WETLANDS AND OTHER WATERS OF THE U.S. DELINEATION REPORT

YORK ROAD FLOOD MITIGATION PROJECT

TOWN OF SOUTH BETHANY
SUSSEX COUNTY, DELAWARE

Prepared for:
Town of South Bethany
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Bethany Beach, DE 19930

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AECOM

July 2024

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1.0 INTRODUCTION

The York Road Flood Mitigation Project is located in the Town of South Bethany, DE in a residential community bordered by Fenwick Island State Park on the south end (Site). The Site has a history of flooding, which has necessitated a study of potential mitigation actions. The existing roads are at a low elevation and are surrounded by open tidal waters, as well as tidal marsh areas. The Project Study Area (PSA) is approximately 5.76 acres and was determined based on an approximate buffer of 40 feet around the roads expected to be impacted by project activities, as well as a greater area to the south of York Road to capture the tidal marsh (Figure 1).

On behalf of the town of South Bethany, AECOM conducted a wetland and watercourse delineation within the PSA as described in Section 1.1. The delineation involved a desktop review of existing information and a field delineation of wetlands and watercourses. Information collected during the desktop review was used in conjunction with the field delineation to identify regulated areas pursuant to regulations established by the United States Environmental Protection Agency (USEPA) under Section 404 of the Clean Water Act and delegated to the United States Army Corps of Engineers (USACE), as well as regulations established by the Department of Natural Resources and Environmental Control (DNREC) under Title 7 of the Delaware Administrative Code.

This report was prepared to document findings of the wetland and watercourse delineation and to support, as needed, future permit applications.

1.1 SITE DESCRIPTION

The Project Study Area (PSA) is approximately 5.76 acres and includes a buffer around a section of York Road, Plymouth Road, Boone Road, and Carlisle Road, as well as an additional area to the south of York Road covered by tidal marsh. Several canal boundaries were also included in the PSA, where they extend close to the edge of roadways. The Site is bordered on the east side by the southbound lane of the Coastal Highway (U.S. Route 1) and bordered by Fenwick State Park on the south.

2.0 METHODS

This section describes the sources used in the desktop data review and the methods used during the field delineation process.

2.1 DESKTOP DATA REVIEW

A desktop data review of existing information was conducted to assess the potential presence of watercourses, wetlands, and/or wetland indicators within the study area prior to conducting the field delineation. Information reviewed included:

- United States Geological Survey (USGS) Bethany Beach, DE 7.5-minute series topographical quadrangles (NGS, 2024) (Figure 1);
- United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) soil survey (USDA-NRCS, 2023) (Figure 2);
- United States Fish and Wildlife Services' (USFWS) National Wetland Inventory (NWI) Wetland Mapper (USFWS, 2024) (Figure 3);
- USGS National Hydrography Dataset (NHD) (USGS, 2024)(Figure 3);
- Federal Emergency Management Agency (FEMA) National Flood Hazard Layer (NFHL) (FEMA, 2022) (Figure 3); and

- Delaware Department of Natural Resources and Environmental Control (DNREC) State Regulated Wetlands Map Index (DNREC 2024) (Figure 4).

2.2 FIELD DELINEATION METHODS

Field delineation of the study area was conducted on June 5, 2024 by AECOM wetland scientists. Permission to enter private property was not given as part of this project, and therefore some areas were visually assessed from the street and using aerial imagery.

2.2.1 Wetlands

Wetlands were delineated using the routine method defined by the USACE *Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0* (USACE, 2010). The routine method documents three parameters: vegetation, soil characteristics, and hydrology. It evaluates these parameters for evidence of wetland conditions. Wetland boundaries were identified, and the limits were documented using a Trimble R8 GNSS receiver running Trimble Access software on TC3 data collectors. Trimble Access software uses real time correction to provide survey grade locations. These boundaries were then projected onto georeferenced aerial images to create maps used to illustrate the location and size of the delineated wetlands and waterways for incorporation into the wetland delineation report. Paired upland and wetland data points were established at each wetland area to confirm delineated boundary conditions. Information regarding the vegetation, soil characteristics, and hydrology for each data point was documented using the USACE Atlantic and Gulf Coastal Plain Wetland Determination Data Form (Appendix A). Wetlands were classified based on water source (i.e., fresh water (palustrine); salt water (estuarine)) and dominant plant community or mix of communities [i.e., palustrine forested (PFO), palustrine emergent (PEM); estuarine emergent (EEM)].

Vegetation

Vegetation evaluation included identification of trees, saplings and shrubs, herbaceous plants, and woody vine species. As per the USACE guidance for this region, all vegetation strata were evaluated in an approximate 30-foot radius plot. For each stratum, plants were identified to the lowest taxon possible, and the dominant species were determined based on the absolute percent cover of each species. The wetland indicator status of each species was determined using the USACE *2020 National Wetland Plant List* (USACE, 2020).

Soils

At each wetland sample location, a spade shovel or a one-piece hand-auger was used to excavate the soil for inspection of the soil profile. Soil horizon depths were measured and recorded. Each distinct horizon in the soil profile was also examined for hue, value, and chroma using a Munsell Soil color chart (Munsell Color, 2019). In addition, the texture, physical characteristics, and redoximorphic features, if present, of each horizon were noted. This information was used to evaluate the indicators of hydric soil conditions that meet USACE criteria.

Hydrology

Wetland areas were evaluated by visual inspection for the presence of wetland hydrologic indicators, including but not limited to inundation, observed saturation, water marks, drift lines, sediment deposits, water-stained leaves, surface scour, drainage patterns, and/or morphological plant adaptations.

2.2.2 Watercourses

Watercourses were identified by a defined streambed and bank; hydrologically-sorted substrate material; observable dimension, pattern and profile; and the presence of an ordinary high-water mark (OHWM). Watercourse limits were delineated by identifying the OHWM of each bank. The OHWM was determined by the first substantial break in slope between the edge of the stream bed and the surrounding terrain, often displaying a clear line from scour where terrestrial vegetation was not present. All watercourse boundaries were marked with sequentially numbered flags on the left and right banks (when facing downstream), and boundary points were collected using the survey unit. Watercourses Information regarding the stream including geomorphology, flow regime, and other streams characteristics was documented using an AECOM-modified *Physical Characterization/Water Quality Field Data Sheet*. The original base data sheets can be found in the United States Environmental Protection Agency's (USEPA) *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish* (Barbour et al., 1999).

2.2.3 Mapping

GPS data collected during the delineation was projected onto georeferenced aerial images to create maps used to illustrate the location and size of the delineated wetlands and watercourses for incorporation into the wetland delineation report and future use in agency consultations, permit applications, and plans.

3.0 RESULTS AND DISCUSSIONS

The following is a summary of findings from the desktop data review and the results of the field delineation efforts.

3.1 DESKTOP DATA

The following provides the results of the desktop data review conducted for the soils, watercourses, and NWI wetlands within the study area.

3.1.1 Soils

Soils mapped within the study area were identified from the USDA-NRCS soils database. The review indicated that five soil mapping units are present in the PSA. Two of the soil mapping units are listed as being major hydric soils, and three are listed as having hydric soil inclusions (USDA-NRCS, 2023). The soils mapped in the study area are listed in Table 1 and are illustrated on Figure 2.

TABLE 1: Mapped Soils within the Project Study Area

Soil Map Unit	Description	Hydric Rating by Map Unit (%)
AcC	Acquango sand, 5 to 10 percent slopes, occasionally flooded	15
BuA	Brockatonorton-Urban land complex, 0 to 2 percent slopes	7
WDc2	Dredge Channel, 1 to 4 meter water depth	100
Pu	Purnell peat, very frequently flooded, tidal	100
AuB	Acquango-Urban land complex, 0 to 5 percent slopes	7

3.1.2 NWI Wetlands

USFWS NWI maps illustrate wetland habitats and vegetation communities using interpretation of aerial photography. The data on these maps provide general boundaries of potential wetlands and require ground surveys to accurately define the boundaries of wetlands present, if any, and determine their proper classification. The habitats and communities identified are classified according to the scheme provided in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979).

A review of the USFWS NWI Wetlands Mapper website identified four NWI features within the PSA (Figure 2). The features include the canals surrounding the community, and the marsh area to the south. These features are described as:

- Estuarine, subtidal, unconsolidated bottom, subtidal (E1UBL)
- Estuarine, subtidal, unconsolidated bottom, subtidal, excavated (E1UBLx)
- Estuarine, intertidal, emergent persistent vegetation, regularly flooded, partly drained/ditched (E2EM1Nd)
- Palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded-fresh tidal (PFO1/4R)

3.1.3 Watercourses

The Site drains into several named canals, as well as into Jefferson Creek, which is part of Little Bay. The Site also receives hydrology from tidal action in Jefferson Creek and the surrounding canals. It is within the Little Assawoman Bay Watershed (HUC12 Code 020403030301), which is within the Chincoteague subbasin and Mid Atlantic Coastal basin. Based on available National Flood Hazard Layer (FEMA, 2022), the entire PSA is mapped as a 100-year FEMA floodplain. Floodplain data is displayed on Figure 3.

According to 7 DE Administrative Code: 7401 Surface Water Quality Standards, Little Assawoman Bay and its drainage basin have Designated Use categories of Industrial Water Supply, Primary Contact Recreation, Secondary Contact Recreation, Fish, Aquatic Life & Wildlife, Agricultural Water Supply (freshwater sections only), ERES (waters of exceptional recreational or ecological significance) waters, and Fish Consumption (DNREC 2024).

3.2 FIELD DELINEATION

The field delineation conducted on June 5, 2024 resulted in the identification of five wetlands within the study area. Dredged canals were classified as wetland feature, and therefore no watercourses were identified. Mapping showing the location and extent of the wetlands is illustrated on Figure 5, and a photographic log is provided in Appendix B.

3.2.1 Wetlands

Five wetlands were identified within the study area. At least one wetland sample point was taken for each wetland to characterize the properties of the hydrology, vegetation, and soil of the wetland. The field data forms are provided in Appendix A.

TABLE 2: Wetlands Identified within the Project Study Area

Wetland ID[1]	Classification[2]	Description	DE State Wetland	Delineated Size (acres)[3]
W1	PFO	Forested component of W1 above the intertidal zone. *Pinus taeda* is the dominant tree species.	Yes	0.12
	EEM	Emergent component of W1 within the intertidal zone. *Juncus effusus* and *Distichlis spicata* are the dominant emergent species, with scattered *Baccharis halimifolia* shrubs.		1.61
W2	EUB	Dredged canal (Bristol Canal)	Yes	0.03
W3	EUB	Dredged canal (York Canal)	Yes	0.01
W4	EUB	Dredged canal (Carlisle Canal)	Yes	0.02
W5	EUB	Dredged canal (Boone Canal)	Yes	0.02
				Total Delineated Acres: 1.81

1. Wetland ID generated by AECOM during field delineation.
2. EEM = Estuarine Emergent, EUB = Estuarine Unconsolidated Bottom , PFO = Palustrine Forested
3. Area of the wetland as delineated within the Project Study Area.

4.0 SUMMARY AND CONCLUSIONS

The wetlands and watercourse delineation identified five wetlands within the study area. The total delineated wetland area was 1.81 acres.

Waters of the United States and Waters of the State of Delaware, which cannot be avoided, may require permitting from both DNREC under Title 7 of the Delaware Administrative Code and the USACE under the USEPA's Section 404 of the Clean Water Act.

5.0 REFERENCES

Barbour, M.T., et al. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. USEPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington District of Columbia.

Cowardin, L.M., et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States, Report No. FWS/OBL-97/31. U. S. Department of the Interior, Fish and Wildlife Service, Washington, District of Columbia.

Delaware Department of Natural Resources and Environmental Control (DNREC). 2024a. State Regulated Wetlands Map Index. Tile DNR004. https://dnrec.delaware.gov/water/wetlands/maps/ Accessed June 2024.

DNREC. 2024b. 7 DE Administrative Code: Part 7 Natural Resources. https://delcode.delaware.gov/title7/index.html. Accessed June 2024.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Munsell Color. 2009 Year Revised; 2009 Production. Munsell Soil Color Charts. Grand Rapids, Michigan.

Munsell Color. 2009 Year Revised/2019 Production. Soil-Color Charts. Grand Rapids, Michigan.

National Geographic Society (NGS). 2024. USGS 7.5 Minute Topographic Quadrangle: South Bethany, Delaware.

United States Army Corps of Engineers (USACE). 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, C.V. Noble, and J.F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USACE. 2020. National Wetland Plant List, Version 3.5. USACE Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. https://cwbi-app.sec.usace.army.mil/nwpl_static/v34/home/home.html. Accessed June 2024.

United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS). Updated September 2023. Web Soil Survey for Sussex County, DE. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm. Accessed June 2024.

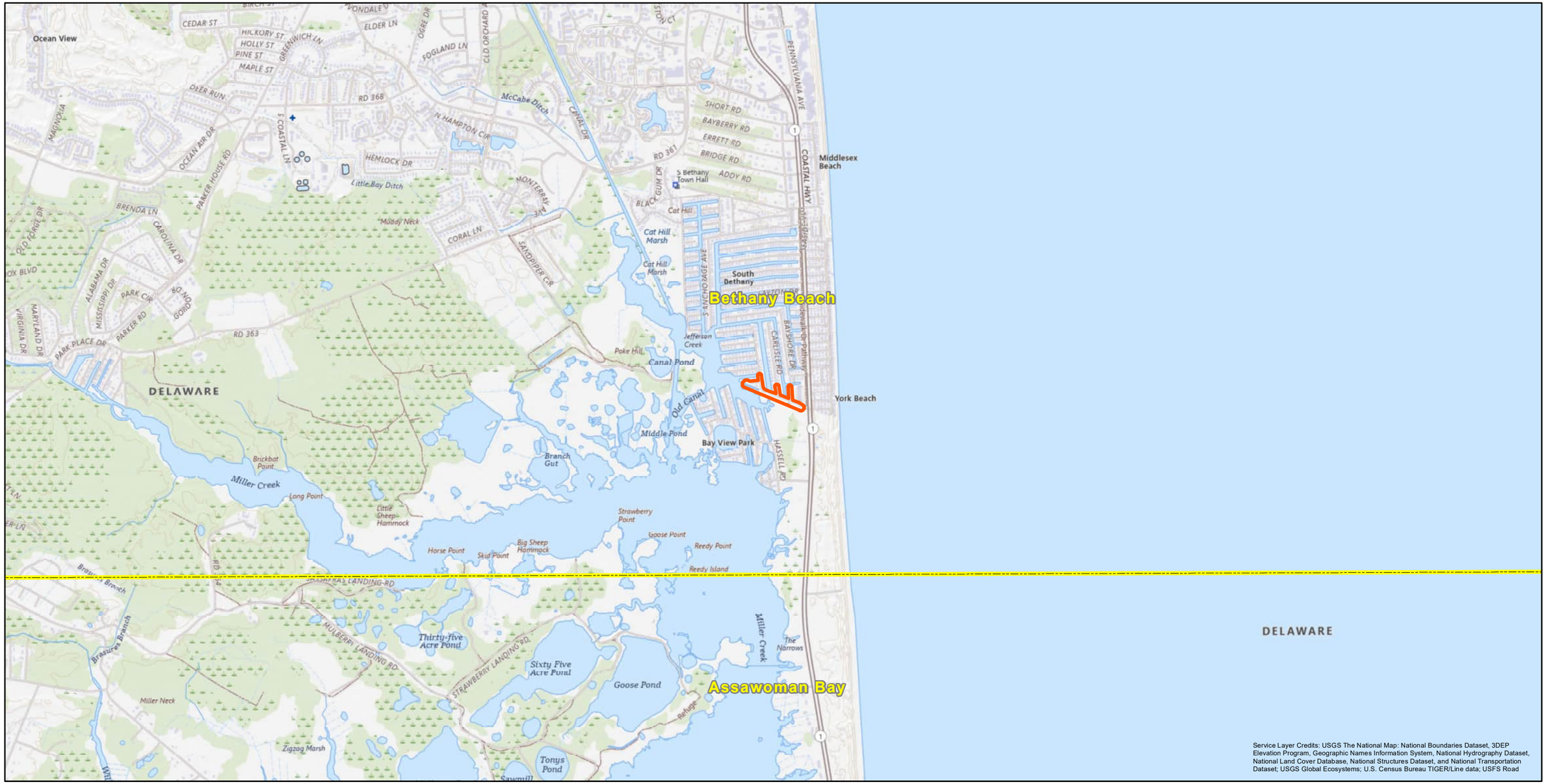
United States Environmental Protection Agency (USEPA). 2002. Clean Water Act of 1972, 33 U.S.C. § 1251 et seq. (2002). https://www.epa.gov/sites/production/files/2017-08/documents/federal-water-pollution-control-act-508full.pdf. Accessed June 2024.

United States Federal Emergency Management Agency (FEMA). 2022. FEMA Flood Map Service Center National Flood Hazard Layer for Sussex County, DE. Updated 2022. U.S. Department of Homeland Security, Washington, D.C. https://msc.fema.gov/portal. Accessed June 2024.

United States Fish and Wildlife Service (USFWS). 2024. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. https://www.fws.gov/wetlands/. Accessed June 2024.

United States Geological Survey (USGS). 2024. National Hydrography Dataset – The National Map (TNM). https://viewer.nationalmap.gov/basic/. Accessed June 2024.

FIGURES



Service Layer Credits: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road

Legend

- Project Study Area
- USGS 24k Topo Map Boundaries

Notes

NAD 1983 State Plane
Delaware FIPS 0700 Feet

Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:
Quadrangles (USGS)
USGS Topographical Basemap (ESRI)

0 1,000 2,000 4,000
Feet

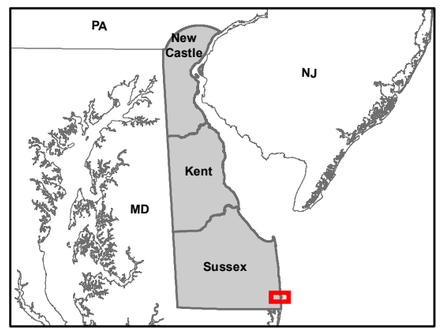


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Figure 1
Project Location

York Road Flood Mitigation Project

Town of South Bethany
Sussex County, Delaware

Prepared By: MC	Checked By: DY
Job: 60707136	Date: 7/29/2024

Legend

- Project Study Area
- Non-Hydric Soil
- Minor Hydric Soil
- Major Hydric Soil

Notes

NAD 1983 State Plane
Delaware FIPS 0700 Feet

Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:
SSURGO Soils (USDA/NRCS 09/2023)

0 100 200 400
Feet

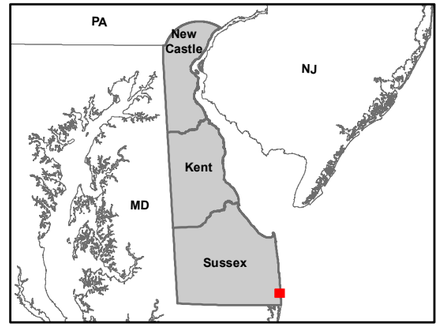

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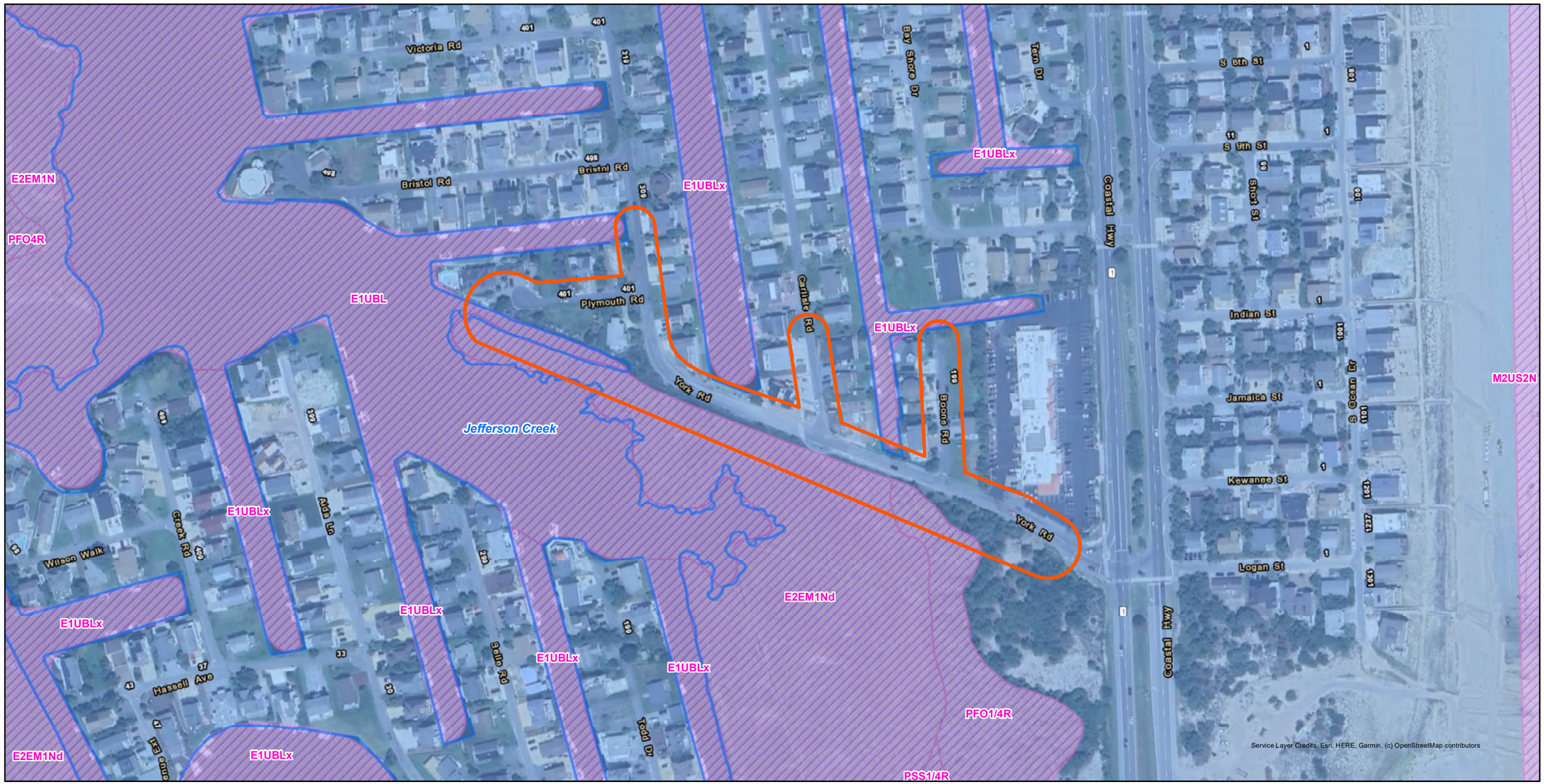
Figure 2
Hydric Soils

York Road Flood Mitigation Project

Town of South Bethany
Sussex County, Delaware

Prepared By: MC	Checked By: DY
Job: 60707136	Date: 7/29/2024



Legend

- Project Study Area
- NHD Areas
- NWI Wetland
- 100-Year Floodplain

Notes

NAD 1983 State Plane
Delaware FIPS 0700 Feet

Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:
NWI Wetlands (2024)
FEMA NFHL for Sussex County (2022)
NHD Areas (2024)

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Feet

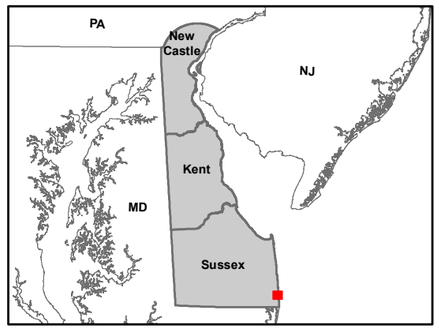

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Figure 3
Desktop Wetlands and Watercourses

York Road Flood Mitigation Project

Town of South Bethany
Sussex County, Delaware

Prepared By: MC	Checked By: DY
Job: 60707136	Date: 7/29/2024

Legend

Project Study Area

State Wetlands

B-Beach
M-Marsh
O-Other (Upland of Non-tidal wetlands less than 400 acres)
W-Water

Notes

NAD 1983 State Plane
Delaware FIPS 0700 Feet

Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:
DNREC Regulated Tidal Wetlands
Map Panel DNR004 (1988)

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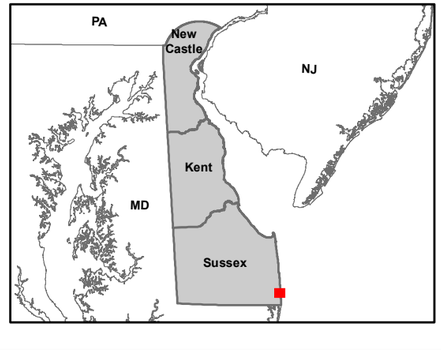

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Figure 4
State Mapped Wetlands

York Road Flood Mitigation Project

Town of South Bethany
Sussex County, Delaware

Prepared By: MC	Checked By: DY
Job: 60707136	Date: 7/29/2024

Legend

- Project Study Area
- Wetland Data Point
- Culvert
- Upland Data Point
- Wetland Boundary Point
- Delineated EEM Wetland
- Delineated PFO Wetland
- Delineated EUB Wetland

Notes

1. Wetland Delineation conducted by AECOM wetland scientists on June 5, 2024.

NAD 1983 State Plane
Delaware FIPS 0700 Feet

Projection: Lambert Conformal Conic
Linear Unit: US Foot

References:

0 50 100 200
Feet

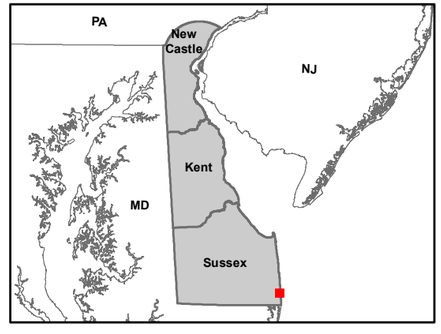

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Figure 5
Resource Delineation

York Rd Flood Mitigation Project

Sussex County, Delaware
Town of South Bethany

Prepared By: MC	Checked By: DY
Job: 60707136	Date: 7/29/2024

APPENDIX A
Wetland Data Forms

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: York Road Flood Mitigation Study and Design Project City/County: Sussex County Sampling Date: 6/5/2024

Applicant/Owner: Town of South Bethany State: DE Sampling Point: W1 PFO

Investigator(s): D. Yezuita, M. Curran Section, Township, Range: Town of South Bethany

Landform (hillside, terrace, etc.): toe of slope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR or MLRA): LRR T, MLRA 153D Lat: 38.50943 Long: -75.05604 Datum: NAD83

Soil Map Unit Name: AcC: Acquango sand, 5 to 10 percent slopes, occasionally flooded NWI classification: PFO1/4R

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

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

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

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

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

Remarks:
Wetland data point taken to represent the PFO community type within the Wetland 1 complex. Tidal influence is less impactful at this upper range, which may be allowing for more persistent vegetation (trees and shrubs) to grow.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:
Wetland hydrology observed. Water table observed at 18", which is not considered a high water table, but should be noted. Other secondary indicators were also present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W1 PFO

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	40	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40	=Total Cover	
50% of total cover: 20	20% of total cover: 8		
Sapling/Shrub Stratum (Plot size: 30')			
1. *Juniperus virginiana*	10	No	FACU
2. *Morella cerifera*	30	Yes	FAC
3. *Morella pensylvanica*	40	Yes	FAC
4. *Baccharis halimifolia*	15	No	FAC
5.			
6.			
7.			
8.			
	95	=Total Cover	
50% of total cover: 48	20% of total cover: 19		
Herb Stratum (Plot size: 30')			
1. *Carex scoparia*	5	No	FACW
2. *Phragmites australis*	70	Yes	FACW
3. *Andropogon virginicus*	30	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105	=Total Cover	
50% of total cover: 53	20% of total cover: 21		
Woody Vine Stratum (Plot size: 30')			
1. *Toxicodendron radicans*	30	Yes	FAC
2.			
3.			
4.			
5.			
	30	=Total Cover	
50% of total cover: 15	20% of total cover: 6		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	75	x 2 =	150
FAC species	185	x 3 =	555
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	270 (A)		745 (B)
Prevalence Index = B/A =			2.76

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: W1 PFO

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y 6/1	80	2.5Y 5/4	20	C	M	Sandy	Distinct redox concentrations
20-24	10YR 2/1	70	10YR 6/1	30			Mucky Sand	Co-matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- ___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Coast Prairie Redox (A16) **(MLRA 149A)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- ___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soils observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: York Road Flood Mitigation Study and Design Project City/County: Sussex County Sampling Date: 6/5/2024

Applicant/Owner: Town of South Bethany State: DE Sampling Point: W1 EEM

Investigator(s): D. Yezuita, M. Curran Section, Township, Range: Town of South Bethany

Landform (hillside, terrace, etc.): tidal marsh Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T, MLRA 153D Lat: 38.50968 Long: -75.05643 Datum: NAD83

Soil Map Unit Name: Pu: Purnell peat, very frequently flooded, tidal NWI classification: E2EM1Nd

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

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

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

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

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

Remarks:
Wetland data point taken to represent the EEM community type within the greater Wetland 1 complex. This data point represents a tidal marsh, which is typically flooded and within the intertidal zone.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2
Water Table Present?	Yes X	No ____	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:
Indicators of wetland hydrology observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W1 EEM

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1. *Baccharis halimifolia*	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 =Total Cover		
50% of total cover: 8	20% of total cover: 3		
Herb Stratum (Plot size: 30')			
1. *Phragmites australis*	15	No	FACW
2. *Juncus effusus*	80	Yes	OBL
3. *Distichlis spicata*	30	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	125 =Total Cover		
50% of total cover: 63	20% of total cover: 25		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	110	x 1 =	110
FACW species	15	x 2 =	30
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	140 (A)		185 (B)

Prevalence Index = B/A = 1.32

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

SOIL

Sampling Point: W1 EEM

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Muck	
3-18	2.5Y 4/1	100					Mucky Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- X 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- ___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Coast Prairie Redox (A16) **(MLRA 149A)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- ___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soils observed. Hydrogen sulfide smell noted when digging soil pit.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Atlantic and Gulf Coastal Plain Region
See ERDC/EL TR-10-20; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: York Road Flood Mitigation Study and Design Project City/County: Sussex County Sampling Date: 6/5/2024

Applicant/Owner: Town of South Bethany State: DE Sampling Point: W1 UPL

Investigator(s): D. Yezuita, M. Curran Section, Township, Range: Town of South Bethany

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR or MLRA): LRR T, MLRA 153D Lat: 38.50944 Long: -75.05599 Datum: NAD83

Soil Map Unit Name: AcC: Acquango sand, 5 to 10 percent slopes, occasionally flooded NWI classification: PFO1/4R

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

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

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

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

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

Remarks:
Upland data point taken upslope of Wetland 1, on a sloped sandy area outside of the typical tidal zone. Hydrophytic vegetation is present, likely due to proximity to the tidal wetland and encroachment of invasive Phragmites australis. Hydric soils are not present, and no indicators of wetland hydrology were observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:
No indicators of wetland hydrology observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W1 UPL

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	60	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	60	=Total Cover	
50% of total cover: 30		20% of total cover:	12
Sapling/Shrub Stratum (Plot size: 30')			
1. *Rhus copallinum*	10	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2
Herb Stratum (Plot size: 30')			
1. *Andropogon virginicus*	35	Yes	FAC
2. *Rubus flagellaris*	20	No	UPL
3. *Phragmites australis*	40	Yes	FACW
4. *Smilax rotundifolia*	25	No	FAC
5. *Thlaspi arvense*	5	No	UPL
6. *Opuntia humifusa*	5	No	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	130	=Total Cover	
50% of total cover: 65		20% of total cover:	26
Woody Vine Stratum (Plot size: 30')			
1. *Lonicera japonica*	25	Yes	FACU
2. *Toxicodendron radicans*	15	Yes	FAC
3.			
4.			
5.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	135	x 3 =	405
FACU species	25	x 4 =	100
UPL species	40	x 5 =	200
Column Totals:	240 (A)		785 (B)
Prevalence Index = B/A =			3.27

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below.)
Hydrophytic vegetation present, likely due to the encroachment of Phragmites australis from the adjacent wetland.

SOIL

Sampling Point: W1 UPL

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	5Y 7/1	100					Sandy	
10-19	2.5Y 6/1	100					Sandy	

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

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) (**MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- ___ Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Coast Prairie Redox (A16) **(MLRA 149A)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, T)**
- ___ Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- ___ Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

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

Remarks:

Hydric soils not observed.

APPENDIX B
Photographic Log

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Town of South Bethany, DE	York Road Flood Mitigation Project Sussex County, Delaware	60707136

Photo No.	Date:
1	6/5/2024

Direction Photo Taken:

West

Description:

View of Wetland 1 (W1 PFO) at the palustrine forested community. The dominant tree species in this community was loblolly pine (*Pinus taeda*).

Photo No.	Date:
2	6/5/2024

Direction Photo Taken:

West

Description:

View of Wetland 1 (W1 EEM) at the estuarine emergent community. Soft rush (*Juncus effusus* and salt-grass (*Distichlis spicata*) are the dominant emergent species, with scattered groundsel (*Baccharis halimifolia*) shrubs.

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Town of South Bethany, DE	York Road Flood Mitigation Project Sussex County, Delaware	60707136

Photo No.	Date:
3	6/5/2024

Direction Photo Taken:

South

Description:

View of Wetland 2 (W2 EUB), an estuarine unconsolidated bottom feature. This is a reinforced canal used for recreational boating and is named Bristol Canal.

Photo No.	Date:
4	6/5/2024

Direction Photo Taken:

East

Description:

View of Wetland 3 (W3 EUB), an estuarine unconsolidated bottom feature. This is a reinforced canal used for recreational boating and is named York Canal.

AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Town of South Bethany, DE	York Road Flood Mitigation Project Sussex County, Delaware	60707136

Photo No.	Date:
5	6/5/2024

Direction Photo Taken:

Southeast

Description:

View of Wetland 4 (W4 EUB), an estuarine unconsolidated bottom feature. This is a reinforced canal used for recreational boating and is named Carlisle Canal.

Photo No.	Date:
6	6/5/2024

Direction Photo Taken:

Northwest

Description:

View of Wetland 5 (W5 EUB), an estuarine unconsolidated bottom feature. This is a reinforced canal used for recreational boating and is named Boone Canal.