WATER RESOURCES TECHNICAL REPORT

AUGUST 2013

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1. Introduction and Project Description

1.1 Introduction

The information presented in this technical report provides additional details in support of the FEIS for the following resources within the study area: waters of the United States (WUS) and wetlands, surface waters, floodplains, groundwater and hydrogeology, and aquatic biota and habitat. This document provides further discussions on the affected environment, impact assessment of the Preferred Alternative, and potential mitigation measures.

1.2 Project Description

The Purple Line is a proposed 16.2-mile transit line located north and northeast of Washington DC, inside the circumferential I-95/I-495 Capital Beltway. The Purple Line would extend between Bethesda in Montgomery County and New Carrollton in Prince George's County. The "Purple Line corridor" includes five major activity centers: Bethesda, Silver Spring, Takoma/Langley Park, College Park, and New Carrollton.

The purposes of the Purple Line project are the following:

- Provide faster, more direct, and more reliable east-west transit service connecting the major activity centers in the Purple Line corridor at Bethesda, Silver Spring, Takoma/Langley Park, College Park, and New Carrollton,
- Provide better connections to Metrorail services located in the corridor, and
- Improve connectivity to the communities in the corridor located between the Metrorail lines.

There are two Alternatives discussed herein: the No Build Alternative and the Preferred Alternative.

1.2.1 No Build Alternative

The No Build Alternative represents the future conditions of transportation facilities and services in 2040 in the corridor if the Purple Line were not built. The No Build Alternative includes the existing highway network and transit service, plus those transportation projects listed within the Purple Line corridor for which funding sources have been identified and have been included in the National Capital Region Transportation Planning Board's (TPB) *Financially Constrained Long-Range Transportation Plan* (CLRP) for implementation by 2040. The No Build Alternative provides the basis against which the Preferred Alternative is compared.

1.2.2 Preferred Alternative

The Preferred Alternative would be at grade except for one short tunnel section and three sections elevated on structures. The Preferred Alternative would operate mainly in dedicated or exclusive lanes, providing fast, reliable transit operations.

The following 21 stations are planned for the Preferred Alternative:

- Bethesda
- Chevy Chase Lake
- Lyttonsville
- Woodside/16th Street
- Silver Spring Transit Center
- Silver Spring Library
- Dale Drive
- Manchester Place
- Long Branch
- Piney Branch Road
- Takoma/Langley Transit Center
- Riggs Road
- Adelphi Road/West Campus
- UM Campus Center
- East Campus
- College Park
- M Square
- Riverdale Park
- Beacon Heights
- Annapolis Road/Glenridge
- New Carrollton

Stations would include ticket vending machines, weather shelters for passengers, lighting, wayfinding and informational signage, trash receptacles, seating, and security equipment such as emergency telephones and closed circuit television cameras. Most riders would walk to the stations or transfer from other transit services. Access plans for each station have been developed to enhance pedestrian and transit access for nearby communities. The stations would have either side or center platforms depending on the site characteristics and space availability.

Two storage and maintenance facilities are proposed: one at Lyttonsville in Montgomery County and the other at Glenridge in Prince George’s County. Additionally, traction power substations, used to convert electric power to appropriate voltage and type to power the light rail vehicles, would be required approximately every mile.

As part of the Preferred Alternative the permanent Capital Crescent Trail would be constructed within the Georgetown Branch right-of-way for a distance of 3.3 miles between Bethesda and the CSXT Metropolitan Branch. At the junction with the CSXT the trail is planned to continue on the north side of the CSXT corridor to the SSTC. The permanent Capital Crescent Trail would replace the existing Georgetown Branch Interim Trail which currently extends from Bethesda to Stewart Avenue within the Georgetown Branch right-of-way. The completion of the trail along the CSXT corridor is contingent on agreement with CSXT on the use of their property on the north side of the CSXT tracks for the trail. If agreement is not reached by the time the Purple Line construction occurs, MTA would construct the trail from Bethesda to Talbot Avenue. From Talbot Avenue to Silver Spring an interim signed bike route on local streets would be used. MTA will plan, design, and construct the permanent Capital Crescent Trail between Bethesda and Silver Spring concurrently with the Purple Line. The Capital Crescent Trail will be owned and operated by Montgomery County, which will be responsible for providing the funds to construct it.

2. Regulatory Context and Methodology

The study area assessed for water resources is the Purple Line project's limit of disturbance (LOD), which is the boundary within which construction, materials storage, grading, landscaping, and related activities would occur. For consideration of surface water quality, the nearest sampling sites, located upstream or downstream from the study area, were used.

2.1 WUS and Wetlands

The federal Clean Water Act (CWA) establishes the structure for regulating discharges of pollutants into the WUS and regulating water quality standards for surface waters. WUS include unvegetated ponds, seasonal pools, and perennial, intermittent, and ephemeral stream channels. Wetlands are a subset of WUS and support a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE 2012).

The federal Clean Water Act (CWA) as well as other regulations requires transportation projects to minimize, avoid, or reduce WUS, including wetland impacts. The following regulations and guidance apply to WUS and wetlands:

- **Section 404 of the CWA-** Any project activities that result in the potential discharge of dredged or fill material into WUS, including wetlands, require a permit from the U. S. Army Corps of Engineers (USACE).
- **Executive Order 11990, Protection of Wetlands, and DOT Order 5660.1A, Preservation of the Nation's Wetlands-** This order requires that transportation projects and facilities employ practicable measures to minimize, avoid, or reduce impacts to wetlands during the planning and construction phases.
- **Federal Compensatory Mitigation Rule (33 CFR Part 322) -** The Environmental Protection Agency (EPA) and the USACE require a hierarchy of preferred mitigation for unavoidable impacts to WUS and wetlands. The EPA and USACE prefer compensatory mitigation in the following order: mitigation banks, in-lieu fee, permittee responsible mitigation.
- **Section 401 of the Clean Water Act-** Before the USACE can issue a Section 404 permit, the Maryland Department of the Environment (MDE) must issue a Section 401 Water Quality Certification, which is a finding that the project complies with the State's water quality standards.
- **Maryland Nontidal Wetlands Protection Act-** The MDE issues permits for project activities affecting nontidal wetlands and their vegetated 25-foot buffer.
- **Waterway and 100-year Floodplain Construction Regulations-** Authorization from MDE is required for activities affecting surface waters and 100-year floodplains. These activities may involve bridges or culverts, excavation or filling, channelization, changing the current course or cross section of any stream, and temporary construction within the 100-year floodplain.

Because of the length of time between the AA/DEIS and FEIS, and because of shifts in the Preferred Alternative, the FEIS phase of the project included an updated assessment of WUS, including wetlands. This updated assessment focused on WUS in the vicinity of the Preferred Alternative. Information on potential WUS and wetlands within the study area were gathered from published sources including the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps and NRCS Soil Surveys for Prince George's and Montgomery Counties.

The study area was field investigated for potential WUS and wetlands. Wetland delineations were conducted between December 2011 and April 2012 to verify and supplement data sources in accordance with the Regional Supplements to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0 (USACE 2010) and Eastern Mountains and Piedmont Region (USACE 2010).

All identified WUS and wetlands were classified according to *A Classification of Wetland and Deep-Water Habitats in the United States* (USFWS 1979). The wetland indicator status of the observed vegetation was identified using the *National List of Plant Species That Occur in Wetlands: Region 1 – Northeast* (USFWS 1988).

Wetland functions and values were assessed for all wetlands greater than one-half acre in size using the USACE New England Method as presented in *The Highway Methodology Workbook Supplement – Wetland Functions and Values; A Descriptive Approach* (USACE 1999). This method provides a framework for assessment that relies on the presence of certain physical characteristics broadly understood to indicate the presence of related functions, along with best professional judgment of an experienced wetland scientist. Functions/values assessed using this methodology include 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, and endangered species habitat. For smaller wetlands, a formal analysis of functions and values was not conducted; however, observed functions and values were noted based on the professional experience of the wetland scientists performing the delineations.

The relative extent to which a particular function/value is potentially being provided was evaluated by reviewing a comprehensive list of qualifiers and determining the applicability of each, using a combination of field data, mapping, and best professional judgment. Results were recorded on a Wetland Function-Value Evaluation Form (see Appendix C). This approach was only undertaken for functions/values determined to be “suitable”, based on the characteristics of a given wetland. For example, fish and shellfish habitat is a function/value that is not suitable for consideration among wetlands without permanent aquatic habitat. A function/value was said to be “principal” if more than 50 percent of the potential qualifiers were met. The threshold of 50 percent was established in collaboration with the USACE, MDE, and USFWS during the permitting process for projects throughout the State of Maryland. For wetlands less than one half acre, a formal analysis was not conducted. Rather, relevant functions/values were noted on the wetland field data sheets using best professional judgment only.

Based on EPA and USACE guidance, the agencies will assert jurisdiction over the following WUS:

- Traditional navigable waterways (TNWs)
- Wetlands adjacent to TNWs
- Non-navigable tributaries of TNWs that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least three months of the year
- Wetlands that abut such tributaries

The agencies will determine jurisdiction on a case-by-case basis over the following waters after a basis analysis has been performed to determine whether they have a significant nexus with a TNW:

- Non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent
- Wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary

A significant nexus evaluation (SNE) will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs. As a matter of policy, not law, the USACE requires performing a SNE on all intermittent non-navigable (not perennial) tributaries and their adjacent wetlands, even if the tributary's flow may be relatively permanent.

Wetland Determination Data Forms and Stream Features Field Sheets were completed in the field for each numbered wetland and waterway, as well as adjacent uplands from sampled test plots (see Appendix D). Data recorded included dominant vegetation, hydrologic indicators, and hydric soil indicators. Mapped soil types were documented using NRCS soil surveys and used to support soil profile descriptions in the field. Hydric soil indicators were assessed using the Field Indicators of Hydric Soils in the United States (USDA 1998). Soil color was identified using the Munsell Color Chart handbook (Munsell 1975).

To gain agency concurrence on field-identified WUS and wetland boundaries, USACE and MDE agency field reviews were conducted on May 8 and 9, 2012. The wetlands and waterways described in Section 3.1 reflect the results of these field reviews and agency concurrence with the boundaries as shown. An additional field review was conducted on July 30, 2013 to review additional wetlands and waterways that had been identified since the 2012 field reviews. Minutes of the agency field reviews and corresponding maps are provided in Appendix E.

Based on subsequent coordination with the USACE, the MTA anticipates the USACE will provide an Approved Jurisdictional Determination[1] for WUS and wetlands within the study area by late September, 2013.

2.2 Surface Waters

Under the CWA, the EPA has implemented pollution control programs and set water quality standards for all contaminants in surface waters. The CWA mandates that the State establish total maximum daily loads (TMDL) in order to bring existing water quality up to minimum established water quality standards in streams that have been categorized as "impaired." A TMDL is an estimate of the maximum amount of a pollutant that a given waterbody can absorb without violating environmental water quality standards (MDE 2011). The State of Maryland has established water quality standards for the protection of public health or welfare, simultaneously providing enhancement of water quality and protection of aquatic resources. Additional regulations apply to streams that are designated as scenic or wild, either through the federal or state designation, or navigable. The following regulations and standards apply to streams and water quality:

- **Section 303 (d) of the Clean Water Act-** This section of the CWA mandates that the State establish total maximum daily loads (TMDLs), in order to bring existing water quality up to minimum

[1] Approved Jurisdictional Determinations (JDs) are used by the USACE to help implement Section 404 of the CWA and Sections 9 and 10 of the RHA. An approved JD is an official USACE determination that jurisdictional "waters of the United States," or "navigable waters of the United States," or both, are either present or absent on a particular site. An approved JD precisely identifies the limits of those waters on the project site determined to be jurisdictional under the CWA/RHA. (See 33 C.F.R. 331.2.)

established water quality standards in streams that have been categorized as “impaired”. A TMDL is an estimate of the maximum amount of a pollutant that a given waterbody can absorb without violating environmental water quality standards (MDE 2011). Category 5 of Maryland’s Surface Integrated Report of Surface Water Quality, historically known as the 303 (d) list, is the current list of impaired stream segments. Surface water is typically analyzed for chemical composition and is compared to the standard level of water quality established by the CWA.

- **MDE Water Quality Standards-** MDE defines the goals for a water body by designating its uses, setting criteria to measure attainment of those uses, and establishing policies to protect water quality from pollutants.
- **Federal Wild and Scenic River Act-** This act was established to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development.
- **Maryland Scenic and Wild Rivers Act of 1968-** A Scenic or Wild River is a river that possesses outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value(s). The Maryland Department of Natural Resources (MDNR) program regulates current and future use and development of rivers designated as Scenic or Wild, tributaries thereto, and adjacent land areas, in order to provide protection of their inherent qualities and characteristics, and to protect and maintain the high water quality within such rivers.
- **Section 10 of the Rivers and Harbors Appropriation Act of 1899-** The USACE regulates structures that are located in, under or over navigable waters of the U.S. under this Act. “Navigable waters of the United States are those waters that are subject to ebb and flow of the tide and/or are presently used or have been used in the past or may be susceptible for use to transport interstate or foreign commerce” (33 C.F. R. Part 329.4).

Data for the chemical characteristics of existing water supplies within project-area watersheds were gathered from the MDNR, the Montgomery County Department of Environmental Protection (MCDEP), the Maryland Biological Stream Survey (MBSS), and the Prince George’s Department of Environmental Resources (PGDER). Existing data were based on studies completed over many years; however, only data collected since 2000 were considered current. The MDE has established standards regarding water quality, with parameters based on designated Stream Use Classification. These standards are listed in the COMAR 26.08.02.01-.03–Water. The State has developed and the EPA has approved TMDLs for the overall Chesapeake Bay watershed including the Purple Line study area. The study area streams that are classified as impaired were identified in Maryland’s Integrated Report of Surface Water Quality (MDE 2010).

2.3 Floodplains

Floodplains are regulated to minimize flooding impacts on upstream and downstream properties, and to avoid or minimize impacts to floodplains. The following requirements apply to floodplains:

- **USDOT Order 5650.2, “Floodplain Management and Protection”-** Prescribes policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse effects to regulated floodplains.
- **Executive Order 11988, “Floodplain Management,”-** requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and

modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

- **MDE 100-Year Floodplain Construction Regulations-** These regulations assure that activities in a 100- year floodplain do not create flooding on upstream or downstream property. Authorization from MDE is required for project activities, including bridges or culverts and temporary construction, affecting 100-year floodplains.

Regulated floodplains within the project study area were identified based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) used in conjunction with GIS mapping.

2.4 Groundwater and Hydrogeology

Information regarding groundwater resources and existing hydrology within the study area was gathered from available published data sources, including the United States Geological Survey (USGS), Maryland Geological Survey (MGS), and MDE.

2.5 Aquatic Biota and Habitat

Aquatic biota and habitat within project area surface waters are governed by the same regulations as surface waters as both are a component.

- **COMAR 26.08.02.08-** Stream Segment Designations (MDE 2007)- The MDE has established designated uses for streams in Maryland to attain or maintain water quality standards to protect aquatic resources. Under this regulation, MDE also regulates in-stream construction for the protection of aquatic habitat and fisheries resources during certain periods of the year, depending upon the designated use of the stream.
- **The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) -** requires the National Marine Fisheries Service (NMFS) to integrate NEPA and the fisheries management process for environmental review and to regulate project effects to marine habitat and fisheries resources.
- **Section 404/401 of the Clean Water Act-** This act is regulated by the USACE and MDE for impacts to streams and consequently, the aquatic biota and habitat within them.

3. Affected Environment

3.1 WUS and Wetlands

Field investigations identified 48 WUS and wetlands (33 streams and 15 wetlands), shown in Figure 1. Most stream systems located within developed areas have been relocated, ditched, or channelized to accommodate runoff from adjacent roadways and the Georgetown Branch Interim Trail. The larger streams (such as Sligo Creek, Rock Creek, Northwest Branch, and Northeast Branch) are channelized near roadway bridge crossings but remain stable and without channelization upstream and downstream of the transitway alignment.

Most wetlands in the study area have been degraded by road encroachments and vegetation removal. Despite the high degree of disturbance, these wetland areas continue to provide some limited functions including groundwater discharge/ recharge, sediment/toxicant retention, nutrient removal, and wildlife habitat. The least affected and highest functioning wetlands in the study area are vegetated systems located in the forested floodplain of Rock Creek (Wetland GB-8).

Each of the WUS and wetlands identified during the field investigation are described in detail below and summarized in Table 1. Areas that contained only vegetated wetland resources are denoted as wetlands; areas identified as perennial and intermittent streams or ephemeral channels are labeled as waterways.

Waterway WUS GB-1 is the uppermost reach of Coquelin Run, which originates just south of the southern end of Pearl Street and flows east along the Capital Crescent Trail and under the trail to join the mainstem of Coquelin Run. This stream begins as an intermittent riverine system with a mud bottom (R4SB5) and becomes perennial (R2UB1/2) as it flows under the road to join the mainstem. The channel has been straightened along the trail and is fed by a partially concrete-lined stormwater outfall classified as an ephemeral channel. The intermittent stream is about seven feet wide and four feet deep, while the ephemeral channel is about six feet wide and three feet deep. Approximately one half inch of flowing water was present in the main channel at the time of the field visit, while negligible flow was present in the ephemeral channel. Habitat complexity was considered very poor in this system due to the absence of stable habitat, shallow flows, heavy silt deposition, and moderate bank erosion in the main channel. The perennial portion of the stream is approximately ten feet wide with a channel depth of five feet. During the site visit, the stream was approximately one foot deep. Habitat complexity was considered moderate and characterized by riffle/pool sequencing and undercut banks.

Waterway WUS GB-2 is an unnamed tributary that originates within the Columbia Country Club golf course and flows south under the Capital Crescent Trail, eventually joining Coquelin Run and ultimately, Rock Creek. This stream is classified as an intermittent riverine system with a mud substrate (R4SB5). The width and depth of the channel are eight and three and a half feet, respectively. At the time of the field visit, less than one inch of flowing water was evident within the channel. The stream is channelized near the culvert as it flows south under the trail. Habitat complexity was considered very poor due to a lack of stable habitat and shallow flows.

Figure 1. Wetlands, Waterways and Floodplains

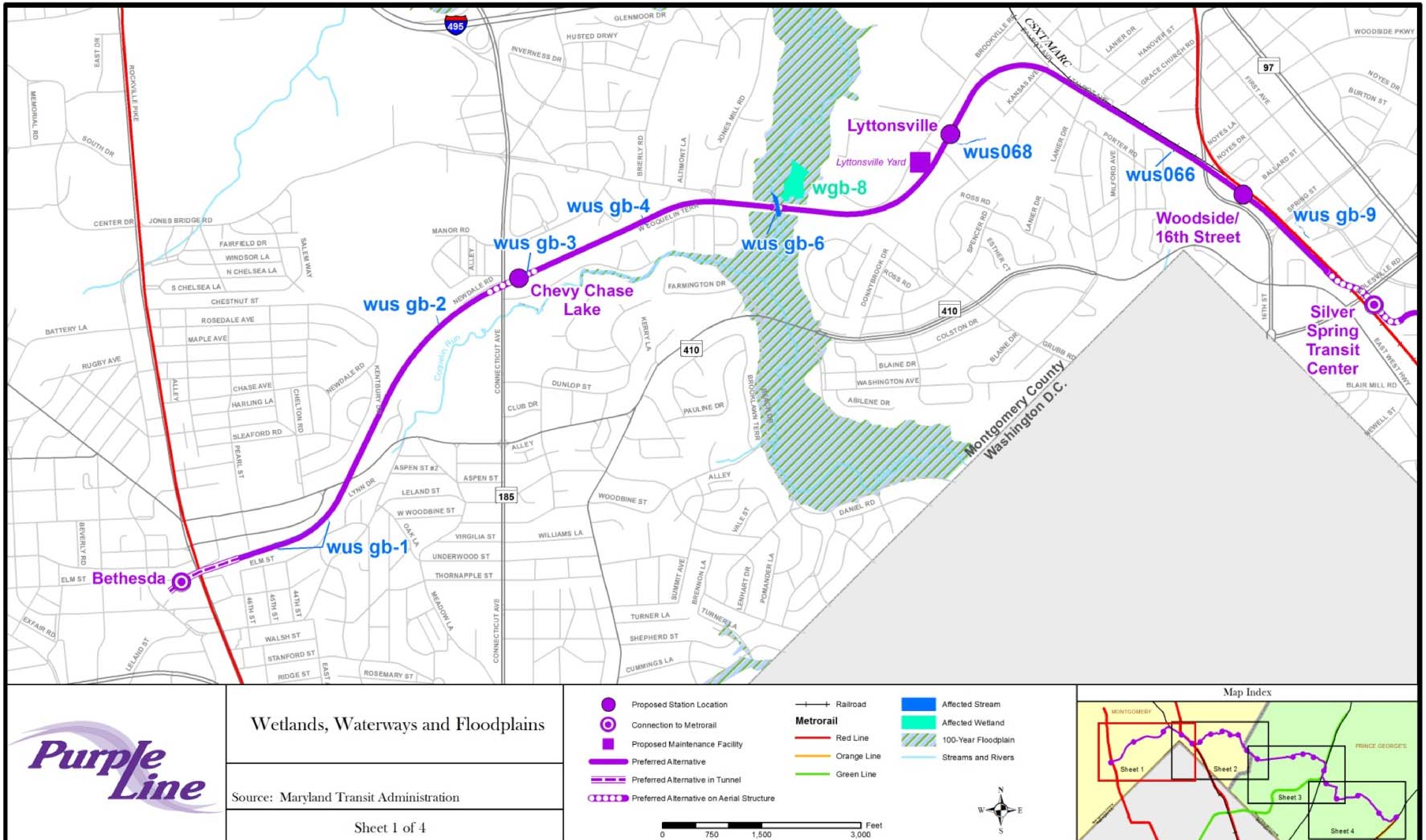

Figure 1. Wetlands, Waterways and Floodplains (continued)

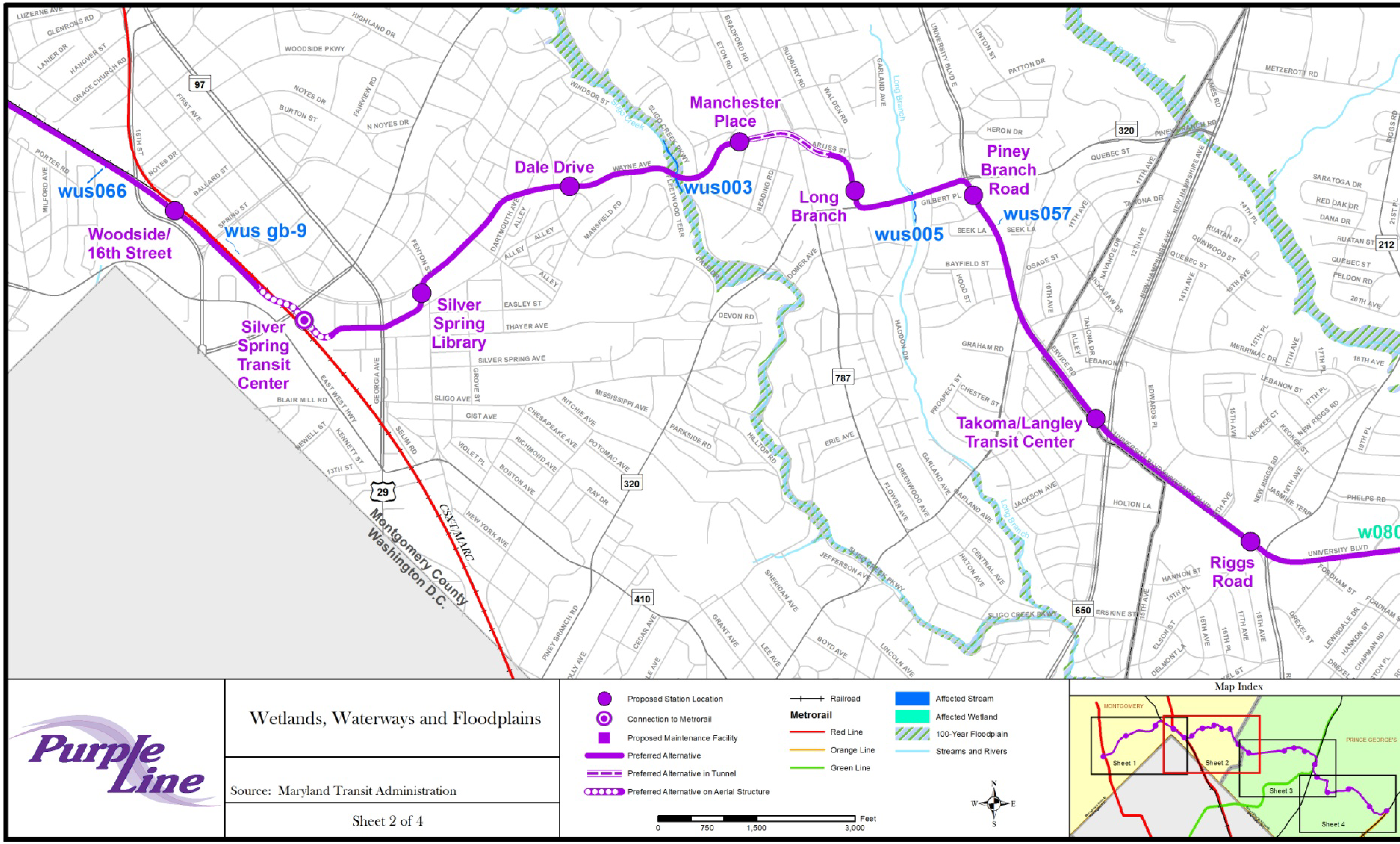

Figure 1. Wetlands, Waterways and Floodplains (continued)

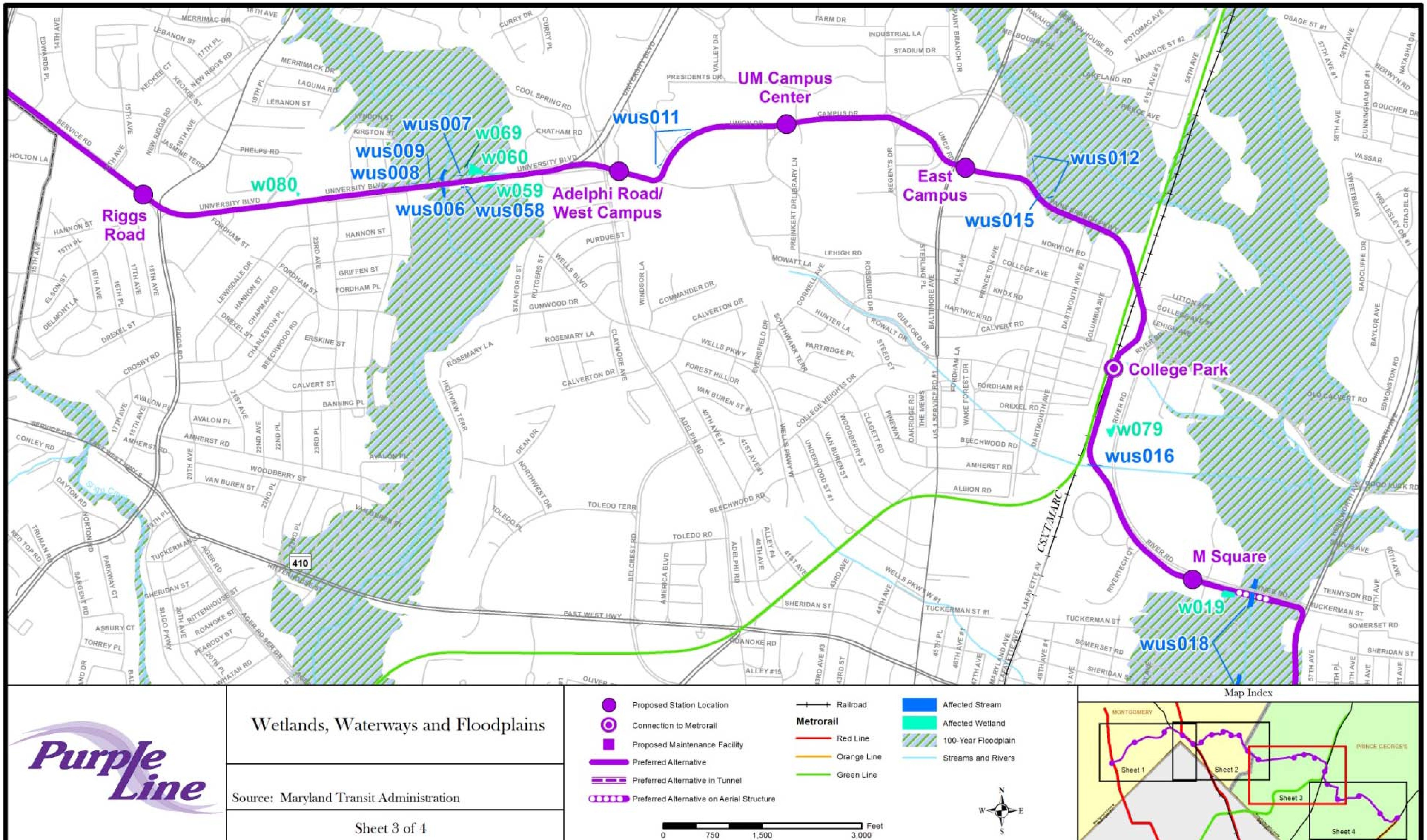

Figure 1. Wetlands, Waterways and Floodplains (continued)

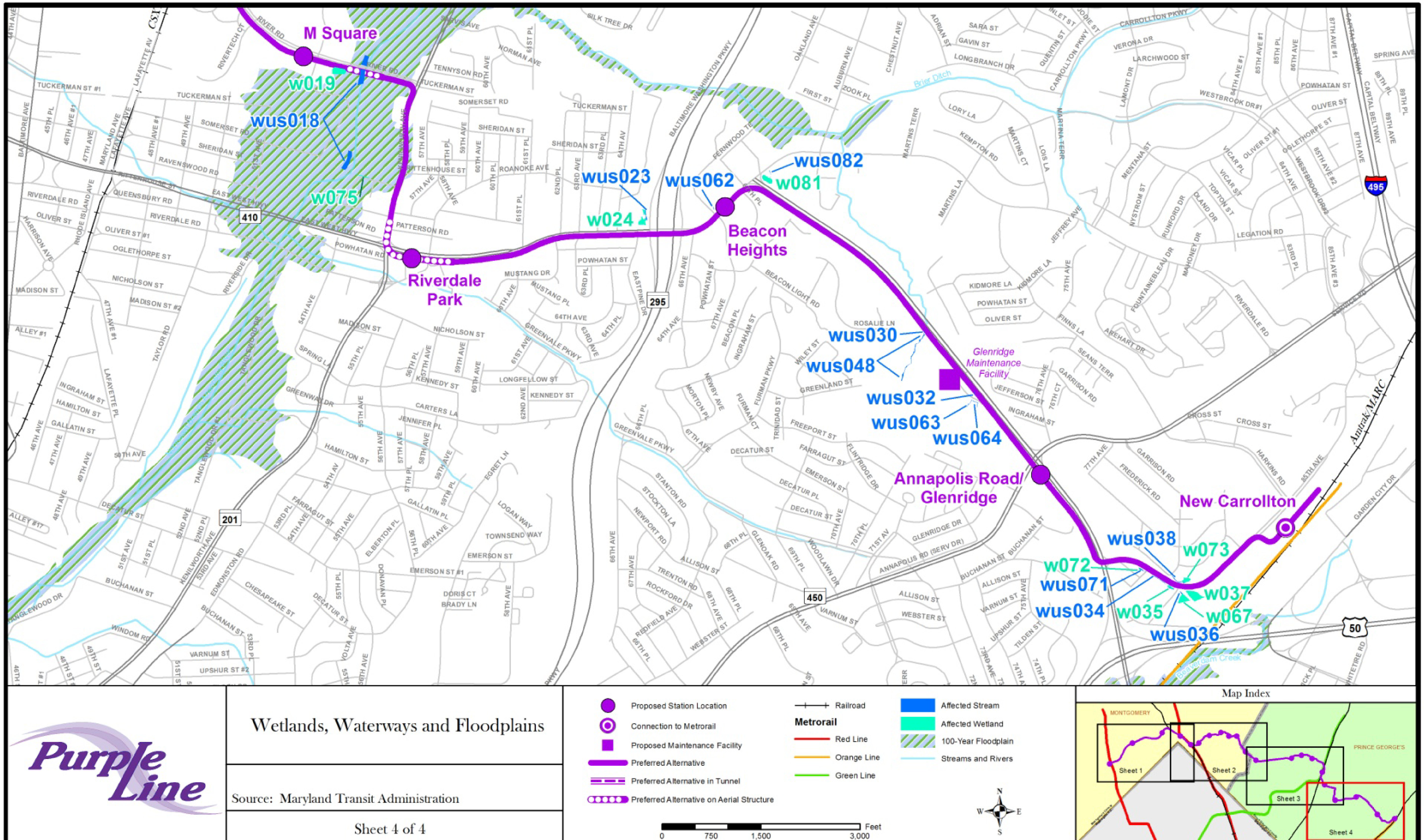

Table 1. WUS and Wetland within Study Area

Wetland Number	Cowardin Classification	Hydrology	Vegetation			Soils	Principal Functions
			Common Name	Scientific Name	Indicator Status		
WUS GB-1	R4SB5/R2UB1/2 Ephemeral	n/a	n/a	n/a	n/a	n/a	n/a
WUS GB-2	R4SB5	n/a	n/a	n/a	n/a	n/a	n/a
WUS GB-3	R2UB3/4	n/a	n/a	n/a	n/a	n/a	n/a
WUS GB-4	R4SB3/4	n/a	n/a	n/a	n/a	n/a	n/a
WUS GB-6	R2UB1	n/a	n/a	n/a	n/a	n/a	n/a
Wetland GB-8	PFO1E/F	Surface Water, High Water Table, Saturation, Water-Stained Leaves, Drainage Patterns, Crayfish Burrows, Saturation on Aerial, Stunted or Stressed Plants	green ash box elder American elm common buttonbush broadleaf cattail sweet woodreed arrowleaf tearthumb	*Fraxinus pennsylvanica* *Acer negundo* *Ulmus americana* *Cephalanthus occidentalis* *Typha latifolia* *Cinna arundinacea* *Polygonum sagittatum*	FACW FAC FACW OBL OBL FACW OBL	**Codorus silt loam;** Depleted Matrix (F3); 6-12 inches of 10YR5/2 silty clay loam with 7.5YR4/6 redox concentrations	Groundwater Recharge/ Discharge, Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat, Recreation, Uniqueness/ Heritage, Visual Quality/Aesthetics
WUS GB-9	R4SB4	n/a	n/a	n/a	n/a	n/a	n/a
WUS 003	R2UB1	n/a	n/a	n/a	n/a	n/a	n/a
WUS 005	R2UB1/2	n/a	n/a	n/a	n/a	n/a	n/a
WUS 006	R2UB2	n/a	n/a	n/a	n/a	n/a	n/a
WUS 007	R2UB2	n/a	n/a	n/a	n/a	n/a	n/a
WUS 008	R4SB4	n/a	n/a	n/a	n/a	n/a	n/a
WUS 009	R4SB3/4	n/a	n/a	n/a	n/a	n/a	n/a
WUS 011	R4SB3/4	n/a	n/a	n/a	n/a	n/a	n/a
WUS 012	R2UB1/2x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 015	R2UBx	n/a	n/a	n/a	n/a	n/a	n/a
WUS 016	R4SB3/4	n/a	n/a	n/a	n/a	n/a	n/a
WUS 018	R2UB1/2	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 019	POW/PEM1Hx	Surface Water, High Water Table, Saturation, Hydrogen Sulfide Odor	broadleaf cattail common rush Japanese honeysuckle	*Typha latifolia* *Juncus effusus* *Lonicera japonica*	OBL FACW FAC	**Codorus-Hatboro-Urban land complex;** Soils did not meet hydric soils criteria due to recent creation of wetland	Floodflow Alteration, Groundwater Recharge/ Discharge, Sediment-Toxicant Retention
Waterway WUS 023	R4SB2/4	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 024 WTP-1	PFO1A/C	Surface Water, High Water Table, Saturation, Drift Deposits, Water-Stained Leaves	black willow American sycamore green ash northern catalpa sweetgum eastern cottonwood silver maple American elm boxelder Amur honeysuckle sallow sedge Japanese stiltgrass Indian hemp curly dock meadow fescue eastern poison ivy Japanese honeysuckle Virginia creeper	*Salix nigra* *Platanus occidentalis* *Fraxinus pennsylvanica* *Catalpa speciosa* *Liquidambar styraciflua* *Populus deltoides* *Acer saccharinum* *Ulmus americana* *Acer negundo* *Lonicera maackii* *Carex lurida* *Microstegium vimineum* *Apocynum cannabinum* *Rumex crispus* *Festuca pratensis* *Toxicodendron radicans* *Lonicera japonica* *Parthenocissus quinquefolia*	OBL FACW FAC FAC OBL FAC FAC FACU FAC UPL OBL FAC FACU FAC FACU FAC FAC FACU	**Christiana-Downer-Urban land complex;** Loamy Gleyed Matrix (F2); 10-15 inches of N5/0 sandy clay with 10YR4/6 redox concentrations	Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal

Table 1. WUS and Wetland within Study Area (continued)

Wetland Number	Cowardin Classification	Hydrology	Vegetation			Soils	Principal Functions
			Common Name	Scientific Name	Indicator Status		
Wetland 024 WTP-2	PEM1A/C	Saturation, Geomorphic Position	common reed	*Phragmites australis*	FACW	Loamy Gleyed Matrix (F2); 10-15 inches of N5/0 with 10YR4/6 redox concentrations	
WUS 030	R4SB2x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 032	R4SB2x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 034	R4SB2x	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 035	PFO1E	Surface Water, Saturation, Drainage Patterns	American sycamore northern catalpa boxelder black willow reed canarygrass smallspike falsenettle Asiatic tearthumb	*Platanus occidentalis* *Catalpa speciosa* *Acer negundo* *Salix nigra* *Phalaris arundinacea* *Boehmeria cylindrica* *Polygonum perfoliatum*	FACW FAC FAC FACW FACW FACW FAC	Issue-Urban land complex; Depleted Matrix (F3); 2-8 inches of 10YR4/2 silt loam with 7.5YR4/6 redox concentrations	Floodflow Alteration, Sediment-Toxicant Retention, Nutrient Removal
WUS 036	R4SB2x	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 037	PEM1G	Surface Water, Saturation, Water Marks	common reed unknown goldenrod common rush Allegheny blackberry Japanese honeysuckle	*Phragmites australis* *Solidago sp.* *Juncus effusus* *Rubus allegheniensis* *Lonicera japonica*	FACW N/A FACW FACU FAC	Issue-Urban land complex; Depleted Matrix (F3); 4-12+ inches of 2.5Y4/2 fine sandy clay with 10YR5/6 redox concentrations	Floodflow Alteration, Sediment-Toxicant Retention, Nutrient Removal, Visual Quality/Aesthetics
WUS 038	R4SB4x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 048	R4SB3/4x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 057	R4SB4x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 058	Ephemeral	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 059	PFO1E	Surface Water, High Water Table, Saturation, Water Marks, Drift Deposits, Drainage Patterns	green ash eastern cottonwood sweetgum boxelder multiflora rose fig buttercup common rush white avens field pennycress reed canarygrass eastern poison ivy	*Fraxinus pennsylvanica* *Populus deltoides* *Liquidambar styraciflua* *Acer negundo* *Rosa multiflora* *Ranunculus ficaria* *Juncus effusus* *Geum canadense* *Thlaspi arvense* *Phalaris arundinacea* *Toxicodendron radicans*	FACW FAC FAC FAC FACU NI FACW FACU NI FACW FAC	Codorus and Hatboro soils; Depleted Matrix (F3); 0-12 inches of 10YR4/1 silt loam with 7.5YR3/4 redox concentrations	Groundwater Recharge/ Discharge, Sediment-Toxicant Retention, Nutrient Removal, Wildlife Habitat
Wetland 060	PFO1E	Surface Water, Saturation, Sediment Deposits, Drift Deposits, Water-Stained Leaves	sweetgum green ash Chinese privet meadow garlic Japanese honeysuckle multiflora rose black cherry white avens eastern poison ivy Virginia creeper	*Liquidambar styraciflua* *Fraxinus pennsylvanica* *Ligustrum sinense* *Allium canadense* *Lonicera japonica* *Rosa multiflora* *Prunus serotina* *Geum canadense* *Toxicodendron radicans* *Parthenocissus quinquefolia*	FAC FACW FACU FACU FAC FACU FACU FACU FAC FACU	Codorus and Hatboro soils, Codorus-Hatboro-Urban land complex, Christiana-Downer-Urban land complex; Depleted Matrix (F3); 0-6 inches of 10YR4/1 silty clay loam with 7.5YR4/6 redox concentrations	Floodflow Alteration, Sediment-Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat, Uniqueness/ Heritage, Visual Quality/Aesthetics
WUS 062	Ephemeral	n/a	n/a	n/a	n/a	n/a	n/a
WUS 063	R4SB4x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 064	R4SB4x	n/a	n/a	n/a	n/a	n/a	n/a
WUS 066	R2UB1/2	n/a	n/a	n/a	n/a	n/a	n/a

Table 1. WUS and Wetland within Study Area (continued)

Wetland Number	Cowardin Classification	Hydrology	Vegetation			Soils	Principal Functions
			Common Name	Scientific Name	Indicator Status		
Wetland 067	POW w/PEM1F fringe	Surface Water, High Water Table, Saturation, Inundation on Aerial Imagery, Oxidized Rhizospheres	swamp verbena common rush seedbox woolgrass	*Verbena hastata* *Juncus effusus* *Ludwigia alternifolia* *Scirpus cyperinus*	FACW FACW FACW FACW	Issue-Urban land complex, Christiana-Downer-Urban land complex; Depleted Matrix (F3); 0-10 inches of 10YR5/2 clay with 7.5YR4/6 redox concentrations along pore linings	Floodflow Alteration, Sediment-Toxicant Retention, Nutrient Removal, Visual Quality/Aesthetics
WUS 068	R4SB3/4	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 069	PEM1A	Sediment Deposits, Sparsely Vegetated Concave Surface, Drainage Patterns	Vegetation not identifiable due to frequent mowing	n/a	n/a	Codorus and Hatboro soils; Redox Dark Surface (F6); 0-4 inches of 10YR3/2 silty clay loam with 7.5YR4/6 redox concentrations	Sediment-Toxicant Retention
WUS 071	Ephemeral	n/a	n/a	n/a	n/a	n/a	n/a
Wetland 072	PFO1B	High Water Table, Saturation, Water-stained Leaves, Sphagnum moss	red maple unknown sedge Northern catalpa tapered rosette grass common rush sweetgum Japanese honeysuckle seedbox	*Acer rubrum* *Carex sp.* *Catalpa speciosa* *Dichanthelium acuminatum* *Juncus effusus* *Liquidambar styraciflua* *Lonicera japonica* *Ludwigia alternifolia*	FAC n/a FAC FAC FACW FAC FAC FACW	Christiana-Downer-Urban land complex; Depleted Matrix (F3); 0-12+ inches of 10YR6/2 clay with 7.5YR4/6 redox concentrations	Groundwater Recharge/ Discharge
Wetland 073	PFO1A	Surface Water, Saturation, Drainage Patterns, Geomorphic Position, Shallow Aquitard	silver maple black willow red maple northern catalpa Virginia pine tuliptree sweetgum American sycamore southern arrowwood American elm fig buttercup fowl bluegrass sensitive fern spotted touch-me-not eastern poison ivy Japanese honeysuckle	*Acer saccharinum* *Salix nigra* *Acer rubrum* *Catalpa speciosa* *Pinus virginiana* *Liriodendron tulipifera* *Liquidambar styraciflua* *Platanus occidentalis* *Viburnum dentatum* *Ulmus americana* *Ficaria verna* *Poa palustris* *Onoclea sensibilis* *Impatiens capensis* *Toxicodendron radicans* *Lonicera japonica*	FAC OBL FAC FACU UPL FACU FAC FACW FAC FAC FAC FAC FACW FACW FAC FAC	Issue-Urban land complex, Christiana-Downer-Urban land complex; Depleted Matrix (F3); 0-3 inches of 2.5Y4/2 sandy clay loam with 7.5YR4/6 redox concentrations	Floodflow Alteration, Sediment/Toxicant Retention, Nutrient Removal, Production Export, Wildlife Habitat
Wetland 075	PEM1A	Surface Water, Saturation, Drift Deposits, Drainage Patterns, Geomorphic Position	lamp rush unknown sedge spotted touch-me-not multiflora rose eastern poison ivy Japanese honeysuckle	*Juncus effusus* *Carex* sp. *Impatiens capensis* *Rosa multiflora* *Toxicodendron radicans* *Lonicera japonica*	OBL n/a FACW FACU FAC FAC	Codorus-Hatboro-Urban land complex; Redox Dark Surface (F6); 0-8 inches of 10YR3/1 sandy loam with 7.5YR5/6 redox concentrations	Sediment/Toxicant Retention

Table 1. WUS and Wetland within Study Area (continued)

Wetland Number	Cowardin Classification	Hydrology	Vegetation			Soils	Principal Functions
			Common Name	Scientific Name	Indicator Status		
Wetland 079	PFO1A	Sparsely vegetated concave surface, Geomorphic Position	red maple northern catalpa sweetgum American elm black willow white oak meadow garlic eastern poison ivy Japanese honeysuckle	*Acer rubrum* *Catalpa speciosa* *Liquidambar styraciflua* *Ulmus americana* *Salix nigra* *Quercus alba* *Allium vineale* *Toxicodendron radicans* *Lonicera japonica*	FAC FAC FAC FAC OBL FACU FACU FAC FAC	Aquasco-Urban land complex; Depleted Matrix (F3), Redox Dark Surface (F6); 0-6 inches of 2.5Y3/2 loam with 10YR4/6 redox concentrations, 6-15 inches of 10YR6/2 silty clay loam with 10YR6/8 redox concentrations	Groundwater Recharge/Discharge, Floodflow Alteration, Wildlife Habitat
Wetland 080	PEM1C	Surface Water, Saturation, Sediment Deposits, Algal Mat or Crust, Inundation Visible on Aerial Imagery, Geomorphic Position, Shallow Aquitard	lamp rush knotty-leaf rush common fox sedge unknown sedge blunt spikerush curly dock seedbox meadow fescue unknown goldenrod Indian hemp	*Juncus effusus* *Juncus acuminatus* *Carex vulpinoidea* *Carex sp.* *Eleocharis obtusa* *Rumex crispus* *Ludwigia alternifolia* *Festuca pratensis* *Solidago sp.* *Apocynum cannabinum*	OBL OBL FACW n/a OBL FAC OBL FACU n/a FACU	Sassafras-Urban land complex; Depleted Matrix (F3); 0-6 inches of 10YR4/2 silt loam with 7.5YR4/6 redox concentrations	Sediment/Toxicant Retention
Wetland 081	PEM1A/C	Surface Water, High Water Table, Saturation	boxelder red maple broadleaf cattail	*Acer negundo* *Acer rubrum* *Typha latifolia*	FAC FAC OBL	Udorthents, Christiana-Downer-Urban land complex Soils could not be assessed due to the presence of a fence around the perimeter of the wetland. Soils are assumed to be hydric based on the presence of other indicators.	Groundwater Recharge/Discharge, Floodflow Alteration, Sediment/Toxicant Retention
WUS 082	R4SB2	n/a	n/a	n/a	n/a	n/a	n/a

Waterway WUS GB-3 is an unnamed tributary that originates near the intersection of Manor Road and Connecticut Avenue, and flows south under the Capital Crescent Trail before joining Coquelin Run and ultimately, Rock Creek. This stream is classified as an intermittent riverine system with a gravel/sand bottom (R4SB3/4). The width and depth of the channel are three and four feet, respectively. At the time of the field visit, approximately two inches of flowing water was evident within the channel, which has been heavily manipulated to accommodate development. Waterway WUS GB-3 is culverted both upstream and downstream of the study area, but the channel remains relatively natural near the Capital Crescent Trail bridge crossing. Habitat complexity was considered poor due to a lack of stable habitat; although some leaf pack habitat was present.

Waterway WUS GB-4 is an unnamed tributary that originates near Brierly Court, just north of the Capital Crescent Trail, and flows under the trail before joining Coquelin Run and ultimately Rock Creek. This stream is classified as an intermittent riverine system with a gravel/sand bottom (R4SB3/4). The width and depth of the channel are eight and three feet, respectively. At the time of the field visit, approximately two inches of flowing water was evident within the channel. Waterway WUS GB-4 is culverted under the trail but remains natural both upstream and downstream of the bridge. Habitat complexity was considered poor to average due to the presence of some stable habitat in the form of undercut banks and rootwads, although banks were slumping in some areas and silt deposition was moderate throughout.

Waterway WUS GB-6 is the mainstem of Rock Creek where it flows under the Capital Crescent Trail. This stream is classified as a lower perennial riverine system with an unconsolidated bottom consisting of cobble and gravel (R2UB1). The average channel width and depth are 60 feet and 5 feet, respectively. During the field visit, the average water depth was one and a half feet. The stream has been channelized to flow under the trail, and a bridge pier exists in the center of the stream. Habitat complexity was considered average due to the presence of deep pools, but stable cover was scarce and few riffle-pool sequences were observed. Silt deposition was heavy, and bank erosion was moderate.

Wetland GB-8 is located north of the Capital Crescent Trail, immediately east of Rock Creek. This wetland flows into Rock Creek through a pipe situated under the path that parallels the western edge of the wetland. Wetland GB-8 is classified as palustrine forested with a seasonally flooded water regime, with some areas being semipermanently flooded (PFO1E/F). Indicators of wetland hydrology observed during the site visit were abundant, including up to one half inch of surface water, a high water table, saturation at the soil surface, water-stained leaves, drainage patterns, crayfish burrows, and stunted or stressed plants. Aerial imagery of the site also showed inundation. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species identified within the wetland test plot (WTP 8-1) are considered FAC, FACW, or OBL. The dominant vegetation included *Acer negundo* (boxelder), *Cephalanthus occidentalis* (common buttonbush), *Cinna arundinacea* (sweet woodreed), *Fraxinus pennsylvanica* (green ash), *Polygonum sagittatum* (arrowleaf tearthumb), *Typha latifolia* (broadleaf cattail), and *Ulmus americana* (American elm). Soils in the wetland are mapped as Codorus silt loam, which is not listed as hydric by NRCS. However, soil samples met the Depleted Matrix (F3) hydric soil indicator at a depth of zero to six inches, with a matrix color of 10YR4/2 and redox concentrations of 7.5YR4/6. Based on the New England method, the principal functions/values likely provided by this wetland include groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, production export, wildlife habitat, recreation, uniqueness/heritage, and visual quality/aesthetics.

Waterway WUS GB-9 is an unnamed tributary that appears to flow west via a pipe to a tributary to Rock Creek. This stream is classified as an intermittent riverine system with a sand substrate (R4SB4). The channel is natural in the vicinity of the study area but has undergone significant manipulations downstream. Width and depth of the channel are eight and four feet, respectively. At the time of the field visit, less than one inch of flowing water was observed. Habitat complexity was considered poor due to shallow flows and a lack of stable habitat, as well as heavy silt deposition throughout the assessed reach.

Waterway WUS 003 is the mainstem of Sligo Creek where it flows south under Wayne Avenue. This stream is classified as a lower perennial riverine system with an unconsolidated cobble-gravel bottom (R2UB1). The channel is natural up and downstream of the Wayne Avenue bridge crossing, with an average width and depth of 15 and five feet, respectively. Approximately one foot of flowing water was present at the time of the field visit. Habitat complexity was considered average due to the presence of riffle-run complexes and leaf pack habitat, as well as only minor silt deposition.

Waterway WUS 005 is the mainstem of Long Branch, a tributary of Sligo Creek, where it flows south under Piney Branch Road near Garland Avenue. This stream is classified as a lower perennial riverine system with an unconsolidated sand-gravel-cobble bottom (R2UB1/2). The channel is natural up and downstream of the Piney Branch Road bridge crossing, with an average width and depth of 10 and three feet, respectively. Approximately four inches of flowing water was present at the time of the field visit. Habitat complexity was considered average due to the presence of riffle-run complexes, coarse woody debris, and rootmat habitat, as well as only minor silt deposition.

Waterway WUS 006 is the mainstem of Northwest Branch, which flows south through the study area, under MD 193. This stream is classified as a lower perennial riverine system with a sand substrate (R2UB2). The average width and depth of the stream are 25 and five feet, respectively. During the field visit, six inches of flowing water was present within the channel. Habitat complexity was considered poor to average due to an absence of clean riffles and few deep pools, as well as heavy silt deposition near the bridge crossing.

Waterway WUS 007 is an unnamed tributary that originates on the east side of Adelphi Manor Park, just north of MD193, and flows west under a private driveway into Northwest Branch. This stream is classified as a lower perennial riverine system with a sand substrate (R2UB2). The channel has been channelized and culverted, with average dimensions of approximately five and a half feet wide and four feet deep. During the field visit, approximately two inches of water were present in the channel. Habitat complexity was considered poor due to heavy silt deposition, and a lack of deep pools or clean riffles.

Waterway WUS 008 is an unnamed tributary that flows east from Lyndon Street through Adelphi Manor Park to join Northwest Branch along the north side of MD 193. This stream is classified as an intermittent riverine system with a sand substrate (R4SB4). The channel has been channelized and directed into a culvert, and consists of an average width and depth of approximately three and a half and three feet, respectively. During the field visit, approximately two inches of flowing water were present in the channel. Habitat complexity was considered poor due to moderate silt deposition and shallow flows.

Waterway WUS 009 is an unnamed tributary that originates within a stormwater management pond in the southeast corner of Adelphi Manor Park and flows southeast into Waterway WUS-008 (described above). This stream is classified as an intermittent riverine system with a gravel-sand substrate (R4SB3/4). The channel was channelized and rip-rapped at the upstream end to accommodate high flows during storm events. Average width and depth of the channel are both about two feet; approximately one inch of flowing water was present during the field visit. Habitat complexity was considered poor due to shallow flows and lack of stable habitat.

Waterway WUS 011 is an unnamed tributary that originates north of a large parking lot east of Presidential Drive on the University of Maryland College Park campus, and then flows south into a pipe which most likely drains to Northwest Branch. This stream is classified as an intermittent riverine system with a gravel/sand bottom (R4SB3/4). The channel has been straightened and a portion of it has been re-directed into a manmade stormwater pond. Average width and depth of the channel are three feet and one foot, respectively, and about four inches of flowing water was present during the field visit. Despite only minor silt deposition, habitat complexity was poor due to a lack of stable habitat within the assessed reach.

Waterway WUS 012 is an unnamed tributary that originates about 600 feet northeast of the intersection of Paint Branch Parkway and US Route 1, then flows southeast into Paint Branch. This stream is classified as lower perennial with a gravel/sand substrate (R2UB1/2x) but has been manipulated in some places in order to straighten and/or stabilize the channel with riprap. Furthermore, a stormwater outfall is present within the more southerly portion of the assessed reach. Width and depth of the channel are 10 and two and a half feet, respectively, and about two inches of flowing water was present in the channel during the field visit. Habitat complexity was considered average based on the presence of some deep pools and undercut banks, although silt deposition was heavy in places.

Waterway WUS 015 flows east into the WUS 012 from the north side of Paint Branch Parkway. The stream is classified as lower perennial with a rip-rap substrate (R2UBx). The average channel width of the stream is five feet with a channel depth of one foot. During the site visit, approximately two inches of water was present within the channel. Habitat complexity is low due to the rip-rap channel and the short distance from the outfall to the confluence.

Waterway WUS016 is an unnamed tributary that originates just east of a railroad berm near the College Park metro station and flows east under River Road toward Northeast Branch. This stream is classified as an intermittent riverine system with a gravel/sand bottom (R4SB3/4). The channel has been straightened, and has an average width and depth of five and two feet, respectively. There was approximately two inches of flowing water during the field visit. Habitat complexity was considered very poor due to shallow flows, lack of structure, and moderate silt deposition.

Waterway WUS 018 is the mainstem of Northeast Branch, which flows south through the study area. This stream is classified as a lower perennial riverine system with a gravel/sand substrate (R2UB1/2). The channel has been straightened in the past, with a width and depth of 55 and seven feet, respectively. Approximately 12 inches of flowing water was present during the field visit. Habitat complexity was considered average due to the presence of riffle-pool sequences and minor silt deposition.

Wetland 019 is located southeast of the intersection of River Road and University Research Court, adjacent to Northeast Branch. This wetland is a vegetated stormwater pond that is classified as palustrine open water-emergent with a permanently flooded water regime (POW/PEM1Hx). Indicators of wetland hydrology observed during the field visit included up to 0.5 inch of surface water, saturation at the soil surface, a high water table, and hydrogen sulfide odor. The only dominant plant that occurred within the wetland test plot (WTP 19-1) was broadleaf cattail, which is considered OBL. Therefore, the requirement for hydrophytic vegetation was satisfied. Soils in the wetland are mapped as Codorus-Hatboro-Urban land complex, which is not listed as hydric by NRCS. Soil samples did not satisfy the hydric soil criteria due to the recent creation of the wetland, but hydric soils are expected to develop over time given the presence of both wetland hydrology and hydrophytic vegetation. Based on best professional judgment, functions/values likely provided by this wetland include floodflow alteration, groundwater recharge/discharge, and sediment-toxicant retention.

Waterway WUS 023 is an unnamed tributary that flows north from a culvert under MD 410 and eventually into Brier Ditch about 0.4 mile north of the study area. Waterway WUS 023 primarily conveys stormflows from adjacent roadways and developments, but is likely also supported by longer duration subsurface flows from Wetland 024 (described below). Thus, it is classified as intermittent with a sand/rip-rap substrate (R4SB2/4). During the field visit, the channel was approximately five feet wide and six inches deep, and an average of three inches of flowing water was present. Habitat complexity was virtually absent, although some low-quality pools and riffles were observed.

Wetland 024 consists of a stormwater retention basin and streamside terrace which both abut Waterway WUS 023, occurring immediately north of the intersection of Eastpine Drive and MD 410. This system contains both emergent and forest vegetation, both of which maintain temporarily to seasonally flooded hydrologic regimes (PEM1A/C, PFO1A/C). In order to best represent observed differences, data were collected at two separate test plots.

The forested portion of Wetland 024, represented by W24-WTP-1, forms a relatively narrow buffer around the center of the stormwater retention basin and extends to the north and east as the floodplain of Waterway WUS 023. During the field visit, hydrologic indicators observed included up to one inch of surface water, a high water table at a depth of six inches, saturation at the soil surface, drift deposits, and water-stained leaves. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species observed within the test plot are considered FAC, FACW, or OBL. These included *Salix nigra* (black willow), *Fraxinus pennsylvanica* (green ash), *Acer saccharinum* (silver maple), *Liquidambar styraciflua* (sweetgum), *Carex lurida* (sallow sedge), *Microstegium vimineum* (Japanese stiltgrass), *Toxicodendron radicans* (eastern poison ivy), and *Parthenocissus quinquefolia* (Virginia creeper). Soils in this portion of the wetland are mapped as Christiana-Downer-Urban land complex, which is not considered hydric by NRCS. However, soil samples met the Loamy Gleyed Matrix (F2) hydric soil indicator based on the presence of a layer of N5/0 sandy clay with redox concentrations of 10YR4/6 occurring at a depth of 10 to 15 inches.

The emergent portion of the wetland, which constitutes the wettest part of the stormwater retention basin and a small disturbed area on the floodplain of Waterway WUS 023, is represented by W24-WTP-2. During the field visit, saturated soils were observed at the ground surface. Geomorphic position was confirmed as a secondary indicator of wetland hydrology. Only *Phragmites australis* was present within the 30-foot radius of the test plot, therefore the Rapid Test for Hydrophytic Vegetation was met. Soils within this portion of the wetland are also mapped as Christiana-Downer-Urban land complex, which is not considered hydric by NRCS. However, soil samples met the Loamy Gleyed Matrix (F2) hydric soil indicator based on the presence of a layer of N5/0 sandy clay with redox concentrations of 10YR4/6 occurring at a depth of 10 to 15 inches.

Based on best professional judgment, the primary functions/values associated with this wetland are floodflow alteration, sediment/toxicant retention, and nutrient removal.

Waterway WUS 030 is an unnamed tributary that flows north under MD 410 toward Brier Ditch, a tributary to Northeast Branch. This stream is classified as an intermittent riverine system with a rip-rap lined channel (R4SB2x). The channel has been channelized and stabilized with rip-rap to control erosion from stormwater runoff. Width and depth of the channel are four feet and one foot, respectively; flowing water was not evident during the field visit. Habitat complexity was considered poor due to infrequent flows and a lack of instream structure.

Waterway WUS 032 is an unnamed tributary that flows north under MD 410 toward an unnamed tributary to Brier Ditch and ultimately, Northeast Branch. This stream is classified as an intermittent riverine system with a rip-rap lined bottom (R4SB2x). The channel has been channelized and stabilized with rip-rap to control erosion from stormwater runoff. Width and depth of the channel are four feet and one foot, respectively; flowing water was not evident during the field visit. Habitat complexity was considered poor due to infrequent flows and a lack of instream structure.

Waterway WUS 034 is an unnamed tributary that flows southeast through forested habitat adjacent to MD 410, eventually joining Lower Beaverdam Creek. This stream is classified as an intermittent riverine system with a rip-rap bottom (R4SB2x). The channel has been channelized and stabilized with rip-rap to control erosion from stormwater runoff. Width and depth of the channel are four and a half and three feet, respectively. Approximately three inches of flowing water was present during the field visit. Habitat complexity was poor due to a lack of stable habitat, unvegetated banks, shallow flows, and moderate silt deposition.

Wetland 035 is located immediately west of the intersection of Hanson Oaks Drive and Ellin Road, on the floodplain of Waterway WUS 034. This wetland is classified as palustrine forested with a seasonally flooded/saturated water regime (PFO1E). Indicators of wetland hydrology observed during the field visit included up to four inches of surface water, soil saturation at a depth of six inches, and drainage patterns. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species identified within the wetland test plot (WTP 35-1) are considered FAC, FACW, or OBL. The dominant vegetation included boxelder, *Catalpa speciosa* (northern catalpa), *Phalaris arundinacea* (reed canarygrass), *Platanus occidentalis* (American sycamore), and *Salix nigra* (black willow). Soils in the wetland are mapped as Issue-Urban land complex, which is not listed as hydric by NRCS. Soil samples were confirmed to meet the Depleted Matrix (F3) hydric soil indicator at a depth of two to eight inches with a matrix color of 10YR4/2 and redox concentrations of 7.5YR4/6. Based on best professional judgment, functions/values likely provided by this wetland include floodflow alteration, sediment-toxicant retention, and nutrient removal.

Waterway WUS 036 is an unnamed tributary that receives drainage from Waterway WUS 034 and Wetland 035 via a culvert under Hanson Oaks Drive, and flows into a stormwater management pond complex which then drains to Lower Beaverdam Creek. This stream is classified as an intermittent riverine system with a rip-rap lined bottom (R4SB2x). The channel has been channelized and stabilized with rip-rap to control erosion from stormwater runoff. Width and depth of the channel are three and a half and one and a half feet, respectively. Approximately one inch of flowing water was present during the field visit. Despite only minor silt deposition, habitat complexity was considered poor due to a lack of stable habitat and shallow flows.

Wetland 037 is the second pond forming the aforementioned stormwater management complex, located directly east of Wetland 067. This wetland is classified as palustrine emergent with an intermittently exposed water regime (PEM1G). Indicators of wetland hydrology observed during the field visit included up to six inches of surface water, saturation at the soil surface, and water marks. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species identified within the wetland test plot (WTP 35-1) are considered FAC, FACW, or OBL. The dominant vegetation included *Phragmites australis* (common reed) and *Lonicera japonica* (Japanese honeysuckle). Soils in the wetland are mapped as Issue-Urban land complex, which is not listed as hydric by NRCS. However, soil samples met the Depleted Matrix (F3) hydric soil indicator at a depth of four to 12 inches with a matrix color of 2.5Y4/2 and redox concentrations of 10YR5/6.Based on the New England method, the principal functions/values likely provided by this wetland include floodflow alteration, sediment/toxicant retention, nutrient removal, and visual quality/aesthetics.

Waterway WUS 038 is classified as an intermittent stream with a sand and rip-rap substrate (R4SB4x). The stream parallels the north side of Ellin Road and is bordered by the community of West Lanham Hills to the north. This stream is approximately four feet wide and has a depth of one foot. At the time of the field investigation, approximately two inches of water were present in the channel. Little or no evidence of bank erosion was observed. Stream habitat complexity was low due to a lack of riffle-pool sequences. The forest buffer is dominated by catalpa, *Prunus* sp. (cherry), tulip poplar, poison ivy, and *Vitis* sp. (grape vine), which provide approximately 95 percent shading to the stream.

Waterway WUS 048 is an unnamed tributary that flows north into Waterway WUS 030. This stream is classified as an intermittent riverine system with a rip-rap/sand-gravel bottom (R4SB3/4x). The southern reaches have been channelized and stabilized with rip-rap to control erosion from stormwater runoff, while the more northern portions of the stream are natural. Average width and depth of the channel are fourteen and nine feet, respectively; less than one inch of flowing water was observed during the field visit. Habitat complexity was considered poor due to infrequent flows, failing banks, and a lack of instream structure.

Waterway WUS 057 is an unnamed tributary that originates near MD 193 and flows east toward Northwest Branch. This stream is classified as an intermittent riverine system with a sand bottom (R4SB4x) that was excavated and rip-rap lined, then directed toward a pipe system just outside the study area. The channel was approximately four and a half feet wide and four feet deep during the field visit, and about six inches of flowing water was present. Despite only minor silt deposition, habitat complexity was poor due to a lack of stable habitat within the assessed reach.

Waterway WUS 058 is an ephemeral channel that extends under a private driveway then north under MD 193 into Waterway WUS 007. This stream is considered ephemeral based on the observation of several indicators of an ordinary high water mark. Such indicators included disturbed/washed away leaf litter, sediment deposition, the presence of a wrack line, and scour. Width of the ephemeral channel is five feet with a channel depth of three feet. The average water depth during the site visit was six inches.

Wetland 059 is located on the south side of MD 193, east of and adjacent to Waterway WUS 058 near a three-acre man-made pond. This wetland is classified as palustrine forested with a seasonally flooded/saturated water regime (PFO1E). Indicators of wetland hydrology observed during the field visit included one inch of surface water, saturation at the soil surface, a high water table, water marks, drift deposits, and drainage patterns. Based on the dominance test for hydrophytic vegetation, 75 percent of the dominant species identified within the wetland test plot (WTP 59-1) are considered FAC, FACW, or OBL. The dominant vegetation included boxelder, green ash, *Ranunculus ficaria* (fig buttercup), *Rosa multiflora* (multiflora rose), and *Toxicodendron radicans* (eastern poison ivy). Soils in the wetland are mapped as Codorus and Hatboro soils, which are listed as hydric by NRCS. Soil samples were confirmed to meet the Depleted Matrix (F3) hydric soil indicator throughout the soil profile with a matrix color of 10YR4/1 and redox concentrations of 7.5YR3/4.

Based on best professional judgment, functions/values likely provided by this wetland include groundwater recharge/discharge, sediment-toxicant retention, nutrient removal, and wildlife habitat.

Wetland 060 is located on the north side of MD 193, just east of Waterway WUS 007, which facilitates a surface connection to Northwest Branch. This wetland is classified as palustrine forested with a seasonally flooded/saturated water regime (PFO1E). Indicators of wetland hydrology observed during the field visit included one inch of surface water, saturation at the soil surface, sediment deposits, drift deposits, and water-stained leaves. Based on the dominance test for hydrophytic vegetation, 50 percent of the dominant species identified within the wetland test plot (WTP 60-1) are considered FAC, FACW, or OBL. Vegetation was confirmed to meet the requirement for hydrophytic vegetation based on the prevalence index, which was 3.0. The dominant vegetation included *Allium canadense* (meadow garlic), green ash, *Liquidambar styraciflua* (sweetgum), *Ligustrum sinense* (Chinese privet), *Parthenocissus quinquefolia* (Virginia creeper), multiflora rose, and eastern poison ivy. Soils in the wetland are mapped as Codorus and Hatboro soils, Codorus-Hatboro-Urban complex, and Christiana-Downer-Urban complex, only the first of which is listed as hydric by NRCS. Soil samples met the Depleted Matrix (F3) hydric soil indicator at a depth of zero to six inches with a matrix color of 10YR4/1 and redox concentrations of 7.5YR4/6.

Based on the New England method, the principal functions/values likely provided by this wetland include floodflow alteration, sediment-toxicant retention, nutrient removal, production export, wildlife habitat, uniqueness/heritage, and visual quality/aesthetics.

Waterway WUS 062 is an unnamed tributary that originates south of MD 410 and flows north via a pipe system toward Brier Ditch and ultimately, Northeast Branch. This stream is considered ephemeral based on the observation of several indicators of an ordinary high water mark. Such indicators included disturbed/washed away leaf litter, sediment deposition, destruction of terrestrial vegetation, and the presence of a wrack line. Width and depth of the ephemeral channel are both two feet; flowing water was not evident at the time of the field visit.

Waterway WUS 063 is a channel that flows north under a private road into Waterway WUS 032. This stream is classified as intermittent with a mud and rip-rap lined substrate (R4SB5x). The average channel width and depth are two feet, with an average water depth of less than one half inch. Habitat complexity was low due lack of riffle/pool complexes.

Waterway WUS 064 is an unnamed tributary that converges with Waterway WUS 063 and flows north under a private road into Waterway WUS 032. This stream is classified as intermittent with a sand and rip-rap lined substrate (R4SB4x). The average channel width and depth are two feet, with an average water depth of less than one inch. Habitat complexity was low due lack of riffle/pool complexes.

Waterway WUS 066 is a tributary to Rock Creek which originates just north of the CSX track and flows south under the track via a culvert, then through forested habitat, eventually joining Rock Creek. This stream is classified as a lower perennial riverine system with an unconsolidated sand-gravel bottom (R2UB1/2). The channel is natural with an average width and depth of 10 and four feet, respectively. Approximately six inches of flowing water was present at the time of the field visit. Habitat complexity was considered average due to the presence of some deep pools and riffle-run complexes, as well as only minor silt deposition.

Wetland 067 is located south of Ellin Drive, and receives drainage directly from Waterways WUS 034 and WUS 036. This wetland is part of a stormwater management pond complex consisting of two ponds that are physically separated by a manmade berm, but remain hydrologically connected by a culvert that was installed underneath the berm. Wetland 067 is classified as palustrine open water with an emergent fringe, and a semipermanently flooded water regime (POW/PEM1F). Hydrologic indicators observed during the field visit included greater than one foot of surface water, a high water table, saturation at the soil surface, and oxidized rhizospheres along living roots. Aerial imagery of the site also showed inundation. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species identified within the wetland test plot (WTP 67-1) were considered FAC, FACW, or OBL. The dominant vegetation included *Juncus effusus* (common rush) and *Ludwigia alternifolia* (seedbox). Soils in the wetland are mapped as Issue-Urban land complex and Christiana-Downer-Urban land complex, neither of which are listed as hydric by NRCS. However, soil samples met the Depleted Matrix (F3) hydric soil indicator with a matrix color of 10YR5/2 and redox concentrations of 7.5YR4/6. Based on the New England method, the principal functions/values likely provided by this wetland include floodflow alteration, sediment/toxicant retention, nutrient removal, and visual quality/aesthetics.

Waterway WUS 068 is a tributary to Rock Creek that begins on the south side of the proposed Lyttonsville facility. The stream is classified as an intermittent stream with a sand/gravel bottom (R4SB3/4). The channel has an average width of six feet and a depth of one foot. Approximately one inch of flowing water was present at the time of the field visit. Habitat complexity was considered very low due to flashy flows.

Wetland 069 is a regularly mowed swale located adjacent to a parking lot just north of MD193 that collects surface runoff and drains into Waterway WUS 007. This wetland is classified as palustrine emergent with a temporarily flooded water regime (PEM1A). During the field visit, sediment deposits were confirmed as a primary indicator of wetland hydrology. Secondary indicators included drainage patterns and a sparsely vegetated concave surface. Vegetation was not identifiable due to frequent mowing, therefore hydrophytic vegetation could not be confirmed. However, it is likely that the species present would satisfy the hydrophytic vegetation criteria if allowed to grow. Soils in the wetland are mapped as Codorus and Hatboro soils, which are listed as hydric by NRCS. Soil samples met the Redox Dark Surface (F6) hydric soil indicator at a depth of zero to four inches with a matrix color of 10YR3/2 and redox concentrations of 7.5YR4/6. Based on best professional judgment, the primary function/value likely provided by this wetland is sediment/toxicant retention.

Waterway WUS 071 is an unnamed tributary along Ellin Road that directs surface runoff into Waterway WUS 034. This channel is considered ephemeral based on the lack of groundwater discharge, sand deposition along a rip-rap substrate, and defined bed and bank features. The channel was manipulated to reduce erosion using rip-rap placement, with dimensions of four feet wide and two feet deep.

Wetland 072 is a small seepage wetland located on a steep, north facing slope along Ellin Road that is classified as palustrine forested wetland with a saturated water regime (PFO1B). This wetland drains directly into Waterway WUS 034. During the field visit, saturation at the soil surface, a high water table, and water-stained leaves constituted primary indicators of wetland hydrology. Sphagnum moss was confirmed as a secondary indicator. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species identified within the wetland test plot (WTP-72-1) are considered FAC, FACW, or OBL. These included red maple, *Carex* sp. (unknown sedge), northern catalpa, *Dichanthelium acuminatum* (tapered rosette grass), sweetgum, seedbox, common rush, and Japanese honeysuckle. Soils in the wetland are mapped as Christiana-Downer-Urban land complex, which is not listed as hydric by NRCS. However, soil samples were confirmed to meet the Depleted Matrix (F3) hydric soil indicator throughout the soil profile, with a matrix color of 10YR6/2 and redox concentrations of 7.5YR4/6. Based on best professional judgment, the primary function/value likely provided by this wetland is groundwater recharge/discharge.

Wetland 073 is a bowl-shaped depression located immediately northeast of Hanson Oaks Drive and Ellin Road, that abuts Waterway WUS 038. This wetland is classified as palustrine forested with a temporarily flooded hydrologic regime (PFO1A). Wetland 073 is primarily influenced by surface runoff from areas to the north and east, which is perched on top of a shallow clay layer. During the field visit, hydrologic indicators observed included up to an inch of surface water, saturation at the soil surface, drainage patterns, geomorphic position, and a shallow aquitard. Based on the dominance test for hydrophytic vegetation, 75 percent of the dominant species observed within the wetland test plot (WTP-73) are considered FAC, FACW, or OBL. These included *Acer saccharinum* (silver maple), *Salix nigra* (black willow), *Acer rubrum* (red maple), *Pinus virginiana* (Virginia pine), *Liriodendron tulipifera* (tuliptree), *Liquidambar styraciflua* (sweetgum), *Ficaria verna* (fig buttercup), *Poa palustris* (fowl bluegrass), *Toxicodendron radicans* (eastern poison ivy), and *Lonicera japonica* (Japanese honeysuckle). Soils in the wetland are mapped as Christiana-Downer-Urban land complex and Issue-Urban land complex, neither of which are considered hydric by NRCS. However, soil samples met the Depleted Matrix (F3) hydric soil indicator at depths of zero to three and three to 12 or more inches with matrix colors of 2.5Y4/2 and 10YR6/2, respectively, and redox concentrations of 7.5YR4/6.

Based on best professional judgment, the primary functions/values associated with this wetland are floodflow alteration, sediment/toxicant retention, nutrient removal, production export, and wildlife habitat.

Wetland 075 is a linear, maintained roadside ditch along 54th Ave, just west of the 54th Place intersection. This wetland conveys stormwater flows toward Waterway WUS 018 but is sufficiently entrenched to intercept groundwater. This wetland is classified as palustrine emergent with a temporarily flooded hydrologic regime (PEM1A). During the field visit, hydrologic indicators observed included up to five inches of surface water, saturated soils at the soil surface, drift deposits, drainage patterns, and geomorphic position. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species observed within the wetland test plot (W075-WTP-1) are considered FAC, FACW, or OBL. These included *Toxicodendron radicans* (eastern poison ivy) and *Lonicera japonica* (Japanese honeysuckle). An unknown sedge (*Carex* sp.), likely a hydrophyte, accounted for significant areal coverage within the wetland, but could not be positively identified due to a lack of flowering parts. Soils in the wetland are mapped as Codorus-Hatboro-Urban land complex, which is considered hydric by NRCS. Soil samples were confirmed to meet the Redox Dark Surface (F6) hydric soil indicator at a depth of zero to eight inches with a matrix color of 10YR3/1 and redox concentrations of 7.5YR5/6.

Based on best professional judgment, the primary function/value associated with this wetland is sediment/toxicant retention.

Wetland 079 is an isolated depression located immediately west of River Road, about 500 feet north of Waterway WUS 016. This wetland is classified as palustrine forested with a temporarily flooded hydrologic regime (PFO1A). Hydrology in the wetland may be partly supported by a seasonally high groundwater table, but the presence of a manmade berm associated with a stormwater conveyance swale found immediately north of the wetland boundary effectively restricts drainage, causing ponding to be the predominant hydrologic influence. Indicators of wetland hydrology observed during the site visit included a sparsely vegetated concave surface and geomorphic position. Based on the dominance test for hydrophytic vegetation, 56 percent of the dominant species found within the wetland test plot (W079-WTP-1) are considered FAC, FACW, or OBL. These included *Liquidambar styraciflua* (sweetgum), *Ulmus americana* (American elm), *Allium vineale* (meadow garlic), *Toxicodendron radicans* (eastern poison ivy), and *Lonicera japonica* (Japanese honeysuckle). Soils in the wetland are mapped as Aquasco-Urban land complex, which is not considered hydric by NRCS. However, soil samples met the Redox Dark Surface (F6) and Depleted Matrix (F3) hydric soil indicators with matrix colors of 2.5Y3/2 and 10YR6/2 and redox colors of 10YR4/6 and 10YR6/8 occurring at depths of zero to six and six to 15 or more inches, respectively.

Based on best professional judgment, the primary functions/values provided by this wetland are groundwater recharge/discharge, floodflow alteration, and wildlife habitat.

Wetland 080 is an isolated depression located within the powerline right-of-way on the north side of MD 193, just east of the Phelps Road intersection. This wetland is classified as palustrine emergent with a seasonally flooded hydrologic regime (PEM1C). Indicators of wetland hydrology observed during the field visit included up to eight inches of surface water, saturation at the soil surface, sediment deposits, algal mats, inundation visible on aerial imagery, geomorphic position, and a shallow aquitard. The latter is likely due to soil compaction resulting from continued maintenance activities within the right-of-way. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species found within the wetland test plot (W080-WTP-1) are considered FAC, FACW or OBL. These included *Juncus effusus* (common rush), *Juncus acuminatus* (tapertip rush), *Carex vulpinoidea* (fox sedge), *Eleocharis obtusa* (blunt spikerush), and *Ludwigia palustris* (marsh seedbox). *Carex* sp. (unknown sedge) and *Solidago* sp. (unknown goldenrod) were also dominant, but could not be identified due to a lack of flowering parts; these plants were not included in the dominance calculation. Soils in the wetland are mapped as Sassafras-Urban land complex, which is not considered hydric by NRCS. However, soil samples met the Depleted Matrix (F3) hydric soil indicator at a depth of zero to six inches with a matrix color of 10YR4/2 and redox concentrations of 7.5YR4/6.

Based on best professional judgment, the primary function/value provided by this wetland is sediment/toxicant retention.

Wetland 081 is a stormwater retention pond located adjacent to the eastern side of the MD410-Riverdale Road intersection. This system flows directly into Waterway WUS 082 (described below), which eventually flows into Brier Ditch. Access to the wetland could not be gained during the field work due to the presence of a large fence; therefore, wetland indicators were assessed from the perimeter where possible. The wetland is classified as palustrine emergent with a temporarily to seasonally flooded hydrologic regime (PEM1A/C). During the field visit, approximately one-half-inch of surface water was evident. Saturation at the soil surface and a high water table were assumed to be present. Saturation visible from aerial imagery was confirmed as a secondary indicator of wetland hydrology. Based on the dominance test for hydrophytic vegetation, 100 percent of the dominant species occurring within the wetland are considered FAC, FACW, or OBL. These included *Acer negundo* (boxelder), *Acer rubrum* (red maple), and *Typha latifolia* (broadleaf cattail). Soils are mapped as Udorthents and Christiana-Downer-Urban land complex, neither of which are considered hydric by NRCS. Hydric soils could not be formally assessed due to the aforementioned fence, but their presence is assumed based on the strongly hydrophytic plant assemblage and excessive hydroperiod.

Based on best professional judgment, the primary functions/values provided by this wetland include groundwater recharge/discharge, floodflow alteration, and sediment/toxicant retention.

Waterway WUS 082 is the outlet channel for Wetland 081, and is classified as intermittent with a rip-rap bottom (R4SB2). Flow was determined to be intermittent during the field visit primarily based on the stream's direct surface connection to a seasonally flooded wetland. Waterway WUS 082 flows north under Riverdale Road and into Brier Ditch about 750 feet north of the study area. The channel was three feet wide and two feet deep, and approximately three inches of surface water was observed flowing through the rip-rap. Habitat complexity was essentially absent given the modified substrate and lack of structural diversity.

3.2 Surface Waters

3.2.1 Watersheds

The study area is in the Chesapeake Bay watershed and contains three MDNR third order watersheds[2]—Potomac River Montgomery County, Rock Creek, and Anacostia River. Within these watersheds are six perennial streams each with their own subwatersheds: Little Falls, Rock Creek, Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek. The majority of the subwatersheds are highly developed with little or no vegetated buffer remaining along streams, especially the more urbanized watersheds of Little Falls, Sligo Creek, and Lower Beaverdam Creek. The subwatersheds are described below and are shown on Figure 2**.**

Little Falls

The Little Falls subwatershed is located in the westernmost portion of the study area and drains approximately 10 square miles (6,400 acres). Fifty percent of the subwatershed is developed, 10 percent is used for agriculture, and 30 percent is forested (CBP 2007). The Little Falls stream system originates south of Bethesda and flows south into the Potomac River, near the Montgomery County line. The Little Falls subwatershed is located within the Piedmont Physiographic Province.

The Little Falls subwatershed is one of Montgomery County's most urban stream systems and was greatly influenced by chemical pollution from the 1950s into the 1970s. The causes of this pollution include chlorine discharges from drinking water treatment facilities, sewer line problems, and a large oil spill that occurred in 1959. In 1976, a study found no aquatic life in Little Falls, although more recent studies have shown the presence of pollution-tolerant fish and macroinvertebrate species in low quantities (MCDEP 2011).

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[2] Using the Strahler stream order, stream size is defined based on a hierarchy of tributaries. When two first-order streams (those with no tributaries) come together, they form a second-order stream. When two second-order streams come together, they form a third-order stream. The U.S. NRCS redefined the third order watersheds creating the HUA14 file.

Figure 2. Watersheds and Water Quality Sampling Locations

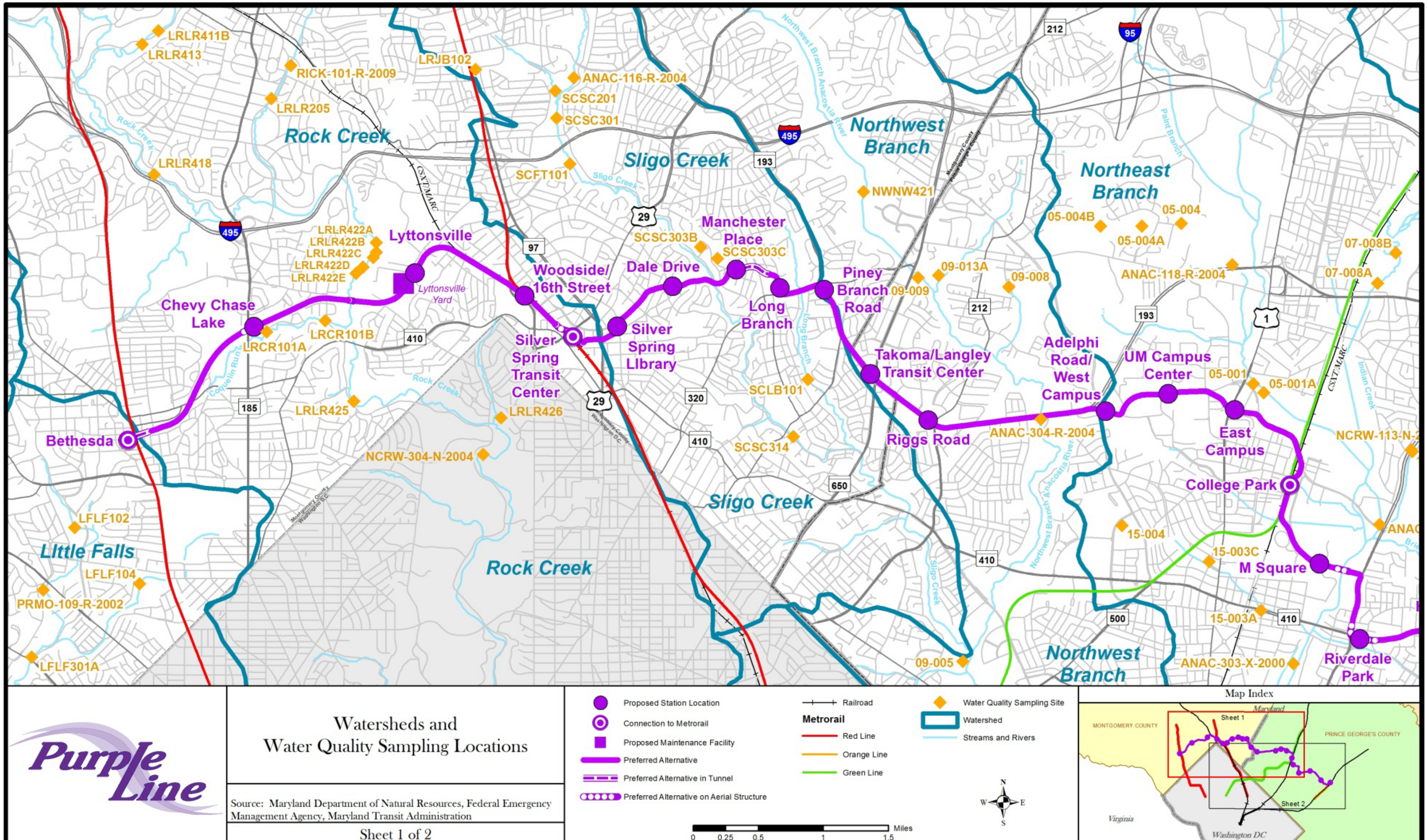
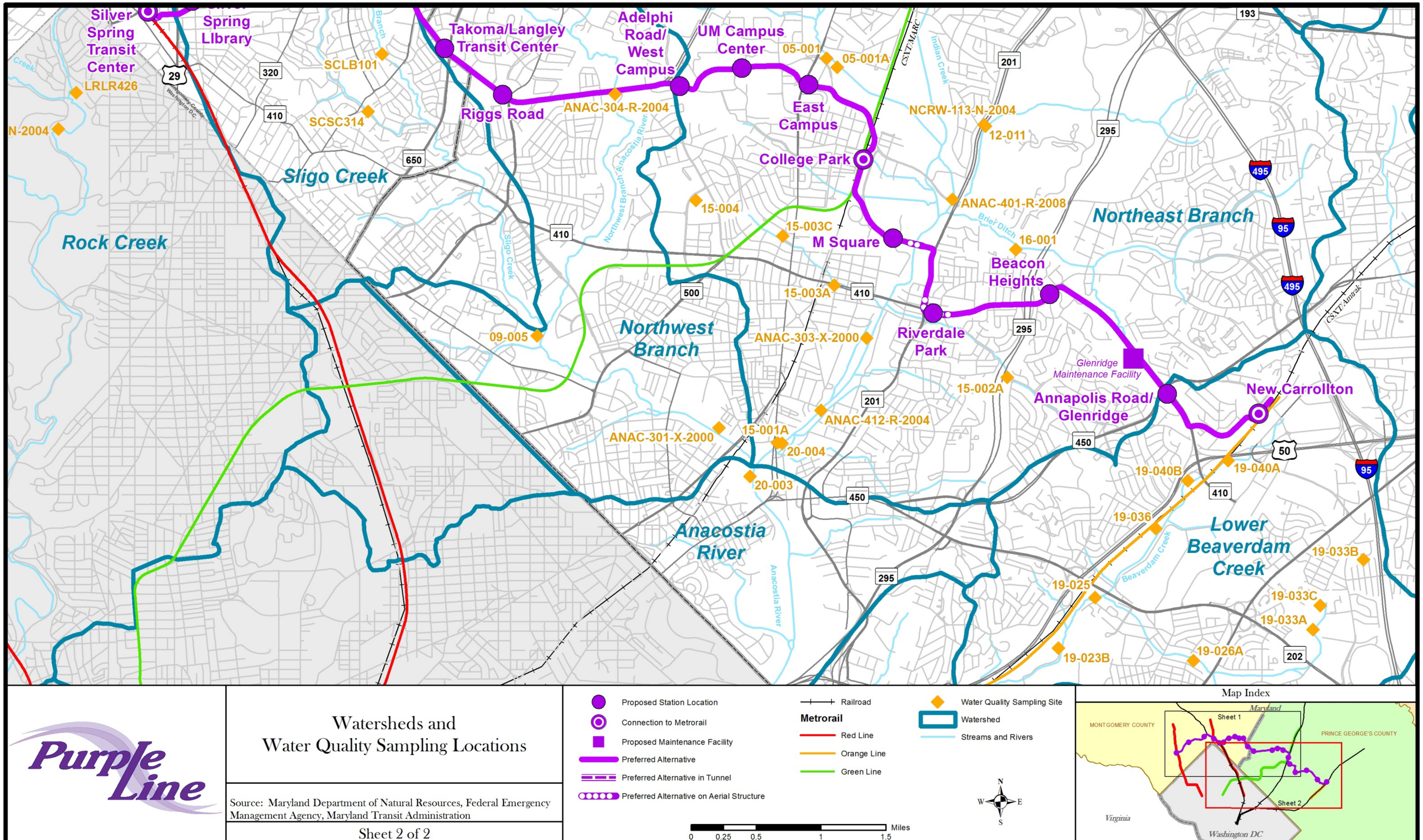


Figure 2. Watersheds and Water Quality Sampling Locations (continued)



Rock Creek

The Rock Creek subwatershed, another tributary of the Potomac River, drains approximately 82 square miles (52,480 acres) and lies within the Piedmont Physiographic Province in Montgomery County, Maryland. Within this subwatershed, 45 percent of land is developed, 19.5 percent is used for agriculture, and 31.7 percent is forested (CBP 2007). The stream originates south of Laytonsville and west of the Oaks Sanitary Landfill in northeast Montgomery County.

The Rock Creek subwatershed contains one of the area's most treasured and frequently used recreation corridors. The forested stream valley corridors provide a protective buffer to the stream and contain wetlands and vernal pools in the floodplain (MCDEP 2011). A major tributary to the Rock Creek watershed within the study area is Coquelin Run. Coquelin Run originates south of Bethesda, flows east paralleling the south side of the Capital Crescent Trail, and joins Rock Creek in the Rays Meadow section of Rock Creek Park. The Rock Creek subwatershed was placed in Category 5 of MDE's, U.S. EPA approved, *The 2010 Integrated Report of Surface Water Quality in Maryland* (MDE 2010) for phosphorous and total suspended solids. The 2010 Integrated Report is discussed in detail in the total maximum daily loads section.

Sligo Creek

The Sligo Creek subwatershed drains approximately 11.6 square miles (7,424 acres) into the Northwest Branch of the Anacostia River, near Hyattsville. Within this urbanized subwatershed, 75 percent is residential, 10 percent is forested, and eight percent is commercial (AWN 2009). The stream system originates in the Kemp Mill section of Silver Spring. This subwatershed occurs in both the Piedmont and the Coastal Plain Physiographic Provinces.

Long Branch is a major tributary of the Sligo Creek subwatershed within the study area. Long Branch originates southwest of the intersection of I-495 and MD 193 and flows south through the study area to join Sligo Creek. Many tributaries of the Sligo Creek subwatershed have been paved over and piped into storm drains. The remaining areas have been channelized, and many banks have been lined with rip-rap to prevent erosion during storm events. These alterations result in little habitat for aquatic life. Until recently, only three pollution-tolerant species of fish were identified in Sligo Creek. New runoff controls and stream channel restoration efforts have allowed for the successful recolonization of native fish species in recent years (MCDEP 2011).

Northwest Branch

The Northwest Branch is one of the largest subwatersheds in the study area and drains 41.89 square miles (26,812 acres). Within this subwatershed, 52 percent of land use is residential, 22 percent forested, nine percent is agricultural, and seven percent is parkland (AWN 2009). The Northwest Branch stream system originates southeast of Olney, in Montgomery County. It flows southeast across the Prince George's county line to meet the Northeast Branch, north of Bladensburg, forming the Anacostia River. This subwatershed occurs in both the Piedmont and the Coastal Plain Physiographic Provinces.

The headwaters of the Northwest Branch include some of the best water quality conditions in the Anacostia watershed. However, in the lower portions of the Northwest Branch these conditions deteriorate due to higher density development, stream channelization, and stormwater impacts (AWN 2009). The Northwest Branch subwatershed was placed in Category 5 of MDE's, U.S. EPA approved, *The 2010 Integrated Report of Surface Water Quality in Maryland* (MDE 2010) for heptachlor epoxide and polychlorinated biphenyls.

Northeast Branch

The Northeast Branch subwatershed drains approximately 14.7 square miles (9,419 acres). Within this subwatershed, 51 percent is residential, 26 percent is forested, and 10 percent is commercial (AWN 2009). The stream originates east of College Park at the confluence of Paint Branch and Indian Creek. Northeast Branch flows south from the confluence to meet the Northwest Branch, north of Bladensburg, to form the Anacostia River. This subwatershed occurs entirely within the Coastal Plain Physiographic Province.

The Northeast Branch subwatershed is channelized for 85 percent of its mainstem length, and most of it is managed as a flood-control channel. This prevents the growth of a riparian forest buffer and, consequently, only 21 percent of the mainstem has an adequate riparian buffer. Thermal loading resulting from channelization and lack of in-stream shading may impair aquatic biotic communities (AWN 2009). The Northwest Branch subwatershed was placed in Category 5 of MDE's, U.S. EPA approved, *The 2010 Integrated Report of Surface Water Quality in Maryland* (MDE 2010)for polychlorinated biphenyls.

Lower Beaverdam Creek

The Lower Beaverdam Creek subwatershed drains 15.7 square miles (10,065 acres). Within this subwatershed, 44 percent of land is in residential land use, 25 percent is forested, and 17 percent is industrial (AWN 2009). The stream flows west, paralleling the south side of US 50 and joins the Anacostia River in the District of Columbia. The subwatershed is located entirely in the Coastal Plain Physiographic Province.

The Lower Beaverdam Creek subwatershed is one of the most developed sections of the Anacostia watershed with its headwaters in dense residential and commercial development. Only 20 percent of the mainstem has an adequate riparian forest buffer. The degradation of aquatic habitat and poor water quality in Lower Beaverdam Creek has severely impaired the aquatic community (AWN 2009).

3.2.2 Water Quality

The MDE has established acceptable standards for several water quality parameters for each designated Stream Use Classification. The standards are listed in the Code of Maryland Regulations (COMAR) 26.08.02.01-.03 – Water Quality and are shown in Table 2**.**

Table 2. Use I and Use IV COMAR Standards

Parameter	Use I-P	Use IV
Temperature	Maximum of 90°F (32°C) or ambient temperature, whichever is greater	Maximum of 75°F (23.9°C) or ambient temperature, whichever is greater
pH	6.5 to 8.5	6.5 to 8.5
Dissolved Oxygen	Minimum of 5 mg/L	Minimum of 5 mg/L
Turbidity	Maximum of 150 Nephelometer Turbidity Units (NTU) and maximum monthly average of 50 NTU	Maximum of 150 Nephelometer Turbidity Units (NTU) and maximum monthly average of 50 NTU

Source: Maryland COMAR 26.08.02.01-03-Water Quality

With the exception of a portion of Northwest Branch, all streams within the study area are classified as Water Quality Use I: Water Contact Recreation and Protection of Non-tidal Warm Water Aquatic Life, which means that these streams support water contact sports, leisure activities involving direct contact with surface water, growth and propagation of fish other than trout and other aquatic life and wildlife, and agricultural and industrial water supply. Northwest Branch, north of East West Highway, is designated as

Use IV: Recreational Trout Waters. This designation means waters from this portion of Northwest Branch are capable of supporting adult trout for a put and take fishery, in addition to the uses supported by Use I streams.

Each parameter, measured by *in situ* sampling and regulated by the State of Maryland, can have a substantial effect on the aquatic communities of streams. These parameters – temperature, pH, dissolved oxygen, turbidity, and conductivity – each have different effects on aquatic biota.

The results of the chemical water quality sampling are summarized in Tables 3 and 4, and the locations of the water quality sampling stations are shown in Figure 2.

Table 3. Summary of Chemical Water Quality Conditions in the Little Falls, Rock Creek, and Sligo Creek Watersheds

		Little Falls		Rock Creek		Sligo Creek	
Parameter	Standard	Avg	% sites outside standard	Avg	% sites outside standard	Avg	% sites outside standard
Dissolved Oxygen (mg/L)	>5	7.97	11.1	9.45	2.7	7.52	12.5
pH (field)	6.5 to 8.5	7.39	0	7.44	0	7.25	0
Temperature (°C)	<32°C	16.97	0	15.81	0	18.90	0
Conductivity (mS/cm)	none	0.61	N/A	0.47	N/A	0.36	N/A

Source: MBSS On-line Resource, MCDEP, and PGDER; N/A= sample not collected

Table 4. Summary of Chemical Water Quality Conditions in the Northwest Branch, Northeast Branch, and Lower Beaverdam Creek Watersheds

		Northwest Branch		Northeast Branch		Lower Beaverdam Creek	
Parameter	Standard	Avg	% sites outside standard	Avg	% sites outside standard	Avg	% sites outside standard
Dissolved Oxygen (mg/L)	>5	10.01	0	9.79	8.7	10.70	0
pH (field)	6.5 to 8.5	7.70	18.2	7.43	17.4	7.55	12.5
Temperature (°C)	<32°C	18.24	0	13.69	0	9.50	0
Conductivity (mS/cm)	none	0.310	N/A	0.31	N/A	0.48	N/A

Source: MBSS On-line Resource, MCDEP, and PGDER; NA= sample not collected

Generally, the six subwatersheds in the study area have *in situ* water quality averages that were within state water quality standards. Within the Little Falls subwatershed, dissolved oxygen levels were below Maryland State standards at one site, or 11.1 percent of the sampling events. Only one out of 70 sites within the Rock Creek subwatershed was below state standards for pH, the remaining *in situ* measurements were in compliance with COMAR standards. One site, or 12.5 percent of the dissolved oxygen readings in the Sligo Creek subwatershed, exhibited dissolved oxygen levels below State standards. In the Northwest Branch subwatershed, pH levels at two sites, or 18.2 percent of the sampling events, were out of compliance with State standards. Within the Northeast Branch subwatershed, pH levels and dissolved oxygen levels were below state standards at 8.7 and 17.4 percent of the readings, respectively, with most of the pH readings exceeding the 8.5 upper limit. Two sites within the Lower

Beaverdam Creek subwatershed, or 12.5 percent of the readings within this subwatershed, were outside of state standards for pH. The highest conductivity levels were seen in Lower Beaverdam Creek and Little Falls, which would be expected due to the high urbanization of these two watersheds.

Total Maximum Daily Loads

Impaired stream segments, also known as water quality limited (WQL) segments, are required by MDE to have a TMDL developed for each segment. These WQL can be considered "impaired" by analyzing a wide variety of water quality monitoring data, including chemical grab samples, *in situ* measurements, continuous measurements, and biological data. After listing a stream as a WQL in Category 5 of the Integrated Report, the state is required to prioritize each waterbody's need for TMDL development. Several WQL segments have been identified by MDE within the project area, and the status and results of the TMDL process are summarized in Table 5. The EPA has also developed and approved TMDLs throughout the Chesapeake Bay watershed.

Table 5. Current Status of TMDLs within the Project Study Area

Watershed/Basin	Impairment	Status
Potomac River (in Maryland)	Nitrogen	Approved: December 29, 2010
Potomac River (in Maryland)	Phosphorus	Approved: December 29, 2010
Potomac River (in Maryland)	Sediments	Approved: December 29, 2010
Potomac River (Montgomery County)	Sediments	Submitted: September 28, 2011
Potomac River (Montgomery County)	Nutrients	Submitted: September 28, 2011
Anacostia River	Bacteria	Approved: March 14, 2007
Anacostia River	PCB	Approved: September 30, 2011
Anacostia River	Sediment	Approved: July 24, 2007
Anacostia River	Nutrients	Approved: June 5, 2008
Anacostia River	Trash	Approved: September 21, 2010
Rock Creek	Sediments	Approved: September 29, 2011
Rock Creek	Bacteria	Approved: July 30, 2007

Sources: MDE TMDL On-line Resource (www.mde.state.md.us/Programs/WaterPrograms/TMDL), EPA Chesapeake Bay TMDL (http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html)

The Little Falls subwatershed is part of the nontidal portion of the Potomac River Montgomery County watershed. In 2011, this portion of the Potomac River had TMDLs submitted for sediment and nutrient impairments, but they have not yet been approved.

The nontidal portion of Rock Creek had TMDLs approved for bacteria and sediment impairments in 2007 and 2011, respectively. Currently, the primary sources of bacteria are bacterial loads from urban wildlife sources. Sediment impairments can be attributed to urbanization and uncontrolled stormwater runoff (MCDEP 2012).

The nontidal portion of the Anacostia River watershed, including Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek subwatersheds, had TMDLs approved for bacteria and sediment impairments in 2007. In 2008, a TMDL was approved for nutrients and in 2010 for trash. TMDL approval in 2011 was for Polychlorinated Biphenyls (PCBs), due to concentrations in the water column that exceed the criteria for human fish consumption. The primary sources of sediment impairment include stormwater runoff and in-stream erosion/scour. Elevated levels of bacteria, PCBs, and nutrients can be attributed to industrial and municipal point sources and combined sewer overflows (DDOE 2012).

The Chesapeake Bay TMDL was developed by the EPA and approved in 2010 to restore clean water in the Bay. The Bay TMDL allocated loadings for phosphorous, nutrients, and sediment based on the 19 major drainage basins. The project lies within the Potomac River basin.

3.2.3 Maryland Scenic and Wild Rivers

Portions of the Potomac River located in Montgomery County and its tributaries and the Anacostia River and its tributaries are designated as Scenic Rivers by the state of Maryland. Within the study area, the tributaries designated as Scenic Rivers are Little Falls, Sligo Creek, Northwest Branch, Northeast Branch, and Lower Beaverdam Creek. Although Rock Creek is a tributary of the Potomac River, it joins the Potomac downstream of the limits of the Scenic River designation and is not considered a Scenic River.

3.2.4 Federal Wild and Scenic Rivers

There are no designated Wild and Scenic Rivers within the study area.

3.3 Floodplains

The 100-year floodplains within the study area are associated with the larger perennial streams – Coquelin Run, Rock Creek, Sligo Creek, Northwest Branch, Paint Branch, Northeast Branch, Brier Ditch, and Lower Beaverdam Creek. Most of these floodplains are wooded because they occur in stream valley parks, where current or future development is regulated, if not prohibited. However, substantial encroachment already has occurred from private development and the construction of public infrastructure, including streets, sewer lines, and water mains that cross or parallel the floodplains. This is especially true within the floodplains of Coquelin Run, Northeast Branch, and Lower Beaverdam Creek. Despite these encroachments, the 100-year floodplains along study area streams continue to serve important floodplain functions including, but not limited to, floodflow attenuation, water quality improvement, and wildlife habitat.

3.4 Groundwater and Hydrogeology

The study area overlies the Piedmont and Blue Ridge Crystalline Rock and the Northern Atlantic Coastal Plain aquifers. The former extends from west of the study area to Riggs Road, while the latter extends eastward from Riggs Road to beyond the study area.

The hydrogeology of the project area is largely defined by the geology of the area. Based on the information gathered from the USGS, MGS, and MDE, five main aquifers are located within the project area. Three major aquifers occur west of MD 212 (Riggs Road) within the Piedmont Physiographic Province: crystalline-rock and undifferentiated sedimentary-rock aquifers, aquifers in early Mesozoic basins, and carbonate-rock aquifers. Two aquifers, Castle-Hayne Aquia and Potomac, located within the Coastal Plain Physiographic Province, extend from MD 212 to the eastern end of the project study area.

Most of the Piedmont Physiographic Province is underlain by dense impermeable bedrock that yields water from secondary porosity and permeability provided by fractures. Recharge is highly variable in these aquifers because it is determined by local precipitation and runoff, which are highly variable and are influenced by topographic relief, roadway infrastructure, land use, and the infiltration rates of the available land surface (USGS 1997). The crystalline-rock and undifferentiated sedimentary-rock aquifers are primarily composed of crystalline metamorphic and igneous rocks. An unconsolidated, permeable material called regolith overlies these aquifers. The regolith consists of saprolite, colluvium, alluvium, and soil. The hydraulic properties of the regolith vary greatly due to the variation in thickness, composition, and grain size. The recharge and discharge process takes place in these aquifers in instream areas where precipitation enters the regolith and then moves laterally through this material, discharging into nearby streams. However, some of the water moves downward through the regolith until it reaches the bedrock where it enters fractures in crystalline rocks. Base flow ranges from 33 to 67 percent of stream flow in the drainage basins underlain by crystalline rocks (USGS 1997).

The aquifers in the early Mesozoic basins are composed of rocks that lie on crystalline rocks and locally sedimentary rocks. Sedimentary rocks in the basins consist predominately of interbedded shale, sandstone, and siltstone. Groundwater in the early Mesozoic aquifers moves primarily along joints and fractures. The hydraulic connection between individual aquifers is poor because most groundwater movement is parallel along bedding planes (USGS 1997).

The carbonate-rock aquifers are composed of limestone, dolomite, and marble, which have low permeability and porosity. Water moves through these rocks along joints, faults, and other openings created by dissolution. These mini-aquifers store water in deep fractures or solution channels that can transmit water several miles from recharge areas to discharge areas. Well yields from carbonate-rock aquifers are generally larger than those from the other two aquifers within the study area. Wells located in rock that is fractured only near the surface will yield from 10 to 20 gallons per minute for a limited amount of time until the fractures are drained. Wells located in depressional areas and valleys tend to have higher-than-average yields as these areas commonly occur near fracture zones in rock or the water table is near or at the surface in topographically low areas. The baseflow of a stream is supported by groundwater discharge and indicates the maximum sustained groundwater yield (USGS 1997).

The Castle Hayne-Aquia aquifer of the Coastal Plain Physiographic Province is subdivided into two local aquifers: the Piney Point Nanjemoy aquifer and the Aquia-Rancocas aquifer. Both aquifers are composed of glauconitic sand from different formations within this group. The aquifers are separated by silt and clay confining units that can be as thick as 210 feet. Water in these aquifers moves laterally from the northwestern limits of the aquifers toward the Potomac River. The Castle Hayne-Aquia aquifer does not receive recharge directly from precipitation and does not discharge by evapotranspiration. Recharge occurs from overlying and underlying aquifers by vertical leakage through confining units.

The Potomac aquifer has an extent that underlies a majority of the eastern portion of the project area. This larger aquifer includes two local aquifers: Patapsco and Patuxent aquifers. The local Patapsco aquifer and the underlying Patuxent aquifer contain a range of fine to coarse gravelly sand. The clay confining unit that separates the two aquifers is approximately 300 feet thick. The Potomac aquifer receives little direct recharge by precipitation. Water moves laterally through the Potomac aquifer but also flows vertically in and out of the aquifer from overlying aquifers.

Groundwater well withdrawals from the Piedmont province aquifers are generally suitable for drinking and other uses, but iron, manganese, and sulfate occur locally in concentrations well above EPA's National Secondary Drinking Water Regulations (NSDWR). These regulations are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. High iron concentrations within drinking water can be attributed to corrosion of steel casings and well fittings, as well as iron-fixing bacteria. The natural weathering of rocks within the Mesozoic aquifers can also contribute iron and manganese to groundwater, especially if the water is slightly acidic.

The Potomac Aquifer of the Coastal Plain province has experienced saline water encroachment in several areas due to the ion-exchange reactions that occur in the water that percolates downward through overlying aquifers and confining units. Groundwater from monitoring wells drilled within the Coastal Plain aquifers had a more acidic pH than the recommended EPA standard (USGS 2006). Samples were significantly elevated above the EPA standards for the following organic compounds: alachor, benzoanthracene, benzopyrene, diethlpthalate, hexachorobenzene, hexachlorocyclopentadiene, and pentachlorophenol. The potential sources of contamination include discharge from rubber and chemical factories, metal refineries, agricultural chemical factories, and wood-preserving factories. Additional sources of contamination include leaching from the linings of water storage tanks and distribution lines, as well as runoff from herbicide used on row crops. The potential health effects from ingesting water with elevated levels of the above-listed contaminants include problems with the eye, liver, kidney, or spleen; anemia; increased risk of cancer; and reproductive difficulties.

3.5 Aquatic Biota and Habitat

3.5.1 Aquatic Biota

Data relating to aquatic biota were gathered from the Montgomery County Department of Environmental Protection (MCDEP), Prince George’s County Department of Environmental Resources (PGDER), and Maryland Department of Natural Resources Maryland Biological Stream Survey (MDNR MBSS). A scale of very poor to good was used for community health, and a scale of degraded to excellent was used for physical habitat.

MDNR and MCDEP have both developed a Fish Index of Biological Integrity (FIBI), which compares the fish community at a given site to reference fish communities in the least-impaired streams. Both of these FIBIs are based on the same principles of measuring a community using a set of comparative metrics. However, the MDNR FIBI is based on state-wide reference streams and uses nine community metrics found to characterize fish community health in Maryland’s Piedmont streams. PGDER follows the MDNR methods of sampling and analysis; consequently, PGDER and MDNR data are directly comparable. The MCDEP FIBI was developed using reference streams that are only located in Montgomery County, and the scoring of the nine metrics used is adapted specifically to conditions within the County. This difference in the metrics and scoring criteria causes FIBI scores and narrative rankings to also differ between MDNR/PGDER and MCDEP. Table 6 summarizes how each agency ranks each FIBI score and how each of these scores and rankings relates to reference conditions. Table 7 summarizes the scores associated with each subwatershed.

Three MCDEP sites and one MDNR site were located within the Little Falls subwatershed. Fish were absent from two out of three MCDEP sites and blacknose dace and largemouth bass were collected at the third site. Two species, creek chub and blacknose dace were collected at the MDNR site. All three of these fish species are considered to be pollution-tolerant.

Nineteen MCDEP sites were located in the Rock Creek subwatershed, and these sites had a FIBI ranging from 1.20 (Poor) to 3.90 (Fair). Two sites sampled by MDNR had scores ranging from 1.33 (Poor) to 1.67 (Poor). The Rock Creek sites showed a relatively diverse fish community comprising 23 species. Nine of these species are considered to be pollution-intolerant. No game fish were collected at these sites. One migratory species, American eel, was present.

Table 6. MDNR/PGDER and MCDEP FIBI Scores and Rankings

FIBI Score	Narrative Ranking	Characteristics
MDNR/PGDER		
4.0 – 5.0	Good	Comparable to reference streams considered to be minimally impacted, biological metrics fall within the upper 50 percent of reference site conditions.
3.0 – 3.9	Fair	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of minimally impacted streams.
2.0 – 2.9	Poor	Significant deviation from reference conditions, indicating some degradation. On average, biological metrics fall below the 10th percentile of reference site values.
1.0 - 1.9	Very Poor	Strong deviation from reference conditions, with most aspects of biological integrity not resembling the qualities of minimally impacted streams, indicating severe degradation. On average, most or all metrics fall below the 10th percentile of reference site values.
MCDEP		
>4.5	Excellent	Comparable to the biological community found in reference streams. Exceptional assemblage of species with a balanced community composition.
3.5 –4.5	Good	Decreased number of sensitive species; decreased number of specialized feeding groups with some intolerant species present.
2.3 – 3.4	Fair	Intolerant and sensitive species are largely absent; unbalanced feeding group structure.
≤ 2.2	Poor	Top carnivores and many expected species are absent or rare; general feeders and tolerant species dominate.

Source: Roth et. al. 1997, MCDEP 1998, and PGDER 1995

Table 7. Summary of Existing Fish Community Data in Purple Line Watersheds

Subwatershed	Agency	Number of Sites	FIBI Score Range	FIBI Narrative	FIBI Average
Little Falls	MCDEP	2	1.00-1.70	Poor	1.23
Little Falls	MDNR	1	1.00	Very Poor	-
Rock Creek	MCDEP	5	1.20-3.90	Poor-Good	2.43
Rock Creek	MDNR	2	1.33-1.67	Very Poor	1.50
Sligo Creek	MCDEP	7	1.40-2.60	Poor-Fair	1.98
Sligo Creek	MDNR	1	1.33	Very Poor	-
Northwest Branch	MCDEP	1	3.40-4.30	Fair -Good	3.87
Northwest Branch	MDNR	2	3.67-4.00	Fair-Good	3.89
Northeast Branch	MDNR/PGDER	MNDR- 5 PGDER- 2	1.00-4.33	Very Poor - Good	3.24
Lower Beaverdam Creek	PGDER	9	2.00-3.67	Poor - Fair	2.70

Nine sites, eight sampled by MCDEP and one sampled by MDNR, were located within the Sligo Creek subwatershed. At the MCDEP sites, FIBI scores ranged from 1.40 (Poor) to 2.60 (Fair). The MDNR FIBI score was 1.33 (Poor). These sites showed moderate diversity with 14 different species of fish collected. Of these 14 species, 50 percent are considered to be pollution-tolerant. One migratory fish species was present, the American eel.

Three sites were sampled by MCDEP in the Northwest Branch subwatershed and had FIBI scores ranging from 3.40 (Fair) to 4.30 (Good). Three MDNR sites had scores ranging from 3.67 (Good) to 4.00 (Good). Species diversity was relatively high with 36 species of fish documented. Of these species, more than 25 percent are considered to be pollution intolerant and over 33 percent to be pollution-tolerant. Two species of game fish were present, largemouth bass and smallmouth bass. Three migratory fish species were present, the American eel, sea lamprey, and yellow perch.

Seven sites were located in the Northeast Branch subwatershed. Five sites sampled by MDNR had FIBI scores ranging from 2.00 (Poor) to 4.33 (Good). The other two sites were sampled by PGDER and had a range of FIBI scores from 1.00 (Very Poor) to 4.00 (Good). Diversity was high with 37 species of fish documented in this subwatershed. Approximately 30 percent are considered pollution-tolerant species, while approximately 24 percent are considered to be pollution-intolerant. Two species of game fish, largemouth bass and striped bass, were collected in the Northeast Branch. Three migratory fish were found at these sites, American eel, American shad, and sea lamprey.

Five sites, sampled by PGDER, were located in the Lower Beaverdam Creek subwatershed. The FIBI scores at these sites ranged from 2.00 (Poor) to 3.67 (Good). These sites showed moderate diversity with 16 different species of fish collected. Of these 16 species, more than 37 percent are considered to be pollution-tolerant. No game fish were collected at these sites. The American eel was the only migratory species found in the Lower Beaverdam Creek subwatershed.

Table 8 identifies the species of fish that have been collected at each of these sites, summarized by watershed. Overall, 45 species of fish have been collected since 2000, including three species of game fish – largemouth bass, smallmouth bass, and striped bass were collected; and four migratory species – the American eel, striped bass, sea lamprey, and yellow perch.

Table 8. Fish Species Documented in Purple Line Watersheds

Fish Species	Pollution Tolerance	Little Falls	Rock Creek	Sligo Creek	Northwest Branch	Northeast Branch	Lower Beaverdam Creek
American eel (Anguilla rostrata)	No type		X	X	X	X	X
American shad (Alosa sapidissima)	No type					X	
Banded killifish (Fundulus diaphanus)	No type				X	X	X
Blacknose dace (Rhinichthys atratulus)	T	X	X	X	X	X	X
Bluegill (Lepomis macrochirus)	T		X	X	X	X	X
Blue Ridge sculpin (*Cottus caeruleomentum*)	I			X			
Bluntnose minnow (Pimephales notatus)	T		X		X	X	
Brown bullhead (Ameiurus nebulosus)	T			X	X	X	
Channel catfish (Ictalurus punctatus)	No type				X	X	
Common carp (Cyprinus carpio)	No type		X		X		
Common shiner (Luxilus cornutus)	I			X	X	X	
Creek chub (Semotilus atromaculatus)	T	X	X	X	X	X	
Creek chubsucker (Erimyzon oblongus)	No type					X	X
Cutlips minnow (Exoglossum maxillingua)	I		X		X	X	
Eastern mosquitofish (Gambusia holbrooki)	No type				X	X	X
Eastern mudminnow (Umbra pygmaea)	T				X	X	

Table 8. Fish Species Documented in Purple Line Watersheds (continued)

Fish Species	Pollution Tolerance	Little Falls	Rock Creek	Sligo Creek	Northwest Branch	Northeast Branch	Lower Beaverdam Creek
Eastern silvery minnow (Hybognanthus regius)	No type					X	
Fallfish (Semotilus corporalis)	I		X		X		
Fantail darter (*Etheostoma flabellare*)	No type				X		
Fathead minnow (Pimephales promelas)	No type					X	
Gizzard shad (Dorosoma cepedianum)	No type					X	
Golden redhorse (Moxostoma erythrurum)	No type				X	X	
Golden shiner (Notemigonus crysoleucas)	T		X		X		X
Goldfish (Carssius auratus)	No type		X	X		X	
Green sunfish (Lepomis cyanellus)	T		X	X	X	X	X
Lepomis hybrid (Lepomis sp.)	No type			X			X
Largemouth bass (Micropterus salmoides)	T	X			X	X	
Longnose dace (Rhinichthys cataractae)	No type		X	X	X	X	
Mummichog (Fundulus heteroclitus)	No type				X	X	X
Northern hogsucker (Hypentelim nigricans)	I		X		X	X	
Pumpkinseed (Lepomis gibbosus)	T		X		X	X	X
Redbreast sunfish (Lepomis auritus)	I		X		X	X	X
Rosyside dace (Clinostomus funduloides)	I				X	X	
Satinfin shiner (Cyprinella analostana)	I		X		X	X	X
Sea lamprey (Petromyzon marinus)	I				X	X	
Silverjaw minnow *(Notropis buccatus)*	No type				X	X	
Smallmouth bass (Miropterus dolomieu)	No type				X		
Spotfin shiner (Cyprinella spilopterus)	I		X		X	X	
Spottail shiner (Notropis hudsonius)	I		X		X	X	X
Striped Bass (Morone saxatilis)	No type					X	
Swallowtail shiner (Notropis procne)	No type		X	X	X	X	X
Tessellated darter (Etheostoma olmstedi)	T		X	X	X	X	
White sucker (Catostomus commersoni)	T		X	X	X	X	X
Yellow bullhead (Ameiurus natalis)	No type		X		X	X	
Yellow perch (Perca flavescens)	No type				X		
Total Number of Species		2	22	14	36	37	16

T = Pollution Tolerant I = Pollution Intolerant

Source: MCDEP Database, MDNR MBSS Database, PGDER Sampling

In a letter dated May 2012, the NMFS commented that Paint Branch, Northeast Branch, and Brier Ditch are documented as spawning grounds for anadromous fish, such as blueback herring, alewife, and hickory shad, which live in marine waters but migrate to fresh water to breed. They also serve as nursery grounds for catadromous fish, such as the American eel fish, which live in fresh water but migrate to marine waters to breed.

Historically, blockages within and downstream of the study area have prevented anadromous and catadromous fish from migrating. Specific blockages within Rock Creek and Northwest Branch were identified in 2004 and 2007. These blockages continue to be present downstream of the study area, which reduces the likelihood of finding anadromous and catadromous fish passing through or using the study area streams for breeding or early development. A blockage on Northeast Branch just south of River Road was modified to permit fish passage in 1991. Anadromous fish were observed just below this blockage point in 2007. However, the 1991 modification could allow for fish to move north of River Road into the study area.

3.5.2 Benthic Macroinvertebrates

MDNR and MCDEP have both developed a Benthic Index of Biotic Integrity (BIBI) that compares the macroinvertebrate community within a given site to reference macroinvertebrate communities in a least-impaired stream. The MDNR BIBI is based on statewide reference streams and uses nine community metrics found to characterize macroinvertebrate community health in Maryland's Piedmont streams. For its sampling, PGDER follows the MDNR methods of sampling and analysis, so PGDER and MDNR data are directly comparable. The MCDEP BIBI was developed using reference streams only within Montgomery County, and the scoring of the nine metrics used is tailored specifically to conditions within the County. Because the metrics and scoring criteria differ, the resulting BIBI scores and narrative rankings are also different between MDNR/PGDER and MCDEP. Table 9 summarizes how each agency ranks each BIBI score and how each of these scores and rankings relates to reference conditions.

Table 9. MDNR/PGDER and MCDEP BIBI Scores and Rankings

BIBI Score	Narrative Ranking	Characteristics
MDNR/PGDER		
4.00 – 5.00	Good	Comparable to reference streams considered to be minimally impacted, biological metrics fall within the upper 50 percent of reference site conditions.
3.00 – 3.90	Fair	Comparable to reference conditions, but some aspects of biological integrity may not resemble the qualities of minimally impacted streams.
2.00 – 2.90	Poor	Significant deviation from reference conditions, indicating some degradation. On average, biological metrics fall below the 10th percentile of reference site values.
1.00 - 1.90	Very Poor	Strong deviation from reference conditions, with most aspects of biological integrity not resembling the qualities of minimally impacted streams, indicating severe degradation. On average, most or all metrics fall below the 10th percentile of reference site values.
MCDEP		
$\geq$ 35	Excellent	Comparable to the biological community found in reference streams. Exceptional assemblage of species with a balanced community composition.
26 – 34	Good	Decreased number of sensitive species; decreased number of specialized feeding groups with some intolerant species present.
17 – 25	Fair	Intolerant and sensitive species are largely absent; unbalanced feeding group structure.
$\leq$ 17	Poor	Top carnivores and many expected species are absent or rare; general feeders and tolerant species dominate.

Table 10 summarizes the benthic macroinvertebrate community data for the watersheds within the study area, and each watershed is described below.

Table 10. Summary of Existing Benthic Macroinvertebrate Community Data for Purple Line Watersheds From 2000 - 2011

Subwatershed	Agency	Number of Sites	BIBI Score Range	BIBI Narrative	BIBI Average
Little Falls	MCDEP	2	8-16	Poor	11.6
Little Falls	MDNR	1	2.33	Poor	-
Rock Creek	MCDEP	12	8-22	Poor-Fair	11.74
Rock Creek	MDNR	2	1.00-1.67	Very Poor	1.34
Sligo Creek	MCDEP	3	8-14	Poor	11.5
Sligo Creek	MDNR	1	1.67	Very Poor	-
Northwest Branch	MCDEP	1	16	Poor	16
Northwest Branch	PGDER	4	1.00-3.00	Very Poor - Fair	2.24
Northeast Branch	MDNR/PGDER	MDNR- 5 PGDER- 15	1.00-4.14	Very Poor - Good	2.59
Lower Beaverdam Creek	PGDER	15	1.00-3.00	Very Poor - Fair	2.33

Within the Little Falls subwatershed, benthic macroinvertebrate communities were rated as Poor. The macroinvertebrate community within the Little Falls subwatershed was generally dominated by pollution-tolerant midges (Chironomidae) and common net-spinning caddisflies (Hydropsychidae and Cheumatopsyche).

Nineteen sites were located within the Rock Creek subwatershed in the study area; seventeen were sampled by MCDEP, and two were sampled by MDNR. The eighteen sites sampled by MCDEP had BIBI scores ranging from 8 (Poor) to 22 (Fair); over 80 percent of the scores were in the Poor range. Both sites sampled by MDNR were rated as Very Poor. Generally, within Rock Creek, benthic macroinvertebrate communities were comprised of pollution-tolerant midges and net-spinning caddisflies with the sites that scored in the Fair range containing greater numbers of less tolerant damselfly and mayfly larvae.

The MCDEP recorded BIBI scores for four sites in the Sligo Creek subwatershed; all four were rated as Poor. Additionally, MDNR rated one site in the subwatershed as Very Poor. The benthic macroinvertebrate community within Sligo Creek was dominated by tolerant midge taxa, with other less tolerant taxa including scuds (Amphipoda) and net-spinning caddisflies comprising the MDNR site.

The macroinvertebrate community of Northwest Branch was rated as Poor by MCDEP. Maryland Department of Natural Resources and PGDER rated sites in this subwatershed with BIBI scores ranging from 1.00 (Very Poor) to 3.00 (Fair) and an average score of 2.24. These communities were also dominated by midges and net spinning caddisflies, with the addition of a few less tolerant taxa at the higher scoring sites.

The benthic macroinvertebrate communities in Northeast Branch subwatershed as rated by MDNR and PGDER ranged from 1.00 (Very Poor) to 3.86 (Fair), with an average score of 2.59. Similar to other subwatersheds in the project area, these sites were dominated by midges; however, the higher scoring sites had a few less tolerant taxa, including mayflies. The sites in this subwatershed exhibited greater taxa diversity than the other subwatersheds sampled.

Sites sampled within Lower Beaverdam Creek had BIBI scores that ranged between 1.00 (Very Poor) and 3.00 (Fair), with an average score of 2.33. Seventy-three percent of the sites in this subwatershed were rated as Poor. Benthic macroinvertebrate communities were dominated by midges and sensitive benthic macroinvertebrates, and EPT taxa were uncommon in Lower Beaverdam Creek. However, midge dominance was lower in this subwatershed than it was at other sites within the project area.

3.5.3 Physical Habitat

Each agency from which biological data were collected uses its own habitat scoring and narrative ranking process. MCDEP uses EPA's Rapid Bioassessment Protocol (RHAB) for habitat scoring. This protocol is based on the quality of instream habitat, epifaunal substrate, embeddedness, channel alteration, channel flow status, bank vegetative protection, bank stability, and riparian vegetative zones. Through extensive sampling, the narrative ranking criteria in Table 11 were developed by MCDEP specifically for streams within Montgomery County. Prince George's County also uses EPA's RHAB, but with ranking criteria developed specifically for streams within Prince George's County. The habitat assessment used by the MDNR, referred to as the Physical Habitat Index (PHI) is specialized for both Piedmont and Coastal Plain streams. Within the Piedmont Physiographic Province PHI scores are based on remoteness, shading, epifaunal substrate, instream habitat, instream woody debris and rootwads, bank stability, riffle quality, and embeddedness. In the Coastal Plain Physiographic Province, PHI scores are based on remoteness, shading, epifaunal substrate, instream habitat, instream woody debris and rootwads, and bank stability. In 2007, MDNR stopped calculating the PHI, therefore data from this agency will only be presented through 2006.

Table 11. MCDEP, PGDER, MDNR Habitat Ranking Criteria

Score	Narrative
MCDEP RHAB	
166-200	Excellent
154-165	Good/Excellent
113-153	Good
101-112	Fair/Good
60-100	Fair
54-59	Poor/Fair
0-53	Poor
PGDER RHAB	
151-200	Comparable
126-151	Supporting
100-125	Partially Supporting
< 100	Non-supporting
MDNR PHI	
81-100	Minimally Degraded
66-80	Partially Degraded
51-65	Degraded
0-50	Severely Degraded

Source: MCDEP1998, PGDER 1995, and MDNR 2003

Table 12 summarizes the existing habitat data for the watersheds within the study area, and each watershed is described below.

Table 12. Summary of Existing Habitat Data for Purple Line Watersheds

Subwatershed	Agency	Number of Sites	RHAB/ PHI Score Range	BIBI Narrative	BIBI Average
Little Falls	MCDEP	2	78-155	Fair - Excellent/Good	117
Rock Creek	MCDEP	10	80-139	Fair/Good	106
Rock Creek	MDNR	1	61.32	Degraded	-
Sligo Creek	MCDEP	2	69-123	Fair - Good	102
Sligo Creek	MDNR	1	59.27	Degraded	-
Northwest Branch	MCDEP	1	85-162	Fair - Excellent/Good	125
Northwest Branch	MDNR	1	66.82	Partially Degraded	-
Northeast Branch	MDNR/PGDER	MDNR-1 PGDER- 1	30.36-85.93	Severely Degraded - Minimally Degraded	58

In the Little Falls subwatershed, the MCDEP habitat scores ranged from Fair to Good/Excellent. The lowest parameter scores within the Little Falls subwatershed were bank stability, bank vegetation, and sedimentation.

Twenty three MCDEP RHAB ratings were given to 11 sites in the Rock Creek subwatershed. Ratings ranged from Fair to Good. The lowest parameter scores within the Rock Creek subwatershed were riparian vegetation, bank stability, and bank vegetation, while the MDNR site was degraded.

The MCDEP rated five sites in the Sligo Creek subwatershed from Fair to Good. The lowest parameter scores within the Sligo Creek subwatershed were instream habitat for fish, bank stability, bank vegetation, and sedimentation.

The MCDEP documented aquatic habitat conditions at five sites in the Northwest Branch subwatershed with scores ranging from Fair (85) to Excellent Good (162). The MDNR assessed one site in the subwatershed as having Partially Degraded aquatic habitat conditions. The lowest parameter scores within the Northwest Branch subwatershed were instream habitat for fish, embeddedness, and bank stability.

The MDNR PHI rated two sites within the Northeast Branch subwatershed, one as Minimally Degraded and one as Severely Degraded.

4. Preferred Alternative

4.1 Long-Term Operational Effects and Mitigation

4.1.1 WUS and Wetlands

The Preferred Alternative has the potential to permanently affect WUS and wetlands in the study area where roadway widening to accommodate the transitway would occur and to implement drainage improvements. Table 13 describes the potential permanent impacts of the Preferred Alternative on WUS and wetlands within the study area. Table 14 summarizes the total impact by project element. Quantities were calculated based upon the current limit of disturbance.

Table 13. Type of Impact to WUS and Wetlands

Water Resource	Preferred Alternative	Type of Impact
WUS GB-1 Coquelin Run	Waterway Impact (110 linear feet of ephemeral, 1,447 linear feet of intermittent)	Both the ephemeral channel and stream will be placed in a closed drainage system.
WUS GB-2	Waterway Impact (134 linear feet of intermittent)	Culvert extension
WUS GB-3	Waterway Impact (70 linear feet of intermittent)	Culvert extension
WUS GB-4	Waterway Impact (117 linear feet of intermittent)	Culvert extension
WUS GB-9	Waterway Impact (352 linear feet of intermittent)	Stream relocation
WUS 003 Sligo Creek	Waterway Impact (323 linear feet of perennial)	Sligo Creek stream relocation
WUS 005 Long Branch	Waterway Impact (260 linear feet of perennial)	Culvert replacement
WUS 007	Waterway Impact (419 linear feet of perennial)	Retaining walls
WUS 008	Waterway Impact (413 linear feet of intermittent)	Retaining walls
WUS 009	Waterway Impact (41 linear feet of intermittent)	Stream relocation
WUS 012	Waterway Impact (71 linear feet of perennial)	Outfall reconfiguration
WUS 015	None	None
WUS 016	Waterway Impact (249 linear feet of perennial)	Culvert placement
Wetland 019	Wetland Impact (0.02 acre of PEM); POW impact (0.08 acre)	Retaining wall
WUS 030	Waterway Impact (82 linear feet of intermittent)	Stream relocation at culvert in the Glenridge Facility
WUS 032	Waterway Impact (111 linear feet of intermittent)	Stream will be placed in close drainage system in the Glenridge Facility
WUS 034	Waterway Impact (590 linear feet of intermittent)	Relocation into a closed drainage system
Wetland 035	Wetland Impact (0.06 acre of PEM)	Permanent impact due to fill
WUS 036	Waterway Impact (46 linear feet of intermittent)	Culvert reconfiguration
Wetland 037	Wetland Impact (0.10 acre of PEM); POW Impact (0.02 acre)	Culvert reconfiguration
WUS 048	Waterway Impact (139 linear feet of intermittent)	Stream relocation near culvert in the Glenridge Facility
WUS 057	Waterway Impact (33 linear feet of intermittent)	Culvert Extension
WUS 058	Waterway Impact (110 linear feet of ephemeral)	Retaining walls
Wetland 059	Wetland Impact (0.06 acre of PFO)	Retaining walls
Wetland 060	Wetland Impact (0.18 acre of PFO)	Retaining walls

Table 13. Type of Impact to WUS and Wetlands (continued)

Water Resource	Preferred Alternative	Type of Impact
WUS 062	Waterway Impact (65 linear feet of ephemeral)	None
WUS 063	Waterway Impact (83 linear feet of intermittent)	Stream will be placed in closed drainage system in the Glenridge Facility
WUS 064	Waterway Impact (107 linear feet of intermittent)	Stream will be placed in closed drainage system in the Glenridge Facility
WUS 066	Waterway Impact (50 linear feet of perennial)	Culvert reconfiguration
Wetland 067	Wetland Impact (0.03 acre of PEM); POW Impact (0.01 acre)	Culvert reconfiguration
WUS 068	Waterway Impact (14 linear feet of intermittent)	Outfall reconfiguration due to Lyttonsville Facility
WUS 071	Waterway Impact (70 linear feet of ephemeral)	Stream relocation
Wetland 072	None	None
WUS 073	Wetland Impact (0.03 acre of PFO)	Permanent impact due to fill
Wetland 075	Wetland Impact (0.02 acre of PFO)	Permanent impact due to fill
Wetland 079	Wetland Impact (0.23 acre of PEM)	Proposed SWM facility
Wetland 080	Wetland Impact (0.04 acre of PEM)	TPSS location

Table 14. Summary of Impacts to Waters of the U.S. and Wetlands

Alternative and other Project Elements	Vegetated Wetlands (acres)	Palustrine Open Water (acres)	R2/R4[1] (linear feet)	Ephemeral (linear feet)
Transitway and Stations	0.73	0.11	4,616	355
Lyttonsville Yard	0	0	14	0
Glenridge Maintenance Facility	0	0	522	0
TPSS	0.04	0	0	0
Project Total	0.77	0.11	5,152	355

[1]R2 = Riverine Lower Perennial, R4 = Riverine Intermittent

As the project currently stands, the Preferred Alternative would permanently affect approximately 0.77 acres of wetland, with a majority of impacts occurring to the vegetated wetlands located north and south of University Boulevard, west of Northwest Branch, and along the south side of Ellin Road. A majority of the anticipated impacts to WUS occur at streams that currently flow under or parallel to the proposed Purple Line corridor. Long-term effects to these systems are a result of widening the existing roadways to accommodate the track.

During the construction of new, or replacement or extension of existing pipes, culverts or bridges, 5,152 linear feet of intermittent or perennial stream channel would be affected by drainage improvements involving new, replaced, or extended drainage pipes, or by culverts, or bridges. The majority of the stream impacts would occur within the Georgetown Branch right-of-way and along Ellin Road, where stream systems would be placed in closed drainage systems for most of their length within the limits of the project.

- Additionally, a total of 355 linear feet of ephemeral channel (channels that contain water for only short periods of time following precipitation or snowmelt) would be affected by the Preferred Alternative, with a majority of the impacts occurring along the south side of University Boulevard.

Approximately 0.08 acre of a palustrine open water system (small, shallow, unvegetated pond), located along the south side of River Road may also be permanently affected due to retaining walls along that portion of the road as part of the Preferred Alternative. Approximately 0.03 acres of two large palustrine open water systems (small, shallow, unvegetated ponds) located south of Ellin Road would be affected by the extension of a triple box culvert.

4.1.2 Surface Waters

Water Quality

While the MTA has strived to avoid or minimize the water quality impacts, the project would increase impervious surfaces in the study area, which could increase the amount of surface runoff and potentially increase the level of contaminants such as heavy metals, salt, organic molecules, and nutrients in the surface runoff (Trombulak 1999).

MTA is considering using green track along the Georgetown Branch right-of-way and the CSXT right-of-way to minimize runoff. Green tracks typically consist of grass or sedum plantings in an 8-inch deep section of planting medium (a non-engineered soil mix), placed over a free-draining track ballast. Green track allows for some water absorption within the planting medium, thereby reducing the movement of potential contaminants to surface water bodies. The green track reduces stormwater runoff and increases local air humidity. The majority of the eastern portion of the transitway would be located largely within currently paved areas along existing roadways, although some roadway expansions would be required to accommodate the transitway. Redevelopment of the Lyttonsville site for the proposed Lyttonsville Yard would almost completely overlie existing impervious areas, thus creating minimal new impervious surfaces. The Glenridge Maintenance Facility would add new impervious surfaces, as would some stations and TPSS. However, the addition of impervious surfaces from the Glenridge Maintenance Facility would only contribute a net increase of approximately 0.06 percent of impervious surface to the Northeast Branch watershed.

Total Maximum Daily Loads

Since the study area is already developed and the Preferred Alternative includes proposed infrastructure to effectively manage stormwater runoff generated by the project, increases in nutrient and sediment levels from the project are unlikely to affect overall TMDL management. Current water quality impairment issues primarily result from bacteria in animal waste, leaking septic and sewer systems, stormwater outfalls, and sanitary sewer overflows. It is unlikely that the Preferred Alternative would affect or contribute substantially to bacteria levels within the subwatersheds. To the extent that TMDL thresholds pertain to typical contaminants from impervious surfaces and transportation operations, the project stormwater BMPs designed in coordination with the MDE would minimize adverse effects.

Scenic and Wild Rivers

The Preferred Alternative would affect tributaries of the Montgomery County portion of the Potomac River and the Anacostia Rivers, all parts of which are designated as State-listed scenic rivers. The impacts to these streams would be due to culvert and pipe replacement and extension from bridge crossings. The relocation of a section of Sligo Creek north of Wayne Avenue would result in the greatest impact.

4.1.3 Floodplains

The Preferred Alternative has the potential to affect approximately 23.2 acres of existing 100-year floodplains, as quantified in Table 15. These quantities were determined by the estimated footprints of cut and fill areas associated with project construction. Longitudinal crossings of floodplains, which create longer crossings along the length of the floodplain rather than crossing in the shortest perpendicular span, have been avoided because they would result in more floodplain fill, a reduction in water conveyance, and reduction in floodplain storage capacity.

Table 15. 100-Year Floodplain Impacts per Stream System (Acres)

Project Elements	Rock Creek	Sligo Creek	Northwest Branch	Paint Branch	Northeast Branch	Total
Transitway and Stations	0.80	1.4	6.4	4.5	10.0	23.1
Lyttonsville Yard	0	0	0	0	0	0
Glenridge Maintenance Facility	0	0	0	0	0	0
TPSS	0	0	0	0	0.1	0.1
Project Total	0.80	1.4	6.4	4.5	10.0	23.2

4.1.4 Groundwater and Hydrogeology

The majority of the Preferred Alternative, including the yard, maintenance facility and substations, would be constructed at-grade, and only minor changes to the movements of the shallow groundwater table likely would occur during site grading and construction. Where feasible, surface runoff will be directed to suitable outfalls through approved SWM facilities some of which provide environmental site design (ESD) stormwater management techniques as required by the Maryland Stormwater Management Act of 2007. In areas where this is not feasible, off site water quality mitigation will be identified. Any treated or untreated surface runoff will be released at suitable discharge velocities to prevent downstream erosive forces. The proposed tunnel would intercept groundwater within the underlying aquifers. With an expected maximum depth of 50 feet below existing grade, the tunnel could cause permanent, but localized, changes to groundwater flow patterns. The proposed tunnel would likely affect only local water movements and not the quantity or quality of groundwater. Impacts to recharge are not anticipated as recharge is highly variable within the aquifer because it is determined by local precipitation and runoff.

4.1.5 Aquatic Biota and Habitat

Impacts to aquatic habitats and species include loss of habitat from construction of infrastructure elements and the degradation of water quality resulting from construction and operation activities. The installation of proposed infrastructure elements, such as culvert extensions and closed drainage systems, would result in the permanent loss of approximately 5,183 linear feet of stream habitat. While some of these proposed improvements are being undertaken to address local drainage and flooding problems, the proposed activities could lead to direct loss of fish and other aquatic biota within the construction zone and would permanently alter the localized habitat. Northeast Branch would be affected when the in-stream piers of an existing bridge would be replaced with larger piers. Benthic organisms, such as macroinvertebrates, would be impacted by in-stream construction more so than fish, as they are relatively stationary. However, fish mortality is also a possibility as they can be trapped in pools during dewatering of the channel. Most of the species expected to be impacted are acclimated to disturbed settings and would be likely to recolonize temporarily disturbed areas, though the communities are unlikely to be identical to those present prior to construction.

4.1.6 Avoidance and Minimization

Waters of the U.S. and Wetlands

MTA has strived to avoid impacts to WUS and wetlands wherever possible through design solutions, including shifting the transitway alignment, adjusting construction work areas, and using retaining walls and ballast curbs to minimize the area of disturbance. The following measures are currently included in the design:

- Retaining walls along Veterans Parkway to minimize impacts to wetlands located north and south of the roadway and along the proposed Rock Creek trail connection to avoid direct impacts to Wetland GB-8
- Shifting the transitway alignment to the south side of Veterans Parkway to avoid the extensive tributary and wetland system associated with Brier Ditch
- Use of ballast curb, effectively creating a retaining wall condition, where the proposed transitway and the widened existing roadways would parallel stream and ditch edges to reduce horizontal encroachment into existing streams or ditches and minimize the overall LOD.

Floodplains

Several measures designed to minimize, restore, and preserve natural and beneficial floodplain values would be considered as the project design advances, including minimizing fill within the floodplain, returning disturbed areas to natural contours, using minimum grading requirements, reducing compaction, and minimizing vegetation removal.

Groundwater and Hydrogeology

Impacts to groundwater have been minimized, as much of the Preferred Alternative would occupy existing transportation rights-of-way and other paved surfaces. Stormwater runoff from these surfaces will be managed in accordance with MDE guidelines.

Aquatic Biota and Habitat

MTA has and continues to strive to avoid long-term water quality and quantity impacts to aquatic biota by minimizing the amount of new impervious surface associated with the transitway, yard, and maintenance facility. Where practicable, MTA has aligned the transitway and located associated facilities in areas of existing pavement and impervious surfaces, such as the Lyttonsville Yard site.

Project-related riparian impacts to a tributary to Paint Branch along Paint Branch Parkway, impacts to migratory fish species using the Paint Branch tributary, and stormwater discharge to Paint Branch were cited as concerns by the NMFS during the agency field review of the project on May 8th and 9th, 2012. In response to these concerns, MTA shifted this portion of the transitway south to minimize impacts to the riparian zone. In addition, the project has been designed so that stormwater associated with the transitway would not be discharged directly into the tributary of Paint Branch.

As part of project-wide avoidance and minimization efforts, the footprint of the Glenridge Maintenance Facility was shifted east to minimize impacts to a tributary of Brier Ditch.

MTA will continue to coordinate with the NMFS and other regulatory agencies as project design advances to identify measures to avoid or minimize:

- Creation of in-stream barriers that block migratory fish from upstream spawning ground
- Alterations of stream configuration, characteristics and hydrology
- Incremental changes to in-stream water quality from deforestation of the riparian zone

MTA will design proposed culverts and bridges to MDE standards to avoid or minimize secondary and cumulative impacts to migratory fish and to avoid alteration of habitat.

MTA will prepare a FCP, or similar, as the project design advances and will detail additional impact avoidance and minimization techniques to be applied during construction.

4.1.7 Wetland and Stream Mitigation Site Identification

Impacts to aquatic resources and those that cannot be minimized using practicable measures, require mitigation through mitigation banking credits, in-lieu fees, or permittee-responsible mitigation using a watershed approach that is the establishment/creation, enhancement, and preservation of aquatic resource functions.

Traditionally, mitigation requirements under Section 404 are determined by the ratio of wetland acres replaced to wetland acres lost as the result of project implementation. Emergent wetlands are typically mitigated on a 1:1 replacement basis, while forested and scrub-shrub wetlands are mitigated at a 2:1 ratio. The decision to replace function, acreage, or both, may be adjusted at the discretion of the USACE or MDE, depending on the quality of the affected resource and the practicability of the proposed mitigation.

Table 16 provides potential acreage impacts and requirements for wetland compensation based on typical replacement ratios.

Table 16. Projected Wetland Compensation Ratios

Cowardin Class[1]	Wetland Acres Impacted	Wetland Acres Compensation Required (Replacement Ratio)
Palustrine Forested	0.52	1.04 (2:1)
Palustrine Emergent	0.25	0.25 (1:1)
Total	0.77	1.29

The MTA will also mitigate for unavoidable impacts to streams and palustrine open water systems (POWs) by replacing affected functions, when feasible. The determination of mitigation measures for waterway and open water impacts by federal and state regulatory agencies typically considers the size, stream order, and location. Other mitigation measures, such as removal of fish blockages, riparian buffer enhancements, and water quality improvements, also may be required. Table 17 provides potential linear feet stream impacts and open water acreage impacts and requirements for stream mitigation based on typical replacement ratios.

Table 17. Projected Stream and Open Water Compensation Ratios

Cowardin Class[1]	Wetland Acres Impacted	Linear Feet Impacted	Compensation Required (Replacement Ratio)
R2/R4	N/A	5,152	5,152 (1:1)
POW	0.11	N/A	0.11 (1:1)

The compensatory mitigation package will be designed to fulfill the mitigation requirements, as well as meet the resource protection goals of natural resource agencies.

Anticipating the requirement for wetland and stream mitigation of unavoidable impacts, the MTA conducted a mitigation site search, which included the potential for contributing to an established wetland and stream mitigation bank, and simultaneously coordinated with reviewing agencies regarding potential mitigation, in accordance with the Mitigation Rule hierarchy. The mitigation banking organizations that MTA consulted with included EPA, USACE, and Ecotone, Inc. Currently, no active mitigation banks are located within, or near, the study area watersheds.

The project will be required to do permittee responsible mitigation to compensate for unavoidable wetland and stream impacts due to the general lack of approved wetland/stream mitigation banks. Payment into the MDE Wetland Compensation Fund is not an option as permittee mitigation is available and feasible.

A preliminary search was conducted to locate sites with the highest potential for wetland creation or restoration with emphasis on "in-kind" replacement, first on-site and then within specific sub-watersheds to be affected, or the larger watershed if on-site locations are not available.

Wetland Mitigation Site Identification

The mitigation site selection process focused on areas within the USGS-designated watersheds impacted by the project corridor. This designation is represented by Hydrologic Unit Codes (HUC) 02070010 -- Middle Potomac-Anacostia-Occoquan watershed and the Middle Potomac-Catoctin.

In addition to the sites previously identified in the DEIS, a desktop review was conducted in order to identify new sites, and in particular to locate potential sites within the Anacostia watershed. Additional sites were first located using the NRCS Soil Survey for Montgomery and Prince George's counties, USGS topographic maps, digital MDNR wetland inventory maps, digital USFWS national wetland inventory maps, Maryland Department of Assessment and Taxation property maps, and the online Watershed Resource Registry (WRR) developed by the EPA in partnership with other agencies. Land cover types and areas displaying characteristics of poor drainage were identified using Bing aerial photographs.

A windshield survey and then on-site investigations were performed for selected sites. Additional potential mitigation sites were selected based upon the following criteria: presence of hydric soils, hydrology, landscape position, vegetation, habitat and water quality, and potential constraints. These sites are summarized in Table 18.

Table 18. Potential Wetland Mitigation Sites

Site ID	Watershed	County	Latitude/ Longitude	Location Description	Potential Creation (acres)	Existing Conditions
PL-AR-8	Anacostia River	Prince George's	38°52'11.07"N/ 76°52'42.82"W	Northeast of Forest Rd. and west of MD 704	0.70	This site consists of an open field located on the south side of Cattail Branch, a tributary of Beaverdam Run. This parcel has a wetland swale that bisects the site along the southern edge. The site currently exhibits a perched hydrology.
PL-AR-21	Northwest Branch	Montgomery	38°58'28.82"N/ 77°06'11.33"W	South of the intersection of Hamilton Street and 40th Avenue	0.95	This site is situated on the east side of an unnamed tributary of Northwest Branch. The existing bioretention pond could be expanded to include an area north of the pond that is currently a maintained open space. The bioretention pond appears to be at capacity for treating runoff of the adjacent parking lot as aerial photography shows the parking lot flooded at times.
PL-AR-23	Northeast Branch	Prince George's	39°58'13.93"N/ 76°54'41.85"W	Southeast of the intersection of Kenilworth Avenue and Good Luck Road	1.42	This site consists of an abandoned parking lot located within the 100-year floodplain of Brier Ditch. The parking lot is flooded for most of the year due to groundwater seeps that flow into this area from the adjacent hillside. Common reed (*Phragmites australis*) is growing within the parking lot in several places.
PL-AR-24	Northwest Branch	Prince George's	38°59'11.23"N/ 76°57'47.48"W	North of University Boulevard (MD 193), approximately 850 feet east of West Park Drive	2.13	This site is located within the 100-year floodplain of Northwest Branch of the Anacostia River. The site is currently being used as an archery range. Forested wetlands border the north and south sides of the site.
PL-RC-9	Rock Creek	Montgomery	39°04'02.00"N/ 77°06'12.10"W	West of Viers Mill Rd and southwest of Aspen Hill Rd., within "Parklawn Soccer Fields"	4.30	This site contains hydric soils and is adjacent to a large forested wetland. There is little elevation difference between the site and the forested wetland, so little grading would be necessary. A paved trail parallels the tree line along the southwest side of the site; this would need to be removed or relocated.
PL-RC-74	Rock Creek	Montgomery	38°58'28.82"N/ 77°06'11.33"W	North of Oskaloosa Dr.	2.36	ICC RC-74. Potential exists at this site for stream restoration, wetland creation, wetland enhancement, riparian enhancement, and reforestation. Historically, the site hydrology was influenced by beavers and the floodplain was dominated by wetlands.

Stream Mitigation Site Identification

The regulatory agencies target compensatory stream mitigation restoration projects to replace stream functions when feasible. In addition to stream channel improvements, mitigation measures for waterway impacts consider the size, stream order, and location of the stream to determine appropriate stream mitigation. Other mitigation measures such as removal of fish blockages, riparian buffer enhancements, and water quality improvements may be used at the agencies' discretion.

As for wetlands, the stream mitigation site-selection process focused on locating stream segments with the highest potential for restoration within the USGS-designated watershed impacted by the project corridor. This designation is represented by Hydrologic Unit Code (HUC) 02070010- Middle Potomac-Anacostia-Occoquan watershed within Montgomery and Prince George's counties. Under the State of Maryland watershed designations, the Purple Line project would impact 5,183 linear feet of intermittent and perennial streams and 0.09 acre of palustrine open water in the Rock Creek, Sligo Creek, Northwest Branch, Indian Creek, and Lower Beaverdam Creek sub-watersheds. However, mitigation for impacts to the 363 linear feet of ephemeral channels is not required by USACE or MDE, and is therefore, not included in the project estimate of required mitigation.

The twelve stream sites previously identified in the DEIS were narrowed down to 8 sites by removing sites that were entirely concrete-lined channels, and combining sites that were adjacent segments of stream. Since the Inter-County Connector (ICC) alignment crosses the same sub-watersheds as the Purple Line project, additional sites were identified from a list of ICC mitigation sites that were not carried forward for that project (SHA 2004). The list of potential mitigation sites for the ICC had been compiled in 2004 from published documents (previous mitigation site searches and watershed studies) and input from federal, state, and local agencies (SHA 2004). Emphasis was placed on first and second order streams, and potential mitigation sites were compiled in a database inventory (SHA 2004). The ICC mitigation database was revisited for potential Purple Line mitigation projects, and 21 stream mitigation sites that were located in the impacted watersheds but have not been pursued for ICC mitigation were considered for the Purple Line stream mitigation, for a total of 29 potential stream mitigation sites.

Evaluation of the potential mitigation sites has been performed through desktop analysis and on-site investigations. Potential stream mitigation sites were prioritized using the following criteria: bank erosion, floodplain condition, riparian vegetation, habitat and water quality, feasibility, additional benefits, and location.

A desktop assessment of site location was performed using GIS to determine 20% of the ranking score. Stream mitigation sites ranked high for location if they are close to the project alignment (less than 5 miles), located in the same sub-watersheds as the stream impacts, comprise headwater streams, and provide green infrastructure linkage.

The remaining 80% of the total stream ranking score was determined during a field visit. Stream sites that show severe bank erosion, are disconnected from the floodplain, or have poor existing in-stream habitat opportunities were scored high as potential restoration sites. The riparian vegetation criteria gives more points to sites located in urban or agricultural areas where additional riparian buffer could have significant water quality benefits, and sites that have an existing riparian forest will score low for riparian vegetation. Project feasibility was determined by construction access, and was rated on proximity to a public road. Sites within 500 feet or less of a public road scored the highest for feasibility. Additional points were added to sites that can provide benefits such as utility conflict resolution, fish passage restoration, or floodplain creation. All of these criteria (bank erosion, floodplain condition, riparian vegetation, habitat and water quality, feasibility, and additional benefits) were evaluated through on-site observations during the field visit.

Each site was scored on both the field and desktop criteria, for a total of 100 points. The higher the total score, the more suitable the site is for potential stream mitigation. Site rankings may be further refined in the future to give preference to sites that can accommodate both stream and wetland mitigation at one location, or to sites that are located entirely on public property.

A total of seven sites were retained after the field investigations and are described in Table 19.

Table 19. Potential Stream Mitigation Sites

Site ID	Watershed	Sub-Watershed	County	Latitude/ Longitude	Location Description	Stream Length (Linear Ft)	Existing Conditions
AR-1	Anacostia	Lower Beaverdam Creek	Prince George's	38°55'42.43"N/ 76°53'39.36"W	South of MD 202 and east of US 50	300	This site consists of the mouth of Cattail Branch and its confluence with the mainstem of Lower Beaverdam Creek. Barriers to fish passage exist at both the box culvert under Landover Road and at the mouth of Cattail Branch, which is a concrete lined channel. A significant amount of channel and bank erosion is present at the confluence of Cattail Branch and Lower Beaverdam Creek.
AR-2, AR-3, AR-4, AR-8, AR-9	Anacostia	Lower Beaverdam Creek	Prince George's	38°52'11.07"N/ 76°52'42.82"W	East and West of the intersection Martin Luther King Jr. Highway	4,570	This site is associated with Cattail Branch, a tributary to Lower Beaverdam Creek. Several fish barriers exist along the corridor at road and utility crossings. Stream banks are vertical and eroding, particularly along park areas where there is little riparian buffer. Severe bank and channel erosion exists downstream of the culverts under Landover Road (AR-2) and Barlowe Road (AR-9).
AR-21	Anacostia	Northwest Branch	Prince George's	38°56'58.20"N/ 76°57'06.55"W	South of Hamilton St., within Magruder Park	1000	This site is associated with an unnamed tributary of Northwest Branch. The stream channel exhibits some instability and moderate bank erosion due to historical straightening. Located within Magruder Park. Good opportunity for stream buffer reforestation.
AR-22	Anacostia	Lower Beaverdam Creek	Prince George's	38°56'10.33"N/ 76°54'16.42"W	Southwest of the intersection of Otis Street and Osborn Road	650	This site is associated with an unnamed tributary of Lower Beaverdam Creek. The channel is deeply incised and banks have severe erosion. Sewer infrastructure is exposed along the channel. The stream flows through an in-line stormwater pond along Otis Street, which is rapidly filling with sediment from upstream bank erosion.

Table19. Potential Stream Mitigation Sites (continued)

Site ID	Watershed	Sub-Watershed	County	Latitude/ Longitude	Location Description	Stream Length (Linear Ft)	Existing Conditions
AR-23	Anacostia	Northeast Branch	Prince George's	39°58'13.93"N/ 76°54'41.85"W	Southeast of the intersection of Kenilworth Avenue and Good Luck Road	4,000	The mainstem of Brier Ditch is contained within a trapezoidal channel that has vertical unvegetated banks for most of its length. Some areas along the banks have been reinforced with concrete and stone, some of which, have fallen into the stream. Exposed sewer lines within the stream reach, exposed concrete pipes, and a fish blockage could all be restored and linked.
NW-49, NW-50	Anacostia	Northwest Branch	Mont-gomery	39°05'45.27"N/ 77°00'53.57"W	South of Stonegate Elem. and north of Bonifant Rd.	2,700	This site is associated with an unnamed tributary to Northwest Branch. The stream channel is disconnected from its floodplain and has bank stability conditions that are causing bank erosion, in-stream sedimentation, and loss of property. Based on 2003 data collected by SHA, the reach has poor habitat, a poor benthic community, and a poor fish community.
RC-74	Rock Creek	Rock Creek	Mont-gomery	38°58'28.82"N/ 77°06'11.33"W	Southeast of Redland Rd.	4106	Degraded channel with moderate bank erosion and fair instream habitat. Channel segment is located within a large floodplain corridor mostly vegetated by non-native grass species. Excellent opportunity to create forested wetlands connected to the stream channel.

Results of Wetland and Stream Agency Field Reviews

Field reviews with the USACE and MDE were conducted on October 25, 2012 and November 28, 2012 to gain concurrence on the proposed wetland and stream mitigation sites. The materials distributed at the agency field reviews are included within Appendix F. Based on the comments from the USACE and MDE during the field review, some of the proposed wetland and stream mitigation sites were dropped from further consideration as detailed in the meeting minutes in Appendix E. Those wetland and mitigation sites moving forward are shown in Table 20. The potential mitigation sites total 6.05 acres of potential wetland mitigation and 16,560 linear feet of potential stream mitigation. The linear feet of potential stream mitigation does not factor potential mitigation credit for stormwater management (SWM) BMP opportunities associated with some sites.

Table 20. Conceptual Wetland and Stream Mitigation Sites

Site Name	Site ID	Type of Mitigation	Potential Wetland Acreage	Potential Stream Length	Location	Watershed	Property Ownership
Cattail Branch	AR-2 AR-3 AR-4 AR-8 AR-9	Stream & BMP's		4,570 L.F.	Landover	Lower Beaverdam Creek	Public
	AR-8	Wetland	0.70 Acres				
Crabbs Branch	RC-74	Stream		5,360 L.F.	Rockville	Rock Creek	Public
	RC-74	Wetland	3.22 Acres				
Brier Ditch	AR-23	Stream & BMP's		4,000 L.F.	Riverdale	Northeast Branch	Public/ Private
	AR-23	Wetland	1.42 Acres				
Rolling Stone Tributary	NW-49 NW-50	Stream & BMP's		2,700 L.F.	Colesville	Northwest Branch	Public
Adelphi Manor Archery Range	AR-24	Wetland	2.13 Acres		Adelphi	Northwest Branch	Public
		Total Mitigation Estimate:	7.47 Acres	16,630 L.F.			

4.1.8 Mitigation

MTA will mitigate project impacts to WUS, including wetlands, by complying with the Federal Compensatory Mitigation Rule (33 CFR Parts 325 and 40 CFR Part 230), as well as stipulations from federal and state resource agencies.

MTA will coordinate with the regulatory agencies to develop a project-wide compensatory mitigation strategy to offset impacts to wetlands and aquatic resources.

4.2 Short-Term Construction Effects

4.2.1 WUS and Wetlands

The following short-term effects have been preliminarily identified:

- An intermittent stream (WUS GB-2) located within the Columbia Country Club would be crossed during construction of the transitway.
- Approximately 101 linear feet of in-stream construction would occur within Rock Creek (WUS GB-6) to deconstruct, remove, and replace the existing bridge and bridge pier.
- Approximately 370 linear feet of stream diversions would result within the larger perennial streams, such as Northwest Branch (WUS 006) and Northeast Branch (WUS 018), to replace in-stream piers to widen existing bridges.
- Reconstruction of a vegetated stormwater management basin east of the intersection of East-West Highway and Veterans Parkway would affect 0.26 acre of a palustrine emergent wetland (W081) and 83 linear feet of an intermittent stream (WUS 082).

- Reconstruction of a vegetated stormwater management basin north of East-West Highway and west of Baltimore Washington Parkway would affect 0.09 acre of palustrine emergent wetland (W024) and 0.13 acre of palustrine forested wetland (W024), as well as 83 linear feet of an intermittent stream (WUS023).
- An impact of approximately 109 linear feet of an intermittent stream (WUS 038) would result north of Ellin Road to facilitate cleaning of existing culverts under Ellin Road and facilitate positive flow through the triple box culvert under the transitway south of Ellin Road.

4.2.2 Surface Water

Short term effects to surface waters would include physical disturbances or alterations to the ground surface over which water flows, accidental spills of construction materials, and sediment releases into the surface water that could affect aquatic life. Construction of the Glenridge Maintenance Facility could permanently affect up to 522 linear feet of streams associated with the Brier Ditch tributary system. The streams that currently flow within the proposed footprint of this Facility would be placed in closed drainage systems or relocated into adjacent culverts.

Short-term effects on designated scenic or wild streams would occur during construction when equipment is placed near stream banks or in-stream diversions are implemented during pier removal.

4.2.3 Floodplains

Short-term effects to the 100-year floodplains would occur during culvert and bridge construction, especially during the deconstruction, removal, and replacement of the existing Rock Creek bridge. Small negligible, approximately up to 6 inches, increases to the 100-year floodplain may result from the proposed configurations of the new culvert and bridge construction.

4.2.4 Groundwater and Hydrogeology

Construction of the Plymouth Street tunnel would have a short-term impact to localized groundwater resources as de-watering activities would be required to maintain a dry work zone. During construction, runoff would be directed to surface waters through sediment trapping and/or pumping facilities. Treatment of dewatering activities will be routed through filtering systems (dewatering basins, filter bags, portable sediment tanks, etc.) prior to discharge to surface waters.

4.2.5 Aquatic Biota and Habitat

Short-term impacts to aquatic biota and habitat resulting from project construction include physical disturbances or alterations to habitat, accidental spills either directly into water resources or indirectly through surface runoff, and sediment releases that could affect aquatic life. Earth-moving activities would expose soils that, if left in an unstable condition, could enter waterways during storms.

Increased sediment loads can destroy or damage fish spawning areas and macroinvertebrate habitat. An accidental sediment release in a stream can clog the respiratory organs of fish, macroinvertebrates, and the other members of their food web (Barrett 1995). Additional suspended sediment loads have also been shown to cause stream warming by reflecting radiant energy (CWP 2003). Many metal contaminants, bound to the small particles, are transported during accidental releases of sediment. Barrett (1995) found that the initial response to increased sedimentation due to construction was a reduction in numbers and species of fish and macroinvertebrates. This reduction in fish numbers in areas of siltation was generally reversed within 12 months of the cessation of construction activity. While sediment releases are possible during construction, the potential for sediment related effects will be greatly minimized through the strict adherence to MDE approved sediment and erosion control plans.

MTA will provide for work area containment, use and storage of fuels and other potential contaminants, a spill management plan, and water quality and quantity controls to protect aquatic biota and habitat based on current regulations and project permit conditions, such as the project's MDE-approved plans for sediment and erosion control and stormwater management.

4.2.6 Avoidance and Minimization

MTA will minimize the area of disturbance to Maryland-designated wild and scenic rivers by clearly marking and fencing the work area and prohibiting activity outside the work area.

MTA will minimize the area of disturbance to Maryland-designated wild and scenic rivers by clearly marking and fencing the work area and prohibiting activity outside the work area. During construction, runoff will be directed to surface waters through stormwater management or treated as it is being infiltrated into the local groundwater through ESD stormwater facilities.

MTA will not undertake in-stream construction during state-mandated stream closure periods.

4.2.7 Mitigation

MTA will restore Sligo Creek approximately 180 feet upstream and 180 feet downstream of the project bridge to provide long-term benefits and enhance its inherent characteristics.

MTA will submit project plans to the MDNR for evaluation in compliance with the Maryland Scenic and Wild Rivers Act. MTA would provide mitigation if MDNR determines that the project would jeopardize the scenic value of the designated rivers.

MTA will perform hydraulic and hydrologic studies. If these studies find that the flood elevation would change, floodplain storage mitigation will be implemented, if required.

MTA will submit project plans to MDE for approval of structural evaluations, fill volumes, proposed grading elevations, structural flood-proofing, and flood protection measures in compliance with FEMA requirements, USDOT Order 5650.2, "Floodplain Management and Protection," and Executive Order 11988.

MTA will obtain applicable environmental permits for water resources.

MTA will develop an Erosion and Sediment Control Plan, in accordance with the Stormwater Management Act of 2007, which will specify proper slope and soil stabilization techniques, erosion and sediment controls, and stormwater management facilities.

MTA will restore and stabilize temporarily disturbed aquatic habitat at the end of construction according to a restoration plan developed in coordination with the USACE and MDE. The permits related to these activities, as well as the required MDE Waterway Construction permit, are intended to protect aquatic biota and water quality and ensure that the Preferred Alternative complies with federally-mandated water quality standards.

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Appendix A – List of Acronyms and Abbreviations

APPENDIX A

List of Acronyms and Abbreviations

ADA	Americans with Disabilities Act
BIBI	Benthic Index of Biotic Integrity
BMP	Best Management Practice
CBD	Central Business District
CDP	Census Designated Places
CLRP	Constrained Long Range Plan
COMAR	Code of Maryland Regulations
CWA	Clean Water Act
DC	Washington, DC
EPA	Environmental Protection Agency
ESD	Environmental Site Design
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Administration
FIBI	Fish Index of Biotic Integrity
FIRM	Federal Insurance Rate Maps
HUC	Hydrologic Unit Code
ICC	Inter-County Connector
LOD	Limit of Disturbance
LRT	Light Rail Transit
MGS	Maryland Geological Survey
MARC	Maryland Area Regional Commuter
MBSS	Maryland Biological Stream Survey
MCDEP	Montgomery County Department of Environmental Protection
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDOT	Maryland Department of Transportation
M-NCPPC	Maryland-National Capital Parks and Planning Commission
MSHA	Maryland State Highway Administration
MSRA	Management Reauthorization Act
MTA	Maryland Transit Administration
MWCOG	Metropolitan Washington Council of Governments
NSDWR	National Secondary Drinking Water Regulations
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
PFA	Priority Funding Areas
PGDER	Prince George Department of Environmental Resources
PHI	Physical Habitat Index
POW	Palustrine Open Water
RHAB	Rapid Bioassessment Protocols
SNE	Significant Nexus Evaluation

SSTC	Silver Spring Transit Center
SWM	Stormwater Management
TOD	Transit Oriented Development
TMDL	Total Maximum Daily Load
TNW	Traditional Navigable Waterway
UMD	University of Maryland
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMATA	Washington Metropolitan Area Transit Authority
WQL	Water Quality Limited
WRR	Watershed Resource Registry
WUS	Waters of the United States

Appendix B – Glossary/Terminology

APPENDIX B

Glossary/Terminology

Anadromous: pertaining to fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn.

Anthropogenic: induced or altered by human activity.

Aquifer: a water bearing rock, rock formation, or group of rock formations.

At-grade: a junction at which two or more transport axes cross at the same level (or grade).

Below-grade: recessed below ground level.

BIBI: Benthic Index of Biotic Integrity. An index that compares the macroinvertebrate community within a given stream to reference macroinvertebrate communities in the least-impaired streams using a series of metrics.

Capital Crescent Trail: the existing paved trail between Bethesda and Georgetown. When the trail alongside the Purple Line is built, the Capital Crescent Trail will extend all the way from Silver Spring to Georgetown.

Catadromous fish: fish that live most of their lives in freshwater, but migrate to seawater to spawn. American eels are catadromous.

COMAR: Code of Maryland Regulations. The official compilation of all administrative regulations issued by agencies of the state of Maryland.

CWA: Clean Water Act. The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.

Conductivity: a measure of the ability of water to conduct an electric current. It is related to the type and concentrations of dissolved ions in the water.

Dissolved oxygen (DO): the amount of free (not chemically combined) oxygen dissolved in water, wastewater, or other liquid, usually expressed in milligrams per liter, parts per million, or percent of saturation.

Endangered: an organism of very limited numbers that may be subject to extinction and is protected by law under the Endangered Species Act.

Ephemeral stream: a stream with flowing water only during and for a short duration after precipitation events in a typical year. Groundwater is not a source of water for the stream.

Epifaunal : “epi” means surface, and “fauna” means animals. Thus, “epifaunal substrate” are structures in the stream (on the stream bed) that provide surfaces on which animals can live. In this case, the animals are aquatic invertebrates (such as aquatic insects) or benthic fish species. These insects live on or under cobbles, boulders, logs, and snags, and the many cracks and crevices found in these structures. In general, older decaying logs are better suited for insects to live on/in than newly fallen “green” logs and trees.

FEMA: Federal Emergency Management Agency. FEMA has ten regional offices, and two area offices. Each region serves several states, and regional staff work directly with the states to help plan for disasters, develop mitigation programs, and meet needs when major disasters occur.

BIBI: Benthic Index of Biotic Integrity. An index that compares macroinvertebrate communities within a given stream to reference fish communities in the least-impaired streams using a series of metrics.

FIBI: Fish Index of Biotic Integrity. An index that compares the fish community within a given stream to reference fish communities in the least-impaired streams using a series of metrics.

FIRM: Flood Insurance Rate Maps. Maps produced by the Federal Emergency Management Agency (FEMA) to determine the locations of flood risks and hazards.

Floodplain (100-year): the area adjacent to a stream that is on average inundated once a century.

Geographic information system (GIS): a computer system capable of storing and manipulating spatial data.

Groundwater: subsurface water and underground streams that can be collected with wells, or that flow naturally to the earth's surface through springs.

Groundwater recharge: increases in groundwater storage by natural conditions or by human activity. See also artificial recharge.

Georgetown Branch right-of-way: the land adjacent to the CSX railroad between Bethesda and Silver Spring (where the trail is today) that was dedicated to a future transit project.

Georgetown Branch interim trail: the crushed stone trail existing today in the Georgetown Branch right-of-way.

Headwater: is the furthest place in a stream from its estuary or confluence with another stream, as measured along the course of the stream.

Intermittent stream: streams that have flowing water during certain times of the year. Groundwater driven; runoff from rainfall or snowmelt is a supplemental source of water.

Limit of Disturbance: the boundary within which construction, materials storage, grading, landscaping, and related activities shall occur.

Maryland Area Regional Commuter: a regional/commuter rail system consisting of three lines in the Baltimore-Washington Metropolitan Area.

Macroinvertebrate: invertebrates visible to the naked eye, such as insect larvae and crayfish.

Maryland-National Capital Parks and Planning Commission: leaders who plan for orderly development and the protection of natural resources in Maryland's two suburban counties bordering the District of Columbia.

Maryland State Highway Administration: the state agency responsible for maintaining numbered Maryland highways outside of Baltimore City.

Maryland Transit Administration: the state-operated mass transit administration in Maryland; part of the Maryland Department of Transportation.

Maryland Department of Natural Resources Third Order Watersheds: statewide watershed designation using Strahler's (Strahler 1952 p. 1120) third order stream classification.

Metropolitan Washington Council of Governments: a regional organization of consisting of 21 local governments in the Washington Metropolitan Area, as well as members of the Maryland and Virginia state legislatures, the US Senate, and the US House of Representatives.

Metrorail: the rapid transit system in Washington, DC, and its surrounding suburbs.

Mitigation: efforts to reduce or compensate for adverse impacts.

National Environmental Policy Act: a United States environmental law that established a national policy promoting the enhancement of the environment; also established the President's Council on Environmental Quality (CEQ).

No Build: the baseline against which the environmental and community impacts of the Preferred Alternative are compared; consists of the transit service levels, highway networks, traffic volumes, and demographics forecasted for horizon year 2040.

Perennial streams: streams that flow year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow.

pH: the negative logarithm of the molar concentration of the hydrogen ion, or, more simply acidity.

Preferred Alternative: the build alternative that is studied in detail in the FEIS (this alternative is a modified/refined/updated version of the Locally Preferred Alternative).

Purple Line corridor: the general area between Bethesda and New Carrollton.

Relatively permanent: streams that flow year-round or have a continuous flow at least seasonally (typically three months).

Relocation: to move/change to a new place.

Right-of-way: legally granted access for the use of property.

Riprap: rock or other material with a specific mixture of sizes referred to as a "gradation," used to stabilize streambanks or riverbanks from erosion or to create habitat features in a stream.

Scenic and Wild River: a river that possesses outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value(s).

SNE: Significant Nexus Evaluation. A significant nexus evaluation (SNE) assesses the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs. As a matter of policy, not law, the USACE requires performing a SNE on all intermittent non-navigable (not perennial) tributaries and their adjacent wetlands, even if the tributary's flow may be relatively permanent.

Spawning: the depositing and fertilizing of eggs (or roe) by fish and other aquatic life.

Study area: the geographic extent that is examined to assess impacts.

TMDL: Total Maximum Daily Load. A regulatory term in the U.S. Clean Water Act, describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

TNW: Traditional Navigable Waterway. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

Transit Center: a sheltered waiting area where multiple mass transportation routes converge; there are two on the alignment, the Silver Spring Transit Center and the Takoma/Langley Transit Center.

Turbidity: an optical measure of the clarity of water by light scattering from suspended and dissolved constituents in the water column.

Waters of the U.S.: all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate "wetlands"; All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters.

Wild and Scenic River: certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

WQL: Water Quality Limited Segment. Portions of streams that are considered impaired by analyzing a wide variety of water quality monitoring data, including chemical grab samples, in situ measurements, continuous measurements, and biological data. After listing a stream as a WQL in Category 5 of the Integrated Report, the state is required to prioritize each waterbody's need for TMDL development.

Wetlands: those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Appendix C – Wetland Function-Value Evaluation Form

Wetland Function-Value Evaluation Form

Total area of wetland >3.4 acres Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? N

Adjacent land use commercial, forest, residential Distance to nearest roadway or other development adj

Dominant wetland systems present PFO, PSS Contiguous undeveloped buffer zone present N

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

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. W-GB8

Latitude ______ Longitude ______

Prepared by: DWR Date 2-14-12

Wetland Impact:
Type ______ Area ______

Evaluation based on:
Office ✓ Field ✓

Corps manual wetland delineation completed? Y ✓ N ______

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	✓		7,8,9,10,13,15	✓	only 6/14 qualifiers met, but wetland is definitely ~~providing this function~~
Floodflow Alteration	✓		1,3,4,5,6,7,9,10,11,13,14,15,18	✓	13/18
Fish and Shellfish Habitat		✓			no permanent aquatic habitat
Sediment/Toxicant Retention	✓		1,2,3,4,7,8,9,10,14,15,16	✓	11/15
Nutrient Removal	✓		1,3,4,5,6,7,8,9,11,12,13,14,15	✓	13/14
Production Export	✓		1,2,3,4,5,7,8,10,11,12,13	✓	11/14
Sediment/Shoreline Stabilization		✓	3,8,9,13,15		5/15 - wetland does not border assoc. watercourse
Wildlife Habitat	✓		3,5,6,7,8,9,11,13,15,18,19,20,21	✓	13/21
Recreation	✓		1,4,5,7,11,12	✓	6/12
Educational/Scientific Value	✓		2,4,5,10,11,13,		6/16
Uniqueness/Heritage	✓		1,5,6,7,8,10,11,12,13,14,15,16,17,19,22,27	✓	16/31
Visual Quality/Aesthetics	✓		1,2,3,4,5,8	✓	6/12
ES Endangered Species Habitat		✓			
Other					95/151 of total qualifiers met of principal functions/values

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland 740 acres Human made? N Is wetland part of a wildlife corridor? Y or a "habitat island"? N

Adjacent land use residential, road, powerline Distance to nearest roadway or other development adjacent

Dominant wetland systems present PFO Contiguous undeveloped buffer zone present N

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

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. W-60

Latitude ______ Longitude ______

Prepared by: DWR Date 12/22/11

Wetland Impact:
Type ______ Area ______

Evaluation based on:
Office ✓ Field ✓

Corps manual wetland delineation completed? Y ✓ N ______

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	✓		7, 8, 9, 13, 15		5/14
Floodflow Alteration	✓		1, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18	✓	14/18
Fish and Shellfish Habitat		✓			wetland is terrestrial habitat
Sediment/Toxicant Retention	✓		1, 4, 7, 8, 9, 10, 12, 14, 15, 16	✓	10/15
Nutrient Removal	✓		1, 3, 4, 6, 7, 8, 11, 12, 13	✓	9/14
Production Export	✓		1, 2, 3, 5, 7, 8, 10, 11, 12, 13	✓	10/14
Sediment/Shoreline Stabilization	✓		1, 3, 6, 8, 14		5/15
Wildlife Habitat	✓		1, 3, 6, 7, 8, 11, 13, 15, 18, 19, 20, 21	✓	12/21
Recreation	✓		4, 5, 7, 12		4/12
Educational/Scientific Value	✓		2, 3, 4, 5, 9, 10, 11, 13,		8/16 - not a principal function, must be >50%
Uniqueness/Heritage	✓		1, 4, 5, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 19, 22, 27,	✓	16/31
Visual Quality/Aesthetics	✓		1, 2, 3, 4, 6, 8, 9,	✓	7/12
ES Endangered Species Habitat		✓			no ES known to occur in wetland
Other					only a small portion of wetland resides within study area

Notes:

*Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland ~1.5 acres Human made? Y Is wetland part of a wildlife corridor? N or a "habitat island"? Y

Adjacent land use railroad, residential, road Distance to nearest roadway or other development adjacent

Dominant wetland systems present PEM/POW Contiguous undeveloped buffer zone present N

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

How many tributaries contribute to the wetland? 1 Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. W-37, W-67

Latitude ____ Longitude ____

Prepared by: DWR Date 12-22-11

Wetland Impact:
Type ____ Area ____

Evaluation based on:
Office ✓ Field ✓

Corps manual wetland delineation completed? Y ✓ N ____

Function/Value	Suitability Y	Suitability N	Rationale (Reference #)*	Principal Function(s)/Value(s)	Comments
Groundwater Recharge/Discharge	✓		4, 7, 8, 9, 15, 16		6/14
Floodflow Alteration	✓		2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 16	✓	13/18
Fish and Shellfish Habitat	✓		7, 9, 10, 17		4/17
Sediment/Toxicant Retention	✓		1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	✓	15/15
Nutrient Removal	✓		2, 3, 4, 5, 7, 9, 11, 12, 13, 14, 15	✓	11/14
Production Export	✓		1, 2, 12		3/14
Sediment/Shoreline Stabilization	✓		3, 4, 6, 8, 12, 13, 15		7/15
Wildlife Habitat	✓		3, 8, 9, 10, 11, 18, 19,		7/21
Recreation		✓	10, 11, 12,		3/12
Educational/Scientific Value	✓		9, 10, 12, 13,		4/16
Uniqueness/Heritage	✓		1, 5, 6, 8, 10, 12, 13, 14, 15, 16, 17, 19		12/31
Visual Quality/Aesthetics	✓		1, 2, 3, 4, 6, 9, 12	✓	7/12
ES Endangered Species Habitat		✓			no ES occur within wetland
Other					appears to be a mitigation site

Notes:

* Refer to backup list of numbered considerations.

Appendix D – Wetland Determination Data Forms and Stream Features Field Sheets

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS #: Wgbl

Observer(s) BG, HS

Stream Flow:

Perennial: ____ Intermittent X Ephemeral X

Gradient: <1% Classification: PHSBS | ephemeral

Channel Characteristics:

Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: Channelized

Channel Has (check all that apply):

- [x] Bed and Banks R4
- [x] OHWM Ephemeral
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [x] leaf litter disturbed or washed away
  - [x] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [x] destruction of terrestrial vegetation
  - [x] the presence of wrack line
  - [ ] sediment sorting
  - [x] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

ephemeral - 6' 3' N/A

Morphology:

Avg. Channel Width 7.5' Depth 4' Avg. Water Depth 0.5"

Has stream morphometry been altered? yes Describe : ____

Channelized

Habitat and Pollutants:

Substrate (predominant type (s)): mud

Habitat Complexity (characterize): very low

Bank Erosion: Severe ____ Moderate X Minor ____

Describe: slumping

Silt Deposition: heavy

Pollutants (observation / potential sources): large amounts of trash

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: Commercial

Riparian vegetation: Forest ________ Shrubs ________ Herbs X

Dominant Species: Bamboo

Riparian Buffer Width: 15'

Approximate % Shading by Woody Species: 95%

Notes: ________

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS #: wg61

Observer(s) BG, HS

Stream Flow:
Perennial: X Intermittent ___ Ephemeral ___

Gradient: 1% Classification: R2UB1/2

Channel Characteristics:
Natural X Artificial (man-made) ___ Manipulated (man-altered) ___

Explain: ___

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ___
- [ ] Discontinuous OHWM (explain): ___

Morphology:
Avg. Channel Width 10 Depth 5 Avg. Water Depth <1'

Has stream morphometry been altered? yes Describe : channelized near trail

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): moderate - riffle/pool complexes - undercut banks

Bank Erosion: Severe ___ Moderate ___ Minor X

Describe: ___

Silt Deposition: minor

Pollutants (observation / potential sources): trail runoff

Stormwater Outfalls: N/A

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____

____

Riparian Zone:

Development: residential

Riparian vegetation: Forest X Shrubs X Herbs ____________

Dominant Species: black walnut, bush honeysuckle, Acer rubrum

Riparian Buffer Width: 100'

Approximate % Shading by Woody Species: 50%

Notes: ____

____

Stream Features
Field Sheet

Date: 7-12-02 Project Site: Purple Line WUS #: GP-2

Observer(s) BG + SW

Stream Flow:

Perennial: ______ Intermittent ✓ Ephemeral ______

Gradient: <1% Classification: R4SB5

Channel Characteristics:

Natural ✓ Artificial (man-made) ______ Manipulated (man-altered) ✓

Explain: likely manipulated during golf course construction

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 8' Depth 3.5' Avg. Water Depth <1"

Has stream morphometry been altered? yes Describe: culverted under trail + piped into pond to the south

Habitat and Pollutants:

Substrate (predominant type (s)): organic

Habitat Complexity (characterize): very low, lack of stable habitat

Bank Erosion: Severe ______ Moderate ______ Minor ✓

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): none observed, but nutrient loads probably excessive

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: Columbia Country Club - golf course

Riparian vegetation: Forest ____ Shrubs ____ Herbs ✓

Dominant Species: maintained lawn

Riparian Buffer Width: none

Approximate % Shading by Woody Species: ~5%

Notes: ________

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS #: wg63

Observer(s) BG, HS

Stream Flow:
Perennial: ✓ Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R4SB3/4

Channel Characteristics:
Natural X Artificial (man-made) ____ Manipulated (man-altered) ____

Explain: ____

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:
Avg. Channel Width 3' Depth 4' Avg. Water Depth 2"

Has stream morphometry been altered? Yes Describe: Channelized under bridge.

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): minimal - leaf packs for macros

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: ____

Silt Deposition: moderate

Pollutants (observation / potential sources): parking lot runoff

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed Species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____________

Riparian Zone:

Development: commercial / residential

Riparian vegetation: Forest X Shrubs X Herbs ____________

Dominant Species: Box elder, Bush honeysuckle

Riparian Buffer Width: > 50'

Approximate % Shading by Woody Species: 80%

Notes: ____________

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS #: Wg64

Observer(s) BG, HS

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB3/4

Channel Characteristics:
Natural X Artificial (man-made) ______ Manipulated (man-altered) ______

Explain: ______

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 8' Depth 3' Avg. Water Depth 2"

Has stream morphometry been altered? No Describe : ______

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): minimal - moderate - undercut banks, root wads

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: slumping

Silt Deposition: moderate

Pollutants (observation / potential sources): none

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: Residential

Riparian vegetation: Forest X Shrubs X Herbs ______

Dominant Species: Tulip Poplar, box elder, honey suckle

Riparian Buffer Width: >50'

Approximate % Shading by Woody Species: 80%

Notes: ______

Stream Features
Field Sheet

Date: 7-10-02 Project Site: Purple Line WUS #: GB-6

Observer(s) S. Williamson

Stream Flow:
Perennial: ✓ Intermittent ____ Ephemeral R2UB1

Gradient: 1% Classification: R

Channel Characteristics:
Natural ✓ Artificial (man-made) ____ Manipulated (man-altered) ✓

Explain: straightened under bridge w/ bridge pier in center

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:
Avg. Channel Width 60' Depth 5' Avg. Water Depth 12-24"

Has stream morphometry been altered? yes Describe : straightened

Habitat and Pollutants:
Substrate (predominant type (s)): cobble-gravel

Habitat Complexity (characterize): deep pools, but few areas with stable cover + riffle sequences - average

Bank Erosion: Severe ✓ Moderate ✓ Minor ____

Describe: some areas are severe

Silt Deposition: heavy throughout

Pollutants (observation / potential sources): stormwater runoff, sewer leak likely

Stormwater Outfalls: none observed

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: parkland, hiker/biker trail on LB

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ✓

Dominant Species: tuliptree, greenash, Am. elm, red maple, Am. sycamore

Riparian Buffer Width: ~1000 ft in study area

Approximate % Shading by Woody Species: ~10%

Notes: ______

Wg08

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Montgomery Sampling Date: 1-26-11

Applicant/Owner: MTA State: MD Sampling Point: WTP8-1

Investigator(s): BG, AJ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): <1

Subregion (LRR or MLRA): MLRA 147/148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: 53A - Codorus silt loam NWI classification: PFO1E/F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- X Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0.5	
Water Table Present?	Yes X	No ___	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP81

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	30	Y	FACW
2. Acer negundo	15	Y	FAC
3. Ulmus americana	25	Y	FACW
4.			
5.			
6.			
7.			
8.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Cephalanthus occidentalis	30	Y	OBL
2. Acer negundo	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35	= Total Cover	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia	25	Y	OBL
2. Canna flaccida / cannaceae	45	Y	FACW
3. Polygonum sagittatum	40	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110	= Total Cover	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WTP8-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR4/2	90	7.5YR4/6	10	C	M	SiCl	
6-12	10YR5/2	75	7.5YR4/6	25	C	M	SiCl	
12-	10YR5/1	60	7.5YR4/6	40	C	M	SiCl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

Stream Features
Field Sheet

Date: 7-9-02 Project Site: Purple Line WUS #: GB-9

Observer(s) SW + BG

Stream Flow:
Perennial: ____ Intermittent ✓ Ephemeral ____

Gradient: 1% Classification: R4SB4

Channel Characteristics:
Natural ✓ Artificial (man-made) ____ Manipulated (man-altered) ____

Explain: ____

Channel Has (check all that apply):

- [x] Bed and Banks
- [x] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [x] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:
Avg. Channel Width 8' Depth 4' Avg. Water Depth <1"

Has stream morphometry been altered? unknown Describe : ____

Habitat and Pollutants:
Substrate (predominant type (s)): sand

Habitat Complexity (characterize): poor

Bank Erosion: Severe ____ Moderate ✓ Minor ____

Describe: undercut banks

Silt Deposition: heavy

Pollutants (observation / potential sources): trash

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: rail line/commercial

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ______

Dominant Species: boxelder, Japanese knotweed

Riparian Buffer Width: ~70 ft

Approximate % Shading by Woody Species: 95%

Notes: ______

Sligo Creek

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS # : 003

Observer(s) BG, HS

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB1

Channel Characteristics:
Natural X Artificial (man-made) ______ Manipulated (man-altered) ______

Explain: Channelized through culvert

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 15' Depth 5' Avg. Water Depth 1'

Has stream morphometry been altered? No Describe : ______

Habitat and Pollutants:
Substrate (predominant type (s)): Cobble / gravel

Habitat Complexity (characterize): riffle / run complexes, leaf packets - moderate

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____________

Riparian Zone:

Development: Playground / Roadway

Riparian vegetation: Forest X Shrubs ____________ Herbs ____________

Dominant Species: Black locust, Cherry, red maple, willow oak

Riparian Buffer Width: 10'

Approximate % Shading by Woody Species: 50%

Notes: ____________

Stream Features
Field Sheet

Date: 11-30-11 Project Site: Purple Line WUS # : 005

Observer(s) BG, HS

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB1/2

Channel Characteristics:
Natural X Artificial (man-made) ______ Manipulated (man-altered) ______

Explain: ______

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 10' Depth 3' Avg. Water Depth 4"

Has stream morphometry been altered? Yes Describe : Channelized

Habitat and Pollutants:
Substrate (predominant type (s)): cobble/gravel/sand

Habitat Complexity (characterize): moderate - riffle/run sequence, woody debris, roots

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: few areas of scour

Silt Deposition: minor

Pollutants (observation / potential sources): high % of trash in stream

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________________________________

____

Riparian Zone:

Development: apartment Complexes

Riparian vegetation: Forest X Shrubs ________ Herbs ________

Dominant Species: red maple, tulip poplar, bush honeysuckle

Riparian Buffer Width: 20 – 50'

Approximate % Shading by Woody Species: 85%

Notes: ________________________________

____

NW Branch

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 006

Observer(s) BG, HS

Stream Flow:

Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB2

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: near culvert

Channel Has (check all that apply):

- [ ] Bed and Banks
- [x] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 25' Depth 5' Avg. Water Depth 6"

Has stream morphometry been altered? yes Describe : Channelized near culvert

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (characterize): low to moderate - few deep pools, no clean riffles

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: unvegetated areas

Silt Deposition: heavy near culvert

Pollutants (observation / potential sources): road runoff.

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____________

Riparian Zone:

Development: Fields on both sides, narrow buffer

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: multiflora rose, foxtail, black willow, Sycamore

Riparian Buffer Width: 20'

Approximate % Shading by Woody Species: 40%

Notes: ____________

tib to NW Branch

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 007

Observer(s) BG, HS

Stream Flow:

Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB2

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: channelized its entire length due to culvert.

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width ______ Depth ______ Avg. Water Depth ______

Has stream morphometry been altered? ______ Describe : ______

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (characterize): low - lack of deep pools, no clean riffles

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: erosion concentrated below pipe

Silt Deposition: heavy

Pollutants (observation / potential sources): roadside runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: (L) Bank - archery Course; (R) Bank - MD 193 - narrow buffer

Riparian vegetation: Forest x Shrubs x Herbs x

Dominant Species: ironwood, tulip poplar, red maple, box elder, poison ivy, Japanese brome

Riparian Buffer Width: 20'

Approximate % Shading by Woody Species: 95%

Notes: ________

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 008

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB4

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: channelized

Channel Has (check all that apply):

- [x] Bed and Banks

- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______

- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 3.5' Depth 3' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe : Channelized to culvert

Habitat and Pollutants:

Substrate (predominant type (s)): sand

Habitat Complexity (characterize): low due to shallow flows

Bank Erosion: Severe X Moderate ______ Minor ______

Describe: in lower reaches

Silt Deposition: moderate

Pollutants (observation / potential sources): trash - road runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: L Bank - MD 193, R Bank - Cricket Course

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: green ash, princess tree

Riparian Buffer Width: 40'

Approximate % Shading by Woody Species: 90%

Notes: ________

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS #: 009

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SB3/4

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: Channelized and rip rap at top

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 2' Depth 2' Avg. Water Depth 1"

Has stream morphometry been altered? ______ Describe : ______

see above

Habitat and Pollutants:

Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): very low

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): pond effluent

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ____ Fish Spawn Areas ____

Other Environmentally-Sensitive Species ____ Aquatic/Wildlife Diversity ____

Explain Findings: ____

Riparian Zone:

Development: R cricket course L tributary

Riparian vegetation: Forest x Shrubs x Herbs ____

Dominant Species: Black walnut, sycamore

Riparian Buffer Width: 35'

Approximate % Shading by Woody Species: 95%

Notes: ____

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Montgomery Sampling Date: 11-30-11

Applicant/Owner: MTA State: MD Sampling Point: WTP10-1

Investigator(s): B. Garner H. Spears Section, Township, Range: ______

Landform (hillslope, terrace, etc.): excavated depression Local relief (concave, convex, none): Concave Slope (%): <1%

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Urban land-Russett-Christiana Complex NWI classification: PEM1F/Hx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ______		Is the Sampled Area within a Wetland? Yes X No ______
Hydric Soil Present? Yes X No ______		
Wetland Hydrology Present? Yes X No ______		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ True Aquatic Plants (B14)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres on Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Stunted or Stressed Plants (D1)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ Microtopographic Relief (D4)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 18"

Water Table Present? Yes X No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Created wetland Site

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP10-1

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
		= Total Cover	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia	100	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: WTP10-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	5Y3/1	100						muck
3-10	5Y6/1	85	10YR5/6	15	C	M	SiCl	
10+	5Y6/1	80	10YR5/6	20	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ______

Remarks:

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS #: 011

Observer(s) BG, HS

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: <1 Classification: R4SB3/4

Channel Characteristics:
Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: portions of the stream have been dug out; very straight, buffer disturbance

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 3' Depth 1' Avg. Water Depth 4"

Has stream morphometry been altered? yes Describe : ______

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): very low due to lack of structure

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): Road runoff

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: maintained lawn / parking lot

Riparian vegetation: Forest X Shrubs ✓ Herbs ________

Dominant Species: Sweet gum, elm, greenbriar

Riparian Buffer Width: 5' on both sides

Approximate % Shading by Woody Species: 35%

Notes: ________

tributary to Paint Branch

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS #: 012

Observer(s) BG, HS, AK

Stream Flow:
Perennial: ✓ Intermittent ______ Ephemeral ______ R2UB1/2x (rip rap)

Gradient: 1-5% Classification: ______

Channel Characteristics:
Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: channelized along road

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width upper 4' 10' Depth upper 2' 2.5' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe: Rip-rap placement

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand/rip-rap

Habitat Complexity (characterize): moderate; deep pools, few undercut banks - minnows observed

Bank Erosion: Severe ______ Moderate x Minor ______

Describe: rip rap stabilization evident

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: 3

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: (L) Bank - Paint Branch Pkwy, (R) Forested

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ______

Dominant Species: Sycamore, green ash, box elder, silver maple, spikerush, swamp smartweed

Riparian Buffer Width: >50'

Approximate % Shading by Woody Species: 95%

Notes: ______

Stream Features
Field Sheet

Date: 7-16-12 Project Site: Purple Line WUS # : 015

Observer(s) BG, AT

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2OBx

Channel Characteristics:
Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: Channelized w/ rip-rap

Channel Has (check all that apply):

- [x] Bed and Banks

- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______

- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 5' Depth 1' Avg. Water Depth 2"

Has stream morphometry been altered? yes Describe : rip-rap lined channel

Habitat and Pollutants:
Substrate (predominant type (s)): rip-rap

Habitat Complexity (characterize): very low

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____

____

Riparian Zone:

Development: disturbed due to roadway maintanance

Riparian vegetation: Forest x Shrubs x Herbs x

Dominant Species: princess tree, Norway maple, rubus sp.

____

Riparian Buffer Width: 35'

Approximate % Shading by Woody Species: 95%

Notes: ____

____

Stream Features
Field Sheet

Date: 12/9/14 Project Site: Purple Line WUS #: 016

Observer(s) BG, HS

Stream Flow:

Perennial: ____ Intermittent X Ephemeral ____

Gradient: <1% Classification: R4SB1/2

Channel Characteristics:

Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: Channelized

Channel Has (check all that apply):

- [X] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:

Avg. Channel Width 5' Depth 2' Avg. Water Depth 2"

Has stream morphometry been altered? Yes Describe : Channelized

Habitat and Pollutants:

Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): low due to shallow flows

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: –

Silt Deposition: moderate

Pollutants (observation / potential sources): None

Stormwater Outfalls: None

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____________

Riparian Zone:

Development: none

Riparian vegetation: Forest x Shrubs x Herbs x

Dominant Species: Black willow, elm, red maple

Riparian Buffer Width: >50'

Approximate % Shading by Woody Species: 80%

Notes: ____________

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 18

Observer(s) BO, HS

Stream Flow:

Perennial: X Intermittent ____ Ephemeral ____

Gradient: <1% Classification: R2UB1/2

Channel Characteristics:

Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: Channelized

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:

Avg. Channel Width 55' Depth 7' Avg. Water Depth 12"

Has stream morphometry been altered? yes Describe : Channelized

Habitat and Pollutants:

Substrate (predominant type (s)): gravel / sand

Habitat Complexity (characterize): moderate - riffle / pool sequence

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: ____

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: (L) Bank - trail, (R) Bank - overgrown field

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: poison ivy, sycamore, red maple, deertongue witchgrass

Riparian Buffer Width: >50'

Approximate % Shading by Woody Species: 4%

Notes: ______

W019

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: College Park Sampling Date: 12-5-11

Applicant/Owner: MTA State: MD Sampling Point: WTP19-1

Investigator(s): B. Garner H. Spears Section, Township, Range: ______

Landform (hillslope, terrace, etc.): SWM pond Local relief (concave, convex, none): concave Slope (%): ______

Subregion (LRR or MLRA): MLRA-148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus-Hatboro-Urban land complex NWI classification: POW w/ PEM1Hx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ______ Hydric Soil Present? Yes X No ______ Wetland Hydrology Present? Yes X No ______	Is the Sampled Area within a Wetland? Yes X No ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ Marl Deposits (B15) **(LRR U)**
- X Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): .5

Water Table Present? Yes X No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): ______

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

emergent fringe around SWM pond

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WTP 191

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia	98	Y	OBL
2. Juncus effusus	20		FACW
3. Lonicera japonica	15		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	133 = Total Cover		
50% of total cover: 66	20% of total cover: 26		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ______

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP 19-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5 4 3/1	100	—				Sil	
3+	fill material.							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ____ No ✓

Remarks:

disturbed soils

Stream Features
Field Sheet

Date: 5/24/13 Project Site: Purple Line/Riverdale WUS #: 23

Observer(s) SS, MD

Stream Flow:
Perennial: ______ Intermittent ✓ Ephemeral ______

Gradient: ______ Classification: R4SB2/4

Channel Characteristics:
Natural ______ Artificial (man-made) ✓ Manipulated (man-altered) ______

Explain: ______

Channel Has (check all that apply):
- [x] Bed and Banks
- [x] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [x] vegetation matted down, bent, or absent
  - [x] leaf litter disturbed or washed away
  - [x] sediment deposition
  - [ ] water staining
  - [x] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [x] sediment sorting
  - [x] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 5' Depth 6" Avg. Water Depth 3"

Has stream morphometry been altered? yes Describe: concrete culvert inflow

Habitat and Pollutants:
Substrate (predominant type (s)): sand, rip-rap

Habitat Complexity (characterize): some riffles and pools

Bank Erosion: Severe ______ Moderate ______ Minor ✓

Describe: <5% actively eroding

Silt Deposition: yes, new bar formation in channel

Pollutants (observation / potential sources): highway, large amounts of trash

Stormwater Outfalls: yes, concrete culvert, fed by SWP

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: highway, housing complex immediatley adjacent to riparian buffer

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ✓

Dominant Species: Salix nigra, Carex lurida, Lonicera Maackii, Lonicera japonica, Microstegium Vimineum

Riparian Buffer Width: facing downstream: right-30', left-60'

Approximate % Shading by Woody Species: 65%

Notes: ______

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line / Riverdale Rd. City/County: Riverdale Sampling Date: 5/24/13

Applicant/Owner: MTA State: MD Sampling Point: W24-WTP1

Investigator(s): SS, MD Section, Township, Range: PG County

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): ≤1%

Subregion (LRR or MLRA): MLRA-149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Christiana-Downer-Urban land complex NWI classification: PFO-1A/C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks: Plot within stormwater management basin. Soils have been disturbed in the past but have since naturalized and manifest indicators of hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ✓ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ~1"

Water Table Present? Yes ✓ No ___ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Photo #6 Looking at wetland

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W24-WTP1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	50	✓	OBL
2. Platanus occidentalis	5		FACW
3. Fraxinus pennsylvanica	40	✓	FACW
4. Catalpa speciosa	8		FACU
5. Liquidambar styraciflua	5		FAC
6. Populus deltoides	8		FAC
7.			
8.			
	116 = Total Cover		
50% of total cover: 58	20% of total cover: 23.2		

Sapling/Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	15	✓	FAC
2. Liquidambar styraciflua	10	✓	FAC
3. Ulmus americana	3		FAC
4. Acer negundo	3		FAC
5. Lonicera maackii	6		UPL
6. Fraxinus pennsylvanica	3		FACW
7.			
8.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carex lurida	30	✓	OBL
2. Microstegium vimineum	35	✓	FAC
3. Apocynum cannabinum	15		FACU
4. Rumex crispus	3		FAC
5. Festuca pratensis	15		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	98 = Total Cover		
50% of total cover: 49	20% of total cover: 19.6		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	20	✓	FAC
2. Lonicera japonica	5		FAC
3. Parthenocissus quinquefolia	20	✓	FAC
4.			
5.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W24-UTP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-½"	2.5Y 2/1	100	—	—	—	—	SL	mucky mineral layer
½-10"	10YR 2/1	100	—	—	—	—	SL	
10"-15"+	N 5/0	95	10YR 4/6	5	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.   [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
✓ Loamy Mucky Mineral (F1) **(LRR O)**
X Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line/Riverdale Rd City/County: Riverdale / PG Sampling Date: 5/24/13

Applicant/Owner: MTA State: MD Sampling Point: W24-WTP2

Investigator(s): SS, MD Section, Township, Range: ______

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <1%

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Christiana-Downer-Urbanland complex NWI classification: PEM1A/C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ___		Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present? Yes ✓ No ___		
Wetland Hydrology Present? Yes ✓ No ___		

Remarks:
Photo #8. Wetland is within stormwater management basin and is dominated by Phragmites australis.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ______

Water Table Present? Yes ___ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0"

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W3H-WTP2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4. NONE			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: ______ 20% of total cover: ______

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4. NONE			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: ______ 20% of total cover: ______

Herb Stratum (Plot size: ______)			
1. Phragmites australis	100	✓	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3. NONE			
4.			
5.			
	= Total Cover		

50% of total cover: ______ 20% of total cover: ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W24-WTP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 2/1	100	—	—	—	—	SL	
10"-15"	N 5/0	95	10YR 4/6	5	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line / Riverdale Rd City/County: Riverdale/PG Sampling Date: 5/24/13

Applicant/Owner: MTA State: MD Sampling Point: W24-UTP-1

Investigator(s): SS MD Section, Township, Range: ______

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Christiana-Downer-Urban land complex NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✓, or Hydrology ___ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:
- Area significantly disturbed + contains fill material due to SWM basin construction.
- Photo #7

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): None
Water Table Present?	Yes ___	No X	Depth (inches): > 8"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): > 8"

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W24-UTP1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	10	✓	FACW
2. Juglans nigra	6		FACU
3. Morus alba	10	✓	FACU
4. Ulmus americana	5		FAC
5. Salix nigra	6		OBL
6. Populus deltoides	20	✓	FAC
7. Quercus palustris	6		FACW
8.			
	63 = Total Cover		
50% of total cover: 31.5	20% of total cover: 12.6		

Sapling/Shrub Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera maackii	10	✓	UPL
2. Morus alba	5		FACU
3. Pyrus calleryana	3		UPL
4. Rosa multiflora	3		FACU
5. Liquidambar styraciflua	8	✓	FAC
6. Acer negundo	10	✓	FAC
7.			
8.			
	39 = Total Cover		
50% of total cover: 19.5	20% of total cover: 7.8		

Herb Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Festuca pratensis	6	✓	FACU
2. Rumex crispus	3	✓	FAC
3. Juncus effusus	4	✓	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	13 = Total Cover		
50% of total cover: 6.5	20% of total cover: 2.6		

Woody Vine Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Parthenocissus quinquefolia	60	✓	FAC
2. Toxicodendron radicans	40	✓	FAC
3. Lonicera japonica	70	✓	FAC
4.			
5.			
	170 = Total Cover		
50% of total cover: 85	20% of total cover: 34		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ✓ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W24-UTP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8"*	10YR 4/4	100					SL	w/fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: fill

Depth (inches): 8"

Hydric Soil Present? Yes ______ No ✓

Remarks:

*: augur refused by fill at 8"

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: PG Sampling Date: 12-5-11

Applicant/Owner: MTA State: MD Sampling Point: WP25-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): SWM pond Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Udorthents, 0-65% slopes NWI classification: POW / PSS1E/4

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (**LRR U**)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1'-unknown

Water Table Present? Yes X No ___ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ______

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP 25-1

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	60	Y	FACW
2. Cephalanthus occidentalis	25	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Leerzia oryzoides	25	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	~~28~~ 25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP 25-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR4/3	100	—	—	—	—	fsl	
2-8	10YR4/1	100	—	—	—	—	sl	
8+	10YR4/3	100	—	—	—	—	scl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No ✓

Remarks:

disturbed soils
fill material

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 30

Observer(s) BG, HS

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: 2% Classification: R4SB2x-rip-rap

Channel Characteristics:
Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: rip rap

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 4' Depth 1' Avg. Water Depth no water

Has stream morphometry been altered? yes Describe :
Straightened, filled w/rip-rap

Habitat and Pollutants:
Substrate (predominant type (s)): rip rap / sand

Habitat Complexity (characterize): low; rip rap, low flows

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: rip rap

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: —

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: none

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: red maple, tulip poplar, black locust, black willow

Riparian Buffer Width: 35'

Approximate % Shading by Woody Species: 30%

Notes: ______

Stream Features
Field Sheet

Date: 12/9/11 Project Site: Purple Line WUS # : 032

Observer(s) BG, HS

Stream Flow:
Perennial: ✓ Intermittent ____ Ephemeral ____

Gradient: 2% Classification: R4SB2 & rip-rap

Channel Characteristics:
Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: rip rap

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:
Avg. Channel Width 4' Depth 1' Avg. Water Depth No water

Has stream morphometry been altered? Yes Describe : straightened w/ rip-rap placement

Habitat and Pollutants:
Substrate (predominant type (s)): rip rap w/ sand

Habitat Complexity (characterize): low - low flows, lack of habitat

Bank Erosion: Severe ____ Moderate ____ Minor ✓

Describe: ____

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: None

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: narrow forested buffer and road

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Box elder, sycamore, maple, poison ivy, multiflora rose

Riparian Buffer Width: 20'

Approximate % Shading by Woody Species: 90%

Notes: flows out and into culvert that connects to WUS 29

W33

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: PG Sampling Date: 12/5/1

Applicant/Owner: MTA State: MD Sampling Point: WTP33-1

Investigator(s): BO, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): SWM pond Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Udorthents, 0-65% slopes NWI classification: PEM1Ex

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (**LRR U**)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (**LRR T, U**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1'-unknown

Water Table Present? Yes X No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

PEM serves as SWM pond.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WP 33-1

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Sapling/Shrub Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Herb Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia	100	Y	OBL
2. Juncus effusus	8		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	108 = Total Cover		
50% of total cover: 104	20% of total cover: 22		

Woody Vine Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP33-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR4/2	100					SiCl	Rootlets
4-	2.5Y5/2	80	7.5YR4/6	20	C	M	fSC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS # : 34

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: 1% Classification: R4SB2x

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: channelized - rip-rap in stream

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 4.5' Depth 3' Avg. Water Depth 3"

Has stream morphometry been altered? yes Describe : straightened

Habitat and Pollutants:

Substrate (predominant type (s)): sand | rip-rap

Habitat Complexity (characterize): low - lack of stable habitat

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: unvegetated banks

Silt Deposition: moderate

Pollutants (observation / potential sources): road runoff - lots of trash in channel

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: narrow buffer w/ L bank-road, R bank residential

Riparian vegetation: Forest X Shrubs X Herbs ________

Dominant Species: sycamore, maple, sweet gum, black locust, catalpa

Riparian Buffer Width: 15'

Approximate % Shading by Woody Species: 85%

Notes: ________

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: Montgomery Sampling Date: 12-9-11

Applicant/Owner: MTA State: MD Sampling Point: WTP 35-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 1

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Issue-Urban land complex, occ. flooded NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches): 4	
Water Table Present?	Yes ___ No X	Depth (inches): ___	
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 6	Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Floodplain wetland

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP35-1

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	25	Y	FACW
2. Catalpa speciosa	25	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Sapling/Shrub Stratum (Plot size: ______)			
1. Acer negundo	15	Y	FAC
2. Salix nigra	15	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: ______)			
1. Phalaris arundinacea	30	Y	FACW
2. Boehmeria cylindrica	5		FACW
3. Polygonum perfoliatum	5		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		
50% of total cover: ______	20% of total cover: ______		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ______

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP35-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR4/2	100	—	—	—	—	Sil	
2-8	10YR4/2	70	7.5YR4/6	30	C	M	Sil	
8+	10YR4/2	65	7.5YR4/6	35	C	M	Sicl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) (**LRR P, T, U**)
- ___ 5 cm Mucky Mineral (A7) (**LRR P, T, U**)
- ___ Muck Presence (A8) (**LRR U**)
- ___ 1 cm Muck (A9) (**LRR P, T**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A**)
- ___ Sandy Mucky Mineral (S1) (**LRR O, S**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR P, S, T, U**)
- ___ Polyvalue Below Surface (S8) (**LRR S, T, U**)
- ___ Thin Dark Surface (S9) (**LRR S, T, U**)
- ___ Loamy Mucky Mineral (F1) (**LRR O**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR U**)
- ___ Depleted Ochric (F11) (**MLRA 151**)
- ___ Iron-Manganese Masses (F12) (**LRR O, P, T**)
- ___ Umbric Surface (F13) (**LRR P, T, U**)
- ___ Delta Ochric (F17) (**MLRA 151**)
- ___ Reduced Vertic (F18) (**MLRA 150A, 150B**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149A**)
- ___ Anomalous Bright Loamy Soils (F20) (**MLRA 149A, 153C, 153D**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR O**)
- ___ 2 cm Muck (A10) (**LRR S**)
- ___ Reduced Vertic (F18) (**outside MLRA 150A,B**)
- ___ Piedmont Floodplain Soils (F19) (**LRR P, S, T**)
- ___ Anomalous Bright Loamy Soils (F20) (**MLRA 153B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS #: 36

Observer(s) BG, HS

Stream Flow:

Perennial: ________ Intermittent X ________ Ephemeral ________

Gradient: ________ Classification: R4SB2x

Channel Characteristics:

Natural ________ Artificial (man-made) ________ Manipulated (man-altered) X

Explain: straightened, filled w/rip-rap

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ________
- [ ] Discontinuous OHWM (explain): ________

Morphology:

Avg. Channel Width 3.5' Depth 1.5' Avg. Water Depth 1"

Has stream morphometry been altered? yes Describe : channelized

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap

Habitat Complexity (characterize): low

Bank Erosion: Severe ________ Moderate ________ Minor X

Describe: ________

Silt Deposition: minor

Pollutants (observation / potential sources): Road runoff

Stormwater Outfalls: None

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: Shrubs / maintained grass

Riparian vegetation: Forest ________ Shrubs X Herbs X

Dominant Species: black willow, Phragmites

Riparian Buffer Width: 15'

Approximate % Shading by Woody Species: 50%

Notes: ________

W37

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: PG Sampling Date: 12/5/11

Applicant/Owner: MTA State: MD Sampling Point: WTP 37-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): MLRA-149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ISSue-Urban land complex, occ. flooded NWI classification: PEM1G

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____	Is the Sampled Area within a Wetland? Yes X No ____	
Hydric Soil Present? Yes X No ____		
Wetland Hydrology Present? Yes X No ____		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 6

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP37-1

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Phragmites australis	95	Y	FACW
2. Solidago sp.	2		n/a
3. Juncus effusus	5		FACW
4. Rubus allegheniensis	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	102	= Total Cover	
50% of total cover:	20% of total cover:		

Woody Vine Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. Lonicera japonica	10	Y	FAC
3.			
4.			
5.			
	10	= Total Cover	
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	____	x 1 = ____
FACW species	____	x 2 = ____
FAC species	____	x 3 = ____
FACU species	____	x 4 = ____
UPL species	____	x 5 = ____
Column Totals:	____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP 37-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 3/1	100					fscl	high % of organics
4-12+	2.5Y4/2	80	10YR 5/6	20	C	m	fsC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

Stream Features
Field Sheet

Date: 7-31-12 Project Site: Purple Line WUS #: 038

Observer(s) BG, AT

Stream Flow:
Perennial: ____ Intermittent X Ephemeral ____

Gradient: 21% Classification: R4SB4x

Channel Characteristics:
Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: ____

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:
Avg. Channel Width 4' Depth 1' Avg. Water Depth 2"

Has stream morphometry been altered? ____ Describe: ____

Habitat and Pollutants:
Substrate (predominant type (s)): sand / rip-rap

Habitat Complexity (characterize): very low - no riffle / pool sequences

Bank Erosion: Severe ____ Moderate ____ Minor X

Describe: —

Silt Deposition: moderate

Pollutants (observation / potential sources): trash

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

______

Riparian Zone:

Development: (L) Bank- Road (R) - Residential

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Catalpa, Cherry, tulip poplar, poison ivy, grape vine

Riparian Buffer Width: 35'

Approximate % Shading by Woody Species: 95%

Notes: ______

______

Stream Features
Field Sheet

Date: 7-18-12 Project Site: Purple Line WUS #: 039

Observer(s) BG/MAT

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB4x

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: Channelized along road

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 4.5' Depth 2' Avg. Water Depth 1"

Has stream morphometry been altered? Yes Describe : Channelized along road

Habitat and Pollutants:

Substrate (predominant type (s)): Sand | rip-rap

Habitat Complexity (characterize): low - shallow flows - No stable habitat

Bank Erosion: Severe ______ Moderate X Minor ______

Describe: eroding along sound wall - undermining

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff, trash

Stormwater Outfalls: 2

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ____________________

____

Riparian Zone:

Development: (L) Bank - Ellin Road (R) bank Forest

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Elm, arrow-wood, red maple, poison ivy, Japanese honeysuckle

Riparian Buffer Width: 40'

Approximate % Shading by Woody Species: 95%

Notes: ____________________

____

Stream Features
Field Sheet

Date: 8-15-07 Project Site: Purple Line WUS #: WUS 048

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent ✓ Ephemeral ______

Gradient: 1% Classification: R4SB3/4x

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) ✓

Explain: upper portions were straightened + rip-rapped

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 14' Depth 9' Avg. Water Depth <1"

Has stream morphometry been altered? yes Describe: see above

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap upstream, sand-gravel downstream

Habitat Complexity (characterize): low, shallow flows, few riffles

Bank Erosion: Severe ✓ Moderate ______ Minor ______

Describe: many unvegetated, failing banks in upper portions

Silt Deposition: moderate

Pollutants (observation / potential sources): none apparent

Stormwater Outfalls: 1 (US)

Biological Habitat For (check all that apply):

Federally Listed species ____________ Fish Spawn Areas ____________

Other Environmentally-Sensitive Species ____________ Aquatic/Wildlife Diversity ____________

Explain Findings: ____________

Riparian Zone:

Development: mid-successional forest

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ✓

Dominant Species: Sweetgum, red maple, mountain laurel, poison ivy

Riparian Buffer Width: >100 ft - both banks

Approximate % Shading by Woody Species: 90%

Notes: ____________

Stream Features
Field Sheet

Date: 4-21-11 Project Site: Purple Line WUS #: 057

Observer(s) BG, HS

Stream Flow:
Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB4x

Channel Characteristics:
Natural ______ Artificial (man-made) X Manipulated (man-altered) ______

Explain: rip-rap channel between pipes

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 4.5' Depth 4' Avg. Water Depth 6"

Has stream morphometry been altered? yes Describe : straightenend and rip rap

Habitat and Pollutants:
Substrate (predominant type (s)): rip-rap|Sand
Habitat Complexity (characterize): none

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________

Riparian Zone:

Development: Maintained lawn

Riparian vegetation: Forest ________ Shrubs ________ Herbs X

Dominant Species: grass

Riparian Buffer Width: Ø

Approximate % Shading by Woody Species: Ø

Notes: ________

Stream Features
Field Sheet

Date: 4-21-11 Project Site: Purple Line WUS # : 58

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent ______ Ephemeral X

Gradient: ______ Classification: ______

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: ephemeral condition

Channel Has (check all that apply):

- [x] Bed and Banks
- [x] OHWM
  - [x] clear, natural line impressed on the bank
  - [x] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [x] leaf litter disturbed or washed away
  - [x] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [x] the presence of wrack line
  - [x] sediment sorting
  - [x] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 5' Depth 3' Avg. Water Depth 6"

Has stream morphometry been altered? Yes Describe : straightened along MD 193

Habitat and Pollutants:

Substrate (predominant type (s)): Sand

Habitat Complexity (characterize): low

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: minor

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: West of road - Forest/Road
East of road - maintained lawn

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Box elder, silver maple, Japanese knotweed

Riparian Buffer Width: 750'

Approximate % Shading by Woody Species: 60%

Notes: unclear whether stream is backwatered at pipe or flows north under road - may not go anywhere.

WS9

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Montgomery Sampling Date: 4/21/11

Applicant/Owner: MTA State: MD Sampling Point: WTP59-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Seep Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus + Hatboro soils, freq. flooded NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland?	Yes X No ___
Hydric Soil Present?	Yes X No ___		
Wetland Hydrology Present?	Yes X No ___		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches): 0-1	
Water Table Present?	Yes X No ___	Depth (inches): 0	
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 0	**Wetland Hydrology Present?** Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP59-1

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanicum	65	Y	FACW
2. Populus deltoides	15		FAC
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: ______)			
1. Liquidambar styraciflua	2		FAC
2. Acer negundo	40	Y	FAC
3. Rosa multiflora	40	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	62	= Total Cover	
Herb Stratum (Plot size: ______)			
1. Ranunculus ficaria	40	Y	NI
2. Juncus effusus	5		FACW
3. Geum canadense	5		FACU
4. Thlaspi arvense	8		NI
5. Phalaris arundinacea	10		FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	68	= Total Cover	
Woody Vine Stratum (Plot size: ______)			
1. Toxicodendron radicans	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ______

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WTP 59-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR4/1	95	7.5YR3/4	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) (**LRR N**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- ___ Thin Dark Surface (S9) (**MLRA 147, 148**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- ___ Umbric Surface (F13) (**MLRA 136, 122**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 148**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**MLRA 147**)
- ___ Coast Prairie Redox (A16) (**MLRA 147, 148**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

WL60

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: PG Sampling Date: 4-21-11

Applicant/Owner: MTA State: MD Sampling Point: WTP 60-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus + Hatboro, Codorus-Hatboro-Urban complex, Christiana-Downer-Urban complex NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches): 1
Water Table Present?	Yes ___ No X	Depth (inches): —
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 6

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTPK0-1

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	50	Y	FAC
2. Fraxinus pennsylvanicum	70	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	120	= Total Cover	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	30	Y	FAC
2. Ligustrum sinense	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60	= Total Cover	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Allium canadense	25	Y	FACU
2. Lonicera japonica	5		FAC
3. Rosa multiflora	10	Y	FACU
4. Prunus serotina	5		FACU
5. Geum canadense	5		FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	8	Y	FAC
2. Parthenocissus quinquefolia	8	Y	FACU
3.			
4.			
5.			
6.			
	16	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	70	x 2 = 140
FAC species	93	x 3 = 279
FACU species	83	x 4 = 332
UPL species		x 5 =
Column Totals:	246 (A)	751 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WTP60-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR4/1	95	7.5YR4/6	5	C	M	SiCl	
6+	7.5YR4/6	2	disturbed	fill	material		Cl	Manganese Concretions
	10YR4/6	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5)
- __ 2 cm Muck (A10) (**LRR N**)
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Dark Surface (S7)
- __ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- __ Thin Dark Surface (S9) (**MLRA 147, 148**)
- __ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- __ Umbric Surface (F13) (**MLRA 136, 122**)
- __ Piedmont Floodplain Soils (F19) (**MLRA 148**)

Indicators for Problematic Hydric Soils[3]:

- __ 2 cm Muck (A10) (**MLRA 147**)
- __ Coast Prairie Redox (A16) (**MLRA 147, 148**)
- __ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes X No ___

Remarks:

Stream Features
Field Sheet

Date: 4-26-11 Project Site: Purple Line WUS #: 62

Observer(s) BG, LTS

Stream Flow:
Perennial: ______ Intermittent ______ Ephemeral X

Gradient: ______ Classification: ______

Channel Characteristics:
Natural X Artificial (man-made) ______ Manipulated (man-altered) ______

Explain: flows from pipe under MD 410

Channel Has (check all that apply):

- [ ] Bed and Banks
- [x] OHWM
  - [x] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [x] leaf litter disturbed or washed away
  - [x] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [x] destruction of terrestrial vegetation
  - [x] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 2' Depth 2' Avg. Water Depth none

Has stream morphometry been altered? no Describe : ______

Habitat and Pollutants:
Substrate (predominant type (s)): Sand/gravel

Habitat Complexity (characterize): none

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: —

Pollutants (observation / potential sources): road runoff; high % of trash

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: Road - Industrial Complex - narrow buffer

Riparian vegetation: Forest ______ Shrubs x Herbs ______

Dominant Species: ROMU, Am. elm, Silver maple, honeysuckle

Riparian Buffer Width: 20' on either side

Approximate % Shading by Woody Species: 75%

Notes: ______

Stream Features
Field Sheet

Date: 4-24-11 Project Site: Purple Line WUS #: 63

Observer(s) BG, HS

Stream Flow:

Perennial: ______ Intermittent X Ephemeral ______

Gradient: ______ Classification: R4SB3/4x

Channel Characteristics:

Natural ______ Artificial (man-made) ______ Manipulated (man-altered) X

Explain: rip-rap placed within channel

Channel Has (check all that apply):

[X] Bed and Banks

[ ] OHWM

- [ ] clear, natural line impressed on the bank
- [ ] changes in character of soil
- [ ] shelving
- [ ] vegetation matted down, bent, or absent
- [ ] leaf litter disturbed or washed away
- [ ] sediment deposition
- [ ] water staining
- [ ] the presence of litter and debris
- [ ] destruction of terrestrial vegetation
- [ ] thre presence of wrack line
- [ ] sediment sorting
- [ ] scour
- [ ] multiple observed or predicted flow events
- [ ] abrupt change in plant community
- [ ] other (list): ______

[ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 2 Depth 2 Avg. Water Depth <0.4'

Has stream morphometry been altered? No Describe : ______

Habitat and Pollutants:

Substrate (predominant type (s)): rip rap / sand

Habitat Complexity (characterize): none

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: —

Silt Deposition: heavy

Pollutants (observation / potential sources): road runoff

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ______ Fish Spawn Areas ______

Other Environmentally-Sensitive Species ______ Aquatic/Wildlife Diversity ______

Explain Findings: ______

Riparian Zone:

Development: none

Riparian vegetation: Forest x Shrubs x Herbs x

Dominant Species: LITU, LIST, PIVI, TORA

Riparian Buffer Width: 750'

Approximate % Shading by Woody Species: 100%

Notes: ______

Stream Features
Field Sheet

Date: 4-24-11 Project Site: Purple Line WUS # : 64

Observer(s) BG, HS

Stream Flow:
Perennial: ________ Intermittent X Ephemeral ________

Gradient: ________ Classification: R4SB3/4x

Channel Characteristics:
Natural ________ Artificial (man-made) ________ Manipulated (man-altered) X

Explain: rip-rap placed within channel

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ________
- [ ] Discontinuous OHWM (explain): ________

Morphology:
Avg. Channel Width 2 Depth 2 Avg. Water Depth <1"

Has stream morphometry been altered? No Describe : ________

Habitat and Pollutants:
Substrate (predominant type (s)): Sand

Habitat Complexity (characterize): none

Bank Erosion: Severe ________ Moderate ________ Minor X

Describe: ________

Silt Deposition: minor

Pollutants (observation / potential sources): none

Stormwater Outfalls: none

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________________________________

Riparian Zone:

Development: none

Riparian vegetation: Forest ✓ Shrubs ✓ Herbs ✓

Dominant Species: TORA, LITU, LIST

Riparian Buffer Width: >50' on R bank; Road on left

Approximate % Shading by Woody Species: 50%

Notes: ________________________________

W65

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Montgomery Sampling Date: 12/9/11

Applicant/Owner: MTA State: — Sampling Point: WTP 65-1

Investigator(s): BG, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Floodplain seep Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Glenelg-Urban land, Codorus silt loam 0-3% slopes NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ______	Is the Sampled Area within a Wetland? Yes X No ______
Hydric Soil Present?	Yes X No ______	
Wetland Hydrology Present?	Yes X No ______	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- __ High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ True Aquatic Plants (B14)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres on Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Stunted or Stressed Plants (D1)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ Microtopographic Relief (D4)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ______ Depth (inches): 1

Water Table Present? Yes ______ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ______ Depth (inches): 0

Wetland Hydrology Present? Yes X No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP651

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	40	Y	FAC
2. Fraxinus pennsylvanica	60	Y	FACW
3. Ulmus americana	25	Y	FACW
4.			
5.			
6.			
7.			
8.			
	125	= Total Cover	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera tatarica	50	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50	= Total Cover	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ranunculus ficaria	20	Y	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	______	x 1 =	______
FACW species	______	x 2 =	______
FAC species	______	x 3 =	______
FACU species	______	x 4 =	______
UPL species	______	x 5 =	______
Column Totals:	______ (A)		______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: WTP65-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12+	10YR4/2	80	7.5YR4/6	20	C	M	SiCl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

unable to touch soils due to sewage overflow. Color is approximated.

Stream Features
Field Sheet

Date: 12-9-11 Project Site: Purple Line WUS #: 66

Observer(s) BG, HS

Stream Flow:
Perennial: X Intermittent ______ Ephemeral ______

Gradient: <1% Classification: R2UB1/2

Channel Characteristics:
Natural X Artificial (man-made) ______ Manipulated (man-altered) ______

Explain: ______

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:
Avg. Channel Width 10' Depth 4' Avg. Water Depth 6".

Has stream morphometry been altered? yes Describe: near culvert, rip-rap has been placed w/in bank

Habitat and Pollutants:
Substrate (predominant type (s)): gravel/sand

Habitat Complexity (characterize): moderate - deep pools, riffle/run complex

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: ______

Silt Deposition: minor

Pollutants (observation / potential sources): CSX track runoff

Stormwater Outfalls: Ø

Biological Habitat For (check all that apply):

Federally Listed species ___________ Fish Spawn Areas ___________

Other Environmentally-Sensitive Species ___________ Aquatic/Wildlife Diversity ___________

Explain Findings: ___________

Riparian Zone:

Development: Apartment complexes

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: Green ash, tulip poplar, red maple, Bush honeysuckle, English ivy

Riparian Buffer Width: 20'

Approximate % Shading by Woody Species: 80%

Notes: ___________

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region W67

Project/Site: Purple Line City/County: PG Sampling Date: 1-26-12

Applicant/Owner: MTA State: MD Sampling Point: WTP-67-1

Investigator(s): BU, AT Section, Township, Range: ______

Landform (hillslope, terrace, etc.): SWM pond Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Issue Urban land complex / Christiana-Downer Urban Complex NWI classification: POW w/ PEM1F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____	Is the Sampled Area within a Wetland?	Yes X No ____
Hydric Soil Present? Yes X No ____		
Wetland Hydrology Present? Yes X No ____		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ Marl Deposits (B15) (LRR U)
- __ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): Unknown

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SWM pond w/ PEM fringe

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP67-1

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover: ___	20% of total cover: ___		

Sapling/Shrub Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover: ___	20% of total cover: ___		

Herb Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1. Verbena hastata	3		FACW
2. Ludwigia alternifolia	35	Y	FACW
3. Scirpus cyperinus	5		FACW
4. Juncus effusus	50	Y	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	93 = Total Cover		
50% of total cover: 46.5	20% of total cover: 19		

Woody Vine Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover: ___	20% of total cover: ___		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP 67-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR5/2	95	7.5YR4/6	5	C	PL	C	
10-14+	10YR5/2	90	7.5YR5/6	10	C	M	fsc	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes X No ______

Remarks:

Stream Features
Field Sheet

Date: 3-13-2012 Project Site: Purple line WUS #: 68 Flags WUS68-01-714 WUS68-01A-714A

Observer(s) A. Tatone, O. Rodgers

Stream Flow:

Perennial: ____ Intermittent X Ephemeral ____

Gradient: 3-5% Classification: R4SB sand/gravel

Channel Characteristics:

Natural ____ Artificial (man-made) ____ Manipulated (man-altered) X

Explain: Both banks have armoring in places, lots of pipes, & a riser @ bottom

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ____
- [ ] Discontinuous OHWM (explain): ____

Morphology:

Avg. Channel Width 5' Depth 1' Avg. Water Depth 1"

Has stream morphometry been altered? Yes Describe: Riser @ bottom no access to floodplains

Habitat and Pollutants:

Substrate (predominant type (s)): sand/gravel

Habitat Complexity (characterize): very low, low flashy flow

Bank Erosion: Severe ____ Moderate X Minor ____

Describe: major erosion

Silt Deposition: minor

Pollutants (observation/ potential sources): pipe with continuous flow, white precipitate forming, terrible odor

Stormwater Outfalls: 3

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: College Park/PG Sampling Date: 3/13/12

Applicant/Owner: MTA State: ______ Sampling Point: WTP-69-1

Investigator(s): DR, AT, MN Section, Township, Range: ______

Landform (hillslope, terrace, etc.): shallow swale Local relief (concave, convex, none): Concave Slope (%): ______

Subregion (LRR or MLRA): MLRA-149a Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus & Hatboro soils, freq. flooded NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ✓
Hydric Soil Present?	Yes ✓	No ______
Wetland Hydrology Present?	Yes ✓	No ______

Is the Sampled Area within a Wetland? Yes ✓ No ______

Remarks:
Vegetation routinely mowed, ruts in wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present?	Yes ______	No ✓	Depth (inches): ______
Water Table Present?	Yes ______	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ______	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
receives runoff from parking lot, which collects over tight soils

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WTP-69

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		
Sapling/Shrub Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		
Herb Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		
Woody Vine Stratum (Plot size: ______)			
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		
50% of total cover: ______	20% of total cover: ______		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? unknown Yes ______ No ______

Remarks: (If observed, list morphological adaptations below).

vegetation not identifiable due to mowing

SOIL

Sampling Point: WTP-69

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/2	90	7.5YR4/6	10	C	M	sicl	
4-6	2.5Y5/6		—				c	
6-12+	10YR5/6		—				LS	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ___

Remarks:

Stream Features
Field Sheet

Date: 3-13-2012 Project Site: purple line WUS #: 71

Observer(s) A. Tatone, D. Rodgers

Stream Flow:

Perennial: ______ Intermittent ______ Ephemeral X

Gradient: 7 8 b Classification: ephemeral rip-rap/sand

Channel Characteristics:

Natural ______ Artificial (man-made) X Manipulated (man-altered) ______

Explain: drainage alongside road

Channel Has (check all that apply):

- [x] Bed and Banks
- [ ] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [ ] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [ ] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] thre presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [ ] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 4' Depth 2' Avg. Water Depth 1"

Has stream morphometry been altered? Yes Describe: rip-rap

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap / sand

Habitat Complexity (characterize): N/A

Bank Erosion: Severe ______ Moderate ______ Minor X

Describe: None

Silt Deposition: Moderate sand on top of rip-rap/trash

Pollutants (observation / potential sources): road runoff, trash

Stormwater Outfalls: 1

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: None

Riparian Zone:

Development: Road Right bank, Forest left bank

Riparian vegetation: Forest X Shrubs X Herbs X

Dominant Species: LIST, PLOC, LOSA, bittersweet, ALRU

Riparian Buffer Width: ________

Approximate % Shading by Woody Species: 55%

Notes: Steep rip-rap channel receives flow from wetland 7Z & outfal @ top

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple line City/County: Prince George's Sampling Date: 3-13-2012

Applicant/Owner: MTA State: MD Sampling Point: WTP-72

Investigator(s): A. Tatone, D. Rodgers Section, Township, Range: ______

Landform (hillslope, terrace, etc.): slope seep Local relief (concave, convex, none): Convex Slope (%): >10%

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Christiana-Downer-Urban land complex NWI classification: PFO1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___		Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present? Yes X No ___		
Wetland Hydrology Present? Yes X No ___		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- X Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes X No ___ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

clayey soils restrict groundwater movement leading to shallow water table

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WTP-72

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	5		FAC
2. Liquidambar styraciflua	8	Y	FAC
3. Catalpa speciosa	15	Y	FAC
4.			
5.			
6.			
7.			
8.			
	28 = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	25	Y	FAC
2. Liquidambar styraciflua	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	55 = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carex sp	20	Y	n/a
2. Dichanthelium acuminatum	10	Y	FAC
3. Ludwigia alternifolia	12	Y	FACW
4. Juncus effusus	1		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	43 = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera japonica	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTP-72

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12+	10YR6/2	85	7.5YR4/6	15	C	M	C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: PG Sampling Date: 5-7-13

Applicant/Owner: MTA State: MD Sampling Point: WIP75DT3

Investigator(s): A. Tatone, D. Rodgers Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1-2%

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Urban land w/ ~~Christiana~~ Downer + Issue, occ. flooded NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:

Currently raining

~~[illegible]~~ perched on clay

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) (LRR U)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes X No ~~X~~ Depth (inches): <1"

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Small rivulets present in wetland w/ surface water

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-73

Tree Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	10	Y	FAC
2. Salix nigra	25	Y	OBL
3. Acer rubrum	10	Y	FAC
4. Catalpa speciosa	15	Y	FACU
5. Pinus virginiana	10	Y	UPL
6. Liriodendron tulipifera	10	Y	FACU
7. Liquidambar styraciflua	8		FAC
8. Platanus occidentalis	8		FACW
	96 = Total Cover		

50% of total cover: ______ 20% of total cover: 19.2

Sapling/Shrub Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	50	Y	FAC
2. Liquidambar styraciflua	45	Y	FAC
3. Viburnum dentatum	7		FAC
4. Catalpa speciosa	15		FACU
5. Ulmus americana	5		FACW
6.			
7.			
8.			
	122 = Total Cover		

50% of total cover: ______ 20% of total cover: 24.4

Herb Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Ficaria verna	45	Y	FAC
2. Poa palustris	20	Y	FAC
3. Liquidambar styraciflua	15		FAC
4. Acer rubrum	6		FAC
5. Onoclea sensibilis	8		FACW
6. Viburnum dentatum	4		FAC
7. Impatiens capensis	3		FACW
8.			
9.			
10.			
11.			
12.			
	101 = Total Cover		

50% of total cover: ______ 20% of total cover: 20.2

Woody Vine Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	10	Y	FAC
2. Lonicera japonica	3	Y	FAC
3. Lonicera			
4.			
5.			
	13 = Total Cover		

50% of total cover: ______ 20% of total cover: 2.6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: (If observed, list morphological adaptations below).

21- Looking east at WTP-073

SOIL

Sampling Point: WTP-073

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y4/2	95	7.5YR 4/6	5	C	M	SCL	
3-12+	10YR6/2	60	7.5YR4/6	40	C	M	C	w/gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR O)**
___ 2 cm Muck (A10) **(LRR S)**
___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line City/County: Riverdale Park/PG Sampling Date: 5/7/13
Applicant/Owner: MTA State: MD Sampling Point: WTP-75
Investigator(s): D. Rodgers, A. Tatone, Section, Township, Range: ______
Landform (hillslope, terrace, etc.): SWM ditch Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______
Soil Map Unit Name: Codorus-Hatboro-Urban land complex, freq flooded NWI classification: PEM1A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:
Vegetated swale carries stormwater runoff

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ✓ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✓ No ___	Depth (inches): ≤5"	
Water Table Present?	Yes ___ No ✓	Depth (inches): ___	
Saturation Present? (includes capillary fringe)	Yes ✓ No ___	Depth (inches): 0	Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
trash present
~avg precip YTD
raining during delineation

Photo 23 - looking W

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WTP-75

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus effusus	5		OBL
2. Carex sp.	50		n/a
3. Impatiens capensis	7		FACW
4. Rosa multiflora	3		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65	= Total Cover	
50% of total cover:		20% of total cover:	13

Woody Vine Stratum (Plot size: -)	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	8	Y	FAC
2. Lonicera japonica	10	Y	FAC
3.			
4.			
5.			
	18	= Total Cover	
50% of total cover:		20% of total cover:	3.6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (If observed, list morphological adaptations below).

Carex unidentifiable due to early season, species present more than likely hydrophytes

SOIL

Sampling Point: WTP-75

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR3/1	90	7.5YR5/6	10	C	M	sl	buried organics
8-12+	10YR6/4	50					sl	gravel present
	7.5YR5/8	50						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ✓ No ______

Remarks:

WETLAND DETERMINATION DATA FORM – ~~Eastern Mountains and Piedmont~~ Atlantic Gulf Coastal Plain

Project/Site: Purple Line / River Road City/County: College Park Sampling Date: 5/14/13

Applicant/Owner: MTA State: MD Sampling Point: W079-WTP-1

Investigator(s): SS, DR, AC Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Aquasco-urban land complex, 0-5% slopes NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? N Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes Y No ___	

Remarks: Closed depression with sparse herbaceous vegetation. Appears to be associated w/ old home site due to presence of bottles and other refuse, as well as Catalpa and Honey locust. Culvert present just downslope of wetland, but outlet is restricted/blocked due to berm, causing water to pond in wetland.
photo looking south at plot

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): None

Water Table Present? Yes ___ No X Depth (inches): >15"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >15"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Sl. below avg precip during Mar & Apr

Atlantic Gulf Coastal Plain

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W079-WTP7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	25		FAC
2. Catalpa speciosa	40	Y	FACU
3. Liquidambar styraciflua	30	Y	FAC
4. Ulmus americana	40	Y	FACW
5.			
6.			
7.			
8.			
	135	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	40	Y	FACW
2. Catalpa speciosa	35	Y	FACU
3. Salix nigra	5		OBL
4. Quercus alba	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	86	= Total Cover	

Herb Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Allium vineale	3	Y	FACU
2. Catalpa speciosa	3	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	6	= Total Cover	

Woody Vine Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	7	Y	FAC
2. Lonicera japonica	25	Y	FAC
3.			
4.			
5.			
6.			
	32	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 56 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W079-WTP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5y 3/2	90	10yr 4/6	10	C	M	Loam	Rootlets present
6-15	10yr 6/2	65	10yr 6/8	30	C	M	SiCl	organic streaking
	10yr 3/1	5						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE

Depth (inches): N/A

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – ~~Eastern Mountains and Piedmont~~ Atlantic Gulf Coastal Plain

Project/Site: Purple Line/ River Road City/County: College Park Sampling Date: 5/14/13

Applicant/Owner: MTA State: ______ Sampling Point: W79-UTP

Investigator(s): SS, DR, AC Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): <1

Subregion (LRR or MLRA): MLRA-149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Aquasco-urban land complex NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? N Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___		**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present? Yes ___ No X		
Wetland Hydrology Present? Yes ___ No X		

Remarks:
ph#27 – looking S at plot. Area appears to be old home site due to presence of old refuse and Catalpa + Honey Locust.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): NONE

Water Table Present? Yes ___ No X Depth (inches): >12"

Saturation Present? Yes ___ No X Depth (inches): >12"
(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators evident

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W079-UTP-1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Gleditsia triacanthos	60	Y	FAC
2. Catalpa speciosa	15		FACU
3. Juglans nigra	10		UPL
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Morus alba	8	Y	FACU
2. Gleditsia triacanthos	5	Y	FAC
3. Lonicera maackii	5	Y	FACU
4. Quercus rubra	3		FACU
5. Catalpa speciosa	3		FACU
6. Quercus phellos	3		FAC
7. Diospyros virginiana	5	Y	FAC
8.			
9.			
10.			
	32	= Total Cover	

Herb Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Glechoma hederacea	80	Y	FACU
2. Cinna arundinacea	7		FACW
3. Poa sp.	7		n/a
4. Galium aparine	5		FACU
5. Alliaria petiolata	4		FACU
6. Arum maculatum	3		UPL
7.			
8.			
9.			
10.			
11.			
12.			
	106	= Total Cover	

Woody Vine Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera japonica	50	Y	FAC
2.			
3.			
4.			
5.			
6.			
	50	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	11	x 2 =	22
FAC species	123	x 3 =	369
FACU species	119	x 4 =	476
UPL species	13	x 5 =	65
Column Totals:	266 (A)		932 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Meets 50/20 Test, but prevalence index indicates non-hydrophytic veg. Presence of Gleditsia most likely due to planting assoc. w/ old homesite rather than a result of natural regeneration

SOIL

Sampling Point: W079-UTP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10yr 2/1	100	—	—	—	—	SaLo	
7-10	10yr 5/3	80	10yr 4/4	5	C	M	Loam	
	10yr 2/1	15						Organic streaking
10-12+	10yr 6/2	80	10yr 5/6	20	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE

Depth (inches): ______

Hydric Soil Present? **Yes** ______ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – ~~Eastern Mountains and Piedmont~~ Atlantic Gulf Coastal Plain

Project/Site: Purple Line/MD 1T3 City/County: College Park/PG Sampling Date: 5/14/13

Applicant/Owner: MTA State: MD Sampling Point: W80-WTP

Investigator(s): S. Sipple, D. Rodgers, A. Canska Section, Township, Range: ______

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-2

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Sassafras-urban land complex, 0-5% slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:
Ph 28- Looking S-SE
Slightly below avg precip in Mar & Apr
150. depression in powerline ROW

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ✓ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓ No ___	Depth (inches): 8"	
Water Table Present?	Yes ___ No ✓	Depth (inches): ___	
Saturation Present? (includes capillary fringe)	Yes ✓ No ___	Depth (inches): ___	Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
perched over clayey material

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W80-WTP

Tree Stratum (Plot size: ______)

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

Sapling/Shrub Stratum (Plot size: ______)

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			

Herb Stratum (Plot size: ______)

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus effusus	25	Y	OBL
2. Juncus acuminatus	20	Y	OBL
3. Carex vulpinoidea	17	Y	FACW
4. Carex sp.	45	Y	n/a
5. Eleocharis obtusa	12	Y	OBL
6. Rumex crispus	5		FAC
7. Ludwigia palustris	8	Y	OBL
8. ~~[illegible]~~			
9. Festuca pratensis	5		FACU
10. Solidago sp	15	Y	n/a
11. Apocynum cannabinum	3		FACU
12.			
= Total Cover	155		

Woody Vine Stratum (Plot size: ______)

Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

early season - many species unidentifiable
species without indicator status excluded from dominance calc.

SOIL

Sampling Point: W80-WTP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR4/2	95	7.5YR4/6	5	C	M	sil	rootlets present
6-12+	10YR6/6	90	7.5YR3/4	10	C	M	sl	gravel extensive

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ✓ No ___

Remarks:

compacted sandy clay @ ~16"

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line/ MD 193 City/County: College Park/ PG Sampling Date: 5/14/13

Applicant/Owner: MTA State: MD Sampling Point: W80-UPL

Investigator(s): S. Sipple, D. Rodgers, A. Cranska Section, Township, Range: ______

Landform (hillslope, terrace, etc.): gentle slope Local relief (concave, convex, none): convex Slope (%): 2-3

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Sassafras-Urban land Complex, 0-5% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:

UPL meadow in powerline ROW

Ph #29 looking S/SE @ UPL, W080 in back ground

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): None

Water Table Present? Yes ____ No X Depth (inches): >12"

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >12"

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators present

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W080-UTP-1

Tree Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4. NONE			
5.			
6.			
7.			
8.			
= Total Cover			

Sapling/Shrub Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4. NONE			
5.			
6.			
7.			
8.			
9.			
10.			
= Total Cover			

Herb Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1. Anthoxanthum odoratum	70	Y	FACU
2. Houstonia caerulea	10		FAC
3. Holcus lanatus	35	Y	FACU
4. Ranunculus sp.	6		n/a
5. Pyrus calleryana	15		UPL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover	136		

Woody Vine Stratum (Plot size: 30')

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. NONE			
4.			
5.			
6.			
= Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W080-UTP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					L	Many fine rootlets
5-12+	10YR 5/6	100					L	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Purple Line/Riverdale Rd City/County: Riverdale Sampling Date: 5/24/13

Applicant/Owner: MTA State: MD Sampling Point: W81-WTP1

Investigator(s): SS, MD Section, Township, Range: ______

Landform (hillslope, terrace, etc.): stormwater basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR or MLRA): MLRA 149A Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Udorthents/Christiana-Downer-Urban land NWI classification: PEM1A/C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ______		Is the Sampled Area within a Wetland? Yes ✓ No ______
Hydric Soil Present? Yes X No ______		
Wetland Hydrology Present? Yes X No ______		

Remarks:
~~Soil is assumed hydric due to hydrologic and vegetative indicators~~
Storm water basin closed off by fence so soil samples were unable to be taken.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ Marl Deposits (B15) (LRR U)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres along Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ FAC-Neutral Test (D5)
- __ Sphagnum moss (D8) (LRR T, U)

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): 1/2"

Water Table Present? Yes ______ No ✓ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): N/A

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface water was observed from outside fenced area. Soil samples/pits were not taken due to lack of property access, thus saturation and water table levels were not able to be assessed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: WB1-WTP1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. NONE			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	5	✓	FAC
2. Acer rubrum	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Herb Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia	100	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. NONE			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W81 - WTP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
			N/A					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soil samples unable to be taken because stormwater basin was fenced in. Assumed hydric due to presence of standing water and hydrophytic vegetation

Stream Features
Field Sheet

Date: 5/24/13 Project Site: Purple Line WUS # : 82

Observer(s) SS, MD

Stream Flow:

Perennial: ______ Intermittent ✓ Ephemeral ______

Gradient: ______ Classification: R4SB2

Channel Characteristics:

Natural ______ Artificial (man-made) ✓ Manipulated (man-altered) ______

Explain: rip-rap lined outflow for SWM pond

Channel Has (check all that apply):

- [x] Bed and Banks
- [x] OHWM
  - [ ] clear, natural line impressed on the bank
  - [ ] changes in character of soil
  - [ ] shelving
  - [x] vegetation matted down, bent, or absent
  - [ ] leaf litter disturbed or washed away
  - [ ] sediment deposition
  - [ ] water staining
  - [x] the presence of litter and debris
  - [ ] destruction of terrestrial vegetation
  - [ ] the presence of wrack line
  - [ ] sediment sorting
  - [ ] scour
  - [ ] multiple observed or predicted flow events
  - [x] abrupt change in plant community
  - [ ] other (list): ______
- [ ] Discontinuous OHWM (explain): ______

Morphology:

Avg. Channel Width 3' Depth 2' Avg. Water Depth 3"

Has stream morphometry been altered? yes Describe : rip-rap lined channel

Habitat and Pollutants:

Substrate (predominant type (s)): rip-rap

Habitat Complexity (characterize): only rip-rap habitat present

Bank Erosion: Severe ______ Moderate ______ Minor ✓

Describe: no bank erosion

Silt Deposition: No

Pollutants (observation / potential sources): trash, highway

Stormwater Outfalls: outfall of SWM pond

Biological Habitat For (check all that apply):

Federally Listed species ________ Fish Spawn Areas ________

Other Environmentally-Sensitive Species ________ Aquatic/Wildlife Diversity ________

Explain Findings: ________________

Riparian Zone:

Development: Roads adjacent to stream

Riparian vegetation: Forest ________ Shrubs ✓ Herbs ✓

Dominant Species: Acer negundo, Toxicodendron radicans, Parthenocissus quinquefolia, Peltandra virginica

Riparian Buffer Width: 750 ft

Approximate % Shading by Woody Species: 30%

Notes: ________________

near WUS62

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: PG Sampling Date: 4-26-11

Applicant/Owner: MTA State: MD Sampling Point: UTP-1

Investigator(s): BG, HS Section, Township, Range: ____

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR or MLRA): MLRA Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Christiana-Downer-Urban land complex NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____
Hydric Soil Present?	Yes ✓	No ✓
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0.5

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

black drain pipe flows into another ephemeral channel the confluence of these two channel has significant sedimentation, in which vegetation has stabilized. Soil sits on top of rip-rap.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: UTP-1

Tree Stratum (Plot size: ________)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	
Sapling Stratum (Plot size: ________)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: ________)			
1. Liquidambar styraciflua	2		FAC
2.			
3.			
4.			
5.			
6.			
7.			
	2	= Total Cover	
Herb Stratum (Plot size: ________)			
1. Typha latifolia	15		OBL
2. Polygonum sagittatum	50	Y	OBL
3. Leersia virginica	20		FACW
4. Carex crinita	50	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	135	= Total Cover	
Woody Vine Stratum (Plot size: ________)			
1. Lonicera japonica	30	Y	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ______	x 1 = ______
FACW species ______	x 2 = ______
FAC species ______	x 3 = ______
FACU species ______	x 4 = ______
UPL species ______	x 5 = ______
Column Totals: ______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ______

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UTP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
6-8	10YR3/3	100						
8+	Refusal due to rip rap							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No X

Remarks:

Remove wgb 2A

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Montgomery Sampling Date: 12-9-11

Applicant/Owner: MTA State: MD Sampling Point: UTP-2

Investigator(s): B Garner, H Spargas, Section, Township, Range: ____

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): MLRA 148 Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Brinklow-Blocktown channery silt loams NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- stream is incised & has likely undermined the hydrology
- area has been manipulated by golf course maintenance - trees removed, debris placed in area.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UTP-2

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	60	Y	FACU
2. Liquidambar styraciflua	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicer tartarica	50	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50 = Total Cover		

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Glechoma hederacea	50	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UTP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12+	10YR3/2	100	—	—	—	—	sil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- __ Histosol (A1)
- __ Histic Epipedon (A2)
- __ Black Histic (A3)
- __ Hydrogen Sulfide (A4)
- __ Stratified Layers (A5)
- __ 2 cm Muck (A10) **(LRR N)**
- __ Depleted Below Dark Surface (A11)
- __ Thick Dark Surface (A12)
- __ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- __ Sandy Gleyed Matrix (S4)
- __ Sandy Redox (S5)
- __ Stripped Matrix (S6)
- __ Dark Surface (S7)
- __ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- __ Thin Dark Surface (S9) **(MLRA 147, 148)**
- __ Loamy Gleyed Matrix (F2)
- __ Depleted Matrix (F3)
- __ Redox Dark Surface (F6)
- __ Depleted Dark Surface (F7)
- __ Redox Depressions (F8)
- __ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- __ Umbric Surface (F13) **(MLRA 136, 122)**
- __ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- __ 2 cm Muck (A10) **(MLRA 147)**
- __ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- __ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- __ Red Parent Material (TF2)
- __ Very Shallow Dark Surface (TF12)
- __ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Silver Spring/Mont. Sampling Date: 3-2-12

Applicant/Owner: MTA State: MD Sampling Point: UTP-3

Investigator(s): H Spargas, P. Rodgers Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex Slope (%): ______

Subregion (LRR or MLRA): MLRA-148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus silt loam, 0-3 % slopes NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ______

Water Table Present? Yes ___ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: UTP-3

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	30	Y	FACW
2. Liriodendron tulipifera	25	Y	FACU
3. Acer negundo	10		FAC
4. Fraxinus pennsylvanica	15	Y	FACW
5.			
6.			
7.			
8.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera tatarica	40	Y	FACU
2. Lindera benzoin	5		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45	= Total Cover	

Herb Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ranunculus ficaria	60	Y	FAC*
2. Glechoma hederacea	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	= Total Cover	

Woody Vine Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera japonica	10	Y	FAC
2. Vitis sp.	2		N/A
3.			
4.			
5.			
6.			
	12	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	50	x 2 = 100
FAC species	80	x 3 = 240
FACU species	85	x 4 = 340
UPL species		x 5 =
Column Totals:	215 (A)	680 (B)

Prevalence Index = B/A = 3.16

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
✓ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

meets 50/20 rule indicator, but P.I. ≥ 3.0
* = indicator status taken from 1996 list

SOIL

Sampling Point: UTP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR3/3	100	—	—	—	—	Si cl.	
10-14+	7.5YR4/6	100	—	—	—	—	Scl	coarse frag.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: Silver Spring/Mont. Sampling Date: 3/2/12

Applicant/Owner: MTA State: ______ Sampling Point: UTP-4

Investigator(s): DR, HS Section, Township, Range: ______

Landform (hillslope, terrace, etc.): floodplain edge Local relief (concave, convex, none): convex Slope (%): ______

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus silt loam, 0-3 % slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ______	Is the Sampled Area within a Wetland? Yes ______ No ✓
Hydric Soil Present?	Yes ______	No ✓	
Wetland Hydrology Present?	Yes ______	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

no hydro indicators observed

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: UTP-4

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	70	Y	FACW
2. Betula nigra	40	Y	FACW
3. Acer rubrum	50	Y	FAC
4. Acer negundo	30		FAC
5. Robinia pseudoacacia	5		FACU
6.			
7.			
8.			
	195	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. Lonicera tatarica	15	Y	FACU
2. Rosa multiflora	5		FACU
3. Acer negundo	10	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30	= Total Cover	
Herb Stratum (Plot size:)			
1. Ranunculus ficaria	70	Y	FAC*
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. Lonicera japonica	40	Y	FAC
2.			
3.			
4.			
5.			
6.			
	40	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

* = status taken from 1996 list

SOIL

Sampling Point: UTP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/3	100					loam	rootlets throughout
2-6	7.5YR4/6	100					ls	fill material
6-12+	7.5YR4/6	100					s	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: College Park/PG Sampling Date: 2-2-12

Applicant/Owner: MTA State: MD Sampling Point: UTP-5

Investigator(s): H. Spargus, D. Rodgers Section, Township, Range: ______

Landform (hillslope, terrace, etc.): gentle slope Local relief (concave, convex, none): convex Slope (%): ______

Subregion (LRR or MLRA): MLRA 148 Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Codorus + Hatboro soils, freq. flooded NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______ No X	Is the Sampled Area within a Wetland?	Yes ______ No X
Hydric Soil Present?	Yes ______ No X		
Wetland Hydrology Present?	Yes ______ No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- __ Surface Water (A1)
- __ High Water Table (A2)
- __ Saturation (A3)
- __ Water Marks (B1)
- __ Sediment Deposits (B2)
- __ Drift Deposits (B3)
- __ Algal Mat or Crust (B4)
- __ Iron Deposits (B5)
- __ Inundation Visible on Aerial Imagery (B7)
- __ Water-Stained Leaves (B9)
- __ Aquatic Fauna (B13)
- __ True Aquatic Plants (B14)
- __ Hydrogen Sulfide Odor (C1)
- __ Oxidized Rhizospheres on Living Roots (C3)
- __ Presence of Reduced Iron (C4)
- __ Recent Iron Reduction in Tilled Soils (C6)
- __ Thin Muck Surface (C7)
- __ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- __ Surface Soil Cracks (B6)
- __ Sparsely Vegetated Concave Surface (B8)
- __ Drainage Patterns (B10)
- __ Moss Trim Lines (B16)
- __ Dry-Season Water Table (C2)
- __ Crayfish Burrows (C8)
- __ Saturation Visible on Aerial Imagery (C9)
- __ Stunted or Stressed Plants (D1)
- __ Geomorphic Position (D2)
- __ Shallow Aquitard (D3)
- __ Microtopographic Relief (D4)
- __ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No X Depth (inches): ______

Water Table Present? Yes ______ No X Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No X Depth (inches): ______

Wetland Hydrology Present? Yes ______ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UTP-5

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	40	Y	FAC
2. Prunus serotina	10		FACU
3. Robinia pseudoacacia	30	Y	FACU
4. Fagus grandifolia	15		FACU
5. Fraxinus pennsylvanica	5		FACW
6.			
7.			
8.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rosa multiflora	40	Y	FACU
2. Lonicera tartarica	25	Y	FACU
3. Fagus grandifolia	10		FACU
4. Quercus sp	10		n/a
5.			
6.			
7.			
8.			
9.			
10.			
	85	= Total Cover	

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Glechoma hederacea	10	Y	FACU
2. Allium vineale	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Lonicera japonica	80	Y	FAC
2. Celastrus orbiculatus	10		UPL
3.			
4.			
5.			
6.			
	90	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 29 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	______	x 1 = ______
FACW species	______	x 2 = ______
FAC species	______	x 3 = ______
FACU species	______	x 4 = ______
UPL species	______	x 5 = ______
Column Totals:	______ (A)	______ (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: OTP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/4	100	—				SL	
2-14+	7.5YR5/6	100	—				SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Purple Line City/County: College Park / PG Sampling Date: 3-2-12

Applicant/Owner: MTA State: MD Sampling Point: UTP-6

Investigator(s): DR & HS Section, Township, Range: ____

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): convex Slope (%): ____

Subregion (LRR or MLRA): MLRA-148 Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Codorus-Hatboro-Urban land complex NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland?	Yes ____ No X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches): ____	
Water Table Present?	Yes ____ No X	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches): ____	Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UTP-6

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		= Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1. Acer negundo	10	Y	FAC
2. Liquidambar styraciflua	5	Y	FAC
3. Fraxinus pennsylvanica	10	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25	= Total Cover	
Herb Stratum (Plot size: ____)			
1. Allium vineale	25	Y	FACU
2. Ranunculus ficaria	10		FAC*
3. aster sp.	2		n/a
4. thistle sp.	5		n/a
5. Microstegium vimineum	40	Y	FAC
6. Schedonorus pratensis	15		FACU
7.			
8.			
9.			
10.			
11.			
12.			
	97	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. Lonicera japonica	25	Y	FAC
2.			
3.			
4.			
5.			
6.			
	25	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	10	x 2 =	20
FAC species	90	x 3 =	270
FACU species	40	x 4 =	160
UPL species		x 5 =	
Column Totals:	140 (A)		450 (B)

Prevalence Index = B/A = 3.21

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

meets 50/20 rule, but P.I. ≥ 3.0

* = taken from 1996 list

SOIL Sampling Point: UTP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR4/3	100	—				Sil	
3-8	10YR5/3	95	10YR5/6	5	C	m	Sil	
8-14+	10YR5/3	80	10YR4/6	20	C	m	Sil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5)
__ 2 cm Muck (A10) **(LRR N)**
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Dark Surface (S7)
__ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
__ Thin Dark Surface (S9) **(MLRA 147, 148)**
__ Loamy Gleyed Matrix (F2)
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__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
__ Umbric Surface (F13) **(MLRA 136, 122)**
__ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

__ 2 cm Muck (A10) **(MLRA 147)**
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__ Red Parent Material (TF2)
__ Very Shallow Dark Surface (TF12)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ____ **No** ✓

Remarks:

Appendix E – Agency Field Review Meeting Minutes and Maps

MEETING MINUTES

COASTAL RESOURCES INC.

2988 Solomons Island Road
Edgewater, MD 21037
410-956-9000
410-956-0566 (Fax)

Date: **May 17, 2012**

To: **Maria Teresi– USACE**
Laura Burge- USACE
Laura Shively- USACE
Erica Schmidt- USACE
Steve Hurt- MDE
John Nichols- NMF
Adam Tatone- CRI
Steve Morsberger- CRI
Bridgette Garner- CRI

From: **Bridgette Garner**

Subject: **Purple Line Jurisdictional Determination (JD)**

The attendees met at the Meadowbrook Local Park parking lot in Chevy Chase, Maryland at 9:30 a.m. on May 8, 2012 to review the western segment of the Purple Line project. The attendees met at the parking lot adjacent to the Glenridge Facility on May 9, 2012 to review the eastern segment of the Purple Line project. The purpose of this meeting was to review flagged waters of the U.S., including wetlands within the Preferred Alternative in order to obtain a jurisdictional determination (JD) for the project and discuss resource agency concerns. A total of 41 numbered waters of the U.S., including wetlands, were reviewed. The general context of the issues discussed for each area is summarized below.

WUS GB-1 This waterway was accepted as flagged by the agencies. The headwall of a tributary to the mainstem of Coquelin Run is located just outside of the LOD. This headwall was surveyed in the field and MDE and USACE requested that it be shown on the map. WUS GB-1 flows south under the trail and eventually into Coquelin Run.

WUS GB-2 This waterway was accepted as flagged.

WUS GB-3 This waterway was accepted as flagged. The stream designation was changed from a perennial stream to an intermittent stream.

WUS GB-4 This waterway was accepted as flagged.

WUS GB-6 This waterway was accepted as flagged.

Wetland 065 This wetland was accepted as flagged.

Wetland GB-8 This wetland was accepted as flagged.

WUS 066 This waterway was accepted as flagged.

WUS GB-9 This waterway was accepted as flagged.

WUS 003 This waterway was accepted as flagged. Steve Morsberger inquired whether or not the relocation of Sligo Creek north of Wayne Avenue could serve as suitable compensatory stream mitigation. Steve Hurt commented that the relocation of Sligo Creek is necessary to comply with required bridge hydraulics and does not necessarily agree that stream relocation could be included as stream mitigation because the channel appeared to be relatively stable and would likely include removal of some large trees that currently provide stability and other resource benefits. Mr. Hurt indicated that the Purple Line team should provide the concept designs of stream relocation to the resource agencies sooner than later for their review and comment. The review team noted recent stream construction associated with sewer rehabilitation work located on the downstream side of the Wayne Avenue crossing.

WUS 005 This waterway was accepted as flagged by the agencies. The LOD in this area extends approximately 200 feet south of Piney Branch Road to include a section of the stream that is being proposed for stream restoration. CRI inquired whether or not the restoration of that segment could count towards compensatory mitigation for impacts to waters of the U.S. The channel on the downstream end of the culvert at Piney Branch Road has scoured more than three (3) feet below the culvert invert elevation and could pose as a fish blockage to upstream resources. The review team agreed that fish resources should be investigated in Long Branch to evaluate the significance of the culvert blockage on fish passage. It was also noted that additional improvements to stream stability and function may be warranted depending on the biological resources found in Long Branch. Steve Hurt recommended bringing USFWS and MDNR to this section of the stream for review as potential stream mitigation.

WUS 057 This waterway was accepted as flagged.

WUS 008 This waterway was accepted as flagged.

WUS 009 This waterway was accepted as flagged.

WUS 006 This waterway was accepted as flagged.

WUS 007 This waterway was accepted as flagged.

Wetland 060 This wetland was accepted as flagged.

WUS 058 The ephemeral section of the stream was considered non-jurisdictional by the USACE and MDE and the intermittent designation was changed to ephemeral west of the park access road. This was also the case to the east of the access road, where the intermittent stream designation was changed to ephemeral and the ephemeral channel was considered non-jurisdictional. The wetland flagged as part of this system was accepted as flagged.

Wetland 059 This wetland was accepted as flagged.

WUS 011 This waterway was accepted as flagged, but the designation of perennial was changed to intermittent.

Wetland 10 This wetland was considered non-jurisdictional by the USACE and MDE as it was created in uplands to serve as storm water management (SWM) for the campus and does not have a perennial flow into the adjacent waterway (WUS 011).

WUS 012 This waterway was accepted as flagged. John Nichols commented that the Preferred Alternative should try and avoid any impacts to the buffer, which is currently in maintained grass and forest, of the tributary to Paint Branch. Mr. Nichols also commented that any stormwater management associated with this portion of the project should not be directly discharged into this tributary.

WUS 016 This waterway was accepted as flagged.

Wetland 019 This wetland was accepted as flagged. This wetland serves as SWM for the park and is created in uplands but has a perennial connection to Northeast Branch via a pipe.

WUS 018 This waterway was accepted as flagged.

WUS 062 This waterway was accepted as flagged.

Wetland 025 The wetland was not considered jurisdictional by the USACE and MDE due its creation within uplands and lack of perennial flow to the stream (WUS 026) north of MD 410.

WUS 026 This waterway was accepted as flagged.

WUS 030 This waterway was accepted as flagged. John Nichols commented that the LOD associated with the Glenridge yard and shop should avoid impacting this stream. Bridgette Garner explained that the engineers are currently working to avoid and minimize impacts to this waterway. Mr. Nichols further recommended that the stream maintain a buffer and that the current LOD be moved to the top of slope.

Wetland 33 This wetland was considered non jurisdictional by the USACE and MDE as it was created uplands and does not have a perennial connection to WUS 032.

WUS 032 This waterway was accepted as flagged.

WUS 064 This waterway was accepted as flagged.

WUS 063 This waterway was accepted as flagged. However, the ephemeral designation was changed to intermittent.

WUS 048 This waterway is the extension of WUS 30. All comments discussed above pertain to this section of the waterway as well.

WUS 071 This waterway was accepted as flagged.

Wetland 072 This wetland was accepted as flagged.

WUS 034 This waterway was accepted as flagged.

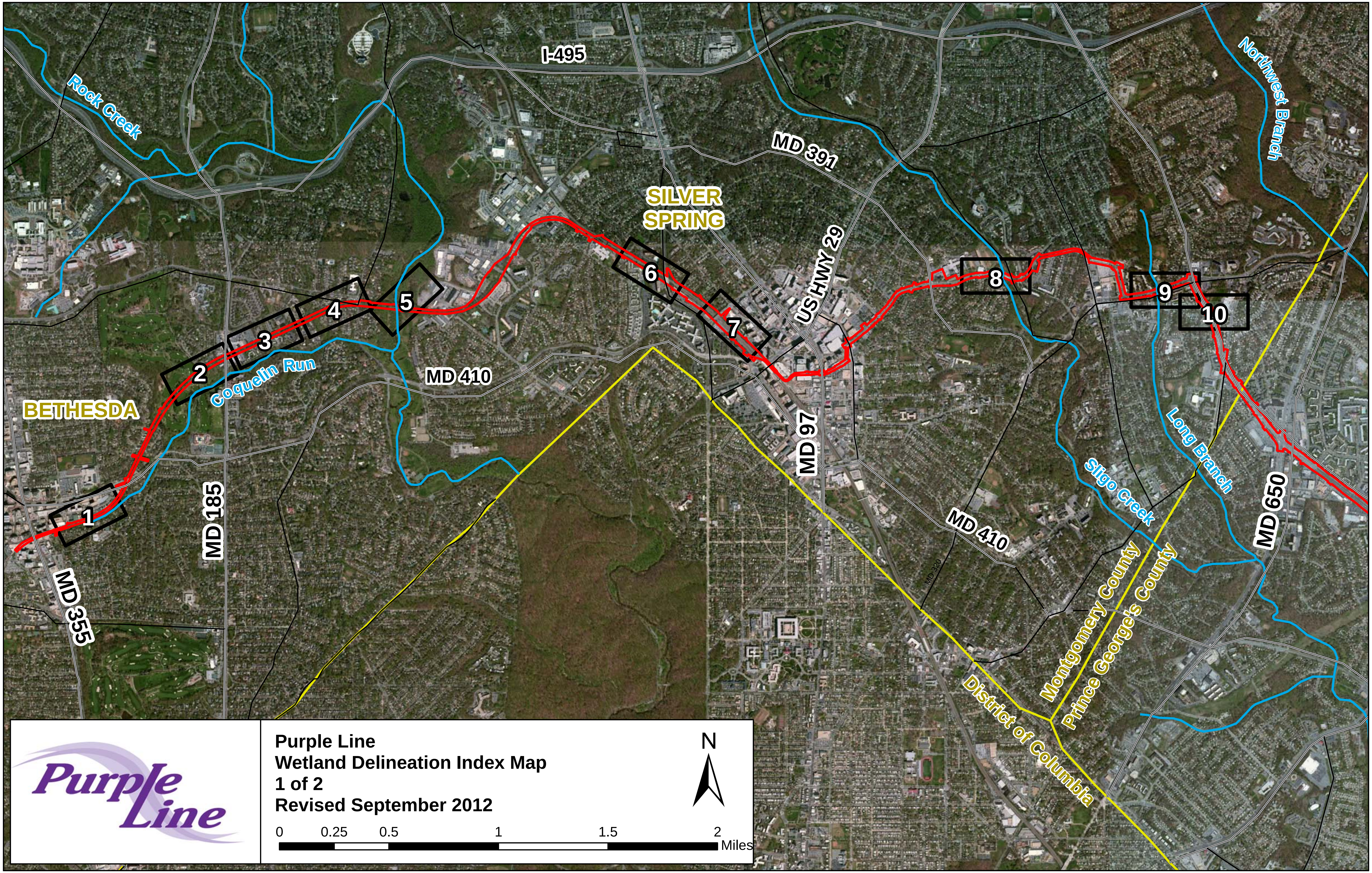
Wetland 035 This wetland was accepted as flagged.

WUS 036 This waterway was accepted as flagged.

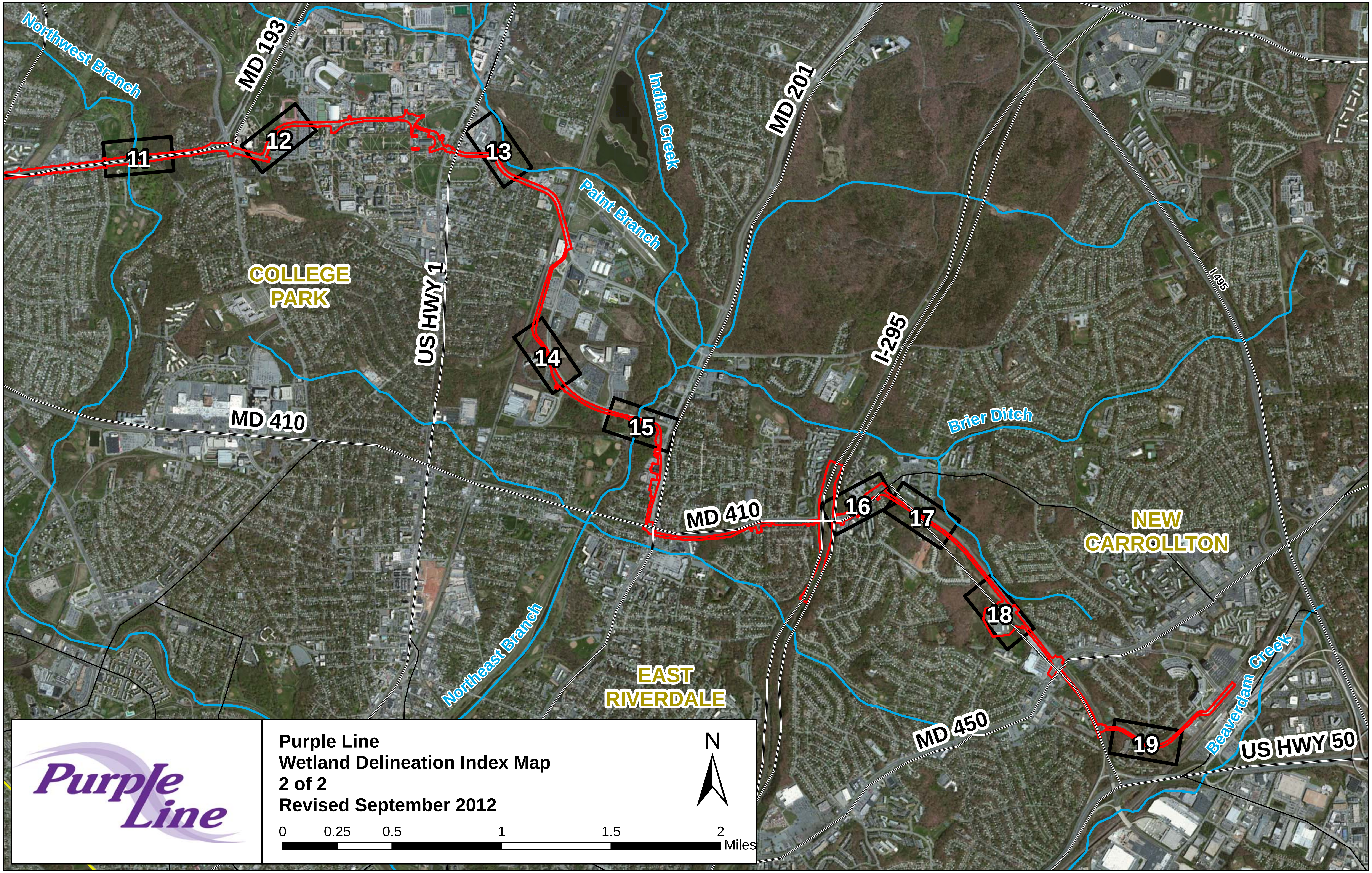
Wetland 037 This wetland was accepted as flagged.

Wetland 067 This wetland was accepted as flagged.

These minutes represent the general context and content of items and issues discussed during field review on May 8th and 9th, 2012. Should anyone have any revisions or need any clarifications on the minutes, please provide your revisions and comments by April 25, 2012. After that date, this draft will be considered final. Thank you. Feel free to contact me at (443) 837-2145 or bridgetteg@coastal-resources.net.



Purple Line
Wetland Delineation Index Map
1 of 2
Revised September 2012



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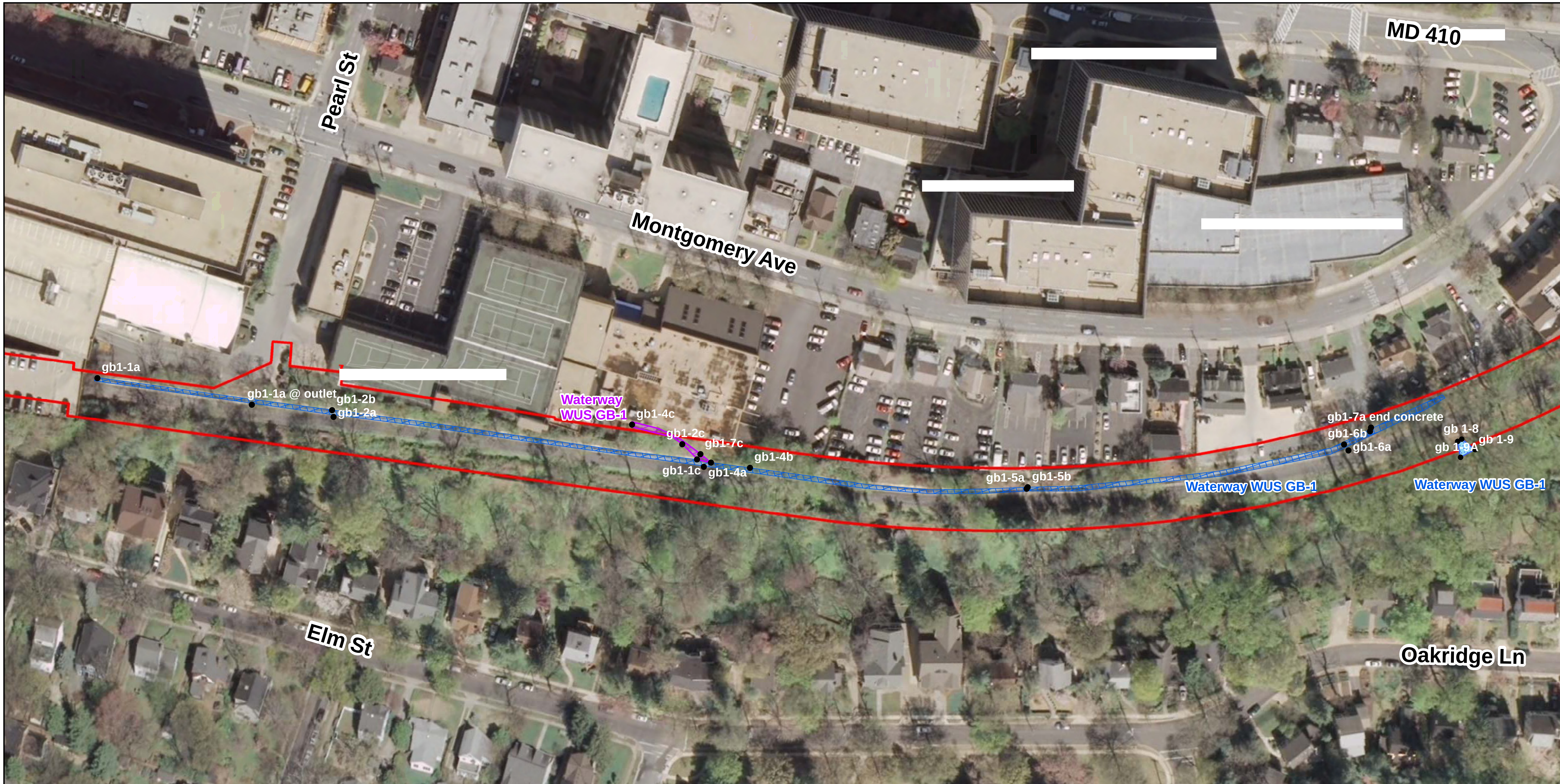
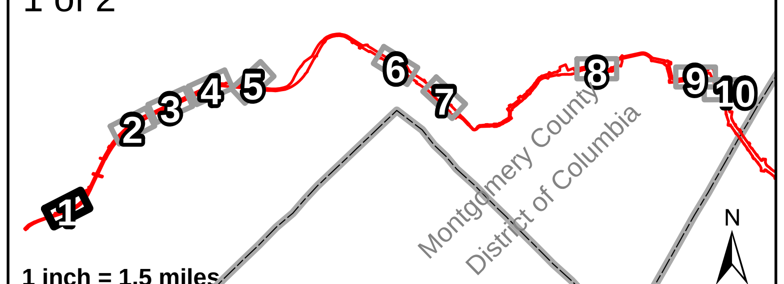
2 of 2
Revised September 2012



Index Map

1 of 2



1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

SHEET 1 of 19

Legend

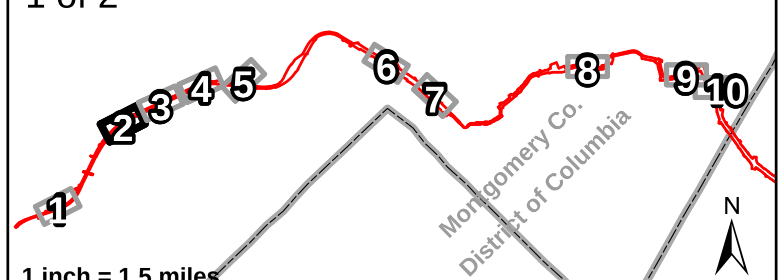
- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N

Index Map

1 of 2



Purple Line
Wetland Delineation Map
LOD Change Addendum

Montgomery County, MD
Revised September 2012

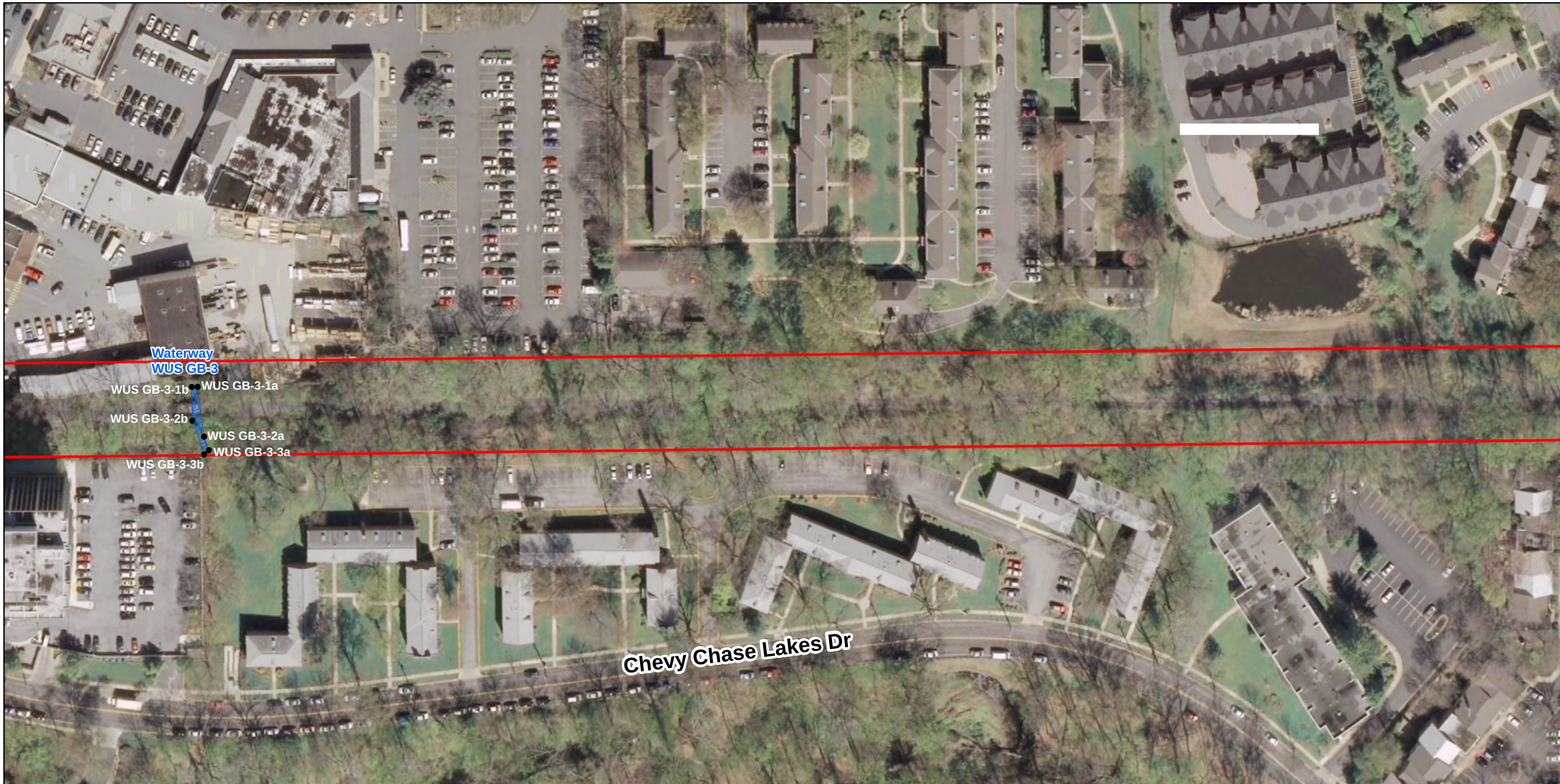
SHEET 2 of 19

Legend

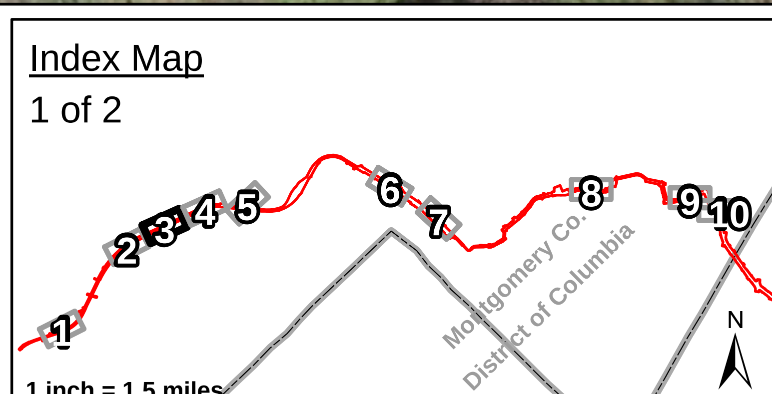
Updated FEIS LOD
FEIS LOD
Forested wetland
Emergent wetland
Scrub-shrub wetland
Ephemeral stream
Intermittent stream
Perennial stream
Open water
Upland test plot
Wetland Test Plot
Flag Point

Feet
0 50 100 200 300 400

N



Purple Line



Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

SHEET 3 of 19

Legend

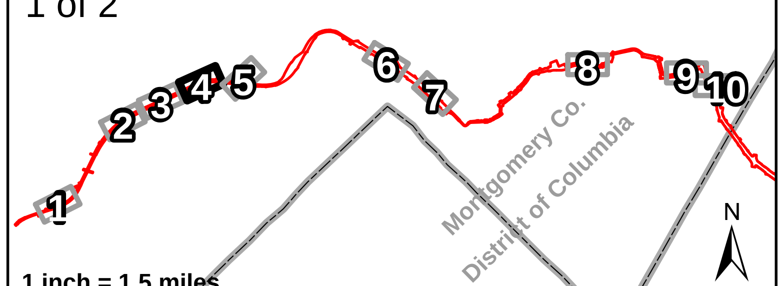
LOD
Ephemeral stream
Upland test plot
Forested wetland
Intermittent stream
Wetland Test Plot
Emergent wetland
Perennial stream
Flag Point
Scrub-shrub wetland
Open water

N

Feet
0 50 100 200 300 400

Index Map

1 of 2



1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

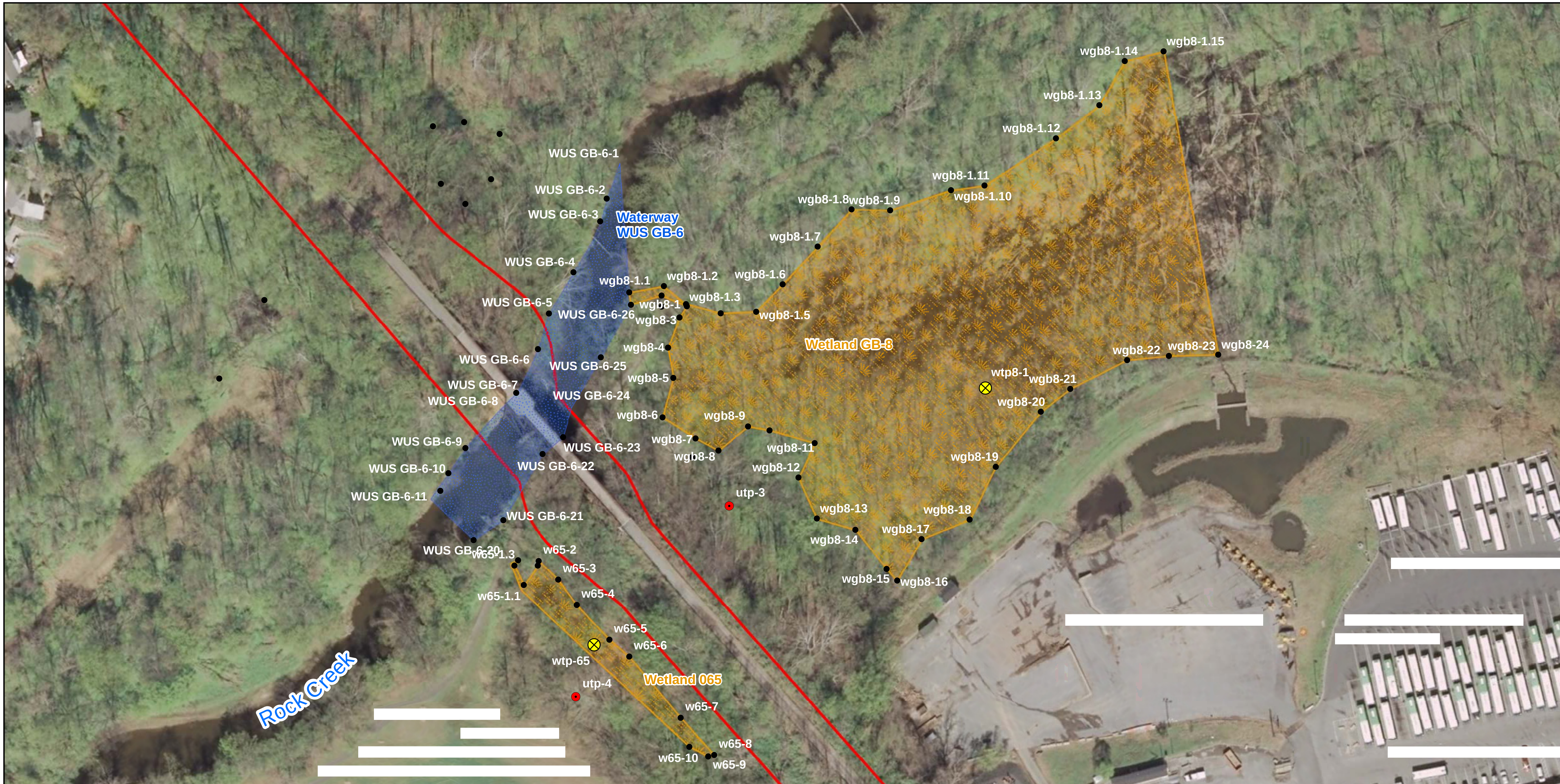
Montgomery County, MD
Revised September 2012

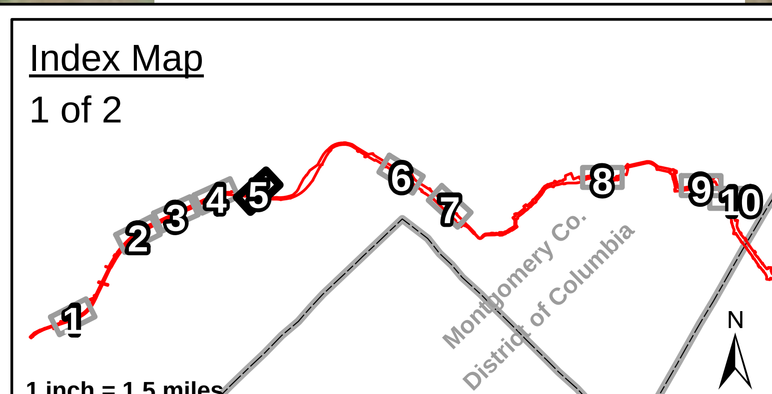
SHEET 4 of 19

Legend

- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet





Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

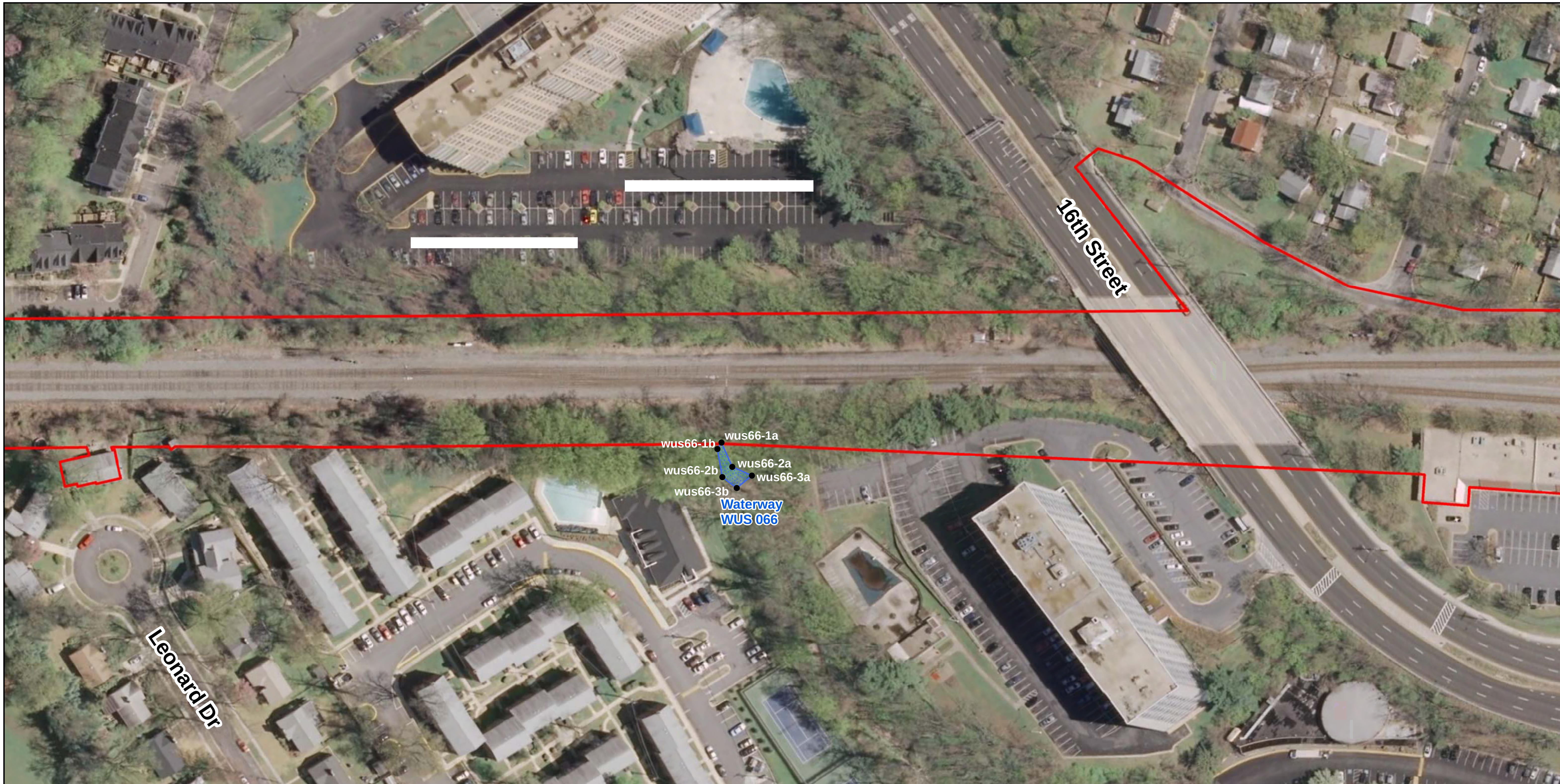
SHEET 5 of 19

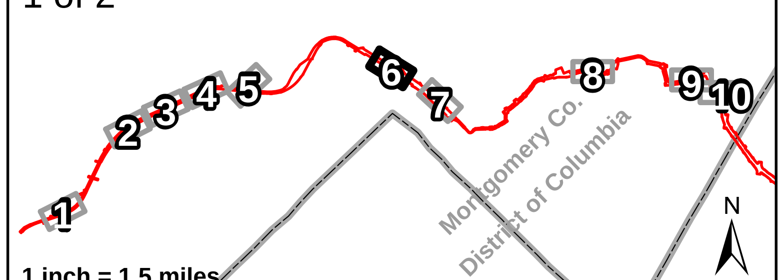
Legend

LOD
Forested wetland
Emergent wetland
Scrub-shrub wetland
Ephemeral stream
Intermittent stream
Perennial stream
Open water
Upland test plot
Wetland Test Plot
Flag Point

Feet
0 50 100 200 300 400

N





Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

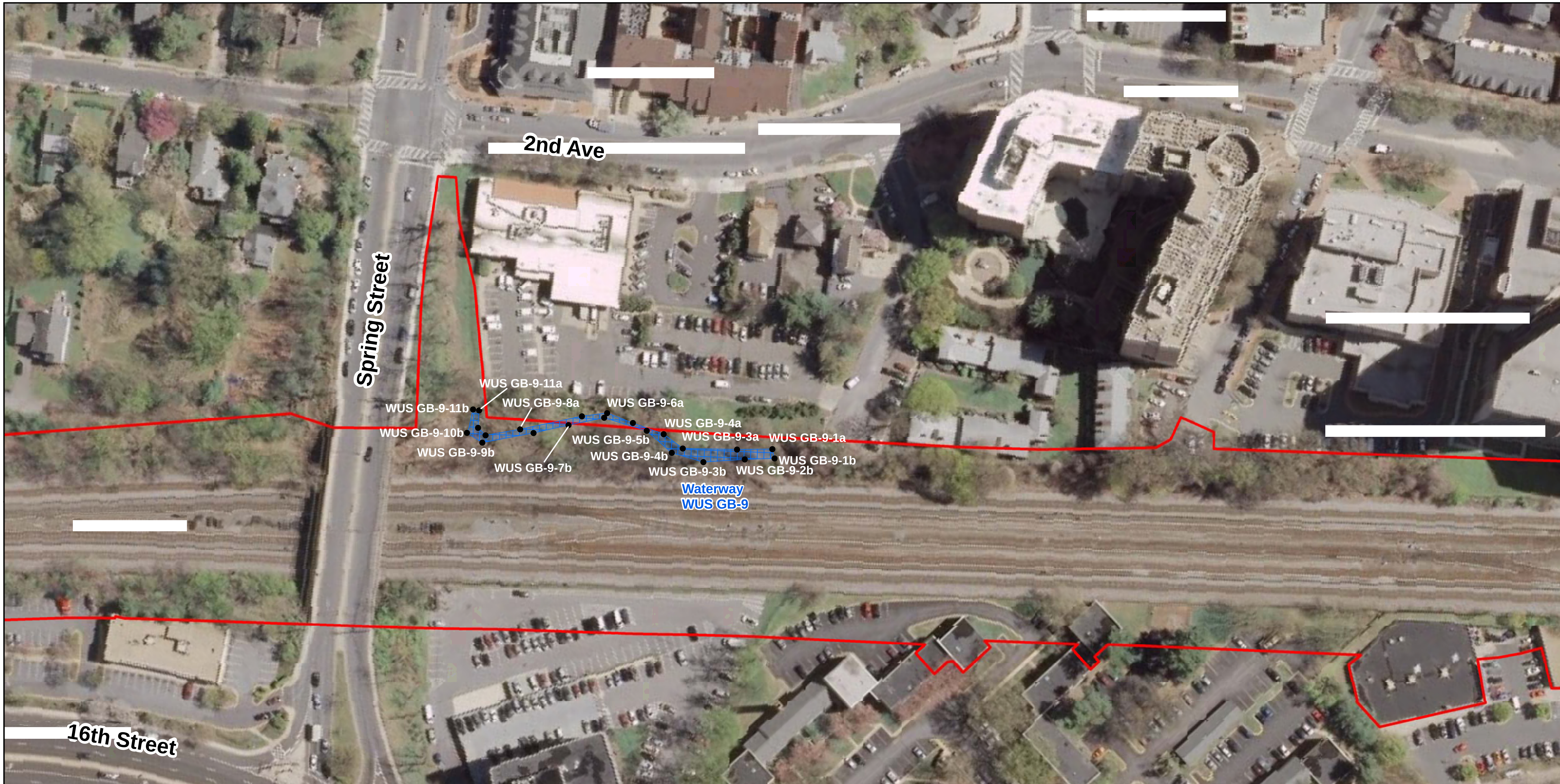
SHEET 6 of 19

Legend

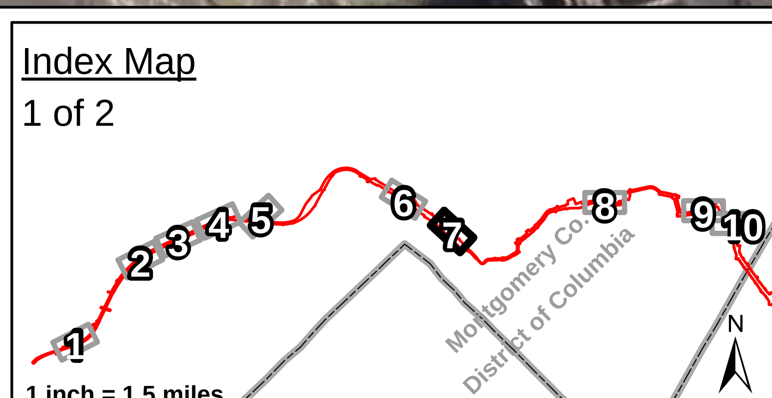
LOD	Ephemeral stream	Upland test plot
Forested wetland	Intermittent stream	Wetland Test Plot
Emergent wetland	Perennial stream	Flag Point
Scrub-shrub wetland	Open water	

Feet
0 50 100 200 300 400

N



Purple Line



Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

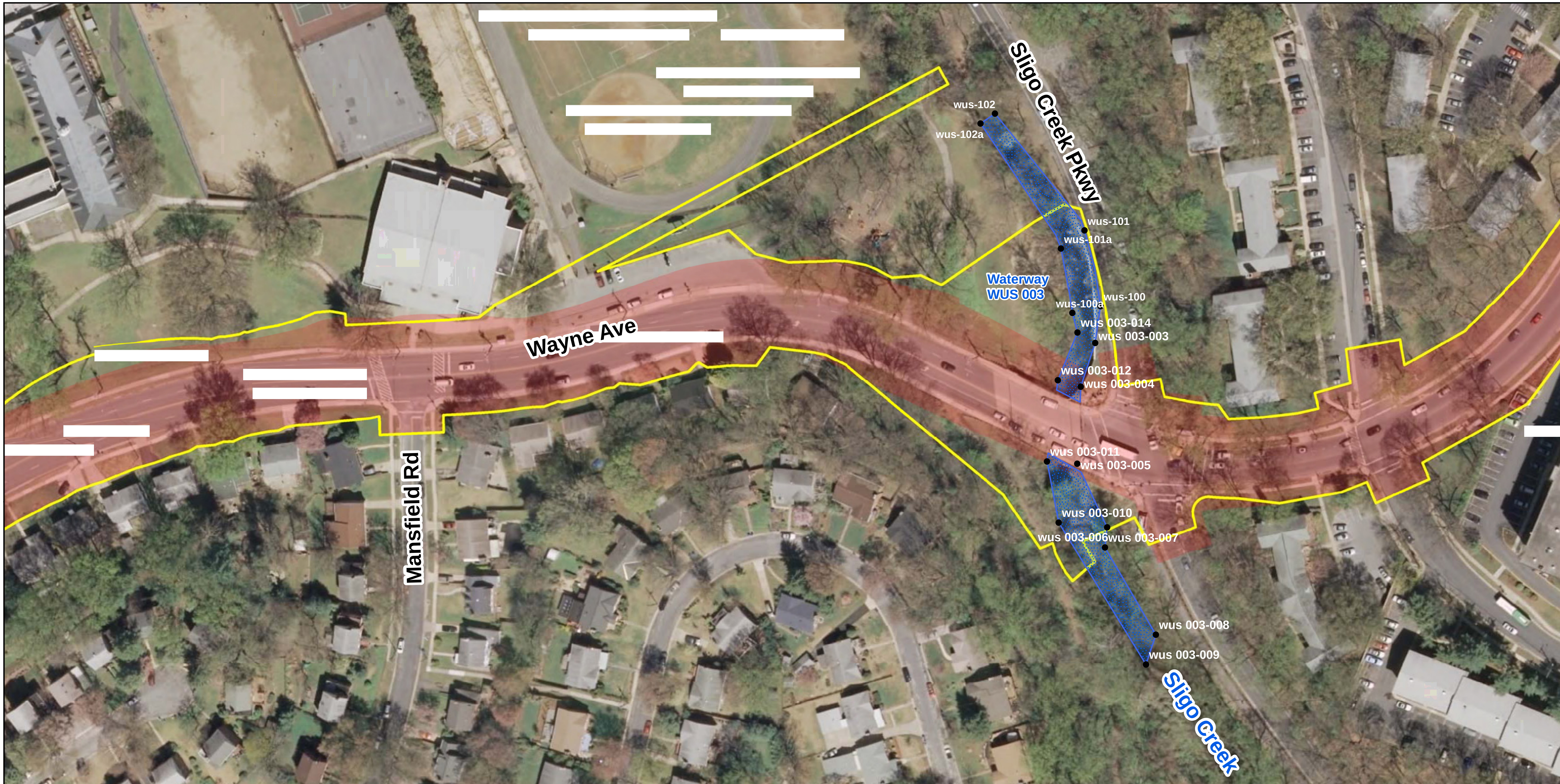
SHEET 7 of 19

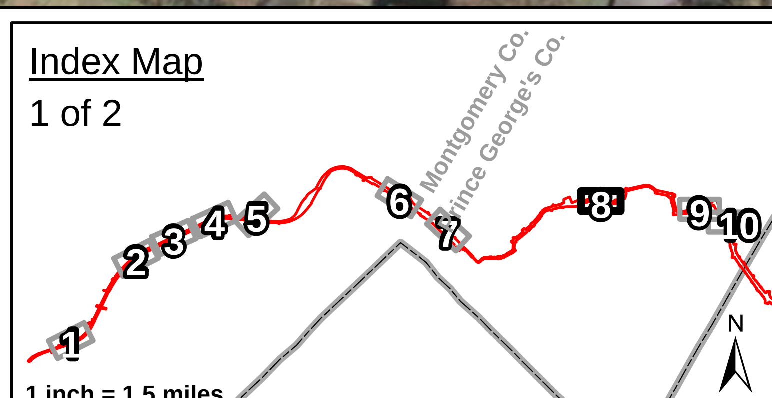
Legend

LOD	Ephemeral stream	Upland test plot
Forested wetland	Intermittent stream	Wetland Test Plot
Emergent wetland	Perennial stream	Flag Point
Scrub-shrub wetland	Open water	

Feet
0 50 100 200 300 400

N





Purple Line
Wetland Delineation Map
LOD Change Addendum

Montgomery County, MD
Revised September 2012

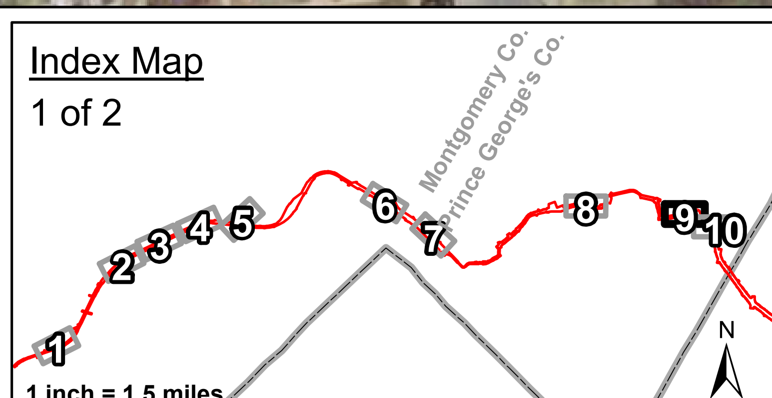
SHEET 8 of 19

Legend

- Updated FEIS LOD
- FEIS LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N



Purple Line
Wetland Delineation Map
LOD Change Addendum

Montgomery County, MD
Revised September 2012

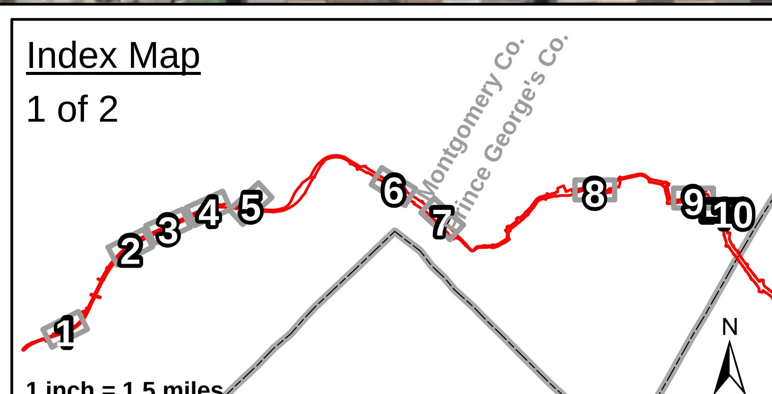
SHEET 9 of 19

Legend

- Updated FEIS LOD
- FEIS LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

Feet: 0, 50, 100, 200, 300, 400

N



Purple Line
Wetland Delineation Map

Montgomery County, MD
Revised September 2012

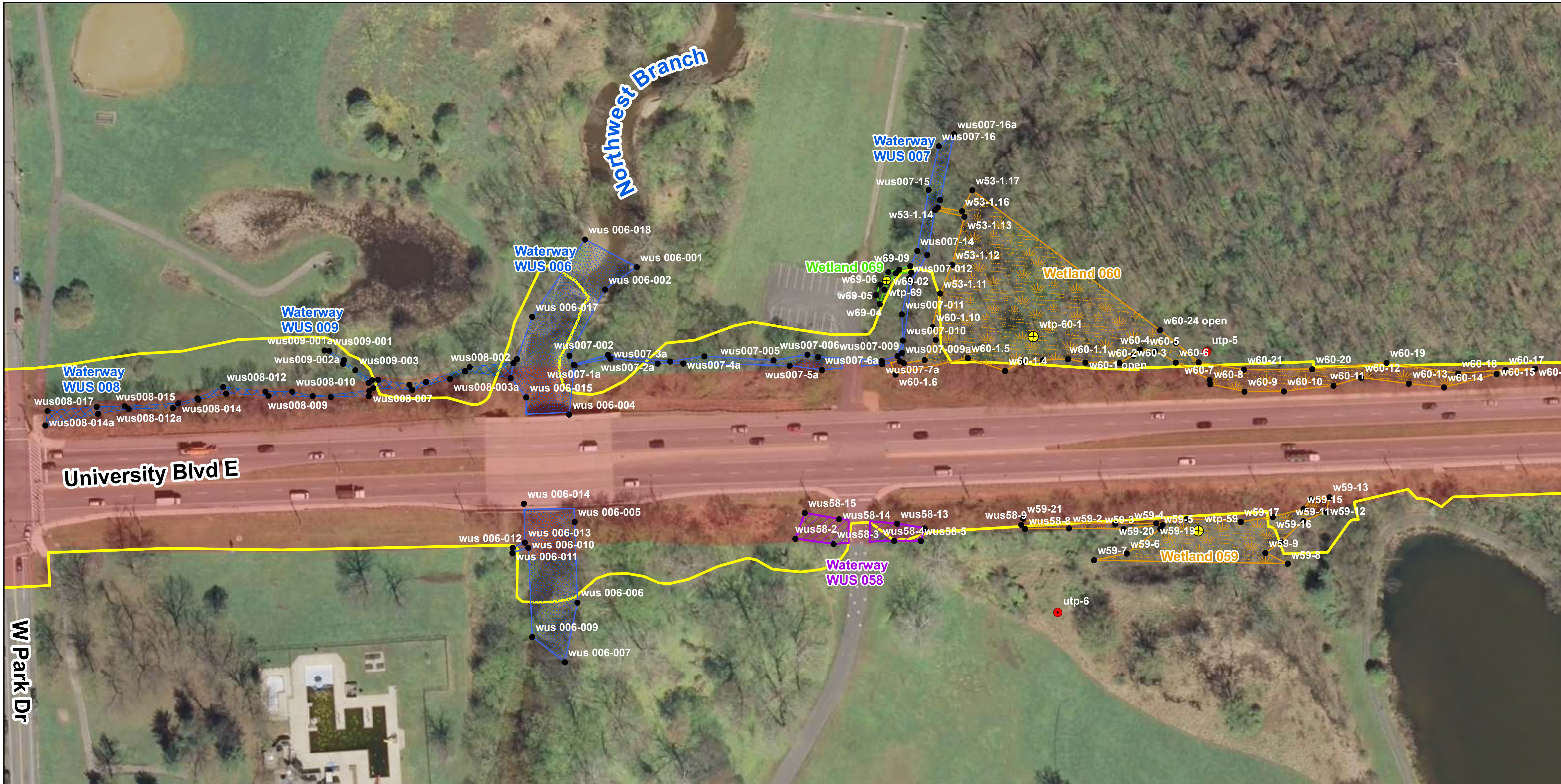
SHEET 10 of 19

Legend

LOD
Forested wetland
Emergent wetland
Scrub-shrub wetland
Ephemeral stream
Intermittent stream
Perennial stream
Open water
Upland test plot
Wetland Test Plot
Flag Point

Feet
0 50 100 200 300 400

N



Purple Line
Wetland Delineation Map
LOD Change Addendum

Prince George's County, MD
Revised September 2012

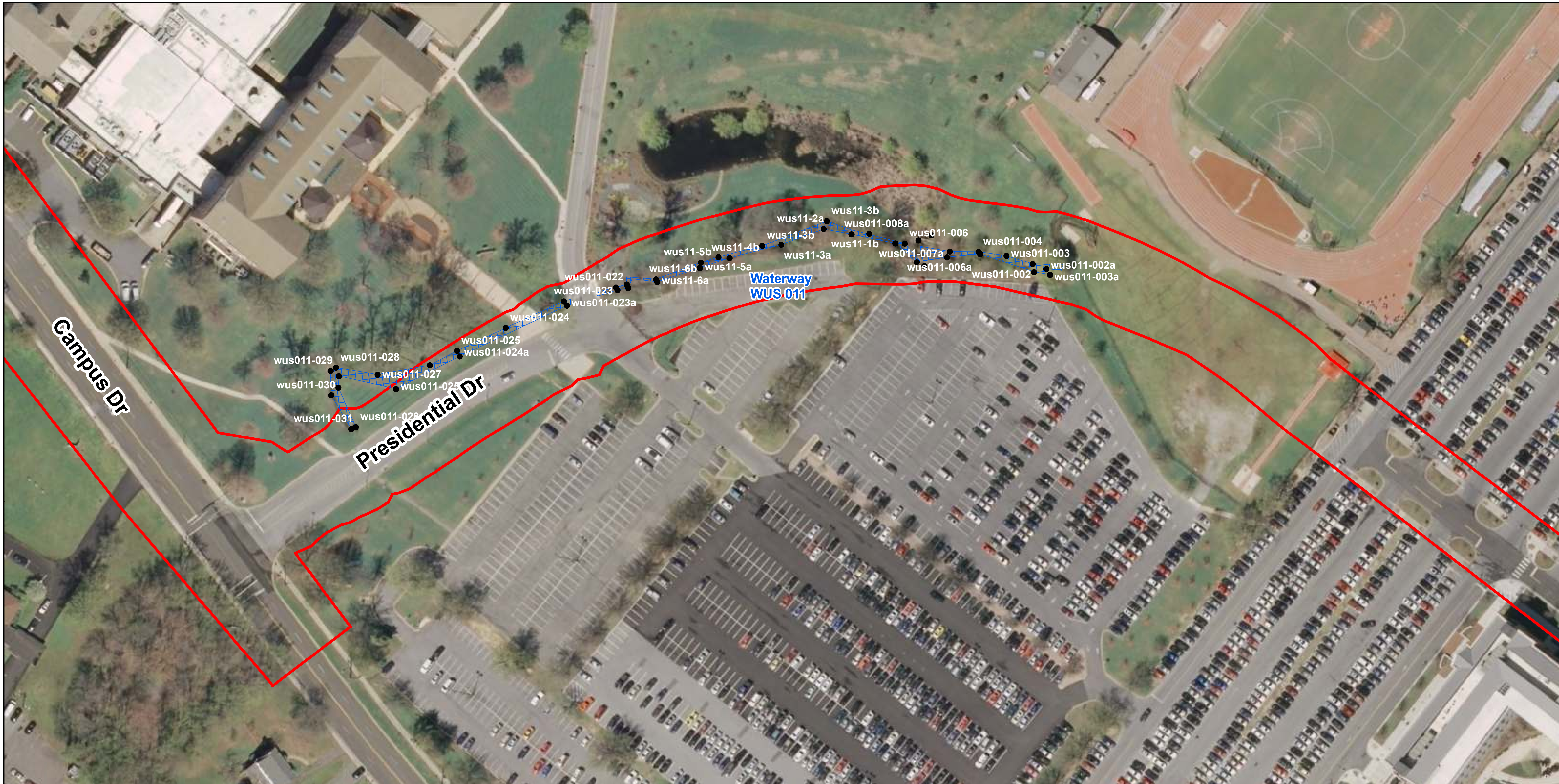
SHEET 11 of 19

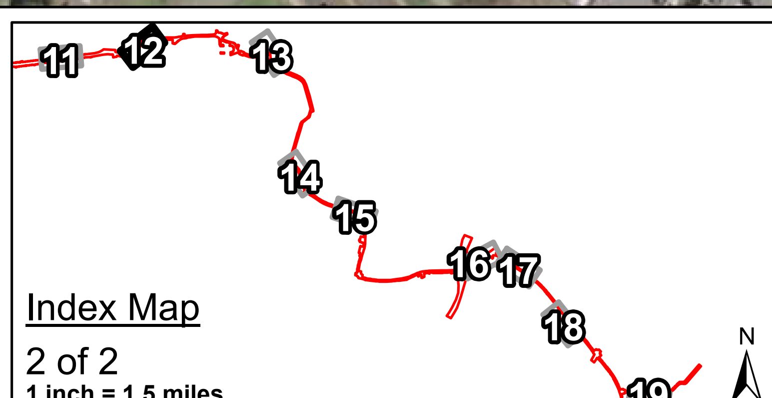
Legend

- Updated FEIS LOD
- FEIS LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N





Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

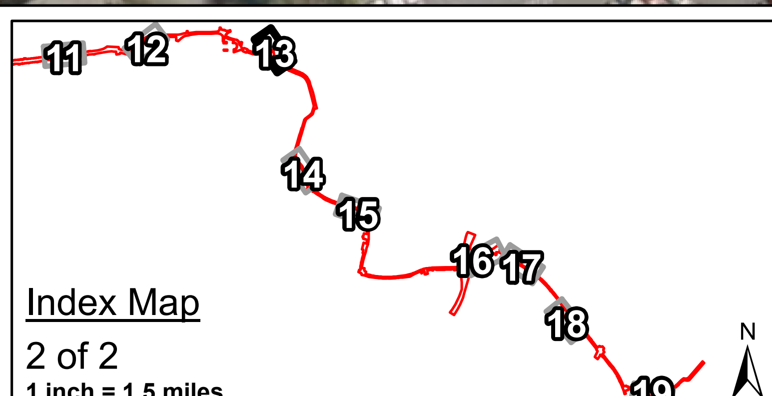
Prince George's County, MD
Revised September 2012

SHEET 12 of 19

Legend

- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet



Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised September 2012

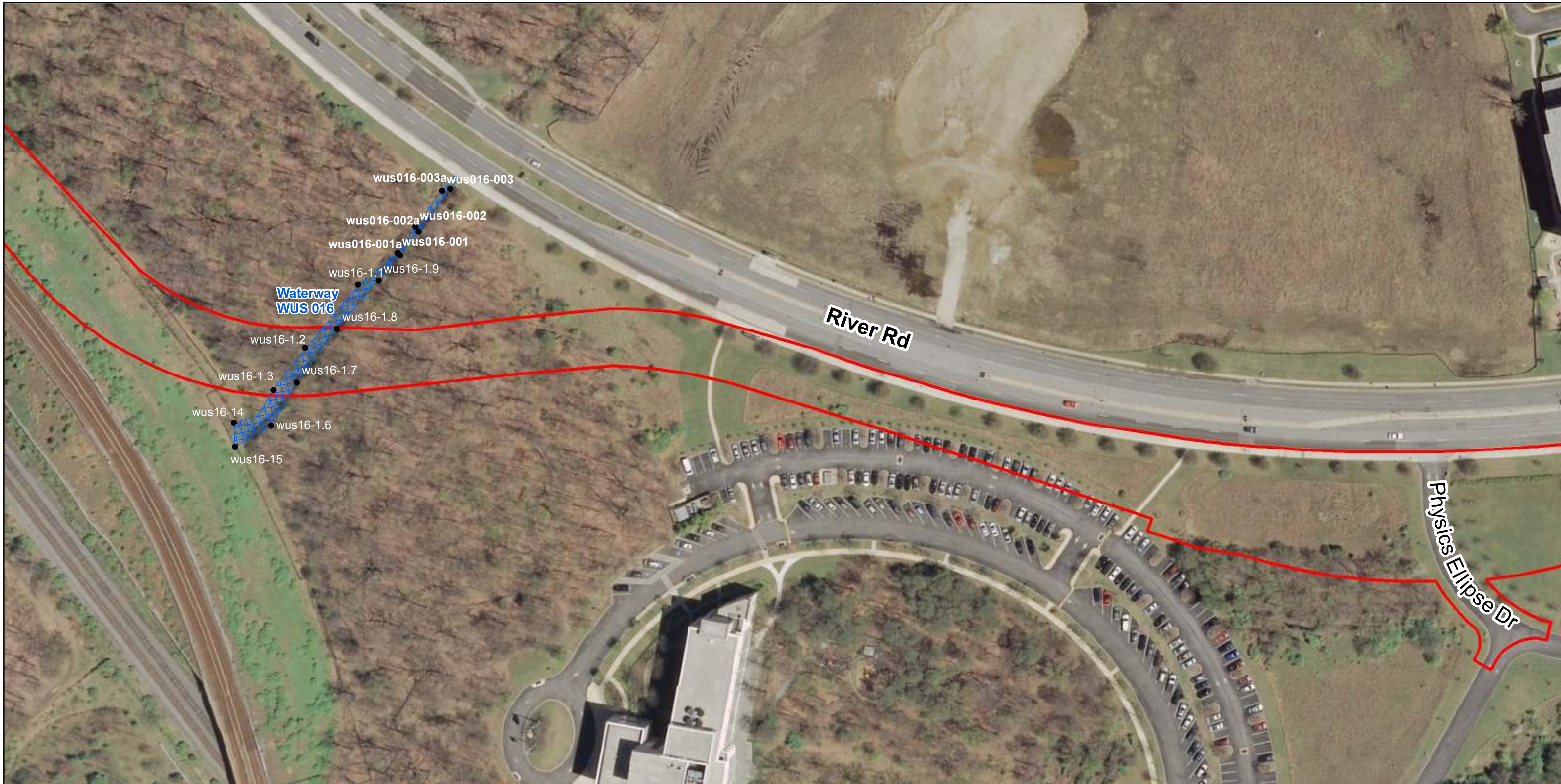
SHEET 13 of 19

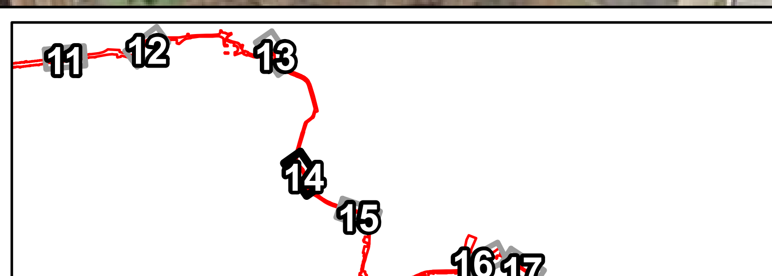
Legend

LOD	Ephemeral stream	Upland test plot
Forested wetland	Intermittent stream	Wetland Test Plot
Emergent wetland	Perennial stream	Flag Point
Scrub-shrub wetland	Open water	

Feet
0 50 100 200 300 400

N





Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised September 2012

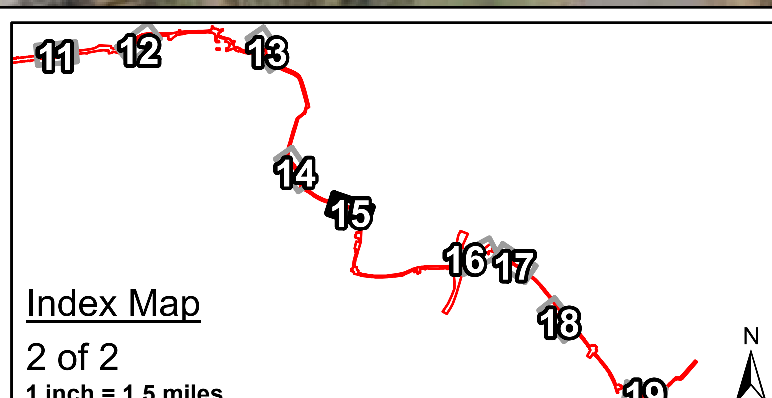
SHEET 14 of 19

Legend

LOD
Ephemeral stream
Upland test plot
Forested wetland
Intermittent stream
Wetland Test Plot
Emergent wetland
Perennial stream
Flag Point
Scrub-shrub wetland
Open water

Feet
0 50 100 200 300 400

N



Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised September 2012

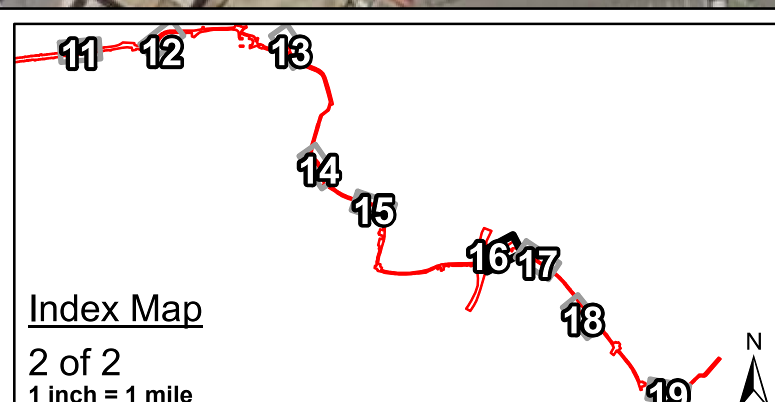
SHEET 15 of 19

Legend

- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N



Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised September 2012

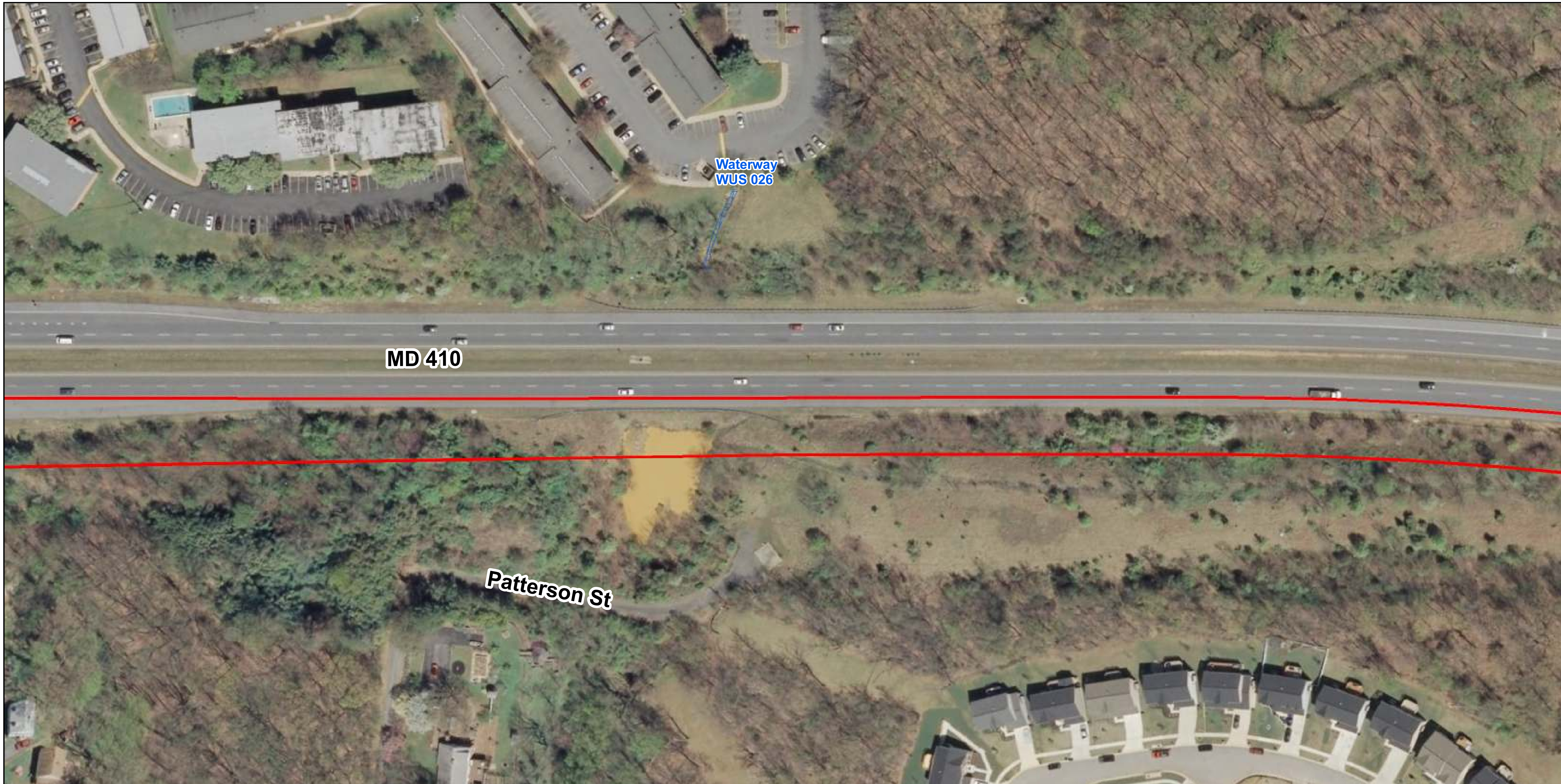
SHEET 16 of 19

Legend

- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N



Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised September 2012

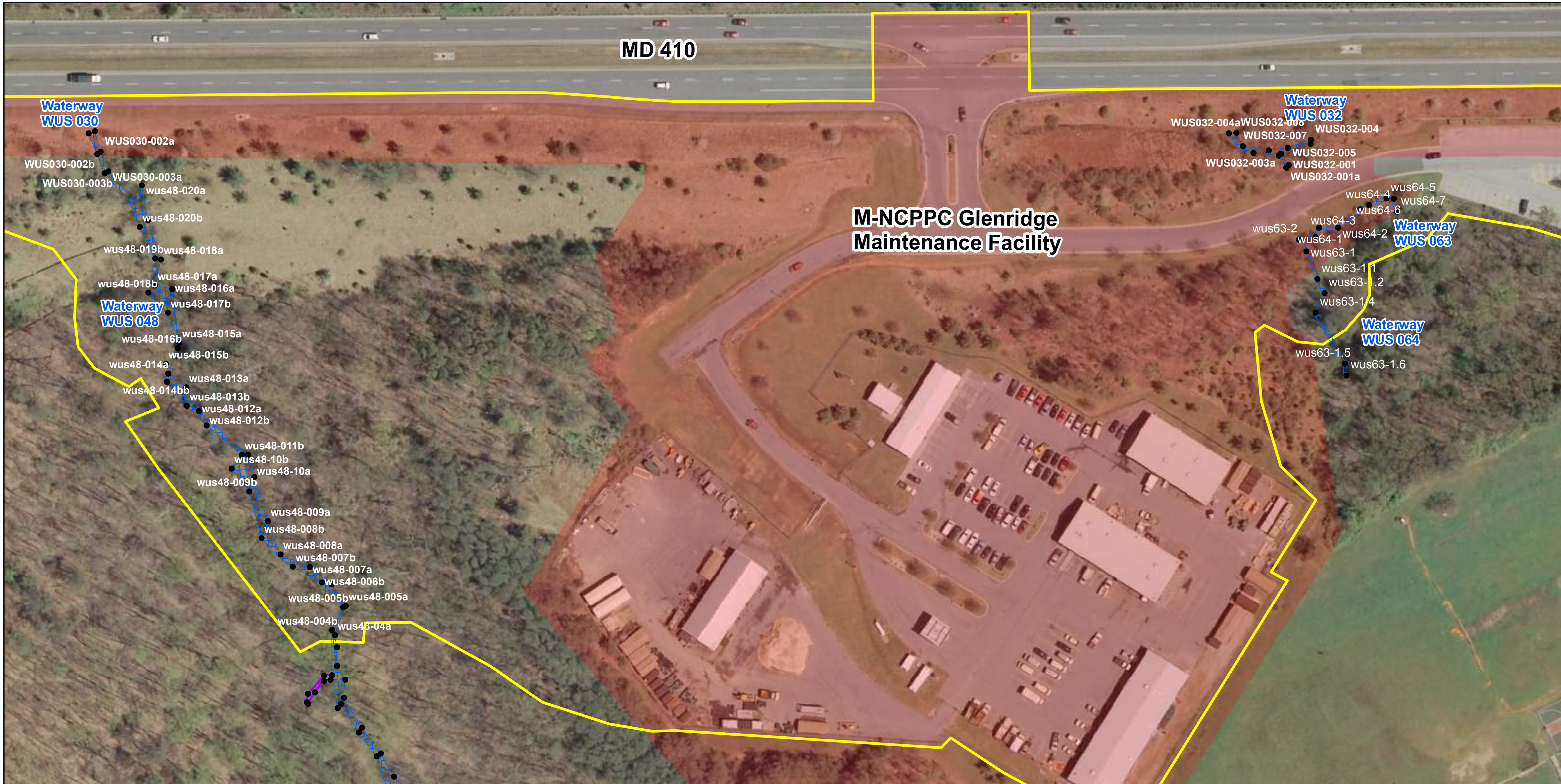
SHEET 17 of 19

Legend

- LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

Feet: 0, 50, 100, 200, 300, 400

N



Purple Line

Index Map

2 of 2

1 inch = 1.5 miles

Purple Line
Wetland Delineation Map
LOD Change Addendum

Prince George's County, MD
Revised September 2012

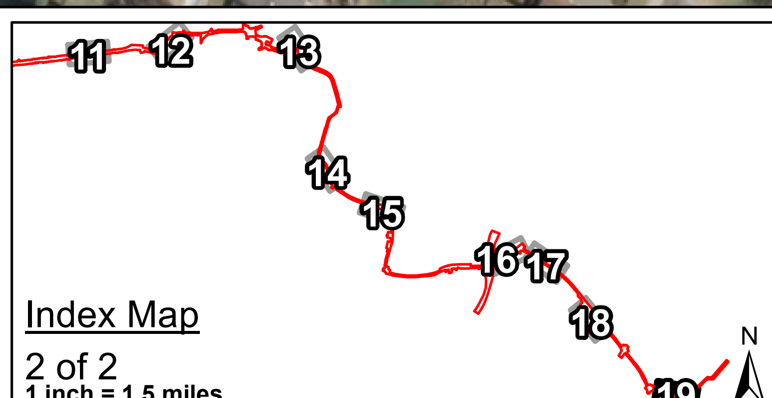
SHEET 18 of 19

Legend

- Updated FEIS LOD
- FEIS LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

0 50 100 200 300 400 Feet

N



Purple Line

Purple Line
Wetland Delineation Map
LOD Change Addendum

Prince George's County, MD
Revised September 2012

SHEET 19 of 19

Legend

- Updated FEIS LOD
- FEIS LOD
- Forested wetland
- Emergent wetland
- Scrub-shrub wetland
- Ephemeral stream
- Intermittent stream
- Perennial stream
- Open water
- Upland test plot
- Wetland Test Plot
- Flag Point

Feet
0 50 100 200 300 400

N

MEETING MINUTES

MEETING SUBJECT:	**Purple Line Agency Field Review II**
MEETING DATE, TIME:	**July 30, 2013 at 9:00 a.m.**
MEETING LOCATION:	**Glenridge Shopping Center in Prince George's County, MD**
ATTENDEES:	**Maria Teresi - USACE** **Nick Ozburn - USACE** **Emily Dolbin - MDE** **Bridgette Garner - CRI** **Adam Tatone - CRI**
PREPARED BY:	**Adam Tatone**

The attendees met in the northwest corner of the Glenridge Shopping Center parking lot in Hyattsville, Maryland at 9:00 a.m. on July 30, 2013 to review additional areas within the eastern portion of the Purple Line project. The purpose of this meeting was to review additional flagged waters of the U.S., including wetlands, within the Preferred Alternative in order to obtain an approved jurisdictional determination (JD) for the project and discuss resource agency concerns. A total of 12 numbered waters of the U.S., including wetlands, were reviewed. The general context of the issues discussed for each area is summarized below.

Wetland 074 This wetland was accepted as flagged.

Wetland 080 This wetland was accepted as flagged.

Wetland 079 This wetland was accepted as flagged.

Wetland 077 This wetland was considered non-jurisdictional by the USACE and MDE as it was created as a result of compaction from the clearing of this previously forested parcel.

Wetland 078 This wetland was considered non-jurisdictional by the USACE and MDE as it was created as a result of compaction from the clearing of this previously forested parcel.

WUS 018 This waterway was accepted as flagged.

Wetland 075 This wetland was accepted as flagged.

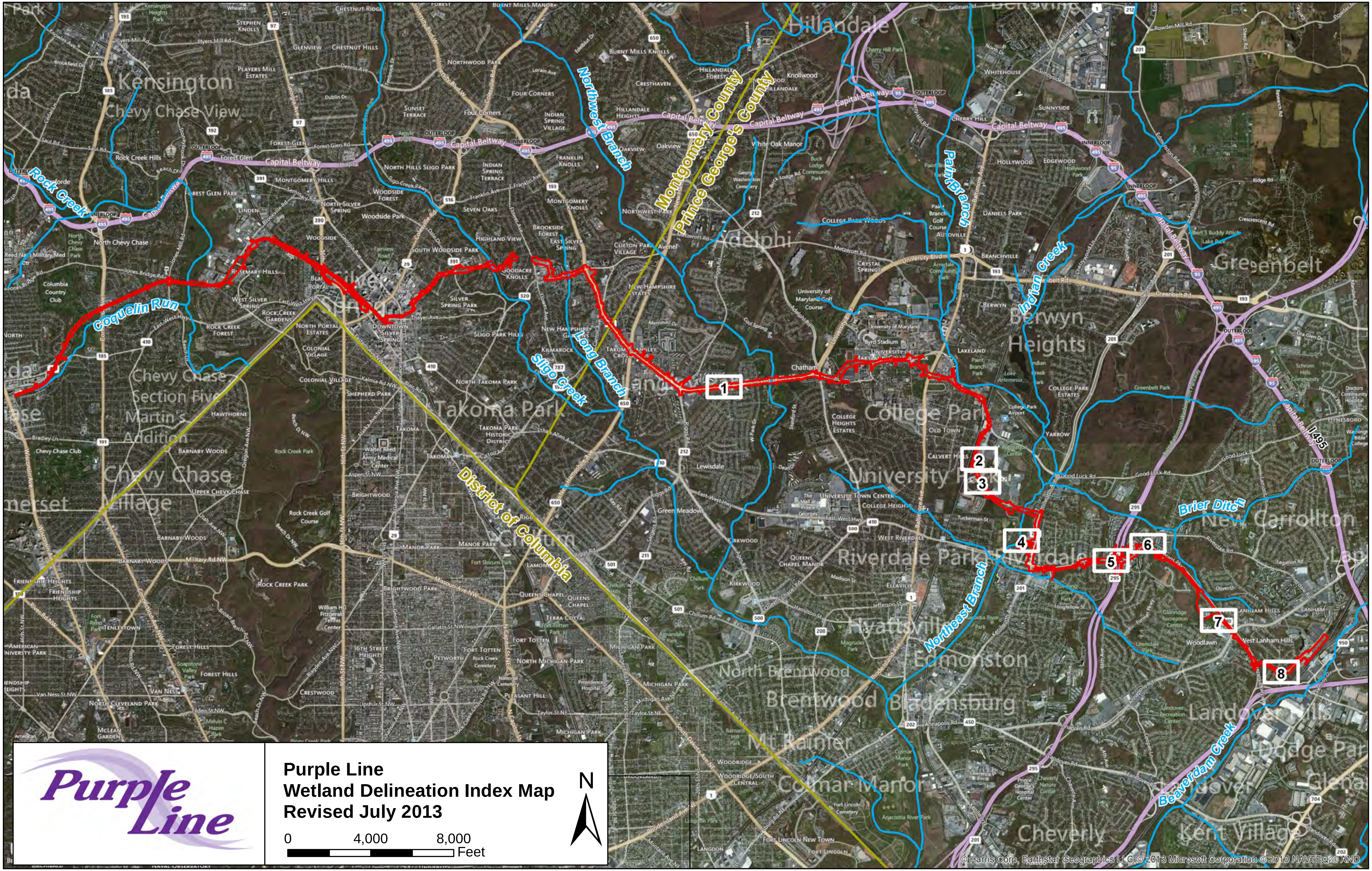
Wetland 024 This wetland was accepted as flagged.

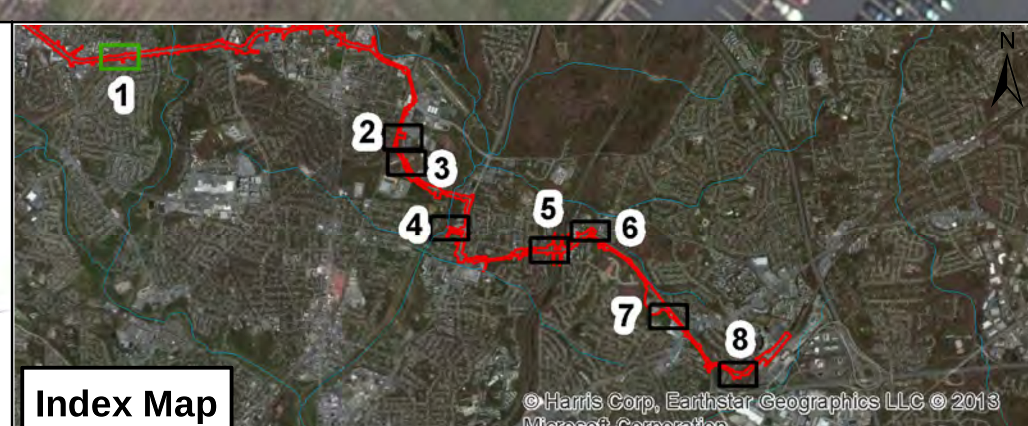
WUS 023 This waterway was accepted as flagged.

WUS 082 This waterway was accepted as flagged.

Wetland 081 This wetland was accepted as flagged. An area east of Wetland 081 was questioned as being a wetland, but further investigation found a leaking water main was providing the hydrology for this area. Therefore, the USACE and MDE did not consider this area to meet the wetland criteria.

Wetland 074 This wetland was accepted as flagged.


Purple Line
Wetland Delineation Index Map
Revised July 2013
0
4,000
8,000
Feet
N
Purple Line
1
2
3
4
5
6
7
8
Rock Creek
Coquelin Run
Sligo Creek
Long Branch
Northwest Branch
Paint Branch
Indian Creek
Northeast Branch
Brier Ditch
Beaverdam Creek
I-495
Montgomery County
Prince George's County
District of Columbia
Kensington
Chevy Chase View
Hillandale
Adelphi
Greenbelt
Berwyn Heights
College Park
University Park
Riverdale Park
New Carrollton
Hyattsville
Edmonston
North Brentwood
Brentwood
Bladensburg
Mt Rainier
Colmar Manor
Cheverly
Landover Hills
Kent Village
Takoma Park
Chevy Chase Section Five
Martin's Addition
Chevy Chase Village
Capital Beltway
© Harris Corp, Earthstar Geographics LLC © 2013 Microsoft Corporation © 2010 NAVTEQ © AND



Legend

FEIS LOD	Intermittent stream
Forested wetland	Perennial stream
Emergent wetland	Open water
Scrub-shrub wetland	Upland test plot
Ephemeral stream	Wetland test plot
Approved wetlands 2012 JD	Flag point

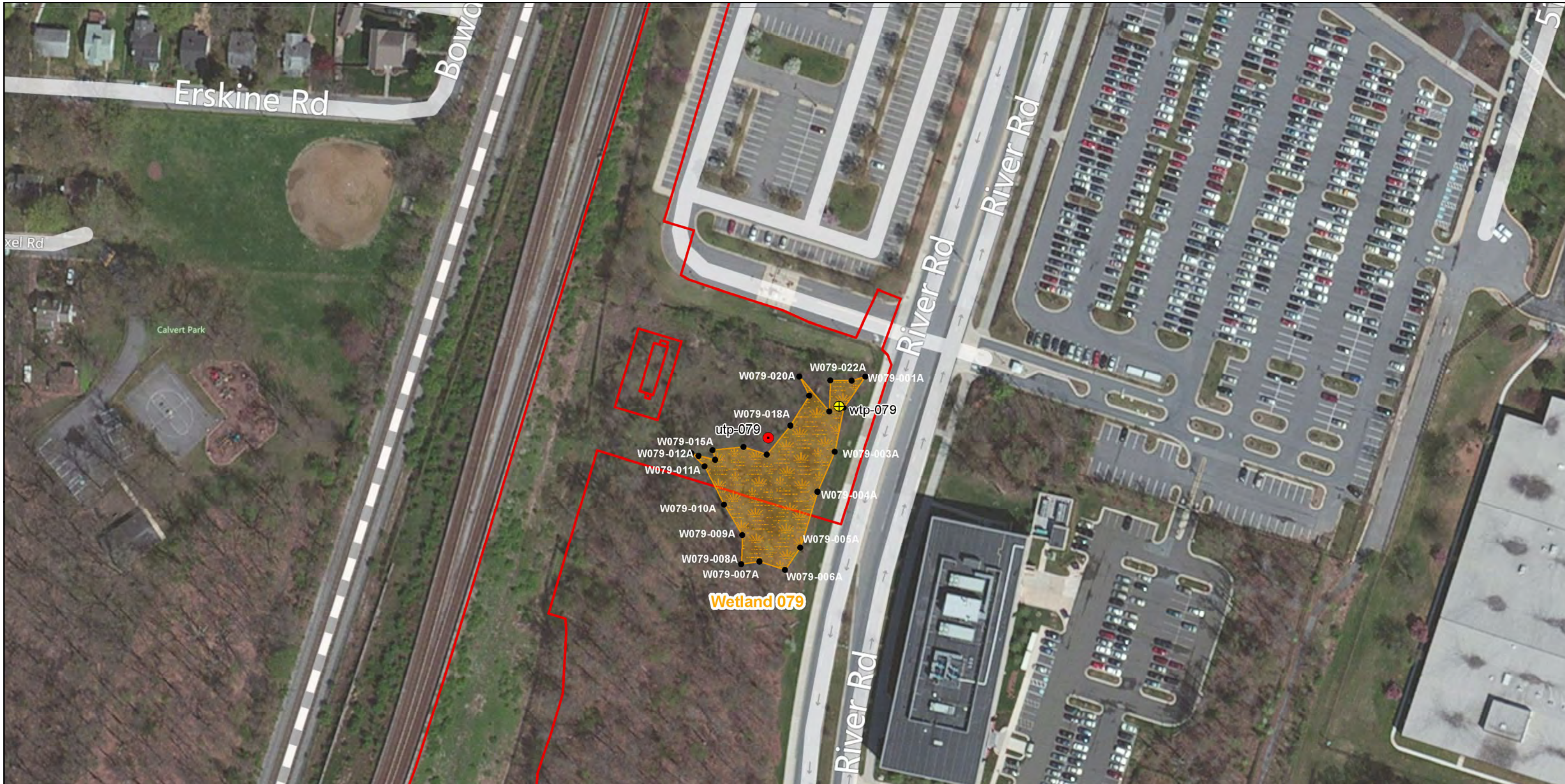
N

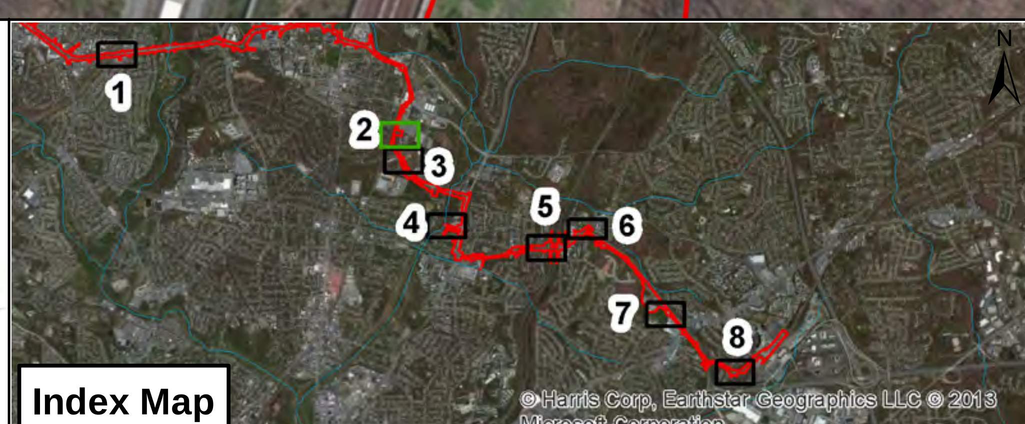
0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 1 OF 8





Legend

	FEIS LOD		Intermittent stream
	Forested wetland		Perennial stream
	Emergent wetland		Open water
	Scrub-shrub wetland		Upland test plot
	Ephemeral stream		Wetland test plot
	Approved wetlands 2012 JD		Flag point

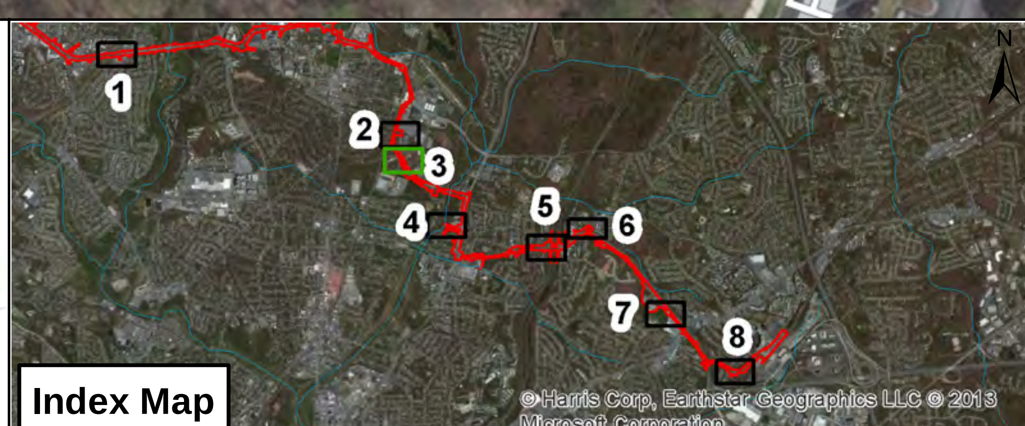
N

0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 2 OF 8



Legend

FEIS LOD	Intermittent stream
Forested wetland	Perennial stream
Emergent wetland	Open water
Scrub-shrub wetland	Upland test plot
Ephemeral stream	Wetland test plot
Approved wetlands 2012 JD	Flag point

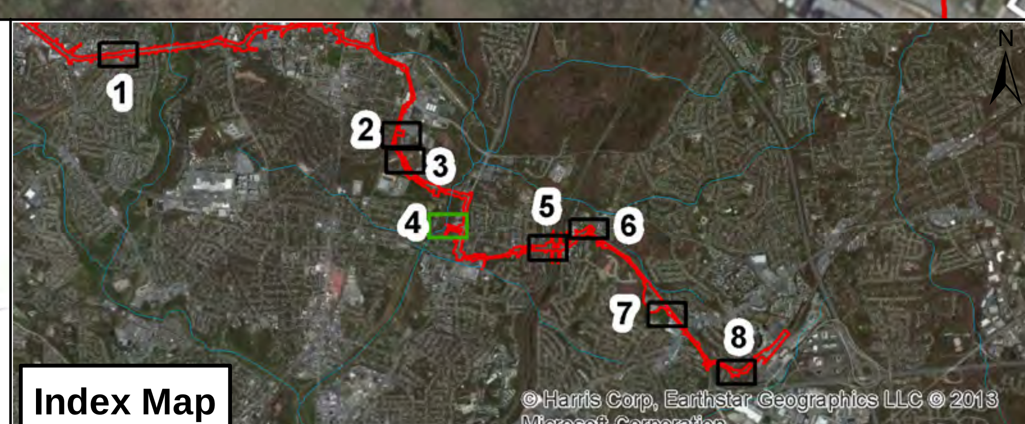
N

0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 3 OF 8



Legend

	FEIS LOD		Intermittent stream
	Forested wetland		Perennial stream
	Emergent wetland		Open water
	Scrub-shrub wetland		Upland test plot
	Ephemeral stream		Wetland test plot
	Approved wetlands 2012 JD		Flag point

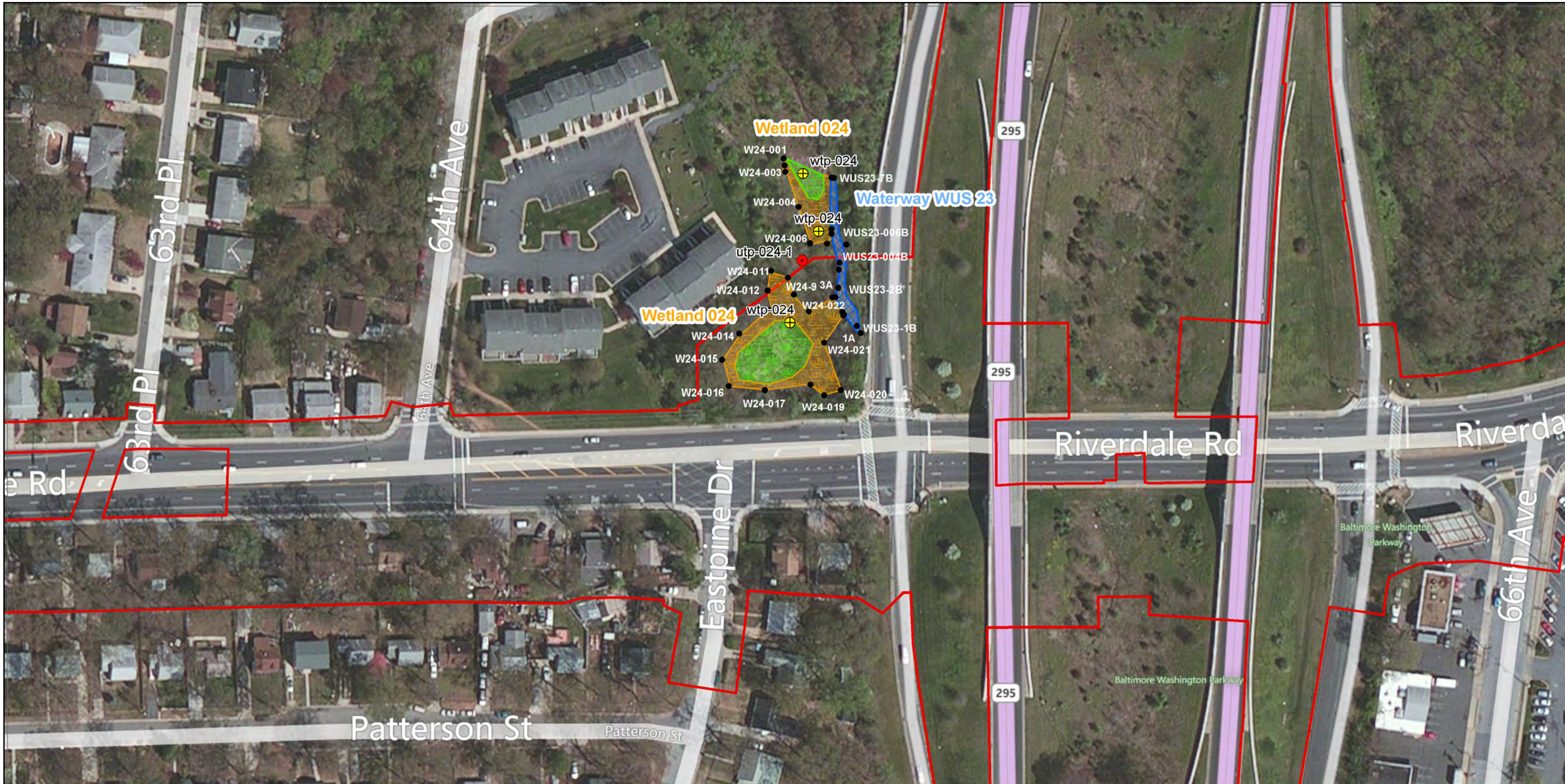
N

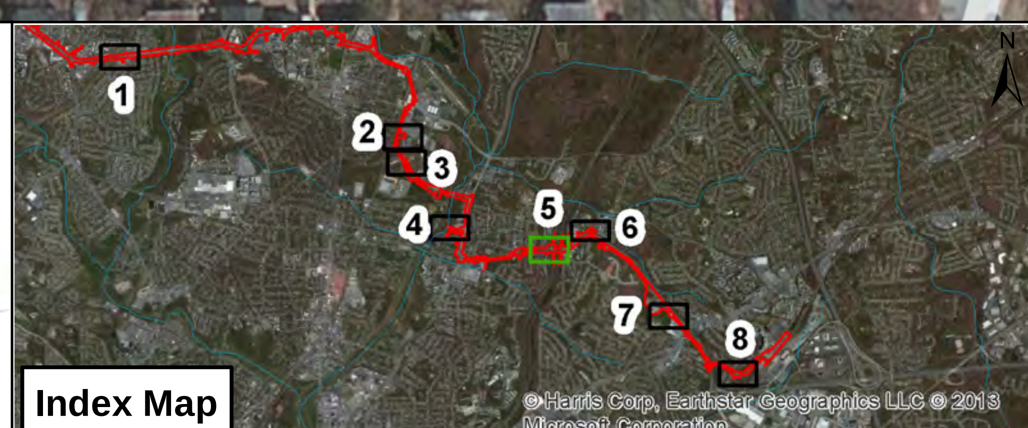
0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 4 OF 8





Legend

FEIS LOD	Intermittent stream
Forested wetland	Perennial stream
Emergent wetland	Open water
Scrub-shrub wetland	Upland test plot
Ephemeral stream	Wetland test plot
Approved wetlands 2012 JD	Flag point

N

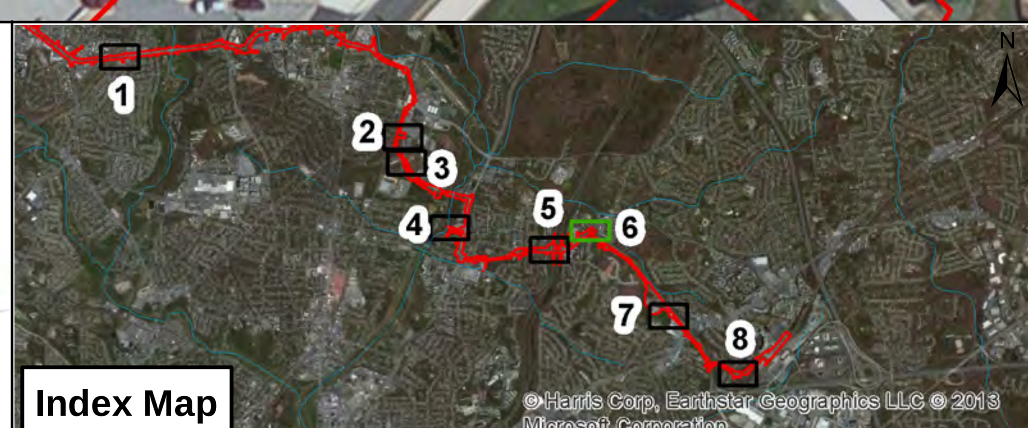
0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 5 OF 8

Purple Line



Legend

FEIS LOD	Intermittent stream
Forested wetland	Perennial stream
Emergent wetland	Open water
Scrub-shrub wetland	Upland test plot
Ephemeral stream	Wetland test plot
Approved wetlands 2012 JD	Flag point

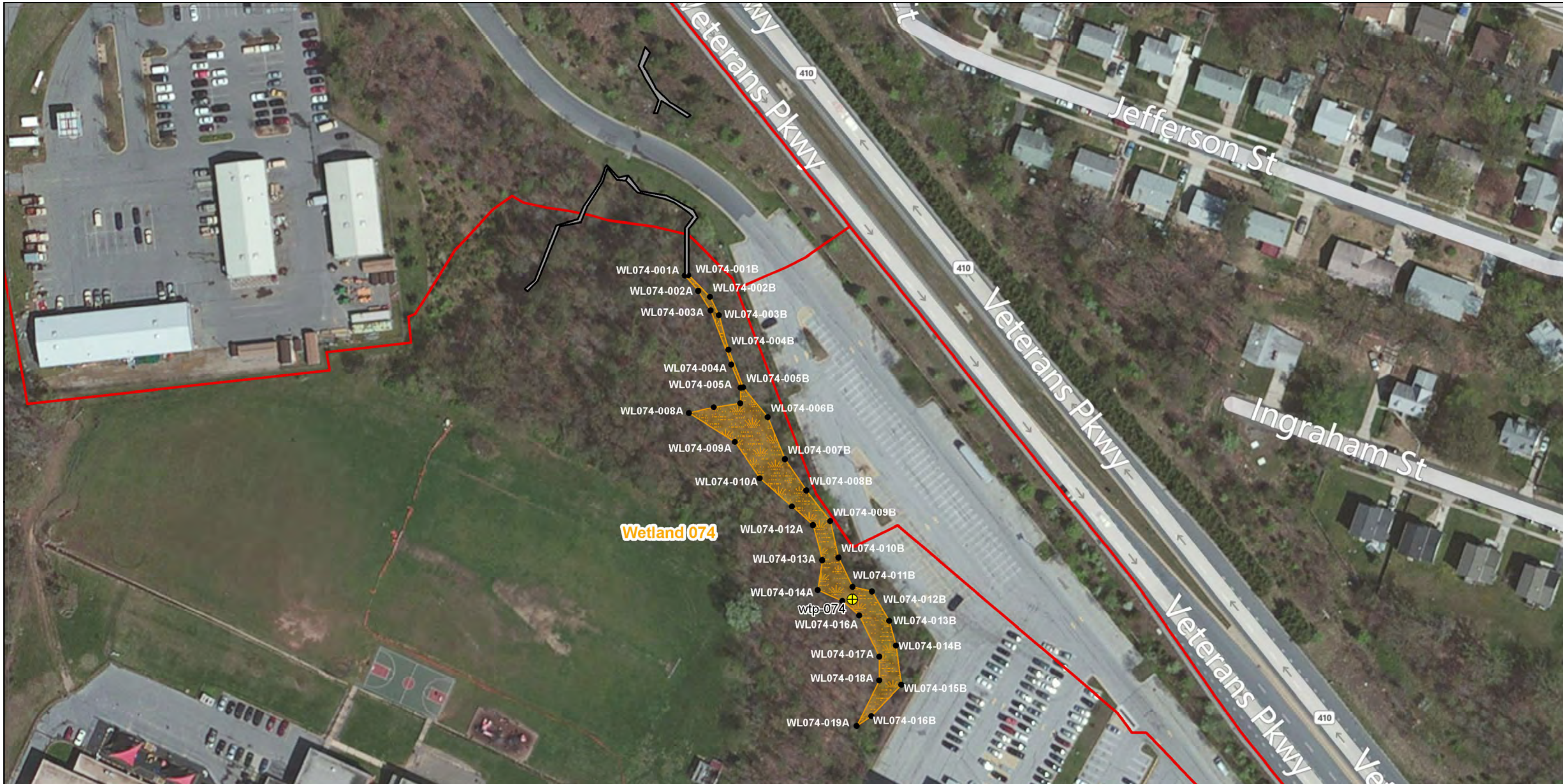
N

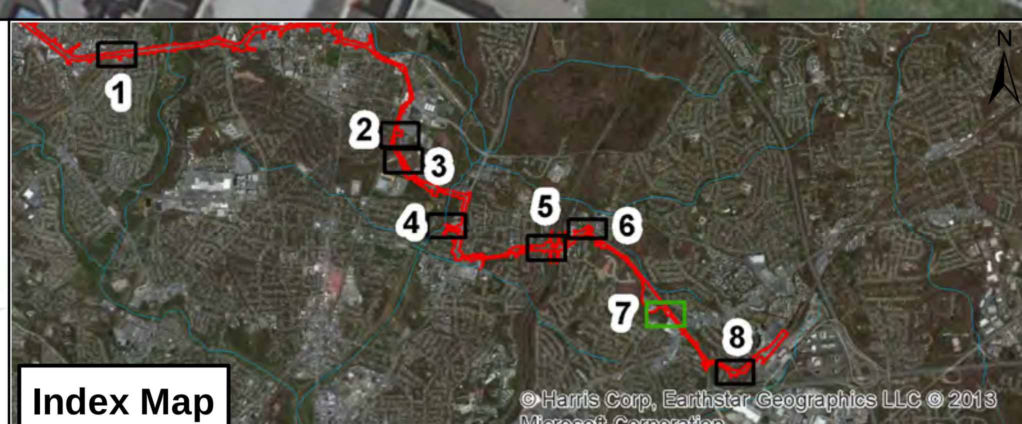
0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 6 OF 8





Purple Line

Legend

FEIS LOD	Intermittent stream
Forested wetland	Perennial stream
Emergent wetland	Open water
Scrub-shrub wetland	Upland test plot
Ephemeral stream	Wetland test plot
Approved wetlands 2012 JD	Flag point

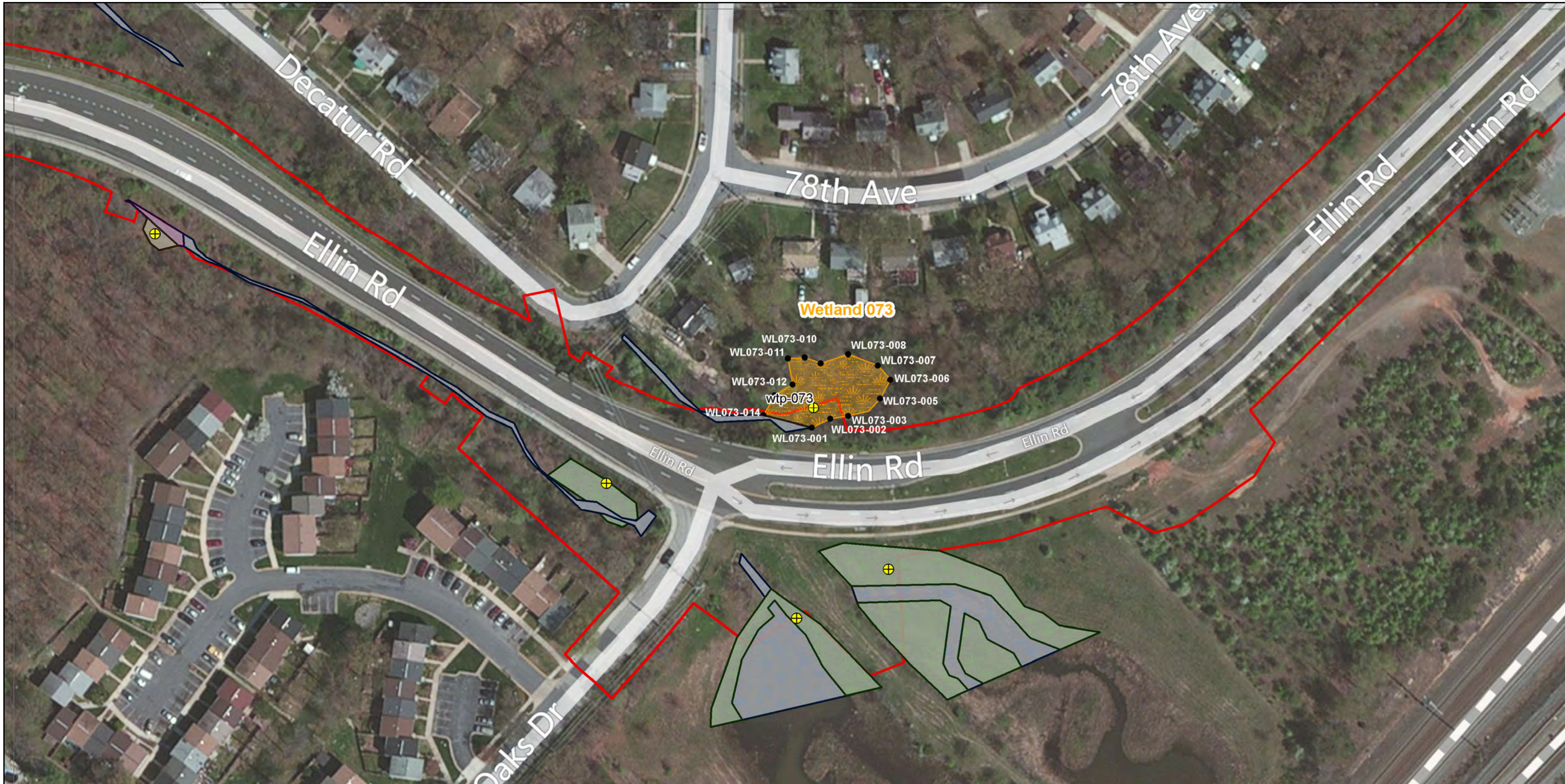
N

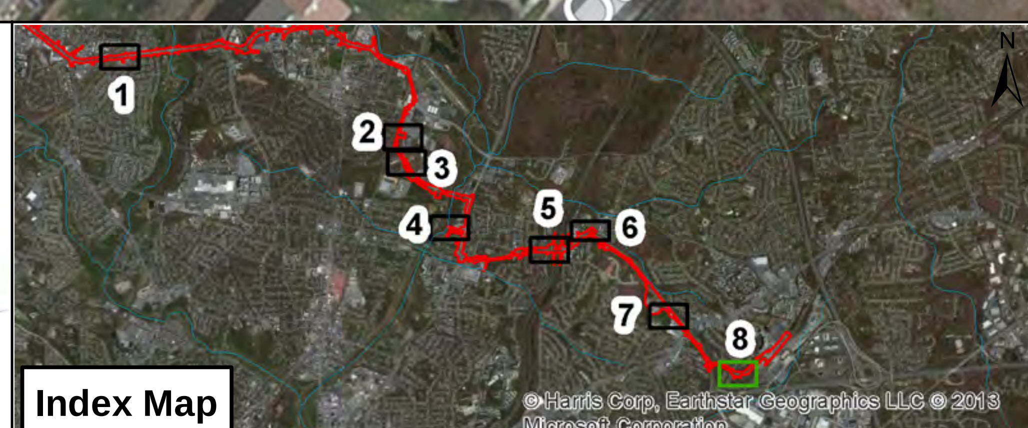
0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 7 OF 8





Legend

	FEIS LOD		Intermittent stream
	Forested wetland		Perennial stream
	Emergent wetland		Open water
	Scrub-shrub wetland		Upland test plot
	Ephemeral stream		Wetland test plot
	Approved wetlands 2012 JD		Flag point

N

0 100 200 Feet

Purple Line
Wetland Delineation Map

Prince George's County, MD
Revised July 2013

SHEET 8 OF 8

Appendix F – Mitigation Agency Field Review Packages

General Engineering Consultant Team
801 South Caroline Street
Baltimore, MD 21231

Purple Line Project
Potential Wetland and Stream Mitigation Sites
Agency Field Review

Agenda

Meeting Objective: To provide an overview of potential wetland and stream mitigation sites.

October 25, 2012

- Meet at Home Depot Parking Lot (4700 Cherry Hill Rd, College Park, MD) at 9:00 AM

  - Review of Agenda
  - Project Status

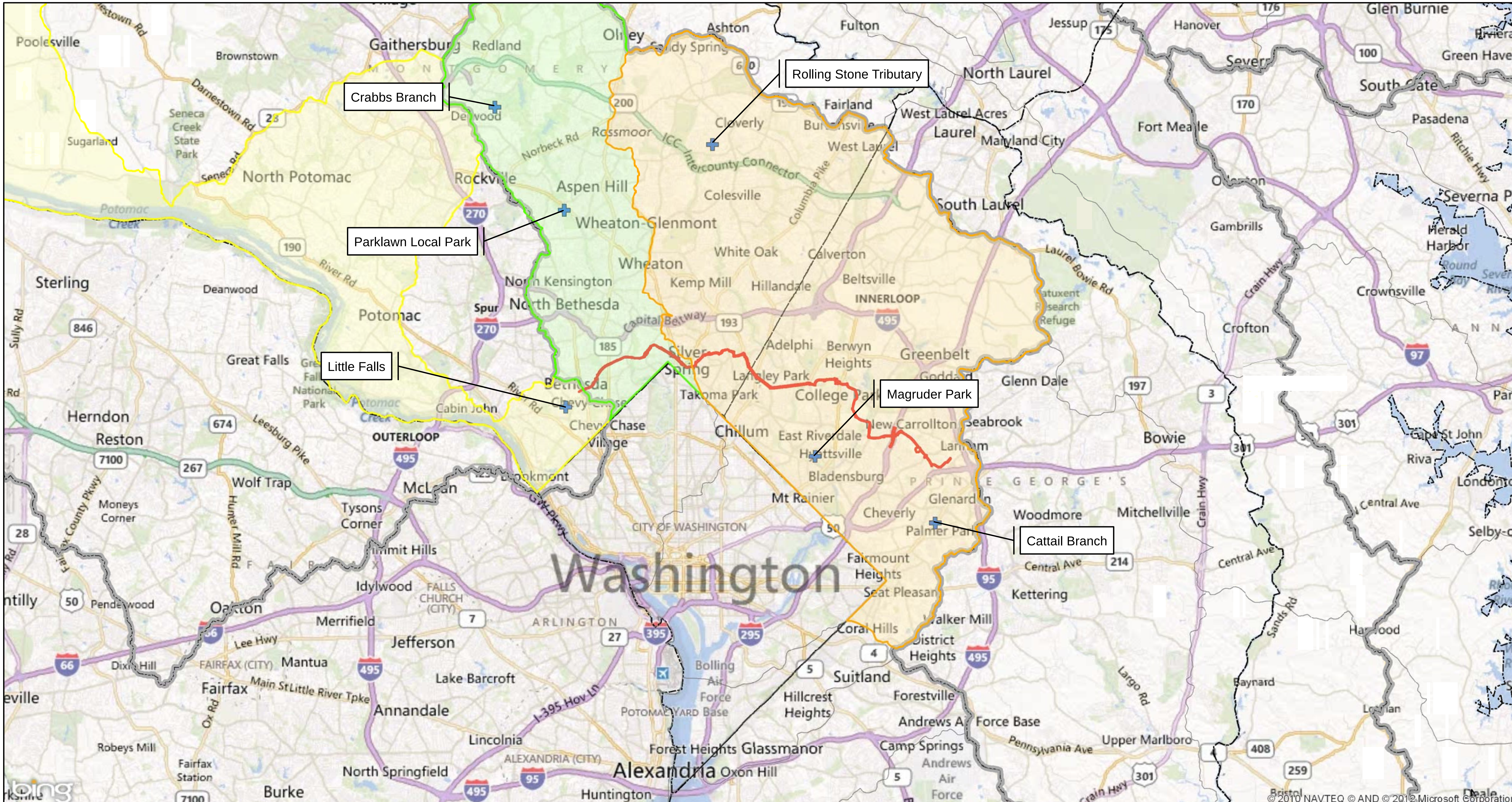
1. Cattail Branch – Wetland and Stream Mitigation Site
2. Magruder Park – Wetland and Stream Mitigation Site
3. Little Falls Branch - Optional Stream Mitigation Site
4. Pit stop for Lunch and/or bathroom
5. Parklawn Local Park – Wetland Mitigation Site
6. Crabbs Branch – Wetland and Stream Mitigation Site with Riparian Buffer Enhancement Opportunities
7. Rolling Stone Tributary – Stream Mitigation Site

- Wrap-up and Discussion of Purple Line Mitigation Sites for Conceptual Package
- Discuss dates/need for tour of privately owned parcels.

Purple Line Project

Potential Wetland and Stream Mitigation Sites

Site Name	Site ID	Type of Mitigation	Site size (acres and/or L.F.)	Location	Watershed	Property Ownership
Cattail Branch	AR-2 AR-3 AR-4 AR-8 AR-9	Stream	4,500 L.F.	Landover	Beaverdam Creek	Public
	AR-8	Wetland	0.70 Acres			
Magruder Park	AR-21	Stream	950 L.F.	Hyattsville	Northwest Branch	Public
	AR-21	Wetland	0.95 Acres			
Little Falls Branch	PR-1	Stream	850 L.F.	Bethesda	Potomac River	Public
Parklawn Local Park	RC-9	Wetland	4.37 Acres	Rockville	Rock Creek	Public
Crabbs Branch	RC-74	Stream	5,360 L.F.	Derwood	Rock Creek	Public
	RC-74	Wetland	3.22 Acres			
Rolling Stone Tributary	NW-49 NW-50	Stream	2,700 L.F.	Colesville	Northwest Branch	Public



Legend

- Potential Sites
- Subwatersheds
- MD County Boundaries
- HUC8 Boundaires
- Purple Line Corridor
- Little Falls
- Rock Creek
- Anacostia River

Purple Line
Potential Mitigation Sites
Vicinity Map

October 2012

N

1 inch = 3 miles

0 1.5 3 6 Miles

Purple Line Project
Potential Stream and Wetland Mitigation Site on Cattail Branch
(AR-2, AR-3, AR-4, AR-8, AR-9)

Existing Conditions Summary

Location Information

County:	Prince George's
Watershed:	Beaverdam Creek
Coordinates:	38°52'11.07"N / 76°52'42.82"W **USGS Quad:** Washington East and Lanham
Location:	East and West of the intersection of Martin Luther King Jr. Hwy and Greenleaf Rd, Landover, MD
Property Ownership:	Public (Maryland-National Capital Park and Planning)
Constraints:	Utilities

Site Conditions

Parcel Area:	77.03 Ac **Existing Land Use:** Forest, Parkland
Landscape Position:	Stream Valley **Adjacent Land Use:** Residential, Commercial
Drainage Area:	1,792 Ac
Habitat Location:	Contiguous to wetland/upland forest, 25 to 100 Acres
Mapped Soils:	Issue-urban land complex; Christiana-Downer-Urban land complex; Zekiah and Issue soils; Zekiah-urban land complex; Christiana-Downer complex
Mapped Wetlands:	NWI and DNR wetlands mapped on site
Green Infrastructure:	Not located adjacent to Green Infrastructure

This wetland creation and stream restoration site is located east and west of the intersection of Martin Luther King Jr. Highway and Green Leaf Rd. This site is associated with Cattail Branch, a tributary of Beaverdam Run. The stream corridor is forested (the downstream end is within the Kentland Park area), with adjacent residential and commercial development. Several fish barriers exist along the corridor at road and utility crossings. Stream banks are vertical and eroding, particularly along park areas where there is little riparian buffer. Severe bank and channel erosion exists downstream of the culverts under Landover Rd (AR-2) and Barlowe Rd (AR-9). An open field located at the end of E. Forest Rd currently exhibits a perched hydrology suitable for wetland creation.

Summary of Opportunities

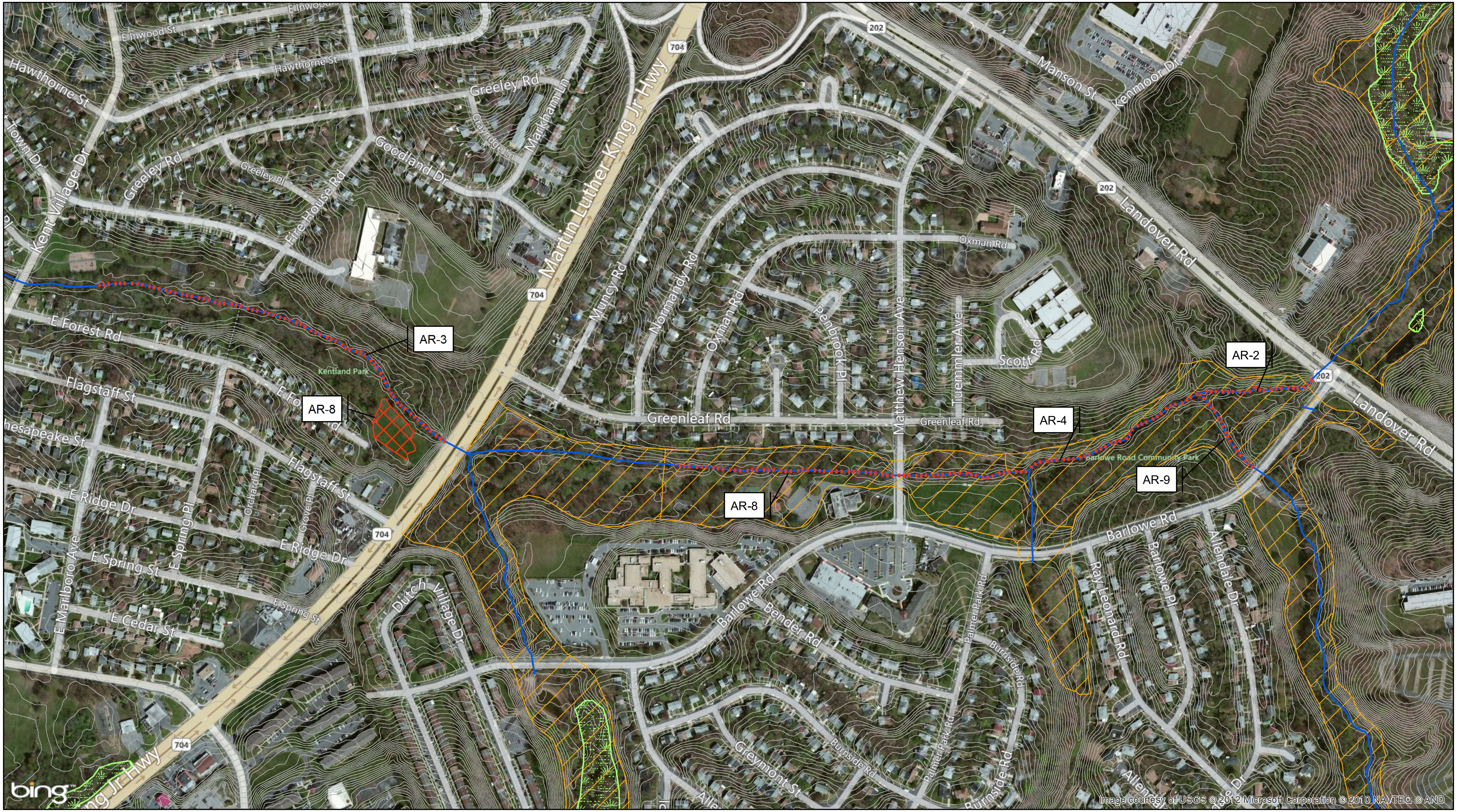
- Stream Restoration – Approximately 4,570 Linear Feet
- Wetland Creation – Approximately 0.70 Acres

Restoration Objectives

- Stream Stabilization and Floodplain Reconnection, Protection of Utilities and Park Assets
- Fish Passage
- Wetland Creation

Restoration Concept

- Installation of in-stream structures and bank grading to improve channel stability, reduce sediment loading, provide floodplain connection, and improve in-stream habitat
- Provide fish passage over barriers and through culverts to allow unrestricted access through the 1.8 miles of forested, natural stream corridor owned by M-NCPPC
- Minor grading/compaction and wetland planting in the field at the end of E. Forest Rd.



Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands
Hydric Soils

N
1 in = 400 feet
0 200 400 800 Feet

ASSOCIATED SITE ID:

AR-2 AR-8
AR-3 AR-9
AR-4

Purple Line
Potential Mitigation Sites

Cattail Branch

October 2012

Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands

N
1 in = 50 feet
0 25 50 100 Feet

ASSOCIATED SITE ID:

AR-3
AR-8

Purple Line
Potential Mitigation Sites

Cattail Branch

October 2012

Purple Line Project
Potential Wetland and Stream Mitigation Site at Unnamed Tributary of Northwest Branch
(AR-21)

Existing Conditions Summary

Location Information

County:	Prince George's		
Watershed:	Northwest Branch		
Coordinates:	38°56'58.20"N / 76°57'06.55"W	**USGS Quad:**	Washington East
Location:	South of the intersection of Hamilton St. and 40th Ave., Hyattsville, MD		
Property Ownership:	Public (Maryland-National Capital Park and Planning, City of Hyattsville)		
Constraints:	Utilities, Ball Fields		

Site Conditions

Parcel Area:	17.78 Ac	**Existing Land Use:**	Forest
Landscape Position:	Stream Valley	**Adjacent Land Use:**	Recreational, Residential
Drainage Area:	256 Ac		
Habitat Location:	Contiguous to wetland/upland forest, 25 to 100 Acres		
Mapped Soils:	Cordorus and Hatboro soils; Cordorus-Hatboro-Urban land complex		
Mapped Wetlands:	NWI and DNR wetlands mapped on site		
Green Infrastructure:	Located within Gap and Corridor Green Infrastructure		

This site is located south of the intersection of Hamilton St and 40th Ave, within Magruder Park. This site is associated within an unnamed tributary of Northwest Branch. The stream flows through a forested corridor adjacent to recreational fields associated with Magruder Park. The stream channel exhibits some instability and moderate bank erosion due to historical straightening. An open area on the north side of an existing bioretention area appears suitable for wetland creation.

Summary of Opportunities

- Stream Restoration – Approximately 950 Linear Feet
- Wetland Creation – Approximately 0.95 Acres

Restoration Objectives

- Wetland Creation
- Stream Stabilization
- Habitat improvement
- Floodplain Reconnection

Restoration Concept

- Minimal grading to north of bioretention area to create wetlands
- Planform adjustment to return the channel to a meandering stream
- Bank grading to improve floodplain connectivity and reduce sediment loading
- Installation of in-stream structures to improve channel stability, protect existing utilities, and improve in-stream habitat

Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands
Hydric Soils

N
1 in = 200 feet
0 100 200 400 Feet

ASSOCIATED SITE ID:
AR-21

Purple Line Potential Mitigation Sites

Magruder Park

October 2012

Purple Line Project
Potential Stream Mitigation Site on Little Falls Branch
(PR-1)

Existing Conditions Summary

Location Information

County:	Montgomery		
Watershed:	Potomac River		
Coordinates:	38°58'28.82"N / 77°06'11.33"W	**USGS Quad:**	Washington West
Location:	Southwest of the intersection of Bradley Blvd. and Little Falls Pkwy., Bethesda, MD		
Property Ownership:	Public (Maryland-National Capital Park and Planning)		
Constraints:	None		

Site Conditions

Parcel Area:	35.4 Ac	**Existing Land Use:**	Forest, Recreational
Landscape Position:	Stream Valley	**Adjacent Land Use:**	Residential
Drainage Area:	320 Ac		
Habitat Location:	Contiguous to wetland/upland forest, 25 to 100 Acres		
Mapped Soils:	Brinklow-Blocktown channery silt loams; Gaila silt loam; Glenelg-urban land complex		
Mapped Wetlands:	NWI and DNR wetlands mapped on site		
Green Infrastructure:	Not located adjacent to Green Infrastructure		

This stream site is located southwest of the intersection of Bradley Boulevard and Little Falls Parkway. The site is associated with Little Falls Branch, a tributary of the Potomac River. The stream corridor is forested, with nearby residential development and a recreational foot path (Capital Crescent Trail).

Summary of Opportunities

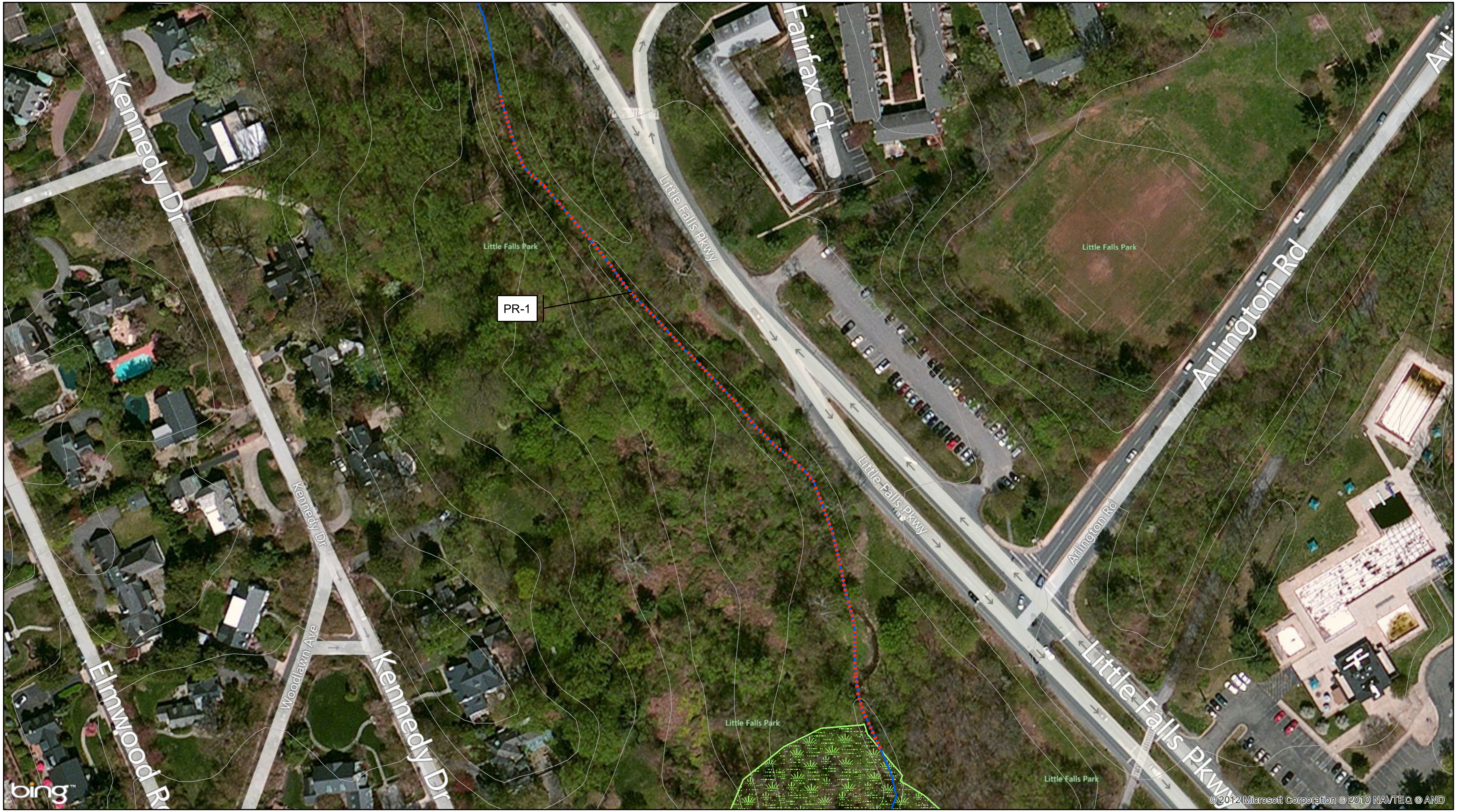
- Stream Restoration – Approximately 850 Linear Feet

Restoration Objectives

- Reconnect the stream to the floodplain
- Reduce bank erosion and in-stream sedimentation
- Enhance habitat conditions and the benthic and fish communities

Restoration Concept

- Installation of in-stream structures and bank grading to improve channel stability, reduce sediment loading, and provide floodplain connection
- Installation of woody debris and other types of in-stream cover and gravel channel material to enhance the benthic and fish habitats and communities



Purple Line

Potential Stream Sites
Streams
2" Contours
DNR/NWI Wetlands
Hydric Soils

N

1 in = 100 feet

0 50 100 200 Feet

ASSOCIATED SITE ID:

PR-1

Purple Line
Potential Mitigation Sites

Little Falls Branch

October 2012

Purple Line Project
Potential Wetland Mitigation Site at Parklawn Local Park
(RC-9)

Existing Conditions Summary

Location Information

County: Montgomery
Watershed: Rock Creek
Coordinates: 39°04'02.00"N / 77°06'12.10"W **USGS Quad:** Rockville
Location: Southwest of Veirs Mill Rd approximately 700 feet southeast of Aspen Hill Rd, Rockville, MD
Property Ownership: Public (Maryland-National Capital Park and Planning)
Constraints: Rock Creek Trail bike path on southwest side of soccer field

Site Conditions

Parcel Area: 79.19 Ac **Existing Land Use:** Soccer Field
Landscape Position: Stream Valley **Adjacent Land Use:** Residential
Drainage Area: 36.7 sq. mi.
Habitat Location: Contiguous to wetland/upland forest > 100 Acres
Mapped Soils: Elsinboro silt loam
Mapped Wetlands: NWI and DNR wetlands mapped within southwest corner of site
Green Infrastructure: Located within Hub Green Infrastructure

This wetland site is located along the southwest side of Veirs Mill Rd approximately 700 feet south east of Aspen Hill Rd. The open area of the parcel contains soccer fields within Parklawn Local Park on the north side of Rock Creek Trail, a paved hiker/biker trail. The area is situated topographically low and is slightly higher than the elevation of the mainstem of Rock Creek. Dominant canopy vegetation within the adjacent forests includes red maple, tuliptree, and American sycamore.

Summary of Opportunities

- Wetland Creation - Approximately 4.37 acres

Restoration Objectives

- Wetland Creation
- Floodplain Reforestation

Restoration Concept

- Minor grading to extend intercept groundwater
- Reforestation within floodplain of Rock Creek
- Wetland education
- Community outreach

Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands

N
1 in = 100 feet
0 50 100 200 Feet

ASSOCIATED SITE ID:
RC-9

Purple Line
Potential Mitigation Sites

Parklawn Local Park

October 2012

Purple Line Project
Potential Stream and Wetland Mitigation Site on Crabbs Branch
(RC-74)

Existing Conditions Summary

Location Information

County: Montgomery
Watershed: Rock Creek
Coordinates: 38°58'28.82"N / 77°06'11.33"W
USGS Quad: Rockville
Location: Southeast of the intersection of Redland Rd and Crabbs Branch Way, Derwood, MD
Property Ownership: Public (Maryland-National Capital Park and Planning)
Constraints: Utilities

Site Conditions

Parcel Area: 80.44 Ac
Existing Land Use: Forest, Field
Landscape Position: Stream Valley
Adjacent Land Use: Residential
Drainage Area: 1,152 Ac
Habitat Location: Contiguous to wetland/upland forest > 100 Acres
Mapped Soils: Hatboro silt loam; Glenelg silt loam; Glenville silt loam; Brinklow-Blocktown channery silt loams
Mapped Wetlands: NWI and DNR wetlands mapped on site
Green Infrastructure: Hub and Gap Green Infrastructure located on site

This stream and wetland restoration site is located southeast of the intersection of Redland Rd and Crabbs Branch Way. The site is associated with Crabbs Branch, a tributary of Rock Creek. The existing hydrology and morphology of Crabbs Branch at RC-74 has been heavily influenced by anthropogenic structures such as the Crabbs Branch Regional Stormwater Pond and buried infrastructure that crosses the stream channel within the RC-74 study area. The stream channel alignment has been altered and the stream bed hardened at most utility crossings. The channel is laterally unstable as it is still adjusting to historic impacts. Channel incision is draining/has drained the wetlands. Several areas exist where existing wetlands can be extended. Riparian vegetation is dominated by invasive reed canarygrass which prevents forest from naturally regenerating on the site, and contributes to bank instability and high sediment loading.

Summary of Opportunities

- Stream Restoration - Approximately 5,360 Linear Feet
- Wetland Restoration - Approximately 3.22 acres

Restoration Objectives

- Bank Stabilization
- Floodplain Reforestation
- Wetland Restoration and Enhancement
- Non-native Invasive Species Control
- Improvement of In-Stream and Riparian Habitat

Restoration Concept

- Minor grading to extend existing wetlands and enhancement with wetland plantings
- Vernal pool creation within the floodplain
- Removal of reed canarygrass and installation of riparian plantings
- Planform adjustment involving channel realignment and the construction of an appropriately sized channel cross section
- Installation of in-stream structures to provide channel stability and habitat diversity

Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
Delineated Wetlands
Hydric Soils

N
1 in = 200 feet
0 100 200 400 Feet

ASSOCIATED SITE ID:

RC-74

Purple Line Potential Mitigation Sites

Crabbs Branch

October 2012

Purple Line Project
Potential Stream Mitigation Site at Unnamed Tributary of Northwest Branch (NW-49, NW-50)

Existing Conditions Summary

Location Information

County: Montgomery
Watershed: Northwest Branch
Coordinates: 39°05'45.27"N / 77°00'53.57"W **USGS Quad:** Kensington
Location: North of the intersection of Bonifant Rd. and Notley Rd., Silver Spring MD
Property Ownership: Public (Maryland Park and Planning)
Constraints: Utilities

Site Conditions

Parcel Area: 25.71 Ac **Existing Land Use:** Forest and Open Space
Landscape Position: Stream Valley **Adjacent Land Use:** Residential
Drainage Area: 256 Ac
Habitat Location: Contiguous to wetland/upland forest > 100 Acres
Mapped Soils: Hatboro silt loam; Glenville silt loam; Brinklow Blocktown channery silt loams; Glenelg silt loam; Gaila silt loam
Mapped Wetlands: NWI and DNR wetlands mapped on site
Green Infrastructure: Gap Green Infrastructure adjacent to site

This site is located north of the intersection of Bonifant Rd and Notley Rd, and is associated with an unnamed tributary of Northwest Branch. The stream corridor is forested, with nearby residential development, and a recreational pool within the upper part of the reach. The stream channel is disconnected from its floodplain and has far bank stability conditions that are causing bank erosion, in-stream sedimentation, and loss of property. Based on 2003 data collected by SHA, the reach has poor habitat, a poor benthic community, and a poor fish community.

Summary of Opportunities

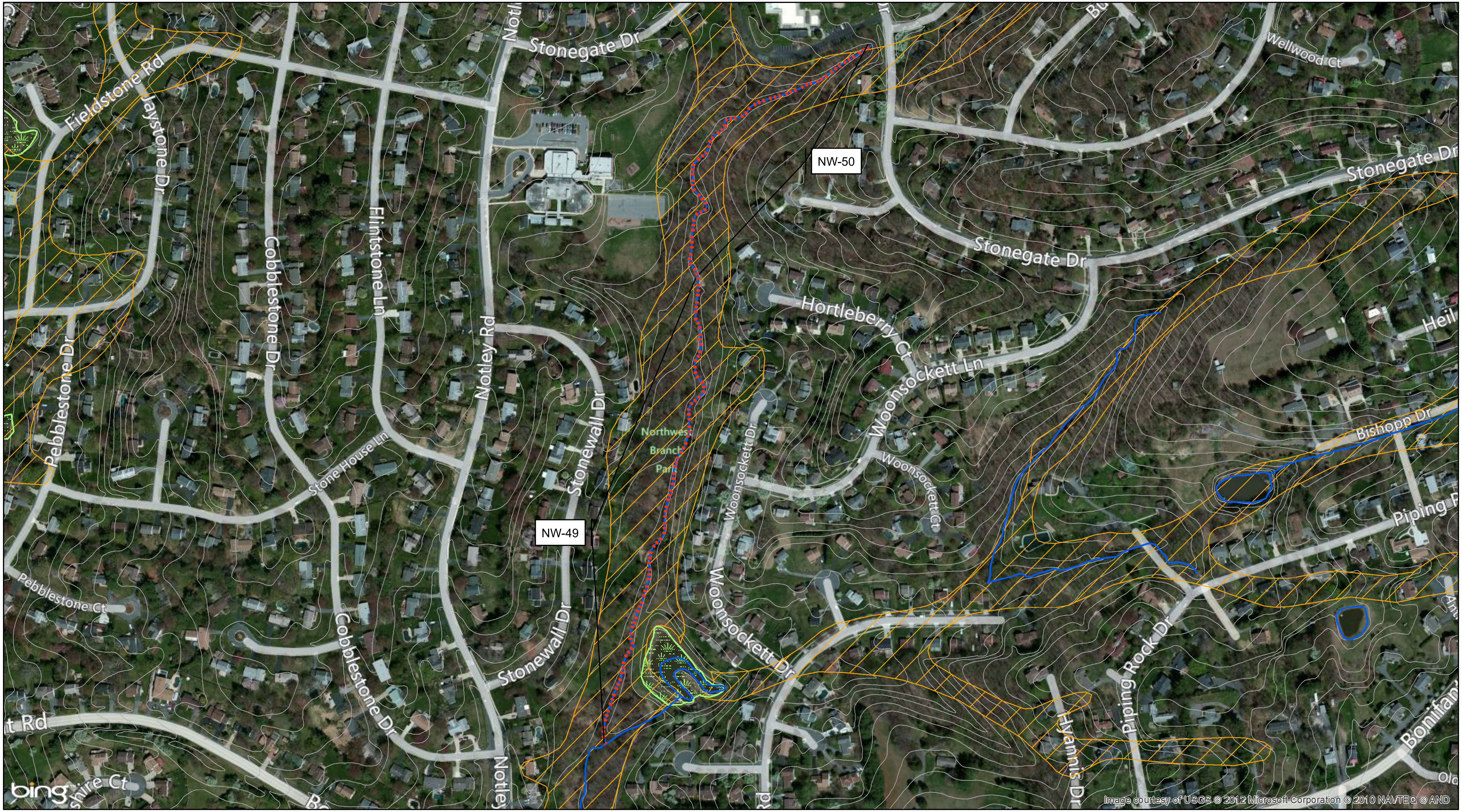
- Stream Restoration – Approximately 2,700 Linear Feet

Restoration Objectives

- Reconnecting the stream to the floodplain
- Reducing bank erosion and in-stream sedimentation
- Enhancing the riparian buffer
- Resolving utility conflicts
- Enhancing the habitat conditions and the benthic and fish communities

Restoration Concept

- Floodplain creation to provide energy dissipation of erosive flood flows, reduce erosive shear stresses, reduce channel incision, and increase infiltration and groundwater recharge
- Bank stabilization to provide energy dissipation of erosive flood flows, reduce erosive shear stresses, and reduce bank erosion and in-stream sedimentation
- Riparian buffer plantings
- Installation of in-stream structures to protect exposed utilities
- Installation of woody debris and other types of in-stream cover and gravel channel material to enhance the benthic and fish habitats and communities



Purple Line

Potential Stream Sites	DNR/NWI Wetlands
Streams	Hydric Soils
2" Contours	

N

1 in = 300 feet

0 150 300 600 Feet

ASSOCIATED SITE ID:

NW-49
NW-50

Purple Line Potential Mitigation Sites

Rolling Stone Tributary

October 2012

General Engineering Consultant Team
801 South Caroline Street
Baltimore, MD 21231

Purple Line Project
Potential Wetland and Stream Mitigation Sites
Agency Field Review 2

Agenda

Meeting Objective: To provide an overview of potential wetland and stream mitigation sites.

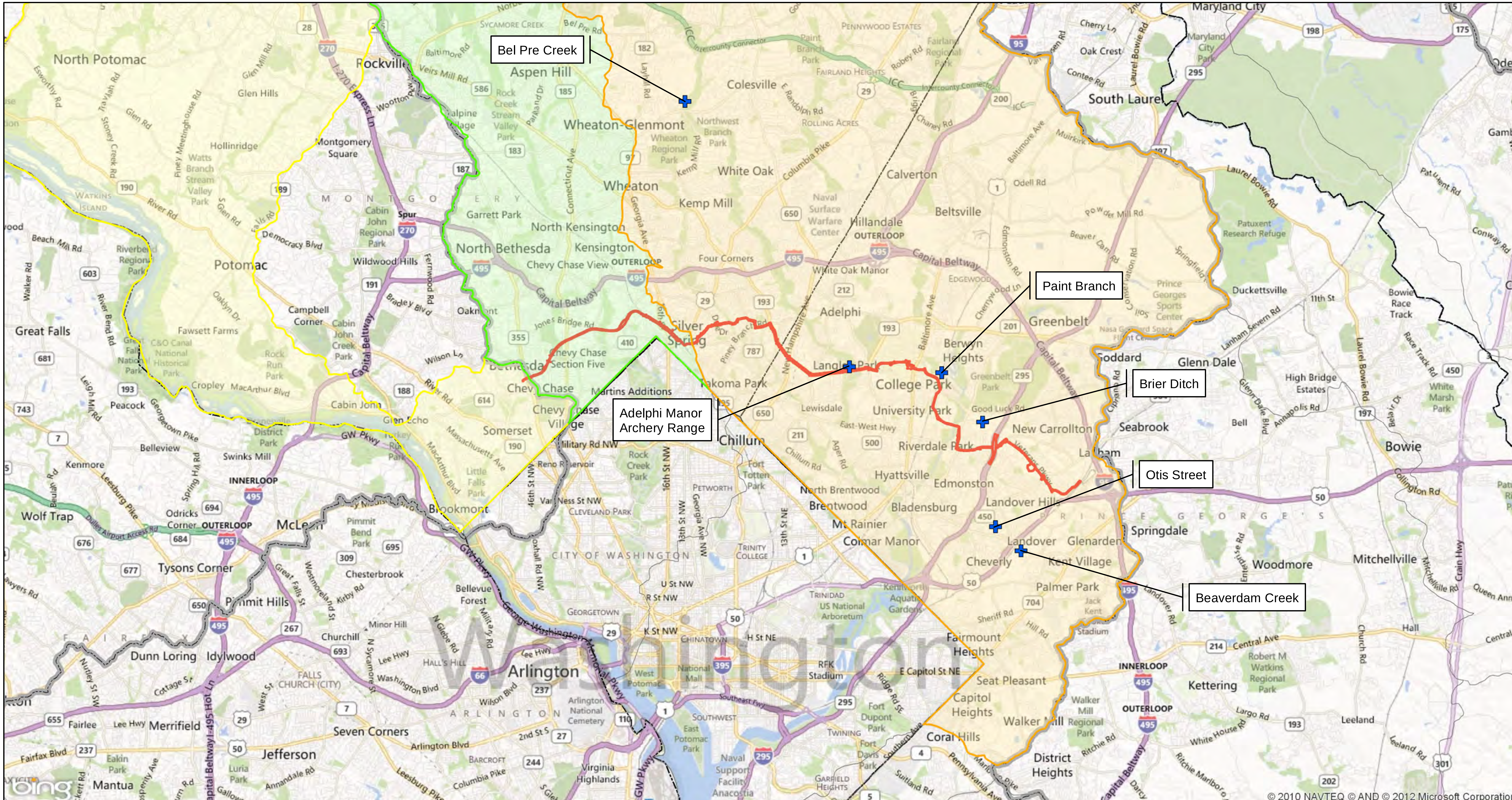
November 28, 2012

- Meet at Home Depot Parking Lot (4700 Cherry Hill Rd, College Park, MD) at 9:00 AM
  - Review of Agenda
  - Project Status

1. Beaverdam Creek – Stream Mitigation Site
2. Otis Street – Stream Mitigation Site
3. Brier Ditch – Wetland and Stream Mitigation Site
4. Pit stop for Lunch and/or bathroom
5. Paint Branch – Optional Stream Mitigation Site
6. Adelphi Manor Archery Range – Wetland and Stream Mitigation Site
7. Bel Pre Creek – Optional Wetland and Stream Mitigation Site

- Wrap-up and Discussion of Purple Line Mitigation Sites for Conceptual Package

Purple Line Project						
Potential Wetland and Stream Mitigation Sites						
Site Name	**Site ID**	**Type of Mitigation**	**Site size (acres and/or L.F.)**	**Location**	**Watershed**	**Property Ownership**
Beaverdam Creek	AR-1	Stream	400 L.F.	Landover	Beaverdam Creek	Private
Otis Street	AR-22	Stream	658 L.F.	Landover	Beaverdam Creek	Public/Private
Brier Ditch	AR-23	Stream	4,200 L.F.	Riverdale	Northeast Branch	Public/Private
		Wetland	1.42 Ac.			
Paint Branch	PB-93	Stream	5,900 L.F.	College Park	Northeast Branch	Public/Private
Adelphi Manor Archery Range	AR-24	Wetland	2.13 Ac.	Adelphi	Northwest Branch	Public
Bel Pre Creek	AR-102	Stream	1,500 L.F.	Glenmont	Northwest Branch	Public/Private
		Wetland	2.79 Ac.			



Purple Line

Legend

Potential Sites	Purple Line Corridor
Subwatersheds	Little Falls
MD County Boundaries	Rock Creek
HUC8 Boundaires	Anacostia River

N

1 inch = 2 miles

0 1 2 4 Miles

Purple Line
Potential Mitigation Sites
Vicinity Map

November 2012

Purple Line Project
Potential Stream Mitigation Site on Beaverdam Creek
(AR-1)

Existing Conditions Summary

Location Information

County:	Prince George's
Watershed:	Beaverdam Creek
Coordinates:	38°55'42.43"N / 76°53'39.36"W **USGS Quad:** Washington East
Location:	Northwest of the intersection of Pinebrook Ave and Country Club Rd, Landover, MD
Property Ownership:	Private (Washington Metro Area Transportation Authority)
Constraints:	Utilities (overhead power line)

Site Conditions

Parcel Area:	19.41 Ac	**Existing Land Use:**	Forest
Landscape Position:	Stream Valley	**Adjacent Land Use:**	Residential, Industrial
Drainage Area:	4,608 Ac		
Habitat Location:	Contiguous to wetland/upland forest, 25 to 100 Acres		
Mapped Soils:	Zekiah and Issue soils		
Mapped Wetlands:	DNR and NWI wetlands mapped on site		
Green Infrastructure:	Not located adjacent to Green Infrastructure		

This site is located northwest of the intersection of Pinebrook Ave. and Country Club Rd. This site is associated with Beaverdam Creek at the confluence with Cattail Branch, is mostly forested, and has adjacent residential and commercial development. Barriers to fish passage exist at both the box culvert under Landover Road and at the mouth of Cattail Branch, which is a concrete-lined channel reach. There is also a significant amount of channel and bank erosion at the confluence of Cattail Branch and Beaverdam Creek.

Summary of Opportunities

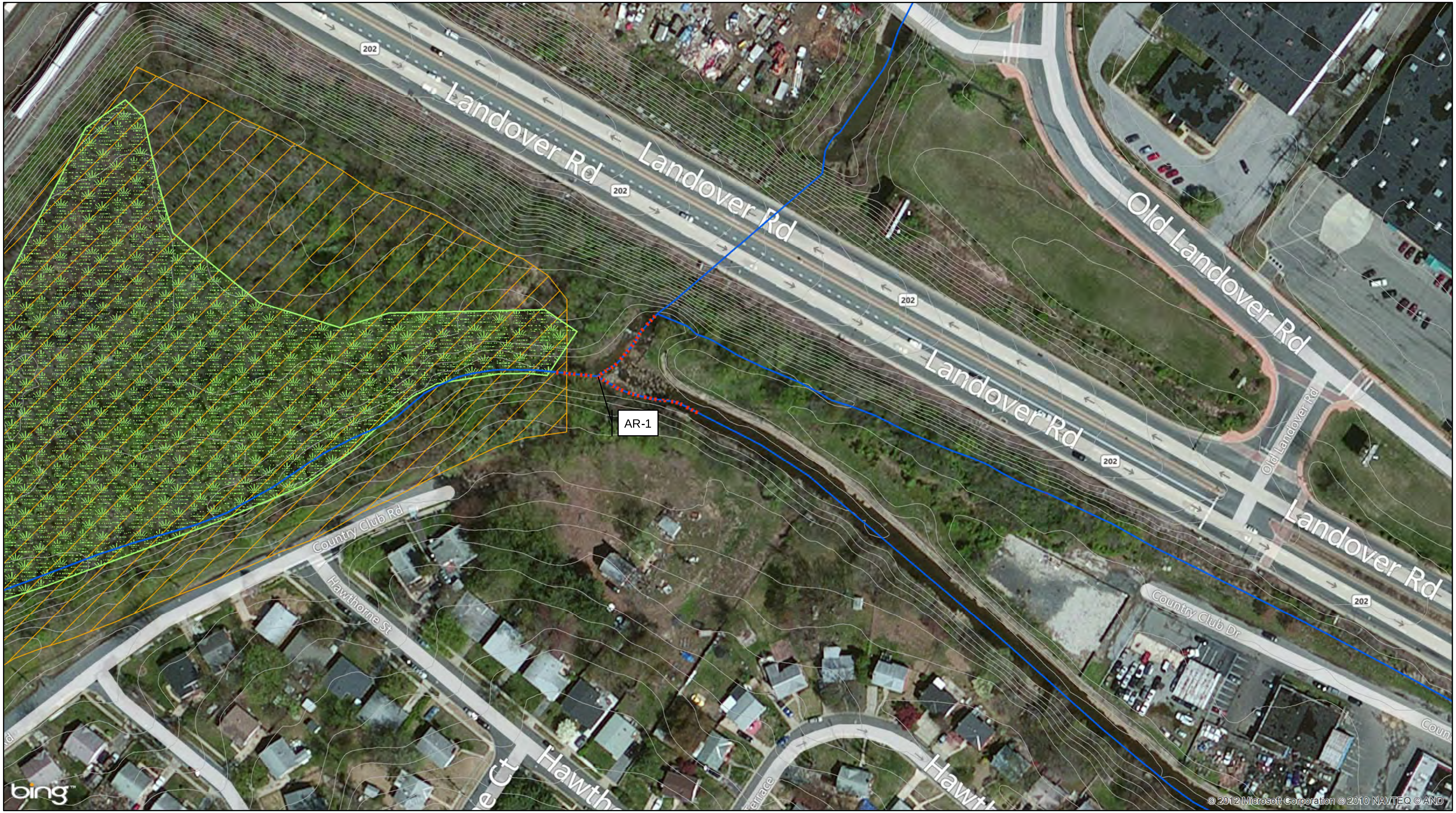
- Stream Restoration – Approximately 400 Linear Feet

Restoration Objectives

- Stream Stabilization
- Fish Passage

Restoration Concept

- Installation of in-stream structures and bank grading to improve channel stability
- Installation of structures to provide fish passage



Purple Line

Potential Stream Sites

Streams

2" Contours

DNR/NWI Wetlands

Hydric Soils

N

1 in = 100 feet

0 50 100 200 Feet

ASSOCIATED SITE ID:

AR-1

Purple Line
Potential Mitigation Sites

Beaverdam Creek

October 2012

Purple Line Project
Potential Stream Mitigation Site on Unnamed Tributary of Beaverdam Creek (AR-22)

Existing Conditions Summary

Location Information

County:	Prince George's
Watershed:	Beaverdam Creek
Coordinates:	38°56'10.33"N / 76°54'16.42"W **USGS Quad:** Washington East
Location:	Southwest of the intersection of Otis Street, and Osborn Road, Landover, MD
Property Ownership:	Public and Private
Constraints:	Utilities

Site Conditions

Parcel Area:	16.04 Acres	**Existing Land Use:**	Forest
Landscape Position:	Stream Valley	**Adjacent Land Use:**	Residential
Drainage Area:	64 Acres		
Habitat Location:	Contiguous to wetland/upland forest 25-100 Acres		
Mapped Soils:	Issue-Urban land complex; Christina-Downer complex; Christina-Downer-Urban land complex		
Mapped Wetlands:	No NWI or DNR wetlands mapped on site		
Green Infrastructure:	Not located adjacent to Green Infrastructure		

This potential stream mitigation site is located southwest of the intersection of Otis Street and Osborn Road. This site is associated with an unnamed tributary of Beaverdam Creek, which drains into the Anacostia River. The stream corridor is forested, with adjacent residential development. The stream is a headwater channel that begins from surface drainage and a culvert near the apartment complex at 65th Avenue. The channel is deeply incised and banks have severe erosion. Sewer infrastructure (manholes) is exposed along the channel. The stream flows through an in-line stormwater pond along Otis Street, which is rapidly filling with sediment from upstream bank erosion.

Summary of Opportunities

- Stream Restoration – Approximately 650 Linear Feet

Restoration Objectives

- Stream Stabilization

Restoration Concept

- Installation of in-stream structures and bank grading to improve channel stability, reduce sediment loading, protect existing utilities, and improve in-stream habitat

Purple Line

Potential Stream Sites

Streams

2" Contours

DNR/NWI Wetlands

Hydric Soils

N

1 in = 100 feet

0 50 100 200 Feet

ASSOCIATED SITE ID:

AR-22

Purple Line
Potential Mitigation Sites

Otis Street

November 2012

Purple Line Project
Potential Wetland and Stream Mitigation Site on Brier Ditch
(AR-23)

Existing Conditions Summary

Location Information

County:	Prince George's
Watershed:	Brier Ditch
Coordinates:	39°58'13.93"N / 76°54'41.85"W **USGS Quad:** Washington East
Location:	Southeast of the intersection of Kenilworth Avenue, and Good Luck Road, Riverdale, MD
Property Ownership:	Public and Private
Constraints:	Unknown

Site Conditions

Parcel Area:	46.39 Acres	**Existing Land Use:**	Forested
Landscape Position:	Stream Valley, Topographically Intermediate	**Adjacent Land Use:**	Commercial, Residential Institutional
Drainage Area (wetland):	9.68 Acres		
Drainage Area (stream):	2,688 Acres		
Habitat Location:	Contiguous to wetland/upland forest > 100 Acres		
Mapped Soils:	Codorus-Hatboro-Urban land complex; Zekiah and Issue soils; Sassafras sandy loam; Russett-Christiana complex; Issue-Urban land complex		
Mapped Wetlands:	NWI and MDNR wetlands mapped along a portion of site		
Green Infrastructure:	Located within a Green Infrastructure Corridor and Gap		

This mitigation site is located southeast of the intersection of Kenilworth Avenue and Good Luck Road. The site is associated with Brier Ditch, a tributary of the Anacostia River. The stream corridor is forested with adjacent commercial and residential development. Two schools are also adjacent to the stream reach. An abandoned parking lot within the 100-year floodplain remains wet for most of the year due to groundwater seeps in the adjacent hillside and runoff. The site presents multiple mitigation opportunities for the Purple Line project. Opportunities include wetland creation at the abandoned parking lot, and stream restoration/stabilization in Brier Ditch.

Summary of Opportunities

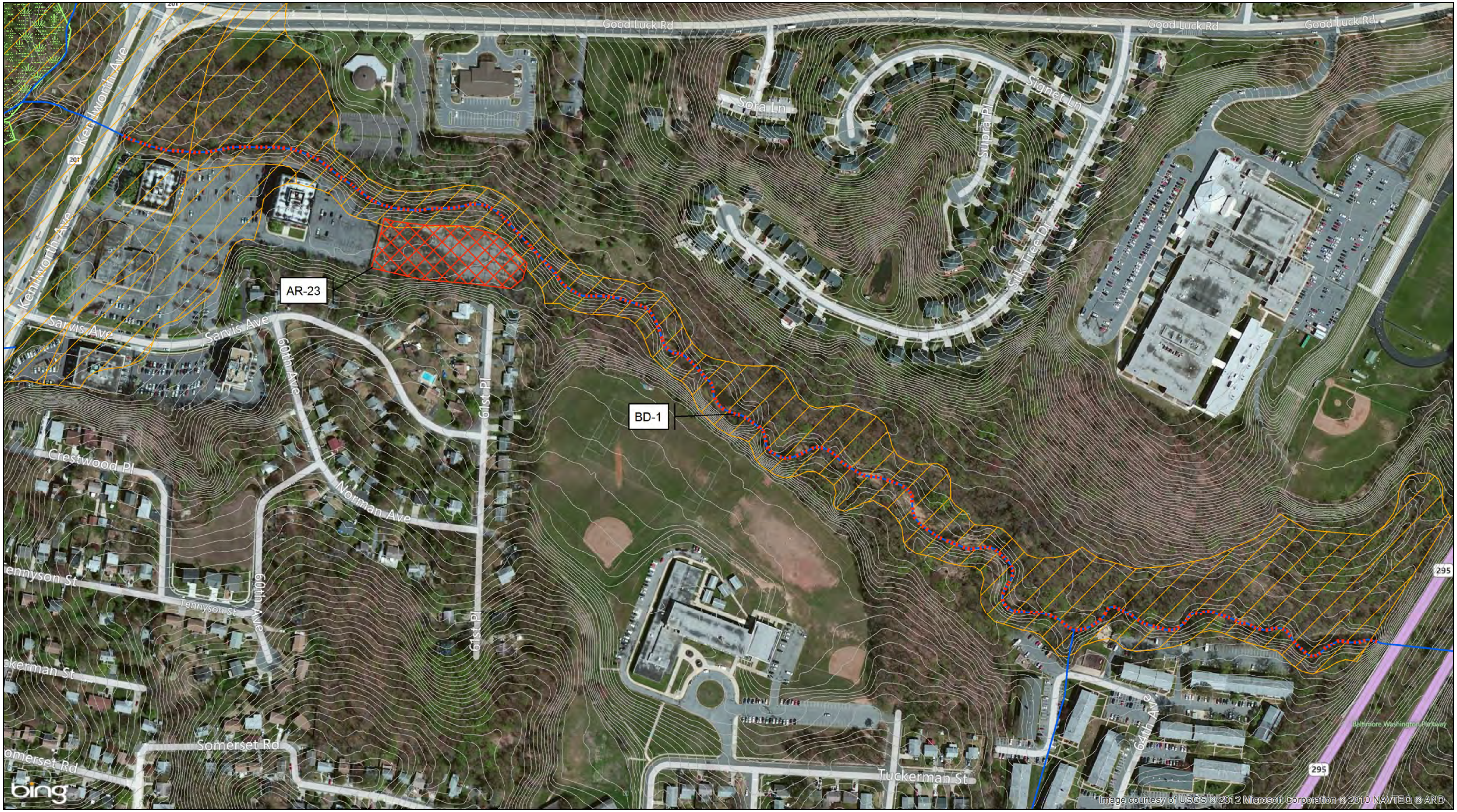
- Wetland Creation – 1.42 Acres
- Stream Restoration – 4,000 Linear Feet

Restoration Objectives

- Flood Flow Alteration – enhancing floodplain connection and storage of flood waters
- Groundwater Recharge – increased retention time will allow for surface water infiltration
- Sediment/Toxicant Retention – sediment storage with connected floodplain
- Nutrient Removal – nutrient uptake/assimilation in floodplain and wetlands
- Stream Stabilization

Restoration Concept

- Removal of pavement to create a floodplain wetland fed by groundwater seeps and runoff
- Installation of in-stream structures and bank grading to improve channel stability, reduce sediment loading, protect existing utilities, and improve in-stream habitat



Purple Line

Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands
Hydric Soils

N
1 in = 250 feet
0 125 250 500 Feet

ASSOCIATED SITE ID:

BD-1
AR-23

Purple Line Potential Mitigation Sites

Brier Ditch

November 2012

Purple Line Project
Potential Stream Mitigation Site on Paint Branch
(PB-93)

Existing Conditions Summary

Location Information

County: Prince Georges
Watershed: Paint Branch
Coordinates: 38°59'20.65"N / 76°56'01.05"W **USGS Quad:** Washington East
Location: Southeast of the intersection of Baltimore Avenue, and Paint Branch Parkway, College Park, MD
Property Ownership: Public and Private
Constraints: Utilities

Site Conditions

Parcel Area: 140.53 Acres **Existing Land Use:** Forest, Parkland
Landscape Position: Stream Valley **Adjacent Land Use:** Residential, Commercial
Drainage Area: 20,032 Acres
Habitat Location: Contiguous to wetland/upland forest > 100 Acres
Mapped Soils: Fallsington-Urban land complex; Cordorus and Hatboro soils; Codorus-Hatboro-Urban land complex; Urban land-Sassafrass complex
Mapped Wetlands: Both NWI and DNR wetlands mapped on site
Green Infrastructure: Located adjacent to Hub, Gap, and Corridor Green Infrastructure

This potential stream mitigation site is located southeast of the intersection of Baltimore Avenue and Paint Branch Parkway. This site is associated with Paint Branch, a tributary of the Anacostia River. The stream corridor is forested (the upstream section is within the Paint Branch Stream Valley Park), with adjacent residential and commercial development. The channel is wide through this section and has large sediment bars. Some of the bars are stabilizing as new bankfull floodplains, but the stream is still transporting a tremendous amount of sediment in this reach.

Summary of Opportunities

- Stream Restoration – Approximately 5,900 Linear Feet

Restoration Objectives

- Stream Stabilization and Sediment Reduction

Restoration Concept

- Installation of in-stream structures and bank grading to improve channel stability, reduce sediment loading, protect existing utilities, and improve in-stream habitat

Potential Stream Sites

Streams

2" Contours

DNR/NWI Wetlands

Hydric Soils

N

1 in = 500 feet

0 250 500 1,000 Feet

ASSOCIATED SITE ID:

PB-93A
PB-93B

Purple Line Potential Mitigation Sites

Paint Branch

November 2012

Purple Line Project
Potential Wetland Mitigation Site at Adelphi Manor Archery Range (AR-24)

Existing Conditions Summary

Location Information

County: Prince George's
Watershed: Northwest Branch
Coordinates: 38°59'11.23"N / 76°57'47.48"W **USGS Quad:** Washington East
Location: North of University Boulevard (MD 193), approximately 850 feet east of West Park Drive, Riverdale, MD
Property Ownership: Public
Constraints: Park Property

Site Conditions

Parcel Area: 6.66 Acres **Existing Land Use:** Park, Forested
Landscape Position: Topographically Intermediate **Adjacent Land Use:** Commercial, Residential, Forested

Drainage Area: 28.6 square miles
Habitat Location: Contiguous to wetland/upland forest > 100 Acres
Mapped Soils: Codorus-Hatboro-Urban land complex, frequently flooded
Mapped Wetlands: NWI and MDNR wetlands mapped along north and east sides of site
Green Infrastructure: Located within a Green Infrastructure Corridor

This wetland mitigation site is located north of University Boulevard (MD 193) and approximately 850 feet east of West Park Drive. The site is within the 100-year floodplain of the Northwest Branch of the Anacostia River. The stream corridor is forested with adjacent commercial and residential development. Currently the site is used as an archery range. Forested wetlands border the north and east sides of the site.

Summary of Opportunities

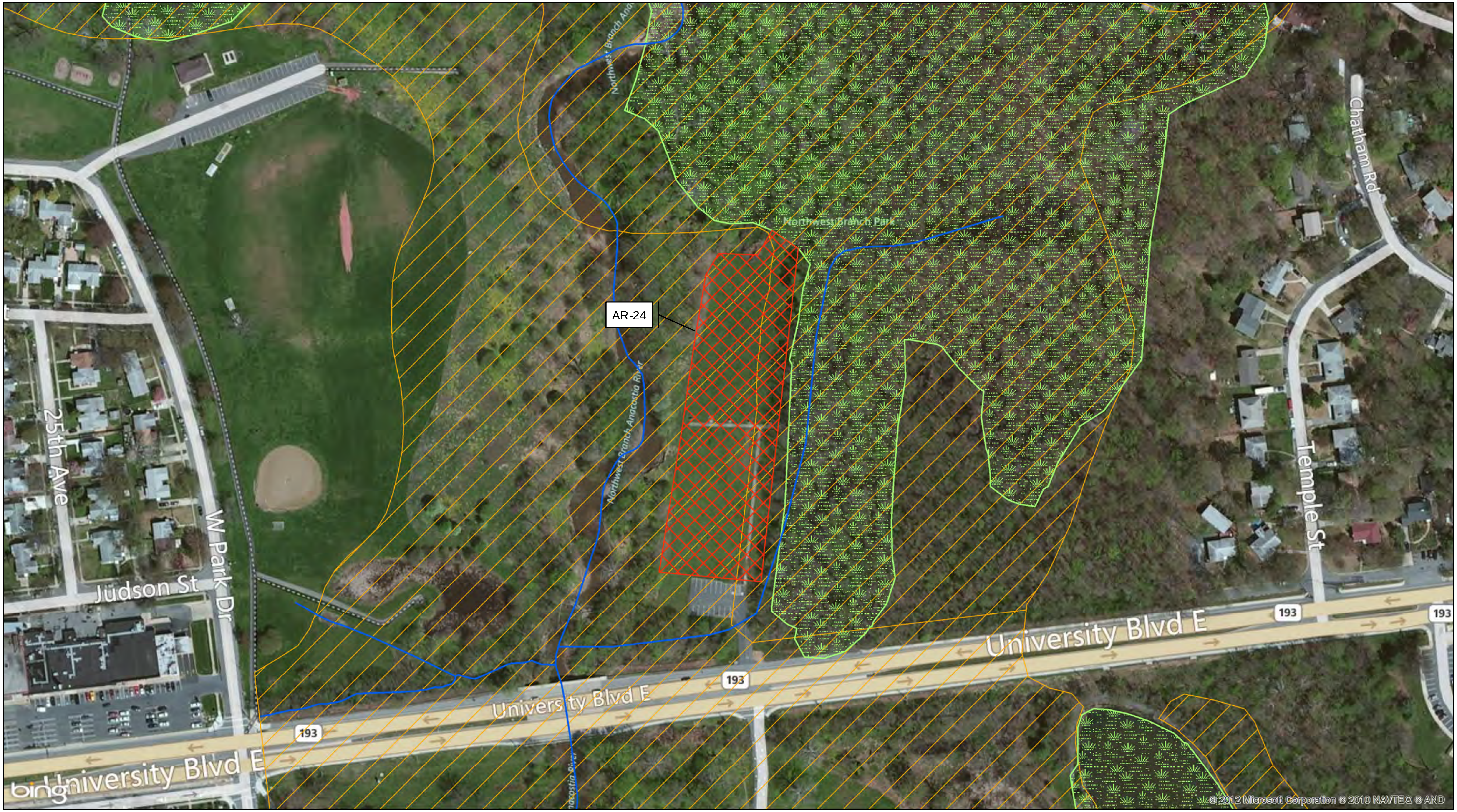
- Wetland Creation – Approximately 2.13 Acres

Restoration Objectives

- Flood Flow Alteration - enhancing floodplain connection and storage of flood waters
- Groundwater Recharge - increased retention time will allow for surface water infiltration
- Sediment/Toxicant Retention - sediment storage with connected floodplain
- Nutrient Removal - nutrient uptake/assimilation in floodplain and wetlands
- Stream Stabilization

Restoration Concept

- Ditch plugging to increase retention
- Minimal grading to intercept groundwater
- Removal of parking lot to reduce impervious surface



Potential Stream Sites
Streams
2" Contours
Potential Wetland Sites
DNR/NWI Wetlands
Hydric Soils

N
1 in = 150 feet
0 75 150 300 Feet

ASSOCIATED SITE ID:

AR-24

Purple Line
Potential Mitigation Sites

Adelphi Manor Archery Range

November 2012

Purple Line Project
Potential Wetland and Stream Mitigation Site on Bel Pre Creek
(AR-102)

Existing Conditions Summary

Location Information

County:	Montgomery
Watershed:	Northwest Branch
Coordinates:	39°04'13.59"N / 77°01'50.34"W **USGS Quad:** Kensington
Location:	Confluence of Bel Pre Creek and Northwest Branch, north of intersection of Randolph Road and Kemp Mill Road, Glenmont, MD
Property Ownership:	Public (Maryland-National Capital Park and Planning) and Private (Winchester Homes)
Constraints:	Future development plans

Site Conditions

Parcel Area:	107.56 Acres	**Existing Land Use:**	Forest, Open Land
Landscape Position:	Stream Valley	**Adjacent Land Use:**	Residential, Forested
Drainage Area:	2,880 Acres		
Habitat Location:	Contiguous to wetland/upland forest > 100 Acres		
Mapped Soils:	Hatboro silt loam; Brinklow-Blocktown channery silt loams		
Mapped Wetlands:	NWI and MDNR wetlands mapped on site		
Green Infrastructure:	Hub and Gap Green Infrastructure adjacent to site		

AR-102 is located on Bel Pre Creek at the confluence with Northwest Branch, north of the intersection of Randolph Road and Kemp Mill Road. The 2,880 acre drainage area upstream of the reach is approximately 37% impervious. AR-102 has poor bank stability, is disconnected from the floodplain, and has a primarily forested riparian area. Based on 2002 data collected by MDEP, the reach has good habitat, a fair benthic community, and a fair fish community. The site presents multiple mitigation opportunities for the Purple Line project. Opportunities include wetland creation north of the stream (dependent on future development plans) and stream restoration/stabilization on Bel Pre Creek.

Summary of Opportunities

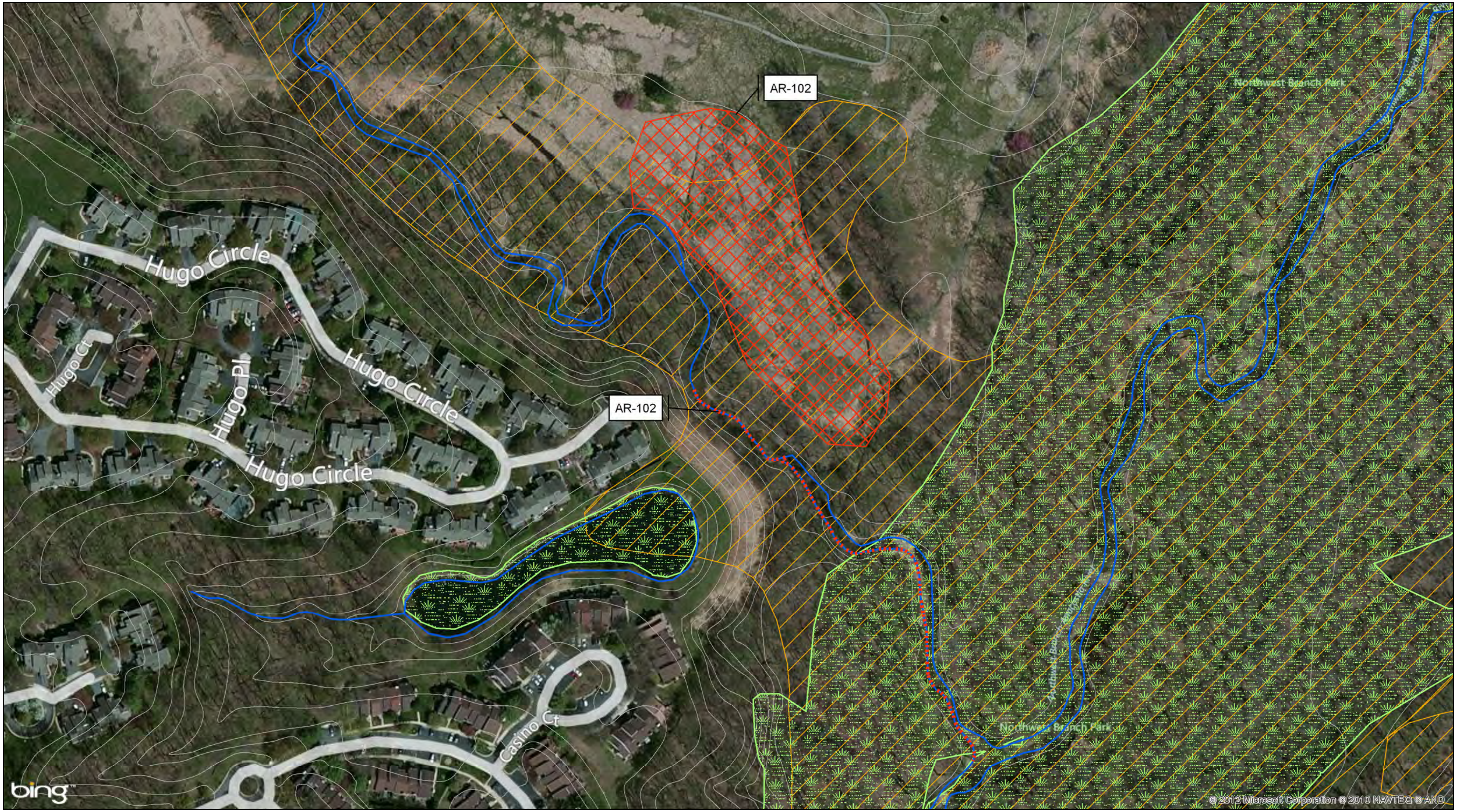
- Wetland Creation – Approximately 2.79 Acres
- Stream Restoration – Approximately 1,500 Linear Feet

Restoration Objectives

- Flood Flow Alteration – enhancing floodplain connection and storage of flood waters
- Reconnecting the stream to the floodplain
- Reducing bank erosion and in-stream sedimentation
- Enhancing the riparian buffer
- Enhancing the habitat conditions and the benthic and fish communities

Restoration Concept

- Minimal grading and the plugging of a ditch on the east side to create a floodplain wetland
- Floodplain creation to provide energy dissipation of erosive flood flows, reduce erosive shear stresses, reduce channel incision, and increase infiltration and groundwater recharge
- Bank stabilization to provide energy dissipation of erosive flood flows, reduce erosive shear stresses, and reduce bank erosion and in-stream sedimentation
- Riparian buffer plantings
- Installation of woody debris and other types of in-stream cover and gravel channel material to enhance the benthic and fish habitats and communities



Purple Line

Legend			
Potential Stream Sites	Potential Wetland Sites		
Streams	DNR/NWI Wetlands		
2" Contours	Hydric Soils		

N

1 in = 150 feet

0 75 150 300 Feet

ASSOCIATED SITE ID:

AR-102

Purple Line
Potential Mitigation Sites

Bel Pre Creek

November 2012