

Appendix F: Ecology
F-3 Wetland Delineation Report



Wetland Delineation Report for the Tappan Zee Hudson River Crossing Project

June 2012

Enclosure 1: Wetland Delineation Report

**Tappan Zee Hudson River Crossing Project
Wetland Delineation Report
Temporary Access Road Location, Westchester County, NY
April 12, 2012**

SUMMARY

Federally-regulated wetlands and waters have been identified and field delineated at the proposed location of the temporary construction access road in Westchester County. The boundaries of these regulated wetland areas have been surveyed by a licensed land surveyor.

INTRODUCTION

The Federal Highway Administration (FHWA), as the federal lead agency, and the New York State Department of Transportation (NYSDOT) and the New York State Thruway Authority (NYSTA), as joint lead agencies are proposing the Tappan Zee Hudson River Crossing Project, which would result in the construction of a new bridge crossing, consisting of two structures (Replacement Bridge), over the Hudson River between Rockland and Westchester Counties (proposed project). The project site is located on the Hudson River (River Mile [RM] 27) in the Village of Tarrytown, Westchester County, NY and the Village of South Nyack, Rockland County, NY. The project site can be identified on the United States Geological Survey (USGS) map (Nyack and White Plains Quadrants; 41° 04' 12.55''N, 73° 54' 27.47''W) (see Enclosure 2, Figure 1). The purpose of the proposed project is to maintain a vital link in the regional and national transportation network by providing an improved Hudson River crossing between Rockland and Westchester Counties. The proposed project would address the structural, operational, mobility, safety, and security limitations and deficiencies of the existing Tappan Zee Bridge.

A Joint Permit Application (JPA) was submitted to the United States Army Corps of Engineers (USACE), New York State Department of Environmental Conservation (NYSDEC), and New York State Office of General Services (NYSOGS) on March 26, 2012 for the proposed construction of waterfront bridge staging areas in Westchester and Rockland Counties and a temporary access road immediately south of the toll plaza in Westchester County (see Enclosure 2, Figure 2). The existing conditions with respect to wetlands as described in the March 2012 JPA were based on a preliminary wetland investigation that was performed prior to the growing season (March 6, 2012). On April 6, 2012, several of the project team members (i.e., FHWA, NYSDOT, NYSTA, and AKRF) met with the USACE onsite to discuss the wetlands present within the vicinity of the Westchester and Rockland County Bridge Staging Areas and temporary access road location in Westchester County. As described in the JPA (JPA Enclosure 3, page 10), in the vicinity of the proposed Westchester County temporary access road there is a small stream and wetland area located approximately 300 feet south of the existing bridge and toll plaza. During the April 6, 2012 site visit, the USACE indicated that the stream/wetland would fall under the jurisdiction of the USACE and requested a formal delineation in order to

initiate the review of the JPA. This report and attached datasheets serve as the formal delineation report and replace the existing conditions section (JPA Enclosure 3, Page 10) of the March 2012 JPA pertaining to the Westchester County stream and wetland area.

METHODOLOGY

Prior to field investigations, NYSDEC and National Wetlands Inventory (NWI) maps were reviewed to determine the presence or absence of state and federal wetlands in the proposed project area. No NYSDEC- or NWI-mapped wetlands occur in the project area (see Enclosure 2, Figure 3). On April 12, 2012, a team of two AKRF, Inc. field staff conducted a delineation of the stream and associated wetland following methods outlined in the United States Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0) (January 2012). Methodology pertaining to the three USACE wetland indicators (i.e., hydrology, soils, and hydrophytic vegetation) is described below.

HYDROLOGY AND SOILS

Hydrology was documented using site observations and an auger to determine soil saturation or a high water table. The soils of the site were documented with the use of an auger and a Munsell Soil Color Chart. Both hydrology and soils observations were made during a period of dry weather.

VEGETATION

Wetland

Due to the linear orientation of the riparian zone, the tree and vine strata were documented for two 20 by 35 foot (ft) (700 square [sq] ft) linear plots paralleling the stream. One 10 by 10 ft (100 square ft) shrub plot was established in each of the tree stratum plots and herbaceous vegetation was documented and averaged for three 3.28 ft by 3.28 ft (~9 sq ft) plots located within each of the tree stratum plots. Both the Dominance Test and Prevalence Index tests were used to calculate the indicators of hydrophytic vegetation.

Upland

For the upland plot, a 30-ft radius plot was established for the tree and vine strata. Within this plot, a 15-ft radius plot and a 5-ft radius plot were sampled for shrubs and herbs, respectively.

STREAM AND WETLAND BOUNDARY MAPPING

Both sides of the wetland and stream were flagged and surveyed by a NYSDOT licensed land survey team

EXISTING CONDITIONS

The federally-regulated area consists of an intermittent stream corridor and portions of its adjacent, vegetated floodplain. The stream and wetland area measure 0.2344 acres. The stream begins near the top of the slope at an approximately 2-ft diameter outfall located in an embankment (see Enclosure 3, photo 1). The stream flows through a disturbed successional forest (approximately 0.63 acres) dominated by Norway maple (*Acer platanoides*) with European black alder (*Alnus glutinosa*) and oak (*Quercus* sp.) at lower percentages in the

canopy. Multi-flora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), wineberry (*Rubus phoenicolasius*), and Japanese knotweed (*Polygonum cuspidatum*) form dense thickets along the stream banks and upland areas, particularly at the higher contour elevations. Large rocks, boulders, metal, asphalt, pipes, and slabs of concrete are present within the streambed at the higher elevations (see Enclosure 3, photo 2). Particularly along the southern edge of the site, the streambed is cut deeply into the hill with large sections of bank erosion. This steeply sloped portion of the stream, before it turns northwards, has no vegetation or soils and was flagged solely on the presence of flowing water and the eroded banks that approximate an “ordinary high water mark.” Where the stream width was greater than 3+/- feet, both banks were flagged and surveyed in the field.

At the toe of the slope, the stream flows through a foundation structure and takes a sharp bend to the north. This region exhibits hydrophytic vegetation and hydric soils in and adjacent to the stream. The stream flows parallel to the Metro North Railroad (MNR) tracks and the toe of slope along a flat streambed (see Enclosure 3, photo 3) for approximately 250 feet until it turns directly west and flows under the MNR tracks to the Hudson River. The wetland associated with the stream at the toe of the slope as well as the conditions immediately upslope from the wetland are described below in the context of the three wetland parameters as defined by the USACE: hydrology, hydrophytic vegetation, and hydric soils.

HYDROLOGY

Wetland

The wetland is located between the east bank of the stream and the toe of the slope. It is fed, in part, by surface expressions (i.e., groundwater seeps) from the side of the slope (see Enclosure 3, photo 4). In some locations, these seeps produce surface water (A1) flow to the stream and in other locations, are limited to standing water (A1) with minimal flow. As documented for Sampling Plots W-1 and W-2 the water table was observed at 8 inches and 6 inches (A2), respectively. Water stained leaves (B9) were observed throughout the sampling plots, particularly where seeps are present. All of these hydrologic features are defined by USACE as “primary indicators” of hydrology.

In addition to the stream and associated seeps, a drainage channel or ditch (see Enclosure 3, photo 5) is located at the northern end of the stream where it is diverted to the Hudson River via a culvert that runs under the MNR tracks. This ditch conveys surface runoff along the eastern side of railroad tracks southwards, entering the stream channel where it is conveyed beneath the railroad tracks. Although hydrology was observed within this ditch, hydric soils and hydrophytic vegetation are not present. Ditches that drain only uplands and do not carry a relatively permanent flow of water are generally not jurisdictional under the Clean Water Act (CWA). Therefore, it is expected that the USACE would not take jurisdiction over this ditch. This ditch appears to be located on MNR property and in close proximity to moving trains. It was not flagged as part of the April 12, 2012 delineation.

Upland

Hydrology indicators were not observed upslope from the wetland area.

VEGETATION

Wetland

Enclosure 3, Photos 6 through 10, show the vegetation sampling areas. The tree canopy along the streambed and associated wetland area is dominated by European black alder (FACW-) with a small number of Norway maple (NI). The shrub layer contains pockets of common privet (*Ligustrum vulgare*) (FACU) (see data form for Sampling Plot W-3). Skunk cabbage (*Symplocarpus foetidus*) (OBL) (see data form for Sampling Plot W-1) is present in small pockets within the herbaceous layer with patches of garlic mustard (*Alliaria petiolata*) (FACU-), poison ivy (*Toxicodendron radicans*) (FAC), and Indian strawberry (*Duchesnea indica*) (FACU-) (see Enclosure 4, data form for Sampling Plot W-2). While there are non-wetland species present in the herbaceous layer, these are represented in low percentages and are not dominant. In general, the species composition/absolute percent cover in the understory is relatively scarce in comparison to the European black alder-dominated (~55 to 65 percent absolute cover) canopy.

Upland

Immediately upslope from the wetland area, the canopy is dominated by Norway maple, with a small percentage of European black alder. The understory is quite open and is lacking a shrub layer altogether. The herbaceous layer is also quite bare, with garlic mustard as the only herbaceous plant observed at about 7 percent absolute cover.

SOILS

Wetland

Soils within the three sampling locations meet one or more of the following hydric soil indicators: “Thick Dark Surface” (A12), “Loamy Mucky Mineral” (F1), “Loamy gleyed matrix” (F2), and “Depleted Matrix” (F3). Soil texture ranges from silty loam to sandy loam within the upper 16 inches of the solum. The O and A horizons were uniformly low value/low chroma and typically include 4 inches (+/-) of mucky mineral soil material. Within 10 inches, a depleted matrix is observed, mottling was shown, or the dark surface value/chroma continues to a depth of 10 inches or greater where gley soil colors are obtained without appreciable mottling.

Upland

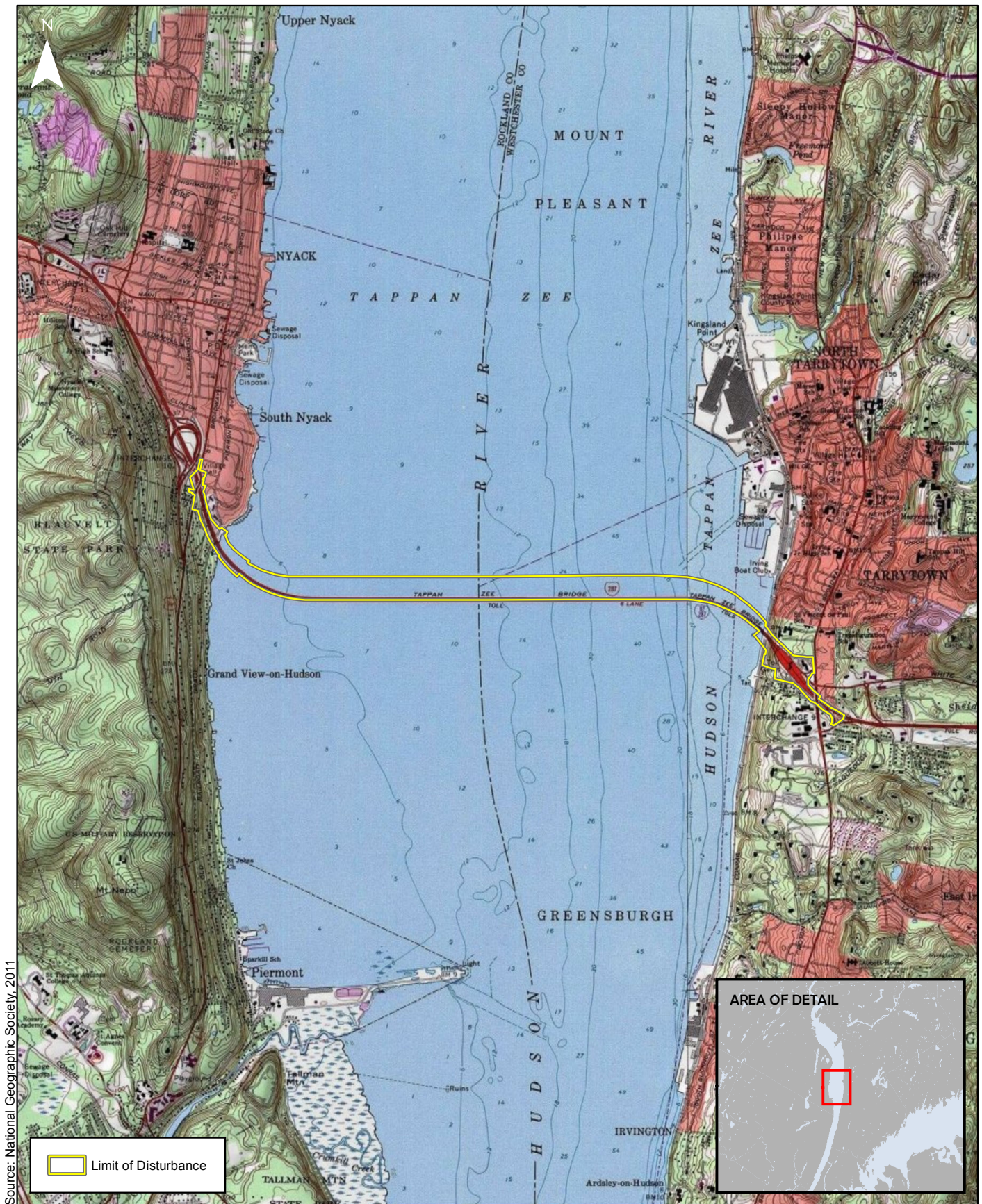
Hydric soils were not observed in the upland portions of the site. In some locations, it was difficult to sample soils due to rock, riprap, and other debris located near the surface of the soil. In locations where a sample was possible, the soils demonstrated a 10 YR 5/4 and 4/4 to 4/6 up to a 12 inch depth with no redox features.

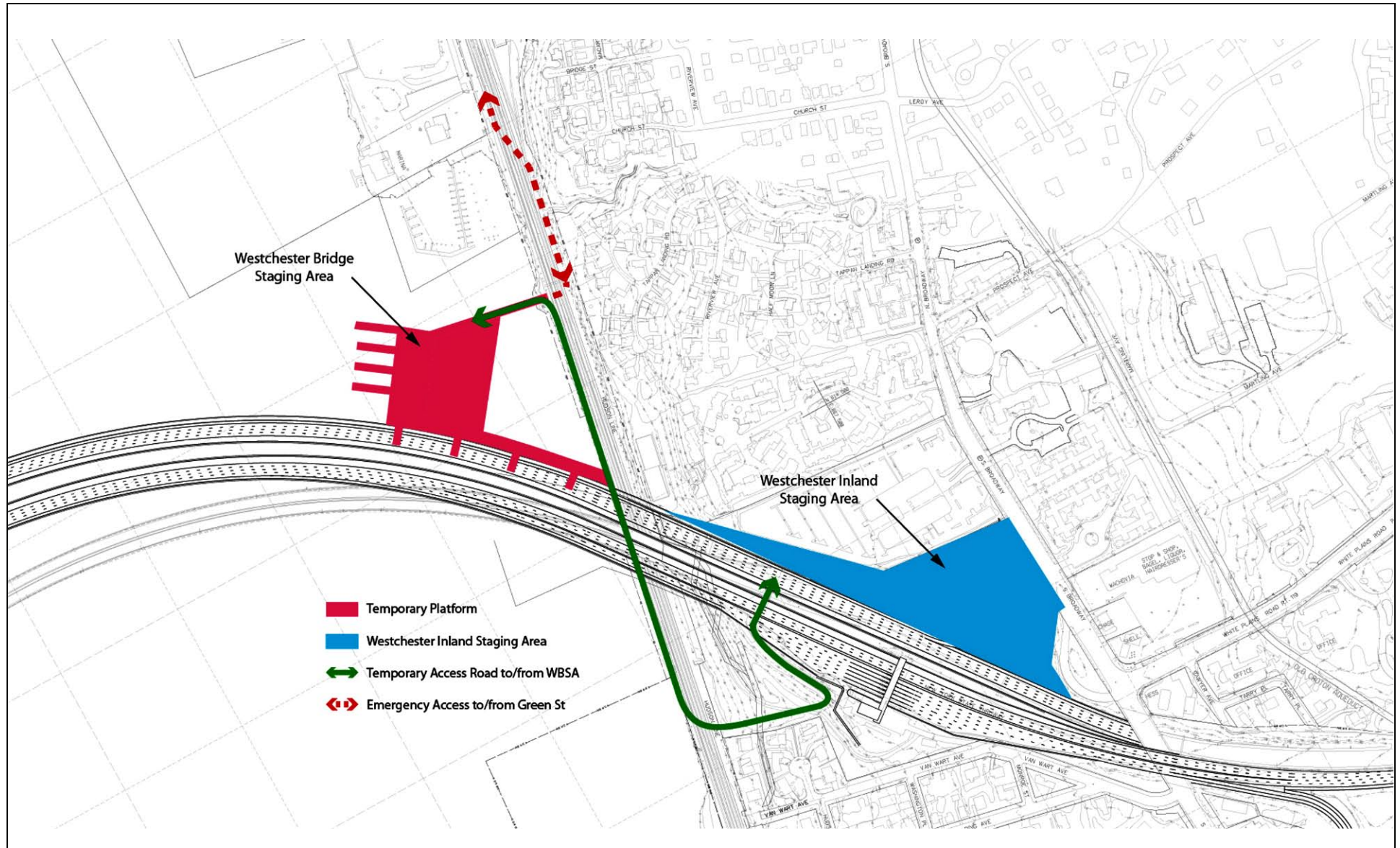
CONCLUSIONS

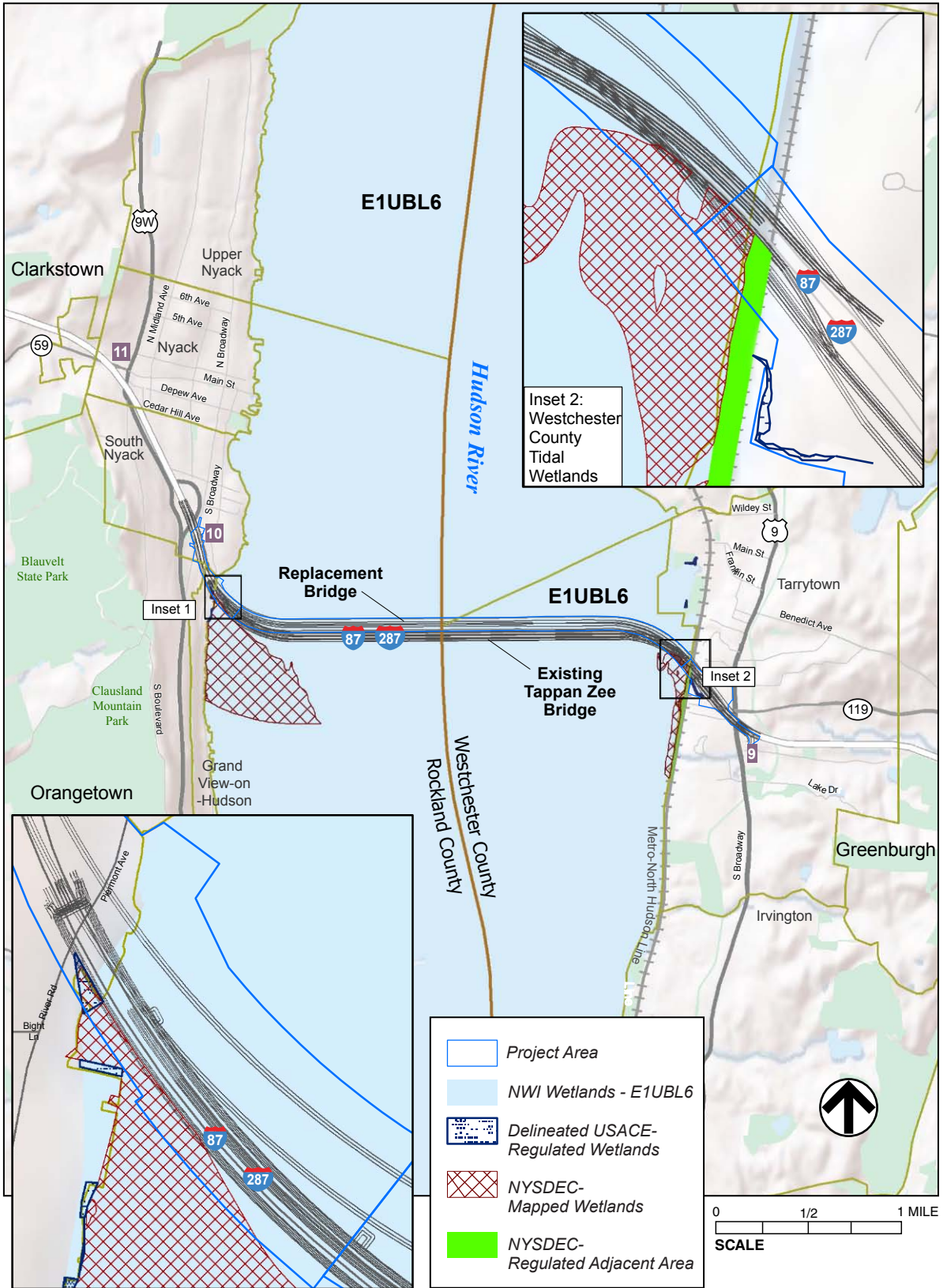
Based on the data collected during the wetland delineation performed on April 12, 2012 and the site visit with USACE on April 6, 2012, the stream and associated wetland area would be expected to fall under the jurisdiction of the USACE. Enclosure 4 includes four data sheets documenting the wetland and upland hydrology, vegetation, and soils of the site. Three of the data forms (Sampling Plots W-1 to W-3) show wetland conditions as defined by USACE and the fourth (Sampling Plot W-4) demonstrates the non-wetland conditions immediately upslope from the wetland boundary. In addition, Drawing Sheet 10 of 16 in Enclosure 4 of the JPA, has been

updated to include the survey of the wetland boundary showing the flag numbers and is included (see Sheet 6 of 6) in Enclosure 2 of this report.

Enclosure 2: Vicinity Map and Figures







Enclosure 3: Photographs



Photo 1: View of the culvert where the stream surfaces above ground at the top of the slope.



Photo 2: View of boulders and debris lining the channel along the south side of the property.



Photo 3: View of the flat streambed before it discharges to the Hudson River.



Photo 4: View of surface water from hillside seep. (Note: This photo is located in the vicinity of Sampling Plot W-2.)



Photo 5: View facing north of drainage ditch that is located parallel to MNR tracks.



Photo 6: View of skunk cabbage and garlic mustard in Sampling Plot W-1.



Photo 7: View facing south of Sampling Plot W-1.



Photo 8: View of general location of Sampling Plot W-2.



Photo 9: View of general location of Sampling Plot W-3 facing south.



Photo 10: View of general location of Sampling Plot W-3 facing north.

Enclosure 4: Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tappan Zee Bridge Hudson River Crossing Project City/County: Tarrytown/Westchester County Sampling Date: April 12, 2012
Applicant/Owner: New York Thruway Authority State: NY Sampling Point: W-1
Investigator(s): Jim Nash and Aubrey McMahon, AKRF, Inc. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Stream floodplain Local relief (concave, convex, none): _____
Slope (%): 0 Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Charlton loam 25 to 35% slopes (ChE) 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 No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	If yes, optional Wetland Site ID: <u>W</u>
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

This wetland is adjacent to a stream at the toe of a steep slope. The upland, stream, and wetland have been disturbed as large boulders, debris, drainage channels, and pipes are present throughout the site. Saturated soils, high water table, and surface water are present throughout the wetland area. Seeps are present at the toe of the slope, and in most instances, produce surface flow to the stream. Although much of the understory of the wetland along the stream is bare, the invasive European Black Elder (*Alnus glutinosa*) (FACW-) is dominant in the canopy. Skunk cabbage (*Symplocarpus foetidus*) (OBL), poison ivy (*Toxicodendron radicans*) (FAC) is present in pockets as are invasive species such as garlic mustard (*Alliaria petiolata*) (FACU-) and privet (*Ligustrum vulgare*) (FACU). As stated in the attached wetland delineation report, this wetland is in a narrow riparian habitat. Therefore, the vegetation monitoring plot sizes were modified to accommodate the linear configuration of the wetland area.

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Water-Stained Leaves (B9)	_____ Drainage Patterns (B10)
<u>X</u> High Water Table (A2)	_____ Aquatic Fauna (B13)	_____ Moss Trim Lines (B16)
_____ Saturation (A3)	_____ Marl Deposits (B15)	_____ Dry-Season Water Table (C2)
_____ Water Marks (B1)	_____ Hydrogen Sulfide Odor (C1)	_____ Crayfish Burrows (C8)
_____ Sediment Deposits (B2)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Drift Deposits (B3)	_____ Presence of Reduced Iron (C4)	_____ Stunted or Stressed Plants (D1)
_____ Algal Mat or Crust (B4)	_____ Recent Iron Reduction in Tilled Soils (C6)	<u>X</u> Geomorphic Position (D2)
_____ Iron Deposits (B5)	_____ Thin Muck Surface (C7)	_____ Shallow Aquitard (D3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Other (Explain in Remarks)	_____ Microtopographic Relief (D4)
_____ Sparsely Vegetated Concave Surface (B8)		_____ FAC-Neutral Test (D5)

Field Observations:	Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>8 inches</u> Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____	

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

Remarks:

Observations were made during a dry period. The sampling point is in between an intermittent stream (located in a floodplain of this stream) and a rocky/talus slope.

A high water table at an 8 inch depth was observed within the sampling plot. Adjacent the sampling plot seeps (surface water [A1]) at the toe of the adjacent rocky/talus slope are present. In some instances, these seeps produce surface flow to the creek, while others demonstrate ponding at the soil surface.

VEGETATION – Use scientific names of plants.

 Sampling Point: W-1

Tree Stratum (Plot size: <u>20x35 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status															
1. <u>Alnus glutinosa</u>	<u>65</u>	<u>Y</u>	<u>FACW-</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
2. <u>Acer platanoides</u>	<u>5</u>	<u>N</u>	<u>NL</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
<u>70</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>)																		
1. <u>N/A</u>				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> </table> Prevalence Index = B/A = _____	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)
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)																	
2. _____																		
3. _____																		
4. _____																		
5. _____																		
6. _____																		
7. _____																		
<u>0</u> = Total Cover																		
Herb Stratum (Plot size: <u>3.28 x 3.28 ft plot ave</u>)																		
1. <u>Symplocarpus foetidus</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Alliaria petiolata</u>	<u>15</u>	<u>N</u>	<u>FACU-</u>															
3. <u>Toxicodendrons radicans</u>	<u>5</u>	<u>N</u>	<u>FAC</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
12. _____																		
<u>45</u> = Total Cover																		
Woody Vine Stratum (Plot size: <u>20 x35 ft</u>)																		
1. <u>N/A</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____														
2. _____																		
3. _____																		
4. _____																		
<u>0</u> = Total Cover																		

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

Photos are included in the Wetland Delineation Report. Photographs 6 and 7 show Sampling Plot W-1.

SOIL

Sampling Point: W-1

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | | | |
|-------------------------------------|---|-------------------------------------|--|
| <input type="checkbox"/> | Histisol (A1) | <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Histic Epipedon (A2) | <input type="checkbox"/> | Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Black Histic (A3) | <input checked="" type="checkbox"/> | Loamy Mucky Mineral (F1) (LRR K, L) |
| <input type="checkbox"/> | Hydrogen Sulfide (A4) | <input checked="" type="checkbox"/> | Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> | Stratified Layers (A5) | <input type="checkbox"/> | Depleted Matrix (F3) |
| <input type="checkbox"/> | Depleted Below Dark Surface (A11) | <input type="checkbox"/> | Redox Dark Surface (F6) |
| <input checked="" type="checkbox"/> | Thick Dark Surface (A12) | <input type="checkbox"/> | Depleted Dark Surface (F7) |
| <input type="checkbox"/> | Sandy Mucky Mineral (S1) | <input type="checkbox"/> | Redox Depressions (F8) |
| <input type="checkbox"/> | Sandy Gleyed Matrix (S4) | | |
| <input type="checkbox"/> | Sandy Redox (S5) | | |
| <input type="checkbox"/> | Stripped Matrix (S6) | | |
| <input type="checkbox"/> | Dark Surface (S7) (LRR R, MLRA 149B) | | |

Indicators for Problematic Hydric Soils³:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> | Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> | Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> | Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> | Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> | Red Parent Material (TF2) |
| <input type="checkbox"/> | Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> | Other (Explain in Remarks) |

³Indicators 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 – Northcentral and Northeast Region

Project/Site: Tappan Zee Bridge Hudson River Crossing Project City/County: Tarrytown/Westchester County Sampling Date: April 12, 2012
 Applicant/Owner: New York Thruway Authority State: NY Sampling Point: W-2
 Investigator(s): Jim Nash and Aubrey McMahon, AKRF, Inc. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): stream floodplain Local relief (concave, convex, none): _____
 Slope (%): 0 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Charlton loam 25 to 35% slopes (ChE) 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 No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
If yes, optional Wetland Site ID: _____	
Remarks: (Explain alternative procedures here or in a separate report.) See remarks in the data form for Sampling Point W-1.	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>	
Primary Indicators (minimum of one is required; check all that apply)			
<u> </u> Surface Water (A1)	<u>X</u> Water-Stained Leaves (B9)	<u> </u> Surface Soil Cracks (B6)	
<u>X</u> High Water Table (A2)	<u> </u> Aquatic Fauna (B13)	<u> </u> Drainage Patterns (B10)	
<u> </u> Saturation (A3)	<u> </u> Marl Deposits (B15)	<u> </u> Moss Trim Lines (B16)	
<u> </u> Water Marks (B1)	<u> </u> Hydrogen Sulfide Odor (C1)	<u> </u> Dry-Season Water Table (C2)	
<u> </u> Sediment Deposits (B2)	<u> </u> Oxidized Rhizospheres on Living Roots (C3)	<u> </u> Crayfish Burrows (C8)	
<u> </u> Drift Deposits (B3)	<u> </u> Presence of Reduced Iron (C4)	<u> </u> Saturation Visible on Aerial Imagery (C9)	
<u> </u> Algal Mat or Crust (B4)	<u> </u> Recent Iron Reduction in Tilled Soils (C6)	<u>X</u> Stunted or Stressed Plants (D1)	
<u> </u> Iron Deposits (B5)	<u> </u> Thin Muck Surface (C7)	<u> </u> Geomorphic Position (D2)	
<u> </u> Inundation Visible on Aerial Imagery (B7)	<u> </u> Other (Explain in Remarks)	<u> </u> Shallow Aquitard (D3)	
<u> </u> Sparsely Vegetated Concave Surface (B8)		<u> </u> Microtopographic Relief (D4)	
		<u> </u> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present? Yes _____ No _____	Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____	
Water Table Present? Yes <u>X</u> No _____	Depth (inches): <u>6 inches</u>		
Saturation Present? (includes capillary fringe) Yes _____ No _____	Depth (inches): _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Observations were made during a dry period. The sampling point is in between an intermittent stream (located in a floodplain of this stream) and a rocky/talus slope. A high water table at a 6 inch depth was observed within the sampling plot. Adjacent the sampling plot seeps (surface water [A1]) at the toe of the adjacent rocky/talus slope are present. In some instances, these seeps produce surface flow to the creek, while others demonstrate ponding at the soil surface.			

VEGETATION – Use scientific names of plants.

 Sampling Point: W-2

Tree Stratum (Plot size: <u>20 x 35 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																									
1. <u>Alnus glutinosa</u>	<u>65</u>	<u>Y</u>	<u>FACW-</u>	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)																																																								
2. <u>Acer platandoides</u>	<u>5</u>	<u>N</u>	<u>NL</u>																																																									
3. _____	_____	_____	_____																																																									
4. _____	_____	_____	_____																																																									
5. _____	_____	_____	_____																																																									
6. _____	_____	_____	_____																																																									
7. _____	_____	_____	_____																																																									
<u>70</u> = Total Cover																																																												
Prevalence Index worksheet:																																																												
Total % Cover of:		Multiply by:																																																										
OBL species	<u>0</u>	x 1 = <u>0</u>																																																										
FACW species	<u>65</u>	x 2 = <u>130</u>																																																										
FAC species	<u>1</u>	x 3 = <u>3</u>																																																										
FACU species	<u>22</u>	x 4 = <u>88</u>																																																										
UPL species	<u>0</u>	x 5 = <u>0</u>																																																										
Column Totals:	<u>87</u>	(A)	<u>221</u>	(B)																																																								
Prevalence Index = B/A = <u>2.5</u>																																																												
Hydrophytic Vegetation Indicators:																																																												
<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation																																																												
<input type="checkbox"/> Dominance Test is >50%																																																												
<input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹																																																												
<input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)																																																												
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)																																																												
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																																												
Definitions of Vegetation Strata:																																																												
Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.																																																												
Sapling/shrub – Woody plants 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 vines – All woody vines greater than 3.28 ft in height.																																																												
Hydrophytic Vegetation Present? Yes <u>X</u> No _____																																																												
Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>)</th> <th style="width: 10%;">Absolute % Cover</th> <th style="width: 10%;">Dominant Species?</th> <th style="width: 10%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>1. <u>Ligustrum vulgare</u></td> <td><u>10</u></td> <td><u>Y</u></td> <td><u>FACU</u></td> </tr> <tr><td>2. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>7. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr> <td colspan="2" style="text-align: right;"><u>10</u> = Total Cover</td> <td colspan="2"></td> </tr> </tbody> </table>					Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1. <u>Ligustrum vulgare</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	2. _____	_____	_____	_____	3. _____	_____	_____	_____	4. _____	_____	_____	_____	5. _____	_____	_____	_____	6. _____	_____	_____	_____	7. _____	_____	_____	_____	<u>10</u> = Total Cover																							
Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																									
1. <u>Ligustrum vulgare</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>																																																									
2. _____	_____	_____	_____																																																									
3. _____	_____	_____	_____																																																									
4. _____	_____	_____	_____																																																									
5. _____	_____	_____	_____																																																									
6. _____	_____	_____	_____																																																									
7. _____	_____	_____	_____																																																									
<u>10</u> = Total Cover																																																												
Herb Stratum (Plot size: <u>3.28 ft x 3.28 ft (3 plot ave)</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Herb Stratum (Plot size: <u>3.28 ft x 3.28 ft (3 plot ave)</u>)</th> <th style="width: 10%;">Absolute % Cover</th> <th style="width: 10%;">Dominant Species?</th> <th style="width: 10%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>1. <u>Duchesnea indica</u></td> <td><u>7</u></td> <td><u>Y</u></td> <td><u>FACU-</u></td> </tr> <tr> <td>2. <u>Alliaria petiolata</u></td> <td><u>4</u></td> <td><u>Y</u></td> <td><u>FACU-</u></td> </tr> <tr> <td>3. <u>Toxicodendron radicans</u></td> <td><u>1</u></td> <td><u>N</u></td> <td><u>FAC</u></td> </tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>7. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>8. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>9. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>10. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>11. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>12. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr> <td colspan="2" style="text-align: right;"><u>12</u> = Total Cover</td> <td colspan="2"></td> </tr> </tbody> </table>					Herb Stratum (Plot size: <u>3.28 ft x 3.28 ft (3 plot ave)</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1. <u>Duchesnea indica</u>	<u>7</u>	<u>Y</u>	<u>FACU-</u>	2. <u>Alliaria petiolata</u>	<u>4</u>	<u>Y</u>	<u>FACU-</u>	3. <u>Toxicodendron radicans</u>	<u>1</u>	<u>N</u>	<u>FAC</u>	4. _____	_____	_____	_____	5. _____	_____	_____	_____	6. _____	_____	_____	_____	7. _____	_____	_____	_____	8. _____	_____	_____	_____	9. _____	_____	_____	_____	10. _____	_____	_____	_____	11. _____	_____	_____	_____	12. _____	_____	_____	_____	<u>12</u> = Total Cover			
Herb Stratum (Plot size: <u>3.28 ft x 3.28 ft (3 plot ave)</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																									
1. <u>Duchesnea indica</u>	<u>7</u>	<u>Y</u>	<u>FACU-</u>																																																									
2. <u>Alliaria petiolata</u>	<u>4</u>	<u>Y</u>	<u>FACU-</u>																																																									
3. <u>Toxicodendron radicans</u>	<u>1</u>	<u>N</u>	<u>FAC</u>																																																									
4. _____	_____	_____	_____																																																									
5. _____	_____	_____	_____																																																									
6. _____	_____	_____	_____																																																									
7. _____	_____	_____	_____																																																									
8. _____	_____	_____	_____																																																									
9. _____	_____	_____	_____																																																									
10. _____	_____	_____	_____																																																									
11. _____	_____	_____	_____																																																									
12. _____	_____	_____	_____																																																									
<u>12</u> = Total Cover																																																												
Woody Vine Stratum (Plot size: <u>20 x 35 ft</u>) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Woody Vine Stratum (Plot size: <u>20 x 35 ft</u>)</th> <th style="width: 10%;">Absolute % Cover</th> <th style="width: 10%;">Dominant Species?</th> <th style="width: 10%;">Indicator Status</th> </tr> </thead> <tbody> <tr> <td>1. <u>N/A</u></td> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr><td>2. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr> <td colspan="2" style="text-align: right;"><u>0</u> = Total Cover</td> <td colspan="2"></td> </tr> </tbody> </table>					Woody Vine Stratum (Plot size: <u>20 x 35 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1. <u>N/A</u>	_____	_____	_____	2. _____	_____	_____	_____	3. _____	_____	_____	_____	4. _____	_____	_____	_____	<u>0</u> = Total Cover																																			
Woody Vine Stratum (Plot size: <u>20 x 35 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																									
1. <u>N/A</u>	_____	_____	_____																																																									
2. _____	_____	_____	_____																																																									
3. _____	_____	_____	_____																																																									
4. _____	_____	_____	_____																																																									
<u>0</u> = Total Cover																																																												
Remarks: (Include photo numbers here or on a separate sheet.) The sampling plot contains bare areas lacking vegetation. The Duchesnea indica forms one ~4 x ~4 ft patch within the entire wetland area. Alliaria petiolata and Toxicodendron radicans are sparsely scattered throughout the plots. Alnus glutinosa (FACW-) is dominant in the canopy. Photographs are included in the Wetland Delineation Report. Photograph 8 shows Sampling Plot W-2.																																																												

SOIL

Sampling Point: W-2

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | | | |
|-------------------------------------|---|-------------------------------------|--|
| <input type="checkbox"/> | Histosol (A1) | <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Histic Epipedon (A2) | <input type="checkbox"/> | Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Black Histic (A3) | <input type="checkbox"/> | Loamy Mucky Mineral (F1) (LRR K, L) |
| <input type="checkbox"/> | Hydrogen Sulfide (A4) | <input type="checkbox"/> | Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> | Stratified Layers (A5) | <input checked="" type="checkbox"/> | Depleted Matrix (F3) |
| <input type="checkbox"/> | Depleted Below Dark Surface (A11) | <input type="checkbox"/> | Redox Dark Surface (F6) |
| <input checked="" type="checkbox"/> | Thick Dark Surface (A12) | <input type="checkbox"/> | Depleted Dark Surface (F7) |
| <input type="checkbox"/> | Sandy Mucky Mineral (S1) | <input type="checkbox"/> | Redox Depressions (F8) |
| <input type="checkbox"/> | Sandy Gleyed Matrix (S4) | | |
| <input type="checkbox"/> | Sandy Redox (S5) | | |
| <input type="checkbox"/> | Stripped Matrix (S6) | | |
| <input type="checkbox"/> | Dark Surface (S7) (LRR R, MLRA 149B) | | |

Indicators for Problematic Hydric Soils³:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> | Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> | Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> | Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> | Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> | Red Parent Material (TF2) |
| <input type="checkbox"/> | Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> | Other (Explain in Remarks) |

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

Restrictive Layer (if observed):

Type: N/A

Depth (inches):

Hydric Soil Present? Yes X No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tappan Zee Bridge Hudson River Crossing Project City/County: Tarrytown/Westchester County Sampling Date: April 12, 2012
 Applicant/Owner: New York Thruway Authority State: NY Sampling Point: W-3
 Investigator(s): Jim Nash and Aubrey McMahon, AKRF, Inc. Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hill slope/ Local relief (concave, convex, none): none
 Slope (%): 0 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Charlton loam 25 to 35% slopes (ChE) 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 No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) See remarks section in data form for Sampling Point W-1.	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>	
<u>Primary Indicators (minimum of one is required; check all that apply)</u>			
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes <u>X</u> No _____ Depth (inches): <u>~ < 1 inch</u> Water Table Present? Yes <u>X</u> No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>surface</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: <p>Observations were made during a dry period. The sampling point is in between an intermittent stream (located in a floodplain of this stream) and a rocky/talus slope.</p> <p>Within the sampling plot seeps (surface water [A1]) at the toe of the adjacent rocky/talus slope are present. In some instances, these seeps produce surface flow to the creek, while others demonstrate ponding at the soil surface.</p>			

VEGETATION – Use scientific names of plants.

 Sampling Point: W-3

Tree Stratum (Plot size: <u>20 x 35 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus glutinosa</u>	<u>55</u>	<u>Y</u>	<u>FACW-</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
2. <u>Acer platandoides</u>	<u>5</u>	<u>N</u>	<u>NL</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10 x 10 ft</u>)				
1. <u>Ligustrum vulgare</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	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 = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
<u>30</u> = Total Cover				
Herb Stratum (Plot size: <u>3.28 x 3.28 ft (3 plot ave)</u>)				
1. <u>Toxicodendron radicans</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Ligustrum vulgare</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. <u>Alliaria petiolata</u>	<u>5</u>	<u>N</u>	<u>FACU-</u>	
4. <u>Polygonum cuspidatum</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>35</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>20 X 35 ft</u>)				
1. <u>N/A</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				

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

Photographs are included with the Wetland Delineation Report. Photographs 9 and 10 show Sampling Plot W-3.

SOIL

Sampling Point: W-3

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | | | |
|-------------------------------------|---|-------------------------------------|--|
| <input type="checkbox"/> | Histosol (A1) | <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Histic Epipedon (A2) | <input type="checkbox"/> | Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Black Histic (A3) | <input checked="" type="checkbox"/> | Loamy Mucky Mineral (F1) (LRR K, L) |
| <input type="checkbox"/> | Hydrogen Sulfide (A4) | <input type="checkbox"/> | Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> | Stratified Layers (A5) | <input type="checkbox"/> | Depleted Matrix (F3) |
| <input type="checkbox"/> | Depleted Below Dark Surface (A11) | <input type="checkbox"/> | Redox Dark Surface (F6) |
| <input checked="" type="checkbox"/> | Thick Dark Surface (A12) | <input type="checkbox"/> | Depleted Dark Surface (F7) |
| <input type="checkbox"/> | Sandy Mucky Mineral (S1) | <input type="checkbox"/> | Redox Depressions (F8) |
| <input type="checkbox"/> | Sandy Gleyed Matrix (S4) | | |
| <input type="checkbox"/> | Sandy Redox (S5) | | |
| <input type="checkbox"/> | Stripped Matrix (S6) | | |
| <input type="checkbox"/> | Dark Surface (S7) (LRR R, MLRA 149B) | | |

Indicators for Problematic Hydric Soils³:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> | Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> | Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> | Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> | Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> | Red Parent Material (TF2) |
| <input type="checkbox"/> | Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> | Other (Explain in Remarks) |

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): ~ < 1 inch

Hydric Soil Present? Yes X No

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Tappan Zee Bridge Hudson River Crossing Project City/County: Tarrytown/Westchester County Sampling Date: April 12, 2012
Applicant/Owner: New York Thruway Authority State: NY Sampling Point: W-4
Investigator(s): Jim Nash and Aubrey McMahon, AKRF, Inc. Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): none
Slope (%): 35 Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: Charlton loam 25 to 35% slopes (ChE) 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 No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation No, Soil No, or Hydrology No 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 <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
If yes, optional Wetland Site ID: _____	
Remarks: (Explain alternative procedures here or in a separate report.) This Sampling Point is located on a slope located immediately upland from the wetland documented in data forms for Sampling Points W-1 through W-3. The Sampling Point does not meet the USACE wetland definition with respect to hydrology, hydrophytic vegetation, and hydric soils.	

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (minimum of two required)</u>
Primary Indicators (minimum of one is required; check all that apply)		_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Water-Stained Leaves (B9)	_____ Drainage Patterns (B10)
_____ High Water Table (A2)	_____ Aquatic Fauna (B13)	_____ Moss Trim Lines (B16)
_____ Saturation (A3)	_____ Marl Deposits (B15)	_____ Dry-Season Water Table (C2)
_____ Water Marks (B1)	_____ Hydrogen Sulfide Odor (C1)	_____ Crayfish Burrows (C8)
_____ Sediment Deposits (B2)	_____ Oxidized Rhizospheres on Living Roots (C3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Drift Deposits (B3)	_____ Presence of Reduced Iron (C4)	_____ Stunted or Stressed Plants (D1)
_____ Algal Mat or Crust (B4)	_____ Recent Iron Reduction in Tilled Soils (C6)	_____ Geomorphic Position (D2)
_____ Iron Deposits (B5)	_____ Thin Muck Surface (C7)	_____ Shallow Aquitard (D3)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Other (Explain in Remarks)	_____ Microtopographic Relief (D4)
_____ Sparsely Vegetated Concave Surface (B8)		_____ FAC-Neutral Test (D5)
Field Observations:		Wetland Hydrology Present? Yes _____ No <u>X</u>
Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____	Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: W-4

Tree Stratum (Plot size: <u>30-ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer platandoides</u>	<u>70</u>	<u>Y</u>	<u>NL</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. <u>Alnus glutinosa</u>	<u>10</u>	<u>N</u>	<u>FACW-</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
		<u>80</u>	= Total Cover	Prevalence Index worksheet: <div style="display: flex; justify-content: space-between;"> Total % Cover of: Multiply by: </div> 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 = _____
Sapling/Shrub Stratum (Plot size: <u>15-ft radius</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
		<u>N/A</u>	= Total Cover	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>3.28 x 3.28 ft (3 plot ave)</u>)				
1. <u>Alliaria petiolata</u>	<u>7</u>	<u>Y</u>	<u>FACU-</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
		<u>7</u>	= Total Cover	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants 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 vines – All woody vines greater than 3.28 ft in height.
Woody Vine Stratum (Plot size: <u>30-ft radius</u>)				
1. <u>N/A</u>	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
		<u>0</u>	= Total Cover	
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>				
Remarks: (Include photo numbers here or on a separate sheet.) 				

SOIL

Sampling Point: W-4

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

[illegible]

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- | | | | |
|--------------------------|---|--------------------------|--|
| <input type="checkbox"/> | Histosol (A1) | <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Histic Epipedon (A2) | <input type="checkbox"/> | Thin Dark Surface (S9) (LRR R, MLRA 149B) |
| <input type="checkbox"/> | Black Histic (A3) | <input type="checkbox"/> | Loamy Mucky Mineral (F1) (LRR K, L) |
| <input type="checkbox"/> | Hydrogen Sulfide (A4) | <input type="checkbox"/> | Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> | Stratified Layers (A5) | <input type="checkbox"/> | Depleted Matrix (F3) |
| <input type="checkbox"/> | Depleted Below Dark Surface (A11) | <input type="checkbox"/> | Redox Dark Surface (F6) |
| <input type="checkbox"/> | Thick Dark Surface (A12) | <input type="checkbox"/> | Depleted Dark Surface (F7) |
| <input type="checkbox"/> | Sandy Mucky Mineral (S1) | <input type="checkbox"/> | Redox Depressions (F8) |
| <input type="checkbox"/> | Sandy Gleyed Matrix (S4) | | |
| <input type="checkbox"/> | Sandy Redox (S5) | | |
| <input type="checkbox"/> | Stripped Matrix (S6) | | |
| <input type="checkbox"/> | Dark Surface (S7) (LRR R, MLRA 149B) | | |

Indicators for Problematic Hydric Soils³:

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> | Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> | 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> | Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> | Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> | Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> | Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> | Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> | Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> | Red Parent Material (TF2) |
| <input type="checkbox"/> | Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> | Other (Explain in Remarks) |

³Indicators 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: