 feet of the alternates using the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) and floodplain studies. The FEMA designated 100-year floodplains within the Maryland portion of the study area occur along the Potomac River and several tributaries, including Cliffton Creek, Popes Creek, Bunker Hill Branch, and Waverly Creek. Cliffton Creek and Popes Creek are located approximately 1,000 and 3,000 feet north of the Nice Bridge, respectively. Bunker Hill Branch and Waverly Creek are located approximately 4,000 and 6,000 feet south of the Nice Bridge, respectively. In Virginia, the 100-year floodplain occurs along Gambo Creek and the Potomac River. Refer to ***Appendix A*** (Alternates Plates) for the 100-year floodplains along the Maryland and Virginia shores related to the alternates.

Additional information on floodplains is located in the *Nice Bridge Improvement Project Natural Environmental Technical Report* located on the attached CD.

b. Potential Effects

The significance of floodplain encroachment was evaluated with respect to the criteria in Executive Order 11988 (Floodplain Management) and US DOT Order 5650.2. Floodplain encroachments were also analyzed according to the Federal Aid Highway Program Manual, which recommends that longitudinal encroachment (encroachment that parallels the stream channel) be avoided whenever possible. Project alternates are not configured in such a manner that major longitudinal floodplain encroachments would occur. The majority of floodplain encroachments would be from transverse crossings for each of the alternates (encroachment from roadway development that crosses the valley widths of floodplains). ***Table III-9*** presents the potential encroachment into FEMA-designated 100-year floodplains for each alternate. Floodplain impacts are estimated fill areas associated with the construction of the Nice Bridge project. Final impacts to the 100-year floodplain will be determined based on hydrologic and hydraulic modeling, during design of floodplain crossing structures.

Table III-9: *Floodplain Impacts by Alternate Without (and With) Bike/Ped Path Options*

Alternates	Floodplain Impacts (acreage)		
	Maryland	***Virginia***	***Total***
Alternate 1 – No-Build	0 (0)	0 (0)	**0 (0)**
Alternate 2	3.3 (3.4)	2.7 (2.9)	**5.9 (6.3)**
Alternate 3	4.7 (4.8)	3.0 (3.1)	**7.7 (7.8)**
Alternate 4	6.5 (6.6)	1.6 (1.8)	**8.1 (8.4)**
Alternate 5	6.6 (6.7)	1.9 (2.0)	**8.5 (8.7)**
Alternate 6	3.4 (3.4)	3.0 (3.1)	**6.4 (6.5)**
Alternate 7	6.7 (6.7)	1.8 (1.8)	**8.4 (8.6)**

Alternate 1 (No-Build) would not result in any floodplain impacts. All of the build alternates would result in impacts to 100-year floodplains along the Potomac River. Alternate 7 would impact floodplains the most, 8.4 acres (8.6 acres with the ped/bike path option). An increase in impervious cover from a new bridge or bridges and approach roadways may cause additional drainage forces, specifically related to a storm event, to erode adjacent floodplains.

c. Avoidance, Minimization and Mitigation Measures

Efforts to minimize impacts to 100-year floodplains are ongoing, and will continue throughout the planning and design process. Longitudinal crossings have been avoided because they would result in more floodplain fill, reducing conveyance and floodplain storage. Any construction within the 100-year floodplain would require a Waterway Construction Permit from MDE. To ensure that floodwater impacts due to roadway construction are minimized, drainage structures are required to maintain the current flow regime and prevent associated flooding (COMAR 26.17.04).

Minimization and mitigation efforts to impacted 100-year floodplains may also include:

- Extending new bridge spans over the 100-year floodplain;
- Reducing encroachments by using 2:1 minimum slopes for roadways; and
- Building retaining walls where applicable.

As part of the MDE Waterways Construction Permit application process, hydrologic and hydraulic studies would be performed for the preferred alternate to determine the effects of the proposed roadway fill on floodplain elevations once in the design phase. In Virginia, VA DCR is responsible for coordination of all state floodplain programs.

6. Shorelines

Summary: Maryland and Virginia shorelines experience erosion; in some locations up to two feet per year. Dredging and/or vegetation removal necessary for the construction of a new bridge may increase the potential for shoreline erosion. The potential effects can be minimized through best management practices, an erosion and sediment control plan and by restoring the shore areas to existing condition following construction.

a. Existing Conditions

Approximately 11 percent, or 20 miles, of Charles County's shoreline (county-wide) experiences serious erosion rates of two feet per year or greater, particularly areas north of Popes Creek in Maryland. Portions of the Maryland shoreline adjacent to the existing Nice Bridge are protected

from erosion, slightly eroding (less than one foot per year) or slightly accreting (greater than foot per year). The Virginia portion of the Potomac River shoreline also experiences erosion and/or accretion. Some locations are eroding at a rate of approximately two feet per year, while other areas are experiencing rates of one foot of erosion per year. The Virginia shoreline adjacent to the existing bridge is not stabilized and is experiencing slow erosion.

b. Potential Effects

The No-Build Alternate (Alternate 1) would have no effect on shoreline erosion within the study area; erosion would be allowed to continue at its natural pace. Effects of the build alternates on the rate of shoreline erosion cannot be quantified. Dredging and/or vegetation removal necessary for the construction of a new bridge may increase the potential for shoreline erosion. Stabilized construction access and barge docking area may temporarily alter existing erosion and accretion patterns.

c. Avoidance, Minimization and Mitigation Measures

The potential of the build alternates to cause shoreline erosion cannot be predicted and therefore cannot be avoided. The potential effects can be minimized through best management practices and by restoring the shore areas to existing condition following construction. Minimization measures in both Maryland and Virginia will be included as part of the ESCP and temporary impact restoration permit conditions.

In the CMP for the project, the Authority is proposing to provide out-of-kind mitigation through shoreline stabilization and/or tidal marsh creation. Refer to ***Appendix D*** for additional information on the shoreline stabilization that is being proposed as mitigation for the project impacts.

7. Water Supply/Groundwater

Summary: The study area includes four aquifers in Maryland and eight aquifers in Virginia. Potential impacts from the build alternates would be similar and would be caused by runoff associated with the roadway approaches to a new bridge. Sediment and erosion control plans and stormwater best management practices implemented during construction would minimize changes in ground water quality.

a. Existing Conditions

Four major water-bearing aquifers underlie the Charles County portion of the study area. Sloping from west to east, they are the Patuxent, Patapsco, and Magothy formations of the Cretaceous system, and the Aquia Greenstone Formation of the Tertiary system. Replenishment of water in the underground aquifers is provided by precipitation falling in the outcropping area of the formation and filtering downward.

The *King George County 2006 Comprehensive Plan* lists eight aquifers and confining units located in the Fall Zone: Unconfined Aquifer, Nanjemoy – Marlboro Confining Unit, Aquia Aquifer, Middle Potomac Confining Unit, Middle Potomac Aquifer, Lower Potomac Confining Unit, Lower Potomac Aquifer, and Bedrock. Additional information on project area aquifers is located in the *Nice Bridge Improvement Project Natural Environmental Technical Report* located on the attached CD.

b. Potential Effects

Project-related effects to groundwater are not anticipated with the No-Build Alternate. Impacts from the build alternates would be minor because they would not involve substantial excavation into groundwater aquifers. Any excavation during construction may encounter and/or affect areas with shallow groundwater depths. These activities may increase the potential for contamination being introduced into the groundwater system. Once construction of the new bridge and approach roadways is complete, runoff from the roadways would be expected. Runoff conditions can also introduce undesirable materials, including solid particles and chemicals, into the water table by way of permeation.

c. Avoidance, Minimization and Mitigation Measures

Impacts to groundwater from bridge construction activities would be kept to a minimum through the implementation of BMPs, including stormwater management ponds and biofiltration systems. Both stormwater management ponds and biofiltration systems slow runoff velocities and filter out roadway contaminants, reducing the amount of contaminants entering streams, wetlands, and ultimately groundwater.

8. Aquatic Habitat and Wildlife

Summary: Primary impacts to aquatic biota from the build alternates would be impacts to stationary benthic organisms and fish mortality during construction of a bridge (including dredging) and demolition. All of the build alternates have the potential to affect the waterfowl concentration areas but direct impacts are unlikely. None of the alternates would affect SAV or oyster beds. Avoidance and minimization techniques will continue to be considered in the planning and design phases of the project.

a. Existing Conditions

Aquatic Biota

Aquatic biota diversity within the Lower Potomac River and its tributaries, include a wide range of fish, shellfish, benthic species, and algae. According to the *Environmental Atlas of the Potomac Estuary* (1979), the study area is located within the mid-estuary zone with salinities between the low to mesohaline regions (three to seven parts-per-thousand (ppt) and seven to ten ppt, respectively), depending on the time of year. Located in a mid-temperate zone, the Potomac River serves as the northern and southern most range limits for many aquatic species. Subsequently, the area around the Nice Bridge includes the presence of five different categories of fish: freshwater (non-tidal water), estuarine (tidal waters with low salinity), anadromous/semi-anadromous (live at sea, spawn in fresh water), marine (sea), and catadromous (live in fresh water, spawn at sea).

MD DNR has documented anadromous and semi-anadromous fish species spawning in many of the streams within the study area. The documented species include yellow perch (*Perca flavescens)*, white perch (*Morone americana*), herring species (*Alosa sp.*), and striped bass (*Morone saxatilis*). Other likely anadromous or semi-anadromous species present in the study area may include alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), hickory shad (*Alosa mediocris*), and gizzard shad (*Dorosoma cepedianum*). Some of the fish species

listed are found primarily in the mainstem of the Potomac River, where as others are typical of tidal and non-tidal tributaries to the Potomac River.

Marine fish species, typically present in the summer months, can be divided into two groups: estuarine-dependent and summer transient. The former requires that a portion of their life cycle occur within the estuary, acting mostly as a nursery. Species such as Atlantic menhaden *(Brevoortia trannus)* and bluefish (*Pomatomus saltatrix*) are considered estuarine-dependent. Summer transient species, such as cownose rays (*Rhinoptera bonasus*) or Atlantic needlefish (*Strongylura marina*), may periodically pass within the Potomac River in the summer where salinity levels are close enough to oceanic or coastal waters. Only one species within the study area, American eel (*Anguilla rostrata*), is considered a catadromous species. Unlike anadromous fish, this species lives most of their lives in fresh or estuarine waters and return to the ocean to spawn. The *Nice Bridge Improvement Project Natural Environmental Technical Report*, located on the attached CD, includes a comprehensive list of common species present in the Lower Potomac River.

Fisheries data were also obtained from the Potomac River Fisheries Commission (PRFC). Yearly harvest data for the study area, known as landings, include the finfish species, crabs, and oysters. Other than fish, aquatic biota consists of both freshwater and estuarine species including shellfish, benthic species, phytoplankton, and algae. Shellfish species of commercial value include blue crab (*Callinectes sapidus*), brackish water clam (*Rangia cuneata*), and eastern oyster (*Crassostrea virginica*). Soft-shell clams (*Mya arenaria*), once a viable commercial species, are present sporadically throughout the Lower Potomac River. For a complete list, please refer to the *Nice Bridge Improvement Project Natural Environmental Technical Report.*

Submerged Aquatic Vegetation

Submerged Aquatic Vegetation (SAV) includes seagrasses and aquatic plants which provide nursery and breeding habitat for many aquatic biota. SAV locations within the study area are commonly found in shallow, gentle-current water bodies with silt and sandy bottoms. SAV was present on both the Maryland and Virginia shores of the Nice Bridge in 1994 and 1995, and the Virginia side only from 1996 to 1999. No SAV was present on either shore from 2000 to 2006.

Waterfowl Concentration Areas

Based on correspondence with MD DNR, the waters of the Potomac River (one-half mile to the north and south of the Nice Bridge) have been identified as known historic waterfowl concentration areas. These areas may feature concentrations of one or more species of molting or nesting ducks or geese that have been observed during more than one year. Concentration area boundaries are approximate as the number of birds fluctuates year to year. Waterfowl common in the study area include, but are not limited to, diving ducks, such as common goldeneye (*Bucephala clangula*) and canvasback (*Aythya valisineria*), lesser and greater scaup (*Aythya affinis* and *Aythya marila*), and buffleheads (*Bucephala albeola*) (Charles County Department of Planning and Growth Management, June 2001). Recent MD DNR records for the known historic concentration area around the Nice Bridge include canvasback (*Aythya valisineria*), red-breasted mergansers (*Mergus serrator*), tundra swan (*Cygnus columbianus*), and scaup (*Aythya marila*) (MD DNR correspondence 2008, ***Appendix B***).

Records obtained from MD DNR identify the presence of double-crested cormorants (*Phalacrocorax auritus*) nesting on the existing Nice Bridge during breeding season. No other waterbird species is known to nest on the bridge. Coordination with MD DNR reveals that the cormorants have been nesting on the bridge for several years. MD DNR's management strategy includes encouraging the cormorants to use more natural structures, rather than bridges because droppings from the birds can cause corrosive damage bridges. The presence of the birds on the bridge can distract drivers leading to vehicular crashes. As part of their effort to entice this species to use natural sites, MD DNR has been working with the Authority to physically relocate unpopulated nests from the existing Nice Bridge. These efforts include breaking any nests apart, unless fledglings or eggs are present.

Oyster Beds

There are no oyster beds in the vicinity of the Nice Bridge. The nearest oyster beds are located approximately one mile north and south of the existing Nice Bridge. According to MD DNR, the portion of the Potomac River within the study area includes several natural oyster beds including Pascahanza, Lower Cedar Point, and Lower Cedar Point Addition.

b. Potential Effects

Aquatic Biota

Alternate 1 (No-Build) would have no impact on aquatic biota. Primary impacts to aquatic biota from the build alternates would be impacts to stationary benthic organisms and fish mortality during construction of a bridge (including dredging) and demolition. Mortalities would result from a loss of natural habitat due to the placement of pilings and other in-stream structures. A temporary loss of bottom substrate habitat would occur from dredging. Bridge construction activities are not anticipated to result in long term impacts to commercial fish or shellfish species.

Short-term construction impacts from new bridge construction, principally dredging operations, could temporarily displace fish and benthic populations as increased sediment loads enter the river. Pile driving could also kill or injure fish in the immediate vicinity of the pile driving construction activity.

Submerged Aquatic Vegetation

Although historic data indicate SAV presence within the immediate vicinity of the Nice Bridge, current data (VIMS 2005-2007) indicate that SAV is not in the area. Therefore, there are no impacts anticipated with the No-Build or build alternates.

Waterfowl Concentration Areas

Alternate 1 (No-Build) would not impact waterfowl concentration areas within the study area. All of the build alternates have the potential to affect the waterfowl concentration areas but direct impacts are unlikely because the waterfowl can move and a new bridge would be constructed near the existing bridge.

Oyster Beds

No impacts to oyster beds are anticipated for any of the alternates. The closest oyster beds to the existing Nice Bridge are approximately one mile to the north and south and would therefore not be impacted by the construction of the new bridge alternates. However, dredging operations necessary for bridge construction can entrain and destroy oyster eggs and larvae, particularly during spawning and spat periods of the year (June through September). Larval oysters may become starved by ingesting sediment particles from increased sedimentation. This may also cause a delay in spat metamorphosis because the substrate may be covered with loose sediments and therefore may be unstable.

c. Avoidance, Minimization and Mitigation Measures

Aquatic Biota

As the project continues, additional efforts would be made to identify construction methods to avoid and minimize aquatic biota mortality associated with dredging, pile construction and demolition. Dredging efforts for both bridge demolition and construction will require environmentally sensitive methods. If a build alternate is selected, the Authority would consider various minimization techniques including those used as part of the Woodrow Wilson Bridge Project during the design phase. The VA DGIF provided the following guidelines for the Authority to consider in minimizing impacts to aquatic biota:

- No in-stream work in the Potomac River, Gambo Creek and/or their tributaries from February 15 through June 30 of any year;
- Conduct in-stream activities during low or no-flow conditions;
- Using non-erodible cofferdams to isolate the construction area;
- Blocking no more than 50% of the streamflow at any given time;
- Stockpiling excavated material in a manner that prevents reentry into the stream;
- Restoring original streambed and stream bank contours;
- Revegetating barren areas with native vegetation; and
- Implementing strict erosion and sediment control measures.

Other minimization efforts will focus on methods for demolition of the existing bridge, if applicable. An environmentally sensitive approach will be considered wherever feasible and will include time of year restrictions to protect various aquatic species. For additional information, please refer to the *Nice Bridge Improvement Project Essential Fish Habitat Report* located on the attached CD.

Impacts to stream channels would require a Section 404 permit from the USACE, as well as a Section 401 water quality certification from MDE. A waterway construction permit from MDE would also be required for work in streams and floodplains.

Submerged Aquatic Vegetation

Any future design efforts will include yearly data reviews to determine if SAV has been reestablished adjacent to the Nice Bridge. Any minimization and mitigation efforts will be coordinated with appropriate State and Federal agencies and any necessary mitigation will be assessed at that time.

Waterfowl Concentration Areas
If possible, any build alternate would be located in a manner that avoids disturbance of waterfowl staging and concentration areas. Construction is typically restricted during the following time frames:

- Diving Ducks: no disturbance between November 15 through March 30; and
- Dabbling Ducks and Canada Geese: no disturbance between October 1 through March 31.

Further avoidance or minimization for nesting would only be necessary if either MD DNR's policy changes to favor bridges or if another colonizing species were to attempt to nest on the bridge. Coordination efforts will continue throughout the planning phase with MD DNR to determine if the status of waterbird colonies on the existing Nice Bridge has changed.

Oyster Beds
Sediment control devices to minimize the effects of sedimentation on oyster beds in the study area may include sediment traps, silt fences, sedimentation basins, and interception channels.

9. Terrestrial Habitat and Wildlife

Summary: The build alternates would impact forests; impacts range from 0.5 to 1.9 acres. Therefore, terrestrial habitats would also be impacted. No direct impacts to FIDS habitat or Important Bird Areas are anticipated with any of the alternates.

a. Existing Conditions

Forest Communities
Two different forest cover types are found within the Maryland and Virginia portions of the study area: Oak-Pine and Oak-Hickory. The dominant and co-dominant canopy species are similar for both forest cover types, and include species such as eastern white pine (*Pinus strobus)*, northern red oak (*Quercus rubra*), shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), post oak (*Quercus stellata*), black walnut (*Juglans nigra*), and red maple (*Acer rubrum*).

Within the project area, eleven forest stands were identified as part of the forest characterization study (***Table III-10*** and ***Appendix A***). Stands are defined as forested areas at least 10,000 square feet in size with a minimum width of 35 feet. All of the stands are comprised of dominant and co-dominant species from both the Oak-Pine and Oak-Hickory cover types.

Maryland DNR defines large and specimen trees as typically designated by their age, beauty, history, or community significance. There are no specimen (or champion) trees within the Maryland side of the study area. A review of the Virginia Big Tree Program database determined that no specimen or big trees, per Virginia's classification, are located within the study area.

Terrestrial Wildlife

The study area includes diverse terrestrial habitat including: deciduous forest, coniferous forest, and shrub-scrub land. Terrestrial and semi-aquatic species found in the study area are listed in ***Table III-11***. Some wildlife is limited to terrestrial habitat whereas others benefit from, or require, a combination of both terrestrial and aquatic habitats. A large number of wildlife described in this section spends a majority of their time associated with semi-aquatic or aquatic habitat such as the Potomac River, its tributaries, or vegetated wetlands.

Table III-10: *Forest Stands*

Forest Stand	Location	Average DBH*	Size	Dominant Species	Co-Dominant Species
MD -1	North of US 301	16-20 inches	15 acres	sweetgum white oak southern red oak	sweetgum black cherry hickory
MD-2	North of US 301 and south of the Aqua-Land Access Road	16-20 inches	> one acre	sweetgum white oak southern red oak	sweetgum black cherry hickory
MD-3	North of US 301 within the vicinity of the Potomac Gateway Welcome Center	16-20 inches	7 acres	sweetgum white oak southern red oak	sweetgum black cherry hickory
VA-1	North of US 301 and east of the Barnesfield Park entrance	4-9 inches	5 acres	young loblolly pine	sweetgum
VA-2	East of Stand 1 (VA-1), and extending to the Potomac Gateway Welcome Center	12-18 inches	8 acres	sweetgum	southern red oak red maple
VA-3	300 yards north of the Potomac Gateway Welcome Center	4-9 inches	1 acre	young loblolly pine	sweetgum
VA-4	Adjacent to Stand 3 (VA-3) by Roseland Road	4-9 inches	4 acres	sweetgum	---
VA-5	Between Roseland Road and the Potomac River	12-18 inches	8.4 acres	sweetgum	---
VA-6, VA-7, and VA-8	3 stands located within the Dahlgren property	Unknown	3-20 acres	loblolly pine sweet gum	oaks and other hardwood species

***** *DBH = Diameter at Breast Height*

Table III-11: *Wildlife Potentially Present Within the Study Area*

Common name	Scientific Name	Common name	Scientific Name
white-tailed deer	*Odocoileus virginianus*	white-footed mouse	*Peromyscus leucopus*
Eastern rabbit	*Sylvilagus floridanus*	marsh rice rat	*Oryzomys palustris*
raccoon	*Pyrocon lotor*	meadow vole	*Microtus pennsylvanicus*
mink	*Mustela vison*	least shrew	*Cryptotis parva*
red fox	*Vulpes vulpes*	star-nosed mole	*Condylura cristata*
gray fox	*Urocyon cinereoargentus*	muskrat*	*Ondatra zibethica*
opossum	*Didelphis marsupialis*	nutria*	*Myocaster coypus*
gray squirrel	*Sciurus carolinensis*	beaver*	*Castor canadensis*
house mouse	*Mus musculus*	river otter*	*Lutra canadenis*

* Semi-Aquatic Species: These four mammal species are listed under the terrestrial wildlife section, however, are often considered semi-aquatic species. *Source: Environmental Atlas of the Potomac Estuary* (1979)

Reptiles and amphibians common to the study would be found along the Potomac River, its tributaries, wetlands, and surrounding forest habitat area. Common reptiles and amphibians likely to be present in the study area are provided in ***Table III-12***.

Table III-12: *Potential Reptiles and Amphibians Present Within the Study Area*

Common Name	Scientific Name	Common Name	Scientific Name
Northern red-lined salamander	*Eurycea bislineata*	common snapping turtle	*Chelydra serpentine*
red salamander	*Pseudotriton rubber*	common musk turtle	*Sternotherus odoratus*
American toad	*Bufo americanus*	Eastern box turtle	*Terrapene c. Carolina*
fowlers' toad	*Bufo woodhousii fowleri*	black rat snake	*Elaphe obsolete obsolete*
Northern cricket frog	*Acris crepitans*	Northern water snake	*Nerodia sipedon sipedon*
bull frog	*Rana catesbeiana*	Eastern garter snake	*Thamnophis sauritus sauritus*
green frog	*Rana clamitans melanota*	Eastern worm snake	*Carphophis constrictor constrictor*
pickerel frog	*Rana palaustris*		

Source: *MD DNR MBSS County Assessment*

Forest Interior Dwelling Species (FIDS)

There are no areas that meet the MD DNR criteria for FIDS habitat within the Nice Bridge project area. However, existing forests within the project area may serve as resting and stopover areas for FIDS. A listing of FIDS likely to be found within the study area, including coastal waters, is provided in the *Nice Bridge Natural Environmental Technical Report* located on the attached CD.

The nearest Important Bird Area (IBA), the Lower Potomac IBA, is located north of to the study area and extends along the Potomac River shoreline in Virginia from Mathias Point to north of Fort Belvoir. Currently, this IBA area supports a significant community of piscivorous (i.e., fish-eating) bird species, including bald eagles.

Invasive Species

The Commonwealth of Virginia in Executive Order 13112 defines an "invasive species" as a species that is 1) non-native (or alien) to the ecosystem under consideration, and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. In accordance with Executive Order 13112, the potential for the establishment of invasive terrestrial or aquatic animal or plant species during construction of the proposed project would be minimized by following provisions in VDOT's Road and Bridge Specifications. These provisions require prompt seeding of disturbed areas with seeds that are tested in accordance with the Virginia Seed Law and VDOT's standards and specifications to ensure seed mixes are free of noxious species. While the project ROW proposed with the build alternates is vulnerable to the colonization of invasive plant species from adjacent properties, implementation of the stated provisions would reduce the potential for establishment and proliferation of invasive species.

b. Potential Effects

Forest Communities

Alternate 1, the No-Build Alternate, would not impact any forests. Impacts to forests from the build alternates are summarized in ***Table III-13.*** Alternate 7 has the greatest amount impacts among the build alternates (1.8 acres without and 1.9 with the bike/ped path option). The majority of the impacts would consist of either small isolated forest patches or existing forest edge of forest stands along US 301.

Table III-13: *Impacts to Forest Communities Without (and With) Bike/Ped Path Options*

Alternates	MD Forest Impacts (acreage)	VA Forest Impacts (acreage)	Total Forest Impacts
Alternate 1 – No-Build	0.0 (0.0)	0.0 (0.0)	**0.0 (0.0)**
Alternate 2	0.0 (0.0)	0.5 (0.5)	**0.5 (0.5)**
Alternate 3	0.0 (0.0)	0.5 (1.1)	**0.5 (0.5)**
Alternate 4	0.7 (0.7)	0.4 (0.4)	**1.0 (1.0)**
Alternate 5	0.7 (0.7)	0.4 (0.4)	**1.0 (1.0)**
Alternate 6	0.0 (0.0)	0.7 (0.7)	**0.7 (0.7)**
Alternate 7	0.7 (0.8)	1.1 (1.1)	**1.8 (1.9)**

Terrestrial Wildlife

The northern build alternates would impact more terrestrial habitat than the southern alternates. The majority of the terrestrial wildlife impacts would be associated with the loss of forest cover. In general, all the build alternates that would expand the existing US 301 alignment and would have minimal impact on the wildlife communities. Road widening generally creates new edge habitat; however, the existing habitat is not fragmented because the US 301 roadway already exists.

In Maryland, on the north side of existing US 301, the habitat consists of forested edge habitat and lawn-like conditions surrounding the toll plaza. In Virginia, forest cover is evident on both sides of US 301 but maintained grass is the predominant cover on the south side. For both Maryland and Virginia, it is anticipated that any of the build alternates, and subsequent widening of the US 301 roadway, would further impair the passage of wildlife between areas of adjacent habitat. The existing US 301 roadway currently serves as a barrier for most wildlife to move from one side of the highway to the other.

Forest Interior Dwelling Species

No direct impacts to FIDS habitat or Important Bird Areas are anticipated with any of the alternates.

c. Avoidance, Minimization and Mitigation Measures

The project efforts to minimize impacts to forest communities have included:

- Reconnecting the new bridge with the approach roadways as soon as possible; and
- Sound bridge and roadway design practices minimizing the cutting and clearing of trees.

Within Maryland, the primary approach to mitigating forest loss would be through compliance with the Maryland Reforestation Law. Enacted in 1989 and amended in 1992, the Maryland Reforestation Law was created to preserve existing forested lands and protect Maryland forests from being cleared without replacement. When prudent minimization efforts have been considered and one acre or more of forest clearing is still required, replacement of the forests must occur on a one-to-one acre basis. The constructing agency is required to locate state or publicly-owned land of equivalent size to be reforested and coordinate reforestation efforts with MD DNR. Forest impacts within the Virginia portion of the study area would be coordinated with the Virginia Department of Forestry. However, forest impacts from highway projects are exempt from mitigation requirements in Virginia.

10. Rare, Threatened, and Endangered Species (RTE)

Summary: There are three fish species protected under the Endangered Species Act or the Magnuson-Stevens Fishery Conservation and Management Act: the shortnose sturgeon, summer flounder, and bluefish. No impacts to state-listed species are anticipated. Impacts within the Virginia bald eagle concentration zones are anticipated, especially with the northern alternates. Impacts to peregrine falcons could occur with the build alternates if there is any disruption to nests on the existing bridge during the breeding season. Avoidance and minimization techniques will be considered as the project moves forward during the planning and design phases. Coordination will also continue with the USFWS and the Maryland and Virginia.

a. Existing Conditions

Coordination with MD DNR (dated October 12, 2006) identified bald eagle nests in study area. The correspondence also identified habitat for rare, threatened, and endangered (RTE) species including: flier fish species (*Centrarchus macropterus*) and rainbow snake (*Farancia erythrogramma*). Coordination with the VA DGIF (dated November 20, 2007) indicated the presence of the state-threatened upland sandpiper (*Bartramia longicauda*) and the state-threatened loggerhead shrike (*Lanius ludovicianus*). Additional information regarding these species can be found in the *Nice Bridge Natural Environmental Technical Report*. A detailed survey may be required by MD DNR and/or the VA DGIF prior to any construction activities.

Based on agency coordination, bald eagle nests are located in both the Maryland and Virginia portions of the study area. In addition, there is a bald eagle wintering concentration zone along the Virginia shoreline. The zone consists of the width of the shoreline, extending north from the Nice Bridge around Mathias Point to Chotank Creek. Bald eagles are currently de-listed under Endangered Species Act; however, they are still recognized as an RTE species at the state level, and are protected by the federal Bald Eagle Protection Act (Eagle Act) (16 U.S.C. §§668-668d) and the Migratory Bird Treaty Act (MBT Act) (16 U.S.C. §§703-712). Currently, thirteen bald eagle nesting sites have been identified within the study area (four in Maryland and nine in Virginia). The closest nest is located over one-half mile north of the existing Nice Bridge toll plaza. The other nests are scattered throughout the study area in Maryland and Virginia.

The USFWS noted that peregrine falcons (*Falco peregrinus*) may have nested on the existing Nice Bridge. Peregrine falcons are protected under the MBT Act, which prohibits disturbing the nest(s) during breeding and nesting season. Peregrine falcon breeding and nesting season extends from approximately mid-April through August.

There are three fish species protected under the Endangered Species Act or the Magnuson-Stevens Fishery Conservation and Management Act that likely occur within the study area. These federally managed species of importance include the shortnose sturgeon (*Acipenser brevirostrum*), summer flounder (*Paralichthyus dentatus*), and bluefish *(Pomatomus saltatrix).*

Biological Assessment of the Shortnose Sturgeon

The National Marine Fisheries Service (NMFS) indicates that the shortnose sturgeon, a federally listed endangered species, is present within the study area and may use this area for over-wintering, foraging, or pre-spawning activities. In accordance with Section 7 of the Endangered Species Act, the Authority prepared a *Biological Assessment for the Shortnose Sturgeon*, located on the attached CD, to evaluate the potential impact of the Nice Bridge Improvement project on the shortnose sturgeon.

Habitat for foraging shortnose sturgeon also occurs within the study area. Shortnose sturgeon feed on benthic organisms in mud substrates or off plant surfaces. Most sturgeon feed in water depths of one to five meters, but may forage as deep as 25 meters (Dadswell 1984).

Spawning for shortnose sturgeon occurs in freshwater with spawning migrations beginning in April and May in Mid-Atlantic rivers (NMFS 1998). Spawning grounds occur in fast flow regions (40-60 cm/s) with gravel or rubble bottoms, and are generally well upstream and in freshwater (Dadswell 1984). The study area does not provide suitable habitat for sturgeon spawning; however, it is suitable for spawning migrations.

Essential Fish Habitat Evaluation for Bluefish and Summer Flounder

The Potomac River has been identified as Essential Fish Habitat (EFH) for the bluefish (juvenile) and summer flounder (juvenile and adult), as noted in ***Table III-14.*** Additional information regarding the bluefish and summer flounder can be found in the *Nice Bridge Improvement Project Essential Fish Habitat Report* located on the attached CD.

Table III-14: *Summary of Essential Fish Habitat (EFH) in the Study Area*

Species	Life Stage				Habitat/Notes
	Eggs	Larvae	Juveniles	Adults	
bluefish *(Pomatomus saltatrix)*			X		Open waters: Pelagic and bottom waters
summer flounder *(Paralichthys dentatus)*			X	X	Open waters: Demersal (bottom) waters and estuaries in flats, channels, salt marsh creeks, and eel grass beds Emergent wetlands: Habitat of Particular Concern include native species of macroalgae, seagrasses, and fresh and tidal macrophytes

Source: Nice Bridge Essential Fish Habitat Assessment Report

b. Potential Effects

No impacts to either the flier fish or rainbow snake are anticipated. The flier fish has been primarily identified within Mill Creek, which would not be impacted by any of the build

alternates. However, protection measures would be in place to protect all fish species within close proximity to bridge construction.

None of the bald eagle nests are expected to be directly impacted by any of the proposed alternates. Impacts within the Virginia bald eagle concentration zones are anticipated, especially with the northern alternates. Coordination will continue in the planning and design phases with the USFWS and the VA DGIF.

Impacts to peregrine falcons could occur with the build alternates if there are any nests on the existing Nice Bridge during the breeding season. The noise level associated with construction of a new bridge in close proximity could impact the falcons, including interference with breeding activities.

As stated in the *Biological Assessment Report for the Shortnose Sturgeon*, impacts to the shortnose sturgeon's habitat due to construction could include increased turbidity (or churned up sediment in the water) as a result of sedimentation from erosion or dredging activities, pollution from disturbed sediments, and runoff from impervious surfaces. Increased turbidity could deplete dissolved oxygen within sturgeon habitat. Dissolved oxygen levels of five parts per million (ppm) or lower are known to cause stress in aquatic life, and levels of 2.5 milligrams per liter (mg/L) and lower are known to cause mortality in adult sturgeon. Sediment deposits and turbidity from dredging could also disrupt the shortnose sturgeon's foraging habitat. Since the study area has suitable foraging habitat for the species, any impacts to substrates or sediment deposition in the area could cover benthic organisms and affect foraging areas for the shortnose sturgeon.

The project is not likely to adversely affect the EFH for the juvenile bluefish, or the juvenile and adult summer flounder based on best available scientific data. Construction impacts to EFH could include increased turbidity due to sedimentation from erosion or dredging activities, pollution from disturbed sediments, and runoff from impervious surfaces. Increased turbidity can deplete dissolved oxygen within EFH. As a pelagic species, bluefish are not well adapted to inadequate oxygenated (hypoxic) conditions, and summer flounder are highly sensitive to dissolved oxygen levels of less than three ppm, as well as areas of significant pollution. Turbid water also limits vision in fishes, which can inhibit the predation success of bluefish and summer flounder. The project, in consultation with NMFS, would implement appropriate protection measures to minimize any potential effects to EFH within the project area.

The Maryland Nongame and Endangered Species Conservation Act (COMAR 08.03.08) requires the protection of state listed threatened and endangered species. The Virginia Endangered Species Act (§29.1-563 - §29.1-570) and the Virginia Endangered Plant and Insect Species Act (Chapter 39 §3.1-1020 - §3.1-1030) protect federally and state listed endangered or threatened species in Virginia. Two state agencies, the VA DGIF and the Virginia Department of Agriculture and Consumer Services (VA DACS) have legal authority for endangered and threatened species and are responsible for their conservation. A third state agency, the VA DCR Division of Natural Heritage produces an inventory of the Commonwealth's natural resources, and maintains a data bank of ecologically significant sights.

c. Avoidance and Minimization Measures

Appropriate avoidance and minimization efforts would be employed to avoid both the bald eagle concentration zones and the peregrine falcon nesting areas, as well as to reduce the likelihood of adverse impacts to adjacent habitat systems outside the study area. These efforts would include employing BMPs to reduce sedimentation and erosion during all phases of the project.

Bald eagles are sensitive to human activities during their breeding and nesting season. If agitated by human activities, bald eagles may inadequately construct or repair their nest, expend energy defending the nest rather than tending to their young, or abandon their nest altogether. Disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect bald eagles. In addition, the USFWS published the following general guidelines to avoid disturbing nesting bald eagles:

- Keeping a distance between the activity and the nest (distance buffers);
- Maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffer); and,
- Avoiding certain activities during breeding season.

Additional USFWS guideline recommendations include:

- Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly within one-half mile from water;
- Where bald eagles are likely to nest in human-made structures and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structure with either (1) devices engineered to discourage bald eagles from building nests, or (2) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance; and,
- Do not intentionally feed bald eagles.

Coordination with the USFWS regarding the peregrine falcons will continue through the planning process in order to avoid, minimize, and mitigate any impacts that may occur to this peregrine falcon population.

The Nice Bridge Improvement Project would implement specialized protection measures to minimize any potential effects to shortnose sturgeon within the study area. Standard and specialized construction methods for avoidance and minimization will be finalized as the project design progresses. Specialized construction methods may include time-of-year restrictions, conditional blast design requirements, and blast pressure wave maximums.

Methods employed to avoid and minimize impacts to the bluefish and summer flounder are similar to avoidance and minimization efforts of the shortnose sturgeon. Standard and specialized construction methods for avoidance and minimization would be considered as the project design progresses. Potential water quality impacts due to construction and the increase in impervious surfaces related to the build alternates would be managed through implementation of erosion and sediment control BMPs (based on Maryland and Virginia stormwater management regulations) to reduce potential sedimentation within the study area.

11. Unique and Sensitive Areas

Summary: No impacts to Natural Heritage Areas, in either Maryland or Virginia, are anticipated for any of the alternates. Reforestation requirements will promote Green Infrastructure efforts in the study area.

a. Existing Conditions

Natural Heritage Areas

Correspondence with MD DNR dated October 12, 2006 indicates that there are no Maryland Natural Heritage Areas (NHAs) or Virginia Natural Heritage Preserve Areas (NHPAs) within the study area.

Green Infrastructure

Based on the MD DNR Green Infrastructure Atlas, three corridors and one hub were identified within the study area. These include land in the following locations:

- Forested corridor associated with the headwaters of Cliffton Creek north of the Nice Bridge;
- Forested corridor associated with the headwaters of Pasquahanza Creek south of the Morgantown Generating Power Plant;
- Allens Fresh Run NHA Hub (part of Zekiah Swamp Natural Environmental Area); and,
- Popes Creek NHA (Riparian forest corridor associated with Popes Creek and its tributaries).

b. Potential Effects

No impacts to Natural Heritage Areas or Green Infrastructure, in either Maryland or Virginia, are anticipated for any of the alternates. With no impacts anticipated, avoidance and minimization measures are not appropriate for this project. Any reforestation requirements due to tree and forest loss (described in ***Section III.C.9***) could consider locations that would promote Green Infrastructure efforts such as buffer enhancement, forest connectivity (FIDS habitat development), and reforestation near, or adjacent to, existing hubs and corridors.

12. Chesapeake Bay Critical Areas

Summary: Maryland and Virginia have laws protecting Chesapeake Bay Critical Areas or tidally influenced lands along the coastline of the Potomac River and other tidal water bodies in the study area. All of the build alternates have the potential to affect land within the Critical Areas, with the majority of the impacts in Maryland. Alternates 4, 5 and 7 would result in the most impacts to Critical Areas.

a. Existing Conditions

Chesapeake Bay Critical Areas were designated to foster more sensitive land use and development activity along the shoreline of the Chesapeake Bay, its tributaries, and its tidal wetlands, and to ensure the implementation of appropriate long-term conservation measures to protect important habitats. Maryland and Virginia have separate statutes protecting tidal

coastlines. Although the official terms used to classify these areas are different, for the purpose of this study, they are discussed as "Critical Areas." Additional information can be found in the *Nice Bridge Improvement Project Natural Environmental Technical Report* located on the attached CD.

Critical Area in Maryland includes the tidal shorelines of the Potomac River, tributaries, and lands under these waters as well as all land within 1,000 feet of the landward edge of tidal waters. There is also a 100-foot buffer on the landward edge of tidal waters and wetlands for protection from development. Critical Areas within the Virginia portion of the study area include the associated tidal wetlands, 100-foot buffer and shoreline of the Potomac River and tributaries in the study area (***Figure III-7***).

b. Potential Effects

The No-Build Alternate (Alternate 1) would have no impact on Critical Areas within the study area. Each of the build alternates would impact Critical Area in both Maryland and Virginia (***Table III-15)***.

Table III-15: *Impacts to Critical Area Within the Study Area Without (and With) Bike/Ped Path Options (in acres)*

State	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
MD	0 (0)	14.5 (14.5)	14.5 (14.5)	24.4 (24.4)	24.5 (24.5)	14.2(14.2)	24.2 (24.3)
VA	0 (0)	3.3 (3.4)	3.4 (3.5)	1.9 (2.3)	2.2 (2.3)	3.6 (3.6)	2.2 (2.2)
Total	**0(0)**	**17.8(17.9)**	**17.9(18.0)**	**26.3(26.7)**	**26.7(26.8)**	**17.8(17.8)**	**26.4(26.5)**

In Virginia, public roads and their associated structures are conditionally exempt from the *Chesapeake Bay Preservation Area Designation and Management Regulations*, provided they are constructed in accordance with (i) regulations promulgated pursuant to the Erosion and Sediment Control Law (§10.1-560 et seq. of the Code of Virginia) and the Virginia Stormwater Management Act (§10.1-603. 1 et seq. of the Code of Virginia), (ii) an ESCP and a SWM plan approved by the VA DCR, or (iii) local water quality protection criteria at least as stringent as the above requirements. All build alternates would meet criteria necessary for exemption, including preventing or otherwise minimizing encroachment into Critical Areas and adverse effects on water quality.

c. Avoidance, Minimization and Mitigation Measures

Coordination with the Maryland Critical Area Commission will continue throughout the duration of the planning and design process to minimize and mitigate impacts within the Critical Area and would include compliance with all applicable laws protecting Critical Area. Any impacts within the Critical Area (including wetlands, forested areas, and aquatic habitats) would require mitigation in accordance with the Critical Area Act. A Project Application would be prepared for the project with a request for Critical Area Commission approval. The project team will also follow the development of guidance from Federal Agencies in response to Executive Order 13508 of May 12, 2009, Chesapeake Bay Restoration and Protection to ensure that the Nice Bridge Improvement Project is in compliance with any new requirements.

D. NOISE

Summary: The results of the noise analysis shows that NSA 3 (Dahlgren Wayside Park) would experience design year noise levels equal to or exceeding the impact criteria for all of the proposed alternates. Sound barriers were found to be feasible and reasonable for NSA 3 for Alternates 2, 3, 4, 5 and 7. It is the Authority's policy to make final decisions on noise abatement during the final design phase of project development. At that time, the Authority would also consider barrier and non-sound barrier options, such as landscaping, for noise abatement.

1. Existing Conditions

There are currently no noise barriers within the Nice Bridge study area. Three Noise Sensitive Areas (NSAs) were delineated in the study area to encompass the noise-sensitive land uses potentially affected by the proposed improvements. A total of four receptors were identified to represent noise sensitive land uses within the three NSAs. Receptors are located in common use areas nearest to US 301 (***Figure III-8***).

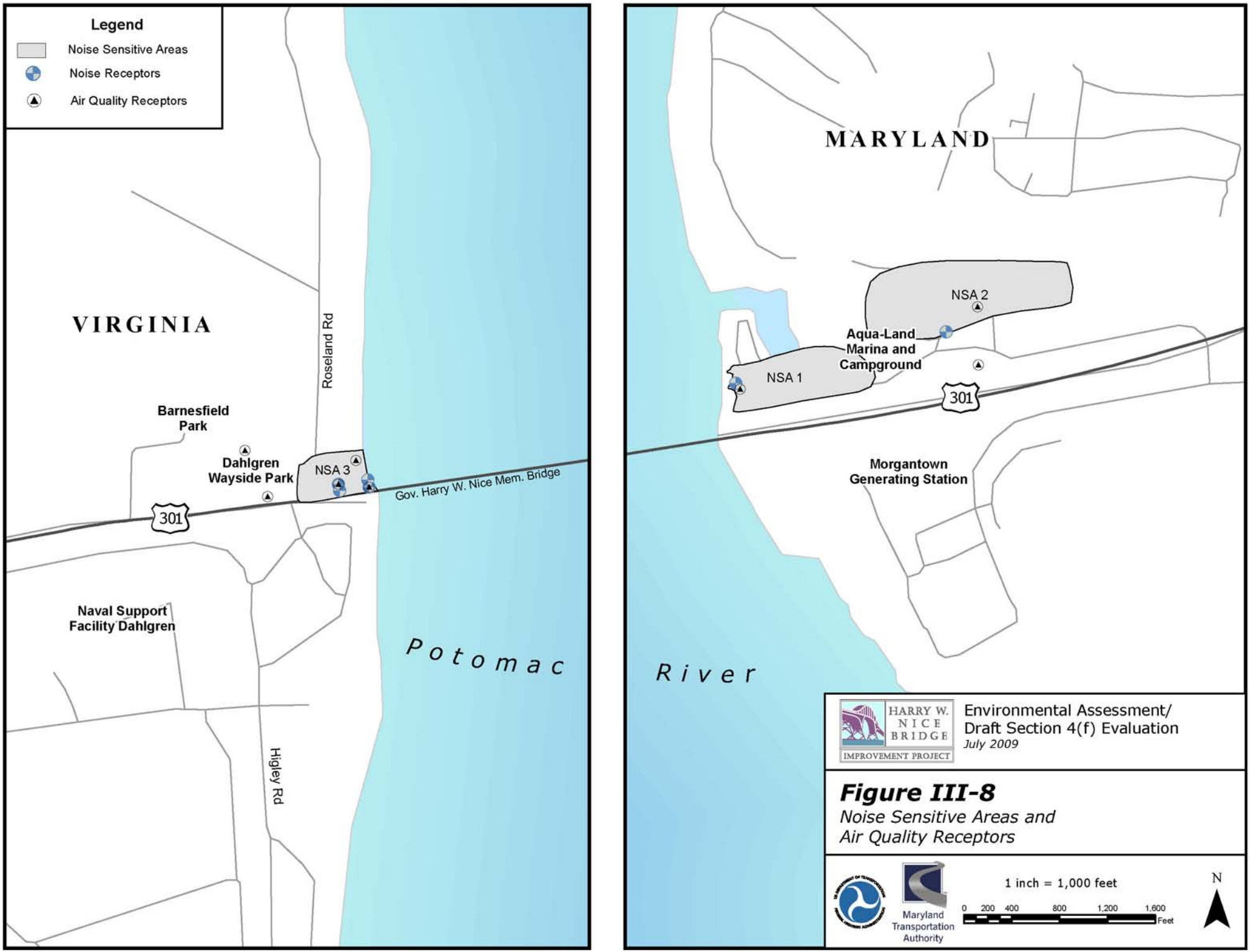
- NSA 1 (represented by Receptor 1-1) consists of the marina area within the Aqua-Land Marina and Campground.
- NSA 2 (represented by Receptor 2-1) consists of the campground (temporary and permanent residents) within the Aqua-Land Marina and Campground.
- NSA 3 (represented by Receptors 3-1 and 3-2) consists of the Dahlgren Wayside Park in Virginia. Receptors 3-1A and 3-2A replace Receptors 3-1 and 3-2 in Alternate 7 due to the northern alignment shift of this alternate.

For more detailed information about the noise analysis, please refer to the *Nice Bridge Improvement Project Noise Quality Technical Report* and *Addendum* located on the attached CD.

2. Impact Assessment

For purposes of this analysis, the Authority used the MD State Highway Administration's (SHA) Sound Barrier Policy methodology, dated May 11, 1998. The Nice Bridge Improvement Project is a Type I noise project as defined in 23 CFR 772. A Type I project provides evaluation of noise mitigation for projects that propose construction of a highway on new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. The determination of traffic noise impacts is based on the relationship between the ambient noise levels, the predicted peak hour traffic noise levels, and the established noise abatement criteria in the study area. For this project, the applicable criteria are defined in 23 CFR 772 and subsequent memoranda. All receptors for NSA 1 were evaluated as Category C (i.e. commercial) and all receptors for NSA's 2 and 3 were evaluated as Category B (i.e. parks). Refer to the *Nice Bridge Improvement Project Noise Quality Technical Report* for additional information regarding criteria for each Category.

Existing noise levels at NSA 3 equal or exceed the MD SHA 66 dBA impact criterion established in the SHA Sound Barrier Policy used by the Authority in completing this noise analysis.


Legend
Noise Sensitive Areas
Noise Receptors
Air Quality Receptors
VIRGINIA
MARYLAND
Roseland Rd
Barnesfield Park
Dahlgren Wayside Park
NSA 3
Gov. Harry W. Nice Mem. Bridge
301
Naval Support Facility Dahlgren
Higley Rd
Potomac River
NSA 2
Aqua-Land Marina and Campground
NSA 1
Morgantown Generating Station
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-8
Noise Sensitive Areas and
Air Quality Receptors
Maryland Transportation Authority
1 inch = 1,000 feet
0 200 400 800 1,200 1,600
Feet
N

Noise abatement or mitigation measures were investigated where the peak hour noise levels approached or exceeded the 67 dBA Federal Noise Abatement Criterion for Category B locations and 72 dBA for Category C locations. However, based on MD SHA's Sound Barrier Policy, 66 dBA is considered approaching the criteria for Category B and 71 dBA is considered approaching the criteria for Category C. Additionally, the policy calls for mitigation measures to be considered where build levels are at least 57 dBA and exceed the present ambient levels by 10 dBA or more.

The design year noise levels presented in ***Table III-16*** represent the noisiest hour(s) of the day in 2030. This hour usually coincides with the peak traffic hour. The combination of 2030 peak hour traffic and associated travel speeds resulted in the "worst-case" noise levels for this analysis.

Table III-16: *Predicted Noise Levels for Existing, No Build and Design Year No-Barrier Conditions*

NSA	Receptor	Receptor Location		Design Year (2030) Noise Levels (dBA)						
			Existing [1]	No-Build [3]	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
1	1-1	Aqua-Land (Beach)	58	58	61	62	63	63	60	65
2	2-1	Aqua-Land (Campground)	55	55	60	60	62	62	59	63
3	3-1	Dahlgren Wayside Park (Beach)	65	65	68	69	displaced	displaced	63	displaced
	3-2	Dahlgren Wayside Park (Picnic Bench)	67	67	71	71	displaced	displaced	67	displaced
	3-1A[2]	Dahlgren Wayside Park (Beach)	62	62	66	67	70	70	63	74
	3-2A[2]	Dahlgren Wayside Park (Lawn Area)	64	64	68	68	73	73	65	displaced
	3-3[2]	Dahlgren Wayside Park (Picnic Bench)	64	64	68	68	72	72	65	displaced
	3-4[2]	Dahlgren Wayside Park (Picnic Bench)	63	64	67	68	71	71	65	displaced
	3-5[2]	Dahlgren Wayside Park (Picnic Bench)	62	63	67	67	70	70	64	displaced
	3-6[2]	Dahlgren Wayside Park (Picnic Bench)	61	61	65	65	68	68	63	71
	3-7[2]	Dahlgren Wayside Park (Picnic Bench)	59	59	64	64	66	66	62	69

Notes:
Shaded cells denote noise impact.
[1] Existing noise levels are predicted by model.
[2] Receptors added to model after calibration.
[3] No-Build traffic volumes capped at LOS D/E.

As indicated in ***Table III-16***, NSA 3 (Dahlgren Wayside Park) would experience No-Build design year noise levels equal to or exceeding the impact criteria. However, since the No-Build Alternate would not involve additional highway improvements or increase existing capacity,

noise abatement was not considered. ***Table III-16*** also shows that NSA 3 would experience design year noise levels equal to or exceeding the impact criteria for each of the proposed build alternates.

3. Reasonable and Feasible Noise Abatement

Feasibility and reasonableness of noise abatement was investigated for NSA 3 (Dahlgren Wayside Park). Sound barrier feasibility is defined as the engineering and acoustical ability to provide effective noise reduction. Reasonability is based on cost effectiveness of the barrier.

Sound barriers were found to be feasible and reasonable for NSA 3 for the following alternates:

- Alternate 2
- Alternate 3
- Alternate 4
- Alternate 5
- Alternate 7

It is the Authority's policy to make final decisions on the construction of Type I (new highways or improvement of existing highways) noise abatement during the final design phase of project development, after final horizontal and vertical engineering alignments are determined and detailed engineering evaluations can be made. It should be noted the Authority would also consider non-sound barrier options, such as landscaping, for noise abatement.

For additional information on the sound barrier characteristics and the noise analysis please refer to the *Nice Bridge Improvement Project Noise Quality Technical Report* located on the attached CD.

E. AIR QUALITY

Summary: Carbon Monoxide (CO) concentrations would not exceed the S/NAAQS at any receptor locations for any of the alternates. The project is proposed to not be "a project of air quality concern" for particulate matter as defined under 40 CFR 93.123(b)(1) and it meets the CAAA and 40 CFR 93.109 requirements. The Nice Bridge Improvement Project would be considered "a project with low potential MSAT effects" because it is an example of a minor widening project where 2030 design year traffic is not projected to exceed 150,000 vehicles. The Metropolitan Washington Region is in moderate nonattainment for the 8-hour ozone (O_3) standard and has a deadline of June 15, 2010 to meet the standard. The approved State Implementation Plan (SIP) for the Region includes a mobile source emissions budget for O_3 precursors and a plan to improve air quality in the Metropolitan Washington Region to meet the NAAQS for O_3.

The purpose of this project-level air quality analysis was to evaluate the potential effects of the proposed alternates on the air quality, including carbon monoxide (CO), fine particulate matter 2.5 microns or smaller in size ($PM_{2.5}$), and Mobile Source Air Toxics (MSATs). The project-level air quality analysis was conducted in accordance with US EPA and FHWA guidelines, per the 1990 Clean Air Act Amendments (CAAA). Please refer to the *Nice Bridge Improvement Project Air Quality Technical Report* located on the attached CD for details on the technical analysis and its components.

1. Carbon Monoxide Micro-scale Evaluation

Carbon monoxide (CO) impacts were analyzed as the accepted indicator of vehicle-generated air pollution. The US EPA CAL3QHC (1993) dispersion model was used to predict CO

concentrations for air quality sensitive receptors for the analyzed Open to Traffic Year (2015) and Design Year (2030). The detailed analyses predicted air quality impacts at each receptor location from CO vehicular emissions for the No-Build and build alternates. Modeled one-hour and eight-hour average CO concentrations were added to background CO concentrations for comparison to the State and National Ambient Air Quality Standards (S/NAAQS).

Eight air quality receptors were used to represent air quality sensitive locations within the study area (refer to ***Figure III-8***). The air quality analysis evaluated worst-case CO concentrations in both 2015 and 2030 for three ARDS: Alternates 1 (No-Build), 6 and 7. These alternates represent the best and worst case conditions in terms of projected volume of traffic and distance of the traffic flow from the air quality receptors.

The analysis indicates the one-hour and eight-hour concentration of CO will not exceed the S/NAAQS of 35 ppm (parts per million) and 9.0 ppm, respectively, at any receptor locations for any of the alternates.

2. $PM_{2.5}$ Regional and Hot-Spot Conformity Determination

King George County, Virginia is not designated as a nonattainment area for $PM_{2.5.}$ However, Charles County, Maryland is in the Washington, DC-MD-VA $PM_{2.5}$ nonattainment area; therefore, a project-level $PM_{2.5}$ Conformity Determination is required.

The Nice Bridge Improvement Project is included in the Maryland Department of Transportation (MDOT) Consolidated Transportation Program (CTP). It will be included in the next update of the National Capital Region Constrained Long Range Plan (CLRP) and Transportation Improvement Plan (TIP) for Air Quality Conformity. Approval of the next update of the CLRP/TIP is expected in the summer 2010. The CLRP is a comprehensive plan of transportation projects and strategies that the National Capital Region Transportation Planning Board realistically anticipates can be implemented over the next 30 years. The TIP is a six-year program that describes the time-frame for federal funds to be obligated to state and local projects. On February 19, 2009, the US DOT determined that the CLRP and the TIP met the systems level PM2.5 conformity requirements of the CAA; therefore, the current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93.

Based on the preliminary review and analysis, it is proposed that the Nice Bridge Improvement Project (including all alternates and options) meets the CAAA and 40 CFR 93.109 requirements. A project-level hot-spot analysis is not required since the project is proposed to **not be a project of air quality concern**, as defined under 40 CFR 93.123(b)(1). Since the project meets the CAAA and 40 CFR 93.109 requirements, the project would not be expected to cause or contribute to a new violation of the $PM_{2.5}$ S/NAAQS, or increase the frequency or severity of a violation. Upon determination of a Preferred Alternate, the $PM_{2.5}$ analysis discussed herein will be updated and a final $PM_{2.5}$ Conformity Determination will be provided for Interagency Consultation.

3. Mobile Source Air Toxics Analysis (MSATs)

FHWA *Guidance on Air Toxic Analysis in NEPA Documents* requires analysis of US EPA identified Mobile Source Air Toxics (MSATs) under specific conditions. The US EPA designated six prioritized MSATs, which are known or probable carcinogens, or can cause

chronic respiratory effects. The six prioritized MSATs are Benzene; Formaldehyde; Diesel particulate matter/diesel exhaust organic gases; Acetaldehyde; Acrolein; and 1,3-Butadiene.

Traffic data for the Nice Bridge Improvement Project demonstrates that the peak 2030 average daily traffic (ADT) for the build condition will be 52,700. According to FHWA guidelines, the Nice Bridge Improvement Project would be considered a minor widening project because the design year traffic average annual daily traffic (ADT) is not projected to exceed 150,000. Projects in this category may require a qualitative MSAT analysis. Per FHWA guidance, this project would be a *"minor widening project[s]" … "that serves to improve operations of highway ... without adding substantial new capacity or creating a facility that is likely to meaningfully increase emissions."* The Nice Bridge Improvement Project would be considered a **project with low potential MSAT effects**.

The *Nice Bridge Improvement Project Air Quality Technical Report*, located on the attached CD, includes a basic analysis of the likely MSAT emission impacts of this project.

4. Ozone (O3)

The US EPA designated the Metropolitan Washington Region as moderate nonattainment for the 8-hour ozone (O_3) standard in April 2004. The Region has a deadline of June 15, 2010 to meet the 8-hour O_3 standard. The approved State Implementation Plan (SIP) for the Region includes a mobile source emissions budget for O_3 precursors (Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO_X)) and a plan to improve air quality in the Metropolitan Washington Region to meet the NAAQS for O_3.

The SIP consists of a Reasonable Further Progress (RFP) Plan, 2002-2008; an attainment plan; an analysis of reasonably available control measures; an attainment demonstration; contingency plans for RFP and attainment; and mobile budgets for 2008, 2009, and 2010. The plan also presents a Base-Year Inventory for 2002 and projected inventories for 2008 and 2009. The plan is intended to show the progress being made to improve air quality in the Washington nonattainment area and the efforts underway to assure that all necessary steps are taken to reach the federal health standard for ground-level O_3 by 2009. The plan was prepared by the Metropolitan Washington Air Quality Committee (MWAQC).

5. Construction Emissions

The construction phase of the proposed project may impact the local ambient air quality by generating fugitive dust through activities such as demolition and materials handling. The MD SHA addressed this possibility by establishing "Specifications for Construction and Materials" which specifies construction procedures to be followed by contractors involved in site work. The Authority would follow these specifications during construction of any Nice Bridge improvements.

During the construction period, all appropriate measures would be incorporated to minimize the impact of the proposed transportation improvements on the air quality of the area (COMAR 26.11.06.03D). Specifically, applying water or appropriate liquids during demolition, land clearing, grading, and construction operations can minimize fugitive dust. At all times when in

motion, open-body trucks transporting materials should be covered, and all excavated material should be removed promptly.

Mobile source emissions can be minimized during construction by not permitting idling trucks or equipment during periods of unloading or other non-active use. The existing number of traffic lanes should be maintained, to the maximum extent possible, and construction schedules should be planned in a manner that would not create traffic disruption and increase air pollutants. Applying these measures would ensure that construction impacts of the project are minimized.

F. CLIMATE

Summary: None of the alternates are expected to impact the climate of the area.

Climate data for the Nice Bridge study area were obtained from the National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA), and the Maryland State Climatologist Office (MSCO).

1. Existing Conditions

The study area is located in the Mid-Atlantic Region of the United States, which exhibits a temperate, humid climate. Normal maximum temperatures are between 41° and 87° F, and the normal minimum temperatures are between 23° and 67° F. Normal average temperatures are between 32° and 76° F (MSCO, 2003). Yearly precipitation averages in the study area are 44 inches of rain and 17 inches of snowfall. The duration of the freeze-free period, on average, is 187 days per year.

2. Potential Effects

The No-Build Alternate (Alternate 1) would have no impact on climate. Although transportation emissions have been linked to warming temperatures, none of the build alternates are expected to bring new sources of motor vehicles to the bridge. Also, the construction of a new bridge would add additional capacity to US 301 resulting in fewer idling cars and trucks. Subsequently, there would be no measurable increase in the amount of emissions released, and therefore, no impact to climate. Please refer to the ***Section E***, Air Quality for additional information regarding air quality and emission factors in relation to the Nice Bridge project.

In the future, climate change could also have an effect on the infrastructure of the Nice Bridge through sea level rise and major storm events. However, a new bridge crossing would improve the emergency evacuation capacity of US 301 during major storm events.

G. HAZARDOUS MATERIALS

Summary: One site, NSF Dahlgren, was identified in the Initial Site Assessment as having a potential high contaminant level within the potential project limits of disturbance. This site is recommended for a Preliminary Site Assessment.

1. Existing Conditions

An Initial Site Assessment (ISA) report was prepared to identify properties with the potential for environmental concern. The ISA included a database search of State and Federal hazardous waste inventories, a site history review using aerial photographs dating to 1972, file reviews at

MDE and VDEQ, and a field reconnaissance of the project area. For the purposes of the ISA report, the investigation area was defined as 200 feet outside the proposed limit of disturbance from the build alternates. For additional information please refer to *the Nice Bridge Improvement Project Initial Site Assessment* located on the attached CD.

Based on the field reconnaissance and background information, a total of 29 sites of potential concern were identified. The properties of potential concern within the investigation area were given a potential contaminant value of high, medium/high, medium, or low.

- The high value was assigned to those sites that were identified as a National Priorities List (NPL) site or an open Leaking Underground Storage Tank (LUST) case. Two sites were classified as high potential contaminant value.
- The medium/high value was assigned to sites that were identified by the environmental database, but details about the site were unavailable and current property operations are cause for concern. Medium/high value was also assigned to sites that appeared to have once been operated as gasoline service stations and information on the status of the USTs was not available. Four sites were classified with a medium/high potential contaminant value.
- Sites with the medium value include those that were listed on the environmental database as closed LUST cases, sites with current Underground Storage Tank (UST) operations on the property, or USTs removed or closed in place. Old gas stations that had tanks removed were given a medium value. Nineteen sites were classified with a medium potential contaminant value.
- Those sites with the low value were classified as such due to no listing on the environmental database, Aboveground Storage Tanks (AST) in good condition, or with no reported releases. Four sites were classified with a low potential contaminant value.

2. Potential Effects

Based on the ISA findings, *No Further Action* was recommended for sites that were not anticipated to be impacted, or were anticipated to be impacted but their contaminant value was considered medium or low. A total of 23 sites were recommended for No Further Action.

No Further Action At This Time was recommended for sites that were anticipated to be impacted with a potential contaminant value of medium/high, or a site with a high value that is not anticipated to be impacted. If it is determined that these sites would be impacted as the design progresses, preliminary site assessments may be necessary to further evaluate the concerns these sites may pose to the project. Five sites were recommended for No Further Action at this time.

One site, NSF Dahlgren, within the potential limits of disturbance would require a Preliminary Site Assessment (PSA). This site has a high potential contaminant value and would be impacted by one or more of the proposed alternates. The PSA would include a detailed field survey, an on-property interview, possible groundwater and/or soil sampling, and/or a geophysical investigation. These additional investigations will be conducted according to all applicable local, state, and federal regulations. The PSA would be conducted prior to any ground disturbing activities in the vicinity of this site to determine the extent of hazardous materials present (currently underway).

H. INDIRECT AND CUMULATIVE EFFECTS (ICE) ANALYSIS

Summary: The ICE Analysis is a comprehensive, long-term assessment of the impacts associated with construction of a build alternate and other past, present and future planned development and transportation projects that might result in overall resource impacts within the ICE boundary. The Nice Bridge Improvement Project would not induce indirect development or land use changes, but may result in indirect effects to environmental resources caused by impacts that are further removed in time and space. Cumulative effects would be minor and are expected to occur in areas zoned for development. Cumulative effects to environmental resources will be regulated by existing applicable federal, state, and local legislation through individual avoidance, minimization and/or mitigation strategies.

In addition to the consideration of a project's "direct" impacts which have been described so far in this chapter, the Council on Environmental Quality (CEQ) regulations also require that the indirect and cumulative effects (ICE) of a project be examined (40 CFR § 1508.25 (c)). Indirect effects are defined as, "Effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR § 1508.8(b)). Cumulative effects are defined as, "Impacts on the environment which result 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). For additional information please refer to the *Nice Bridge Improvement Project Indirect and Cumulative Effects Analysis Technical Report* located on the attached CD.

1. Resources

In determining which environmental resources should be considered in the ICE analysis, those resources that would be directly impacted by the proposed alternates were identified. The following resources were considered:

- Communities;
- Low-Income/Minority Populations;
- Parkland/Recreational Facilities;
- Historic Properties;
- Prime Farmland Soils/Soils of Statewide Importance;
- Wetlands;
- Surface Water (WUS)/Aquatic Habitat;
- 100-Year Floodplains;
- Forest/Terrestrial Habitat;
- Rare, Threatened, and Endangered Species (RTE); and
- Chesapeake Bay Critical Areas/Virginia Preservation Areas.

Also considered were invasive species and submerged aquatic vegetation. Noise and hazardous material are not resources considered in the ICE analysis. Air Quality is addressed in regional conformity and therefore not included in the ICE analysis.

2. ICE Analysis Boundaries

As described in the *ICE Technical Report*, located on the attached CD, the geographic limits for the ICE analysis reach beyond the Nice Bridge study area. The ICE boundary was established through a synthesis of resource sub-boundaries (study area, Area of Traffic Influence, census tracts, sub-watersheds, and Maryland Priority Funding Areas) into one overall ICE boundary. ***Figure III-9*** identifies the ICE boundary in relation to all of the resource sub-boundaries considered.

The year 1970 was selected as the past time frame based on major events within the area that influenced population and/or land use changes. The present/near future time frame was established by projecting out five years from the present (2008) to 2013. The future time frame was chosen based on the project's design year of 2030.

3. Land Use Scenarios

Three land use scenarios (past, present/near future, and future) were prepared for use in an overlay analysis and in identifying trends in land use from the past to present time frame. Additionally, future land use was identified by overlaying present/near future land use mapping with future land use mapping. ***Figures III-10A and 10B*** depict past land use, ***Figures III-11A and 11B*** present/near future land use, and ***Figures III-12A and 12B*** future land use within the ICE boundary, respectively.

4. Indirect Effects

Indirect effects would be minor because there are no major developments and/or transportation projects that are contingent upon the selection of any of the Nice Bridge build alternates. Additionally, population in the area is increasing and is projected to do so through the year 2030. This increase is expected to occur regardless of the Nice Bridge improvements. However, indirect environmental impacts could occur as a result of the proposed build alternates (Alternates 2 through 7). These impacts would include those that are further removed in time or space that affect natural environmental resources due to increased impervious area, roadway and stormwater runoff, sedimentation, and erosion. Please refer to Section II.G.2 of the *Nice Bridge Improvement Project Indirect and Cumulative Effects Analysis Technical Report* for a more detailed assessment of potential indirect effects.

5. Cumulative Impacts

Population projections estimate increased growth in the ICE area between now and 2030. There are also many planned transportation and development projects that are slated to occur in the area between now and 2030, including the Nice Bridge Improvement Project. None of these other development or transportation projects are dependent on the construction of the Nice Bridge Improvement Project.

In general, resources within the ICE boundary have experienced cumulative effects over the past few decades from urban development. These cumulative effects have been more prominent in Maryland due to the greater development pressures that exist, compared to Virginia. It is expected that these trends would continue as additional growth occurs, however, these impacts are expected to be minor.

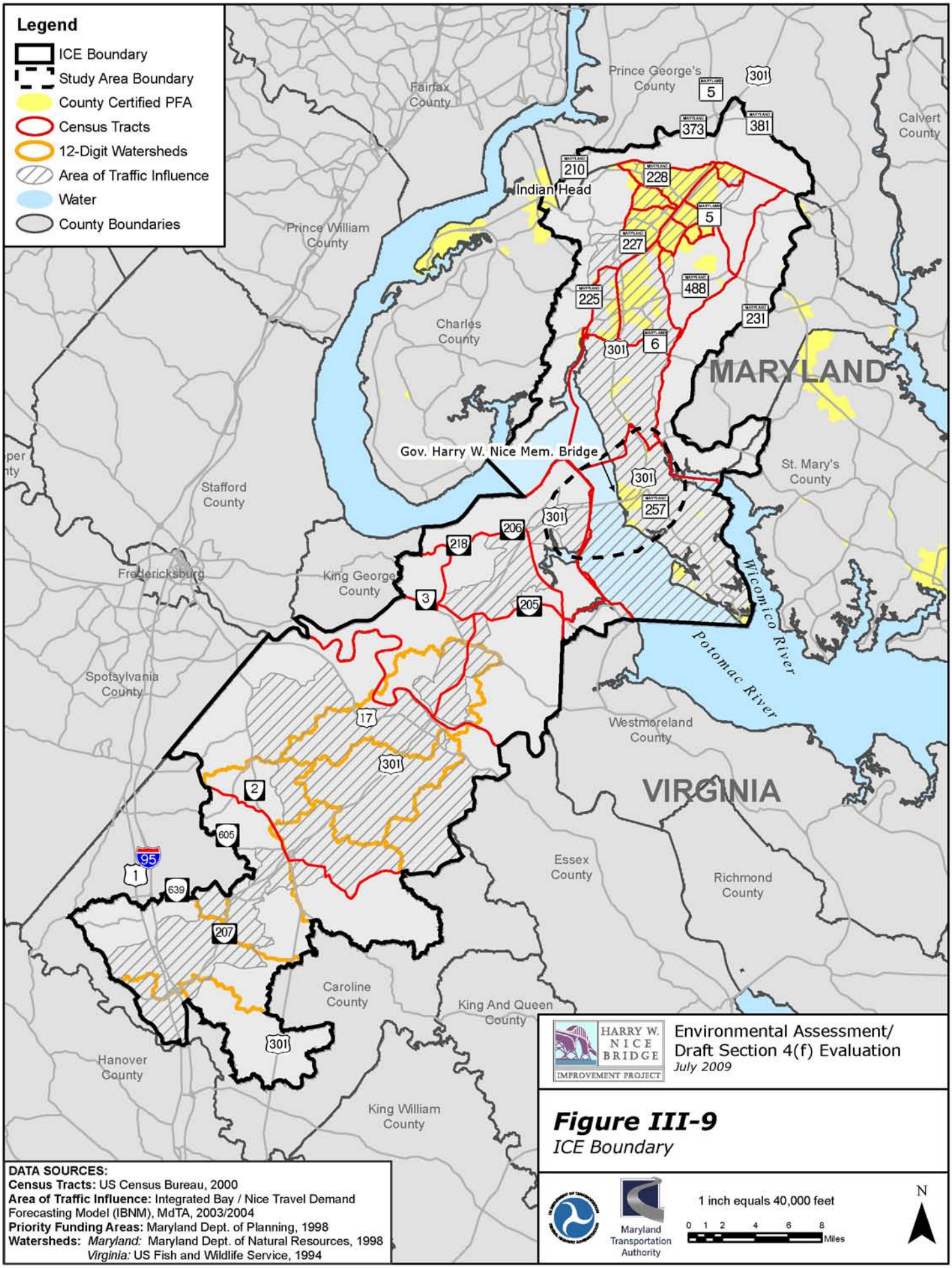


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Figure III-9

ICE Boundary

DATA SOURCES:
Census Tracts: US Census Bureau, 2000
Area of Traffic Influence: Integrated Bay / Nice Travel Demand Forecasting Model (IBNM), MdTA, 2003/2004
Priority Funding Areas: Maryland Dept. of Planning, 1998
Watersheds: *Maryland:* Maryland Dept. of Natural Resources, 1998
Virginia: US Fish and Wildlife Service, 1994

Maryland Transportation Authority

1 inch equals 40,000 feet

0 1 2 4 6 8 Miles

N

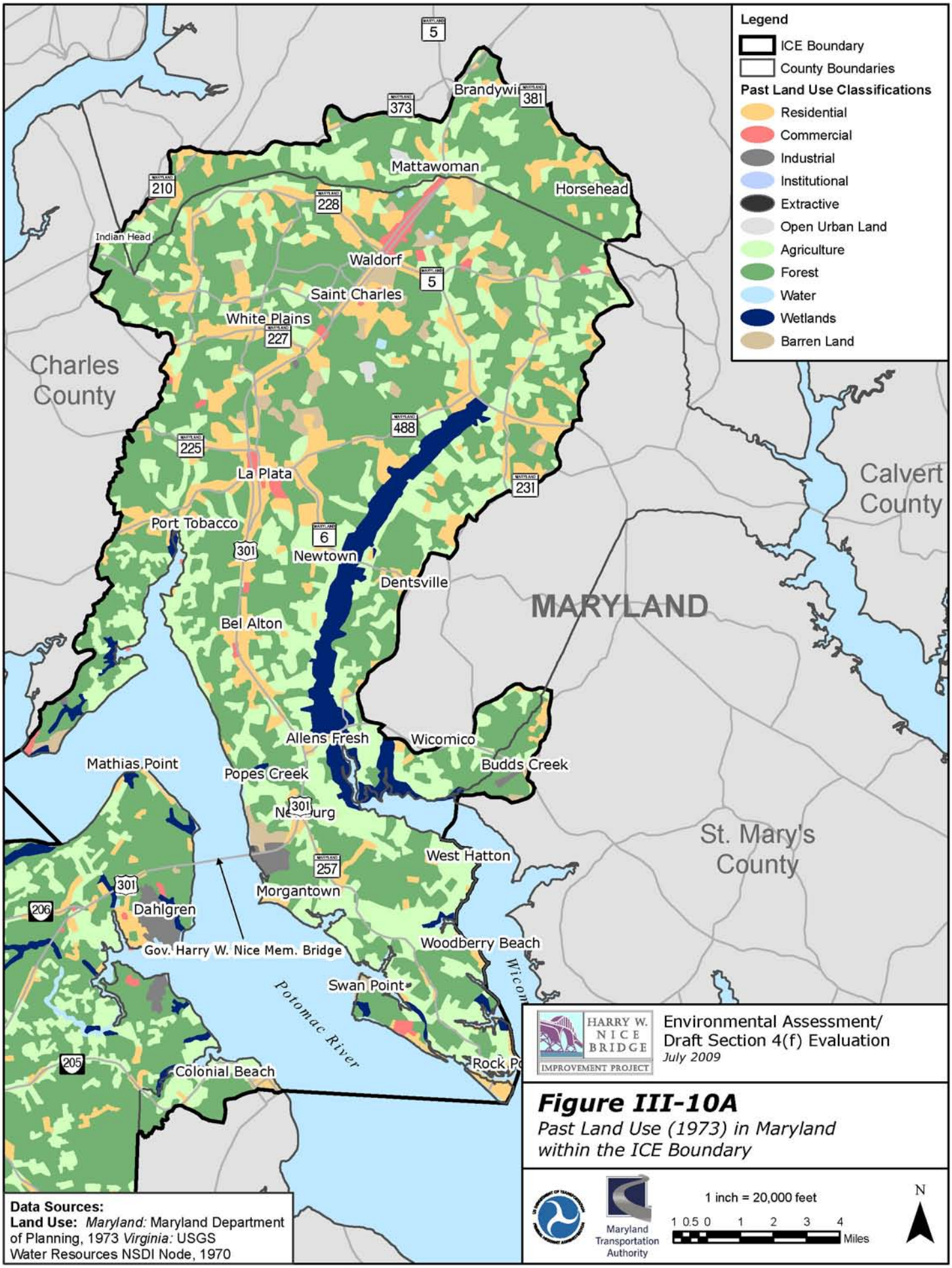

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Figure III-10A

Past Land Use (1973) in Maryland within the ICE Boundary

Maryland Transportation Authority

1 inch = 20,000 feet

1 0.5 0 1 2 3 4 Miles

N

Data Sources:
Land Use: *Maryland:* Maryland Department of Planning, 1973 *Virginia:* USGS Water Resources NSDI Node, 1970

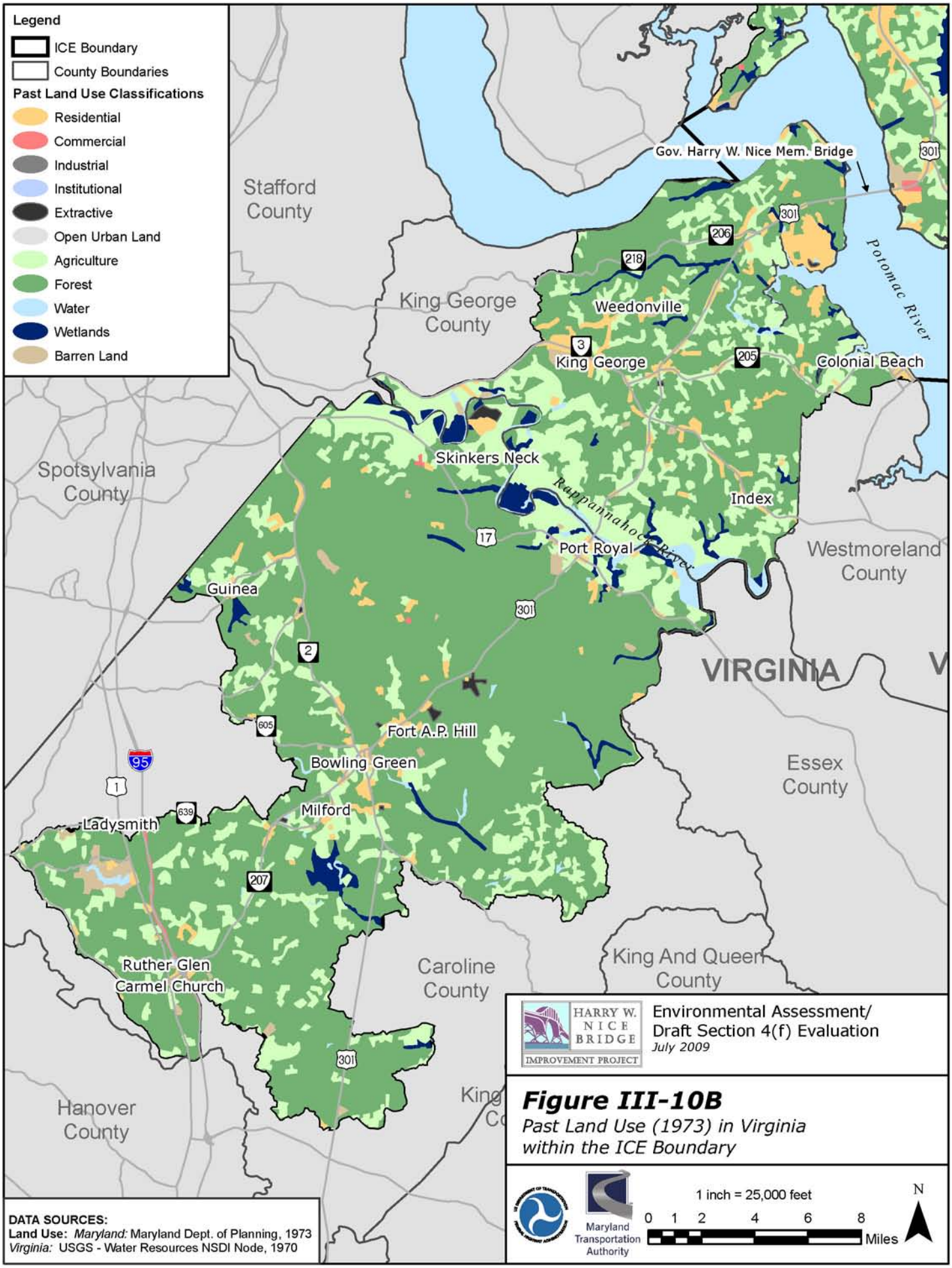
Legend
ICE Boundary
County Boundaries
Past Land Use Classifications
Residential
Commercial
Industrial
Institutional
Extractive
Open Urban Land
Agriculture
Forest
Water
Wetlands
Barren Land
Stafford County
King George County
Spotsylvania County
Caroline County
Hanover County
King And Queen County
Essex County
Westmoreland County
VIRGINIA
Gov. Harry W. Nice Mem. Bridge
Potomac River
Rappahannock River
Weedonville
King George
Colonial Beach
Skinkers Neck
Index
Port Royal
Guinea
Fort A.P. Hill
Bowling Green
Milford
Ladysmith
Ruther Glen
Carmel Church
301
206
218
3
205
17
2
605
95
1
639
207
DATA SOURCES:
Land Use: Maryland: Maryland Dept. of Planning, 1973
Virginia: USGS - Water Resources NSDI Node, 1970
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Figure III-10B
Past Land Use (1973) in Virginia
within the ICE Boundary
Maryland Transportation Authority
1 inch = 25,000 feet
0 1 2 4 6 8
Miles
N

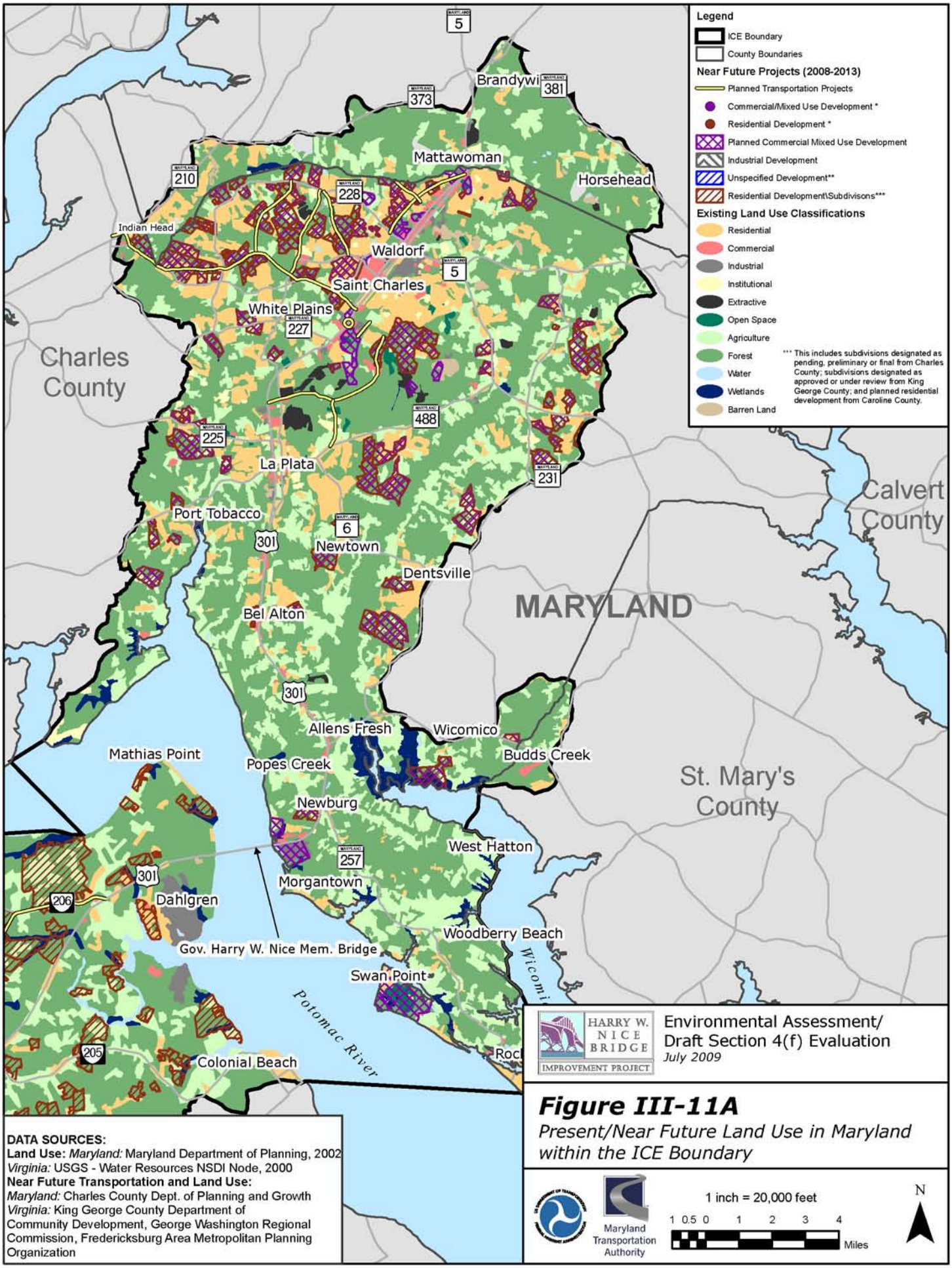

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Figure III-11A

Present/Near Future Land Use in Maryland within the ICE Boundary

DATA SOURCES:
Land Use: *Maryland:* Maryland Department of Planning, 2002
Virginia: USGS - Water Resources NSDI Node, 2000
Near Future Transportation and Land Use:
Maryland: Charles County Dept. of Planning and Growth
Virginia: King George County Department of Community Development, George Washington Regional Commission, Fredericksburg Area Metropolitan Planning Organization

Maryland Transportation Authority

1 inch = 20,000 feet

1 0.5 0 1 2 3 4 Miles

N

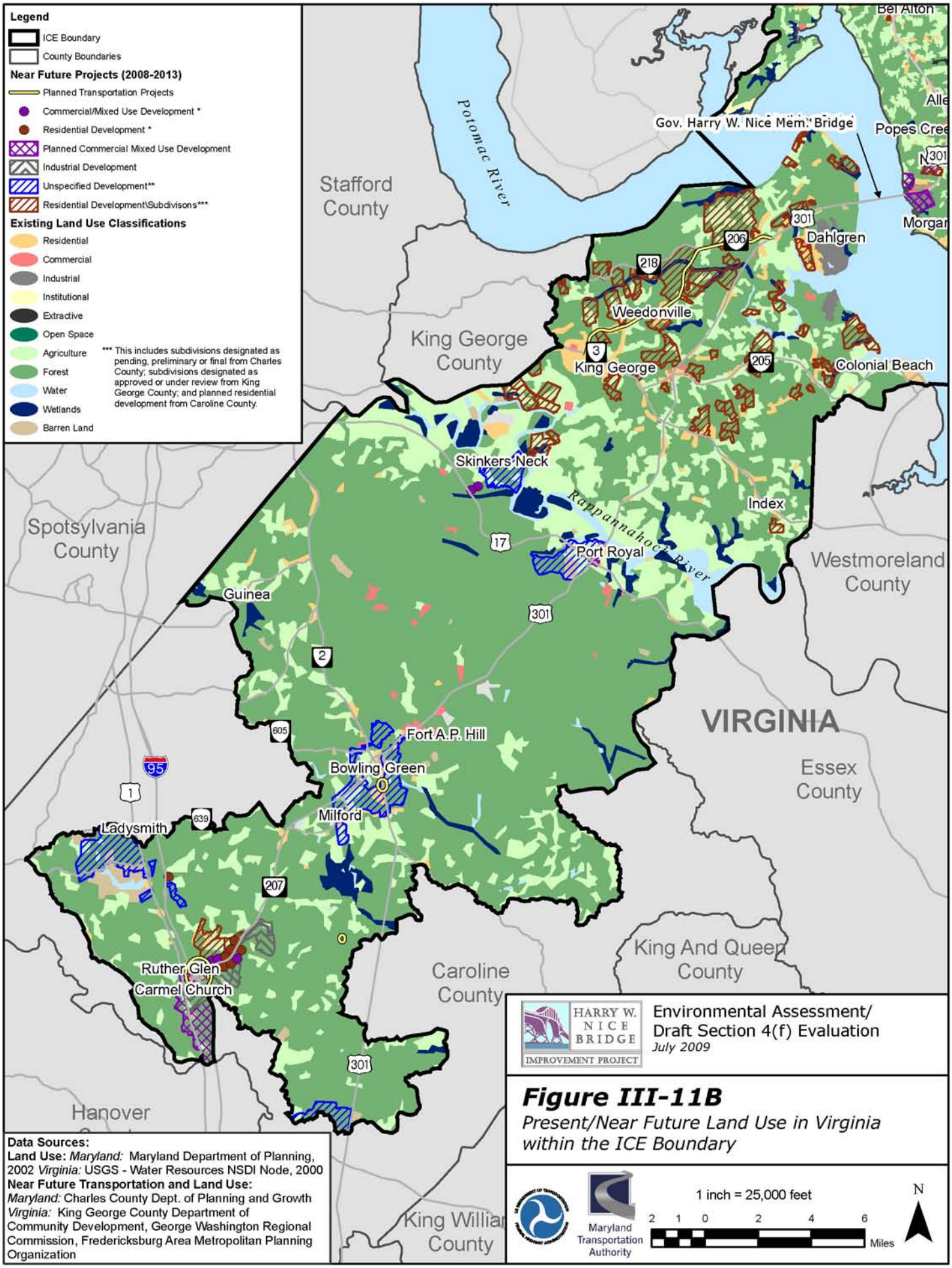
Legend
ICE Boundary
County Boundaries
Near Future Projects (2008-2013)
Planned Transportation Projects
Commercial/Mixed Use Development *
Residential Development *
Planned Commercial Mixed Use Development
Industrial Development
Unspecified Development**
Residential Development\Subdivisons***
Existing Land Use Classifications
Residential
Commercial
Industrial
Institutional
Extractive
Open Space
Agriculture
Forest
Water
Wetlands
Barren Land
*** This includes subdivisions designated as pending, preliminary or final from Charles County; subdivisions designated as approved or under review from King George County; and planned residential development from Caroline County.
Potomac River
Gov. Harry W. Nice Mem. Bridge
Bel Alton
Popes Cree
Morgar
Stafford County
Dahlgren
Weedonville
King George County
King George
Colonial Beach
Skinkers Neck
Rappannahock River
Index
Spotsylvania County
Port Royal
Westmoreland County
Guinea
VIRGINIA
Fort A.P. Hill
Bowling Green
Essex County
Milford
Ladysmith
Ruther Glen
Carmel Church
King And Queen County
Caroline County
Hanover
King William County
301
206
218
3
205
17
2
605
95
1
639
207
Data Sources:
Land Use: Maryland: Maryland Department of Planning, 2002 Virginia: USGS - Water Resources NSDI Node, 2000
Near Future Transportation and Land Use:
Maryland: Charles County Dept. of Planning and Growth
Virginia: King George County Department of Community Development, George Washington Regional Commission, Fredericksburg Area Metropolitan Planning Organization
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Figure III-11B
Present/Near Future Land Use in Virginia within the ICE Boundary
Maryland Transportation Authority
1 inch = 25,000 feet
2 1 0 2 4 6
Miles
N

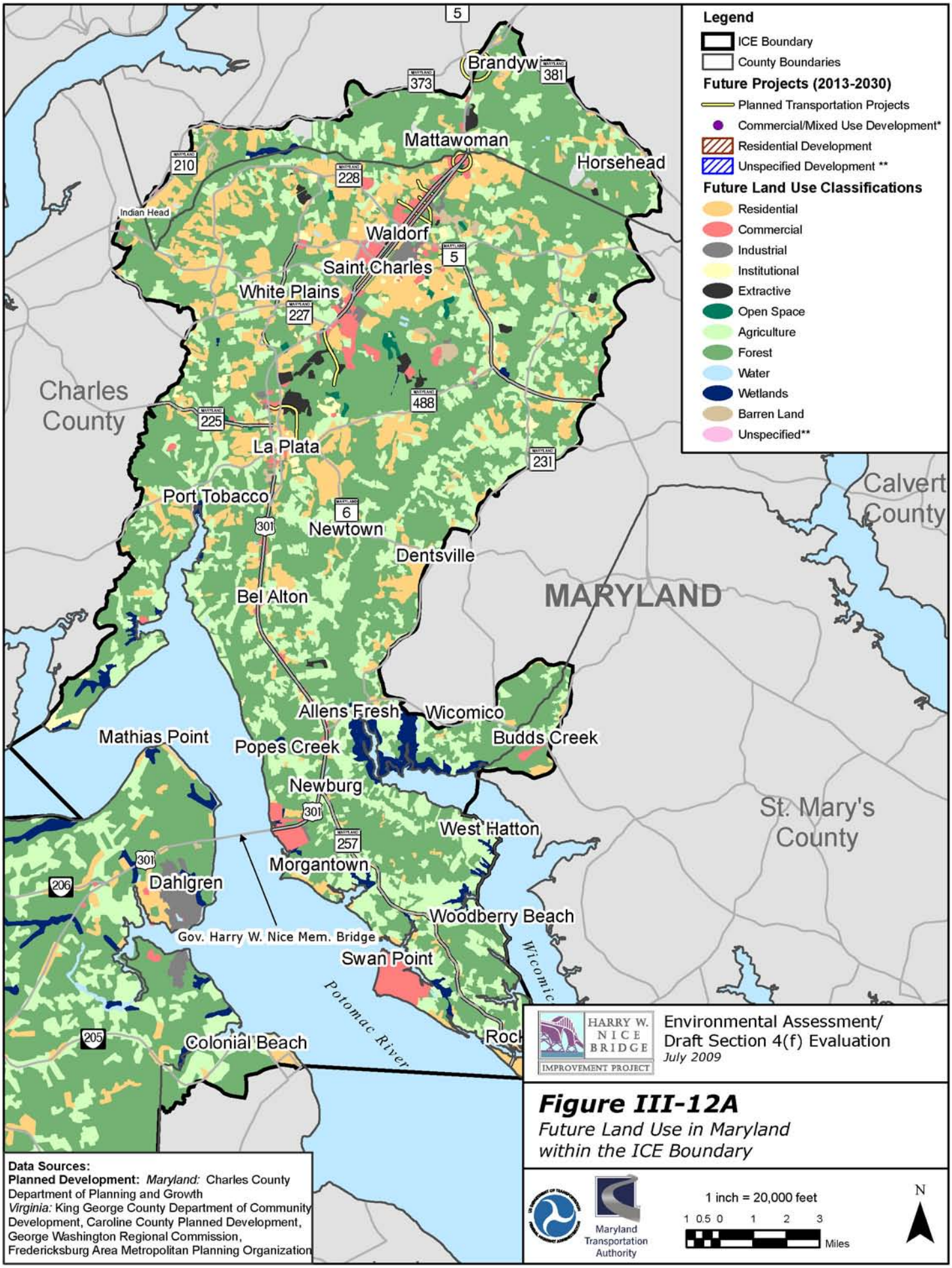

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Figure III-12A

Future Land Use in Maryland within the ICE Boundary

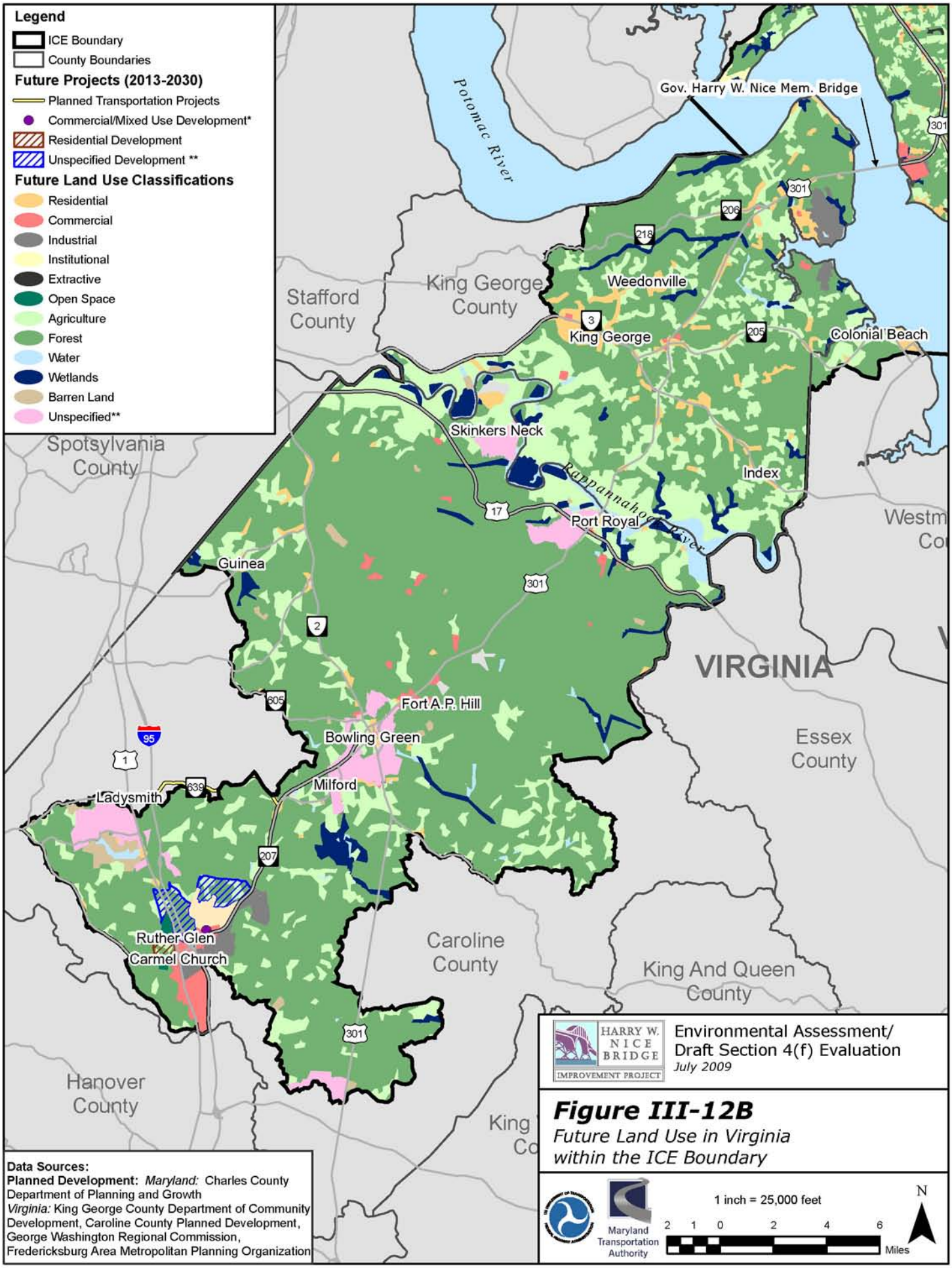
Data Sources:
Planned Development: *Maryland:* Charles County Department of Planning and Growth
Virginia: King George County Department of Community Development, Caroline County Planned Development, George Washington Regional Commission, Fredericksburg Area Metropolitan Planning Organization

Maryland Transportation Authority

1 inch = 20,000 feet

1 0.5 0 1 2 3 Miles

N


Legend
ICE Boundary
County Boundaries
Future Projects (2013-2030)
Planned Transportation Projects
Commercial/Mixed Use Development*
Residential Development
Unspecified Development **
Future Land Use Classifications
Residential
Commercial
Industrial
Institutional
Extractive
Open Space
Agriculture
Forest
Water
Wetlands
Barren Land
Unspecified**
Potomac River
Gov. Harry W. Nice Mem. Bridge
Stafford County
King George County
Weedonville
King George
Colonial Beach
Skinkers Neck
Index
Rappahannock River
Port Royal
Guinea
Spotsylvania County
VIRGINIA
Fort A.P. Hill
Bowling Green
Milford
Ladysmith
Ruther Glen
Carmel Church
Caroline County
King And Queen County
Essex County
Hanover County
Westm
Co
King
Co
301
206
218
3
205
17
2
605
95
1
639
207
Data Sources:
Planned Development: Maryland: Charles County Department of Planning and Growth
Virginia: King George County Department of Community Development, Caroline County Planned Development, George Washington Regional Commission, Fredericksburg Area Metropolitan Planning Organization
HARRY W. NICE BRIDGE
IMPROVEMENT PROJECT
Environmental Assessment/
Draft Section 4(f) Evaluation
July 2009
Figure III-12B
Future Land Use in Virginia
within the ICE Boundary
Maryland Transportation Authority
1 inch = 25,000 feet
2 1 0 2 4 6
Miles
N

Although resource impacts are anticipated from the Nice Bridge project and other transportation and development projects planned for the area, the rate at which impacts would occur is less than what the area has seen in the past decades. Both Maryland and Virginia have laws and regulations in place to reduce the rate and extent of resource impacts from development pressures. Additionally, local jurisdictions responsible for growth management within the ICE boundary have zoning and other planning strategies in place to guide development into areas that can accommodate it while preserving more sensitive areas that might be otherwise vulnerable to growth. ***Table III-17*** is a summary of the existing federal, state and local legislation that will contribute to avoidance, minimization and mitigation of cumulative effects from the Nice Bridge and other projects in the area. Refer to Section II.G.2 of the *Nice Bridge Improvement Project Indirect and Cumulative Effects Analysis Technical Report* for a more detailed assessment of potential cumulative effects.

***Table III-17**: Regulations Contributing to the Avoidance, Minimization and Mitigation of Cumulative Effects*

Resource	Laws/Regulations/Compliance
Communities	NEPA; Maryland Environmental Policy Act; Virginia Code sections 10.1-1188 et seq.
Low income/ Minority	Executive Order 12898; Title VI of the Civil Rights Act
Parks and Recreational Lands	Section 6(f) of the Land and Water Conservation Fund Act of 1965; Section 4(f) of the US Department of Transportation (DOT) Act of 1966
Historic Properties	Section 106 of the National Historic Preservation Act of 1966
Prime Farmland and Soils of Statewide Importance	Agricultural Conservation Districts as part of the *Charles County 1997 Comprehensive Plan;* Virginia State Agricultural Districts Enabling Statutes (Va. Code Ann. §§ 15.2-4300 to 15.2-4314 (2004)) and Virginia Local Agricultural Districts Enabling Statutes (Va. Code Ann. §§ 15.2-4400 to 15.2-4407 (2004))
Waters of the US and wetlands	§ 401 Certification from the USACE; Maryland Tidal and Nontidal Wetlands and Waterways Permits; Virginia Tidal Wetlands Act of 1972; Virginia Water Protection Permit; Virginia Marine Resources Permit
Water Quality	Section 404 of the Clean Water Act; § 401 Certification from the USACE
Floodplains	National Flood Insurance Program (44 CRF 59-79); Section 10 and 404 Permit Programs; Maryland and Virginia Waterway Construction Permit Program for non-tidal floodplains, Tidal and Nontidal Wetlands Permits, and Coastal Zone Management Programs; Charles County, Maryland Floodplain Management Ordinance; King George County Floodplain Management Overlay District
Submerged Aquatic Vegetation	Maryland Article-Natural Resources § 4-213 and § 4-1006.1
Forests	Maryland Reforestation Act (Natural Resources Article, §5-103); Maryland Forest Conservation Act (Natural Resources Article §5-1601 - 1613)
Invasive Species	Natural Resources Article (§4-205.1, Annotated Code of Maryland) and Aquatic Nuisance Species Regulations (COMAR 08.02.19); Virginia Non-indigenous Aquatic Nuisance Species Act (§§ 29.1-571-577 of the Code of Virginia), Virginia Noxious Weed Law, (§§3.1-296.11-21 of the Code of Virginia), and the Virginia Pest Law, (§§3.1-188.20-31:2, of the Code of Virginia).
Rare, Threatened and Endangered Species	Virginia Natural Area Preserves Act of 1989 (Section 10.1-209 through 217, Code of Virginia) Virginia's Endangered Species Act (Section 29.1-564 through 570, Code of Virginia) and Virginia Endangered Plant and Insect Act (Section 3.1-1020 through 1030, Code of Virginia).
Critical Areas	Maryland's Critical Area Act; Virginia's Chesapeake Bay Preservation Designation and Management Regulations