



# III.C

## Wetlands, Waterbodies, and Watercourses

### 1. Existing Conditions and Capacity

This chapter describes the following existing natural resources within the Study Area on the basis of existing information and the results of the reconnaissance field survey: groundwater, surface waters, floodplains, and wetlands based on the Natural Resource Inventory (NRI) surveys, wetland delineations, and the investigating team's experience and familiarity with the site.<sup>1</sup>

On March 10 and March 11, 2016, the on-site wetlands were delineated by Robert G. Torgersen. On March 26, 2019, Capital Environmental Consultants, Inc. (Capital) confirmed the location of Mr. Torgersen's flags and conducted soil sampling to confirm the location and extent of any onsite wetlands and watercourses he delineated. The delineation was performed in accordance with the three-parameter methodology outlined in the ACOE 1987 Wetland Delineation Manual (TR-Y-87-1) and Northcentral and Northeast Regional Supplement.<sup>2,3</sup> The wetland line was physically marked using flagging with alphanumeric labeling. Data sheets were created using information collected by Capital on data point locations along the wetland/upland interface pertaining to site soils, vegetation, and hydrology. Areas along the delineated line were designated as representative locations and data was evaluated along the line transecting the upland/wetland boundary (**Appendix V**). An Approved jurisdictional determination request was submitted to the United States Army Corps of Engineers (USACE) in June 2019. An AJD was issued by USACE on January 10, 2020, confirming the location and extent of the on-site federally regulated wetlands (**Appendix W**).

<sup>1</sup> NRI Field Surveys March 2022 to present; Other site visits March 26, October 9, 2019, and August 12, 2021.

<sup>2</sup> Environmental Laboratory. (1987). Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

<sup>3</sup> U.S. Army Corps of Engineers. 2011. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble, and J.F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

## Groundwater

Groundwater is first encountered between 0.5 feet and 20 feet below ground surface (bgs) throughout the Study Area. Fluctuations in groundwater levels can occur due to variations in topography, season, rainfall, snowmelt, surface infiltration, temperature, construction activities, pumping of dewatering systems, leakage from utilities and other factors.

The Study Area is located within the Ramapo River Basin Aquifer System, a sole source aquifer (SSA). The aquifer is depicted on **Figure III.C-1**, Sole Source Aquifers. NYSDEC has further classified the Study Area to be within an unconfined, mid-yield, primary aquifer. The Safe Drinking Water Act gives EPA the authority to designate aquifers which are the sole or principal drinking water source for an area, and which, if contaminated, would create a significant hazard to public health. USEPA defines a SSA as one which supplies at least 50% of the drinking water consumed in the area overlying the aquifer. EPA guidelines also require that these areas have no alternative drinking water source(s) which could physically, legally, and economically supply water to all who depend on the aquifer for drinking water.<sup>4</sup> Groundwater from four drilled wells located in the Ramapo Valley, within the Ramapo River Basin Aquifer System is the main source of drinking water in the Village of Suffern.

## Aquatic Resources

### Surface Water Resources

The Project Site is located within the USGS Hackensack-Passaic Watershed (HUC 02030103). Surface waters located on the Project Site include intermittent and perennial tributaries to the Mahwah River, located to the north, and a stormwater pond. Tributaries 1, 2, 3, 4, and 5, are located throughout the Project Site, as depicted on **Figure III.C-2**, Waters of the United States.

Capital classified waterbodies on the Property using the U.S. Fish and Wildlife Service Classification of Wetland and Deepwater Habitats of the United States system.

#### › Tributary 1

Tributary 1 is mapped by NWI (**Figure III.C-3**) as a R5UBH (Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded).

Tributary 1 drains on-site from a culvert beneath the railroad tracks along the southern property boundary. Tributary 1 flows through Wetland C. Tributary 1 exits Wetland C via a culvert northerly into Wetland A. The portion of Tributary 1 that lies within Wetland A falls within the 100-year floodplain. Tributary 1 continues draining northerly through the western portion of the property bisecting the majority of Wetland A and exits the site under the NYS Thruway draining into the Mahwah River.

#### › Tributary 2

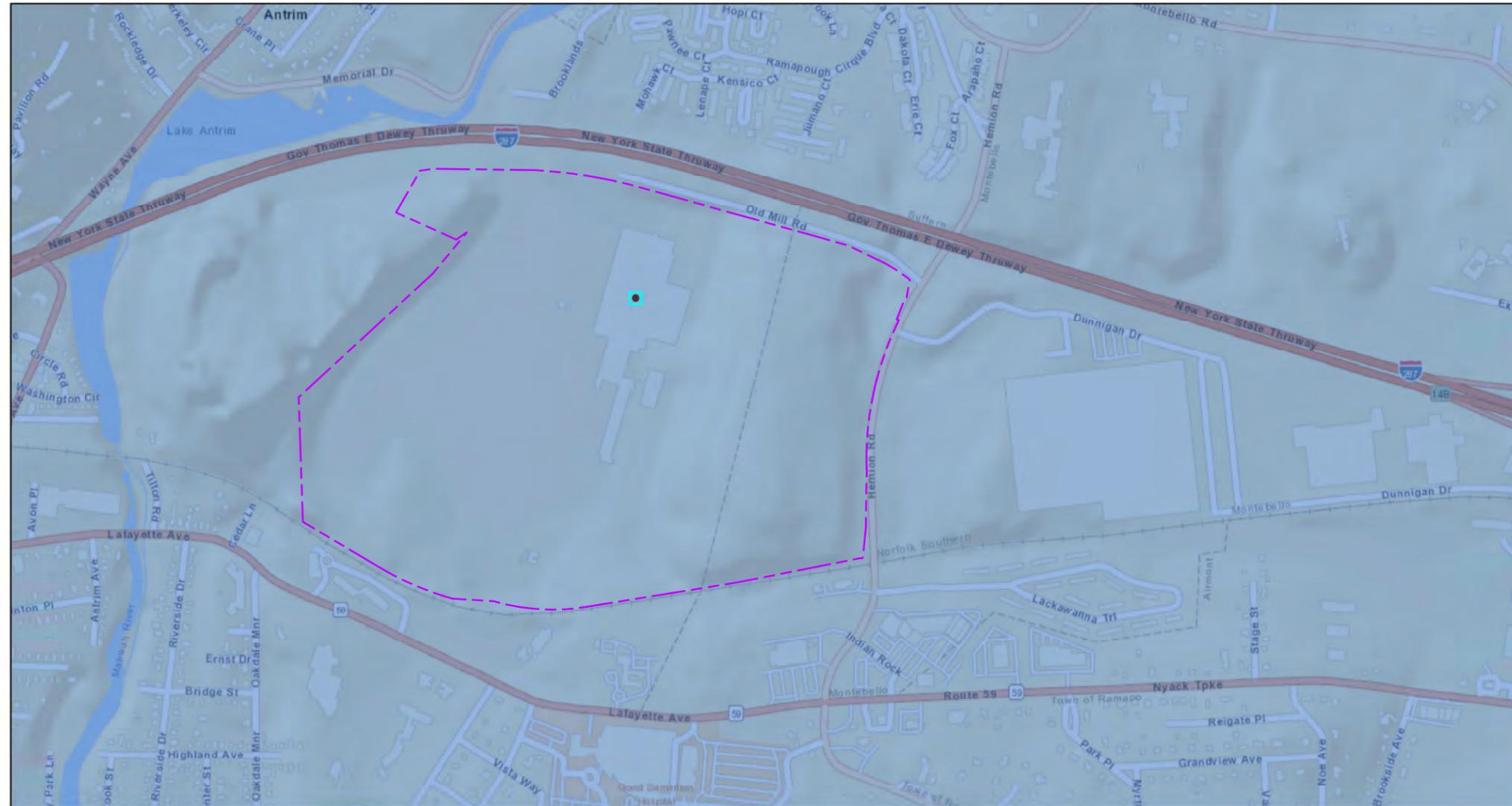
Tributary 2 is not mapped by NWI (**Figure III.C-3**). During the onsite wetland delineation confirmation, Capital observed Tributary 2 as delineated by Robert G. Torgersen in 2016. Capital confirmed the boundaries of Tributary 2 in accordance with the three-parameter methodology outlined in the ACOE 1987 Wetland Delineation Manual (TR-Y-87-1) and Northcentral and

<sup>4</sup> [https://www3.epa.gov/region1/eco/drinkwater/pc\\_solesource\\_aquifer.html](https://www3.epa.gov/region1/eco/drinkwater/pc_solesource_aquifer.html)

Northeast Regional Supplement. Capital observed the tributary characteristics and determined the tributary is best described as a R4SB (Riverine, Intermittent, Streambed).

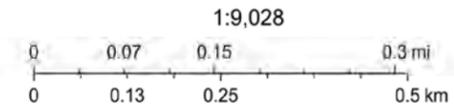
Tributary 2 is located within the south-central portion of the Subject Property. Tributary 2 drains onto the site from a culvert beneath the railroad tracks along the southern property boundary. Tributary 2 drains to Tributary 1 at a confluence located within Wetland C. Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River.

# ArcGIS Web AppBuilder



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Sole\_Source\_Aquifers



State of New Jersey, Esri, HERE, Garmin, GeoTechnologies, Inc., Intermap, NGA, USGS

U.S. Environmental Protection Agency

Source: Nearmap Aerial 4/16/2022; Survey file S370999004\_200\_Radius.dwg

Source: Paulus, Sokolowski and Sartor, LLC, Warren, NJ, Tax Map Section 55.22, Block 1, Lot 1, Tax Map Section 55.37, Block 1, Lot 31, Suffern, NY, Wetlands Survey, 3/25/2016



- Legend
- Jurisdictional Wetlands
  - Pond
  - Project Site Boundary
  - Tributary
  - Culvert



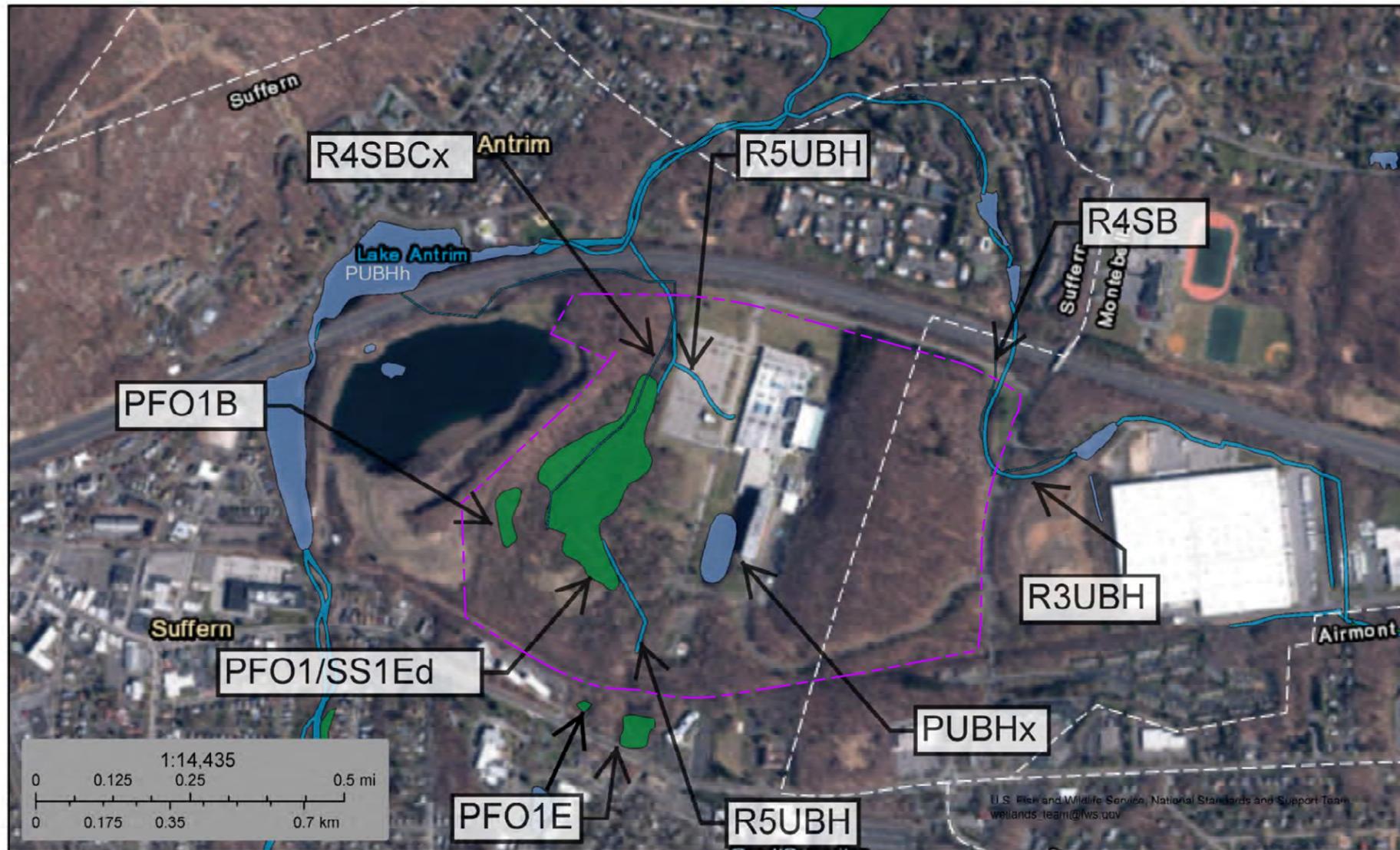
Name	Area onsite (acres)	Area onsite (Square meters)	Length (Feet)
Wetland A/Perennial Stream (Trib. 1)/ Intermittent Stream (Trib. 4)	12.13	49,103.44	NA
Wetland B	1.11	4,482.48	NA
Wetland C/Intermittent Streams (Trib. 1, 2 & 3)	1.74	7,024.31	NA
Wetland D	0.17	706.43	NA
Wetland E/Intermittent Stream (Trib. 3)	0.49	1,972.05	NA
Wetland F/Intermittent Stream (Trib. 3)	0.08	324.14	NA
Tributary 1	NA	NA	3,310
Tributary 2	NA	NA	217
Tributary 3	NA	NA	1,379
Tributary 4	NA	NA	750
Tributary 5 (Perennial Stream)	0.22	876.54	485
Pond/Wetland Fringe	2.23	9,023.86	NA

Waters of the U.S.  
Figure III.C-2



U.S. Fish and Wildlife Service  
National Wetlands Inventory

Old Mill 1



February 26, 2019

**Wetlands**

- |                                   |                 |
|-----------------------------------|-----------------|
| Freshwater Emergent Wetland       | Lake            |
| Freshwater Forested/Shrub Wetland | Other           |
| Estuarine and Marine Deepwater    | Freshwater Pond |
| Estuarine and Marine Wetland      | Riverine        |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)  
This page was produced by the NWI mapper

**Legend**  
 Project Site Boundary

Source: Nearmap Aerial 4/16/2022; Survey file S370999004\_200\_Radius.dwg

#### › Tributary 3

Tributary 3 is not mapped by NWI (**Figure III.C-3**). During the onsite wetland delineation confirmation, Capital observed Tributary 3 as delineated by Robert G. Torgersen in 2016. Capital confirmed the boundaries of Tributary 3 in accordance with the three-parameter methodology outlined in the ACOE 1987 Wetland Delineation Manual (TR-Y-87-1) and Northcentral and Northeast Regional Supplement. Capital observed the tributary characteristics and determined the tributary is best described as a R4SB (Riverine, Intermittent, Streambed).

Tributary 3 is located within the south-central portion of the Subject Property. Tributary 3 forms from stormwater drainage and a potential seep from below the railroad tracks at Wetland D. Tributary 3 drains Wetland D via a culvert beneath the internal roadway into Wetland E. Tributary 3 drains northwesterly through Wetland E and then drains westerly towards Wetland C. Tributary 3 drains to Tributary 1 at a confluence located within Wetland C. Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River.

#### › Tributary 4

Tributary 4 is mapped by NWI (**Figure III.C-3**) as a R4SBCx (Riverine, Intermittent, Streambed, Seasonally Flooded, Excavated).

Tributary 4 is located within the western portion of the Subject Property. Tributary 4 drains northerly through Wetland A into Tributary 1 at a confluence located within Wetland A. Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River.

#### › Tributary 5

Tributary 5 is mapped by NWI (**Figure III.C-3**) as a R3UBH/R4SBC (Riverine Upper Perennial, Unconsolidated Bottom, Permanently Flooded, Riverine, Intermittent, Streambed, Seasonally Flooded).

Tributary 5 drains westerly onto the site from beneath Hemion Road. Tributary 5 and exits the site under Old Mill Road and the NYS Thruway eventually draining into the Mahwah River.

#### › Stormwater Pond

The Stormwater Pond is mapped by NWI (**Figure III.C-3**) as a PuBHx (Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated).

Pond 1 is a dammed/impounded waterbody originally established within a historically existing wetland for industrial stormwater purposes. There is a man-made connection from Tributary 3 into the pond. Ditch 1 infrequently conveys water from Pond 1 to Tributary 1 at a confluence within Wetland A. Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River.

## Water Quality

Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 701 includes classifications for surface waters and groundwater. Tributaries 1 and 5 are mapped by NYSDEC and assigned a classification of 'C'. The best usage for class C fresh surface waters is fishing. Class C waters are suitable for fish, shellfish and wildlife propagation and survival and for primary and secondary contact recreation, although other factors may limit the use for these purposes.

For waterbodies with a year-round flow, which do not appear on the NYSDEC Environmental Resource Mapper (ERM), it is assigned the classification of the water body into which it feeds. All other tributaries on site as classified as intermittent and do not maintain a year-round flow.

The Stormwater Pond is not mapped by NYSDEC and has not been assigned a waterbody classification.

## Aquatic Biota

Tributaries and ponds may support a diverse and productive aquatic community. The following sections provide a brief description of the primary groups of aquatic biota found within tributaries and stormwater pond within the vicinity of the Project Site.

### › Aquatic Vegetation

There was limited aquatic vegetation associated with the upper portion of Tributary 1 within the Project Site. No aquatic vegetation was observed in Tributaries 2, 3, 4, and 5. Observed species included water purslane (*Lythrum portula*) and duckweed (*Lemna minor*). The substrate of all tributaries consisted of unconsolidated mud and some gravel/cobble.

### › Benthic Invertebrates

Invertebrate organisms that inhabit bottom sediments and surfaces of submerged objects (such as rocks, pilings, or debris) are commonly referred to as benthic invertebrates. These organisms are important to an ecosystem's energy flow because they convert detrital and suspended organic material into carbon (or living material). They are also integral components of the diets of ecologically and commercially important fish and waterfowl species. Benthic invertebrates are also essential in promoting the exchange of nutrients between the sediment and water column. Substrate type (rocks, pilings, sediment grain size, etc.), salinity, and DO levels are the primary factors influencing benthic invertebrate communities; secondary factors include currents, wave action, predation, succession, and disturbance. Benthic organisms are likely restricted to the on-site perennial waters, including Tributary 1 and the Stormwater Pond.

### › Amphibians and Reptiles

The fauna throughout the Project Site was surveyed by Capital during Natural Resource Inventory (NRI) field visits. Tributary 1 and the Stormwater Pond were further evaluated in April and May of 2022 by Jason Tesauro Consulting, LLC (Tesauro Consulting) during a bog turtle survey. Tributary 1 within Wetland A was further evaluated during the bog turtle survey as it was identified as an area of potential bog turtle habitat. The stormwater pond was further evaluated during the bog turtle survey as reptiles and amphibians were observed on prior field visits utilizing this habitat. The freshwater systems supported species of amphibians and reptiles including, but not limited to the common snapping turtle (*Chelydra serpentina*), eastern painted turtle (*Chrysemys picta*), Eastern box turtle (*Terrapene carolina*), eastern garter snake (*Thamnophis sirtalis*), northern water snake (*Nerodia sipedon*), northern brown snake (*Storeyia dekayi*), green frog (*Lithobates clamitans melanota*), northern spring peeper (*Pseudacris crucifer*).

## Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are official maps of a community on which FEMA has delineated both the special hazard areas and, for

insurance purposes, the risk premium zones applicable to the community, inclusive of the 100 and 500-year floodplains. The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA). A base flood is the flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the 100-year flood. A 500-year floodplain is an area in which a 0.2% annual chance flood may occur. Additionally, 500-year floodplains identify 100-year floodplains with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from the 100-year flood. Most floods fall into three major categories: riverine flooding, coastal flooding, and shallow flooding.

Based on FEMA FIRM maps, the western portion of the Project Site contains 100 and 500-year floodplains and a floodway. A floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increase in flood heights. Along the western tributaries (Tributary 1 and 4) the Project Site is located within the 100-year floodplain within Zone AE (base flood elevations determined) with a 100-year flood elevation ranging from 302 to 303 feet North American Vertical Datum of 1988 (NAVD88) as depicted on **Figure III.C-4**. Furthermore, the 500-year floodplain expands beyond the 100-year floodplain within the western portion of the site. The 500-year flood elevation has not been determined. No coastal flood zones are mapped on the Project Site.

## Wetlands

Available data related to wetlands on and adjacent to the Project Site were obtained from US Geological Survey quadrangle maps, U.S. Fish and Wildlife Service National Wetlands Inventory Maps (NWI), New York State Department of Environmental Conservation (NYSDEC) Freshwater and Tidal Wetland Maps, US Department of Agriculture—Natural Resource Conservation Service (NRCS) Web Soil Survey, aerial imagery, and other relevant sources.<sup>5,6,7,8</sup>

The NWI maps show the general configuration, location, and category of wetlands found within a given area of coverage.<sup>9</sup> A NWI wetland map depicting the location of the Project Site can be seen in **Figure III.C-3**. Because the NWI maps are limited in precision by their scale and by the identification method used, the presence and boundaries of wetlands shown on the NWI maps need to be more precisely verified in the field. Commonly, small wetland areas, and, less frequently, large wetland areas are not precisely located on NWI maps and may not be wetlands that exhibit the three parameters set forth in USACE guidance.

The NYSDEC is responsible for mapping larger freshwater wetlands that are 12.4 acres in size or greater, or some smaller wetlands that are of unusual local importance (Environmental Conservation Law, Article 24). A NYSDEC Environmental Resources Map depicting no freshwater wetlands on the Project Site is included in **Figure III.C-5**.

<sup>5</sup> USGS 7.5 Min. Quadrangle Map –Ramsey, New Jersey.

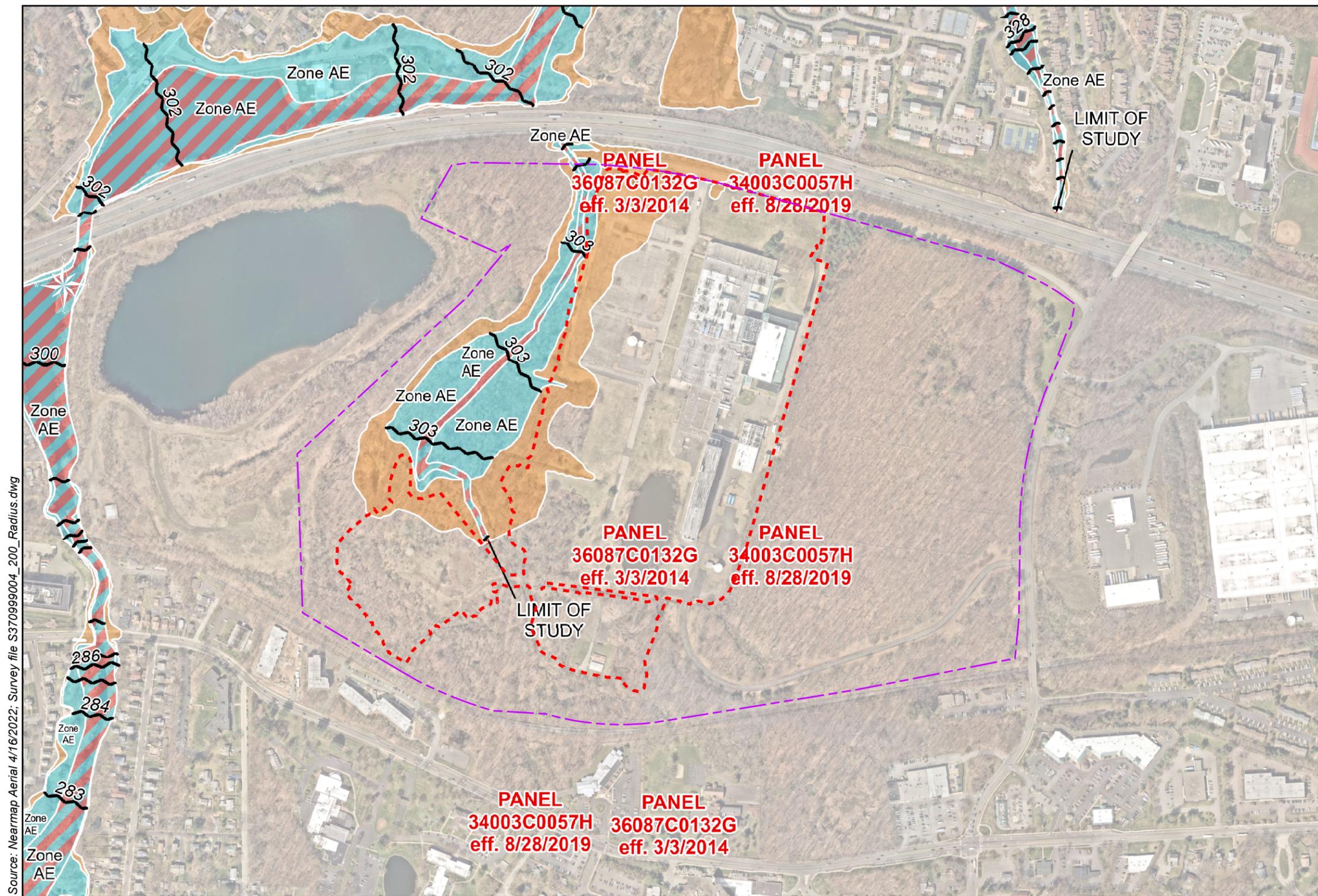
<sup>6</sup> U.S. Fish and Wildlife Service – National Wetlands Inventory; Wetlands Mapper; <http://www.fws.gov/wetlands/data/Mapper.html>.

<sup>7</sup> New York State Department of Environmental Conservation; Online Environmental Resource Mapper; <http://www.dec.ny.gov/gis/erm/>.

<sup>8</sup> New York State Department of State – Geographic Information Gateway; <https://opdgig.dos.ny.gov/#/home>.

<sup>9</sup> Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

The NYSDEC is also responsible for mapping tidal wetlands which border on or lie beneath tidal waters or reside in the intertidal and high marsh areas subject to tidal action (Environmental Conservation Law, Article 25). The NYSDEC Tidal Wetlands Maps were reviewed and no NYSDEC mapped tidal wetlands reside on or adjacent to the Development Site.



Source: Nearmap Aerial 4/16/2022; Survey file S370999004\_200\_Radius.dwg

Flood Hazard Areas in the Limit of Disturbance	
Flood Hazard Designation	Area (acres)
0.2% Annual Chance Flood Hazard	8.34
1% Annual Chance Flood Hazard	0.23

**Legend**

- Project Site Boundary
- Proposed Project Limit of Disturbance
- Base Flood Elevations

**Flood Hazard Boundaries**

**Line Type**

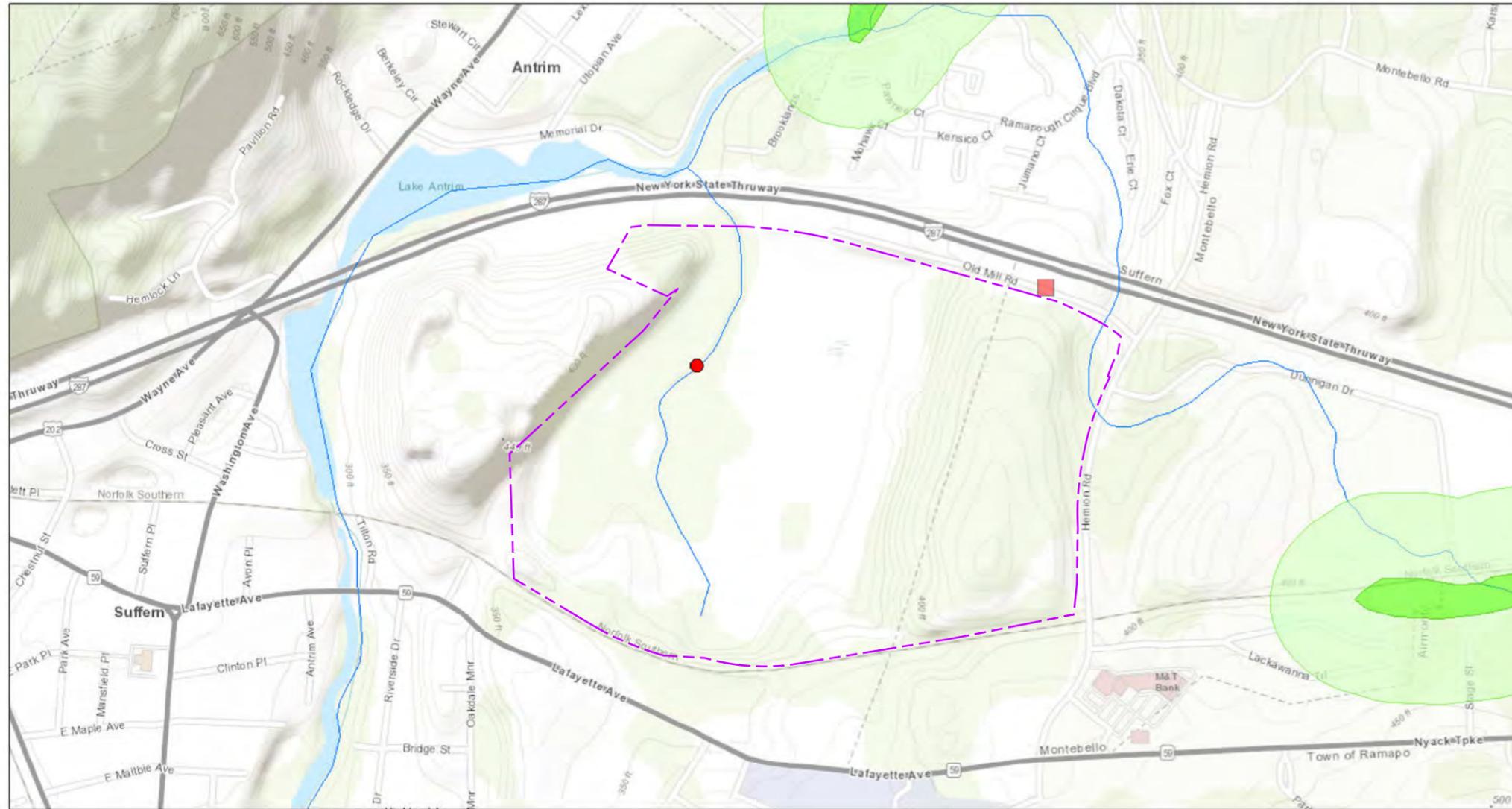
- Limit Lines
- SFHA / Flood Zone Boundary

**Flood Hazard Zones**

**Zone Type**

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area with Risk Due to Levee

# Environmental Resource Mapper

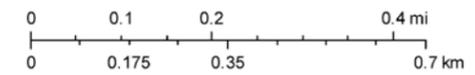


### Legend

- Stream
- NYSDEC Wetland
- NYSDEC Wetland Check Zone
- Project Site Boundary

February 26, 2019

1:9,028



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

NYS Department of Environmental Conservation Not a legal document

Source: Survey file S370999004\_200\_Radius.dwg

The limits of the USACE regulated wetlands and watercourses within the boundaries of the Study Area are depicted on **Figure III.C-2**, Waters of the U.S. The extent of the freshwater wetlands and tributaries were delineated by Capital Environmental Consultants, Inc., and confirmed by USACE staff, as detailed in the Approved Jurisdictional Determination received January 10, 2020. There are a total of seven (7) freshwater wetland areas, inclusive of the stormwater pond, and five tributaries delineated within the boundaries of the Project Site. All wetlands are considered to be “jurisdictional wetlands” subject to the policies, regulations, and procedures established by 33 CFR Parts 320, 323, and 325, respectively, all as administered by the USACE. There are no NYSDEC regulated freshwater or tidal wetlands located on the Project Site.

The Village of Montebello regulates activities located within the Wetlands, Waterbodies, and Streams Environmental Protection Overlay District (W-EPOD). The W-EPOD is defined as:

- Freshwater wetlands, including, but not limited to, USACE or NYSDEC wetlands or wetlands which have a contiguous area of at least 1/10 of an acre and any uplands within 100 feet, horizontal distance, of the wetland boundary.
- Any stream, watercourse, or water body, classified as Class N, AA, A, B, C, or D (with class either Special or Unmodified) under New York Codes, Rules and Regulations (NYCRR), 6 NYCRR 701 et seq. and:
  - o any uplands within 150 feet, horizontal distance, of protected Class A waters (including the Mahwah River);
  - o any uplands within 100 feet, horizontal distance, of the protected Class B waters; and
  - o any uplands within 75 feet, horizontal distance, of the protected Class C waters.

A permit is required to conduct a regulated activity within the W-EPOD, within 100 feet from a vernal pool, or within any area within 50 feet of a natural intermittent watercourse or stream that is running at least three months per year, or any other unclassified stream under 6 NYCRR 701 et seq. There are no Village of Montebello regulated wetlands and uplands within the Proposed Project limit of disturbance.<sup>10</sup> However, as depicted on **Figure III.C-6** there is a Class C Stream mapped within the Study Area.

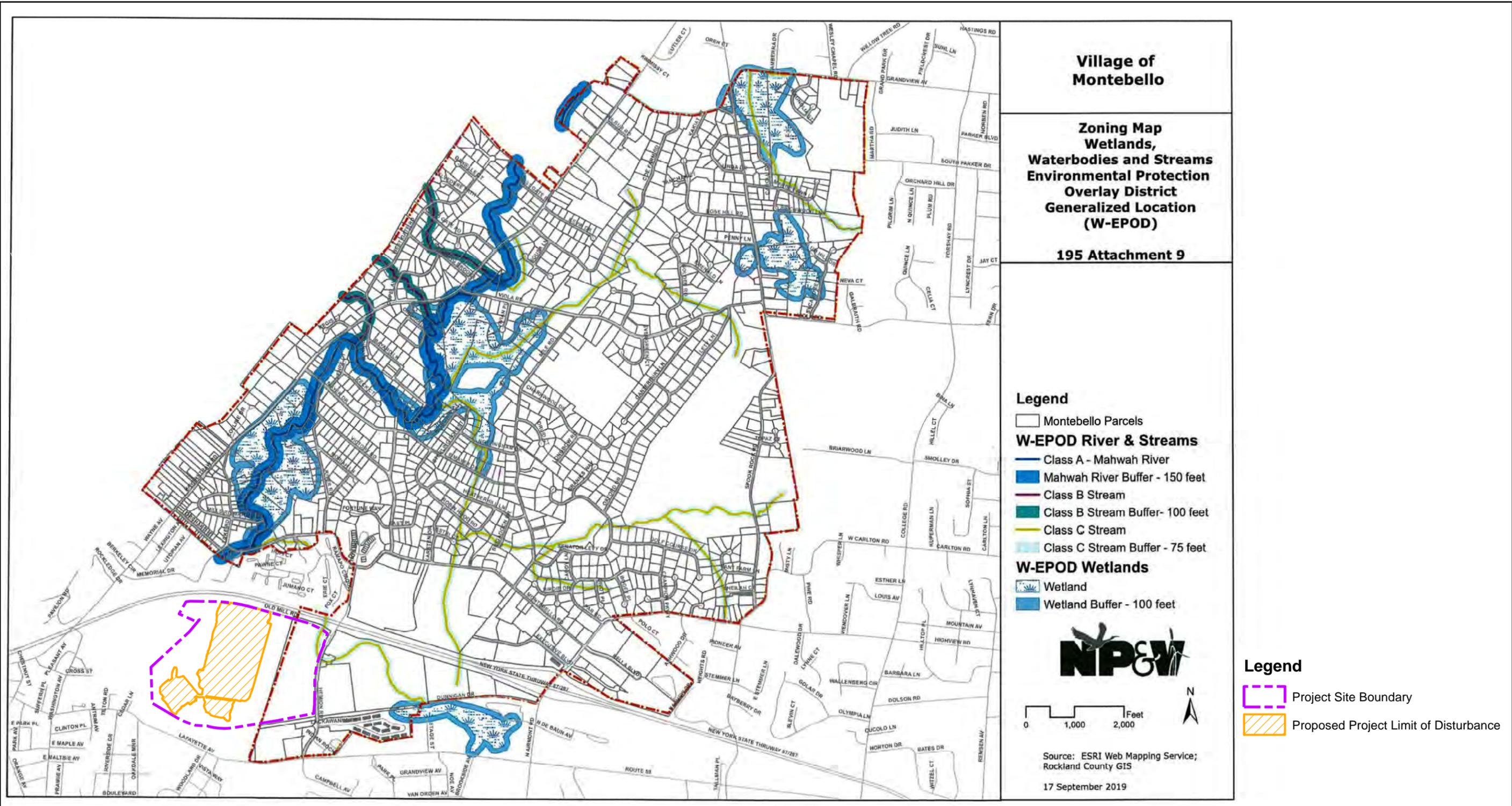
## Wetland A

Wetland A is approximately 12.13 acres and is mapped by NWI (**Figure III.C-3**) as PFO1/SS1Ed/PFO1B (Palustrine, Forested, Broad-Leaved Deciduous - Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded/Saturated, Partially Drained/Ditched - Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Saturated).

The dominant vegetation observed within Wetland A consists of American sycamore (*Platanus occidentalis*) (FACW), green ash (*Fraxinus pennsylvanica*) (FACW), red maple (*Acer rubrum*) (FAC), flowering dogwood (*Cornus florida*) (FACU), spicebush (*Lindera benzoin*) (FACW), broadleaf cattail (*Typha latifolia*) (OLB), Jack-in-the-pulpit (*Arisaema triphyllum*) (FAC), rice cutgrass (*Leersia oryzoides*) (OBL), tussock sedge (*Carex stricta*) (OBL), Japanese stiltgrass (*Microstegium vimineum*) (FAC) and skunk cabbage (*Symplocarpus foetidus*) (OBL).

<sup>10</sup> The study area, specifically SBL 55.06-1-1, contains watercourses that would be regulated per Village of Montebello part II: General Legislation, Chapter 191.

Source: Nearmap Aerial 4/16/2022; Survey file S370999004\_200\_Radius.dwg



Vegetation beyond the wetland/upland interface consists of red maple (*Acer rubrum*) (FAC), black walnut (*Juglans nigra*) (FACU), American elm (*Ulmus americana*) (FACW), tulip-tree (*Liriodendron tulipifera*) (FACU), eastern red cedar (*Juniperus virginiana*) (FACU), silver maple (*Acer saccharinum*) (FACW), red oak (*Quercus rubra*) (FACU), ironwood (*Ostrya virginiana*) (FACU), raspberry (*Rubus idaeus*) (FACU), common blue violet (*Viola sororia*) (FAC) and meadow garlic (*Allium canadense*) (FACU).

Wetland A is associated with Tributary 1 and Tributary 4, as it is located within the active floodplain and is subject to frequent overbank flooding (i.e. every other year on average) (**Figure III.C-2**). Wetland A typically drains to Tributary 1 and Tributary 4. Tributary 4 drains northerly through Wetland A into Tributary 1 at a confluence located within Wetland A. Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River. The source of wetland hydrology is surface water runoff, seasonal groundwater fluctuations and overbank flooding from Tributary 1, although overbank flooding is likely to be less significant and inconsistent sources of hydrology. Indicators of wetland hydrology included saturated soils within the upper 12 inches of soil and the FAC neutral test.

Wetland A primarily functions to provide floodflow alteration and wildlife habitat. Wildlife habitat is further described in Chapter III.B – Ecology and Natural Resources.

### Wetland B

Wetland B is approximately 1.11 acres and is not mapped by NWI (**Figure III.C-3**). During on-site observations, Capital determined the wetland is best described as PFO1E (Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated).

The dominant vegetation observed within Wetland B consists of red maple (*Acer rubrum*) (FAC), sycamore (*Platanus occidentalis*) (FACW), common reed (*Phragmites australis*) (FACW), tussock sedge (*Carex stricta*) (OBL), and skunk cabbage (*Symplocarpus foetidus*) (OBL).

Vegetation beyond the wetland/upland interface consists of gray birch (*Betula populifolia*) (FAC), red oak (*Quercus rubra*) (FACU), white pine (*Pinus strobus*) (FACU), eastern red cedar (*Juniperus virginiana*) (FACU), sycamore (*Platanus occidentalis*) (FACW) and Japanese stiltgrass (*Microstegium vimineum*) (FAC).

The wetland formed along at the base of a disturbed plateau within the southwestern portion of the subject property (**Figure III.C-2**). Wetland B is located south of the 100-year floodplain of Tributary 1 and its hydrology is maintained by groundwater seepage and runoff/precipitation. Wetland B drains to Wetland A via a culvert beneath the internal roadway. Wetland A drains to Tributary 1, which exits the site under the NYS Thruway draining into the Mahwah River. Saturated soils were observed at the surface and standing water was observed 3 inches bgs. Indicators of wetland hydrology included high water table, saturated soils within the upper 12 inches of soil and the FAC neutral test.

Wetland B primarily functions to provide wildlife habitat, as described in Chapter III.B – Ecology and Natural Resources.

### Wetland C

Wetland C is approximately 1.74 acres and is not mapped by NWI (**Figure III.C-3**). During on-site observations, Capital determined Wetland C is best described as PFO1E (Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated).

The wetland vegetation identified within Wetland C consists of sycamore (*Platanus occidentalis*) (FACW), spicebush (*Lindera benzoin*) (FACW), common reed (*Phragmites australis*) (FACW), common blue violet (*Viola sororia*) (FAC) and skunk cabbage (*Symplocarpus foetidus*) (OBL).

The upland vegetation identified around Wetland C consists of silver maple (*Acer saccharinum*) (FACW), black cherry (*Prunus serotina*) (FACU), common blue violet (*Viola sororia*) (FAC) and raspberry (*Rubus idaeus*) (FACU).

Wetland C is not located within the 100-year floodplain of Tributary 1 or Tributary 2, its hydrology is maintained by groundwater seepage and runoff/precipitation. Wetland C drains into Tributary 1 (**Figure III.C-2**). Tributary 1 exits the site under the NYS Thruway draining into the Mahwah River. The soil was saturated 8 inch (bgs) and the depth to free water was 11 inches (bgs). Indicators of wetland hydrology were high water table and saturated soils within the upper 12 inches of soil.

Wetland C primarily functions to provide floodflow alteration and wildlife habitat. Wildlife habitat is further described in Chapter III.B – Ecology and Natural Resources.

### Wetland D

Wetland D is approximately 0.17 acres and is not mapped by NWI (**Figure III.C-3**). During on-site observations, Capital determined Wetland D is best described as PEM5 (Palustrine, Emergent, *Phragmites australis*).

The wetland vegetation identified within Wetland D consists of common reed (*Phragmites australis*) (FACW), sensitive fern (*Onoclea sensibilis*) (FACW), skunk cabbage (*Symplocarpus foetidus*) (OBL), and tussock sedge (*Carex stricta*) (OBL).

The upland vegetation identified around Wetland D consists of Norway spruce (*Picea abies*) (NI), red maple (*Acer rubrum*) (FAC), red oak (*Quercus rubra*) (FACU), silver maple (*Acer saccharinum*) (FACU), flowering dogwood (*Cornus florida*) (FACU), bird's-foot trefoil (*Lotus corniculatus*) (FACU), and mugwort (*Artemisia vulgaris*) (UPL).

Wetland D is located in a steep depression area that collects stormwater runoff and potentially a seep from beneath the railroad bed (**Figure III.C-2**). Wetland D drains to Wetland E via a culvert beneath the internal roadway. Wetland D drains and forms Tributary 3. Tributary 3 drains through Wetland E into Tributary 1, which exits the site under the NYS Thruway draining into the Mahwah River.

Wetland D primarily functions to provide wildlife habitat, as described in Chapter III.B – Ecology and Natural Resources.

### Wetland E

Wetland E is approximately 0.49 acres and is not mapped by NWI (**Figure III.C-3**). During on-site observations, Capital determined Wetland E is best described as PFO1 (Palustrine, Forested, Broad-Leaved Deciduous).

The wetland vegetation identified within Wetland E consists of sycamore (*Platanus occidentalis*) (FACW), spicebush (*Lindera benzoin*) (FACW), common reed (*Phragmites australis*) (FACW), common blue violet (*Viola sororia*) (FAC) and skunk cabbage (*Symplocarpus foetidus*) (OBL).

The upland vegetation identified around Wetland E consists of silver maple (*Acer saccharinum*) (FACW), black cherry (*Prunus serotina*) (FACU), common blue violet (*Viola sororia*) (FAC) and raspberry (*Rubus idaeus*) (FACU).

Wetland E is not located within the 100-year floodplain of Tributary 3, rather its hydrology is maintained by groundwater seepage and runoff/precipitation. Wetland E drains into Tributary 3 (**Figure III.C-2**). Tributary 3 drains into Tributary 1, which exits the site under the NYS Thruway draining into the Mahwah River.

Wetland E primarily functions to provide floodflow alteration and wildlife habitat. Wildlife habitat is further described in Chapter III.B – Ecology and Natural Resources.

### Wetland F

Wetland F is approximately 0.08 acres and is not mapped by NWI (**Figure III.C-3**). During on-site observations, Capital determined Wetland F is best described as PEM (Palustrine, Emergent, Persistent).

The wetland vegetation identified within Wetland F consists of red maple (*Acer rubrum*) (FAC) and skunk cabbage (*Symplocarpus foetidus*) (OBL).

The upland vegetation identified around Wetland F consists of black cherry (*Prunus serotina*) (FACU), Norway maple (*Acer platanoides*) (UPL), shagbark hickory (*Carya ovata*) (FACU), blackhaw (*Viburnum prunifolium*) (FACU), and mugwort (*Artemisia vulgaris*) (UPL).

Wetland F is a linear riparian wetland associated with Tributary 3, however, is not located within the 100-year floodplain of Tributary 3 (**Figure III.C-2**). Rather, its hydrology is maintained by groundwater seepage and runoff/precipitation. Wetland F drains into Tributary 3. Tributary 3 drains into Tributary 1, which exits the site under the NYS Thruway draining into the Mahwah River.

Wetland F primarily functions to provide wildlife habitat, as described in Chapter III.B – Ecology and Natural Resources.

### Stormwater Pond

The stormwater pond is approximately 2.23 acres and is mapped by NWI as a PuBHx (**Figure III.C-3**) (Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated).

The wetland vegetation identified within the stormwater pond consists of black willow (*Salix nigra*).

The upland vegetation identified around the stormwater pond consists of Norway maple (*Acer platanoides*), tulip poplar (*Liriodendron tulipifera*), white ash (*Fraxinus americana*), Japanese barberry (*Berberis thunbergii*), bird's-foot trefoil (*Lotus corniculatus*), common milkweed (*Asclepias syriaca*), germaner speedwell (*Veronica chamaedrys*), and mugwort (*Artemisia vulgaris*).

The stormwater pond is a man-made dammed/impounded waterbody. Water formerly flowed to the pond via a man-made connection from Tributary 3 and out of the pond via a man-made ditch to Wetland A.

The stormwater pond primarily functions to provide floodflow alteration and wildlife habitat. Wildlife habitat is further described in Chapter III.B – Ecology and Natural Resources.

Wetland functions were analyzed using the USACE approved Highway Methodology. Functions and values of the on-site freshwater wetlands are summarized in **Table III.C-1**.

Table III.C-1 Wetland Functions and Values

Wetland Function/Value	Wetland						Stormwater Pond
	Wetland A	Wetland B	Wetland C	Wetland D	Wetland E	Wetland F	
Groundwater Recharge/Discharge	X	X	X	X	X	X	X
Floodflow Alteration	X		X		X		X
Fish and Shellfish Habitat							
Sediment/Toxicant Retention	X	X	X	X	X	X	X
Nutrient Removal	X	X	X	X	X	X	X
Production Export	X	X	X	X	X	X	X
Sediment/Shoreline Stabilization	X						X
Wildlife Habitat	X	X	X	X	X	X	X
Recreation							
Educational/Scientific Value							
Uniqueness/Heritage							
Visual Quality/Aesthetics							
Endangered Species Habitat							

## 2. Potential Impacts

Potential impacts to wetlands, waterbodies, and watercourses from the Proposed Project were evaluated and are summarized below.

### Groundwater

The Study Area overlies an unconfined, mid-yield, primary aquifer. Groundwater from four drilled wells located in the Ramapo Valley within the Ramapo River Basin Aquifer System is the main source of drinking water in the Village of Suffern. The on-site groundwater would not be used as a source of drinking water and would continue to flow north, eventually discharging to the Mahwah River following completion of site construction.

Implementation of the Stormwater Pollution Prevention Plan, consisting of infiltration and detention practices in conformance with NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-20-001), described below, will ensure no impacts to the contributing watershed or to aquifer recharge during and after the construction process.

The proposed stormwater management systems were designed in accordance to Chapter 10 of the NYS Design Manual. This includes specific performance requirements for basin reparation from the seasonal high water table, infiltrating minimum volumes of stormwater runoff, and treating a minimum volume of runoff for water quality requirements. As the Proposed project is located within a sole source aquifer, infiltration basins are required to have a minimum separation from the seasonal high-water table of four feet.

The water quality volume (WQv) or the volume of water required to be treated before discharging or infiltrating into the groundwater was calculated using the Runoff Reduction worksheet provided by the NYSDEC to ensure compliance with the NYSMDM. Furthermore, the Runoff Reduction Volume (RRv) or the minimum amount of runoff required to be infiltrated was also calculated using the same worksheet. The WQv is achieved through discharging of stormwater runoff to either the aboveground infiltration basins or through using proposed manufactured treatment devices for stormwater discharged to proposed underground infiltration basins. In the aboveground infiltration basins, the bottom of the basin is lined with K5 well-draining sand which filters and treats stormwater as it infiltrates through the basin. In the underground infiltration basins, all stormwater is routed through the proposed stormwater conveyance system. Any stormwater runoff that is collected outside of the building roofs which are considered clean runoff, will pass through a manufactured treatment device prior to entering the basin. The manufactured treatment devices will remove and collect contaminants from stormwater that could be found in high potential polluting areas such as the loading docks. The manufactured treatment devices are designed to remove total suspended solids from stormwater to a minimum of 80% in accordance with NYSDEC requirements. Thus stormwater that is infiltrating will be properly treated before reaching the groundwater and ultimately the sole source aquifer.

Through implementation of these practices, the Proposed Project is not anticipated to affect on-site groundwater flow due to stormwater management practices, groundwater flow on adjacent properties, nor result in impacts to the aquifer recharge area so as to create a significant hazard to public health. Groundwater located on the project site will not be in used for drinking purposes as the site will be serviced by public water supplied by the Village of Suffern.

## Aquatic Resources

### Surface Water Resources

The Proposed Project entails the replacement of existing culverts and installation of new culverts to maintain the existing connectivity between USACE regulated freshwater wetlands via USACE regulated tributaries. As such, a USACE Standard individual Permit will be required. A total of four (4) culverts are proposed:

1. Replacement of the existing crossing from Wetland B to Wetland A (**Figure III.C-7**)
2. Replacement of the existing crossing from Wetland C to Wetland A (**Figure III.C-7**)
3. Installation of a new crossing of Tributary 3 west (**Figure III.C-7**)
4. Installation of a new crossing of Tributary 3 east (**Figure III.C-7**)

The proposed culverts will not entail disturbance to Tributary 1, Tributary 2, Tributary 4, or Tributary 5.

#### › Tributary 3

The proposed culvert installations will impact approximately 583 square feet (0.013 acres) of Tributary 3, a USACE regulated tributary. In developing the proposed site plan, disturbance to Tributary 3 was minimized to the maximum extent practical while allowing to provide for the necessary vehicular circulation throughout the Project Site and remain consistent with the goals and objectives of the Applicant. However, given the centralized location of Tributary 3 in the Study Area, minimally impacting 583 square foot (0.013 acres) of Tributary 3 was unavoidable. These impacts

include the demolition that will occur over top of the existing culverts to remove the existing roadway, disturbance to the bank slopes during the removal of existing and installation of proposed road traveling across the removal of an existing culvert in Tributary 3, disturbance to the existing stream bed due to the installation of a new culvert.



The culverts have been sized and designed in accordance with Section G-B of the USACE General Regional Conditions.<sup>11</sup> Bank-full flows will be accommodated through maintenance of the existing bank-full channel cross sectional dimensions within a single culvert. The culverts have been designed at 1.25 times width of the stream channel at the ordinary high water, which is generally equivalent to the width of the channel during the 2-year design storm.

To maintain low flow and aquatic life movement within the culverts, 20 percent of the culvert inverts, including end sections will be embedded. The culvert bed slopes will remain consistent with the slopes of the existing channel both upstream and downstream of the culvert.

No adverse environmental impacts to the tributary, including the dimension, pattern, and profile, above and below the crossing are anticipated with the Proposed Project.

### **Water Quality**

Currently, all stormwater falling on-site drains south to existing wetlands that eventually discharge to Tributary 1 within Wetland A, or stormwater drains west towards Wetland A and Tributary 1, where it eventually drains to the Mahwah River. With the Proposed Project, post-construction stormwater management practices will maintain current stormwater quality and wetlands functionality. The Proposed Project would not cause or contribute to a violation of Class C fresh surface waters when the Proposed Project is in operation. Class C Streams are suitable for fish, shellfish, and wildlife propagation and survival, as well as primary and secondary contact recreation. A violation of Class C fresh surface waters occurs when the waterbody is no longer suitable for fish, shellfish, and wildlife propagation and survival, or for primary and secondary contact recreation.<sup>12</sup>

The proposed use of the site will contain the possibility of introducing contamination through the increased use of truck traffic circulating throughout the site. This could have a harmful effect on the natural wetlands and the tributaries located on the site if not properly treated. As a result it is critical to maintain water quality standards throughout the site. Areas such as the loading areas are considered to be hot spots or areas at risk of high potential contamination. Per NYSDEC, hot spot locations are not permitted to enter the groundwater without proper treatment. Figure III.D-2 in Chapter III.D Stormwater Management provides additional details regarding potential hotspot locations. Current water quality will be maintained through the installation of infiltration facilities, manufactured treatment devices (MTDs) and preservation of natural areas. The infiltration facilities will treat stormwater runoff from 90 percent of all rainfall events. Furthermore, the basins and MTDs treat the stormwater runoff to the extent it is permitted to infiltrate to the groundwater even in hotspot locations. The preserved natural areas will allow the uplands and wetlands to continue to filter stormwater runoff and therefore preserve water quality within the tributaries receiving stormwater runoff. With the Proposed Project, Tributary 1 will continue to receive stormwater runoff from the Project Site. Water quantity will be maintained through the installation of infiltration and detention facilities with outlet control structures. The Proposed Project will result in an increase of impervious surfaces, however, the proposed infiltration and detention facilities will maintain current flow rates and hydrological inputs to Wetland A and Tributary 1, therefore maintaining its current hydrology and functionality. Further, outlet control structures will ensure that stormwater is released at a rate that does not significantly impact the tributary or its associated wetland. In addition, the

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<sup>11</sup> G-B Culverts - Buffalo & New York Districts Final Regional Conditions, Water Quality, Certification, and Coastal Zone Concurrence for the 2021 Nationwide Permits for New York State. Effective February 25, 2022 – Expiration March 14 2026.

<sup>12</sup> Title 6 CRR-NY 701.8. Class C fresh surface waters.

utilization of structural stormwater controls, such as infiltration practices and detention systems, would ensure compliance with the post construction requirements of the NYSDEC State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001). For further information regarding stormwater management with the Proposed Project, please see Chapter III.D Stormwater Management.

As shown in Table III.D-4 and Table III.D-5 of Chapter III.D, through the implementation of the stormwater conveyance system and outlet control structures, the project will result in reduced flows rates discharging to the adjacent wetlands and Tributary 1. While Table III.D-5 shows that the site will result in an increase volume of stormwater runoff due to an increase in impervious area on the site, the outlet control structures will ultimately release the flow at a controlled rate. As a result, runoff will discharge from the proposed basins over the course of hours which will allow the site to maintain or reduce existing stormwater runoff rates with the proposed action.

› Stormwater Pollution Prevention Plan—SWPPP

The Proposed Project would require a NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-20-001) as more than one acre of land would be disturbed. In accordance with NYSDEC SPDES (GP-0-20-001), a Stormwater Pollution Prevention Plan (SWPPP) consisting of both temporary erosion and sediment controls and post-construction stormwater management practices would be prepared.

As such, erosion and sedimentation would be controlled during the construction period by temporary devices in accordance with a construction Erosion and Sediment Control (ESC) plan developed specifically for the Project Site. Erosion and sedimentation would be controlled during the construction period by temporary devices designed and installed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. All disturbed areas will be permanently stabilized post construction with vegetation of hard surfaces to prevent potential for erosion following construction.

› Post-Construction Permanent Control Measures

Post-construction stormwater management measures that would be integrated into the Proposed Project would include infiltration systems and detention systems. The permanent stormwater control measures would incorporate the standards presented in the latest *New York State Stormwater Management Design Manual* (January 2015). All stormwater discharged from the stormwater management devices would discharge at a rate equal to or less than the pre-development drainage condition of the site.

The implementation of the post-construction measures included in the SWPPP would further mitigate discharge of stormwater to the adjacent wetlands and tributaries and maintain its quality. The Proposed Project includes a stormwater drainage system which will convey stormwater to stabilized outlets designed to meet NYSDEC standards. The controlled flow rates and outlet protection will prevent erosion, serve to dissipate stormwater flows, and initiate sheet flow from the development. Further, the primary source of hydrology for Wetland A and Tributary 1 is groundwater supplemented by onsite tributaries, which conveys surface water from offsite areas. These sources account for the majority of hydrology that supports Wetland A and Tributary 1. Stormwater runoff provides only a minor hydrological input to Wetland A and Tributary 1. Through the provision of the stormwater management system, which includes water quality controls, controlled flow rates, and outlet protection, no stormwater related impacts to Wetland A or Tributary 1 are anticipated with the Proposed Project.

The Proposed Project would not significantly adversely impact the water quality of the on-site wetland and tributary systems through the construction or during operation.

- › Fertilizer, Pesticide, Herbicide, and Fungicide Use
- › Fertilizers, pesticides, herbicides, fungicides, and other chemicals are not proposed to be used throughout the Project Site, except for very limited and targeted potential use of herbicides to control very aggressive invasive vegetation in accordance with State and Federal laws and by licensed professionals. Before the use of fertilizers, pesticides, herbicides, and fungicides, any identified invasive species will be first be targeted for physical removal. Should physical removal not suffice, and the use of fertilizers, pesticides, herbicides, or fungicides be required, the Applicant will consult the appropriate regulating authority. It is not anticipated that the Applicant will need to regularly control invasives, however, as part of adaptive management, the Applicant will consult with any regulatory agencies necessary before controlling invasives with fertilizers, pesticides, herbicides, or fungicides. Further, the potential usage of fertilizers, pesticides, herbicides, fungicides, and other chemicals in the Proposed Action portions of the Project Site would also be conducted in accordance with State and Federal laws and by licensed professionals. Stormwater runoff from these developed areas of the property would be collected and treated using the Proposed Action's post-construction stormwater management practices. As such, no significant impacts to wetlands or tributaries are expected from the potential use of fertilizer, pesticides, herbicides, fungicides, and other chemicals on the Project Site.
- › Snow Removal
- › Upon use of the Proposed Project, pollutants carried within snowmelt runoff, including pollutants that may be found within deicing agents, will be flowing to the Project Site's post-construction stormwater management practices and will be treated accordingly. Additionally, snowmelt areas will be provided in and around the parking lots and driveways to ensure snow melt is directed to the post-construction stormwater management practices and is not discharged directly to the on-site wetland systems. The proposed post-construction stormwater management practices, inclusive of infiltration facilities, are designed to maintain current water quality through treatment of the water quality storm. The water quality storm can significantly impact the quality of receiving waters as it is the first 1.5" of stormwater generated from a rainfall event and tends to contain the highest pollutant levels. Therefore, the proposed post-construction stormwater management practices are designed to manage pollutants such as those carried within snowmelt runoff, deicing agents, and chlorides. Salt applied to roads and parking lots in the winter months may be a source of chlorides. The Applicant will consider using a low salt application for on-site snow management. Additionally, all debris, ice dams, or debris from plowing operations that restrict the flow of runoff and meltwater, shall be removed. As such, no significant impacts to wetlands or tributaries are expected from deicing agents and snow removal.

### **Aquatic Biota**

Implementation of stormwater management practices, including infiltration and detention systems, would minimize the potential for operation of the Proposed Project to adversely affect the quality of stormwater discharged to the tributaries. With the proposed post-construction stormwater practices, the current water quality of the onsite wetlands and tributaries will be maintained, therefore the Proposed Project would not impact the existing aquatic biota, such as aquatic vegetation, benthic invertebrates, or reptiles and amphibians. Additionally, the maintenance of

current flow rates and hydrology to the wetlands and tributaries will further prevent impacts to aquatic biota.

Therefore, the Proposed Project would not result in significant adverse impacts to the aquatic biota of on-site tributaries or downstream waters.

## Floodplains

The channels and floodways of Tributary 1 and 4 and the Mahwah River would not be impacted by the Proposed Project. The Proposed Project will impact 0.23 acres of the 100- year floodplain and 8.34 acres of the 500-year floodplain within the western portion of the Project Site (**Figure III.C-4**). Therefore, a Floodplain Development permit, issued by the Village of Suffern, is required to protect from increased flood hazards and exposure to flooding. The Floodplain Development permit will require a technical analysis, by a licensed professional engineer, if required by the local administrator, which shows whether proposed development to be located in an area of special flood hazard may result in physical damage to any other property. If the Proposed Project may result in physical damage to any other property or fails to meet the requirements of the Construction Standards, no Floodplain Development permit shall be issued. Therefore, through implementation of this permitting and review process, no significant adverse environmental impacts to the floodplains are anticipated as a result of the Proposed Project

## Wetlands

The Proposed Project will impact Wetlands A, C, and the stormwater pond described below, and will require a USACE Standard individual Permit. The Proposed Project will not impact Wetland B, Wetland D, Wetland E, or Wetland F.

The Proposed Project will result in unavoidable impacts to federally regulated wetlands and tributaries. The Proposed Project requires placement of fill within regulated freshwater wetlands and totals approximately 3,716 square feet (0.085 acres) of freshwater wetland disturbance, 97,132 square feet (2.23 acres) of USACE regulated stormwater pond disturbance, and 583 square feet (0.013 acres) of disturbance to USACE tributaries within the Project Site (**Table III.C-2**). The disturbance to the federally regulated wetland and tributary areas were minimized to the maximum extent possible when designing the site plan. However, due to the centralized location of the wetlands and tributaries around the current development, the impacts depicted are unavoidable.

**Table III.C-2 Impact Summary to USACE Wetlands and Tributaries**

Wetland/Tributary to be Disturbed	Area of Disturbance (sf)	Area of Disturbance (acres)
Wetland A	3,136	0.072
Wetland C	580	0.013
Stormwater Pond	97,132	2.230
Tributary 3 (culvert west)	309	0.007
Tributary 3 (culvert east)	274	0.006
<b>Total</b>	<b>101,431</b>	<b>2.33</b>

### Wetland A

The Proposed Project would impact approximately 3,136 square feet (0.072 acres) of Wetland A, a USACE regulated freshwater wetland (**Figure III.C-7**). The proposed areas of Wetland A lost with the Proposed Project are finger-like extremities extending east from the wetland proper towards the existing development. This portion of Wetland A is primarily stormwater fed and exhibits extended dry periods during summer months. In developing the proposed site plan, disturbance to Wetland A was minimized to the maximum extent possible practical by utilizing existing cleared and developed areas and retaining walls to avoid wetland impacts. However, given the centralized location of these extremities in the Project Site, certain impacts were unavoidable. No impacts to the functions and values of Wetland A are anticipated due to the minimal proposed disturbance.

### Wetland C

Installation of culverts and internal roadway construction associated with the Proposed Project would impact approximately 580 square feet (0.013 acres) of Wetland C, a USACE regulated freshwater wetland (**Figure III.C-7**). The proposed area of Wetland C to be impacts is confined to a 580 square foot area located adjacent to an existing pathway/unpaved road. In developing the Proposed Project, disturbance to Wetland C was minimized to the maximum extent possible practical. However, given the need for proper site access for large trucks, certain impacts were unavoidable. No impacts to the functions and values of Wetland C are anticipated due to the minimal proposed disturbance.

### Stormwater Pond

The Proposed Project would impact approximately 97,132 square feet (2.23 acres) of the USACE regulated stormwater pond, a man-made dammed/impounded waterbody (**Figure III.C-7**). Water formerly flowed to the pond via a man-made connection from Tributary 3 and out of the pond via a man-made ditch to Wetland A. In developing the Proposed Project, disturbance to the stormwater pond was minimized to the maximum extent possible. However, given the centralized location of the pond in the Project Site, certain impacts were unavoidable. Disturbance of the stormwater pond will result in the loss of the wetlands functions and values, including groundwater recharge/discharge, floodflow alternation, sediment/toxicant retention, nutrient removal, production export, sediment/shoreline stabilization, and wildlife habitat. The loss of wetland functions and values will be

compensated for with mitigation through the implementation of stormwater management practices and other vegetated areas. The mitigated areas will be planted with a variety of native vegetation providing nutrient removal, sediment retention, and wildlife habitat for various types and populations of animals typically associated with wetlands and the wetland edge.

## 3. Mitigation Measures

### Wetlands

The USACE regulated freshwater wetland and tributary areas to be impacted within the central and southern portions of the Project Site are surrounded by developed and/or disturbed areas.

Disturbances located on the periphery of Wetland A, do not provide significant functions or value to Wetland A, and often exhibit dry periods during the summer months. No impacts to the functions and values of Wetland A are anticipated due to the minimal proposed disturbance.

The stormwater pond is a man-made dammed/impounded waterbody and primarily functions to provide floodflow alteration and wildlife habitat. The lost wetland functions will be compensated for with implementation of stormwater management practices and other vegetated areas. The mitigated areas will be planted with a variety of native vegetation providing nutrient removal, sediment retention, and wildlife habitat for various types and populations of animals typically associated with wetlands and the wetland edge. The mitigation area is depicted on **Figure III.C-8**, Mitigation Plan.

Mitigation measures will be prepared and implemented in accordance with a USACE Standard Individual Permit, as depicted on **Figure III.C-8**. The goal of the mitigation is to offset potential significant adverse environmental impacts to natural resources as a result of filling 0.285 acres of USACE freshwater wetlands, the 2.23-acre man-made stormwater pond, and 0.02 acres of USACE tributaries. To compensate for potentially adverse impacts to USACE freshwater wetlands, a mitigation scheme has been incorporated into the Proposed Project, consisting of 43,959 square feet (1.01 acres) of enhanced basin slopes to freshwater wetlands and 2,588 square feet (0.06 acres) of buffering 5-foot-wide hedgerow planted with native species. The proposed enhancements will provide improved freshwater wetland values including groundwater recharge/discharge, floodflow alteration, production export, nutrient removal, wildlife food and habitat, storm control, and ecosystem cleansing. The mitigation area is depicted **Figure III.C-8**, Mitigation Plan.

The design objective of the enhancement areas is to assist in maintaining water quality standards and compensate for the loss of the functions of the stormwater pond with the proposed development. The project mitigation is designed to be an ecologically self-sustaining wetland-adjacent resource that will provide both food and cover for area wildlife, increase nutrient removal, provide flood control, and serve to enhance the subject area providing for more diverse flora and fauna.

As part of the project design, compensation for impacts to 0.285 acres of USACE freshwater wetlands, the 2.23-acre man-made stormwater pond, and 0.02 acres of USACE tributaries will occur. The proposed stormwater management plan includes implementation of infiltration basins to provide stormwater and flood controls, increase nutrient removal, and serve to enhance the subject area providing for diverse flora and fauna.

Source: Dynamic Engineering, Drainage Plan, Brookfield Properties Proposed Industrial park at 25 Old Mill Road, 6/20/22



	<b>5-ft Wide Hedgerow (2,588 LF)</b>	
	1 Shrub per 10 Linear Feet (LF)	
	259 Total Shrubs	
	Spicebush ( <i>Lindera benzoin</i> )	130 Total
	Blackhaw ( <i>Viburnum prunifolium</i> )	129 Total
	<b>Hedgerow to Top of Slope (43,959)</b>	
	0.5 lbs./MSF	
	Switchgrass ( <i>Panicum virgatum</i> )	7.33 lbs. Total
	Little Blue Stem ( <i>Schizachyrium scoparium</i> )	7.33 lbs. Total
	Common Milkweed ( <i>Asclepias syriaca</i> )	7.33 lbs. Total



**Legend**

-  Project Site Boundary
-  Location of Proposed Stormwater Infiltration Basins (68,646 SF)

Mitigation Plan  
Figure III.C-8



Plantings have been chosen to mimic the native species present within the surrounding landscape and are suitable to anticipated hydrologic conditions. The native plantings will provide compensation in aquatic resource areas and functions including improved flood control, an increase in nutrient removal, and providing food and cover for native and migratory wildlife.

The proposed enhancement areas will be located around the proposed infiltration basins and adjacent to Wetland A. In total, 1.07 acres of area will be enhanced in combination with 1.58 acres of proposed infiltration basins.

## Planting Plan

The focus of the wetland mitigation design is to compensate for impacts to USACE freshwater wetlands and tributaries, screen the development from the wetland, and improve on-site habitat for resident and migrating wildlife species through the provision of freshwater wetland habitat. Improving this area will provide storm and flood controls, habitat for area wildlife, and serve to enhance the subject area by providing for diverse flora and fauna. The proposed wetland enhancement areas are approximately 1.07 acres, as depicted on **Figure III.C-8**, Mitigation Plan.

Mitigation planting areas will be cleared of non-native vegetation and covered with clean substrate, as necessary. The substrate will provide the necessary structural support and nutrients to aid in the establishment of the proposed wetland plantings and associated microbial populations.

### › Slopes Along Wetland A

Grasses and herbaceous species will be planted along the slope of the Proposed Project adjacent to Wetland A. Species to be planted include switchgrass (*Panicum virgatum*), little blue stem (*Schizachyrium scoparium*), and common milkweed (*Asclepias syriaca*). This area will be seeded at a density of 0.5 lbs/1,000 sf. Switchgrass provides excellent nesting and cover as it holds up even in heavy snow. The seed provide food for many avian species.<sup>13</sup> Little bluestem is one of the best grasses for nesting and roosting habitat. The clump type of growth habit and many fine leaves at the base provide excellent nesting sites. The seeds are consumed by small mammals and birds, including upland game birds, rosy finches, and juncos, as well as chipping, field, and tree sparrows. The seeds are of high value especially as a food source for birds that spend the winter on grasslands.<sup>14</sup> Chemicals from the milkweed plant make the monarch caterpillar's flesh distasteful to most predators. Monarch butterflies are specific to milkweed plants; this is the only type of plant on which the eggs are laid, and the larvae will feed and matures into a chrysalis. Eggs are laid on the underside of young, healthy leaves.<sup>15</sup>

### › Top of Slope

Shrub species to be planted within the hedgerow include spicebush (*Lindera benzoin*) and blackhaw (*Viburnum prunifolium*). The hedgerow will be planted at a density of one shrub per 10 linear feet. Over 20 species of birds, as well as deer, rabbits, raccoons, and opossums have been recorded as browsing the leaves or eating the fruits of spicebush shrubs.<sup>16</sup> The fruit of blackhaw are eaten by

<sup>13</sup> [https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/gapmcs10202.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/gapmcs10202.pdf)

<sup>14</sup> [https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/ndpmcpg11794.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/ndpmcpg11794.pdf)

<sup>15</sup> [https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg\\_assy.pdf](https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg_assy.pdf)

<sup>16</sup> [https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg\\_libe3.pdf](https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg_libe3.pdf)

songbirds, gamebirds, and mammals. Spicebush and blackhaw are well adapted for growth in well-shaded or full sun areas.

The planting plan has been designed to compensate for the loss of the functions of the stormwater pond with the proposed development and provide an ecologically self-sustaining wetland-adjacent resource that will provide both food and cover for area wildlife, increase nutrient removal, provide flood control, and serve to enhance the subject area providing for more diverse flora and fauna.

With the above described mitigative measures in place, no adverse environmental impacts to wetlands or their functions are anticipated with the Proposed Project.