

POTOMAC YARD METRORAIL STATION

APPENDIX K

APPENDIX K

Functional Assessment



Stantec Consulting Services Inc.
1011 Boulder Springs Drive, Suite 225
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December 31, 2018
File: 203401233

Attention: Ms. Emily Baker
City of Alexandria
301 King Street
Alexandria, Virginia 22314

Dear Ms. Baker,

Reference: Functional Assessment Proposed Impact Areas - Potomac Yard Metrorail Station, City of Alexandria, Virginia

Stantec Consulting Services Inc. (Stantec) conducted a site visit on November 28, 2018 to perform a functional assessment within the proposed wetland impact area within Build Alternative B associated with the proposed Potomac Yard Metrorail Station. To document functions and values of wetlands within the study area, the Highway Methodology, originated by the New England District of the U.S. Army Corps of Engineers (USACE) (USACE, 1993), was utilized. The following sections provide a description of the wetlands proposed for impact, functional assessment methodology, and results.

Site Description

The proposed wetland impact area associated with Alternative B is situated between the George Washington Memorial Parkway and the CSXT railroad tracks, north of the Potomac Greens neighborhood. The land within this area appears to have been highly modified as evidenced by review of historical aerial imagery and the presence of what appears to be spoil piles observed in the field, resulting in mounding and irregular topography throughout this area. A large portion of the wetland impact area was previously occupied by a series of three oil/water separator ponds. These ponds were removed in 1993, remediated, and filled under the supervision of the Virginia Department of Environmental Quality. Wetlands within the impact area can be categorized as palustrine emergent and palustrine forested wetlands with non-tidal water regimes.

Palustrine emergent wetlands within the proposed impact area contain only sparsely scattered trees, saplings, and shrubs such as eastern cottonwood (*Populus deltoides*), American sycamore (*Platanus occidentalis*), Siberian elm (*Ulmus pumila*), and amur honeysuckle (*Lonicera maackii*). Dominant vegetation within these palustrine emergent wetlands includes common reed (*Phragmites australis*), goldenrod (*Solidago spp.*), sawtooth blackberry (*Rubus argutus*), arrowleaf tearthumb (*Persicaria sagittata*), broadleaf cattail (*Typha latifolia*) and significant vine cover from porcelain berry (*Ampelopsis brevipedunculata*), with Japanese honeysuckle (*Lonicera japonica*) also present. Hydrology present within the palustrine emergent wetland areas during field observations varied from areas of saturation in the upper 12 inches of the soil profile to inundation within depressional areas. Soils observed within palustrine emergent wetlands were sandy to silty clay loams 10YR 4/1 to 2.5Y 4/1 in Munsell color notation, with redoximorphic features present, suggesting a fluctuating water table.

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Palustrine forested wetlands within the proposed impact area contain red maple (*Acer rubrum*), eastern cottonwood, green ash (*Fraxinus pennsylvanica*), and silver maple (*Acer saccharinum*) in the canopy. The understory contains red maple, American hornbeam (*Carpinus caroliniana*), and river birch (*Betula nigra*) saplings as well as shrubs such as amur honeysuckle and vine cover from porcelain berry, Japanese honeysuckle and common greenbrier (*Smilax rotundifolia*). Hydrology present within the palustrine forested wetland areas during field observations varied from areas of saturation in the upper 12 inches of the soil profile to inundation within depressional areas. Soils observed within palustrine forested wetlands were primarily silty clay loams 10YR 4/1 to 7.5YR 4/2 in Munsell color notation, with redoximorphic features present, suggesting a fluctuating water table.

The rest of the proposed impact area associated with Alternative B can be characterized as upland mounds and berms characterized by ruderal vegetation with significant cover from invasive species, situated on areas of higher ground. These areas appeared to lack one or more of the three parameters (vegetation, soils, hydrology) required for positive wetland identification during field observations due primarily to topographic setting resulting from historic alteration to the landscape. Vegetative cover within these areas consists of eastern cottonwood, red maple, black locust (*Robinia pseudoacacia*), and black cherry (*Prunus serotina*) in the canopy and amur honeysuckle, eastern red cedar (*Juniperus virginiana*), staghorn sumac (*Rhus typhina*), sawtooth blackberry, and Japanese knotweed (*Fallopia japonica*) in the understory. There is significant vine cover throughout these areas in the form of porcelain berry, Japanese honeysuckle, oriental bittersweet (*Celastrus orbiculatus*), and English ivy (*Hedera helix*). Soils observed throughout these areas were highly variable as a result of historic alteration to the landscape.

A large portion of the vegetation documented within the wetland impact area is composed of invasive species, as identified on the Virginia Department of Conservation and Recreation (DCR) Virginia Invasive Species Plant List. Species on the list are ranked as exhibiting high, medium or low levels of invasiveness based on their threat to natural communities and native species (DCR, 2014). A list of common/dominant invasive species located within the wetland impact area are included in Table 1.

Table 1 – Invasive Species List

Species	Virginia Invasiveness Rank
Amur honeysuckle	High
Common reed	High
English ivy	Medium
Japanese honeysuckle	High
Japanese knotweed	High
Oriental bittersweet	High
Porcelain berry	High
Siberian elm	Low

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Methods

To document functions and values of wetlands within the study area, the Highway Methodology, originated by the New England District of the USACE (USACE, 1993), was utilized. The Highway Method approach includes a qualitative description of the physical characteristics of the wetlands, identifies the functions and values exhibited, and most importantly, provides the basis for the conclusions using "best professional judgment." While it is a descriptive approach to evaluating wetlands, it uses a format that is organized, predictable, and easily documented for each function and value. It incorporates both wetland science and human judgment of values. Functions relate to the ecological significance of wetland properties without regard to subjective human values, including all processes necessary for the self-maintenance of the wetland ecosystem. Values are benefits that derive from either one or more functions and physical characteristics of a wetland, and/or the human judgment of the worth, merit, quality or importance attributed to those functions.

The following functions and values were evaluated for the wetland impact area:

Functions

- Groundwater Recharge/Discharge
- Floodflow Alteration
- Fish and Shellfish Habitat
- Sediment/Toxicant/Pathogen Retention
- Nutrient Removal/Retention/Transformation
- Production Export
- Sediment/Shoreline Stabilization
- Wildlife Habitat

Values

- Recreation
- Educational/Scientific Value
- Uniqueness/Heritage
- Visual Quality/Aesthetics
- Threatened or Endangered Species Habitat

The assessment was completed with analysis of resources including topographic mapping, delineation data, and aerial imagery to support information collected during site visits to perform a qualitative assessment of the functions and values of the wetlands within the study area. A descriptive approach was used to identify functions using knowledge of wetland science, combined with in-field data collection, using a checklist method, to assess the list of the 13 functions and values that are considered by the USACE Regulatory Branch for any Section 404 wetland permit.

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The focus was on principal functions and values of the proposed wetland impacts in Alternative B. Investigators determined presence/absence of each function and value based upon analysis and field data collection and described the basis for conclusions.

Results

Based on the results of the functional assessment evaluation, the proposed wetland impact area for Alternative B retains aquatic functions and values for many of the above-mentioned parameters. The principal functions/values of the system are groundwater recharge/discharge, flood-flow alteration, sediment/toxicant retention, nutrient removal, and wildlife habitat and recreation. Additional functions/values that are suitable within the wetland impact area include sediment/shoreline stabilization, educational/scientific value, uniqueness and heritage, and visual quality/aesthetics. Functions and values lacking within the wetland impact area include fish and shellfish habitat and endangered species habitat. Overall, the functional capacity of the wetlands is reduced due to the land use history and high levels of modification, as well as a dominant presence of invasive species.

The wetland impact area has the capacity to attenuate floodwater and sheet flow from uplands, which contributes to the functions for floodwater alteration, sediment/toxicant retention and nutrient removal. While berms within the wetland provide some benefit, upland mounds that are present reduce the capacity for these functions. Heavy vegetative cover and diffuse flows through the wetlands also contribute to these functions. While there is no shoreline within or immediately adjacent to the wetland impact area, the previously mentioned attributes also provide some benefits to the shoreline stabilization of tidal waters that are downslope and reductions in sedimentation.

The wetland impact area retains some suitable characteristics for wildlife habitat and production export. The wetland area is part of a habitat island surrounded by development, with connections to downstream habitat areas. A dominant presence of invasive species within the wetland impact area reduces the diversity and abundance of native vegetation and suitable food forage for some species, as well as limiting the diversity of community structure. Signs of wildlife observed during the assessment include evidence of white-tailed deer presence, old burrows, a sighting of a red fox, and bird activity.

The presence of significant historic disturbance and dominant invasive species reduce the overall values of the wetlands in the impact area compared to natural, less disturbed wetland systems. The wetland provides recreational value due to the ease of safe access to a handicap accessible trail adjacent to and through the wetland impact area. The wetland provides some educational/scientific value due to an informative placard, view of multiple wetland classes from the trail, and opportunities to view wildlife. The latter two attributes also contribute to the visual quality/aesthetics of the wetlands. The wetland impact area can be attributed with the uniqueness/heritage value due to the lack of wetlands that are accessible to the public in the general area.

A summary of the rationale behind the evaluation for each function/value is included in Table 2 and on the Wetland Function-Value Evaluation Form (Appendix A). Representative photographs are included as Appendix B.

Table 2 Potential Wetland Functions and Values

Function and Value Parameter	Suitability	Principal Functions/Values	Rationale
Groundwater Recharge/Discharge	Y	Y	Wetland displays signs of variable water levels and groundwater discharge. Recharge occurs into perched aquifer. Drains directly into tidal waters.
Floodflow Alteration	Y	Y	High level of impervious surfaces in watershed and flood storage in area appears to be limited. Relatively flat area has ability to retain higher volumes of water than under normal conditions and capture sheet flow from adjacent uplands. Wetlands able to detain water from storm surge, although the presence of earthen berms and mounds reduces this capacity. Wetland provides some protection to valuable properties, structures, and resources downstream. Hydric soils and a high density of vegetation able to absorb and detain water.
Fish and Shellfish Habitat	N		No suitable fish or shellfish habitat present within wetland impact area.
Sediment/Toxicant Retention	Y	Y	Potential sources of sediment and toxicants present from the adjacent railroad and highway. Toxicants may be present in subsurface soil and fill material, as well as potential residual levels of petroleum hydrocarbons and metals within the shallow groundwater table. Slow moving water, diffuse flow and dense vegetation allow opportunities for sediment trapping. Potential for long duration water retention in wetland, due in part to existing berms and earthen mounds. Public water source in Potomac River, downstream of wetland. Wetland edge is broad and intermittently aerobic.
Nutrient Removal	Y	Y	Potential sources of excess nutrients present in watershed above wetland. Overall potential for sediment trapping and nutrient attenuation exists. Wetlands appear to be saturated for most of the season and areas of ponded water are present in portions of the wetlands. A mix of dense emergent and woody vegetation are present in suitable abundance to utilize nutrients.
Production Export	Y		Wildlife food sources grow within wetlands. Detritus development is present and periodic flushing of organic material from a portion of wetlands occurs. Evidence of wildlife use was observed including buck rubs, deer tracks, old animal burrows and bird activity in wetland. Flowering plants used by nectar-gathering insects are present. A high density of vegetation is present, which includes a dominant presence of invasive species within the wetlands.
Sediment/Shoreline Stabilization	Y		No shoreline present within or adjacent to wetland impact area, but is in close proximity to tidal waters downslope. Dense vegetation and diffuse flow through the wetland impact area aid in a reduction of erosive forces and sedimentation downstream.
Wildlife Habitat	Y	Y	Wetland is contiguous with other wetland systems connected by a watercourse. Overland access for wildlife to access other wetlands is present. Food sources for wildlife are within this wetland, but a dominant presence of invasive species reduces the amount and diversity of native vegetation that provide suitable forage. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons. Wetland has potential to contain a high population of insects and large amphibian populations. Wetland has potential for high avian utilization. Animal signs observed including buck rubs, deer tracks, earthen burrows and bird activity. Density of vegetation is high, but a dominant presence of invasive species limits community structure and diversity and reduces the benefits to wildlife.
Recreation	Y	Y	A handicap accessible trail is located within a portion of the wetlands. The wetland is within a short drive/safe walk from highly populated public and private areas. The wetland provides habitat for wildlife.
Educational/Scientific Value	Y		A large portion of the wetland impact area is located within former oil/water separator ponds, which were removed in 1993, remediated, and then refilled and seeded. Evidence of disturbance is still present and the vegetative community is generally dominated by invasive species. These factors reduce the potential education and scientific value of the wetlands compared to what would be found in a natural, less disturbed wetland community. The wetland has a publicly accessible trail with handicap access and informative plaques. A complex of forested and emergent wetlands is observable from the trail.
Uniqueness/Heritage	Y		Wetlands surrounded by residential, transportation and commercial development. A dominant presence of invasive species are located within wetland impact area and significant historic disturbance has occurred within a large portion of this area. Handicap accessible trail provides a view of a forested and emergent wetland complex and opportunities for wildlife observations. Wetland provides several functional values absent from surrounding development.
Visual Quality/Aesthetics	Y		Evidence of historic disturbance is evident and the vegetative community is generally dominated by invasive species. Area provides habitat and opportunities to view wildlife. The wetland has a handicap accessible trail that provides a view of a emergent and forested wetland complex.
Endangered Species Habitat	N		No suitable habitat present for listed species identified in agency database review/coordination.

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Summary

Based on the application of the Highway Methodology, the wetlands in the proposed impact area retain some functions and values normally associated with such systems. The principal functions and values that are associated with the wetland impact area are related to groundwater recharge/discharge, flood-flow alteration, sediment/toxicant retention, nutrient removal and retention, and wildlife habitat and recreation. The functions and values of the wetland system are significant due to the lack of abundance of similar wetlands with public access in the area. Overall, the functional capacity of the wetlands is reduced due to the land use history and high levels of modification, as well as a dominant presence of invasive species.

Regards,

Stantec Consulting Services Inc.



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Attachments: Wetland Function-Value Evaluation Form, Representative Photographs
c. Ms. Loretta Cummings, Stantec Consulting Services Inc.

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References

U.S. Army Corps of Engineers. 1995. The Highway Methodology Workbook Supplement. Wetland Functions and Values: A Descriptive Approach. U.S. Army Corps of Engineers, New England Division. NENEP-360-1-30a. 32pp.

Virginia Department of Conservation and Recreation. 2014. Virginia Invasive Plant Species List. <http://www.dcr.virginia.gov/natural-heritage/document/nh-invasive-plant-list-2014.pdf>. Accessed 12/18/2108.

**APPENDIX A
WETLAND FUNCTION-VALUE
EVALUATION FORM**

Wetland Function-Value Evaluation Form

Total area of wetland _____ Human made? _____ Is wetland part of a wildlife corridor? _____ or a "habitat island"? _____

Adjacent land use _____ Distance to nearest roadway or other development _____

Dominant wetland systems present _____ Contiguous undeveloped buffer zone present _____

Is the wetland a separate hydraulic system? _____ If not, where does the wetland lie in the drainage basin? _____

How many tributaries contribute to the wetland? _____

Wetland I.D. _____

Latitude _____ Longitude _____

Prepared by: _____ Date _____

Wetland Impact:
Type _____ Area _____

Evaluation based on:
Office _____ Field _____

Corps manual wetland delineation completed? Y _____ N _____

Function/Value	Suitability Y / N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
 Groundwater Recharge/Discharge				
 Floodflow Alteration				
 Fish and Shellfish Habitat				
 Sediment/Toxicant Retention				
 Nutrient Removal				
 Production Export				
 Sediment/Shoreline Stabilization				
 Wildlife Habitat				
 Recreation				
 Educational/Scientific Value				
 Uniqueness/Heritage				
 Visual Quality/Aesthetics				
ES Endangered Species Habitat				
Other				

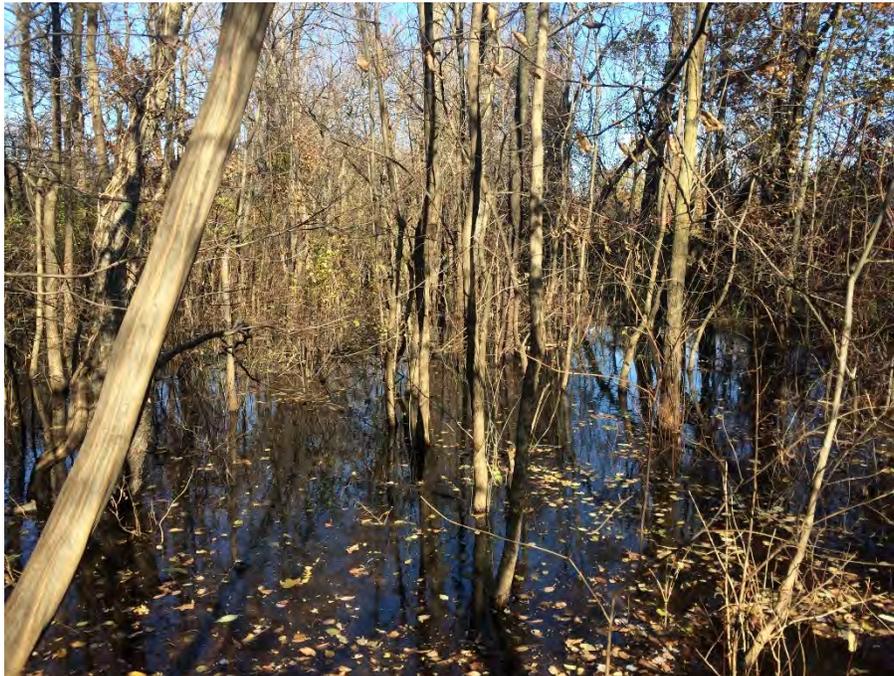
Notes:

* Refer to backup list of numbered considerations.

APPENDIX B
REPRESENTATIVE PHOTOGRAPHS



Photograph 1: View West. Palustrine emergent wetland and berm within the proposed wetland impact area associated with Build Alternative B.



Photograph 2: View North. Successional palustrine forested wetland within northern portion of proposed wetland impact area.



Photograph 3: View North. View from trail of palustrine and emergent wetlands and informational placard.



Photograph 4: View Southwest. Emergent wetland between trail and railway. Hydrology draining from west of rail through small culvert into wetland.



Photograph 5: View South. Palustrine forested wetland with view of Potomac Greens buildings in background.



Photograph 6: View North. View of upland mounds in palustrine emergent and forested wetlands. Overrun with the invasive vine porcelain berry.