Description of Udorthents

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Slope: 0 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Psamments

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: fine sand
H2 - 6 to 60 inches: sand

Properties and qualities

Slope: 0 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-1-UP**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): ______ Lat: 37.447841 Long: -76.472296 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Forested uplands adjacent to GSA1-1-WET.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ______
Water Table Present?	Yes ___	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ___ No ✓

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

Remarks:

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

Sampling Point: GSA1-1-UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	✓	FAC
2. *Platanus occidentalis*	20	✓	FACW
3. *Acer negundo*	5		FAC
4. *Oxydendron arboreum*	5		FACU
5.			
6.			
7.			
8.			
	70	= Total Cover	
50% of total cover: 35.0		20% of total cover: 14.0	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	5	✓	FAC
2. *Acer rubrum*	5	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	10	= Total Cover	
50% of total cover: 5.0		20% of total cover: 2.0	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lonicera japonica*	10	✓	FACU
2. *Glechoma hederacea*	5	✓	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	
50% of total cover: 7.5		20% of total cover: 3.0	

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0.0		20% of total cover: 0.0	

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: 67% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ✓ No ____

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

SOIL

Sampling Point: GSA1-1-UP

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 3/2	100					LoCl	
6-12	10YR 4/1	98	10YR 3/3	2	C	M/PL	Cl	
12-18	10YR 4/1	90	10YR 5/6	10	C	M/PL	Cl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ____ **No** ✓

Remarks:

Transitional zone soils, technically meets F3 here, but no hydrology indicators present. Loses F3 indicator immediately upslope.

Photograph Log

Date: 1/12/22

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

Photograph Direction East

Comments:

Photograph Number ______

Photograph Direction South

Comments:

Photograph Number ______

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-1-WET**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): ______ Lat: 37.447841 Long: -76.472188 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: PUB HGM: Water Type:

Linear abandoned agricultural drainage ditch, adjacent to GSA1-2-PSS, with very narrow strip up upland between the two features. No observable flow, ~6-12" of ponded water, approximately 6' wide.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ✓	No ___	Depth (inches): 9
Water Table Present?	Yes ✓	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

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

Sampling Point: GSA1-1-WET

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: 0.0 20% of total cover: 0.0

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	10	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		

50% of total cover: 5.0 20% of total cover: 2.0

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

50% of total cover: 0.0 20% of total cover: 0.0

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: 0.0 20% of total cover: 0.0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

Very little vegetation rooted in the abandoned agriculture ditch. Filled with standing water and leaves.

SOIL

Sampling Point: GSA1-1-WET

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
0-6	10YR 3/2	100					ClLo	
6-12	10YR 2/1	100					ClLo	
12-18	10YR 2/1	60					ClLo	
12-18	10YR 4/1	40			D	M	Sa	Depleted sand inclusions

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ✓ No ____

Remarks:

Slight hydrogen sulfide odor. Depleted sand inclusions starting at 12". Closest additional indicator matches A11, assuming soil contains 60% depleted sand below 18".

Photograph Log

Date: 1/12/22

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

Photograph Direction East

Comments:

Photograph Number ______

Photograph Direction South

Comments:

Photograph Number ______

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-2-PSS**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Flat Slope (%): 0-5

Subregion (LRR or MLRA): ______ Lat: 37.446857 Long: -76.471293 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: PSS HGM: Slope Water Type: RPWWN

Abandoned agriculture field, potentially prior-converted-croplands (PCC). Developing scrub shrub community dominated by sweetgum, box elder, and silky dogwood saplings.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___ No ✓	Depth (inches): ___	
Water Table Present?	Yes ✓ No ___	Depth (inches): 13	
Saturation Present? (includes capillary fringe)	Yes ✓ No ___	Depth (inches): ___	**Wetland Hydrology Present? Yes** ✓ **No** ___

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

Remarks:

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

Sampling Point: GSA1-2-PSS

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus amomum*	20	✓	FACW
2. *Liquidambar styraciflua*	10	✓	FAC
3. *Acer negundo*	10	✓	FAC
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
50% of total cover: 20.0	20% of total cover: 8.0		

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex lurida*	50	✓	OBL
2. *Scirpus cyperinus*	15		OBL
3. *Juncus effuses*	10		OBL
4. *Andropogon glomeratus*	15		FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45.0	20% of total cover: 18.0		

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

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

SOIL

Sampling Point: GSA1-2-PSS

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					LoCl	
6-18	10YR 4/2	80	7.5YR 4/6	20	C	M/PL	ClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ✓ No ______

Remarks:

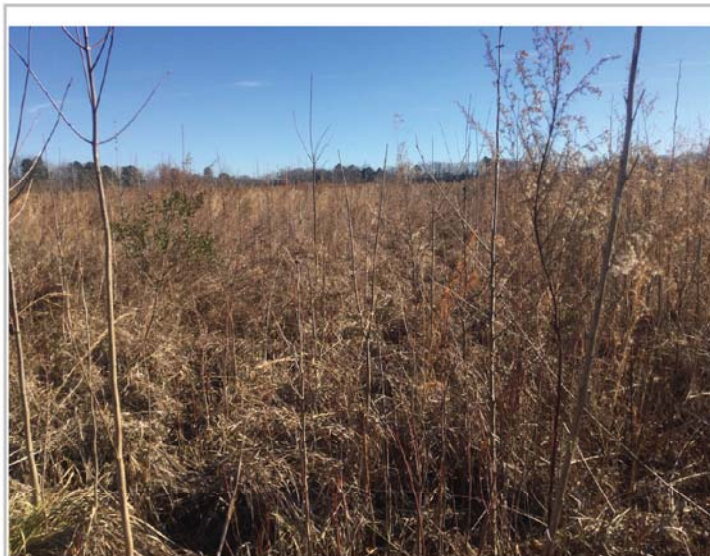
Photograph Log

Date: 1/12/22

Photograph Number

Photograph Direction North

Comments:



Photograph Number

Photograph Direction East

Comments:

Photograph Number

Photograph Direction South

Comments:

Photograph Number

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA1-2-UP**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): linear Slope (%): 0-5

Subregion (LRR or MLRA): ______ Lat: 37.44678 Long: -76.471314 Datum: NAD83

Soil Map Unit Name: Meggett sandy loam NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Mowed, unimproved access road. Evidence that this location is used for access, and is closely mowed/maintained.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ______
Water Table Present?	Yes ___	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ___ **No** ✓

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

Remarks:

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

Sampling Point: GSA1-2-UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Turf grasses*	95		ND
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19.0		

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

Vegetation is closely mowed, and consists of turf grasses and sparse field weeds. Vegetation composition is approximate, as most vegetation is unidentifiable due to season and mowing.

SOIL

Sampling Point: GSA1-2-UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					ClLo	
6-12	10YR 3/2	90	10YR 3/6	10	C	PL	ClLo	
12-20	10YR 4/2	95	10YR 5/6	5	C	PL	ClLo	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: __________

Depth (inches): __________

Hydric Soil Present? Yes ____ No ✓

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number

Photograph Direction East

Comments:

Photograph Number

Photograph Direction West

Comments:

Photograph Number

Photograph Direction

Comments:

Photograph Number

Photograph Direction

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA2-1-PEM**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Other (Explain) Local relief (concave, convex, none): cancave Slope (%): 3-5

Subregion (LRR or MLRA): ______ Lat: 37.446056 Long: -76.473862 Datum: NAD83

Soil Map Unit Name: Lumbee sandy loam NWI classification: UPL

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

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

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

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

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

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

Remarks: Cowardin Code: PEM HGM: Slope Water Type: RPWWN

Unmaintained roadside drainage ditch with prevalence of wetland vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ___
Water Table Present?	Yes ✓	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ✓	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ **No** ___

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

Remarks:

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

Sampling Point: GSA2-1-PEM

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Persicaria saggittata*	75	✓	OBL
2. *Vernonia novboraccensis*	5		FACW
3. *Panicum virgatum*	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
50% of total cover: 45.0	20% of total cover: 18.0		

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: GSA2-1-PEM

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
0-6	10YR 4/2	98	10YR 4/6	2	C	PL	SaCLo	
6-12	10YR 5/4	100					Sa	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes ✓ No ______

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number ______

Photograph Direction NE

Comments: Unmaintained roadside ditch with prevalence of wetland vegetation.

Photograph Number ______

Photograph Direction ______

Comments:

Photograph Number ______

Photograph Direction ______

Comments:

Photograph Number ______

Photograph Direction ______

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA2-UP**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR or MLRA): ______ Lat: 37.446347 Long: -76.474169 Datum: NAD83

Soil Map Unit Name: Rumford loamy fine sand, 2 to 6 percent slopes NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Cleared and mowed uplands adjacent to John Clayton Memorial Highway

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ______
Water Table Present?	Yes ___	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ___ **No** ✓

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: GSA2-UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Turf grasses*	85	✓	ND
2. *Trifolium repens*	10		FACU
3. *Lamium amplexicaule*	5		ND
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50.0	20% of total cover: 20.0		

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

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

Closely mowed vegetation. Species composition is approximate.

SOIL

Sampling Point: GSA2-UP

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8	7.5YR 3/2	100					SaLo	
8-20	10YR 4/4	100					LoCl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

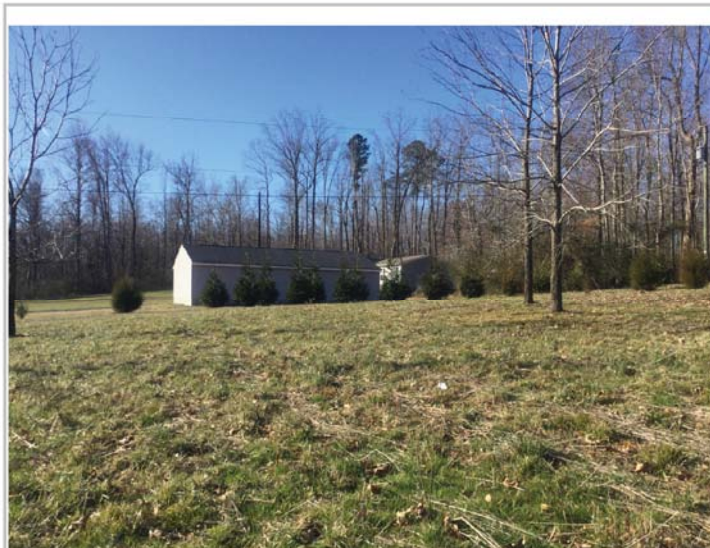
Photograph Direction East

Comments:

Photograph Number ______

Photograph Direction NNW

Comments:



Photograph Number ______

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Gloucester Sampling Date: 01/12/2022

Applicant/Owner: HRSD State: VA Sampling Point: **GSA3-UP**

Investigator(s): Emily Foster Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): linear Slope (%): 5-10

Subregion (LRR or MLRA): ______ Lat: 37.444008 Long: -76.47516 Datum: NAD83

Soil Map Unit Name: Johns variant loamy sand NWI classification: UPL

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

Upland forest adjacent to John Clayton Memorial Highway

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ **No** ✓

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

Remarks:

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

Sampling Point: GSA3-UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	60	✓	FACU
2. *Acer rubrum*	20	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40.0	20% of total cover: 16.0		

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	35	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	35	= Total Cover	
50% of total cover: 17.5	20% of total cover: 7.0		

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Polystichum acrostichoides*	15	✓	FACU
2. *Lonicera japonica*	10	✓	FACU
3. *Ilex opaca*	5		
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	
50% of total cover: 15.0	20% of total cover: 6.0		

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0.0	20% of total cover: 0.0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	40%	(A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes ____ No ✓

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

SOIL

Sampling Point: GSA3-UP

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-10	10YR 3/2	100					SaLo	
10-16	10YR 3/3	100					SaLo	
18-20	10YR 5/3	100					Sa	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Photograph Log

Date: 1/12/22

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

Photograph Direction East

Comments:

Photograph Number ______

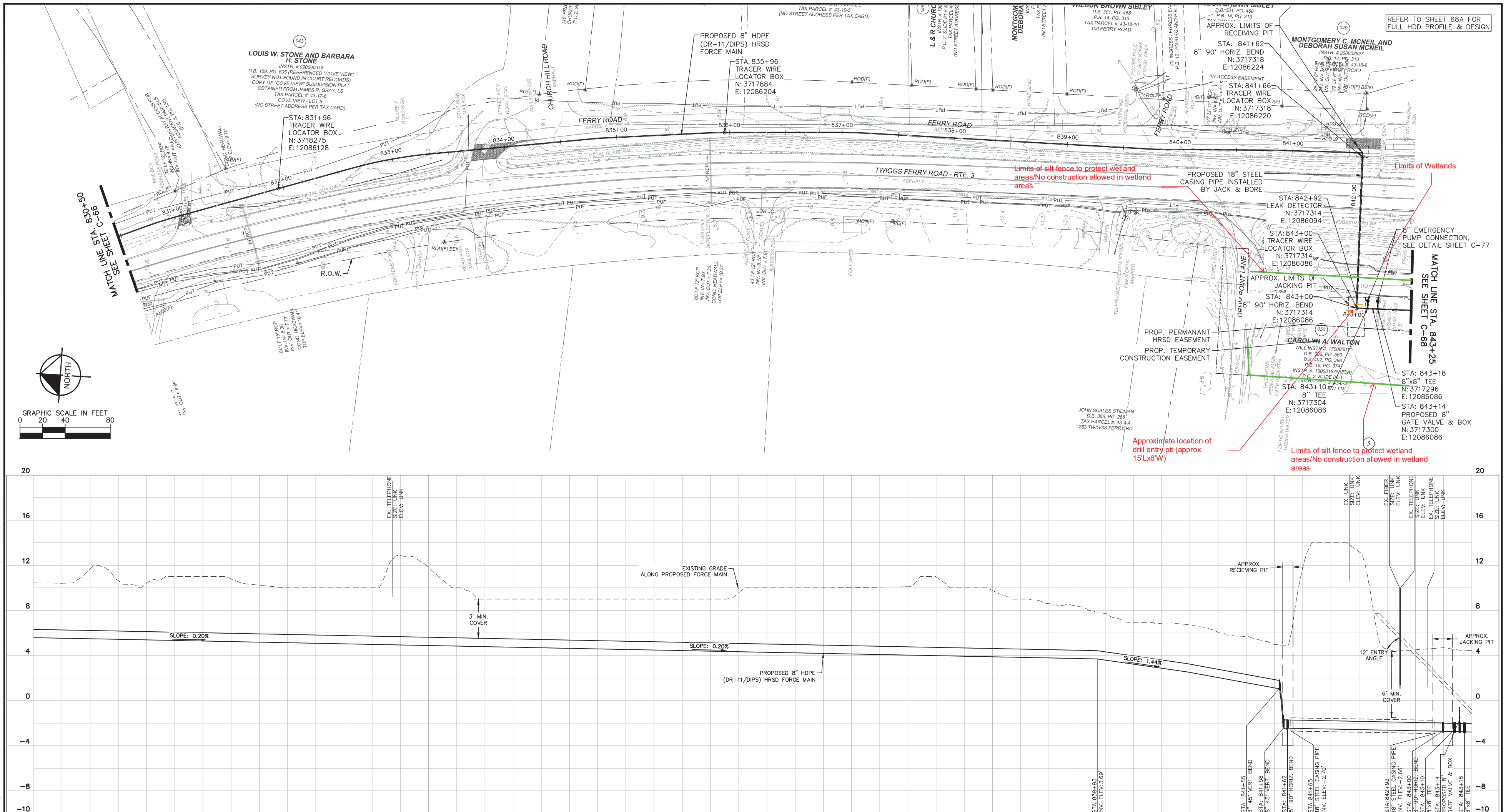
Photograph Direction South

Comments:

Photograph Number ______

Photograph Direction West

Comments:



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

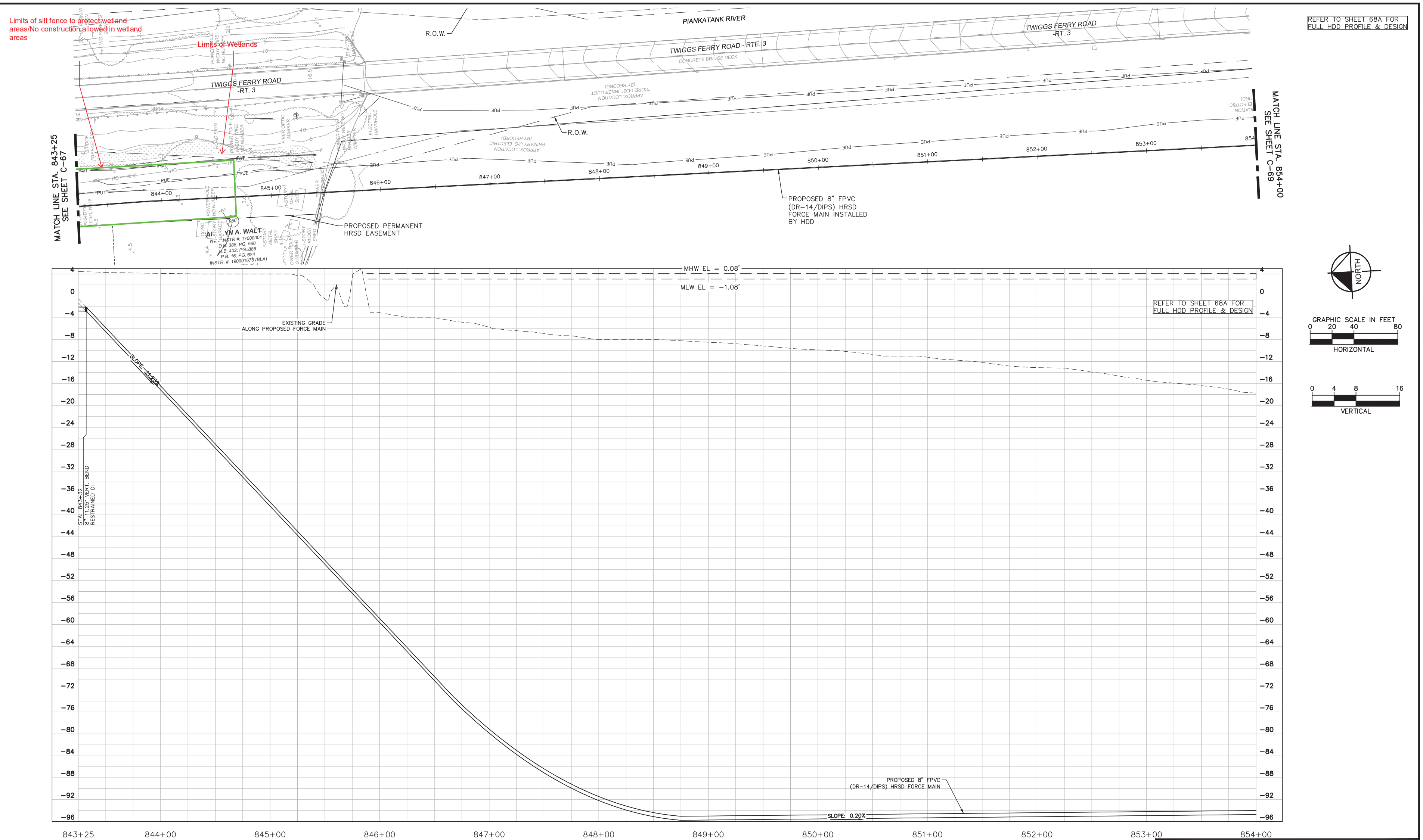
NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 830+50 - 843+25

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II- Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-67
SCALE:		SHEET NO.:	73 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

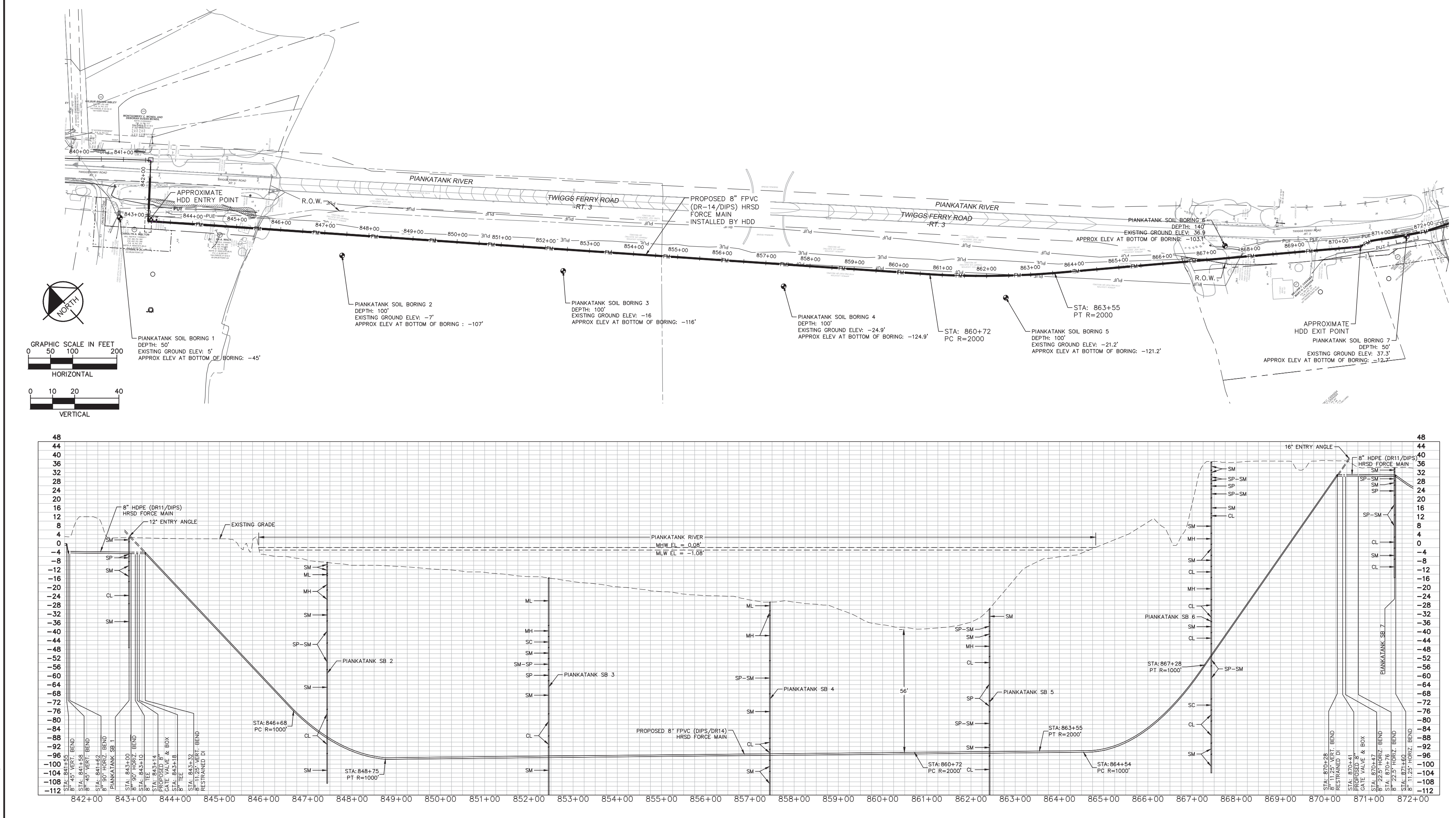
NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 843+25 - 854+00

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-68
SCALE:		SHEET NO.:	74 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

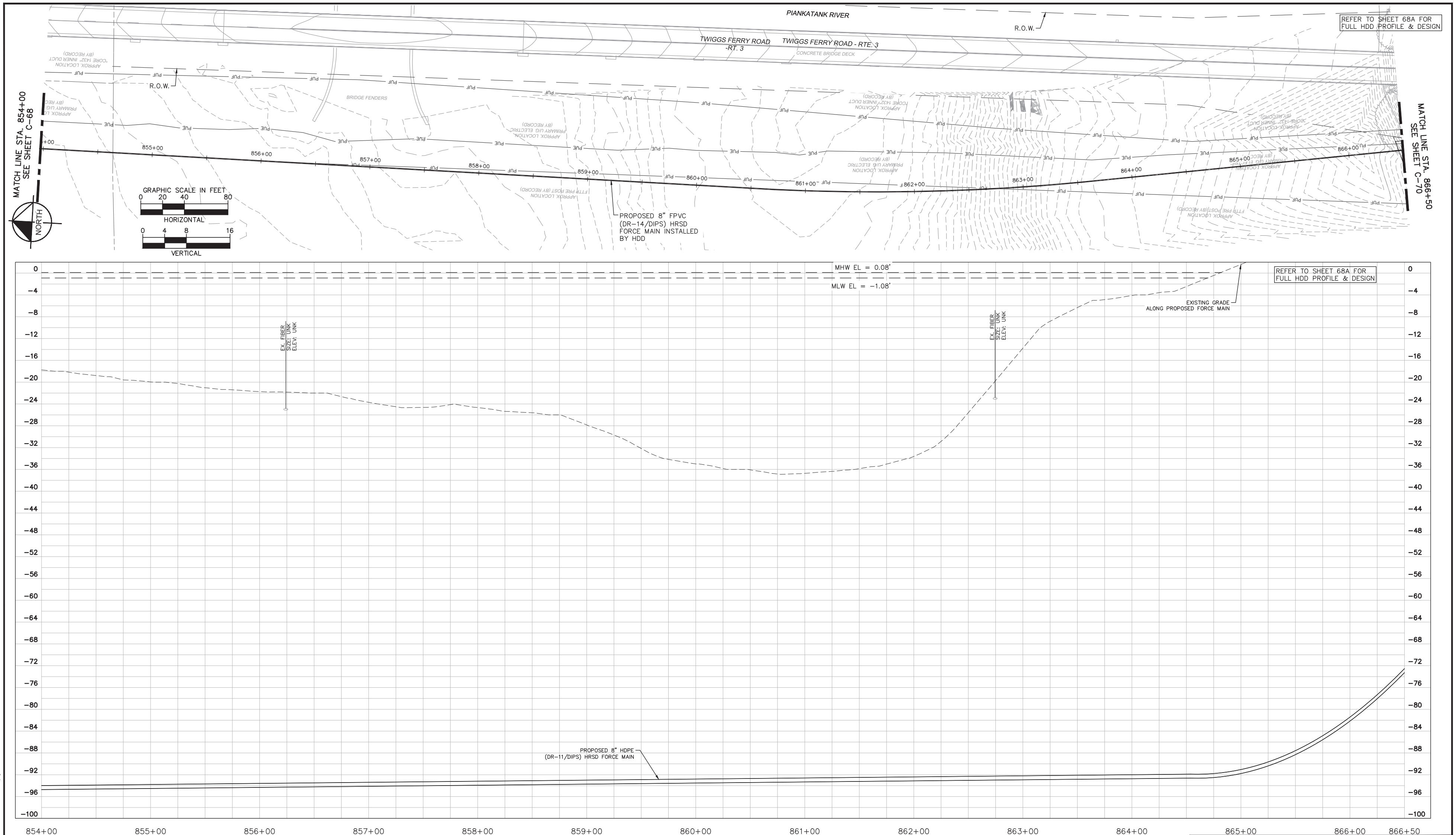
NO.	DATE	BY	REVISION

PIANKATANK HDD PLAN & PROFILE

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-68A
SCALE:		SHEET NO.:	75 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

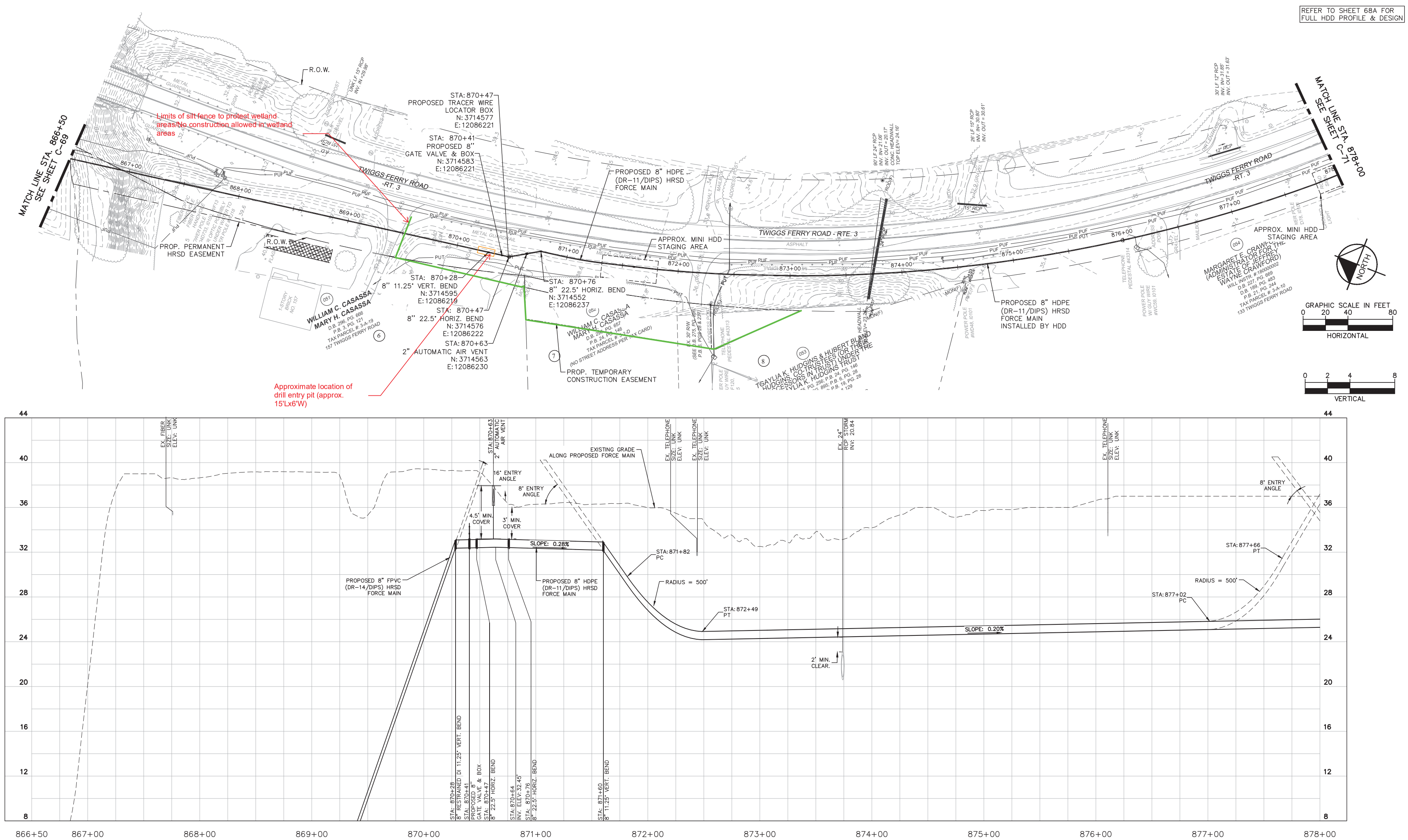
NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 854+00 - 866+50

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-69
SCALE:		SHEET NO.:	76 of 93



90% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FORCE MAIN PLAN & PROFILE STA. 866+50 - 878+00

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	DECEMBER 2021
DRAWN BY:	JHM	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	C-70
SCALE:		SHEET NO.:	77 of 93

TETRA TECH

26 October 2020

USACE Norfolk District Regulator of the Day

Applicant: Hampton Roads Sanitation District
Agent: Ms. Emily Foster Tetra Tech
5700 Lake Wright Drive Norfolk, VA, 23502

Subject: HRSD – Middlesex Interceptor System Program Phase II – Urbanna, Virginia to Mathews, Virginia Transmission Force Main
Pre-Application Consultation Request for Section 106 of the National Historic Preservation Act

To Whom It May Concern,

On behalf of HRSD, Tetra Tech, Inc. is submitting this Pre-Application Consultation Request regarding a planned project to design and construct a sewage conveyance system to serve Middlesex County, Virginia (the Project).

The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

Because the Project includes crossings under the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD) and wetland impacts may be possible along the transmission route, it is anticipated that a Jurisdictional Determination and submittal of a Joint Permit Application (JPA) will be required.

While the Project is still in the preliminary design phase, the Project may require consultation under section 106 of the National Historic Preservation Act and coordination with the Virginia Department of Historic Resources (VDHR) and State Historic Preservation Officer (SHPO). By submitting this Pre-Application Consultation Request, it is HRSD's intent to initiate consultation with the USACE and VDHR as early as possible in the design process in order to identify any potential adverse effects to archaeological or architectural resources prior to submittal of a JPA. If section 106 consultation is likely to be required for the activities described within the attached documents, HRSD would like to initiate consultation as early as possible in order to avoid unanticipated delays to the Project schedule.

HRSD respectfully requests that the USACE Norfolk District Regulator of the Day review the attached Preliminary Design Plans and Preliminary Cultural Resources Assessment to provide guidance pertaining to future Section 106 review and consultation for the Project. Upon receipt and review of this request, please feel free to contact me by phone or e-mail at (540) 841-4752 or emily.foster@tetratech.com.

Respectfully submitted,

Emily Foster

Emily Foster, PWS #2718
Environmental Scientist
Tetra Tech, Inc.

Tetra Tech, Inc.
5700 Lake Wright Dr. Norfolk, VA
Tel (540) 841-4752 Fax (757) 461-4148 tetratech.com

Enclosures

CC Scott Funke, P.E., Kimley-Horn Project Manager

Tim Moore, P.E., Tetra Tech, Inc.

Brad Sweeney, P.E., Tetra Tech, Inc.

Attachments:

1. Norfolk District Regulatory Office Pre-Application Consultation Request Form
2. Preliminary Design Plans
3. Preliminary Cultural Resources Assessment for the HRSD Middlesex Interceptor System Program Phase II – Urbanna to Mathew Transmission TFM, Middlesex and Mathews Counties, Virginia
4. National Wetland Inventory Figure

NORFOLK DISTRICT REGULATORY OFFICE
PRE-APPLICATION AND/OR JURISDICTIONAL WATERS DETERMINATION REQUEST FORM

This form is used when you want to determine if areas on your property fall under regulatory requirements of the U.S. Army Corps of Engineers (USACE). Please supply the following information and supporting documents described below. This form can be filled out online and/or printed and then mailed, faxed, or e-mailed to the Norfolk District. Submitting this request authorizes the US Army Corps of Engineers to field inspect the property site, if necessary, to help in the determination process. **THIS FORM MUST BE SIGNED BY THE PROPERTY OWNER TO BE CONSIDERED A FORMAL REQUEST.**

The printed form and supporting documents should be mailed to:

U.S. Army Corps of Engineers, Norfolk District
Regulatory Branch
803 Front Street
Norfolk, Virginia 23510-1096

Or faxed to (757) 201-7678

Or sent via e-mail to: CENAO.REG_ROD@usace.army.mil

Additional information on the Regulatory Program is available on our website at:
http://www.nao.usace.army.mil/
Please contact us at 757-201-7652 if you need any assistance with filling out this form.

<u>Location and Information about Property to be subject to a Jurisdictional Determination</u>:

1. Date of Request: October 19, 2020

2. Project Name: HRSD – Middlesex Interceptor System Program Phase II – Urbanna, Virginia to Mathews, Virginia Transmission Force Main

3. City or County where property located: Middlesex, Virginia and Mathews, Virginia

4. Address of property and directions (attach a map of the property location and a copy of the property plat): See attached Preliminary Design Plans.

5. Coordinates of property (if known): N/A

6. Size of property in acres: N/A

7. Tax Parcel Number / GPIN (if available): N/A

8. Name of Nearest Waterway: Piankatank River, Urbanna Creek

9. Brief Description of Proposed Activity, Reason for Preapplication Request, and/or Reason for Jurisdictional Waters Determination Request:

   The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

   Because the Project includes crossings under the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD) and wetland impacts may be possible along the transmission route, it is anticipated that a Jurisdictional Determination and submittal of a Joint Permit Application (JPA) will be required. It is anticipated that a subaqueous permit will be required from VMRC for the HDD crossings, and authorization under an applicable USACE Nationwide Permit may be required for authorization of any potential wetland impacts (impacts are to be determined via a wetland delineation in 2021).

   While the Project is still in the preliminary design phase, the Project may require consultation under section 106 of the National Historic Preservation Act and coordination with the Virginia Department of Historic Resources (VDHR) and State Historic Preservation Officer (SHPO). By submitting this Pre-Application Consultation Request, it is HRSD's intent to initiate consultation with the USACE and VDHR as early as possible in the design process in order to identify any potential adverse effects to archaeological or architectural resources prior to submittal of a JPA. If section 106 consultation is likely to be required for the activities described within the attached documents, HRSD would like to initiate consultation as early as possible in order to avoid unanticipated delays to the Project schedule.

10. Has a wetland delineation/determination been completed by a consultant or the Corps on the property previously? ☐ YES ☒ NO UNKNOWN

    If yes, please provide the name of the consultant and/or Corps staff and Corps permit number, if available:

<u>Property Owner Contact Information</u>:

Property Owner Name: See attached preliminary design plans
Mailing Address:
City: State: Zip:
Daytime Telephone:
E-mail Address:

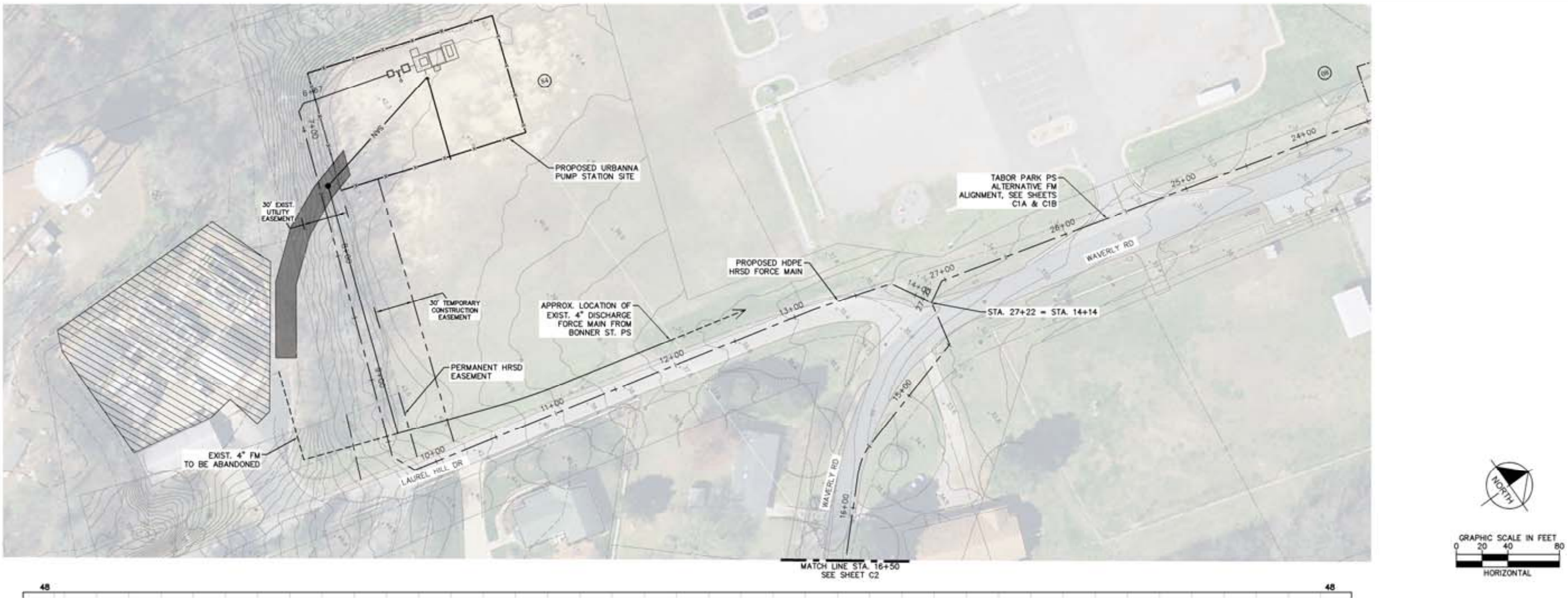
If the person requesting the Jurisdictional Determination is **NOT** the Property Owner, please also supply the Requestor's contact information here:

Requestor Name: HRSD;
Mailing Address:
City: State: Zip:
Daytime Telephone:
E-mail Address:

Additionally, if you have any of the following information, please include it with your request: wetland delineation map, other relevant maps, drain tile survey, topographic survey, and/or site photographs.

CERTIFICATION: I am hereby requesting a preapplication consultation or jurisdictional waters and/or wetlands determination from the U.S. Army Corps of Engineers, for the property(ies) I have described herein. I agree to allow the duly authorized representatives of the Norfolk District Corps of Engineers and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supercedes and waives that prohibition and grants permission to enter the property despite such posting. I hereby certify that the information contained in the Request for a Jurisdictional Determination is accurate and complete:

Property Owner's Signature | Date



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ###### ###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (6+67 - 16+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1
SCALE:	1" = 40'	SHEET NO.:	1 of 77

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

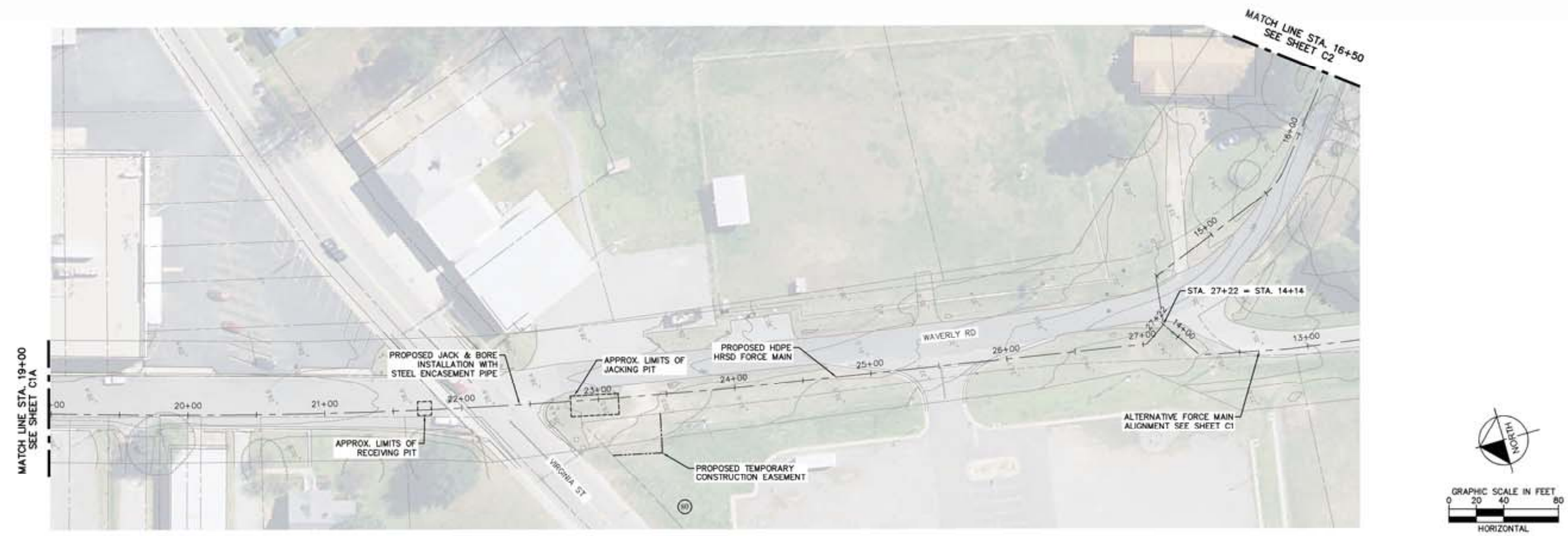
NO.	DATE	BY	REVISION

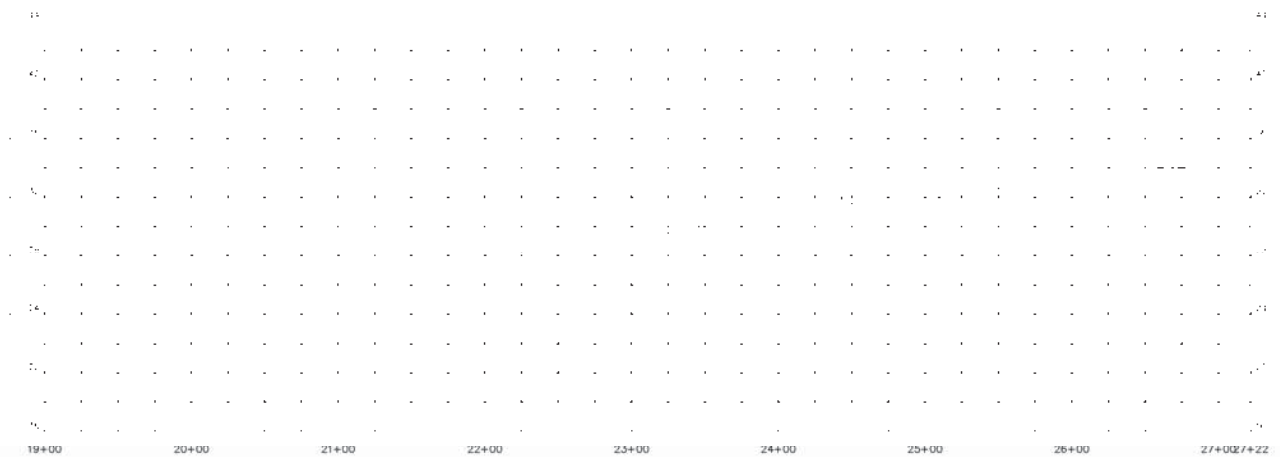
Tabor Park PS
Alternative FM Alignment
Plan and Profile (7+27 - 19+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1A
SCALE:	1" = 40'	SHEET NO.:	2 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

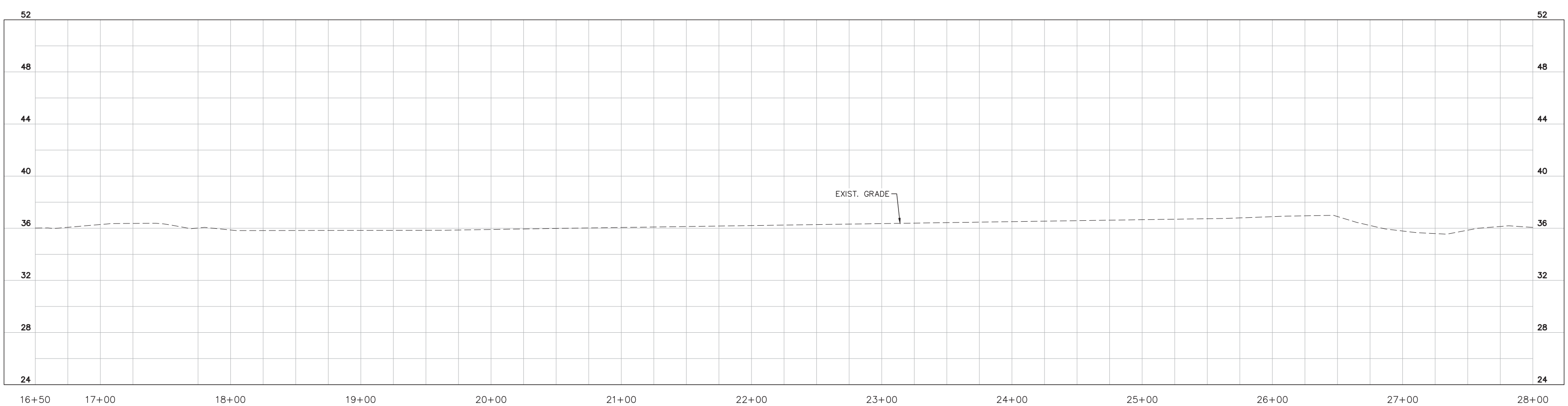
NO.	DATE	BY	REVISION

Tabor Park PS
Alternative FM Alignment
Plan and Profile (19+00 - 27+22)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C1B
SCALE:	1" = 40'	SHEET NO.:	3 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

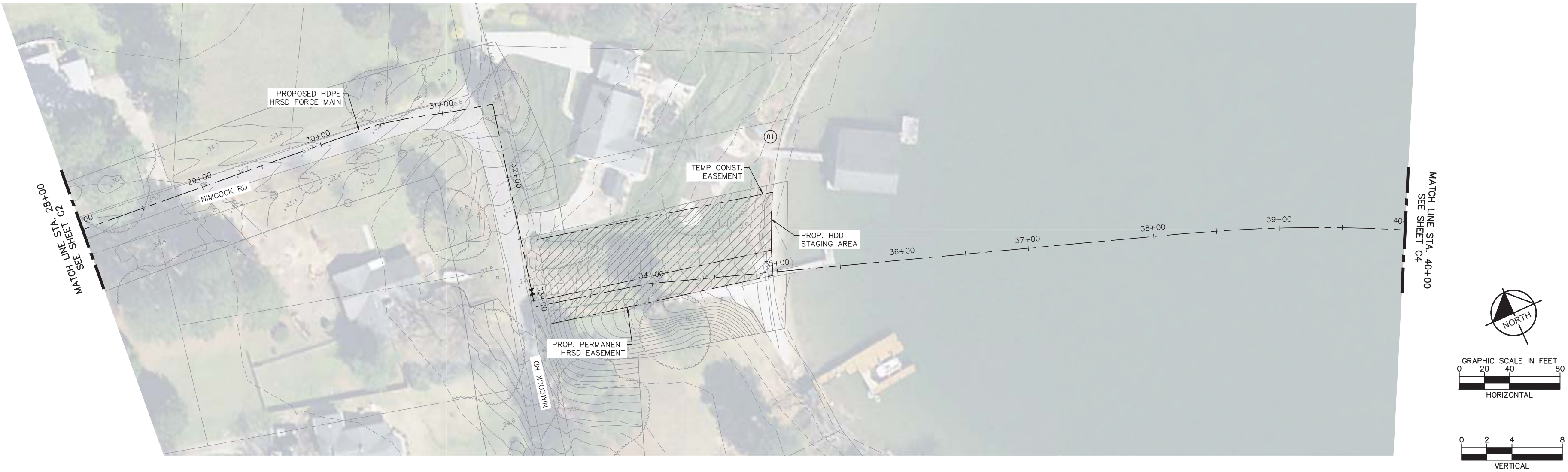
NO.	DATE	BY	REVISION

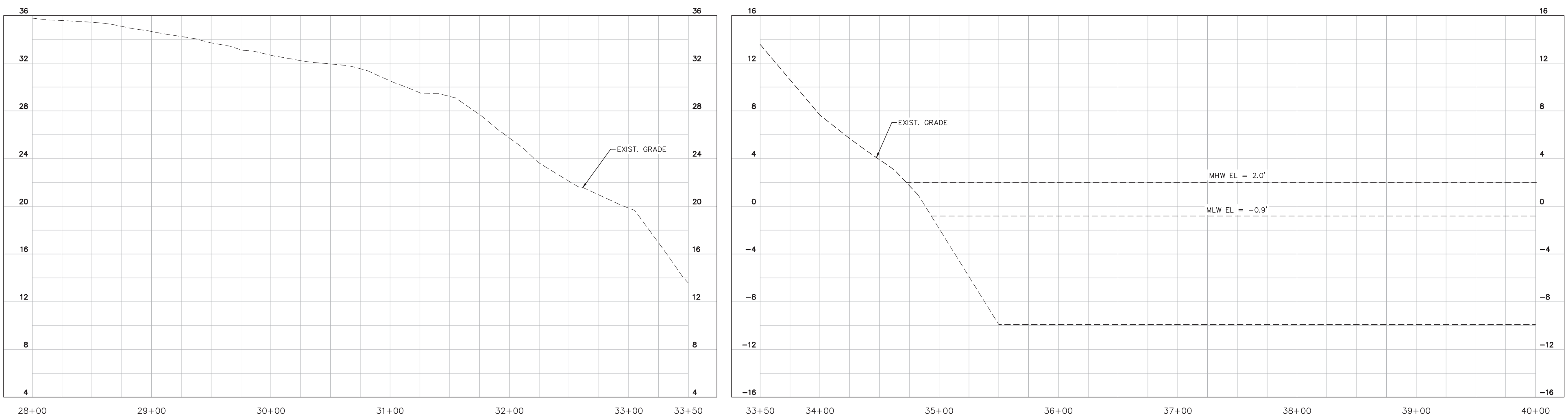
FM Plan and Profile (16+50 - 28+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C2
SCALE:	1" = 40'	SHEET NO.:	4 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

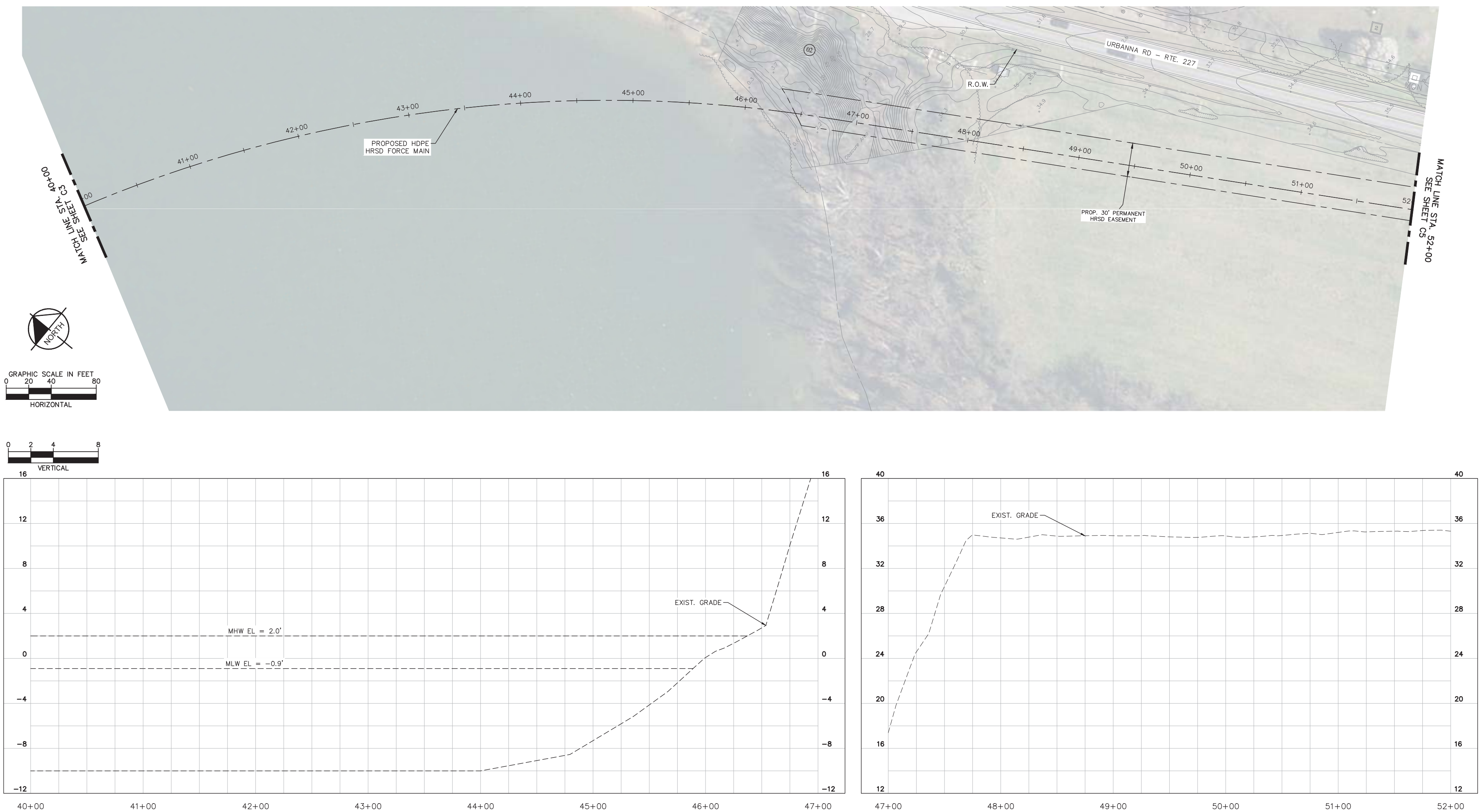
FM Plan and Profile (28+00 - 40+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C3
SCALE:	1" = 40'	SHEET NO.:	5 of 77

COMM. NO. ######.###



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

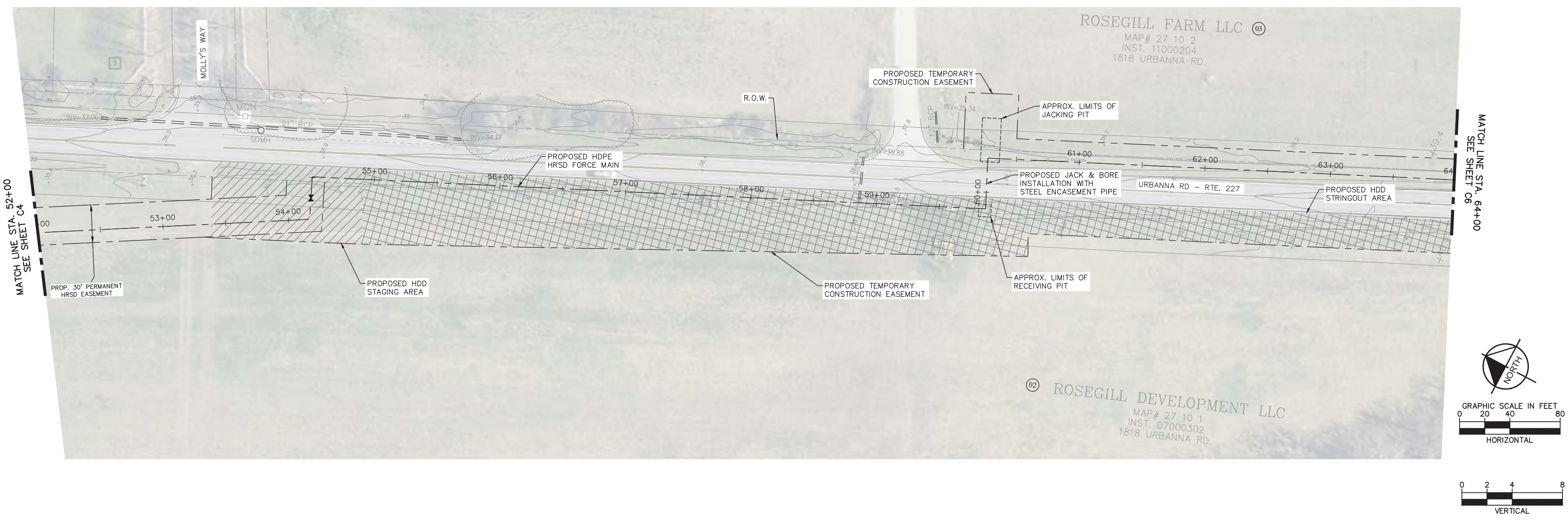
NO.	DATE	BY	REVISION

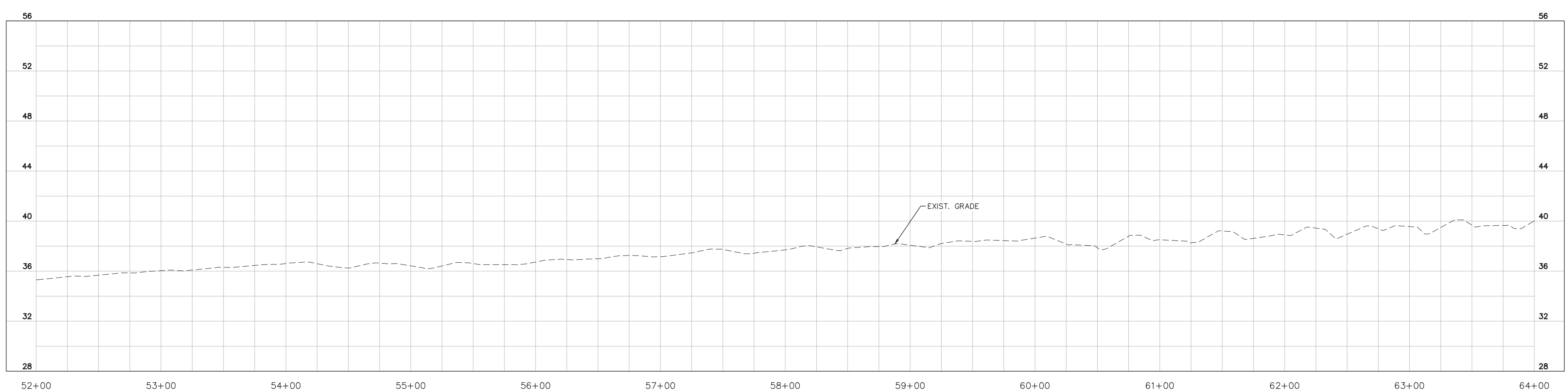
FM Plan and Profile (40+00 - 52+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C4
SCALE:	1" = 40'	SHEET NO.:	6 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

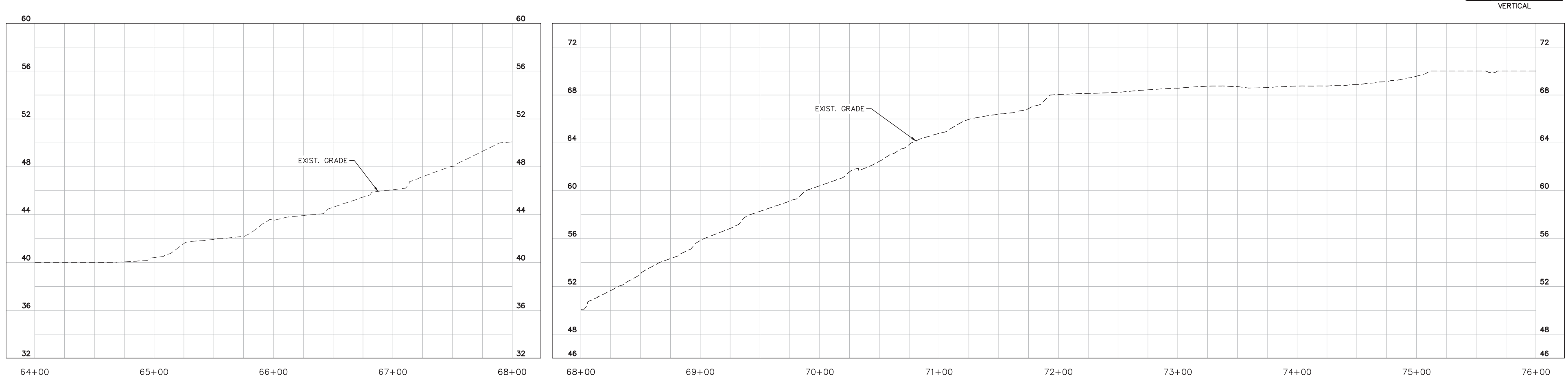
NO.	DATE	BY	REVISION

FM Plan and Profile (52+00 - 64+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C5
SCALE:	1" = 40'	SHEET NO.:	7 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

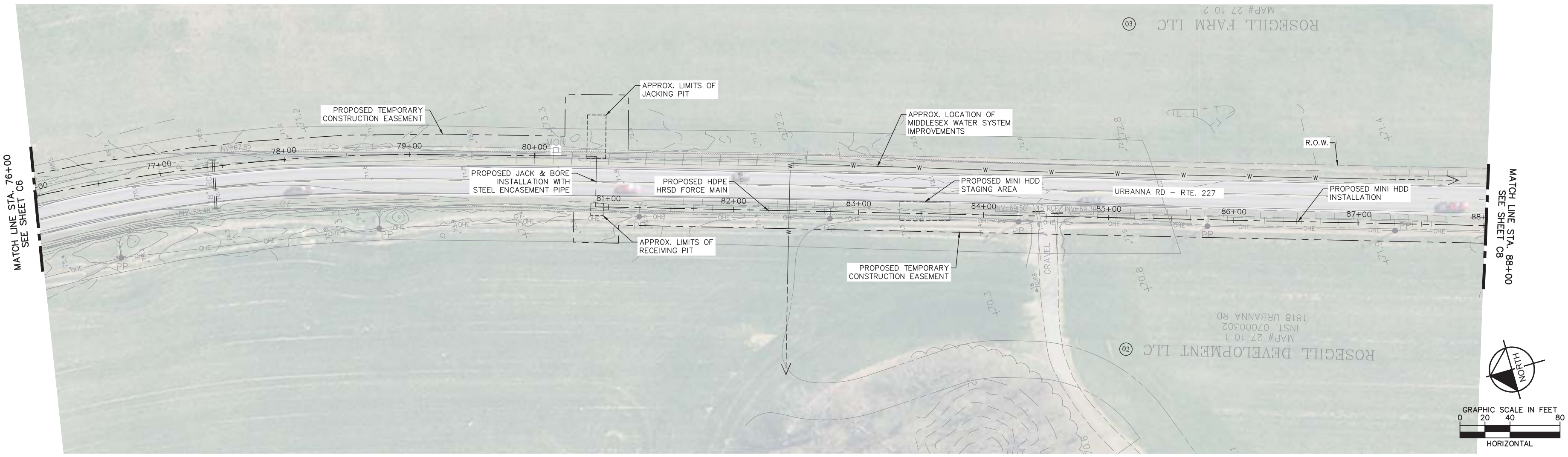
NO.	DATE	BY	REVISION

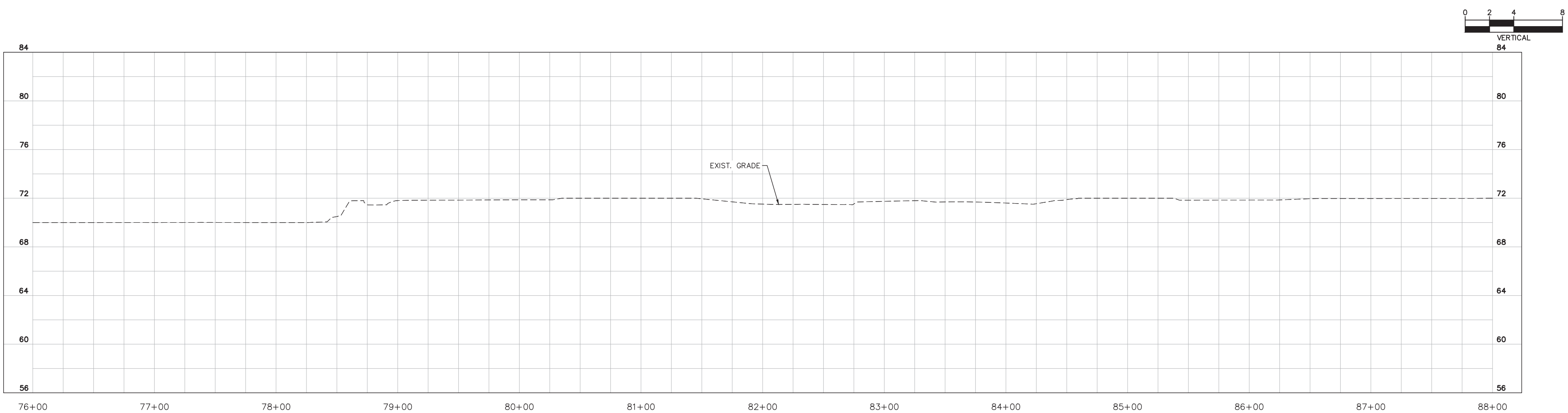
FM Plan and Profile (64+00 - 76+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C6
SCALE:	1" = 40'	SHEET NO.:	8 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

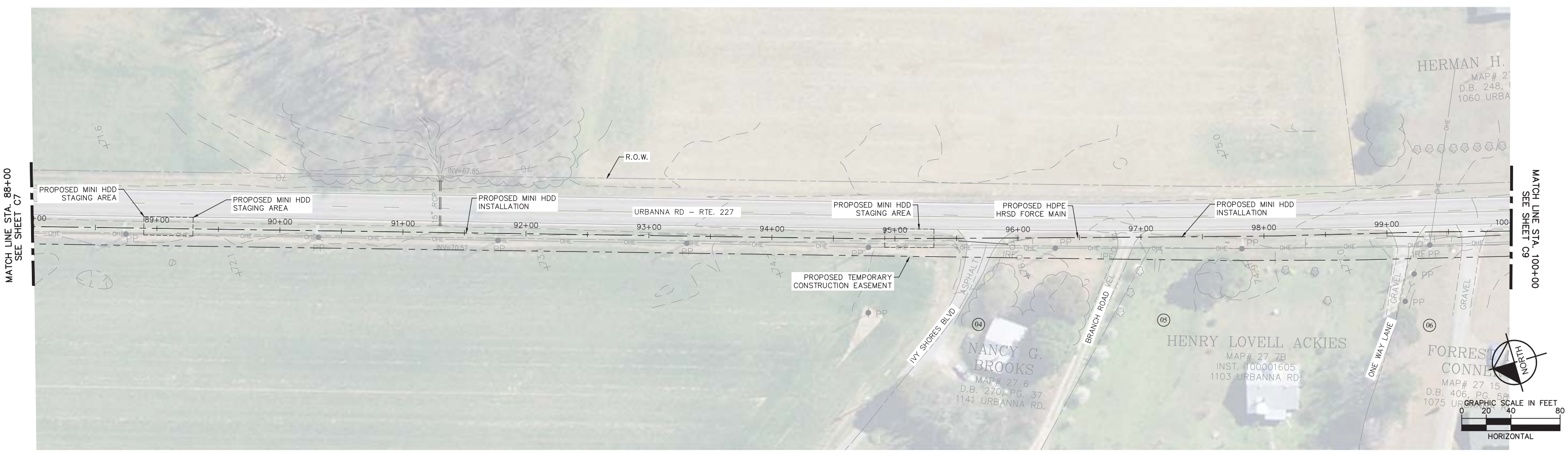
NO.	DATE	BY	REVISION

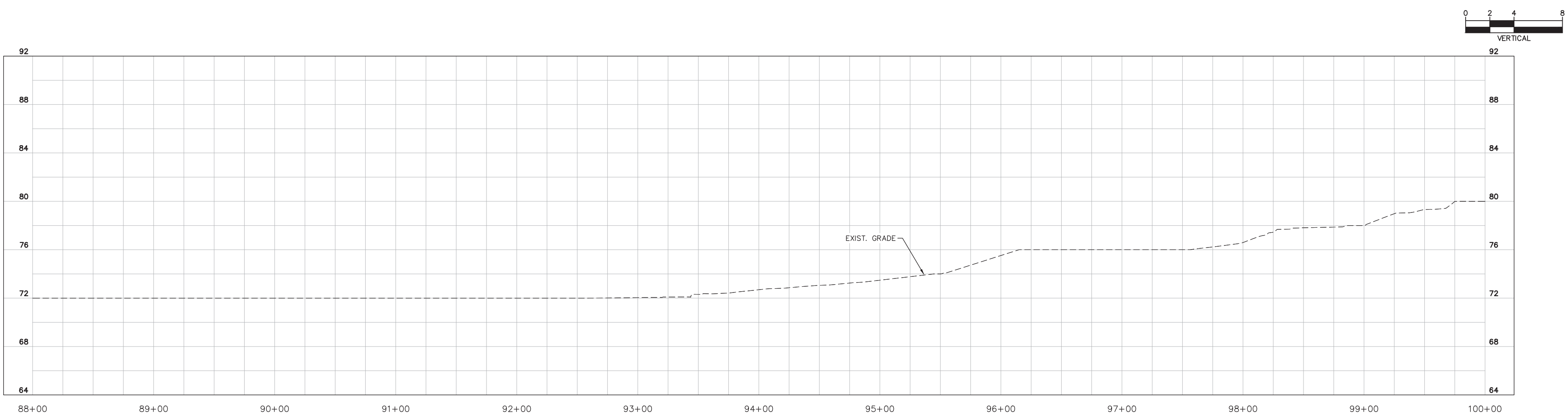
FM Plan and Profile (76+00 - 88+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C7
SCALE:	1" = 40'	SHEET NO.:	9 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

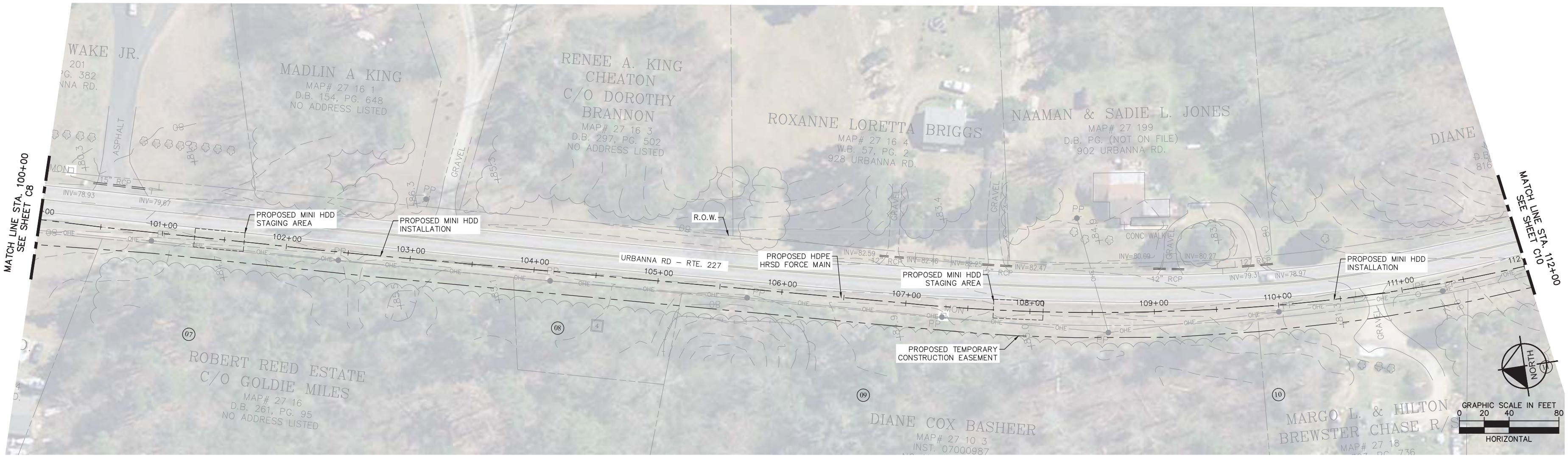
NO.	DATE	BY	REVISION

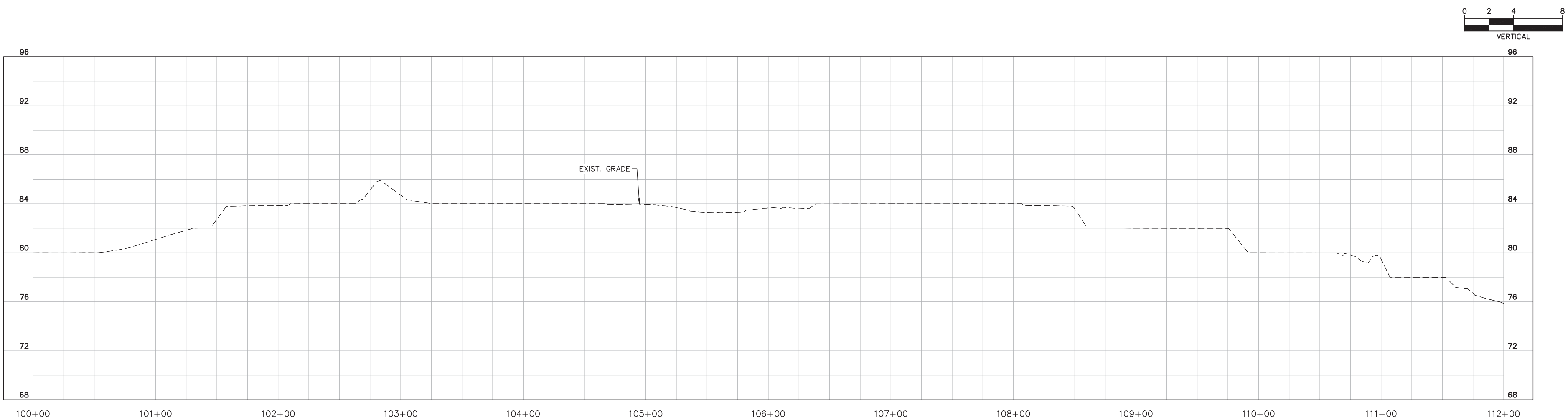
FM Plan and Profile (88+00 - 100+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C8
SCALE:	1" = 40'	SHEET NO.:	10 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

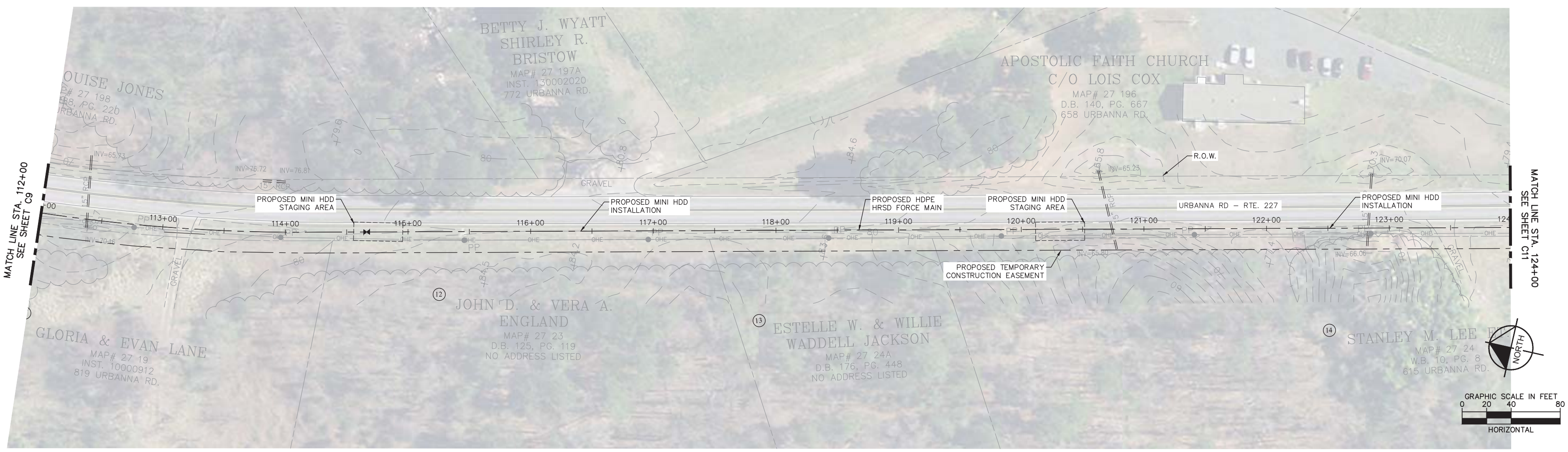
NO.	DATE	BY	REVISION

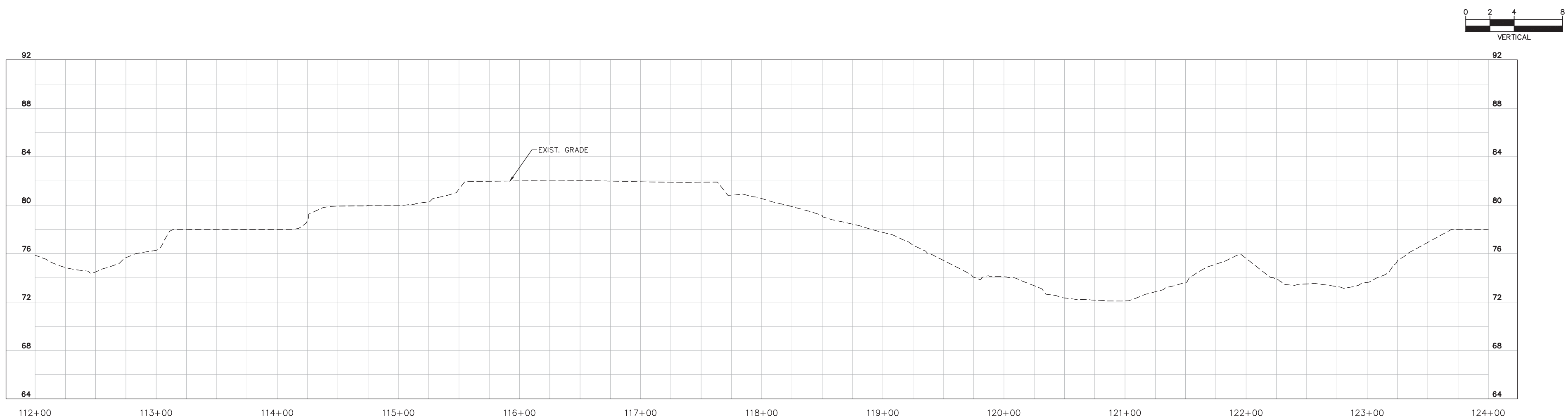
FM Plan and Profile (100+00 - 112+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C9
SCALE:	1" = 40'	SHEET NO.:	11 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

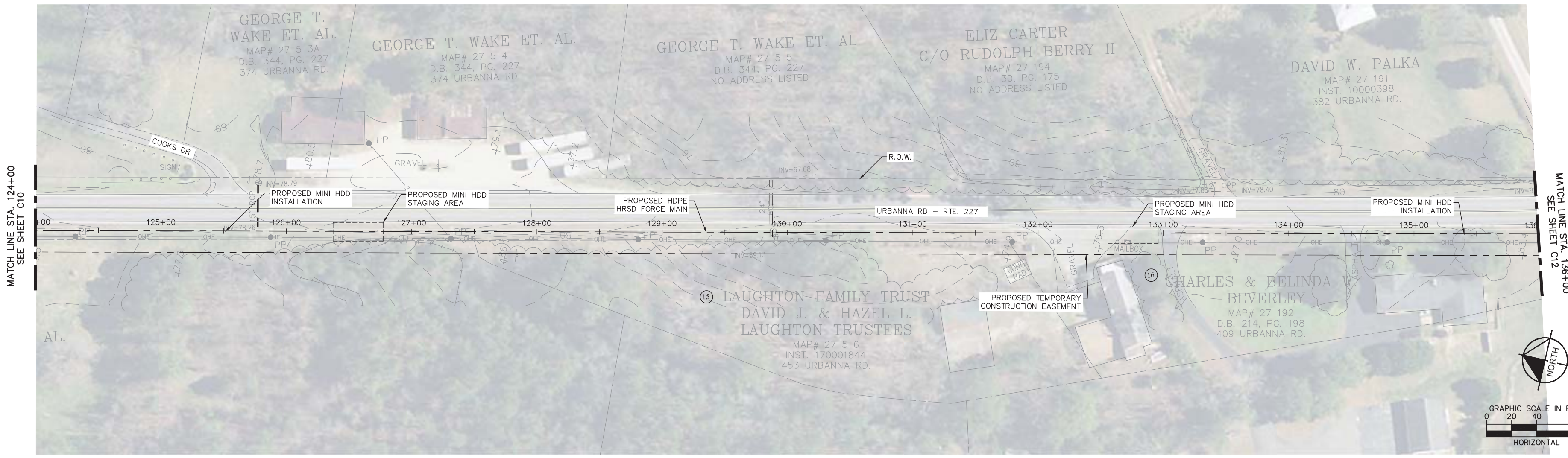
NO.	DATE	BY	REVISION

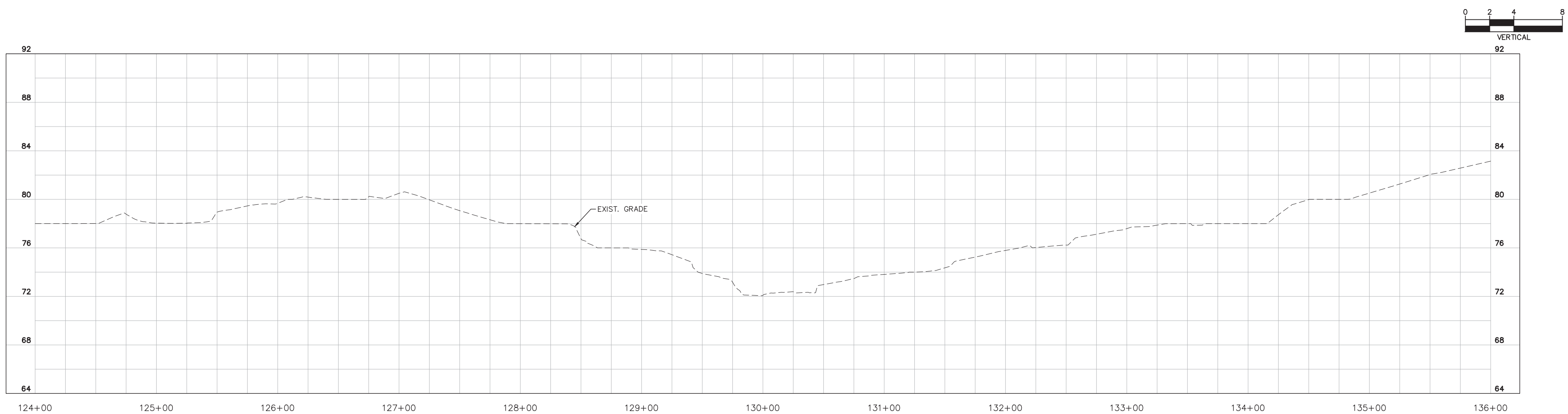
FM Plan and Profile (112+00 - 124+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C10
SCALE:	1" = 40'	SHEET NO.:	12 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

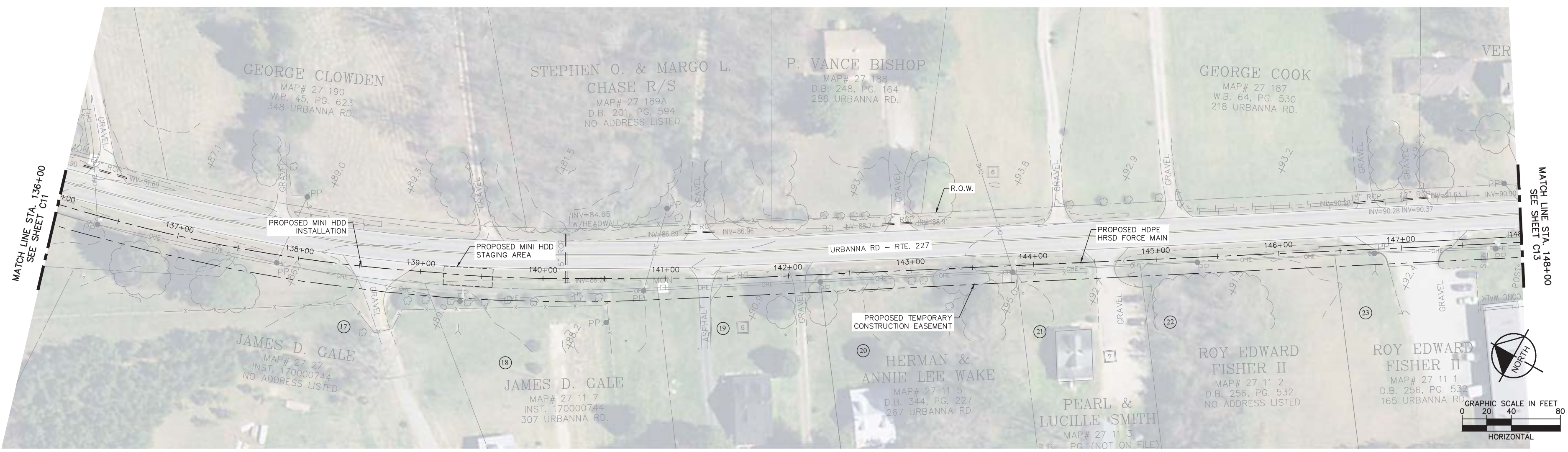
NO.	DATE	BY	REVISION

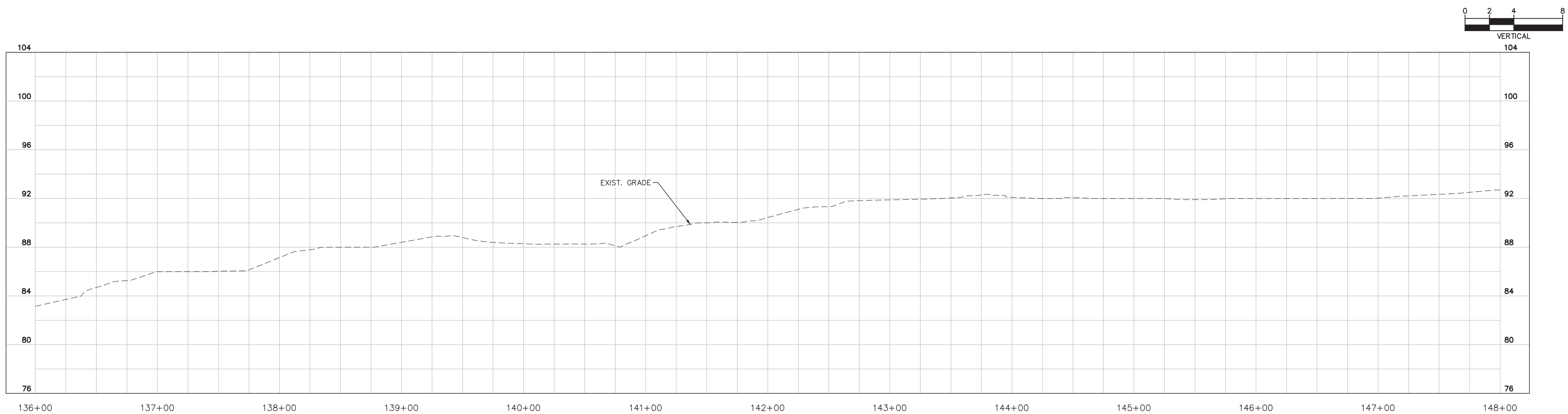
FM Plan and Profile (124+00 - 136+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C11
SCALE:	1" = 40'	SHEET NO.:	13 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

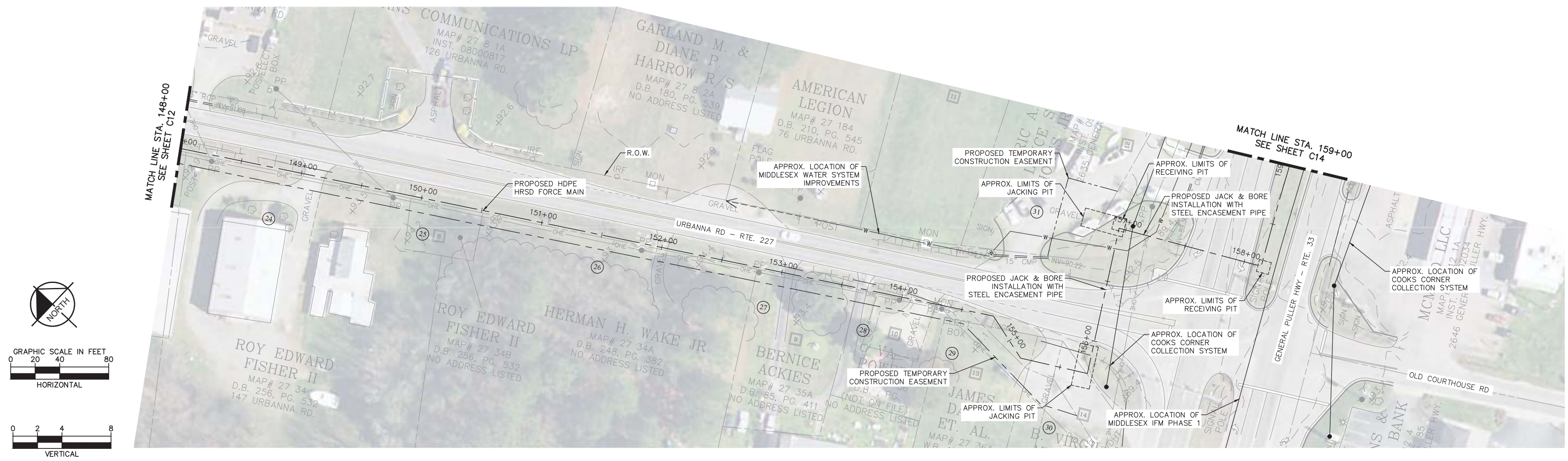
NO.	DATE	BY	REVISION

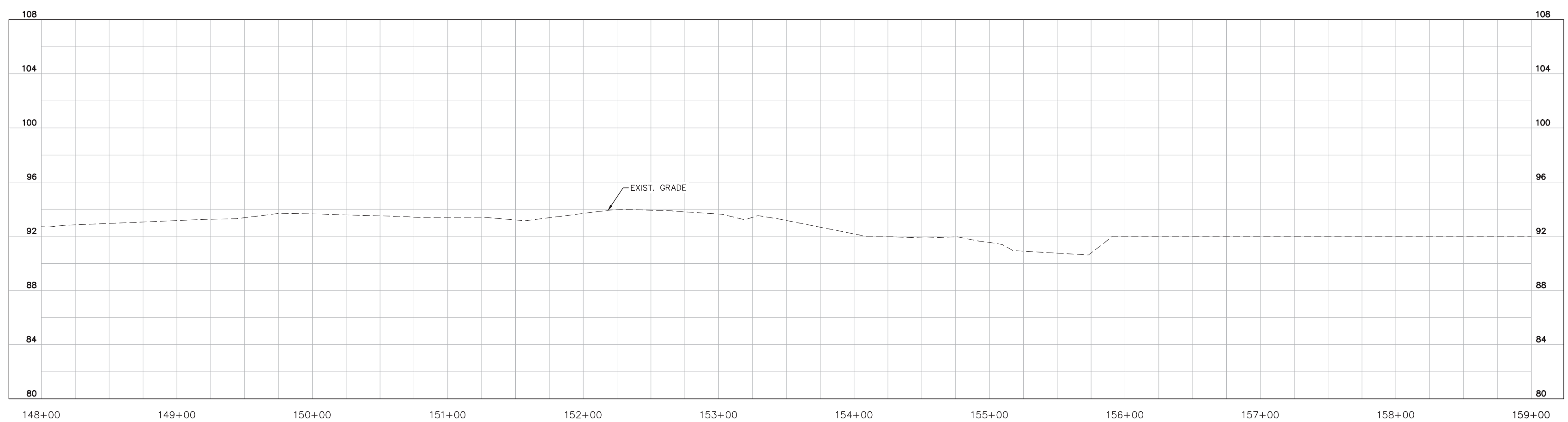
FM Plan and Profile (136+00 - 148+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C12
SCALE:	1" = 40'	SHEET NO.:	14 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

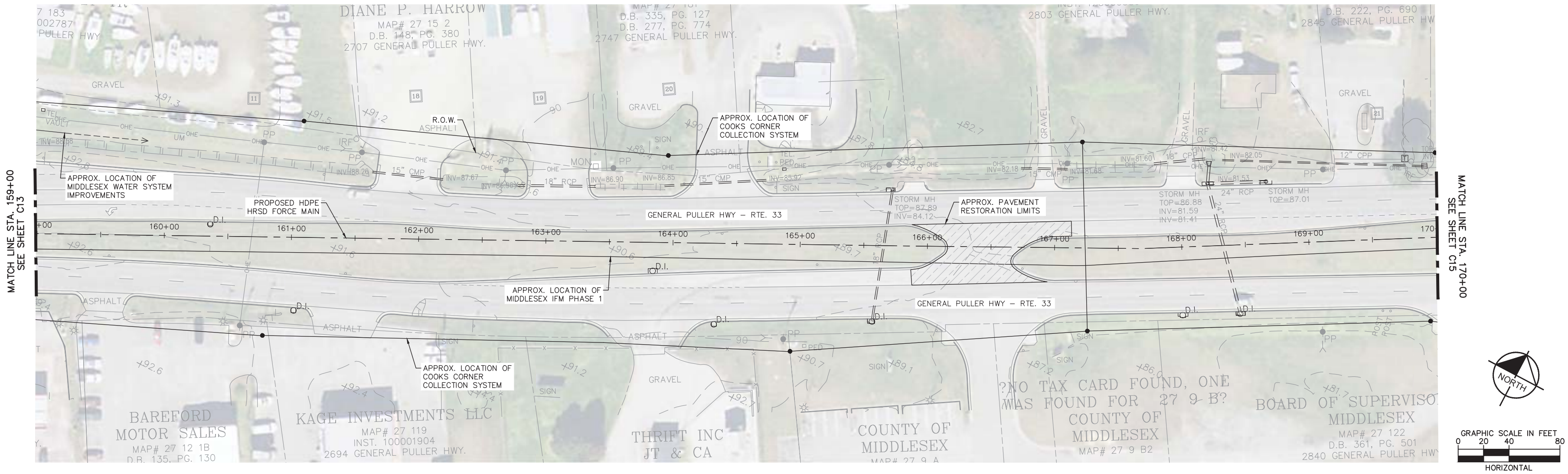
NO.	DATE	BY	REVISION

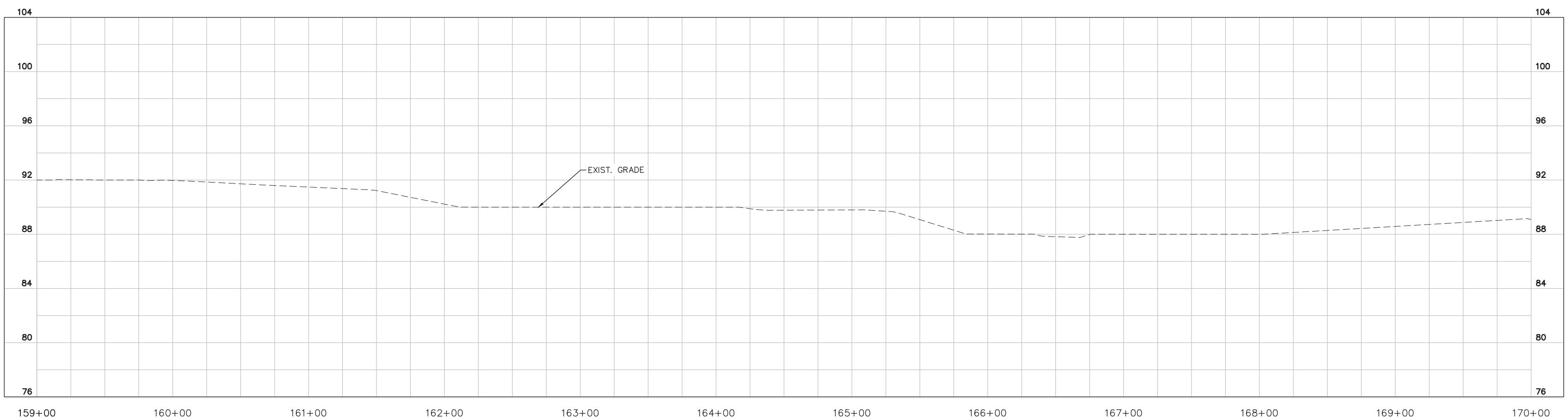
FM Plan and Profile (148+00 - 159+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C13
SCALE:	1" = 40'	SHEET NO.:	15 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

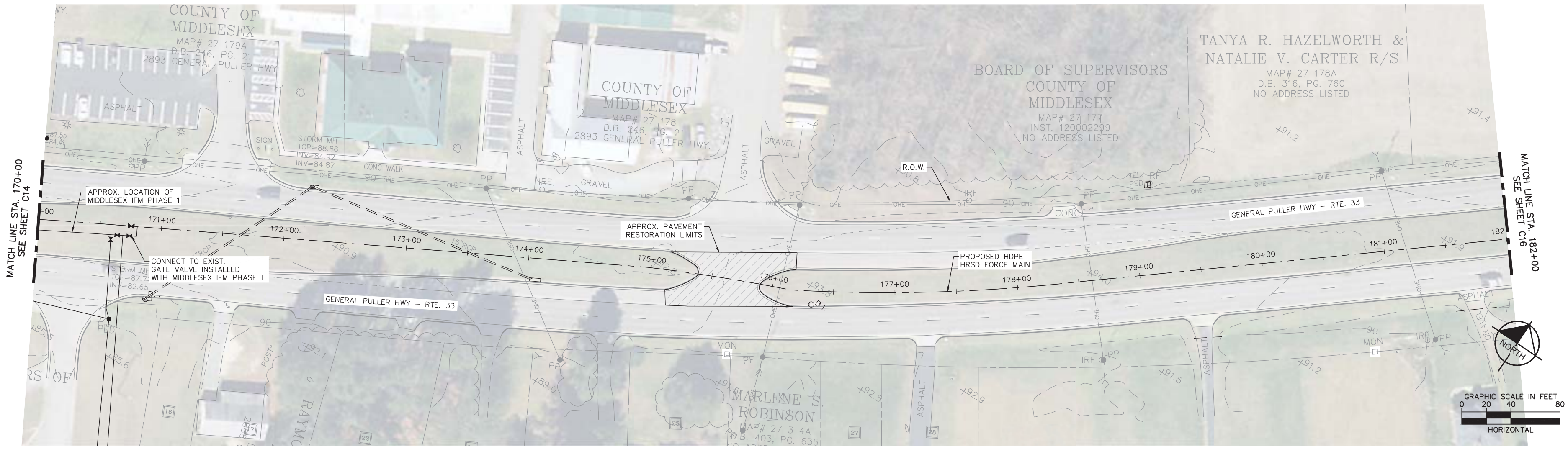
NO.	DATE	BY	REVISION

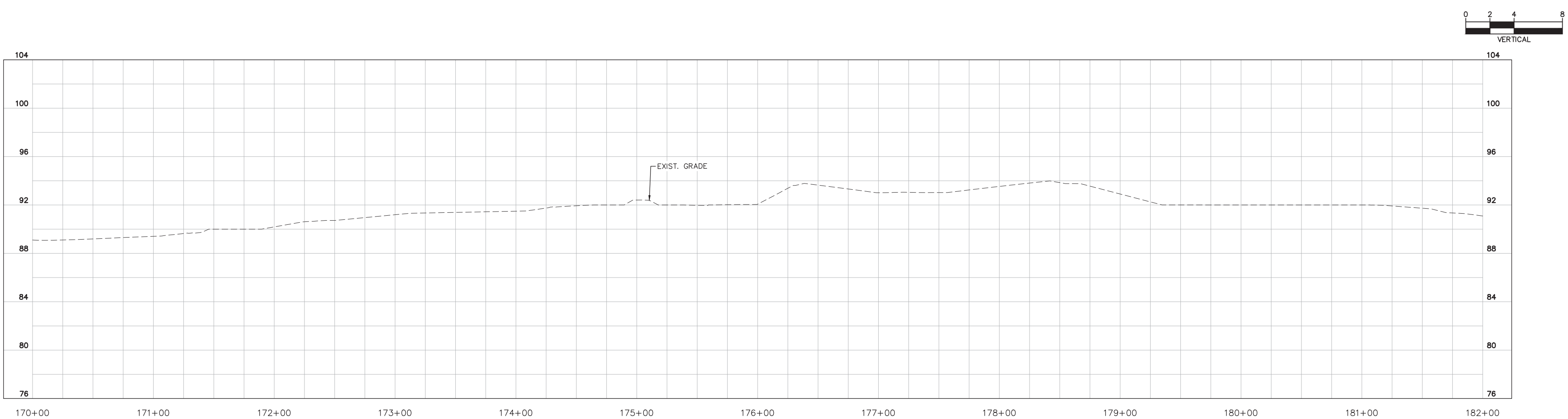
FM Plan and Profile (159+00 - 170+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C14
SCALE:	1" = 40'	SHEET NO.:	16 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

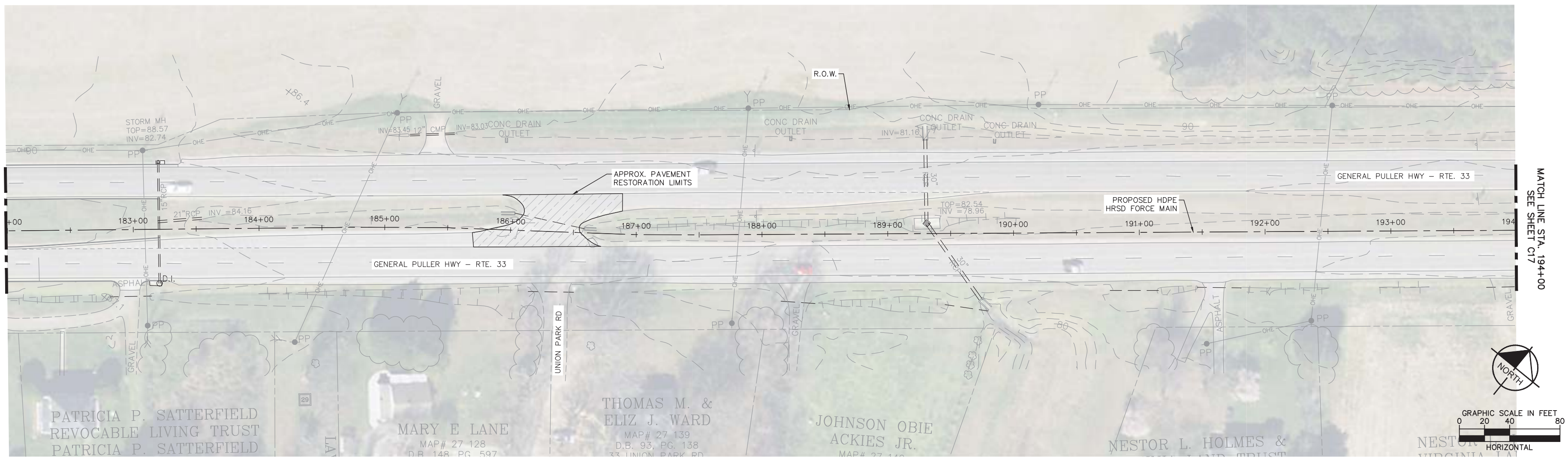
NO.	DATE	BY	REVISION

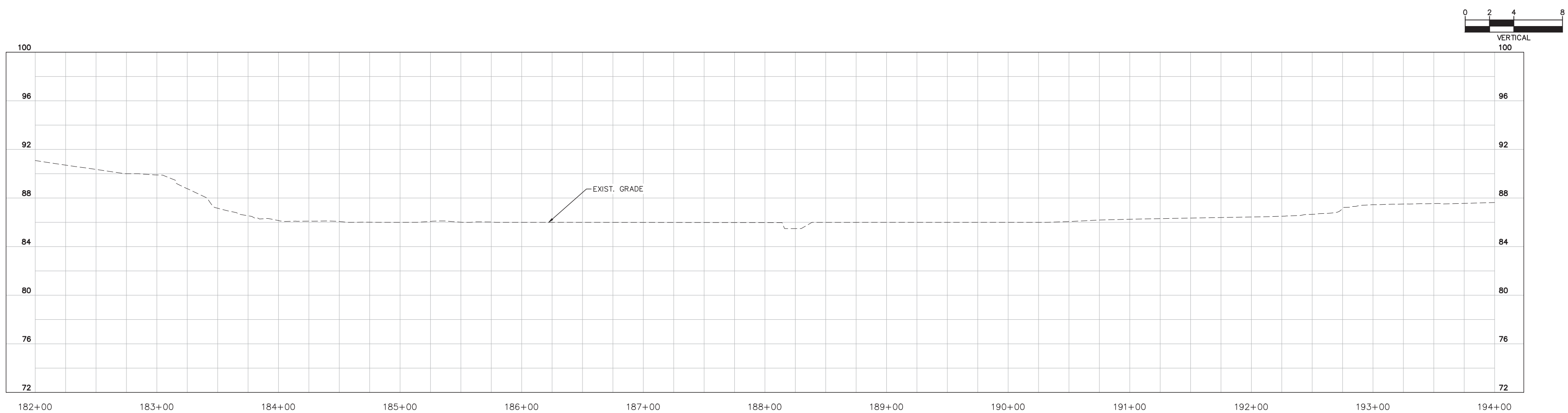
FM Plan and Profile (170+00 - 182+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C15
SCALE:	1" = 40'	SHEET NO.:	17 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

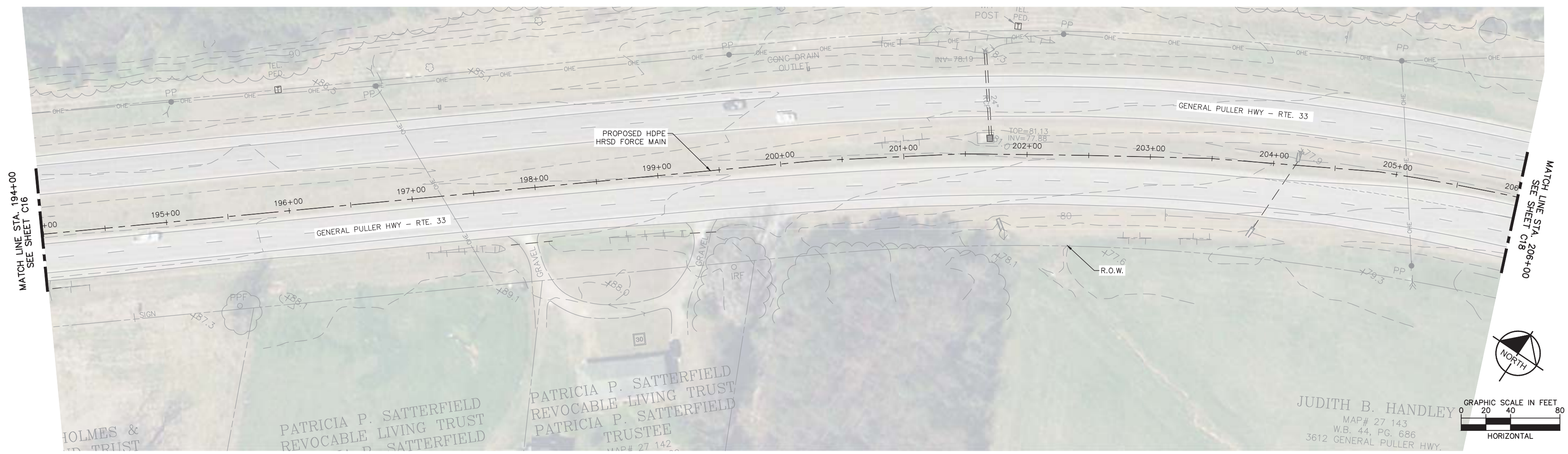
NO.	DATE	BY	REVISION

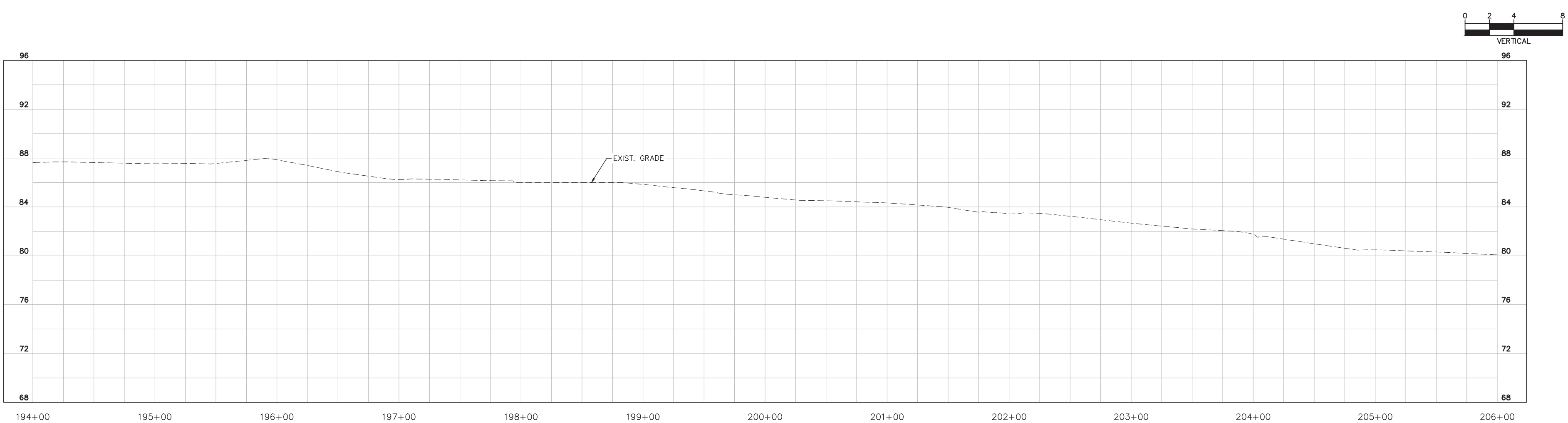
FM Plan and Profile (182+00 - 194+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C16
SCALE:	1" = 40'	SHEET NO.:	18 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

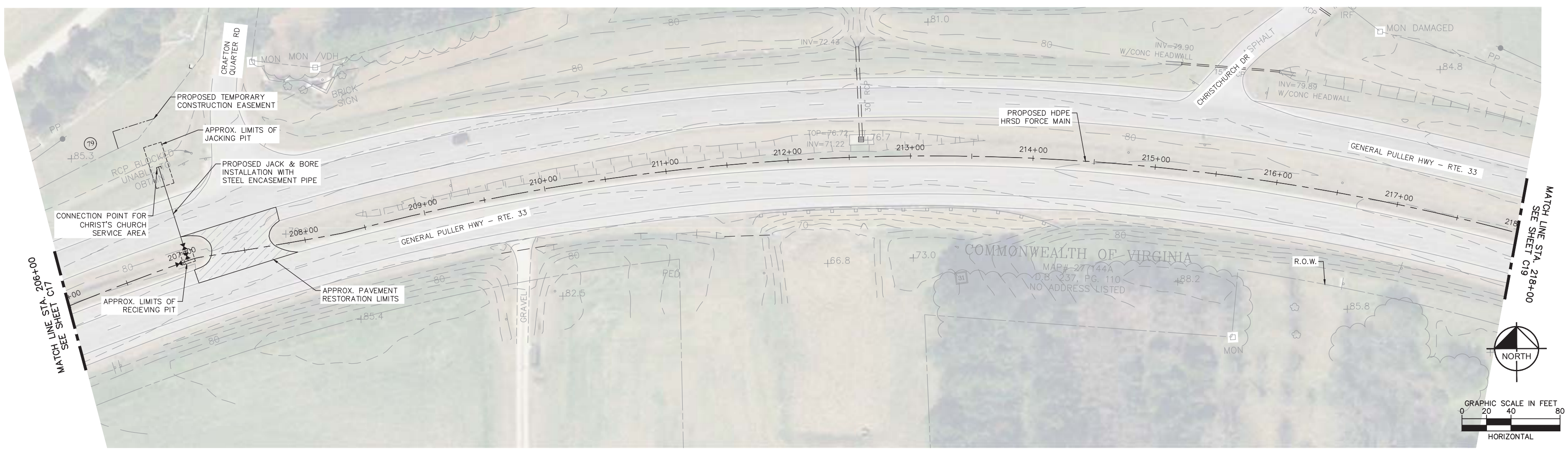
NO.	DATE	BY	REVISION

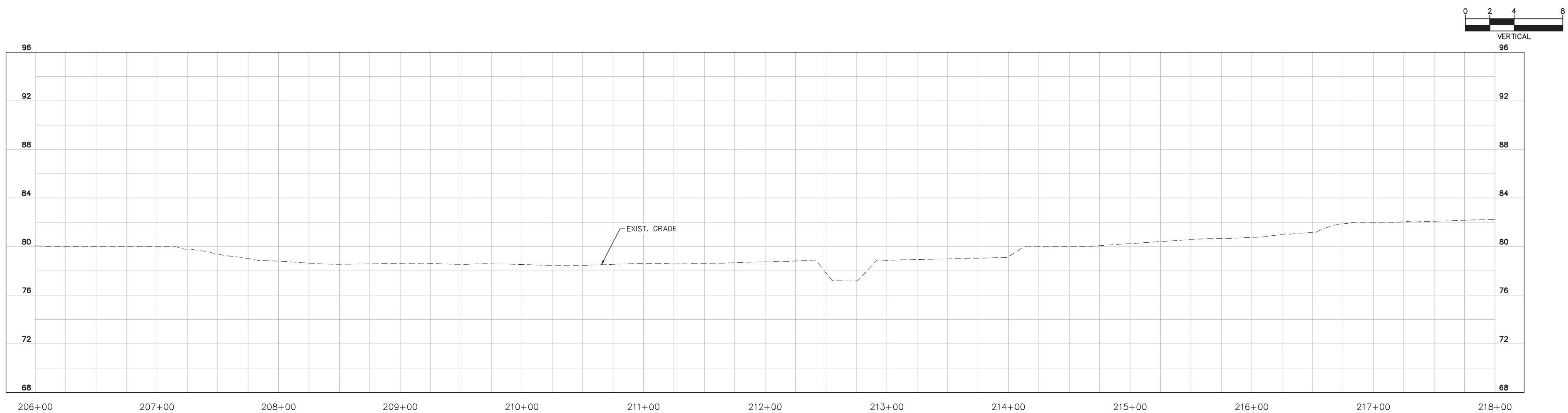
FM Plan and Profile (194+00 - 206+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C17
SCALE:	1" = 40'	SHEET NO.:	19 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

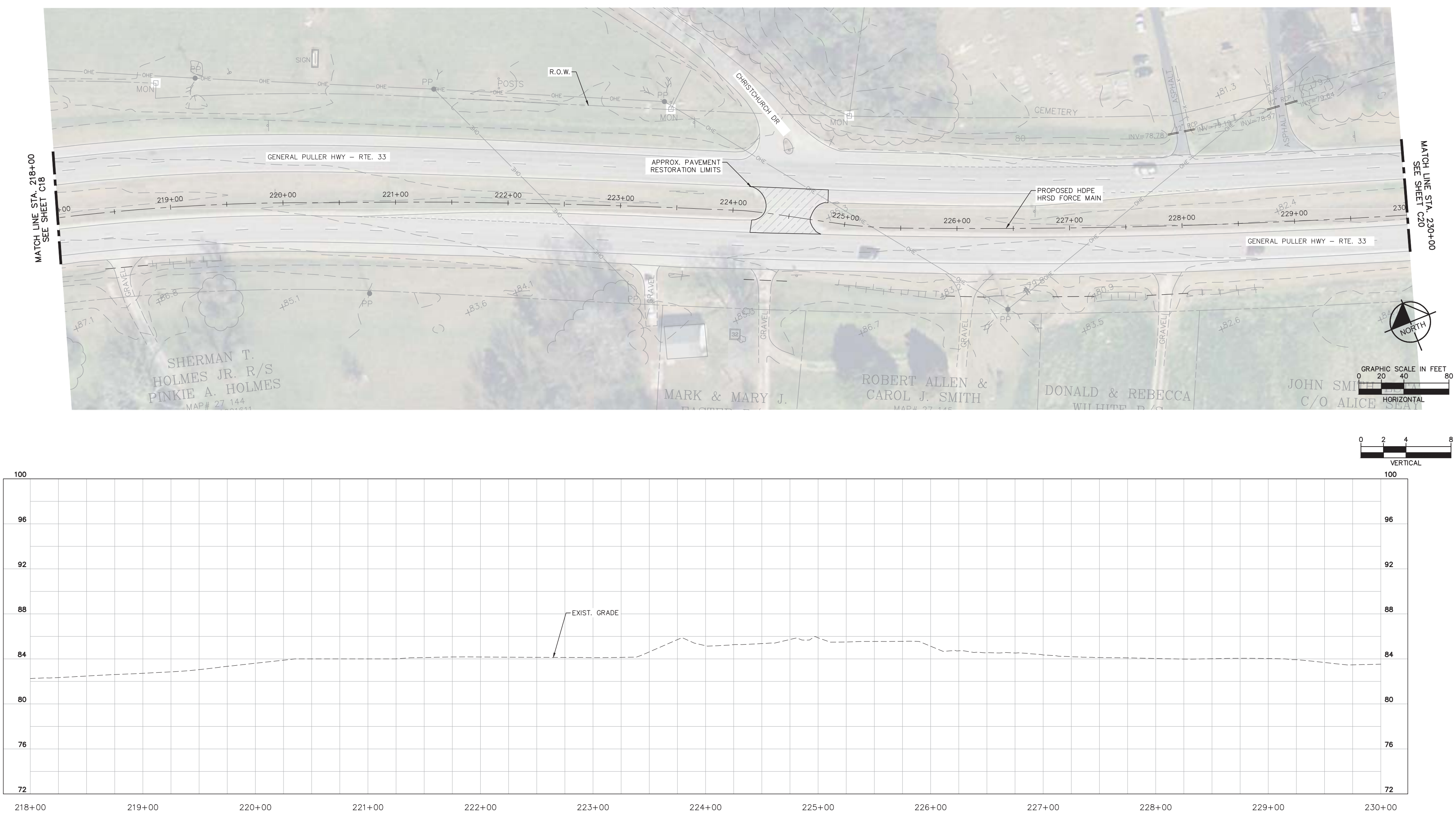
FM Plan and Profile (206+00 - 218+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C18
SCALE:	1" = 40'	SHEET NO.:	20 of 77

COMM. NO. ######.###



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

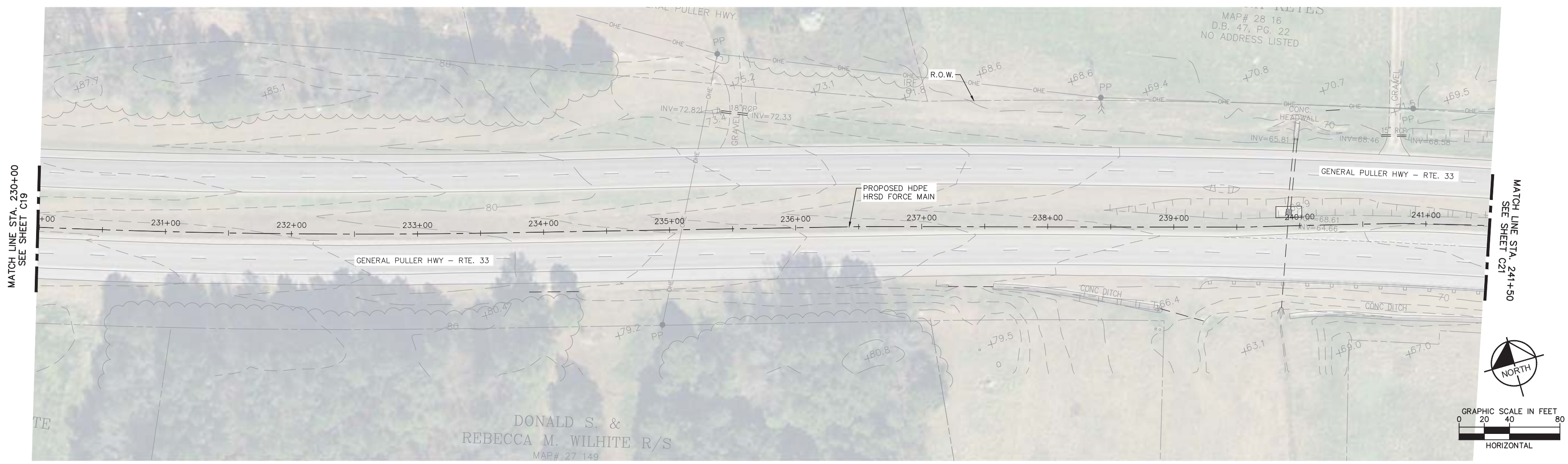
NO.	DATE	BY	REVISION

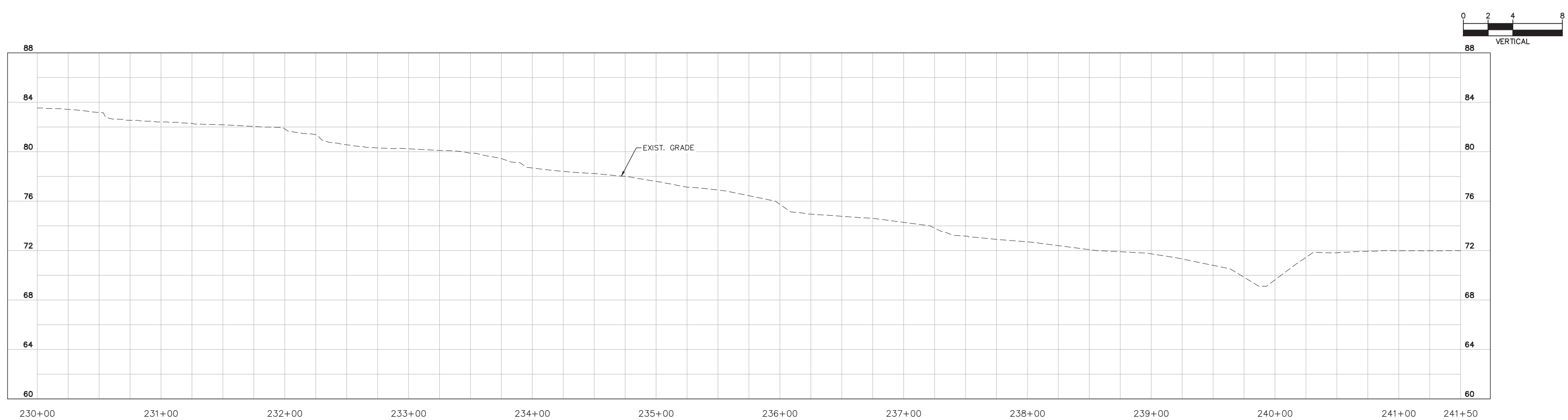
FM Plan and Profile (218+00 - 230+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C19
SCALE:	1" = 40'	SHEET NO.:	21 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

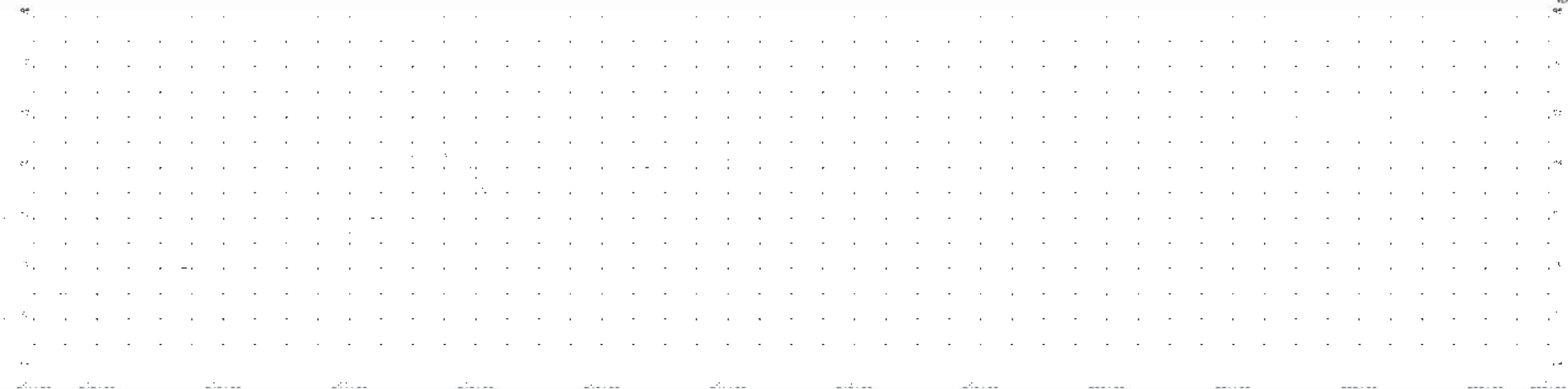
NO.	DATE	BY	REVISION

FM Plan and Profile (230+00 - 241+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C20
SCALE:	1" = 40'	SHEET NO.:	22 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION	Kimley»Horn © 2020 KIMLEY-HORN AND ASSOCIATES, INC. 4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462 PHONE: 757-213-8600 FAX: 757-213-8601 WWW.KIMLEY-HORN.COM	HRSD Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

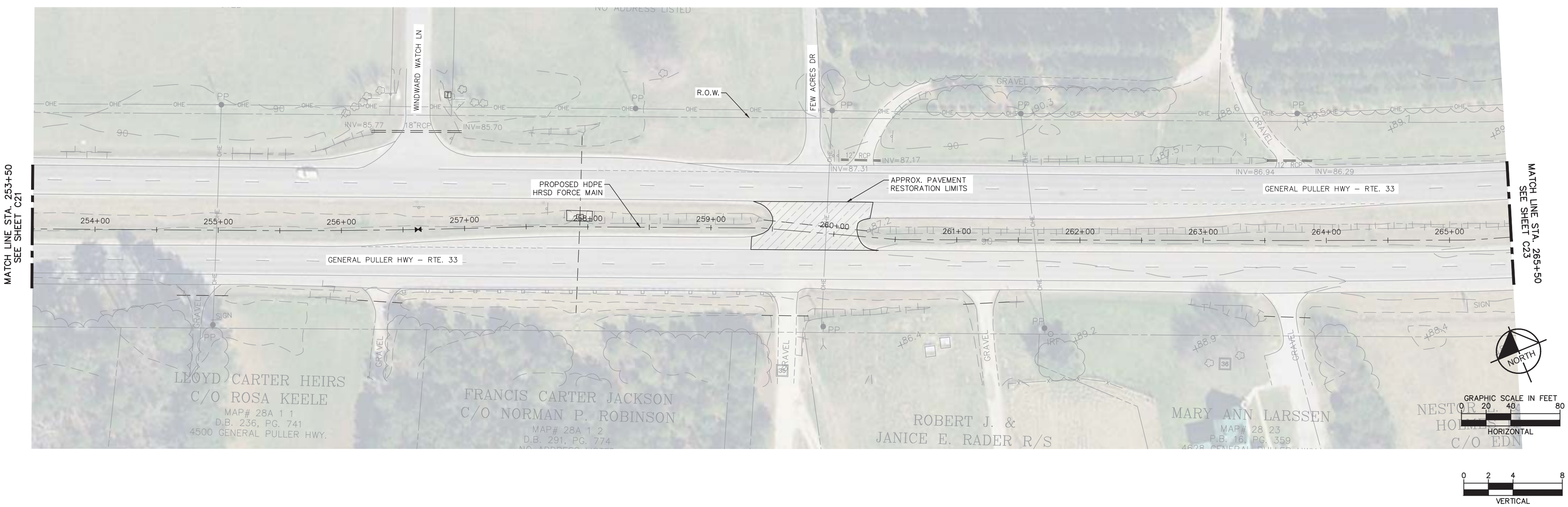
FM Plan and Profile (241+50 - 253+50)

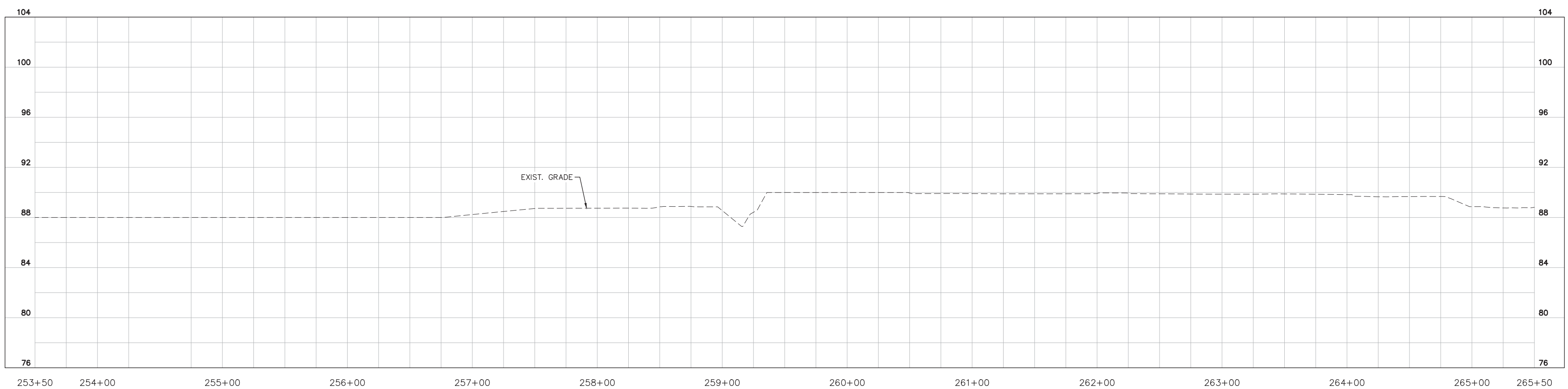
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C21
SCALE:	1" = 40'	SHEET NO.:	23 of 77

COMM. NO. ######.###





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

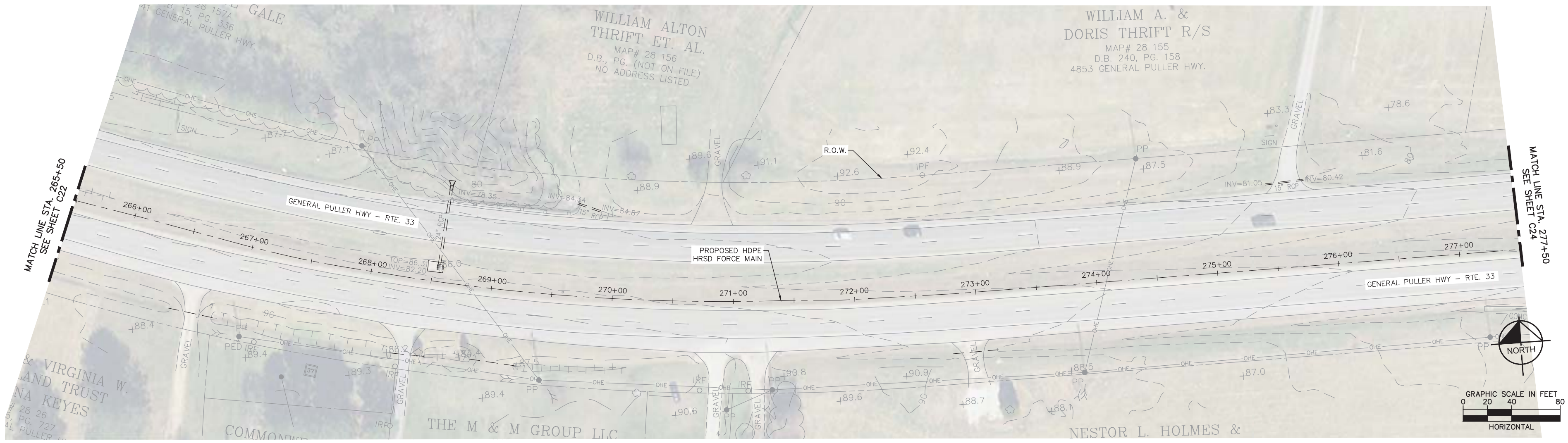
NO.	DATE	BY	REVISION

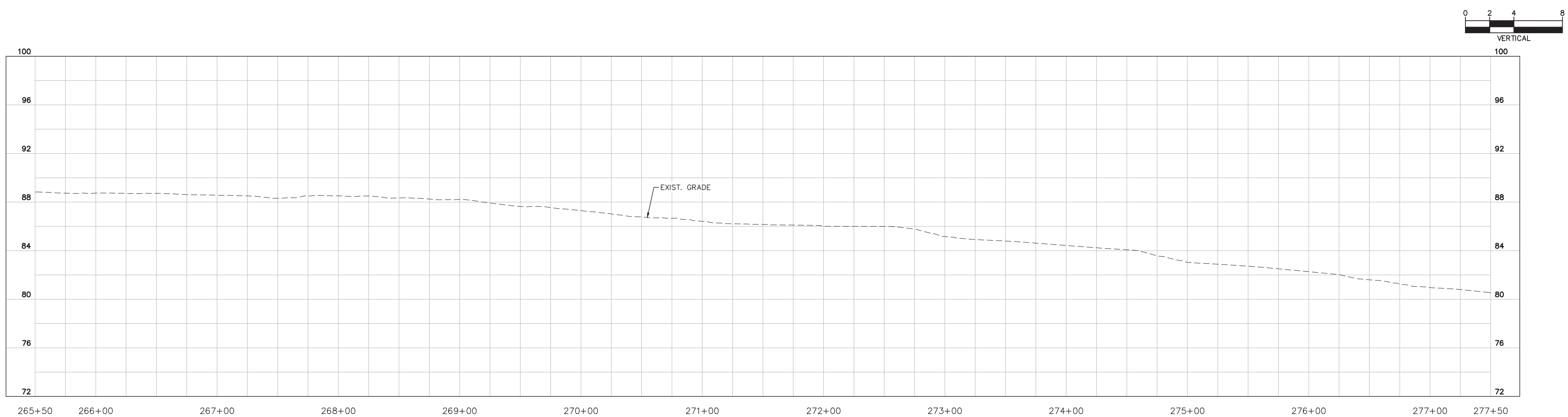
FM Plan and Profile (253+50 - 265+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C22
SCALE:	1" = 40'	SHEET NO.:	24 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

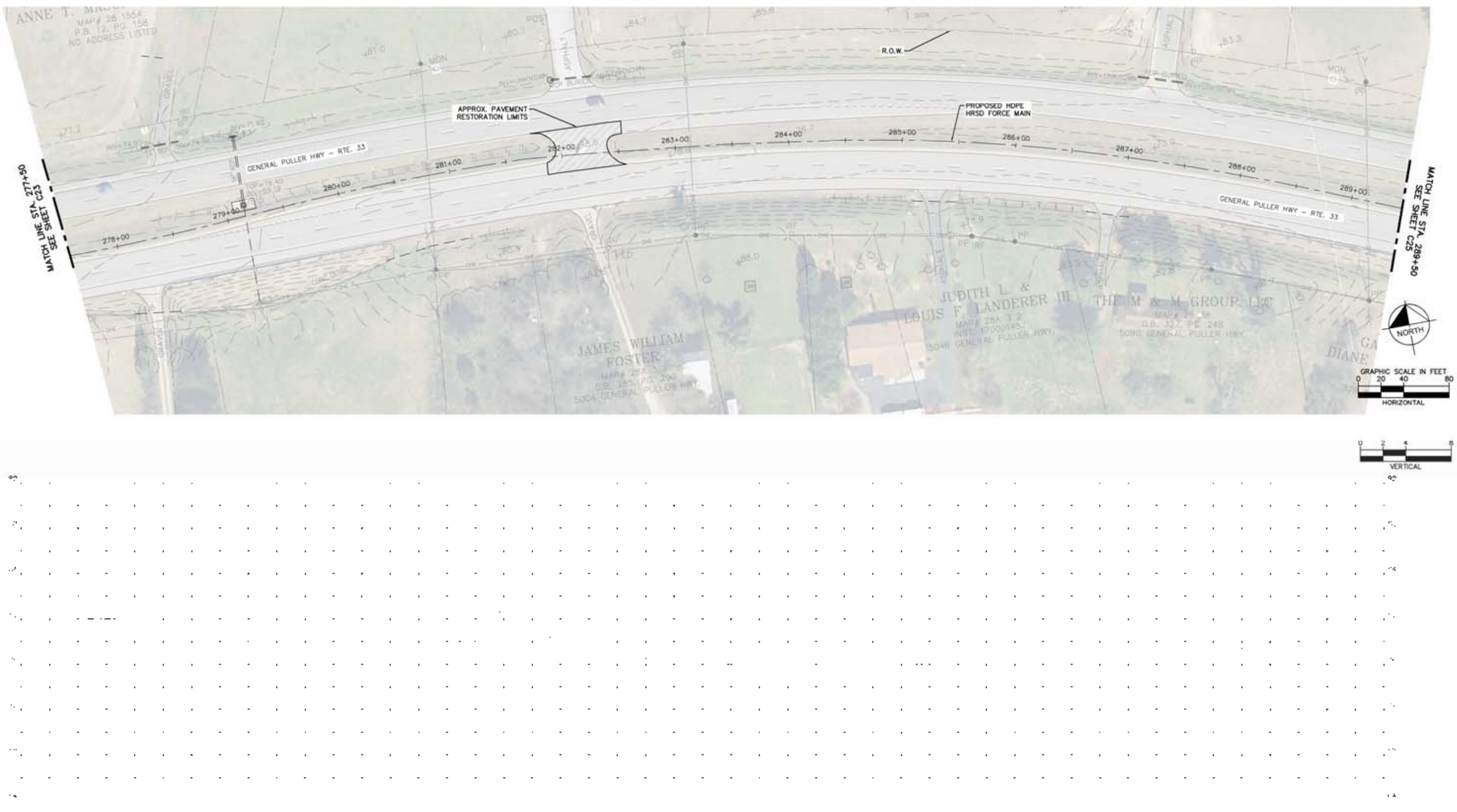
NO.	DATE	BY	REVISION

FM Plan and Profile (265+50 - 277+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C23
SCALE:	1" = 40'	SHEET NO.:	25 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

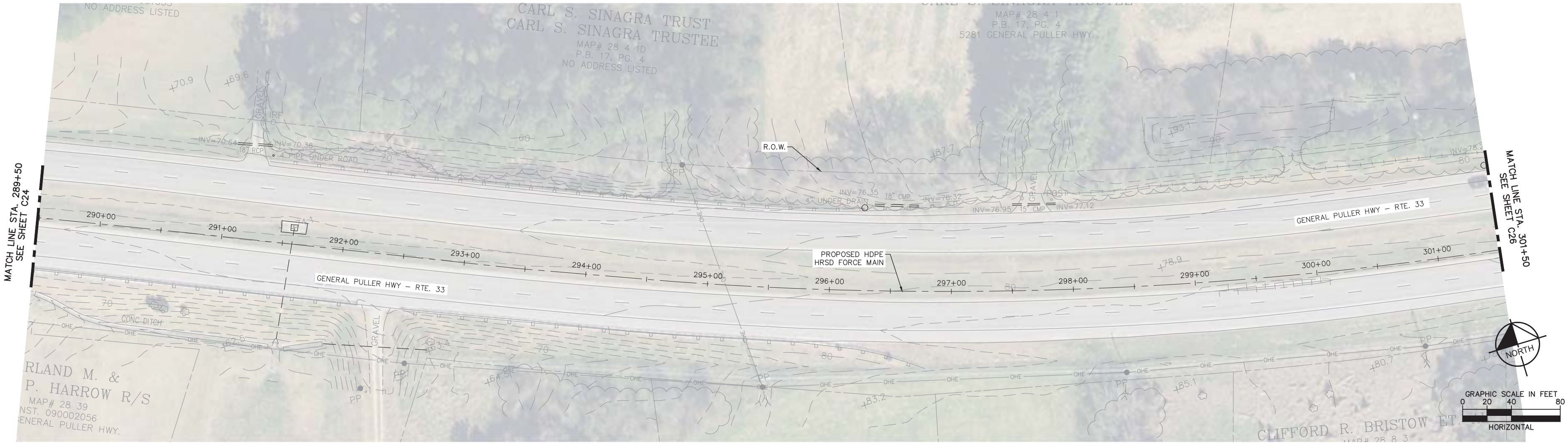
NO.	DATE	BY	REVISION

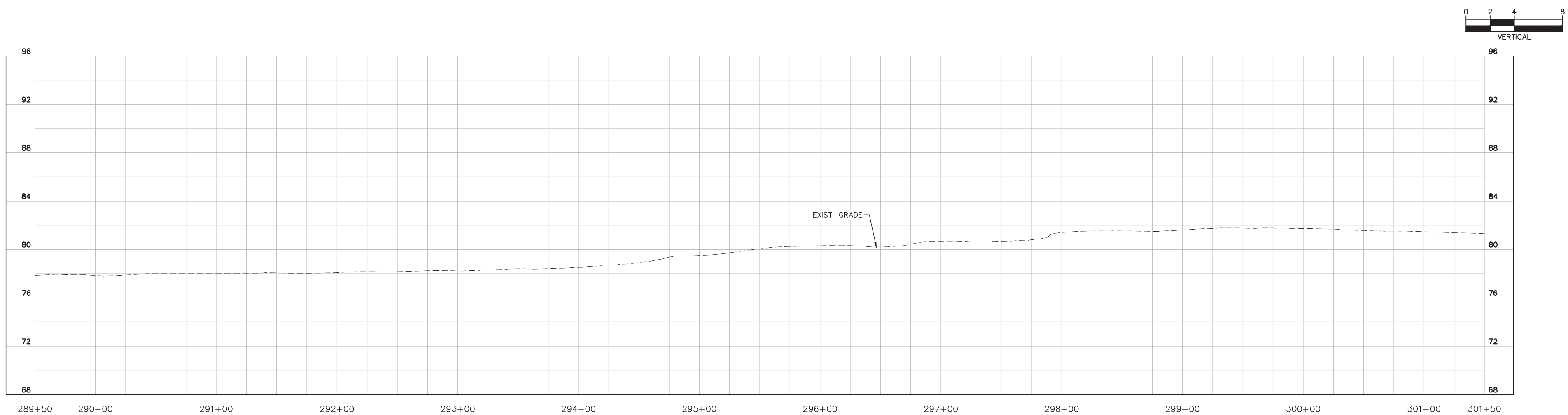
FM Plan and Profile (277+50 - 289+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C24
SCALE:	1" = 40'	SHEET NO.:	26 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

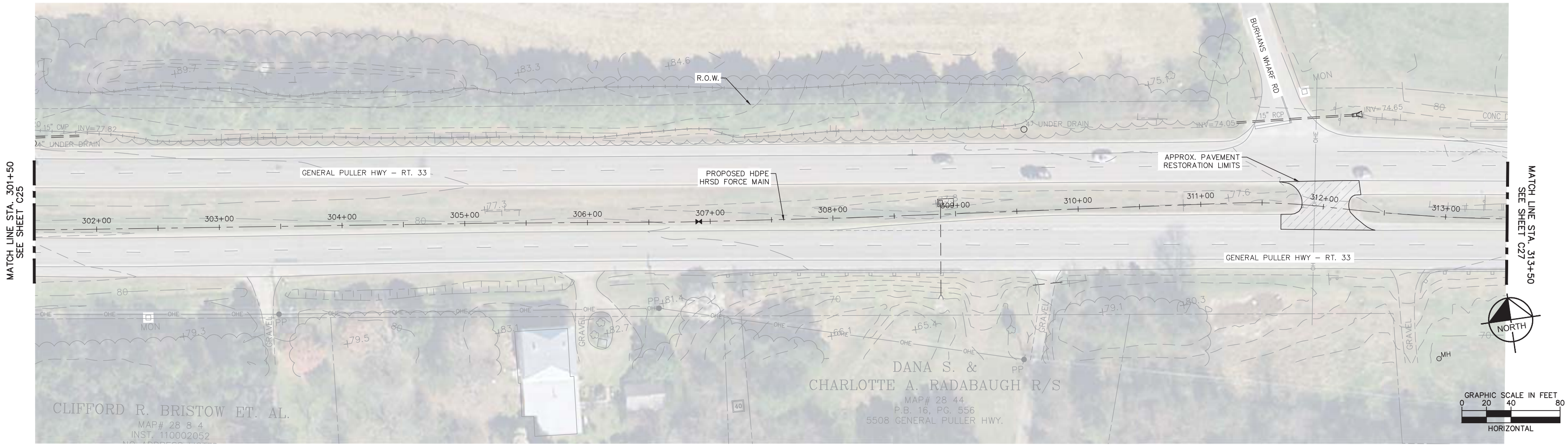
NO.	DATE	BY	REVISION

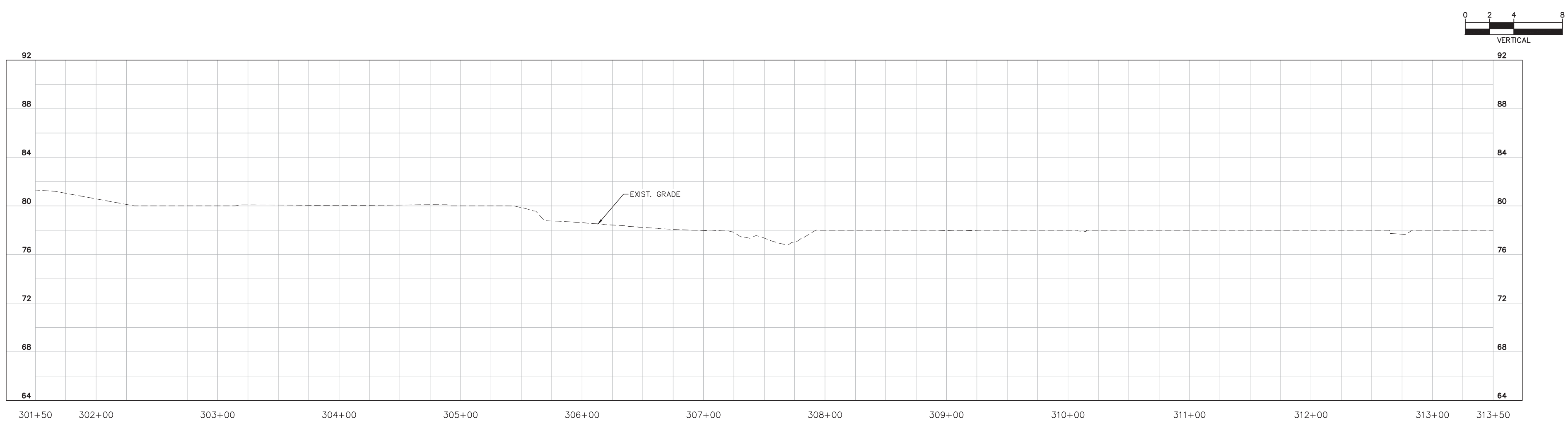
FM Plan and Profile (289+50 - 301+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C25
SCALE:	1" = 40'	SHEET NO.:	27 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

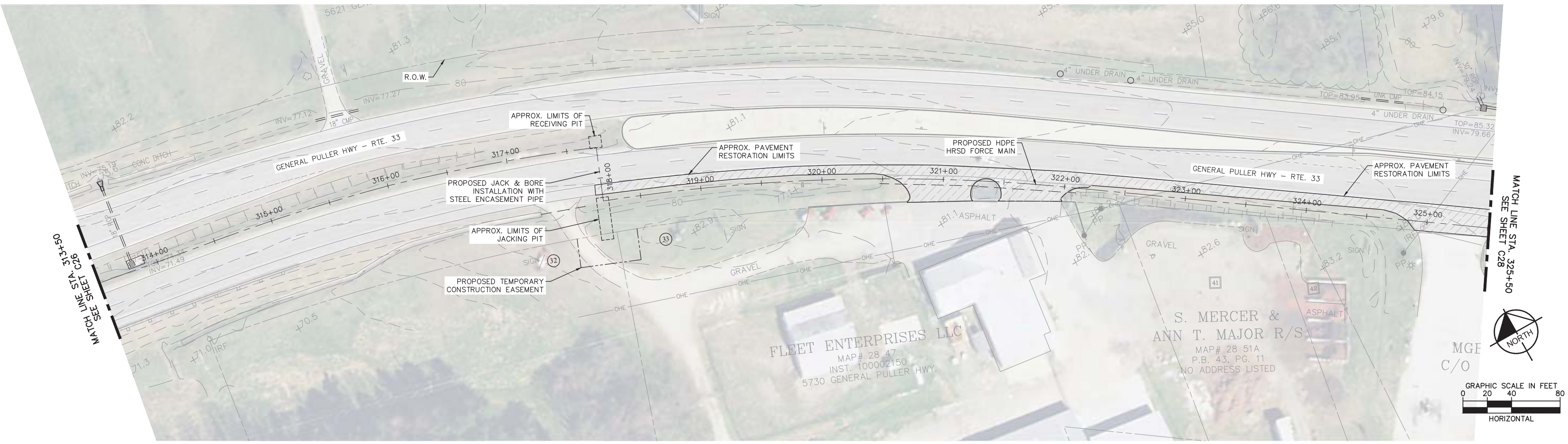
NO.	DATE	BY	REVISION

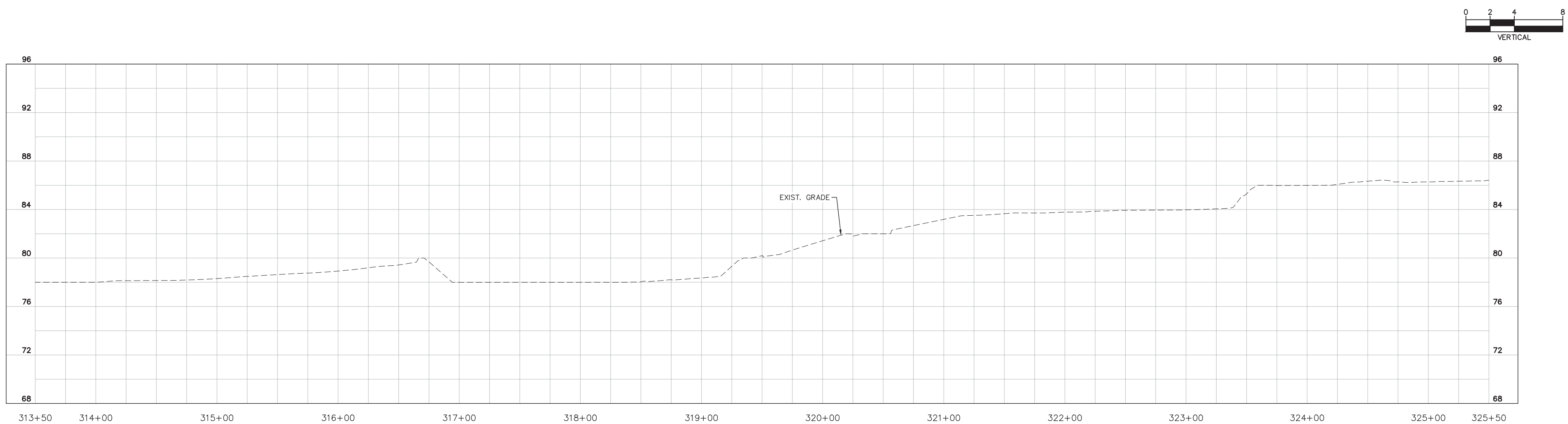
FM Plan and Profile (301+50 - 313+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C26
SCALE:	1" = 40'	SHEET NO.:	28 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (313+50 - 325+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C27
SCALE:	1" = 40'	SHEET NO.:	29 of 77

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

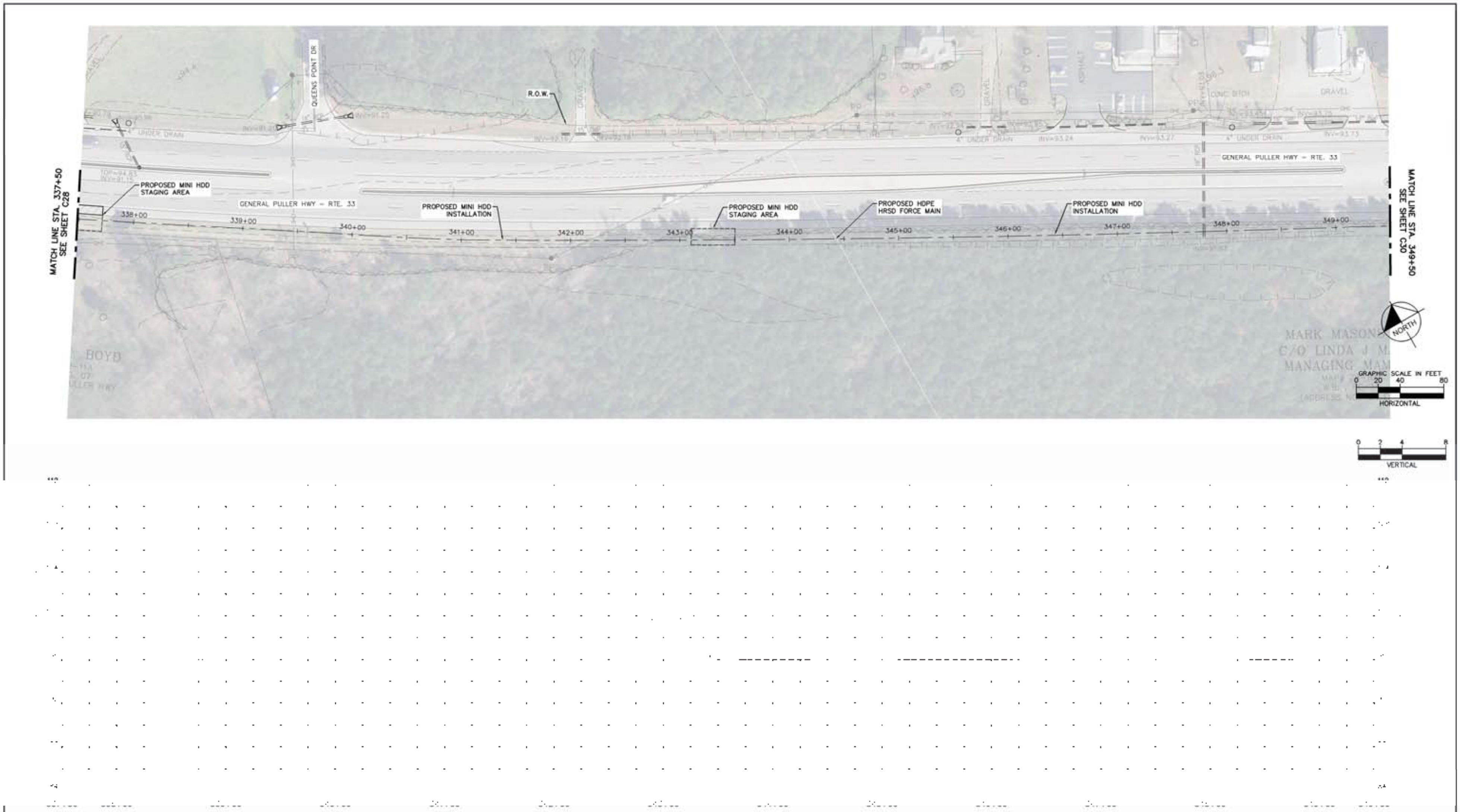
NO.	DATE	BY	REVISION

FM Plan and Profile (325+50 - 337+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C28
SCALE:	1" = 40'	SHEET NO.:	30 of 77



30% SUBMITTAL
NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

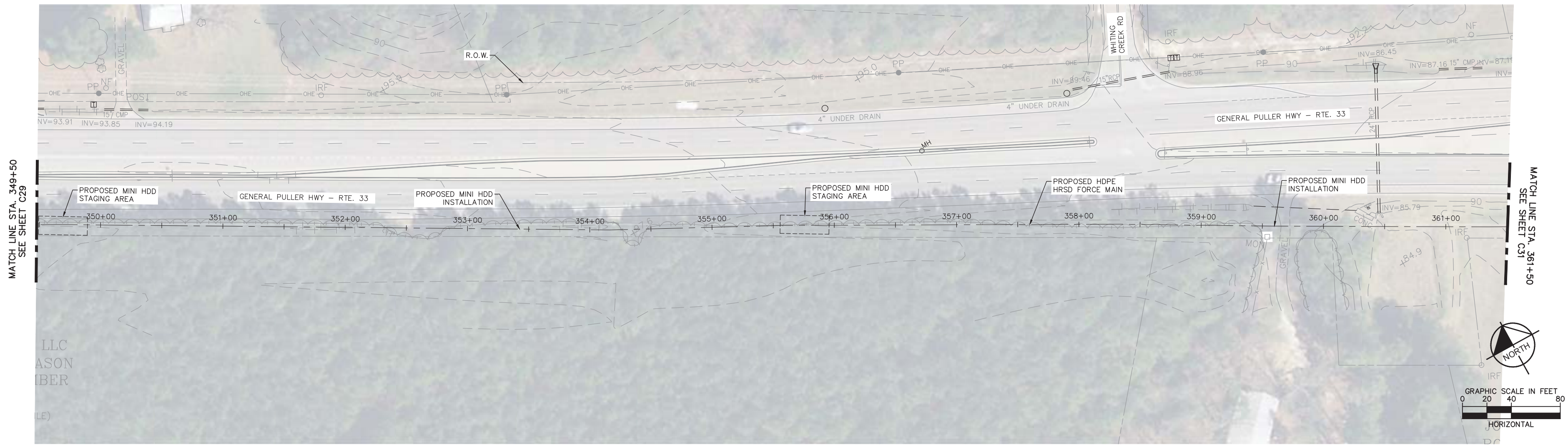
NO.	DATE	BY	REVISION

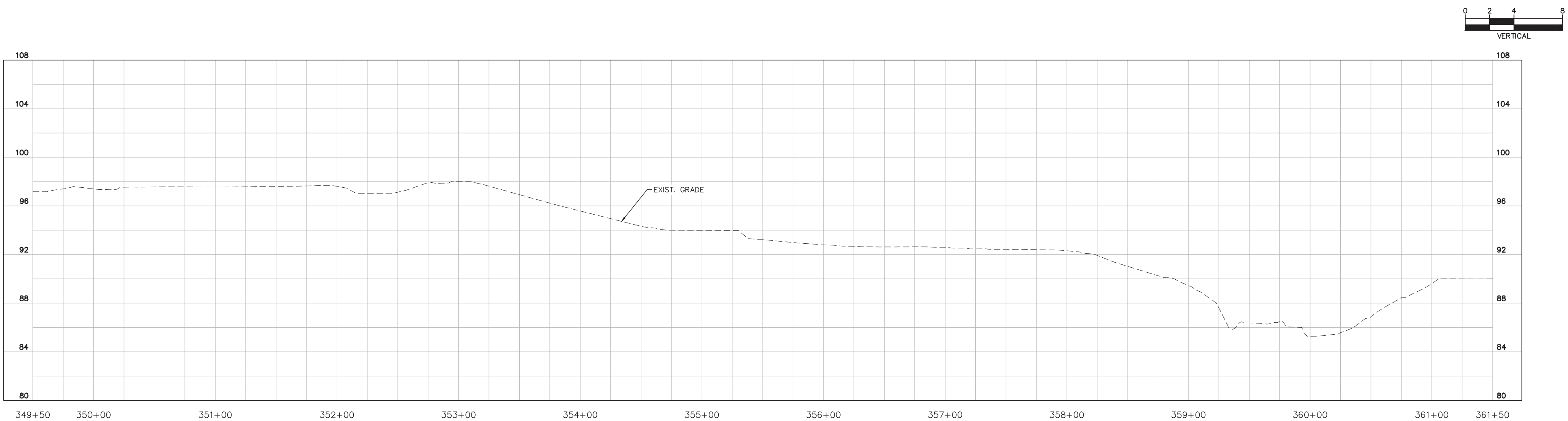
FM Plan and Profile (337+50 - 349+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C29
SCALE:	1" = 40'	SHEET NO.:	31 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

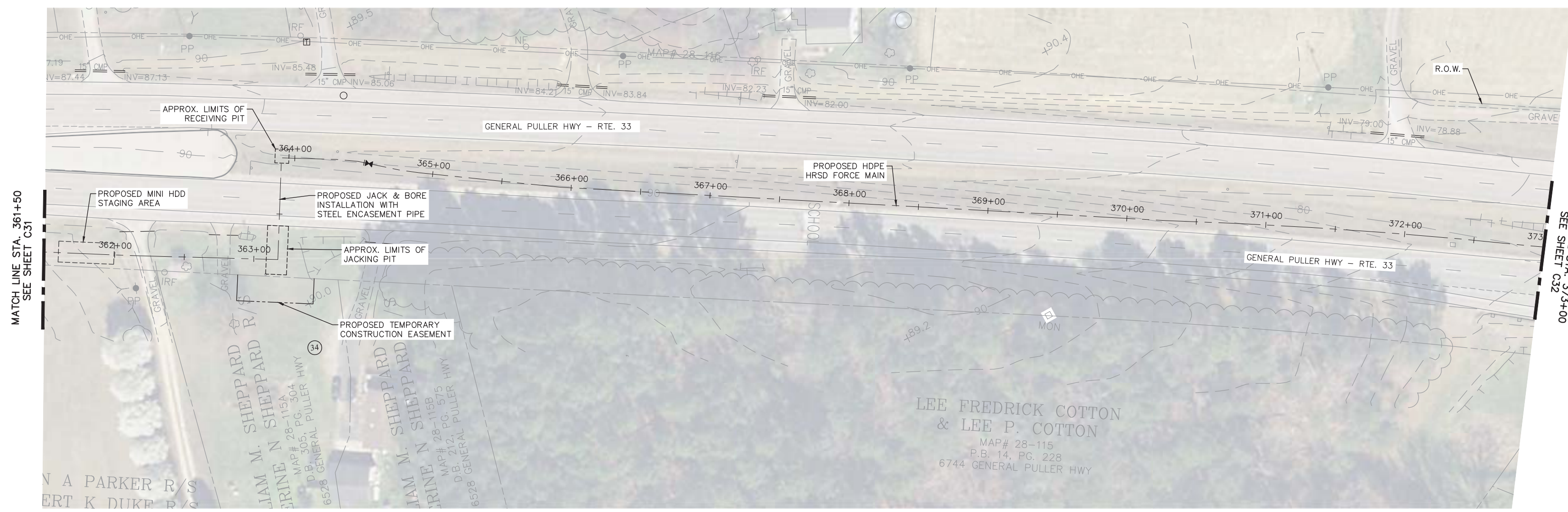
NO.	DATE	BY	REVISION

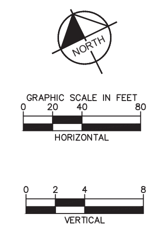
FM Plan and Profile (349+50 - 361+50)

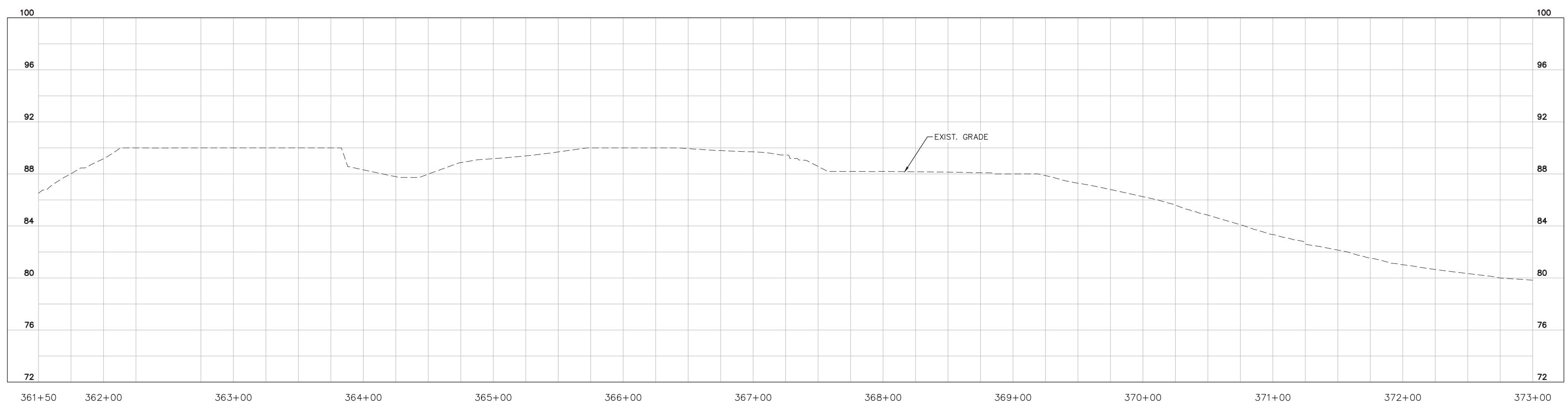
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C30
SCALE:	1" = 40'	SHEET NO.:	32 of 77







30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

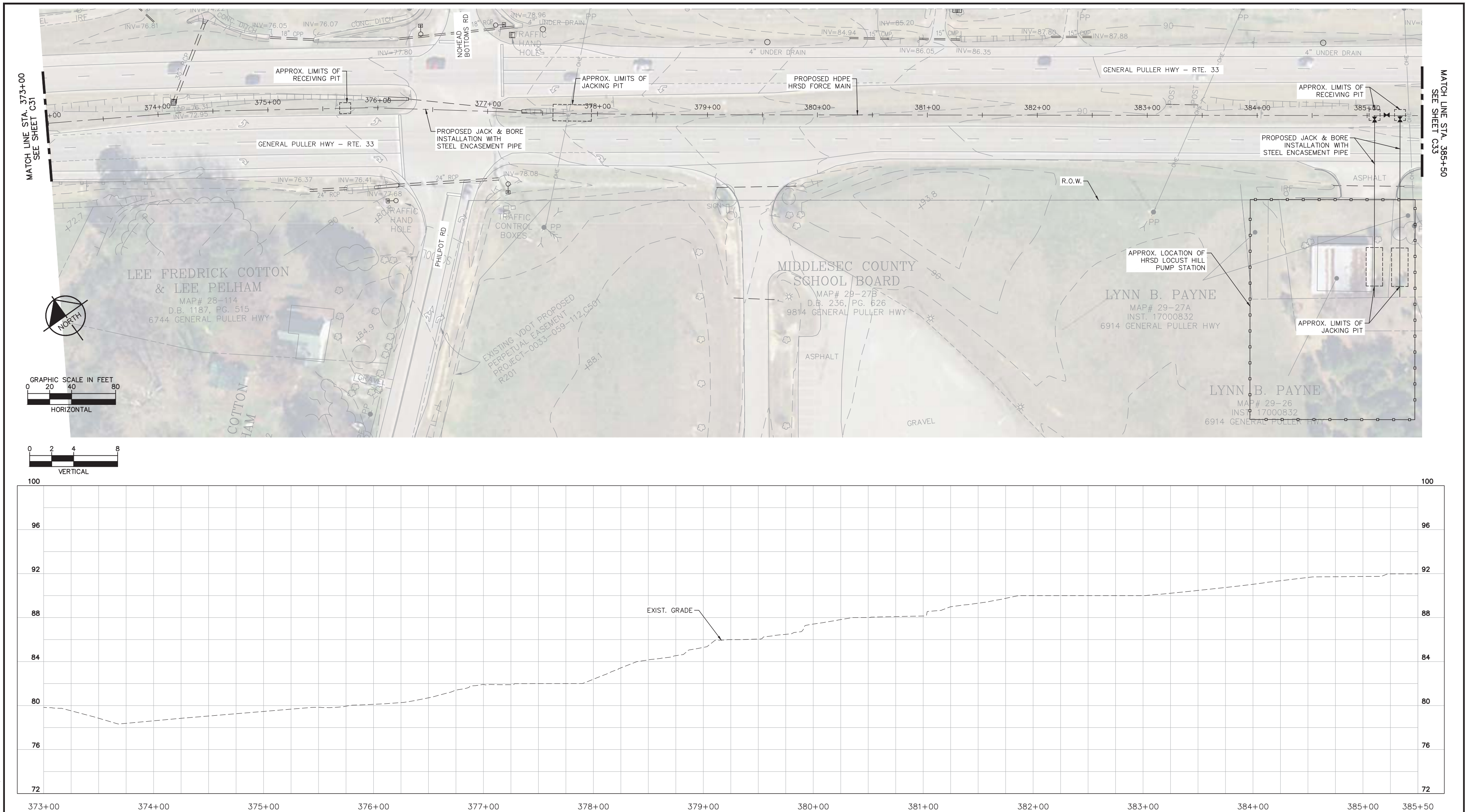
NO.	DATE	BY	REVISION

FM Plan and Profile (361+50 - 373+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C31
SCALE:	1" = 40'	SHEET NO.:	33 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

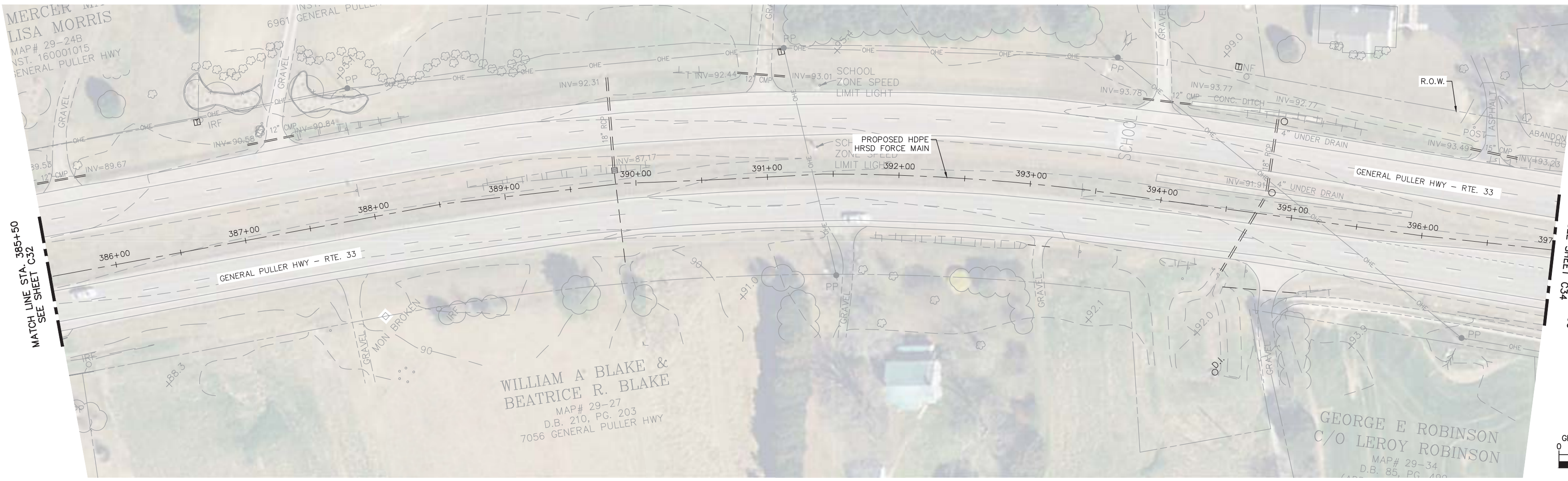
NO.	DATE	BY	REVISION

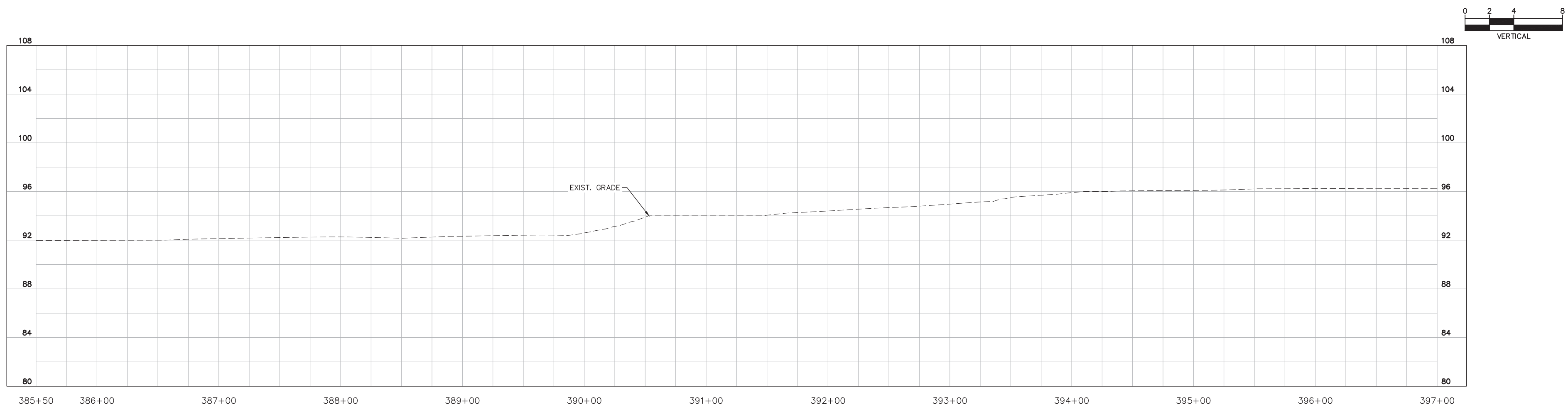
FM Plan and Profile (373+00 - 385+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C32
SCALE:	1" = 40'	SHEET NO.:	34 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (385+50 - 397+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C33
SCALE:	1" = 40'	SHEET NO.:	35 of 77

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

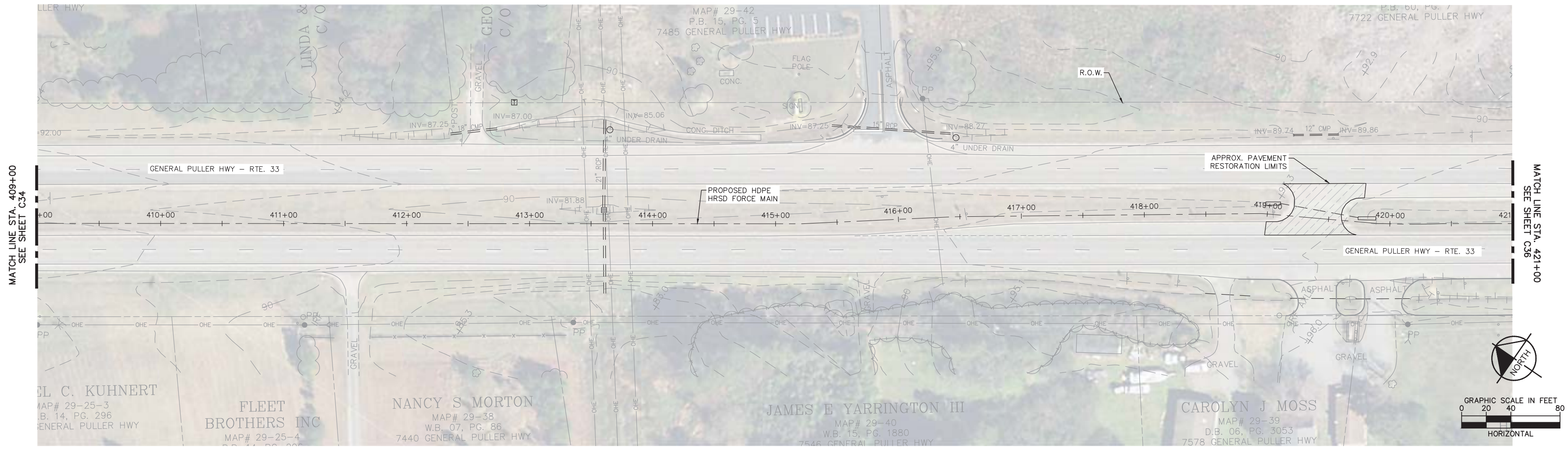
NO.	DATE	BY	REVISION

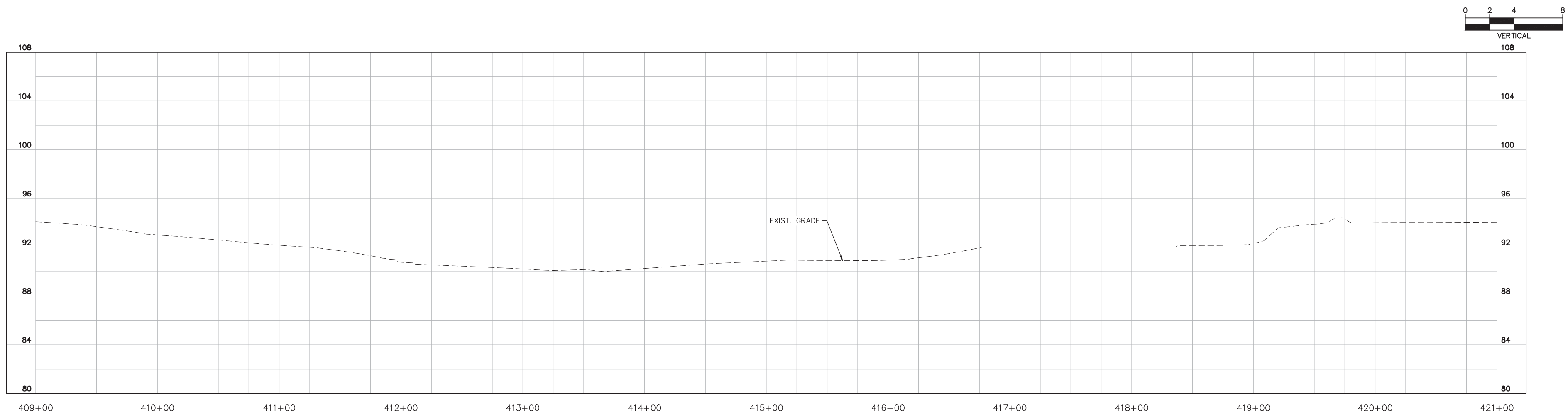
FM Plan and Profile (397+00 - 409+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C34
SCALE:	1" = 40'	SHEET NO.:	36 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

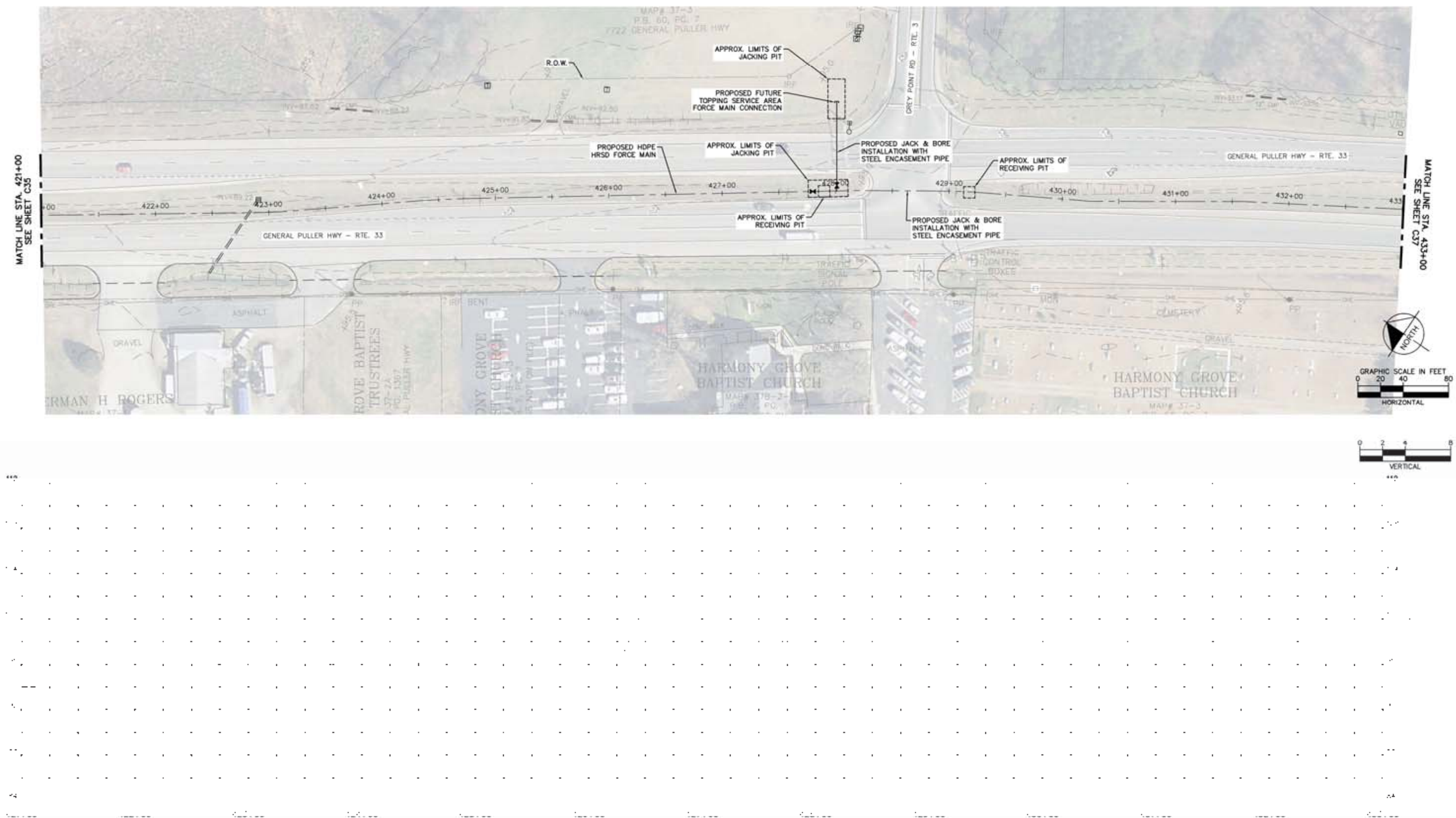
NO.	DATE	BY	REVISION

FM Plan and Profile (409+00 - 421+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C35
SCALE:	1" = 40'	SHEET NO.:	37 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

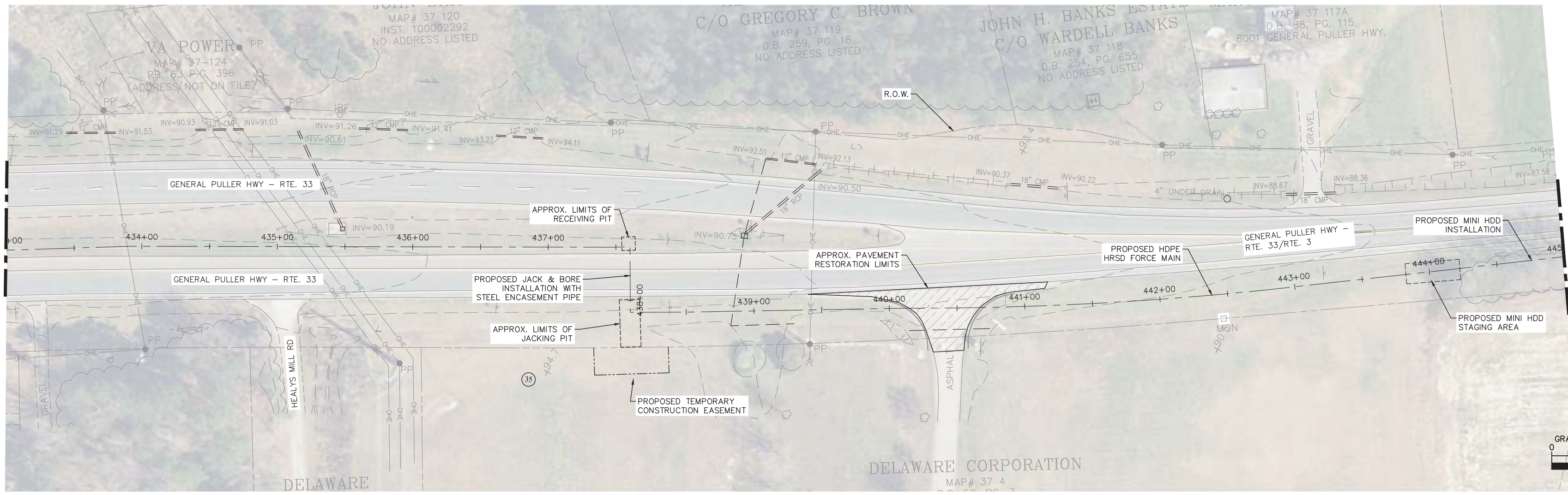
NO.	DATE	BY	REVISION

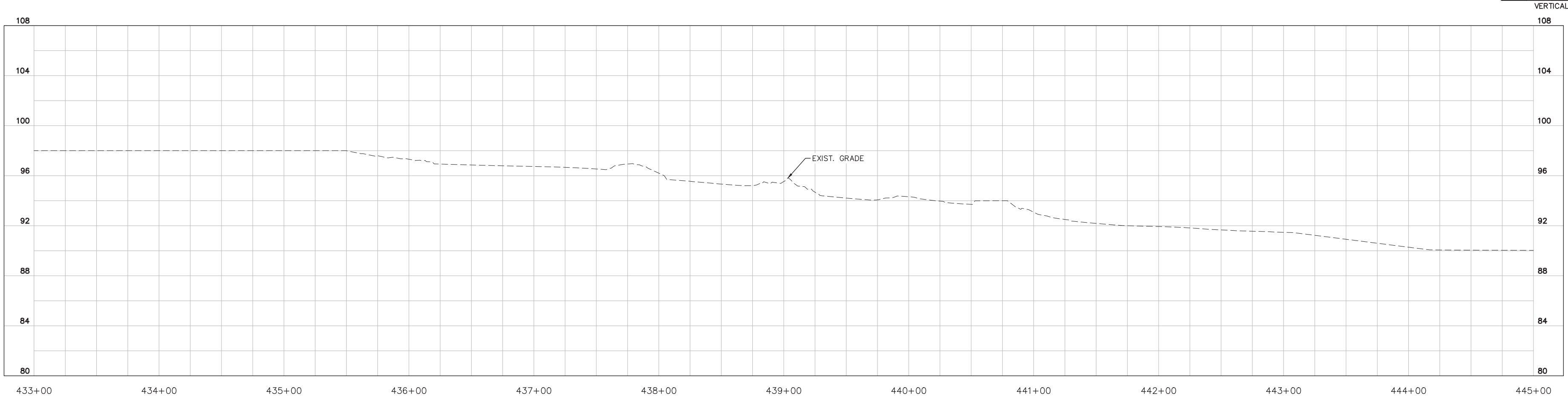
FM Plan and Profile (421+00 - 433+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C36
SCALE:	1" = 40'	SHEET NO.:	38 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

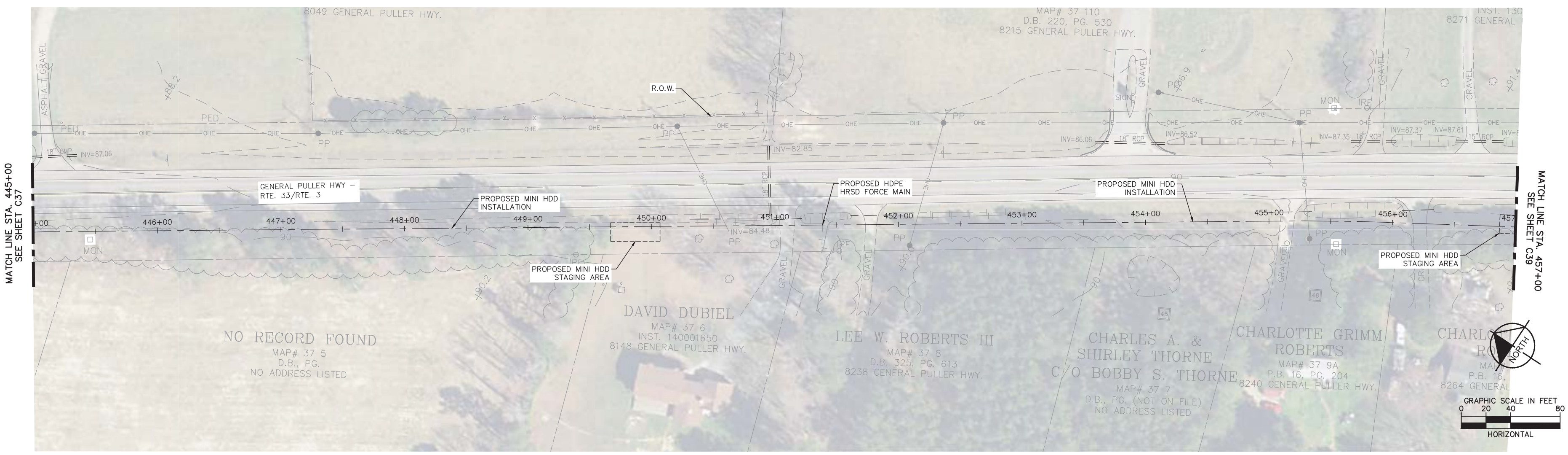
NO.	DATE	BY	REVISION

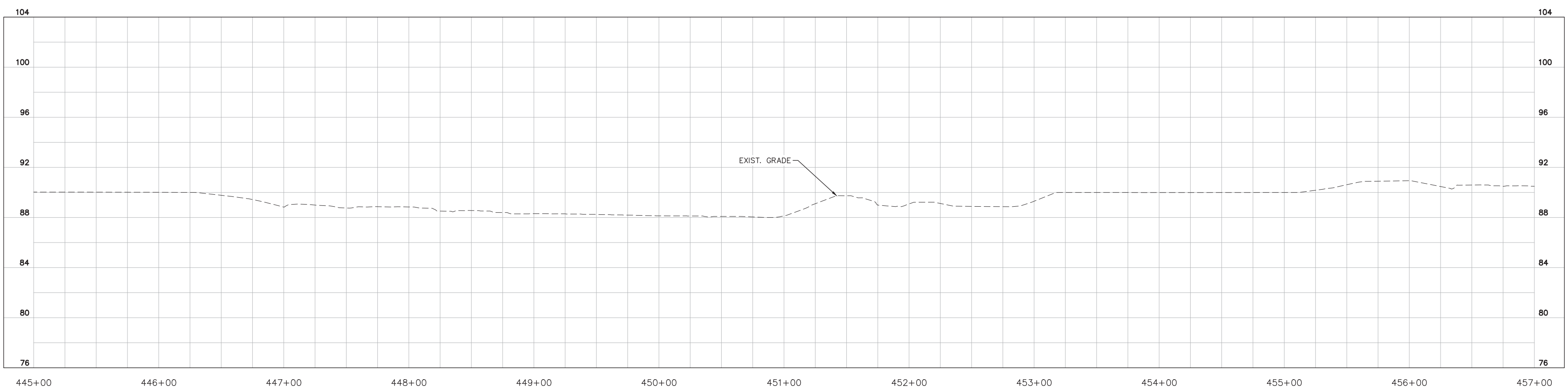
FM Plan and Profile (433+00 - 445+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C37
SCALE:	1" = 40'	SHEET NO.:	39 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

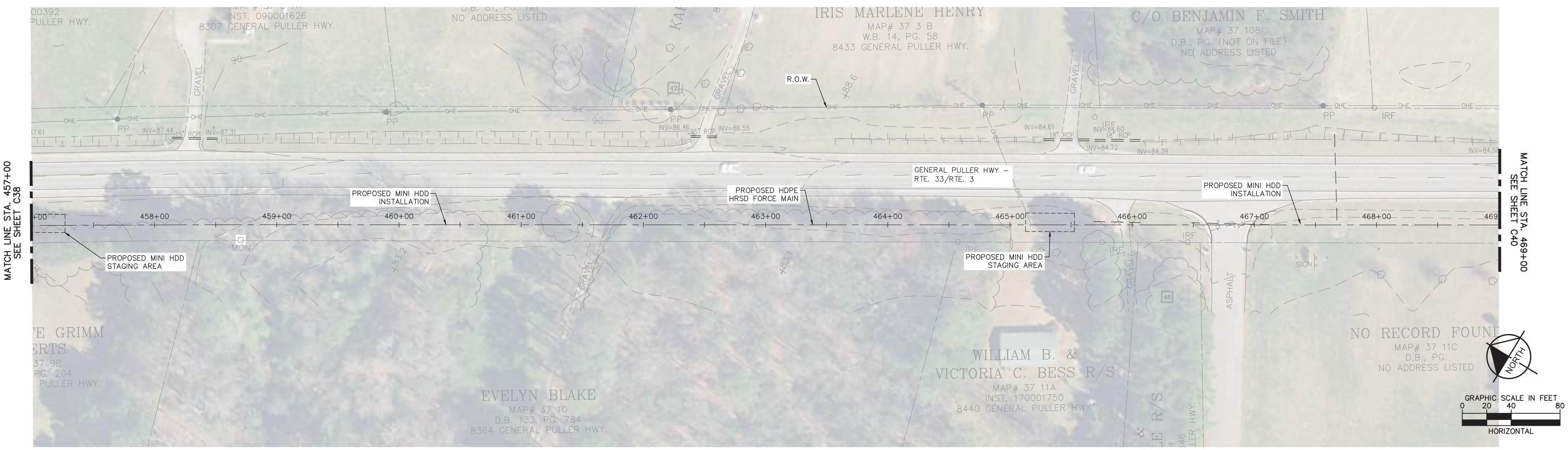
FM Plan and Profile (445+00 - 457+00)

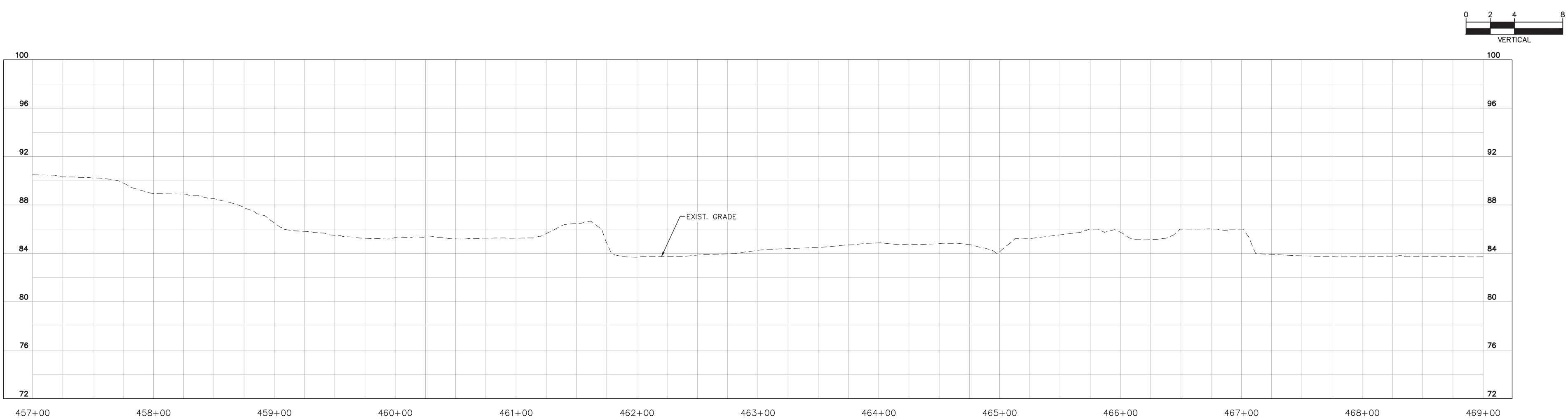
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C38
SCALE:	1" = 40'	SHEET NO.:	40 of 77

COMM. NO. ######.###





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

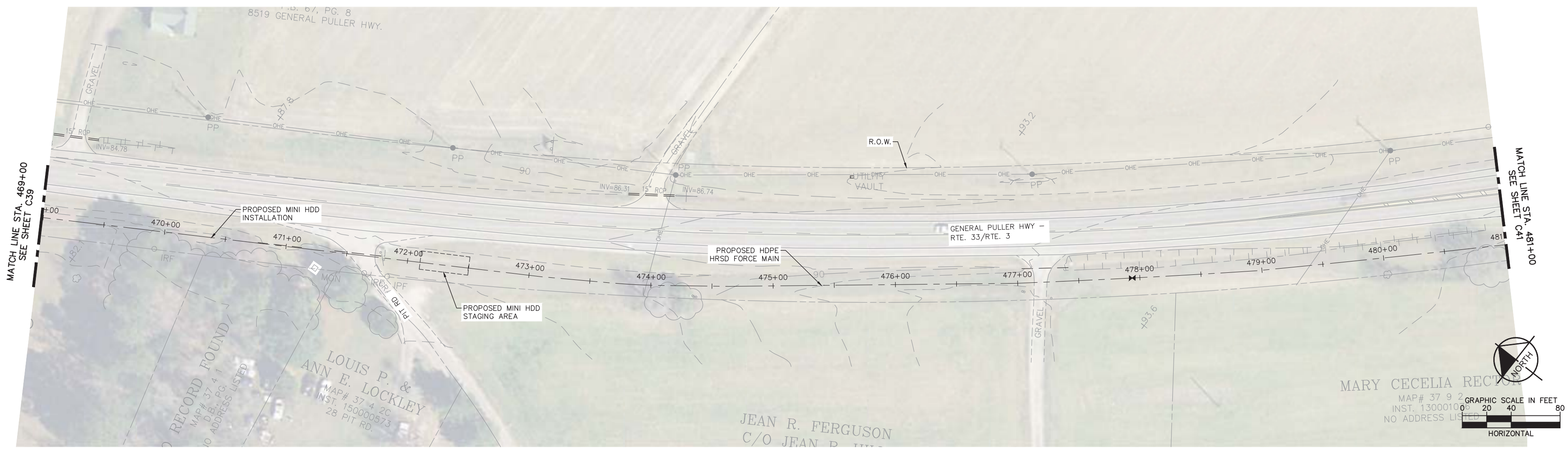
NO.	DATE	BY	REVISION

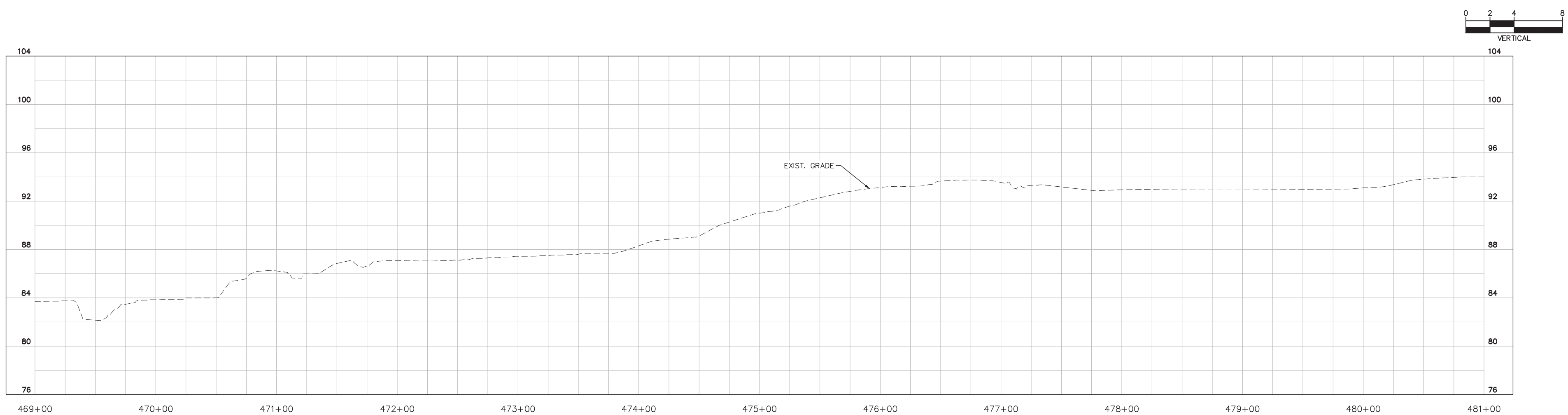
FM Plan and Profile (457+00 - 469+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C39
SCALE:	1" = 40'	SHEET NO.:	41 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

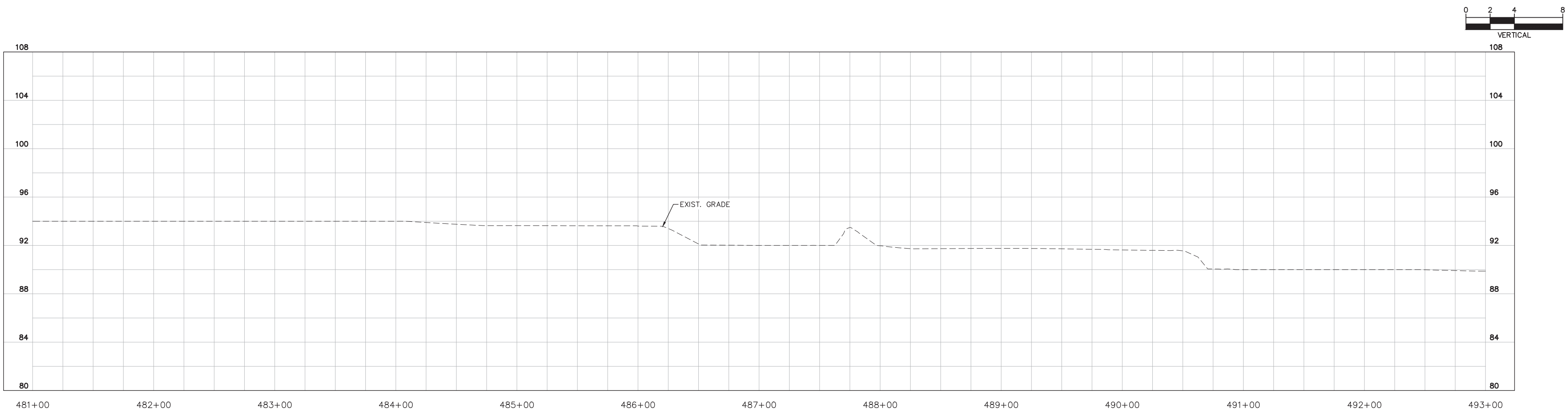
NO.	DATE	BY	REVISION

FM Plan and Profile (469+00 - 481+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C40
SCALE:	1" = 40'	SHEET NO.:	42 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

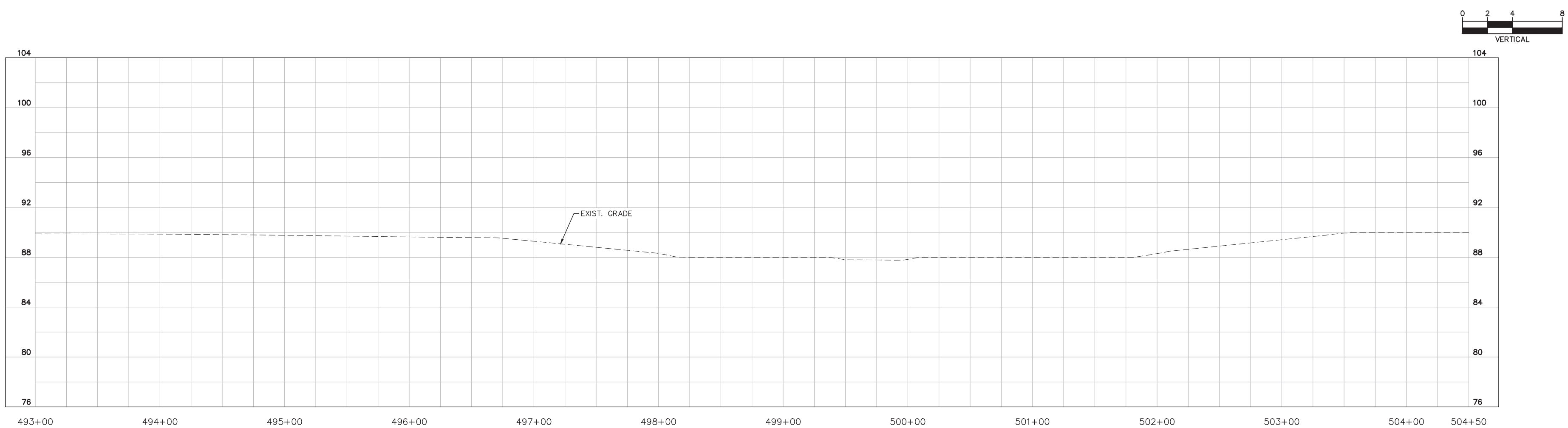
NO.	DATE	BY	REVISION

FM Plan and Profile (481+00 - 493+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C41
SCALE:	1" = 40'	SHEET NO.:	43 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

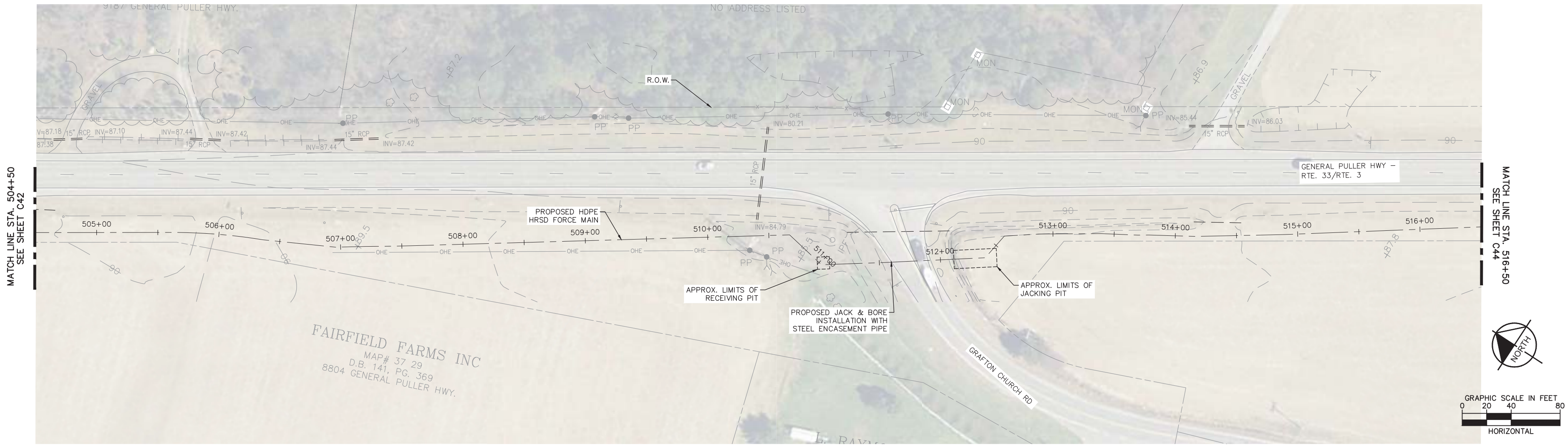
NO.	DATE	BY	REVISION

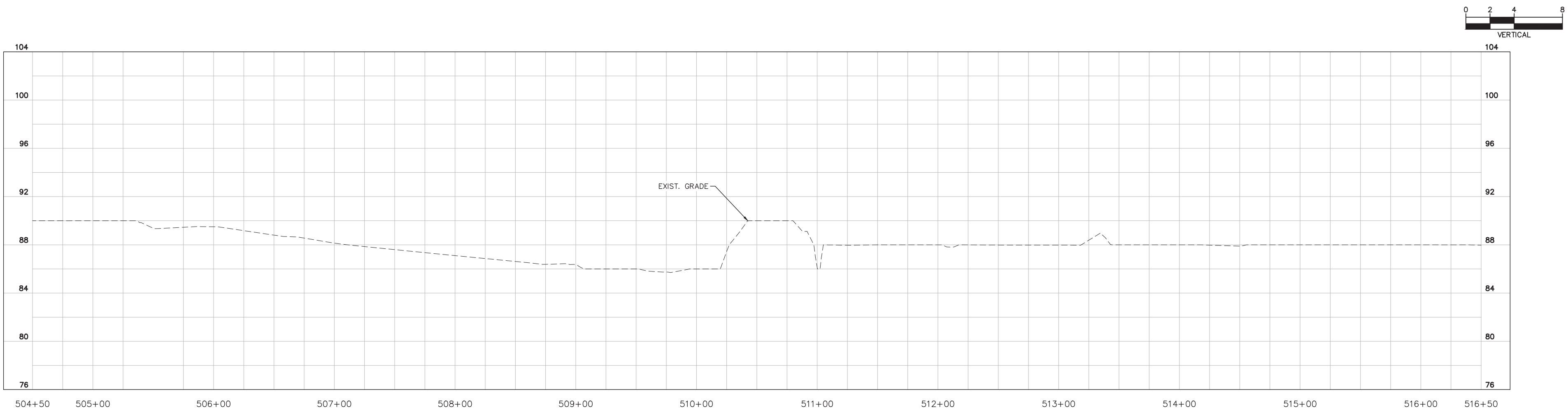
FM Plan and Profile (493+00 - 504+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C42
SCALE:	1" = 40'	SHEET NO.:	44 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

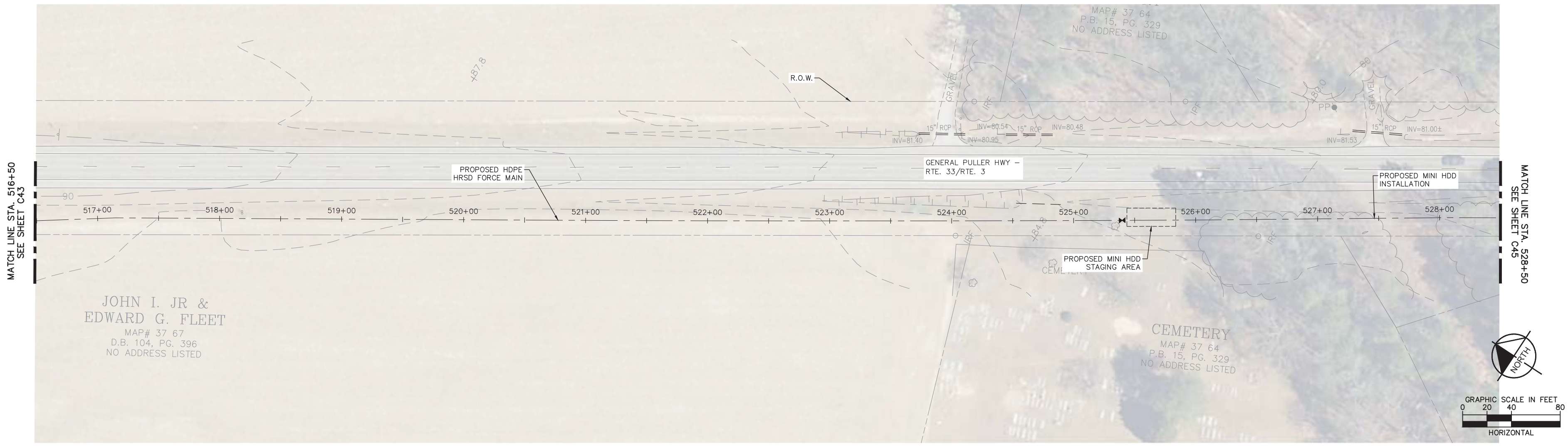
NO.	DATE	BY	REVISION

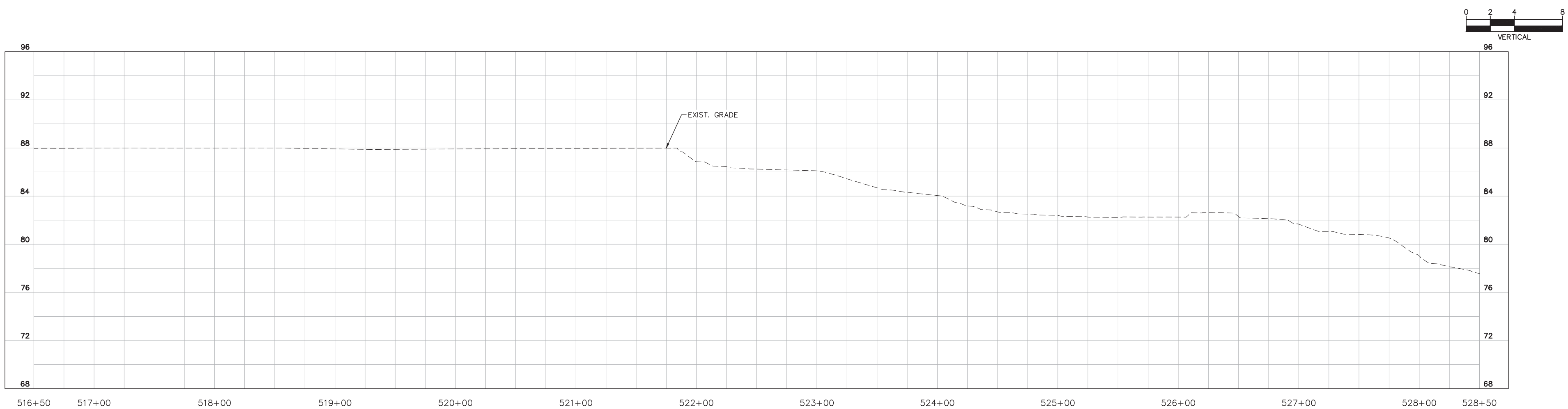
FM Plan and Profile (504+50 - 516+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C43
SCALE:	1" = 40'	SHEET NO.:	45 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (516+50 - 528+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C44
SCALE:	1" = 40'	SHEET NO.:	46 of 77

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

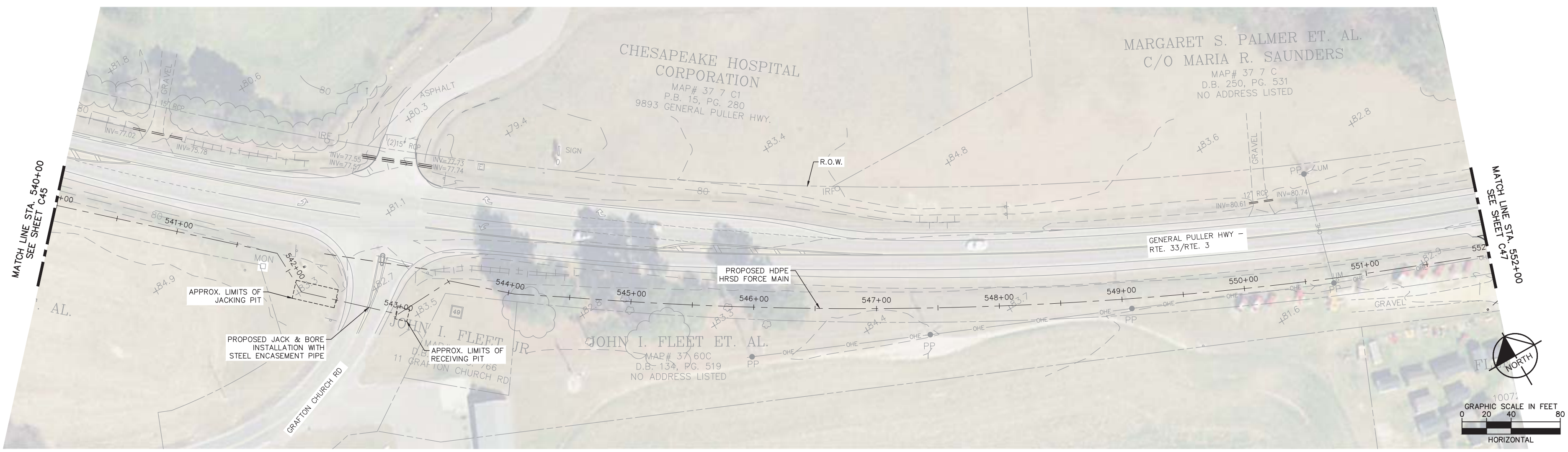
NO.	DATE	BY	REVISION

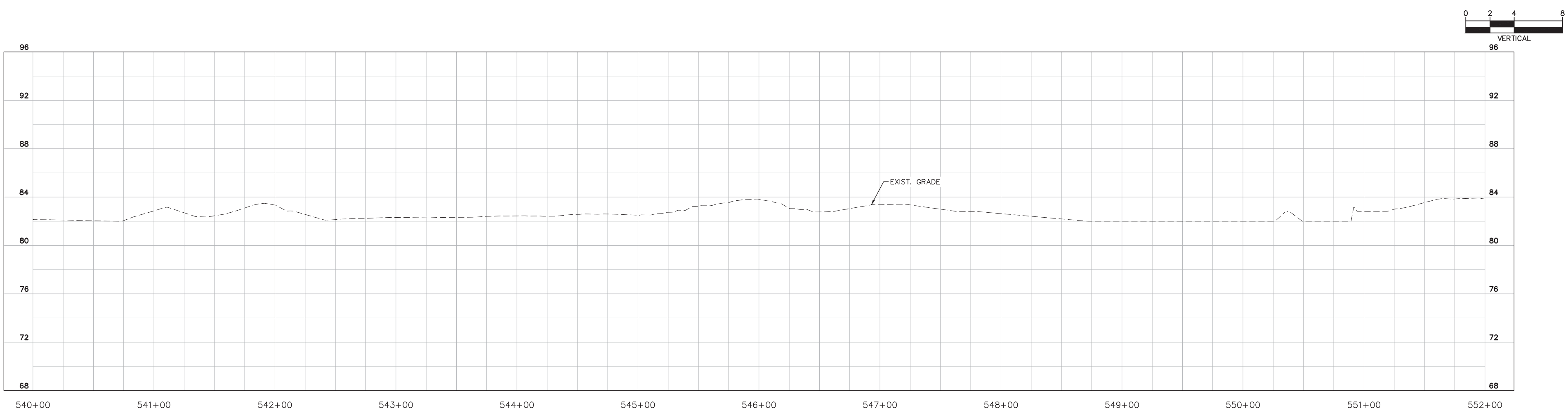
FM Plan and Profile (528+50 - 540+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C45
SCALE:	1" = 40'	SHEET NO.:	47 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

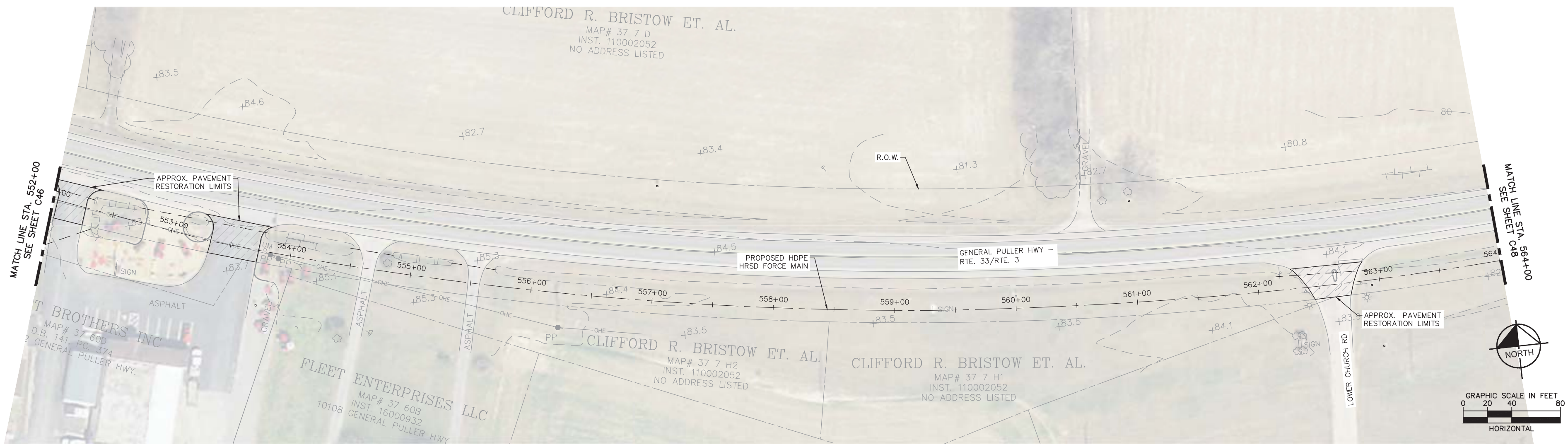
NO.	DATE	BY	REVISION

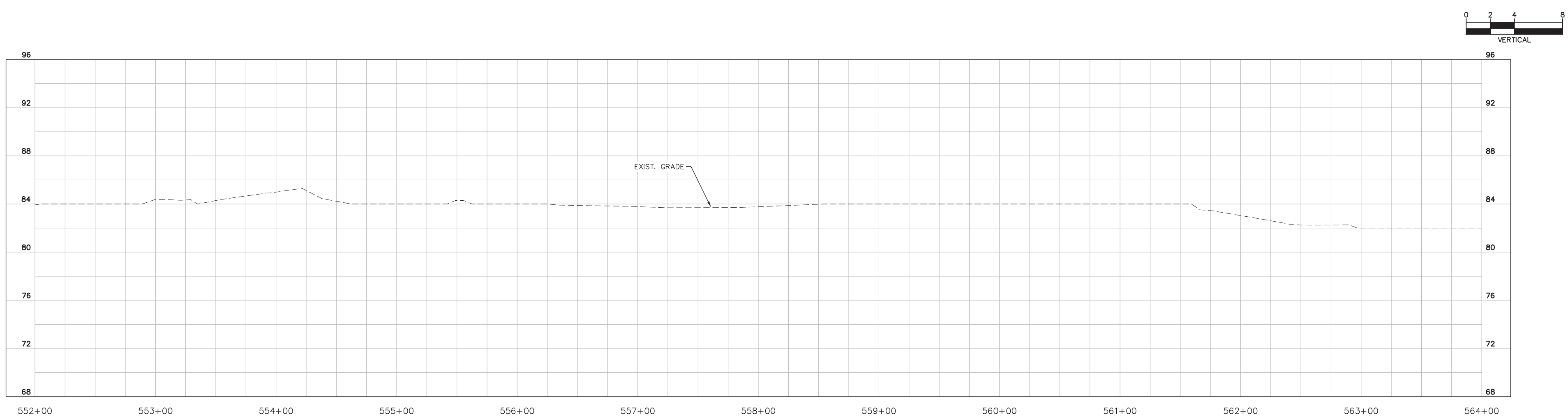
FM Plan and Profile (540+00 - 552+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C46
SCALE:	1" = 40'	SHEET NO.:	48 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

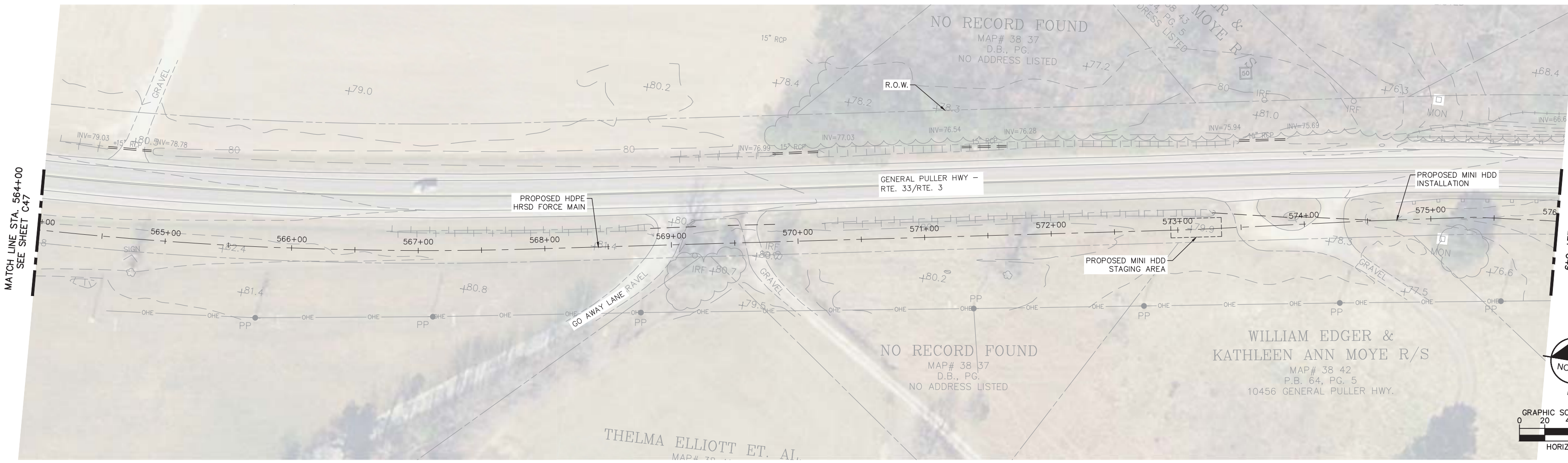
NO.	DATE	BY	REVISION

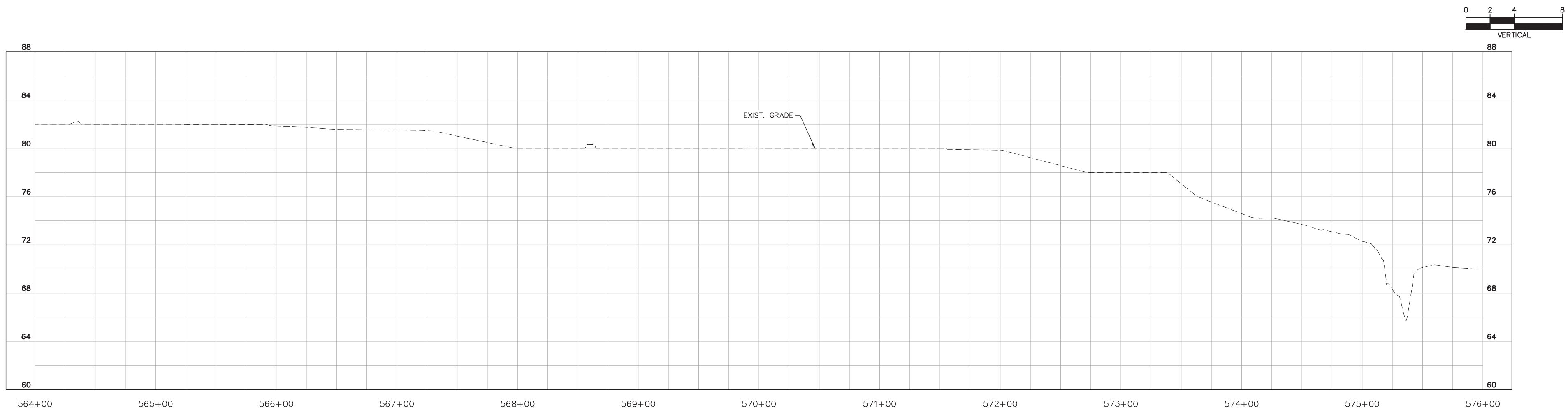
FM Plan and Profile (552+00 - 564+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C47
SCALE:	1" = 40'	SHEET NO.:	48 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

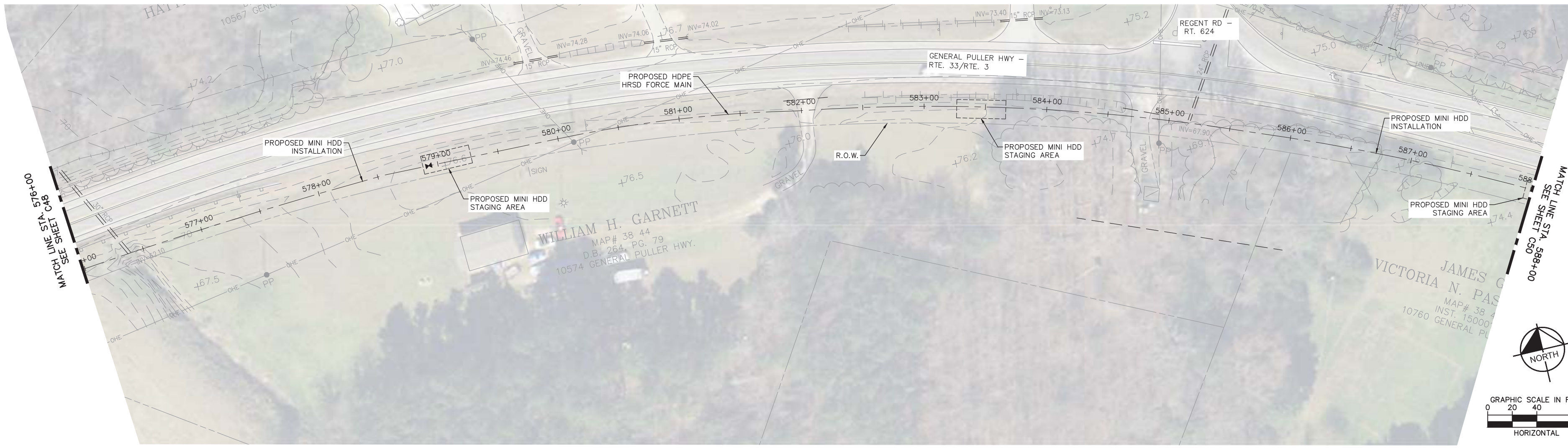
NO.	DATE	BY	REVISION

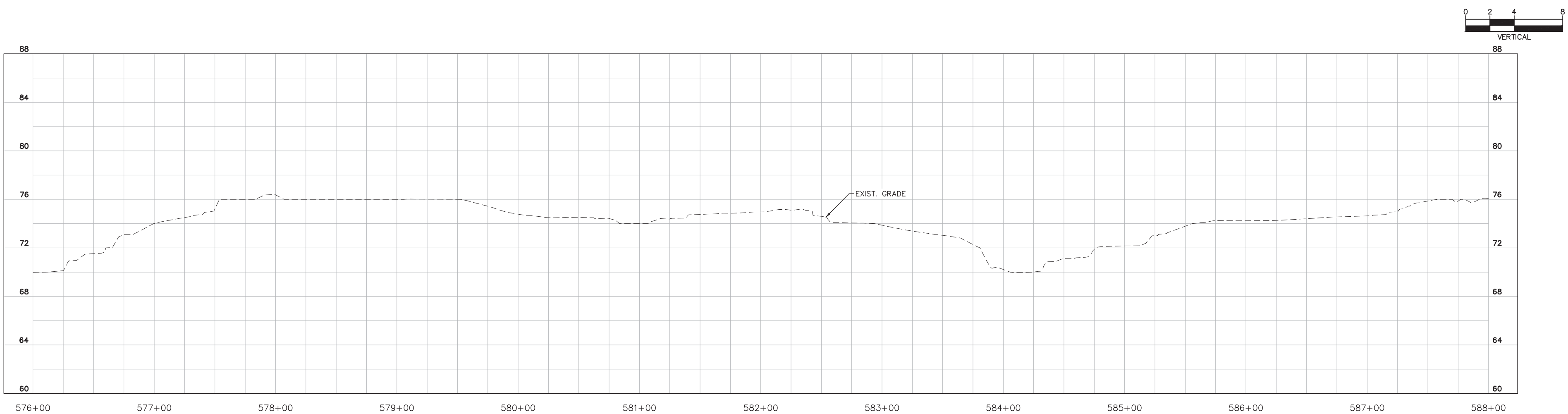
FM Plan and Profile (564+00 - 576+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C48
SCALE:	1" = 40'	SHEET NO.:	50 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

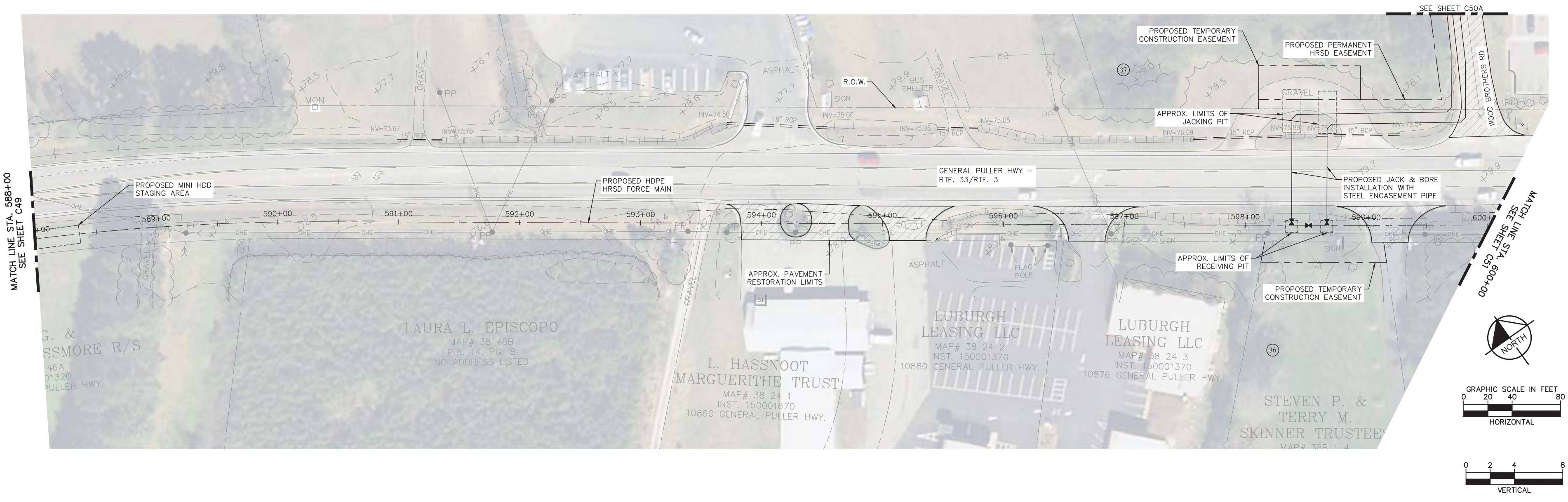
NO.	DATE	BY	REVISION

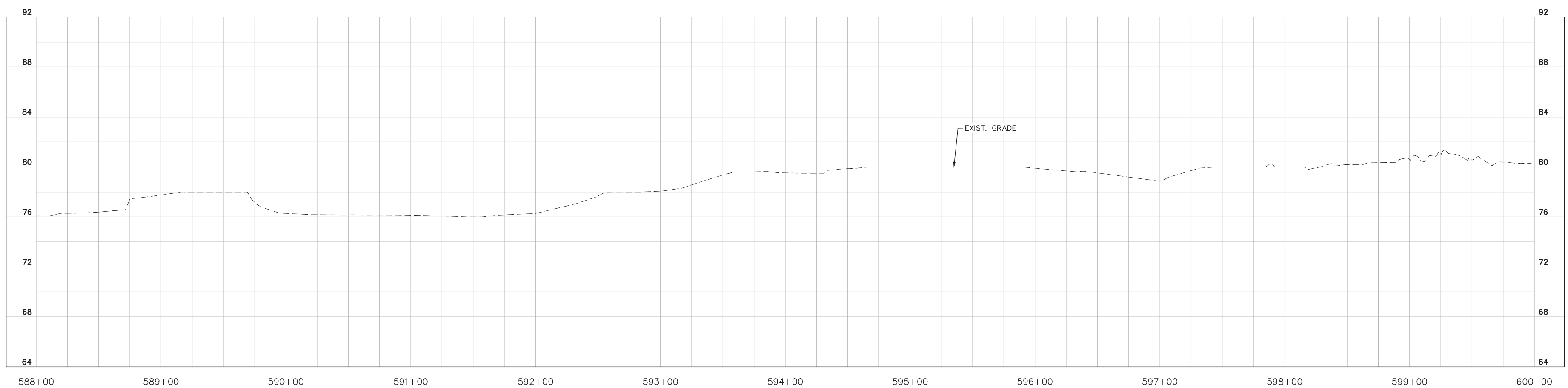
FM Plan and Profile (576+00 - 588+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C49
SCALE:	1" = 40'	SHEET NO.:	51 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (588+00 - 600+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C50
SCALE:	1" = 40'	SHEET NO.:	52 of 77

NORTH

GRAPHIC SCALE IN FEET
0 20 40 80

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

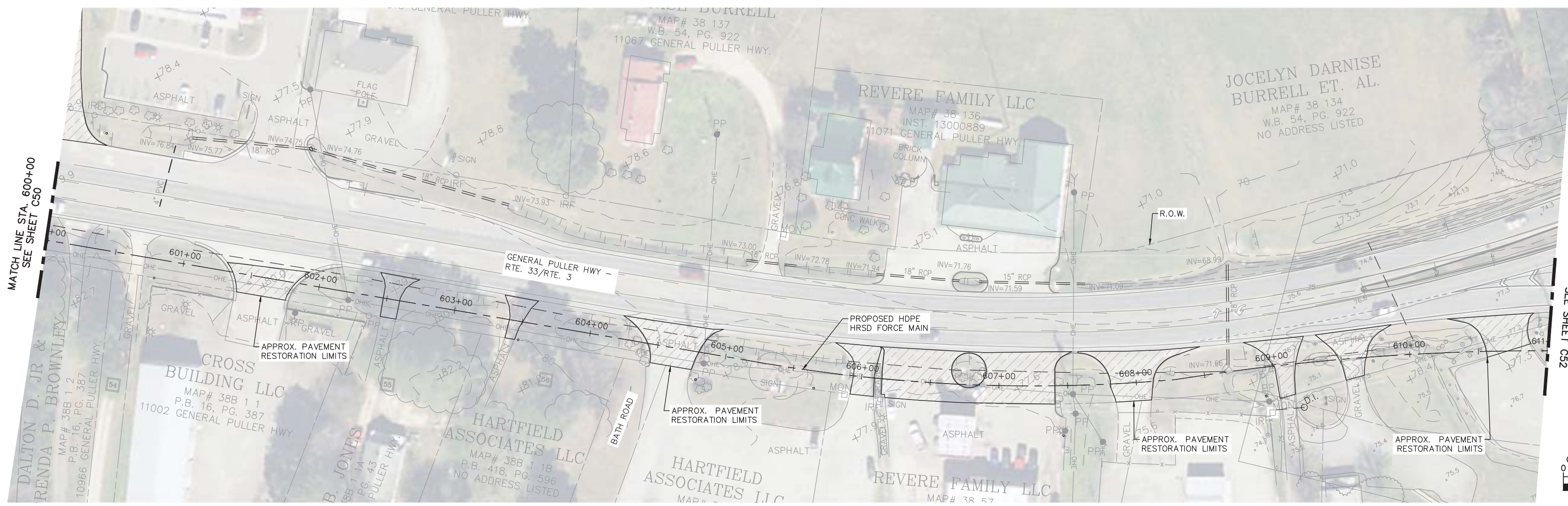
NO.	DATE	BY	REVISION

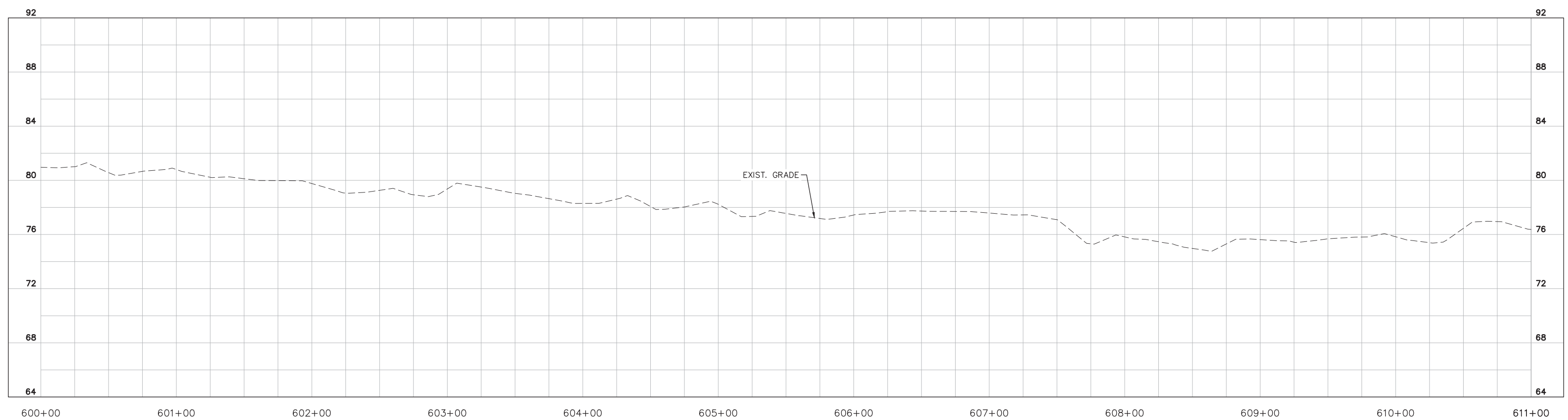
Hartfield Pump Station

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C50A
SCALE:	1" = 40'	SHEET NO.:	53 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

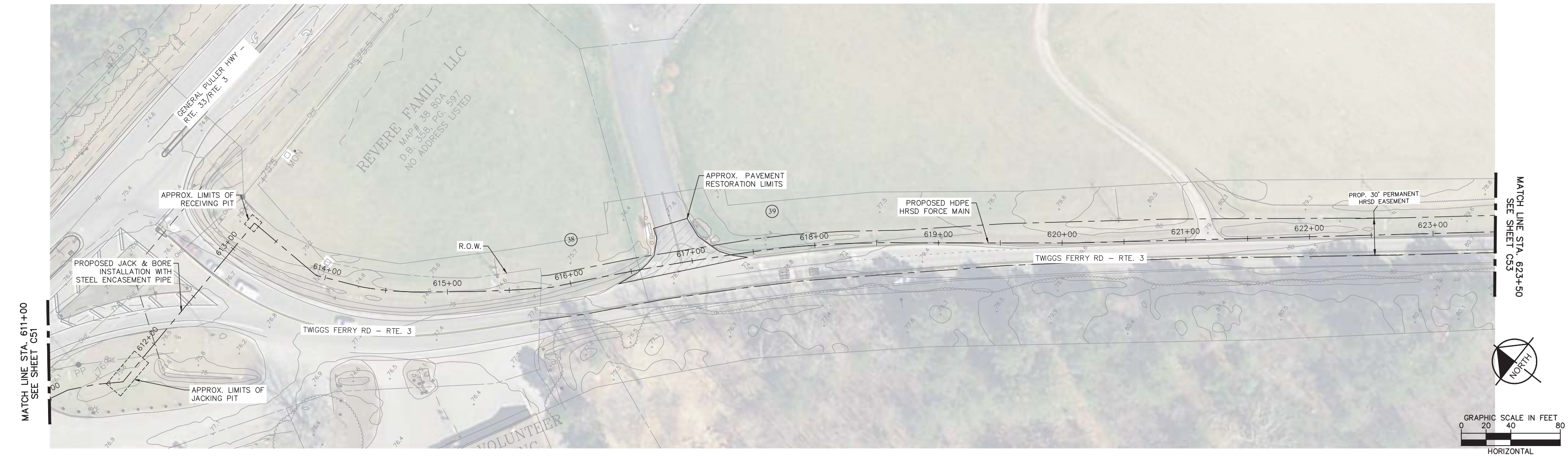
FM Plan and Profile (600+00 - 611+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C51
SCALE:	1" = 40'	SHEET NO.:	54 of 77

COMM. NO. ######.###



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

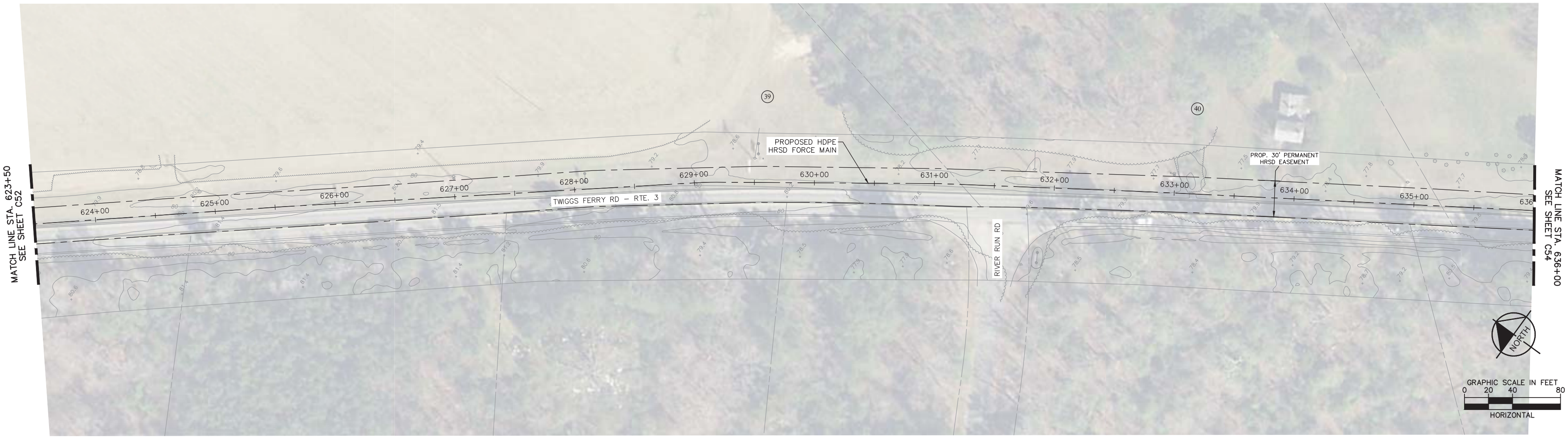
NO.	DATE	BY	REVISION

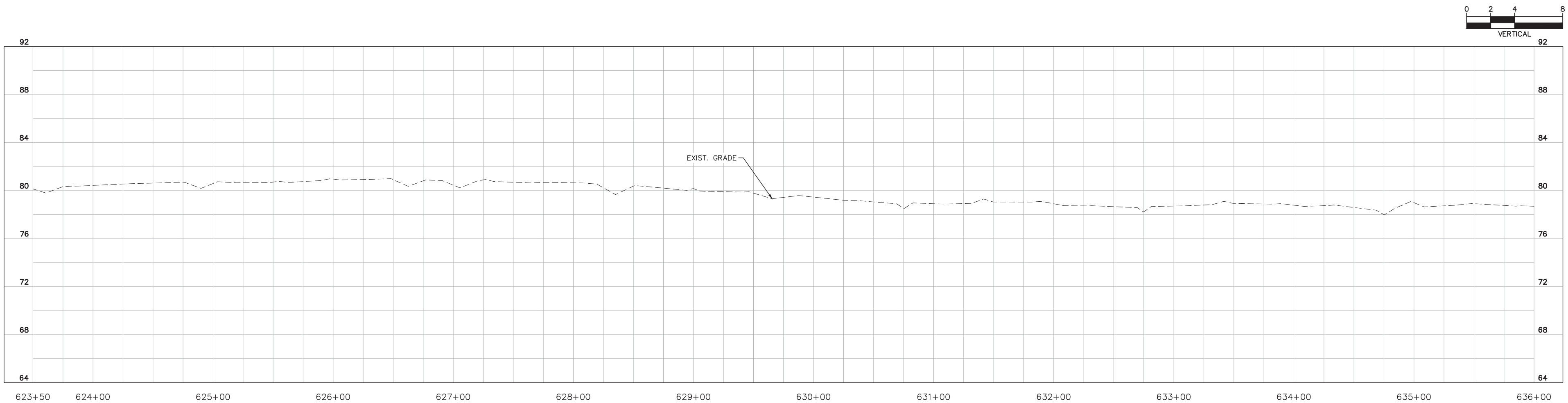
FM Plan and Profile (611+00 - 623+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C52
SCALE:	1" = 40'	SHEET NO.:	55 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

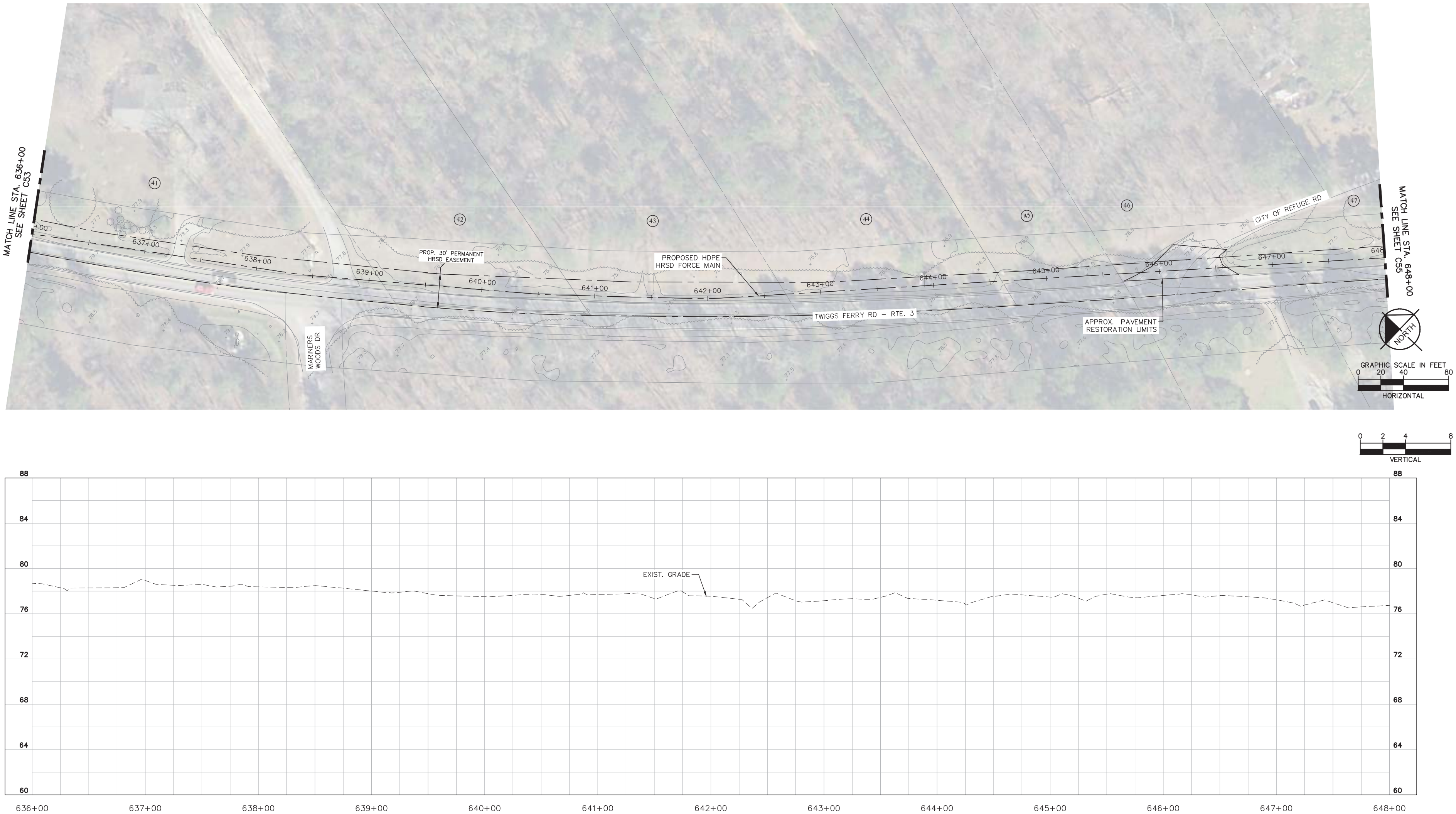
NO.	DATE	BY	REVISION

FM Plan and Profile (623+50 - 636+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C53
SCALE:	1" = 40'	SHEET NO.:	56 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

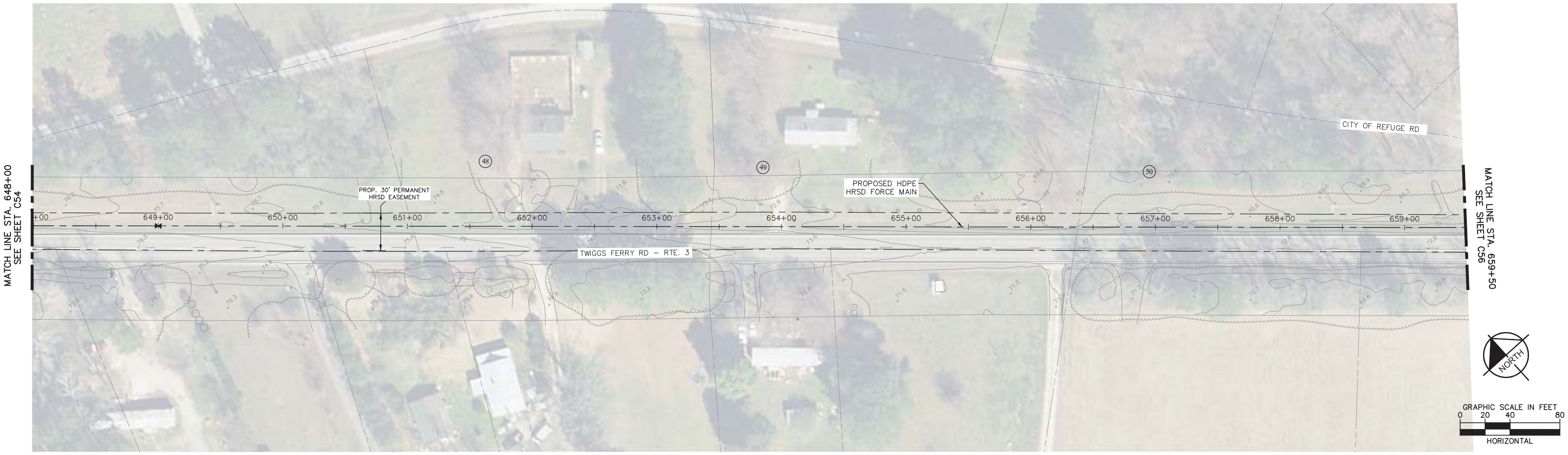
NO.	DATE	BY	REVISION

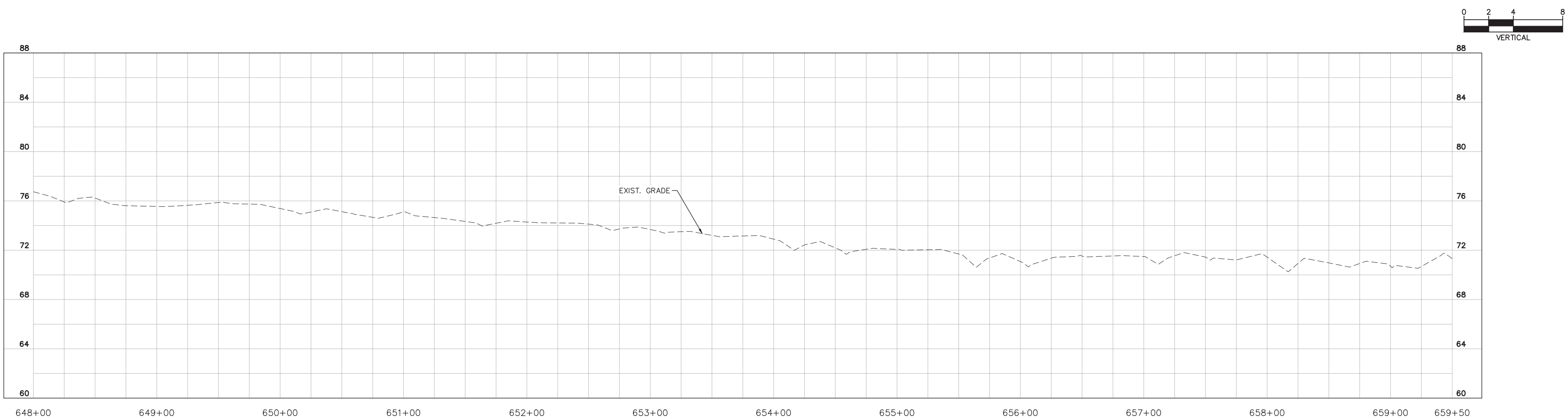
FM Plan and Profile (636+00 - 648+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C54
SCALE:	1" = 40'	SHEET NO.:	57 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

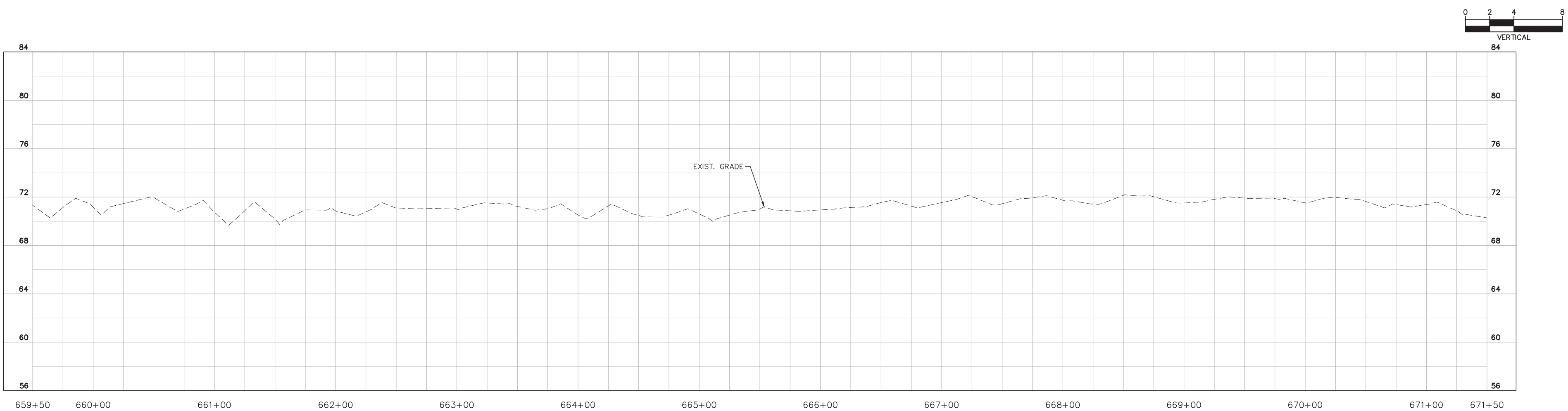
FM Plan and Profile (648+00 - 659+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C55
SCALE:	1" = 40'	SHEET NO.:	58 of 77

COMM. NO. ######.###



30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

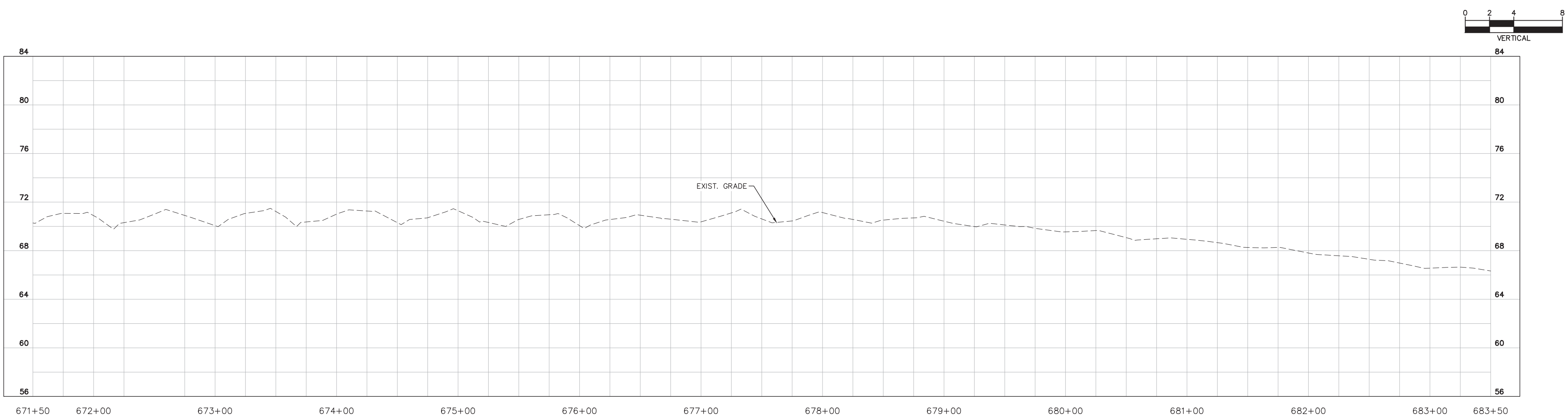
FM Plan and Profile (659+50 - 671+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C56
SCALE:	1" = 40'	SHEET NO.:	59 of 77

COMM. NO. ######.###



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

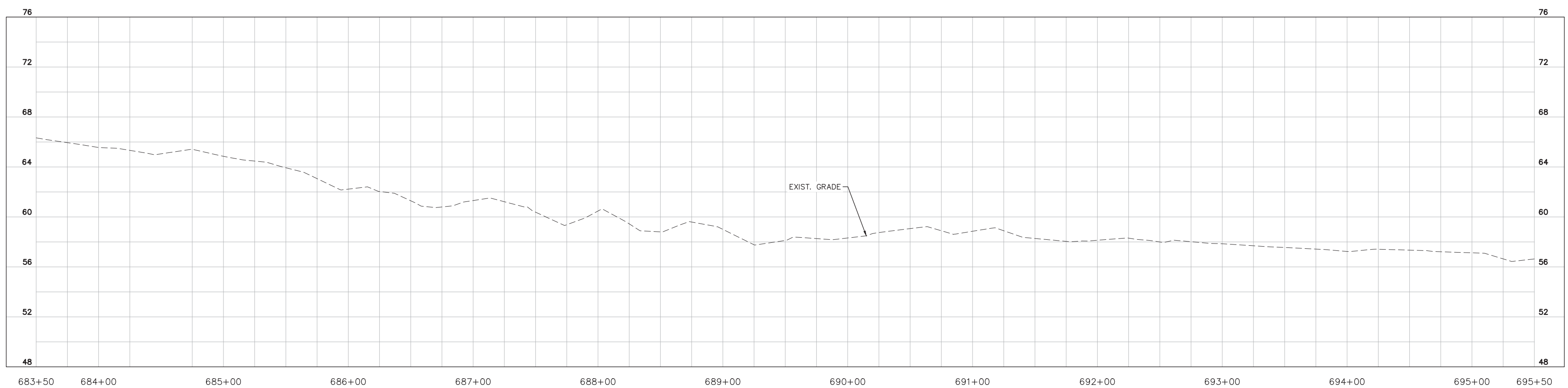
NO.	DATE	BY	REVISION

FM Plan and Profile (671+50 - 683+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C57
SCALE:	1" = 40'	SHEET NO.:	60 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

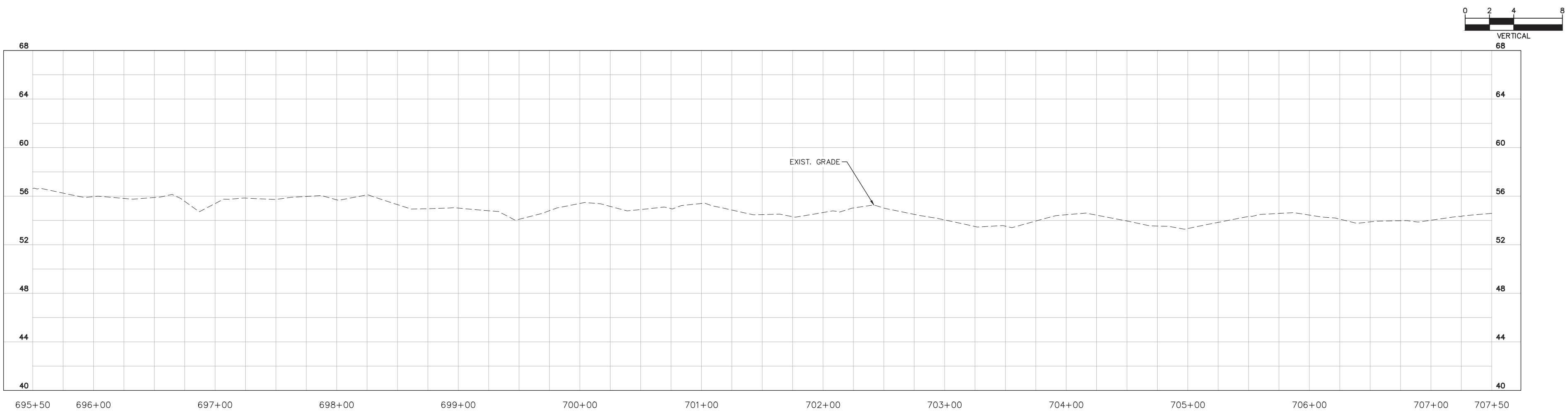
NO.	DATE	BY	REVISION

FM Plan and Profile (683+50 - 695+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C58
SCALE:	1" = 40'	SHEET NO.:	61 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

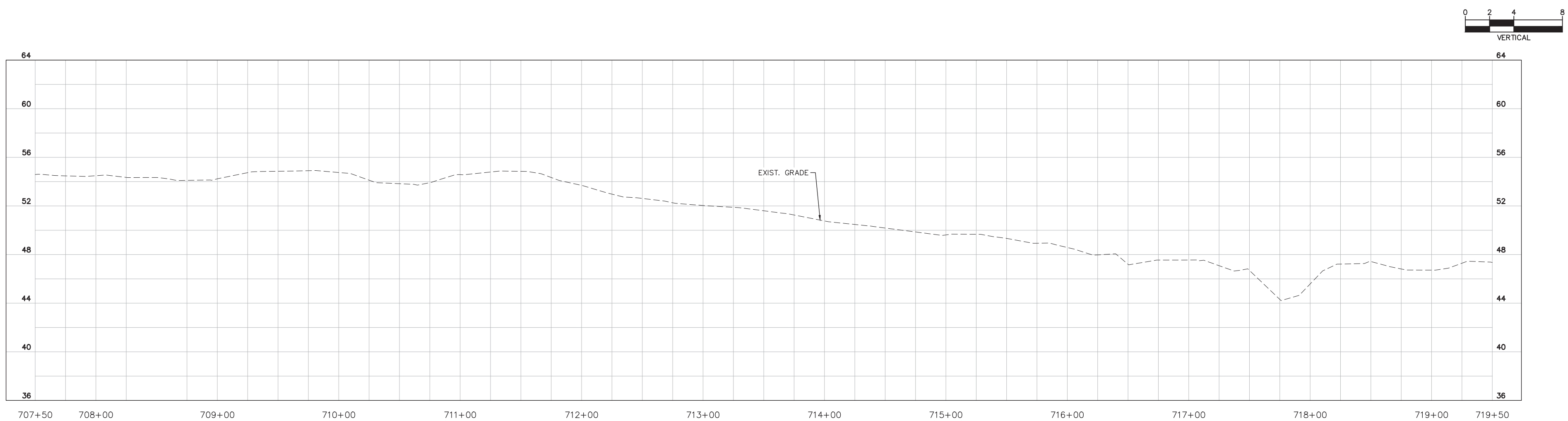
NO.	DATE	BY	REVISION

FM Plan and Profile (695+50 - 707+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C59
SCALE:	1" = 40'	SHEET NO.:	62 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

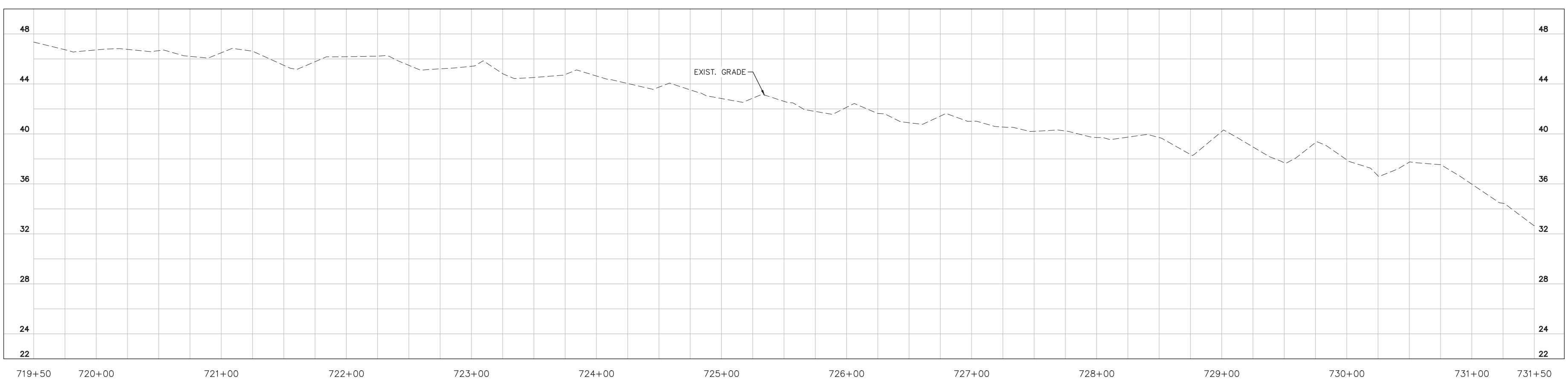
NO.	DATE	BY	REVISION

FM Plan and Profile (707+50 - 719+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C60
SCALE:	1" = 40'	SHEET NO.:	63 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

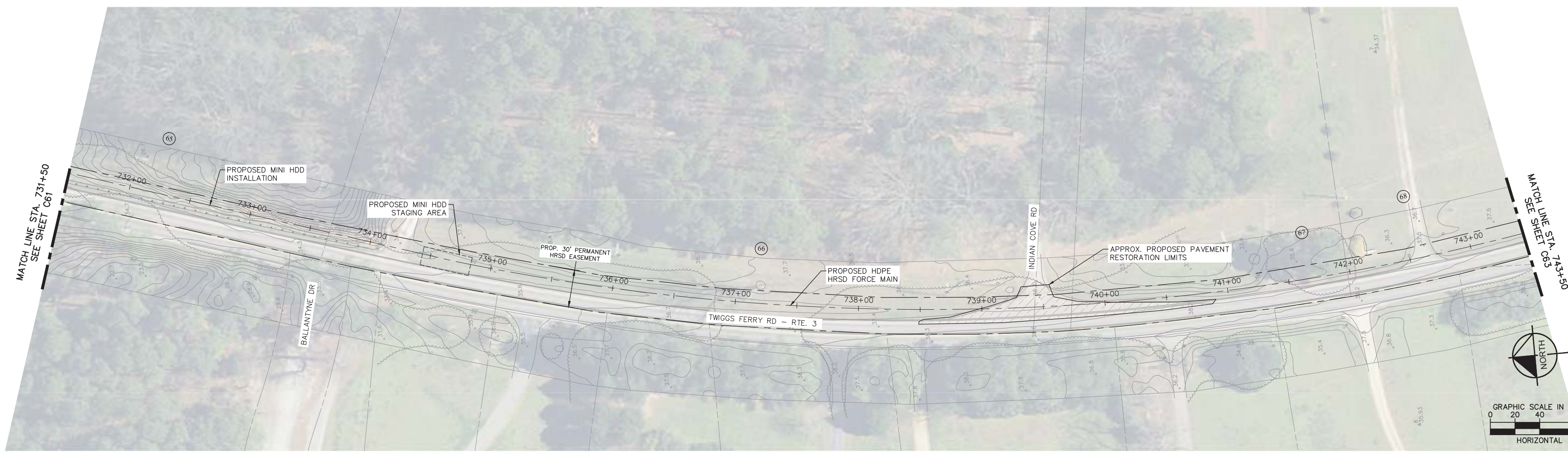
NO.	DATE	BY	REVISION

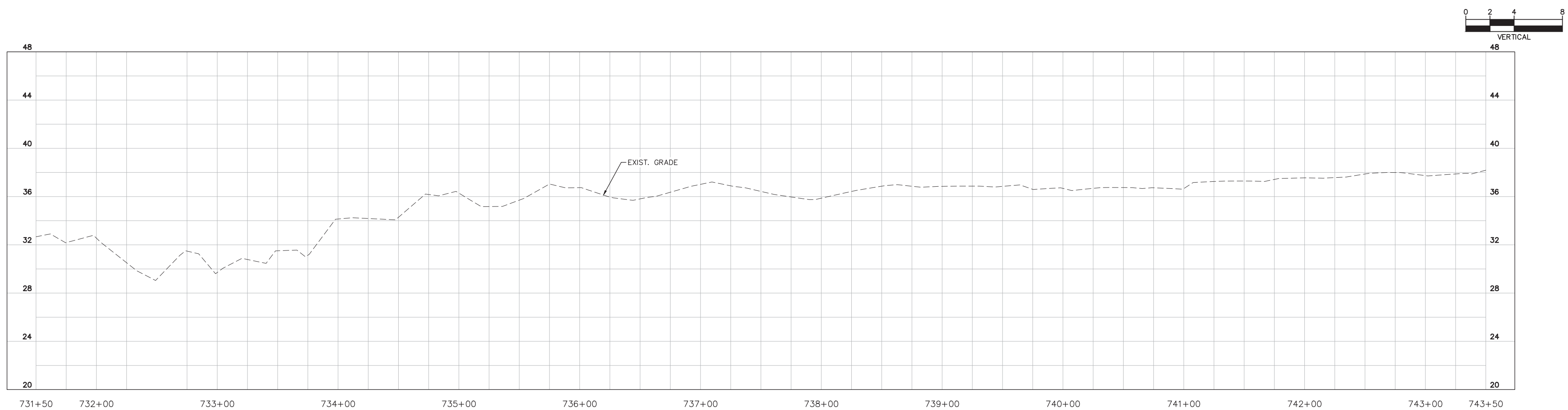
FM Plan and Profile (719+50 - 731+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C61
SCALE:	1" = 40'	SHEET NO.:	64 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

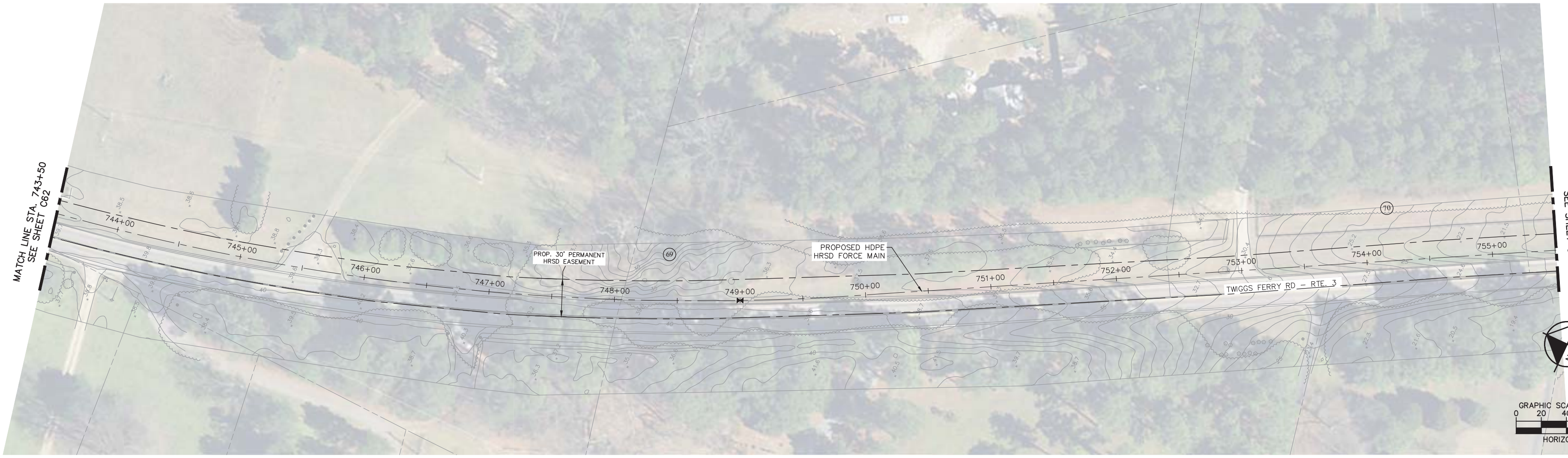
NO.	DATE	BY	REVISION

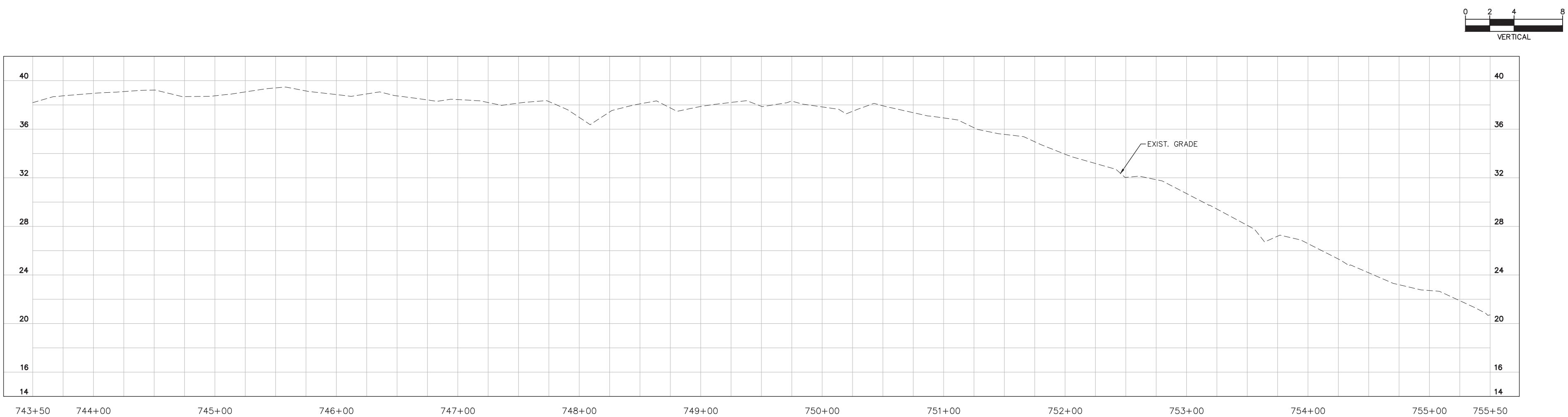
FM Plan and Profile (731+50 - 743+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C62
SCALE:	1" = 40'	SHEET NO.:	65 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

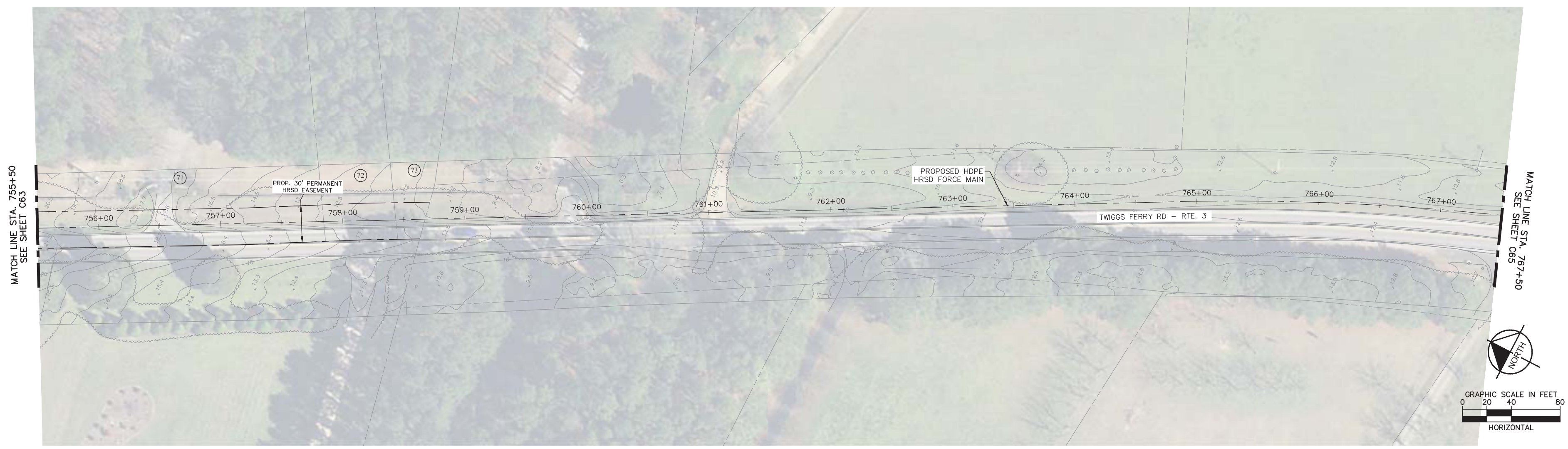
NO.	DATE	BY	REVISION

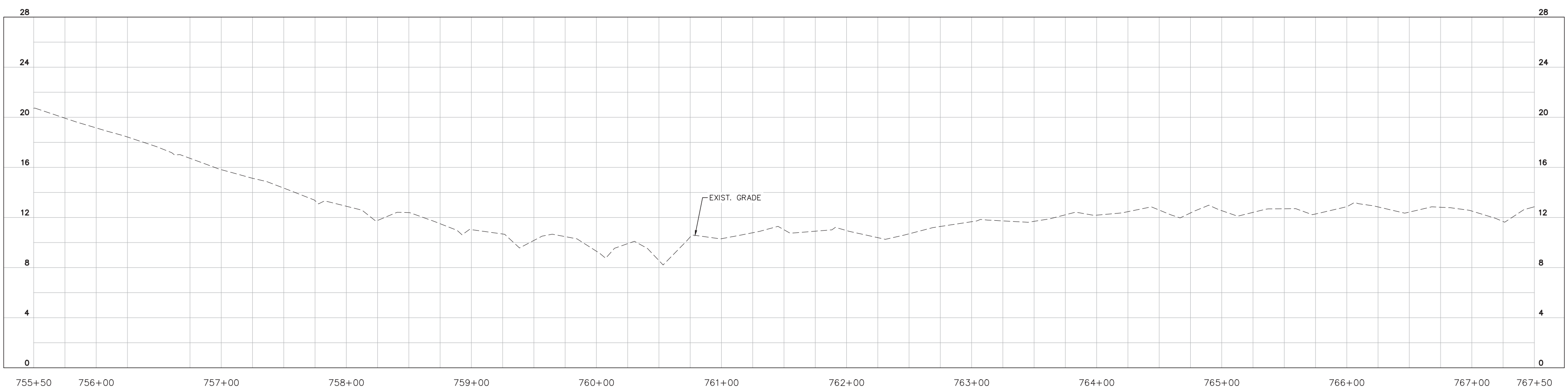
FM Plan and Profile (743+50 - 755+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C63
SCALE:	1" = 40'	SHEET NO.:	66 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

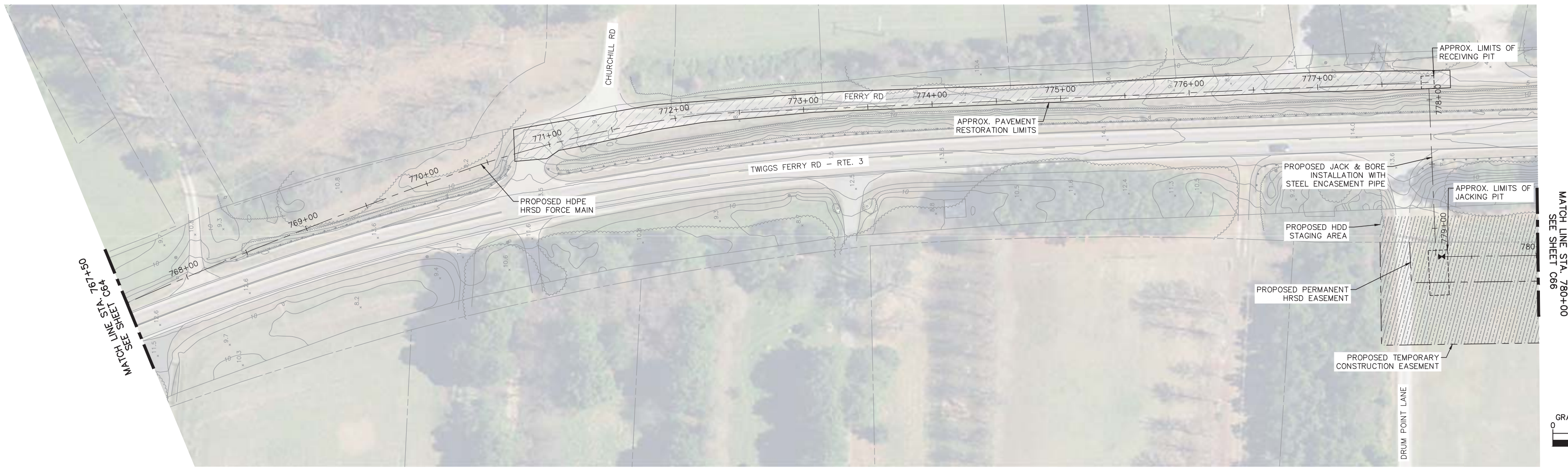
NO.	DATE	BY	REVISION

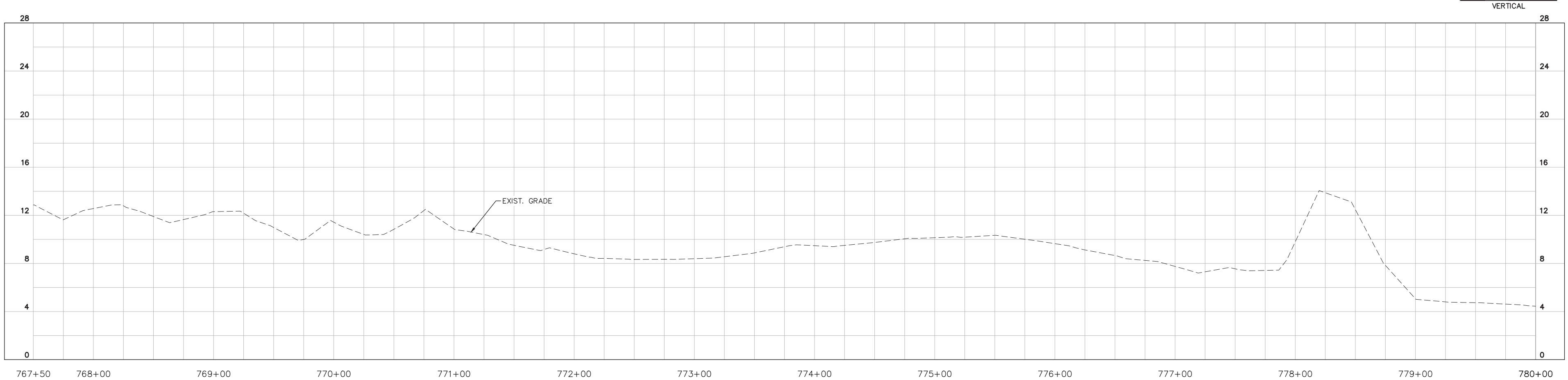
FM Plan and Profile (755+50 - 767+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C64
SCALE:	1" = 40'	SHEET NO.:	67 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

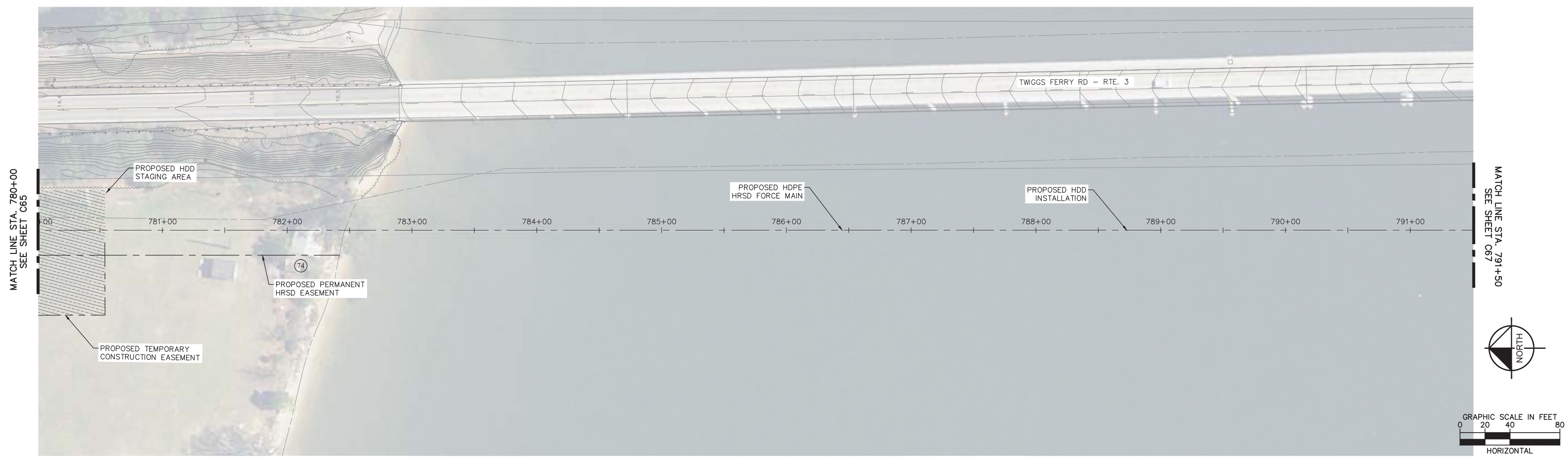
NO.	DATE	BY	REVISION

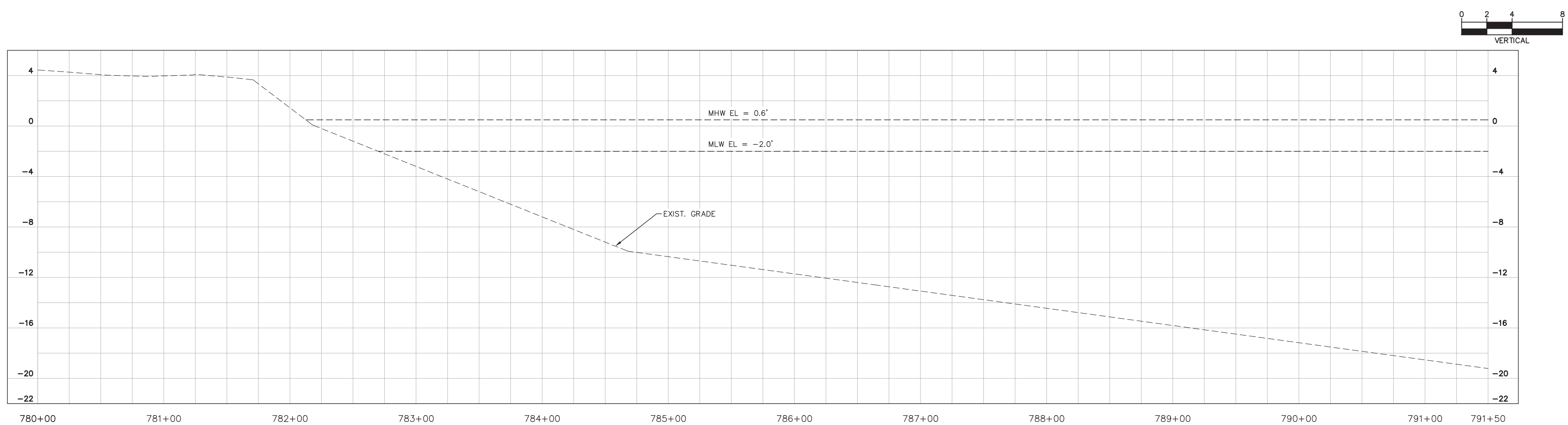
FM Plan and Profile (767+50 - 780+00)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C65
SCALE:	1" = 40'	SHEET NO.:	68 of 77





30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY–HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757–213–8600 FAX: 757–213–8601
WWW.KIMLEY–HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

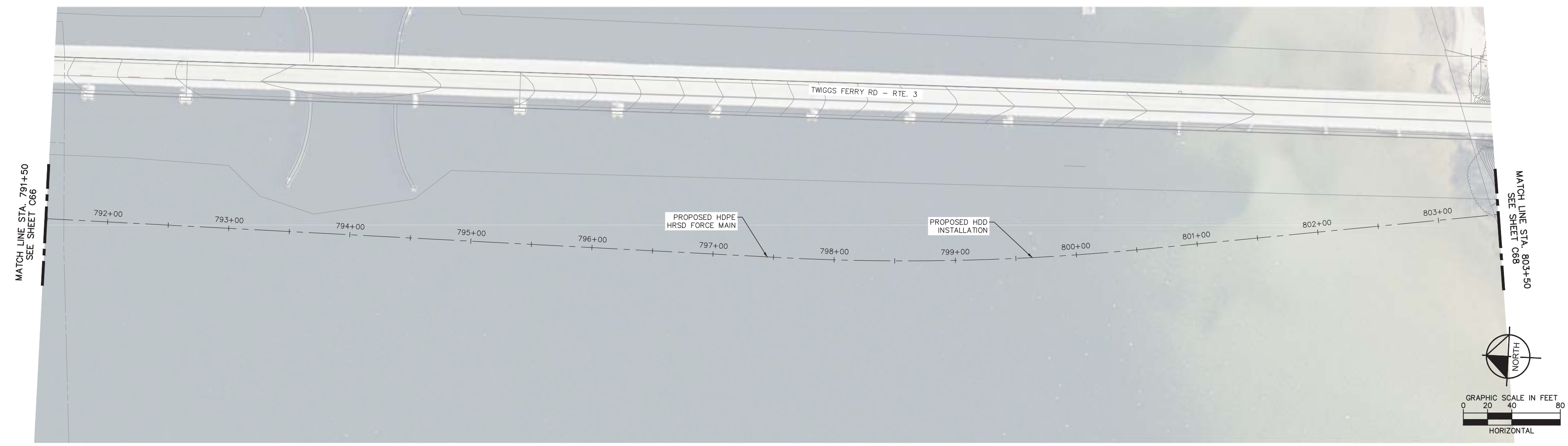
NO.	DATE	BY	REVISION

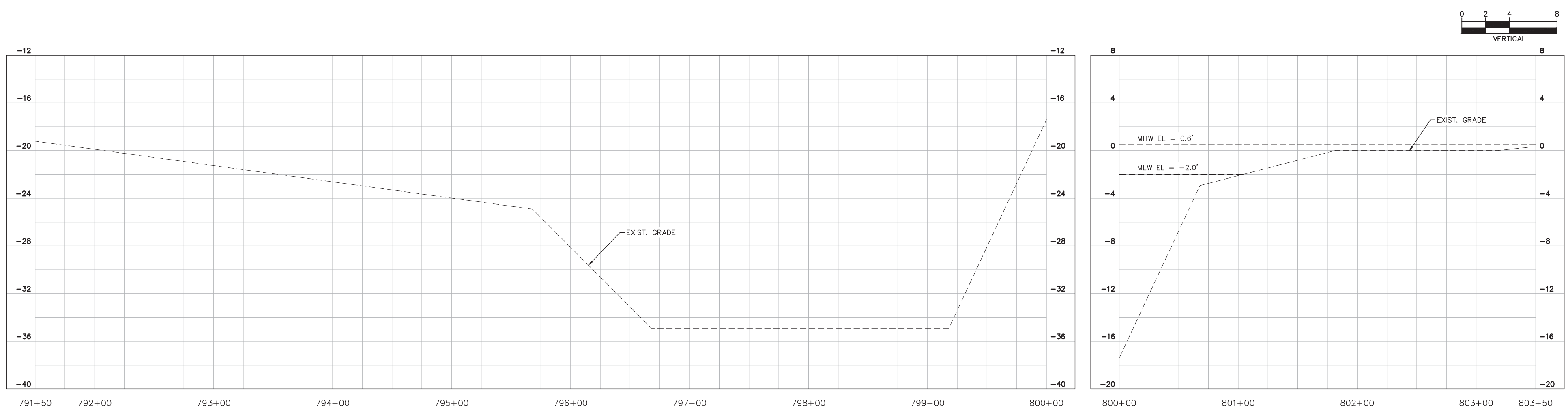
FM Plan and Profile (780+00 - 791+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C66
SCALE:	1" = 40'	SHEET NO.:	69 of 77





30%
SUBMITTAL
NOT FOR
CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

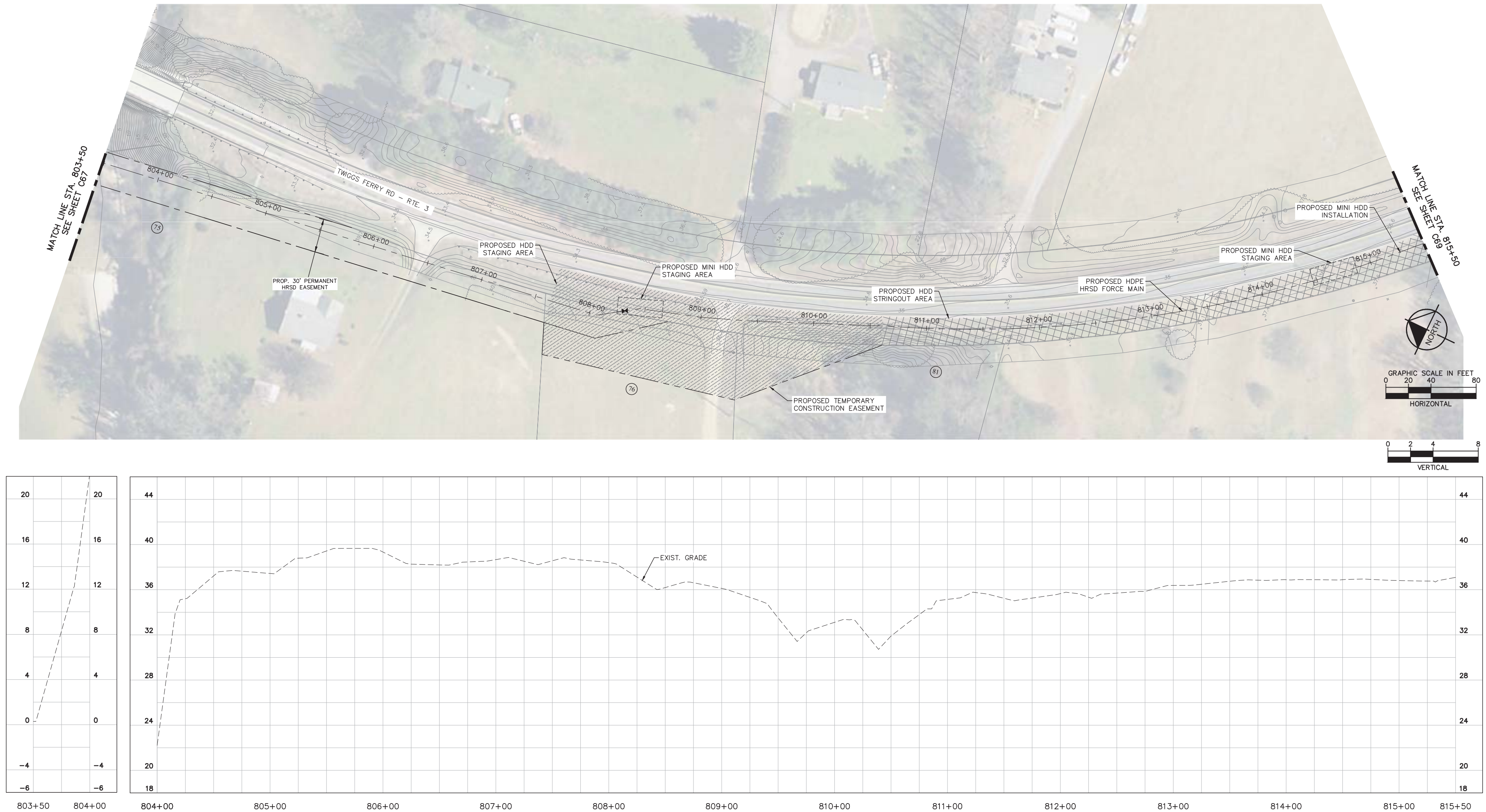
NO.	DATE	BY	REVISION

FM Plan and Profile (791+50 - 803+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C67
SCALE:	1" = 40'	SHEET NO.:	70 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

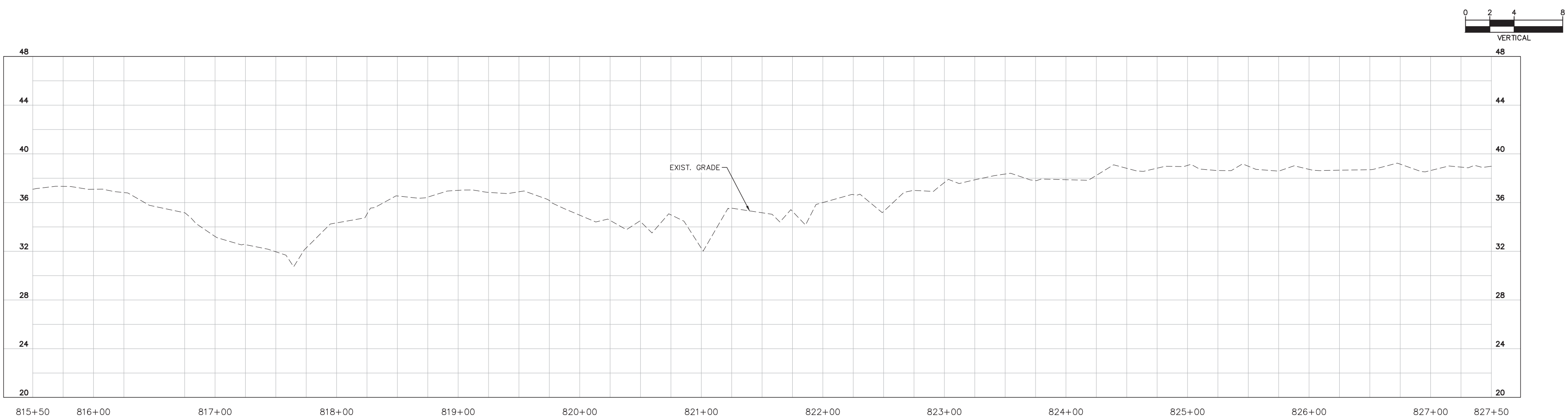
NO.	DATE	BY	REVISION

FM Plan and Profile (803+50 - 815+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C68
SCALE:	1" = 40'	SHEET NO.:	71 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

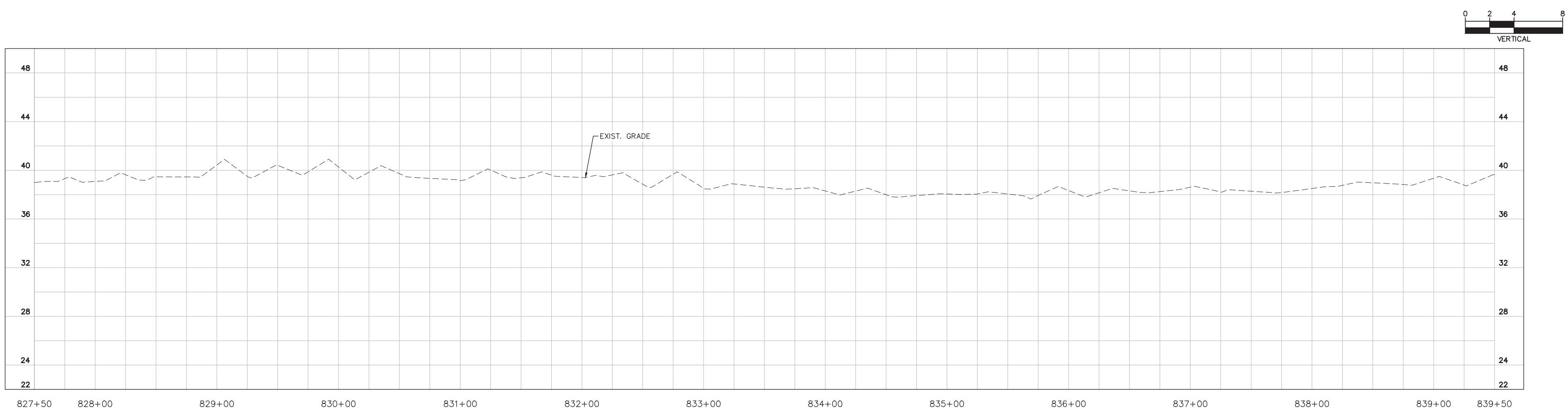
NO.	DATE	BY	REVISION

FM Plan and Profile (815+50 - 827+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C69
SCALE:	1" = 40'	SHEET NO.:	72 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

Kimley»Horn
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

FM Plan and Profile (827+50 - 839+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C70
SCALE:	1" = 40'	SHEET NO.:	73 of 77

COMM. NO. ######.###

30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

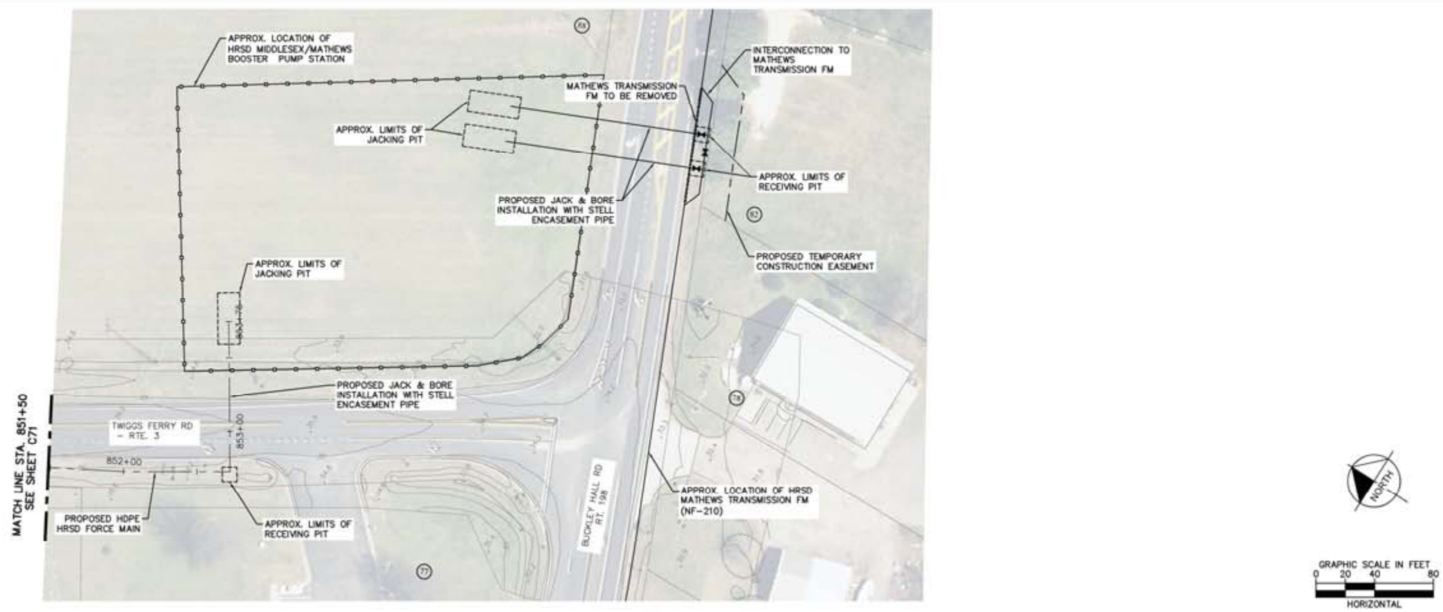
NO.	DATE	BY	REVISION

FM Plan and Profile (839+50 - 851+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C71
SCALE:	1" = 40'	SHEET NO.:	74 of 77



30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

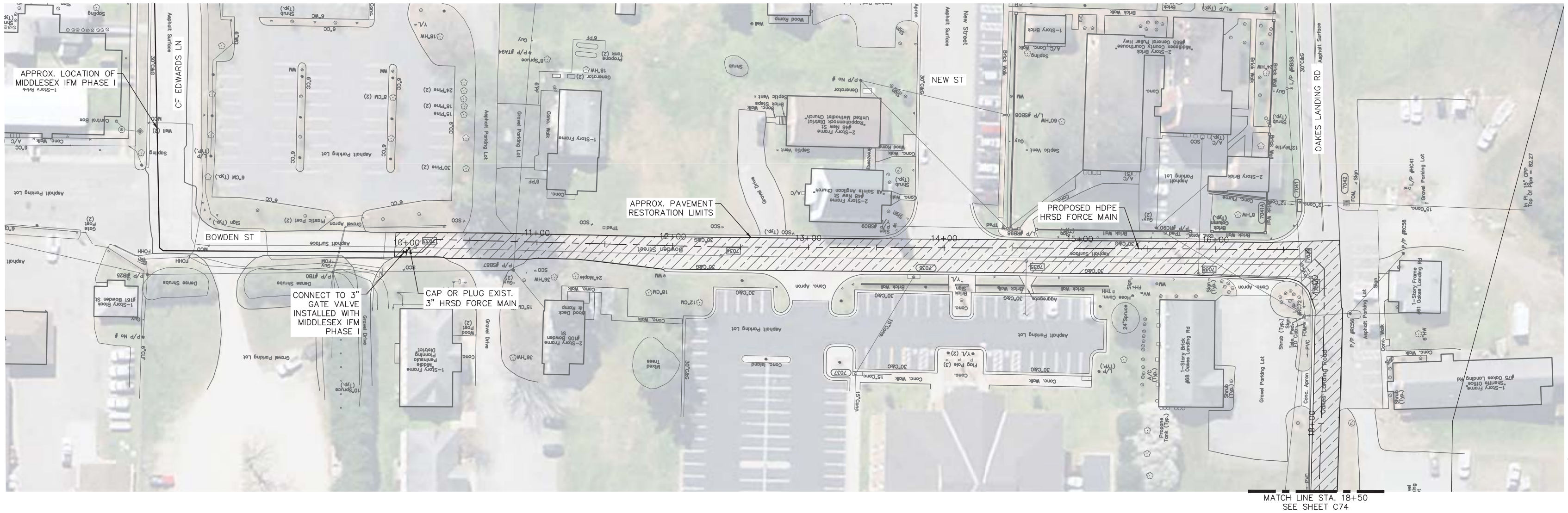
NO.	DATE	BY	REVISION

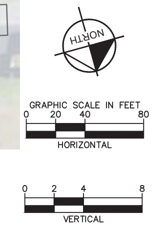
FM Plan and Profile (851+50 - 853+75)

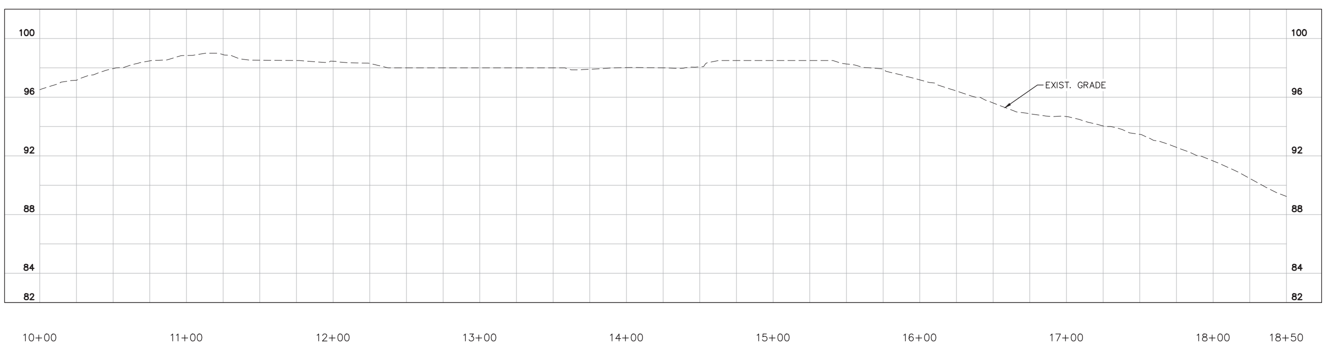
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C72
SCALE:	1" = 40'	SHEET NO.:	75 of 77







30% SUBMITTAL NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD
Cleaning wastewater every day for a better Bay

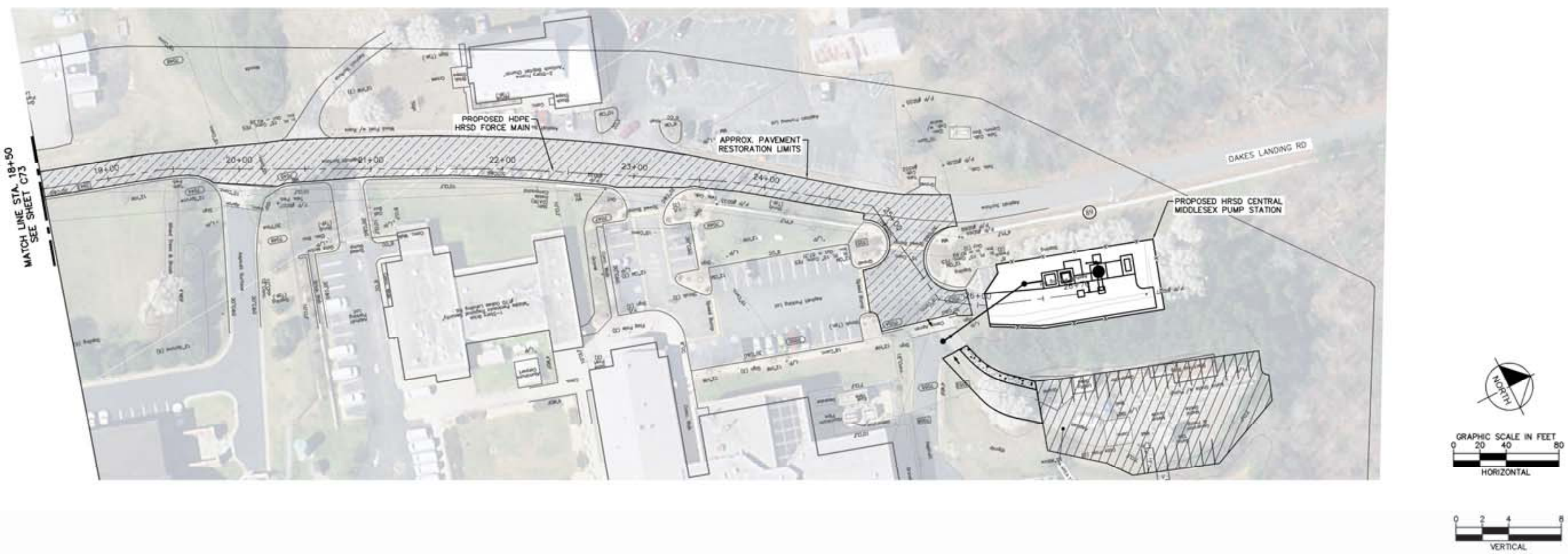
NO.	DATE	BY	REVISION

Middlesex IFM Phase I
Extension
Plan and Profile (10+00 - 18+50)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C73
SCALE:	1" = 40'	SHEET NO.:	76 of 77



30%
SUBMITTAL
NOT FOR
CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

Middlesex IFM Phase I
Extension
Plan and Profile (18+50 - 26+76)

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	RCM	DATE:	07/31/2020
DRAWN BY:	JHM	FILE NO.:	116320052
CHECKED BY:	GSF	DRAWING NO.:	C74
SCALE:	1" = 40'	SHEET NO.:	77 of 77

PRELIMINARY CULTURAL RESOURCES ASSESSMENT FOR THE HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II—URBANNA TO MATHEWS TRANSMISSION TFM MIDDLESEX AND MATHEWS COUNTIES, VIRGINIA

May 2020

Prepared For:

Kimley-Horn
4525 Main Street, Suite 1000
Virginia Beach, Virginia 23452

Prepared By:

Matthew R. Laird, Ph.D., RPA
James River Institute for Archaeology, Inc.
223 McLaws Circle, Suite 1
Williamsburg, Virginia 23185
(757) 229-9485

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

The Hampton Roads Sanitation District (HRSD) is planning to undertake the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project in Middlesex and Mathews counties, Virginia. The project will involve the construction of a 3.2-mile force main from Urbanna to Cooks Corner via State Route 227 (Urbanna Road), and a 13-mile force main along State Route 33 (General Puller Highway) and State Route 3 (Twiggs Ferry Road) from Cooks Corner to the existing Mathews Transmission Force Main in Mathews County (Figures 1-5). The new Middlesex transmission force main (TFM) will convey wastewater from Middlesex County to the York River Treatment Plant and enable decommissioning of both the Urbanna Treatment Plant and the Central Middlesex Treatment Plant in Saluda. The project will also include the construction of new pump stations at the Urbanna Treatment Plant, Central Middlesex Treatment Plant, and Cooks Corner, and potentially two additional booster stations along the TFM. Finally, the project will also require horizontal directional drilling (HDD) under Urbanna Creek and the Piankatank River.

This preliminary cultural resource assessment prepared by the James River Institute for Archaeology, Inc. (JRIA) is intended to assist in planning for potential cultural resource investigations which may be required for the project under Section 106 of the National Historic Preservation Act. It includes a prehistoric and historic context of the overall project area; an analysis of the earliest available detailed historic mapping; a summary of all previously recorded cultural resources (including historic districts, standing structures, and archaeological sites) within or in the immediate vicinity of the proposed area of potential effect (APE) for the project; and recommendations concerning those areas with the highest potential for significant, intact archaeological resources.

In 1991, the William and Mary Center for Archaeological Research (WMCAR) completed a Phase I cultural resources survey of the proposed Route 33 project in Middlesex County (Gallucci et al. 1992). This project, which was conducted on behalf of the Virginia Department of Transportation (VDOT), was designed to identify and evaluate all cultural resources which would be affected by the proposed widening of a 5.3-mile section of Route 33 between Cooks Corner and Harmony Village. No new archaeological sites were identified in the course of this investigation, and two existing archaeological sites (44MX0012 and 44MX0013) were determined to be not eligible for listing in the National Register of Historic Places (National Register). It was determined that the project would have no direct effect on Christ Church (Virginia Department of Historic Resources [DHR] ID# 059-0002). However, four historic properties were determined to be potentially eligible for listing in the National Register, and were further evaluated at the Phase II level. Marsh Pungo (DHR ID# 059-0012), First Baptist Church (DHR ID# 059-0035), and Rappahannock High School (DHR ID# 059-0051) were determined to be not eligible, while the Walker House (DHR ID# 059-0063) was determined eligible.

Because the proposed Middlesex TFM will be constructed within the existing VDOT right-of-way, JRIA has not included the 5.3-mile section between Cooks Corner and Harmony Village previously investigated by WMCAR in this study.

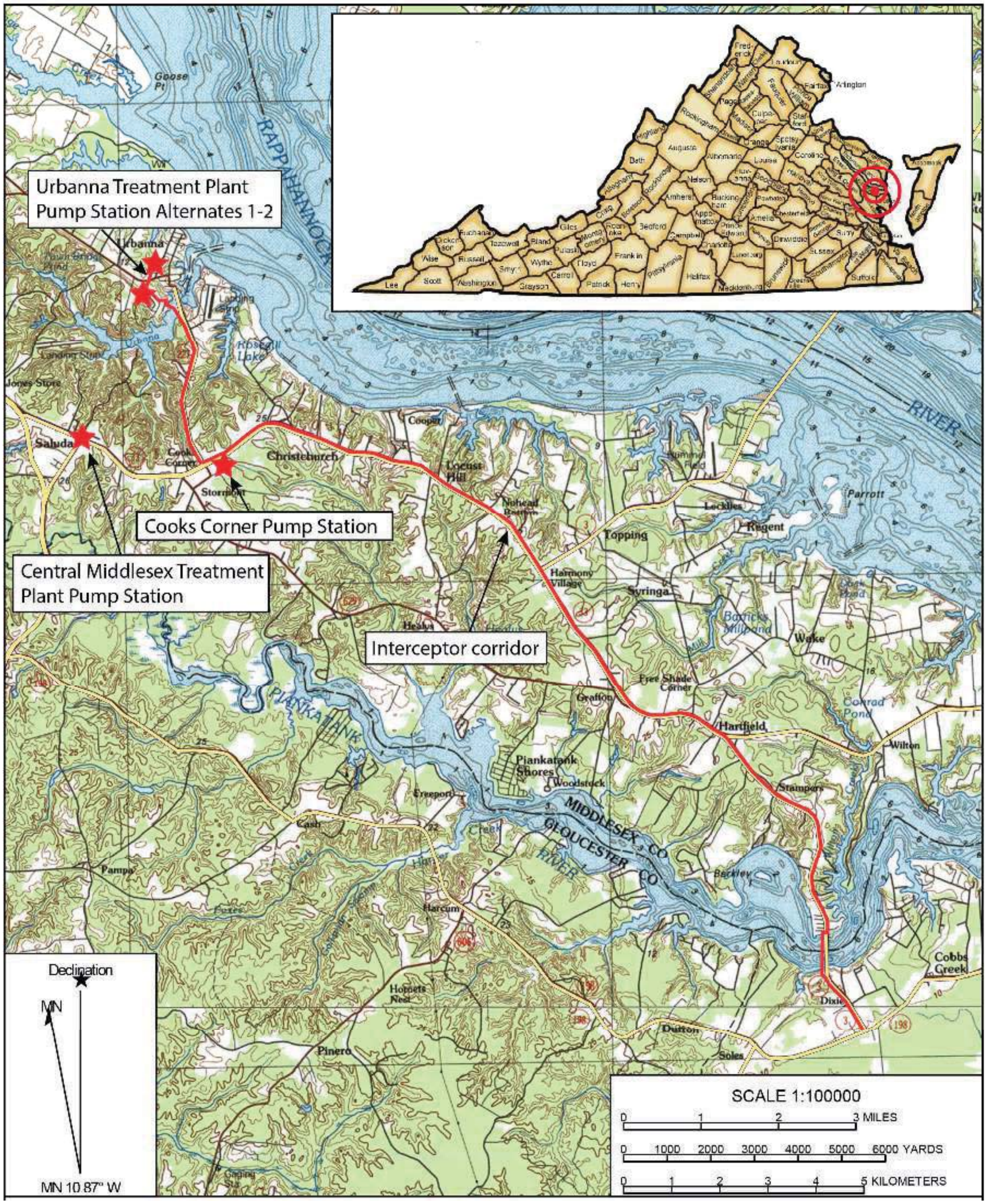


Figure 1. Location of the project corridor on detail of U.S.G.S. 1:100,000 Tappahannock (1984) and Williamsburg (1984) topographic quadrangle maps.

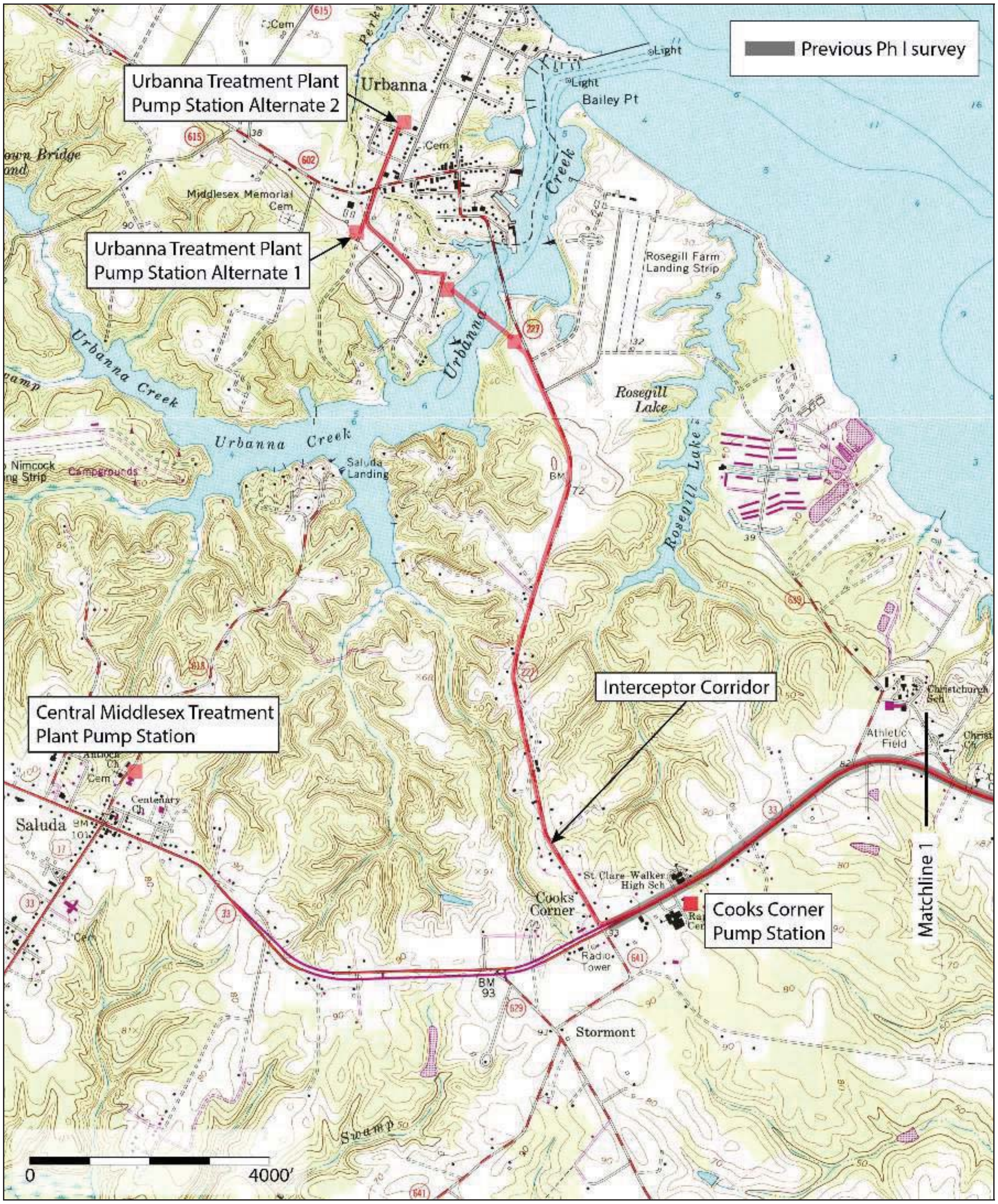


Figure 2. Location of the project area on detail of U.S.G.S. 7.5' Urbanna (1978) and Saluda (1986) topographic quadrangle maps.

Figure 3. Location of the project area on detail of U.S.G.S. 7.5’ Urbanna (1978), Saluda (1986), and Wilton (1992) topographic quadrangle maps.

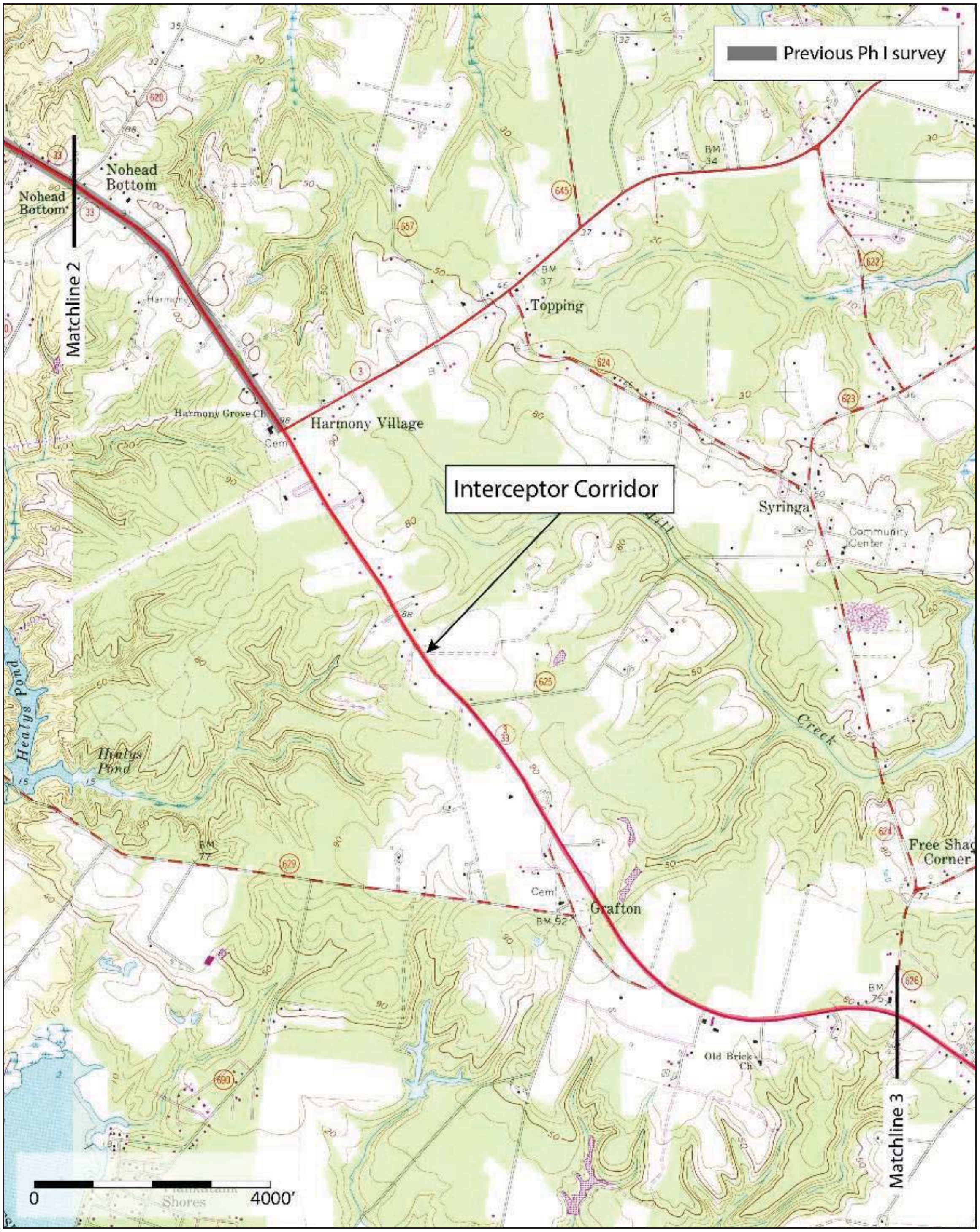


Figure 4. Location of the project area on detail of U.S.G.S. 7.5' Saluda (1986) and Wilton (1992) topographic quadrangle maps.

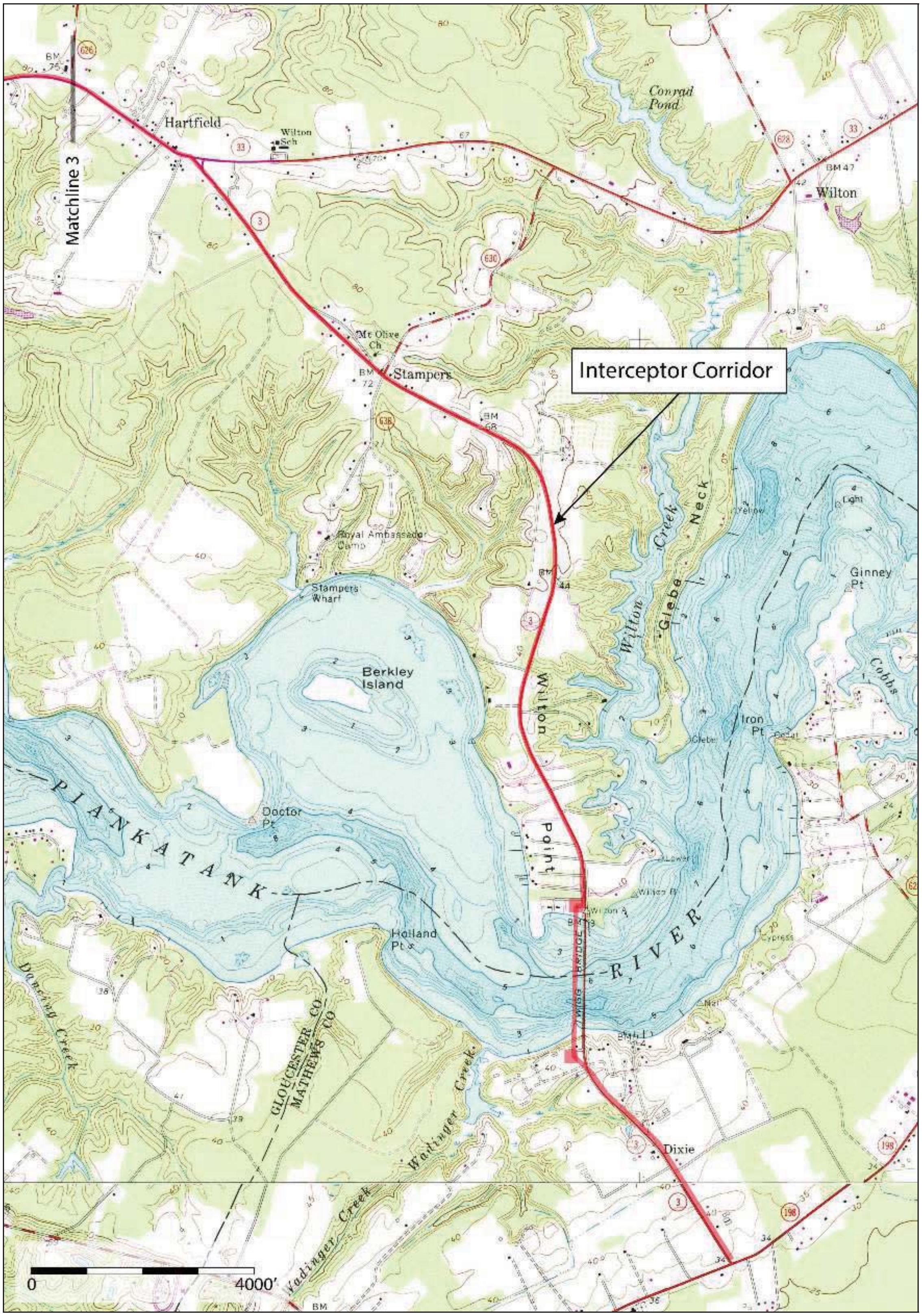


Figure 5. Location of the project area on detail of U.S.G.S. 7.5' Wilton (1992) and Ware Neck (1980) topographic quadrangle maps.

II. CULTURAL CONTEXT

PREHISTORIC CONTEXT

Virginia's prehistoric cultural chronology is subdivided into three major time periods based on changes in subsistence as exhibited by material remains and settlement patterns. These divisions are known as the Paleoindian, Archaic, and Woodland periods. A brief summary of the regional cultural chronology follows, with comments on manifestations of each period within the project area vicinity.

Paleoindian (Prior to 10,000 B.C.)

Paleoindian occupation in Virginia, the first human occupation of the region, began some time before 10,000 B.C. The earliest recognized diagnostic artifacts Clovis projectile points, typically fashioned of high-quality cryptocrystalline materials such as chert, chalcedony, and jasper. Later Paleoindian points include smaller Clovis-like and Cumberland variants, small "Mid-Paleo" points, and, at the end of the period, Dalton, Hardaway-Dalton and Hardaway Side-notched points. Also diagnostic, though to a lesser extent, are certain types of well-made endscrapers, sidescrapers, and other formalized tools. Most current views now hold that eastern Paleoindians were generalized foragers with an emphasis on hunting. Social organization apparently consisted of relatively small bands that exploited a wide, but defined, territory (Gardner 1989: 5-52; Turner 1989: 71-94).

The majority of Paleoindian remains in Virginia are represented by isolated projectile point finds and what appear to be small temporary camps. Although some larger and very notable base camps are present in the state, they are relatively rare and usually associated with sources of preferred, high quality, lithic materials. The most important Paleoindian sites in Virginia, and in the eastern U. S. as a whole, are the Thunderbird Site in the Shenandoah Valley (Gardner 1974, 1977), the Williamson Site in south-central Virginia (McCary 1951, 1975, 1983), and the Cactus Hill Site in Sussex County. Both the Thunderbird and Williamson sites are large base camps associated with local sources of high-grade cryptocrystalline lithic materials. At the Thunderbird site area and its surrounding environs, a site typology has been formulated which includes lithic quarries, quarry-related base camps, quarry reduction stations, base camp maintenance stations, outlying hunting sites, and isolated point sites (Gardner 1981, 1989). Cactus Hill (44SX202), located on the Nottoway River near Stony Creek, is characterized by stratified deposits associated with the Paleoindian through Woodland periods. The site has yielded numerous Clovis projectile points, and generated a radiocarbon date of 15,070 B.P. from a pre-Clovis occupation layer, which is characterized by artifacts in a pre-Clovis core blade tradition (McAvoy and McAvoy 1997)

Archaic (8000-1200 B.C.)

The beginning of the Archaic Period generally coincided with the end of the Pleistocene epoch, marked in the region by a climatic shift from a moist, cool period to a warmer, drier climate. Vegetation also changed at this time from a largely boreal forest setting to a mixed conifer-deciduous forest. In eastern Virginia, a temperate climate was established, and the formation of the Chesapeake estuary began. Increasing differences in seasonal availability of resources brought on by post-Pleistocene changes are thought to have coincided with increasing emphasis on strategies of seasonally geared mobility (Dent 1995:147).

Archaic populations likely were characterized by a band-level social organization involving seasonal movements corresponding to the seasonal availability of resources and, in some instances, shorter-interval movements. Settlement during this era probably involved the occupation of relatively large regions by single band-sized groups living in base camps during part of the year, and dispersing as necessary on seasonal basis, creating smaller microband camps that may have consisted of groups as small as single families. The Archaic period saw the development of more specialized resource procurement activities and associated technologies. These differences in material culture are believed to reflect larger, more localized populations, as well as changes in food procurement and processing methods. The Archaic Period also marked the beginning of ground stone technology, with the occurrence of ground atlatl weights and celts. New tool categories that developed during the Archaic include chipped and ground stone celts, ground stone net sinkers, pestles, pecked stones, mullers, axes, and, during the more recent end of the Late Archaic, vessels carved from soapstone quarried in the Piedmont (Custer 1990: 35-40; Geier 1990: 84-86, 93-94).

Early Archaic

Corner and side-notching became a common characteristic of projectile points at the beginning of the Archaic Period (Early Archaic), indicating changes in hafting technology and possibly the invention of the spear-thrower (atlatl). Notched point forms include Palmer and Kirk Corner-notched and, in localized areas, various side-notched types. The later end of the Early Archaic Period and the beginning of the Middle Archaic Period are marked by a series of bifurcate base projectile point forms that, in this area, are mainly represented by Lecroy points.

Middle Archaic

As a whole, the Middle Archaic ca. 6500 - ca. 3000 BC, witnessed the rise of various stemmed projectile point forms, and there is a notable increase in the number of early Middle Archaic components over the immediately preceding Early Archaic. In this area of central Virginia, the most common Middle Archaic artifact forms are, from oldest to youngest, Lecroy, Stanly, Morrow Mountain, and Guilford projectile point types, followed by the side-notched Halifax type at the end of the period as it transitions into the Late Archaic between ca. 3500 and 3000 B.C. The numbers of Middle Archaic sites recorded in eastern Virginia as a whole indicate population increase at this time.

Late Archaic

The Late Archaic Period (ca. 3000-1200 B.C.) was dominated by stemmed and notched knife and spear point forms, including various large, broad-bladed stemmed knives and projectile points that generally diminish in size by the succeeding Early Woodland period (e.g., Savannah River points and variants). Also found, though less common, are stemmed and notched-stem forms identical to those associated more prominently with areas of Pennsylvania and adjoining parts of the northeast (Susquehanna and Perkiomen points).

Marked increases in population density and, in some areas, decreased mobility characterized the Late Archaic Period in the Middle Atlantic states and eastern North America as a whole. Locally, there is an increase in the numbers of late Middle Archaic (Halifax) and Late Archaic (Savannah River) sites over those of earlier periods, suggesting a population increase and/or intensity of use of this region between about 3500 B.C. and ca. 1200 B.C.

Agriculture in the Middle Atlantic region probably has its origins during this period. Yarnell (1976: 268), for example, writes that sunflower, sumpweed, and possibly goosefoot may have been cultivated as early as 2000 BC. In the lower Little Tennessee River Valley, remains of squash have been found in Late Archaic Savannah River contexts (ca. 2400 BC), with both squash and gourd in slightly later Iddins period contexts (Chapman and Shea 1981: 70). However, no cultigens have been found in Late Archaic contexts locally.

Woodland (1200 B.C. – ca. A.D. 1600)

The Woodland Period was characterized by the introduction of ceramic technology, a gradually developing dependence on horticulture, and increased sedentism. Three sub-periods (Early, Middle, and Late Woodland) have been designated, based primarily on stylistic and technological changes in ceramic and projectile point types, as well as settlement patterns.

Early Woodland

The Early Woodland Period, ca. 1200-500 B.C., is generally defined by the appearance of ceramics in the archaeological record. The earliest Woodland ceramic wares, Marcey Creek Plain and variants, are rectangular or oval and resemble the preceding Late Archaic soapstone vessels. These ceramics are followed by cord-marked, soapstone-tempered Selden Island ceramics, then by sand-and-grit-tempered Elk Island (Accokeek) ceramics with both plain and cord-marked surfaces. The latter traditionally were referred to as the Stony Creek series, although this type is now known to subsume several Early, Middle, and Late Woodland ceramic wares (Egloff 1991: 243-48).

Early Woodland sites in this section of Tidewater Virginia typically consist of small camps in both riverine and lesser-order stream locations, particularly those also occupied in the earlier part of the Middle Woodland period.

Middle Woodland

The Middle Woodland Period in this area, ca. 500 B.C. and A.D. 900, was marked by the appearance of net-marked, sand-tempered, and pebble-tempered pottery that generally spans the period ca. 500 B.C. to about A.D. 300 (Pope's Creek and Prince George wares). These ware types were supplanted by shell-tempered net- and cord-marked Mockley pottery until about A.D. 900 in areas lying east of the Fall Line. Local wares, such as Varina net-marked, were quite common in the Inner Coastal Plain, and have been dated to ca. A.D. 200/250 (Egloff 1991: 243-48).

Previous archaeological studies in the region have demonstrated the intensive use of small tributary streams as well as major river floodplains throughout the Middle Woodland period (ca. 500 B.C. and A.D. 900). Archaeologists have suggested that the Middle Woodland was characterized by "restricted wandering," in which groups used various campsites for several weeks at a time, obtaining needed materials in the site vicinity (Stewart 1992: 12-16).

Late Woodland

By the Late Woodland Period (A.D. 900-1600), agriculture had assumed a role of major importance in the prehistoric subsistence system. The adoption of agriculture represented a major change in the subsistence economy and patterns of settlement. The availability of large areas of arable land became a dominant factor in settlement location, and sites increasingly were located on fertile floodplain soils or on higher terraces or ridges adjacent to them.

Diagnostic artifacts of this period include several triangular projectile point styles that originated during the latter part of the Middle Woodland Period and decreased in size through time. Late Woodland ceramics from about A.D. 900 to the time of European contact in Tidewater Virginia include shell-tempered, Townsend, and Roanoke ceramics; untyped, sand-tempered, fabric-impressed ceramics that are otherwise similar to Townsend; and lithic- and sand-tempered simple-stamped ceramics similar to Gaston and Cashie types of North Carolina.

Although settlements dating to this time include some small camps, a large number of villages and small hamlets appear to have been occupied on a more permanent basis than those of older settlements are present. Some villages were highly nucleated while others were internally dispersed over a wide area. A number of villages were completely fortified by circular or oval palisades, indicating a rise in inter-group conflict, while others contained both a fortified core area and outlying houses. The more dispersed settlements were scattered over a wide area and characterized by fluid settlements within large, sprawling, and loosely defined town or village territories (Turner 1992: 108-114).

Drawings and journals of early European explorers describing Indian villages indicate that houses were constructed of oval, rectanguloid, or circular frameworks of flexible, green sapling poles set in the ground, lashed together, and covered with thatch or bark mats. Burial sites of the period were situated in individual pits or in ossuaries. Such historical accounts are consistent with data obtained from archaeological excavations of Coastal Plain Late Woodland village sites (Hodges and Hodges 1994).

With the development of a more sedentary settlement-subsistence system culminating in the Late Woodland period, permanent habitation sites gradually replaced base camp habitation sites more characteristic of those of previous foragers and hunter-gatherers. Various supporting camps and activity areas were established in the day-to-day procurement of food and other resources (i.e., short-term hunting and foraging camps, quarries, butchering locations, and re-tooling locations). Locations used partially or largely for ceremonial purposes were also present, usually in association with habitation sites. Late Woodland hamlets and villages typically are found on bluffs, terraces, or floodplains adjacent to rivers or major tributaries. Small seasonal camps and non-seasonally based satellite camps supporting nearby sedentary villages and hamlets are located along smaller streams in the interior. These campsites typically are characterized by limited concentrations and sparse scatters of lithics and ceramics (Turner 1992: 108-114).

When John Smith and his fellow English explorers arrived in Tidewater Virginia in the spring of 1607, they stumbled into the territory of the powerful Powhatan Confederacy, one of the most well-organized and populous chiefdoms in the mid-Atlantic region. In his map depicting the location of Native American settlements, it is clear that the settlement in the Rappahannock valley was concentrated on the north bank of the river. However, Smith noted the location of the village of Opiscopank (variously known as Opiscatumek) on the south side of the Rappahannock, east of the mouth of Urbanna Creek (Figure 6). when he mapped it in 1608, he indicated that Opiscopank was the residence of a chief. However, he did not mention it in his narratives, and so it has become known as “John Smith’s mystery village.” English settlers did not begin taking up land in this area until the 1640s; but when they did, they recorded the presence of former Native American settlements in this vicinity. In 1649, when Ralph Wormeley patented the land that would become Rosegill plantation, the grant noted that his acreage on the east side of what is now Urbanna Creek included the “Indian Townes of old & new Nimcock.” Archaeological investigations at Rosegill have identified evidence of Native American settlement dating to the Late Woodland and Contact periods, suggesting that this was the location of the Opiscopank/Nimcock villages (Nugent 1992: 181; DHR 2010).

Figure 6. Location of the project corridor on detail of *Virginia Discovered and Discribed* [sic.] (Smith 1624).

HISTORIC CONTEXT

Settlement to Society (1607-1750)

The land on the south shore of the Rappahannock River remained essentially off-limits to English settlement until the late 1640s. With its prime agricultural lands and convenient access to shipping, however, it was only a matter of time before wealthy landowners began taking up large riverfront tracts and establishing tobacco plantations in this area. The foremost of these was Ralph Wormeley, who patented 3,200 acres east of what is now Urbanna Creek in 1649 and established Rosegill plantation. Within 20 years, the population of this area had grown to the extent that Middlesex County was created from Lancaster County in 1669 (Rutman and Rutman 1984: 46; Gray et al. 1978: 43-44). When he sketched the extent of settlement in Tidewater Virginia in 1670, Augustine Herrman indicated that settlement in Middlesex County was strung out along the Rappahannock River, the primary artery of transportation, communication, and commerce (Figure 7).

In the Rappahannock River valley, and throughout the Chesapeake, it was tobacco, above all, which shaped nearly every aspect of life in the colonial period, encompassing the economy, the cultural landscape, and social relations. By the middle of the seventeenth century, tobacco cultivation formed the principal economic activity of every rank, from the largest landowner to the humblest tenant farmer. And once the system of tobacco monoculture had been established, it was nearly impossible to break free. Though prices for the crop in Europe fluctuated, often drastically, most planters preferred to stick with the staple, rather than risk an expensive investment of time and money in a less reliable export, such as grain (Kulikoff 1986: 4-5; Rutman and Rutman 1984: 41-43).

Much of the territorial conflict in seventeenth-century Virginia can be traced to the fact that the same prime agricultural lands which had supported Native American agricultural settlements for generations now proved equally attractive to Anglo-Virginian planters bent on profiting from tobacco. The location of seventeenth-century English tobacco plantations depended on three primary considerations: proximity to major water routes for ease of transportation; the availability of freshwater springs for drinking water; and good silty or sandy loams for growing tobacco. Because these considerations were identical to those of the resident Late Woodland peoples, there was a strong correlation between the sites of Late Woodland Algonquian villages and seventeenth-century English settlements. The labor-intensive nature of tobacco cultivation limited crops to approximately three acres per person. A perennial shortage of laborers and draft animals made traditional plowing impractical, so tobacco planters adopted Native American methods of hoe agriculture, planting their tobacco and corn around the stumps of newly cleared land. Likewise, the English soon realized the relative infertility of abandoned Indian fields, building their houses in these vegetation-free areas while using the adjoining former village locations for planting (Norris 1983: 27; Potter 1993: 220-21).

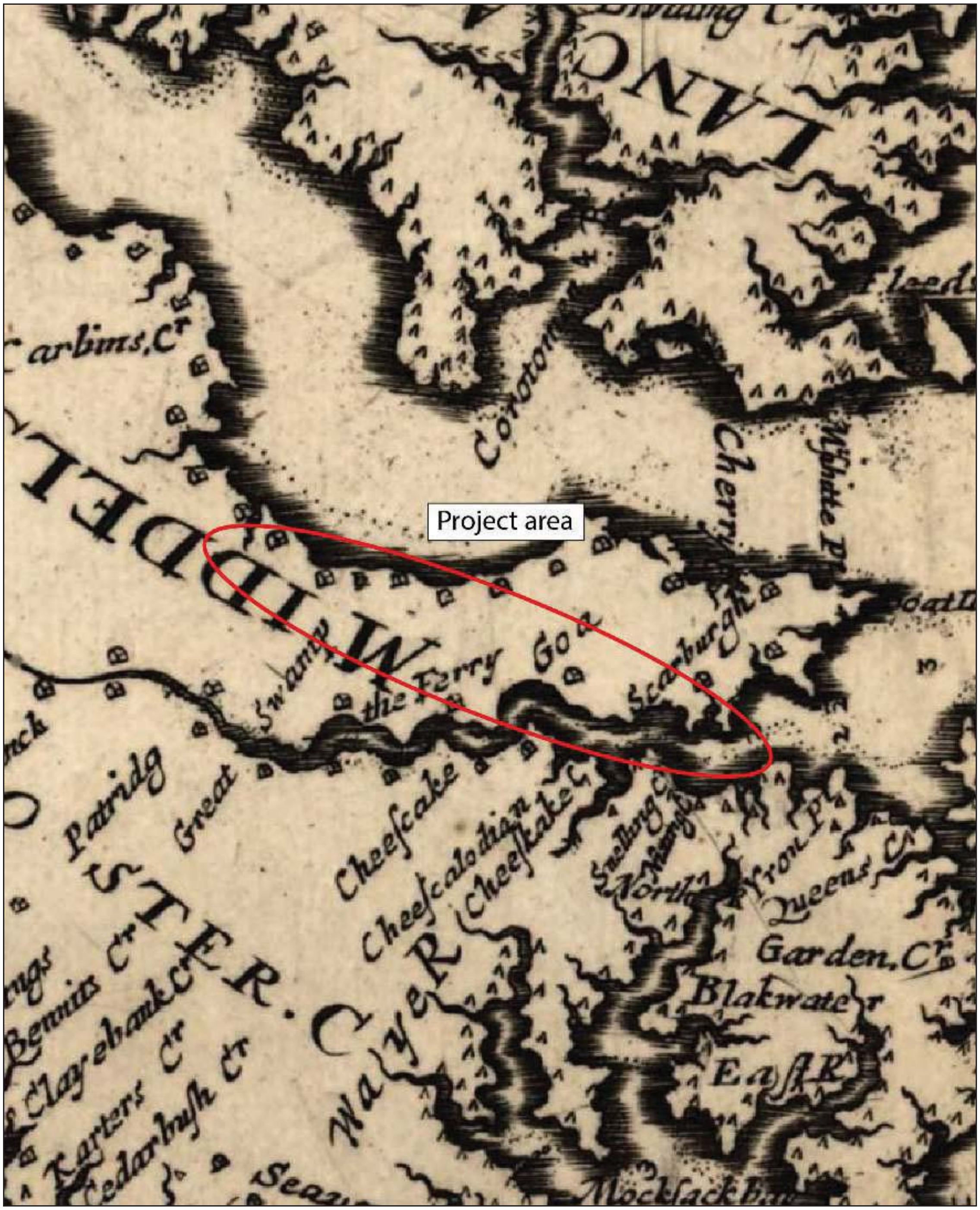


Figure 7. Location of the project corridor on detail of Virginia and Maryland as it is Planted and Inhabited This Present Year 1670 (Herrman 1673).

In his quantitative study of settlement patterns in colonial James City and York counties, Craig Lukezic discovered that soil type, more than any other consideration, determined where Chesapeake tobacco planters chose to live. Since tobacco was overwhelmingly important as a staple crop, Lukezic hypothesized, it should follow that planters would choose to settle on lands most conducive to growing this crop. When he examined statistically the relative importance of a variety of environmental factors in site selection, including soils, access to drinking water, proximity of navigable waterways, and distance from the nearest neighbor, Lukezic discovered that soil type was the most significant locational factor affecting colonial settlement (Lukezic 1990).

Tobacco plants grow best in gently sloped (2-6 percent), well-drained, loosely-structured soils such as light sand or sandy loam. The taste of the tobacco is also strongly influenced by soils, with the best flavor imparted by those with siliceous parentage. Though soil type is critical to the success of tobacco cultivation, topography is also an important consideration. Since tobacco plants will not mature properly if the roots are deprived of oxygen (e.g. by flooding), gently sloping soils in the range of 2-6 percent provide the ideal drainage for healthy plants. Thus, the primary considerations in defining areas of archaeological sensitivity for colonial sites were soil type and slope, with an emphasis on well-drained soils with slopes of 10 percent or less. The probability of locating colonial period resources diminishes accordingly on soil types and slopes less conducive to growing tobacco (Lukezic 1990).

Gaining access to productive tobacco lands was only the first step, however. Maintaining an adequate pool of labor proved more problematic to planters during the colonial era. Without breaking entirely away from tobacco, the only way to combat a decline in prices was to increase production. Greater yields required more plants, and more plants needed the attention of more laborers. Planters had relied for decades on a steady stream of white indentured servants willing to trade seven years of their lives for passage to the colonies, and the chance ultimately to become planters themselves. Beginning in the 1680s, however, the number of white servants arriving in Virginia was declining acutely. Desperate for workers, planters turned reluctantly to a new source: African slaves. In Middlesex County, enslaved Africans came to exceed white servants at some point between 1687, when blacks comprised only 8 percent of the total population, and 1699, when they accounted for 22 percent. The implications of Tidewater's darkening complexion would be profound (Kulikoff 1986: 4-6; Rutman and Rutman 1984: 41-43, 165-66).

The transition from white to black labor throughout Tidewater Virginia coincided with a lengthy period of economic instability. From the 1680s through the 1720s, Virginia suffered through a prolonged depression in the tobacco market. During this period, tobacco prices exceeded the costs of production in only one year out of five. To compound the problem, European wars regularly interrupted transatlantic trade. Chesapeake planters of all ranks responded by becoming more self-sufficient. Many shifted their focus from tobacco to other subsistence crops, such as wheat and corn; they also began to make their own cloth and consume a variety of local products. Released from the tyranny of tobacco, Virginians now had more time on their hands. More time allowed for increasing craft specialization, which in turn fed the growing demand for local products. As a result, Virginians were significantly more self-sufficient in 1750 than they had been at the turn of the eighteenth century (Kulikoff 1986:5; Carr and Walsh 1994).

In addition to its distinctive architectural forms, Tidewater Virginia's particular geography and economy resulted in a unique pattern of settlement that would persist well beyond the colonial period. The overwhelming dependence on tobacco monoculture, combined with the relative ease of waterborne transportation along the region's vast network of navigable rivers and streams, resulted in an extremely dispersed form of settlement, with the landscape characterized by a patchwork of relatively self-sufficient plantations and smaller farms. Colonial officials had long expressed concern about the scattered nature of settlement and the relative absence of urban development. By the latter years of the seventeenth century, Virginia's House of Burgesses began to draft legislation to address this perceived problem. Over the next several decades, this effort to urbanize the colony had a direct effect on this area. A 1680 act for the establishment of towns authorized the establishment of the port town of Urbanna, situated on the only accessible harbor on the south shore of the Rappahannock. Despite a protracted struggle with Ralph Wormeley, upon whose land the town site was located, Urbanna's lots were eventually laid out and the first was sold in 1691. Urbanna had grown considerably by the early years of the eighteenth century, attracting considerable residential and commercial development, and becoming the focal point of trade and commerce in Middlesex County. As such, it figured prominently on the map of Virginia published by Joshua Fry and Peter Jefferson in 1755 (Figure 8) (Reps 1972: 78-79; Ryland et al. 1980: 11-12).

During the seventeenth- and early eighteenth centuries, the project area likely was encompassed by the estate of the wealthy and prominent Robinson family known as Hewick. Christopher Robinson arrived in Virginia around 1666, and by about 1678 had built a home called "The Grange" to the south of what was later named Robinson Creek. Robinson held a number of important political offices, serving as clerk of Middlesex County, as a Burgess and Councilor, and as Secretary of State for the colony. His son, Christopher Robinson II, inherited the property when he died in 1693. The plantation eventually passed to Christopher Robinson III in 1727. It is likely he who renamed the property Hewick after the family's ancestral home in Yorkshire, and built the core of the brick house that survives, in significantly altered form, on the property today (Gray et al. 1978: 1-4; VHLC 1978; Ryland et al. 1980: 14-15).

Colony to Nation (1750-1789)

Although the "noxious weed" had shaped all aspects of economic, social, and material life in the colonial period, Tidewater Virginia's "Golden Age" of tobacco-based prosperity would be relatively short-lived. By the second half of the eighteenth century, even the great plantation-owning gentry were beginning to feel the pinch of a sputtering, century-old tobacco economy. After a few decades of prosperity, tobacco was once again on the decline by the 1760s and 1770s. Severe economic problems in England precipitated by the costly Seven Years' War reverberated throughout the colonies. Faced with economic ruin, English merchants began calling in their debts, threatening the very foundation of the Tidewater economic system. For some time, Virginians of all ranks had relied on British credit to maintain, and gradually increase, their consumption of

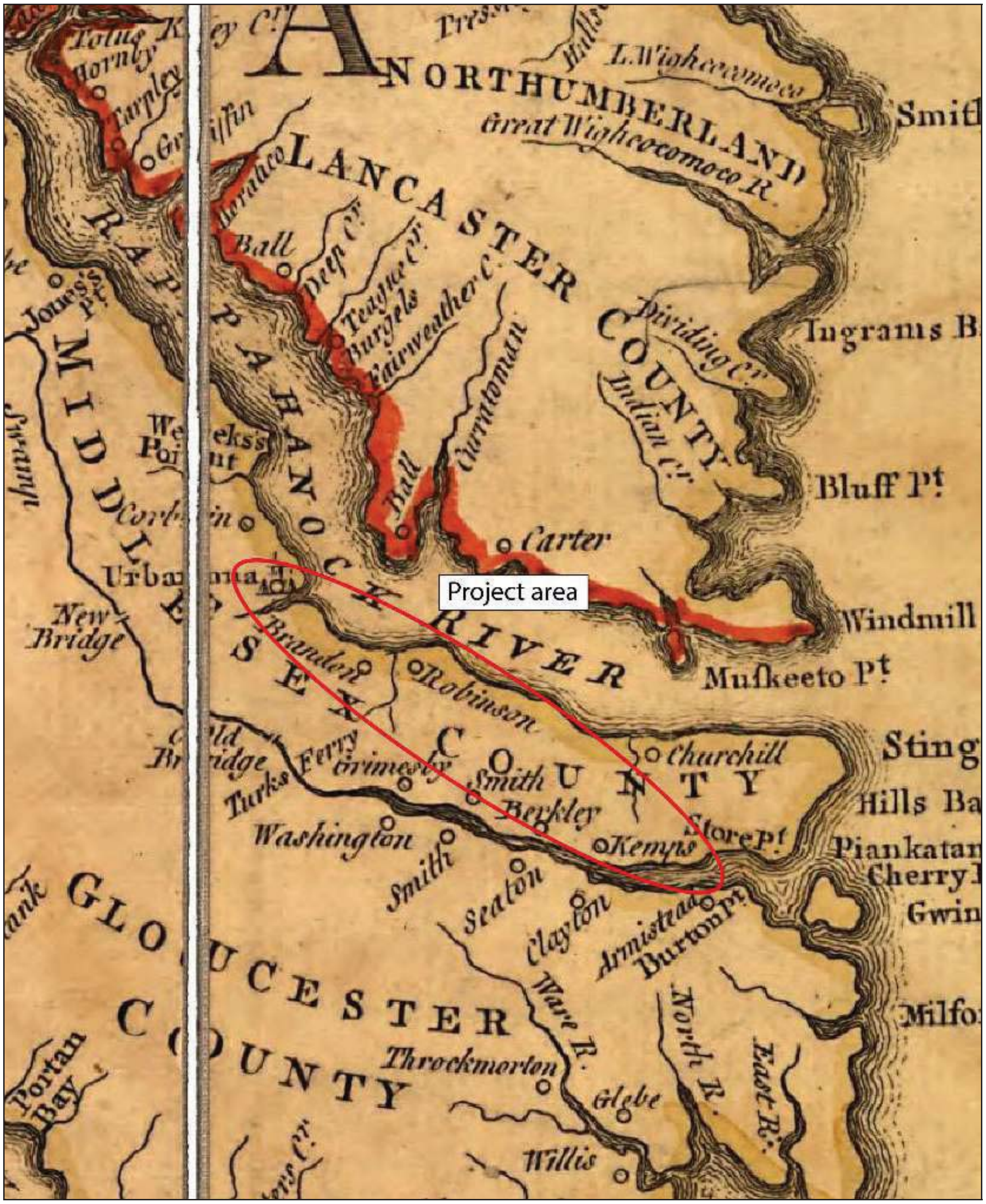


Figure 8. Location of the project corridor on detail of *A Map of the Most Inhabited Part of Virginia* (Fry and Jefferson 1755).

imported goods, thereby raising their standard of living. This constriction of credit threatened to topple even the most prominent planters (Kaplan 1993: 55, 67).

The Anglo-American commercial crisis also had significant political ramifications. Virginians and residents of other colonies balked at the growing imposition of taxes to maintain the imperial interests of Great Britain in America, and were particularly incensed by duties on imported items, of which tea was perhaps the most conspicuous example. The regular meeting of the local militia had long been a fixture of life at the county level, though it was more an opportunity for drinking and socializing than a display of martial prowess. The formerly jovial atmosphere surrounding militia training would soon take on a deadly seriousness, however, for by the following year a state of war existed between the American colonies and Great Britain, and Virginians took up arms to fight for independence. Although no major fighting occurred in this part of the Commonwealth during the Revolutionary War, the Virginia campaign of 1781 brought the rival armies through the area in the waning stages of the conflict, inflicting damage to the area's towns and farms alike. More profoundly, the Revolution effectively brought an end to Virginia's tobacco economy. During the war, the markets for Virginia tobacco were almost completely severed. Planters were forced to diversify, turning primarily to corn, wheat, and livestock for export to the West Indies. As a result, by the 1790s, tobacco had virtually disappeared north of the James River (Kaplan 1993: 55, 67).

Until the American Revolution, the region had been dominated politically, economically, and socially by a relatively small group of wealthy plantation owners who owned the preponderance of the land, slaves, and other resources. The most visible symbols of their prestige were the large stately homes that dotted the landscape, typically set on prominences overlooking the Pamunkey and Mattaponi rivers. But few could afford to live in the relative splendor enjoyed by the plantation elite. In her study of housing in the Northern Neck in the latter part of the eighteenth century, Camille Wells describes a rural landscape characterized by modest tracts of 200 acres or less. These largely self-sufficient farms had a distinct form that caught the attention of a German traveler in 1783. "A plantation in Virginia," he wrote,

> and also in the lower parts of Maryland, has often the appearance of a small village, by reason of the many small buildings, which taken all together would at times hardly go to make a single roomy and commodious house. Here are living-rooms, bed-chambers, guest-chambers, store-rooms, kitchens, quarters for the slaves, and who knows what else (Wells 1994: 6).

Wells' study of property advertisements from the *Virginia Gazette* and other records revealed each plantation as a highly structured landscape, "determined by the impulse of land-owning planters to achieve, maintain, and demonstrate their authority over others." Around the main house were arrayed a number of satellite structures, kitchens, smoke-houses, dairies, barns, sheds, and slave quarters, comprising the "small village" noted by the foreign visitor (Wells 1994: 28).

Early National and Antebellum Periods (1789-1860)

In the latter years of the eighteenth century, the entire Chesapeake region underwent a radical transition between the tobacco-based plantation economy of the colonial period and a new, diversified, grain-based economy that would characterize the region through the nineteenth and twentieth centuries. By the time of the American Revolution, all arable land in the Tidewater and Piedmont regions of Virginia had been planted in tobacco at least once, and most areas were experiencing the effects of severe soil depletion. Between 1790 and 1820, as many as 250,000 Virginians moved from the older settled parts of the state to the recently opened southwest frontier, taking approximately 150,000 enslaved African Americans with them. The virtual collapse of the tobacco economy and the resultant outmigration of significant numbers of people had a revolutionary effect on the social and economic character of the Tidewater region. Large plantations that had relied on slave labor were increasingly subdivided into smaller-scale farmsteads that grew corn and wheat rather than tobacco. This change was also reflected in the cultural landscape, as settlement tended to move away from major rivers and creeks, the primary routes of transportation and communication in the colonial period, and clustered along an increasingly complex system of interior roads (Kulikoff 1986: 422, 429).

As tobacco declined as Virginia's principal export crop, so did the once flourishing port town of Urbanna. When the British minister Harry Toulmin visited the town in 1793, he clearly was unimpressed with its current condition. "Urbanna was formerly a place of some trade and importance," he recorded,

> for as the custom house for the Rappahannock was there, the vessels were obliged to clear at that port. But the customhouse being removed to Port Royal, it is now a deserted village and as the land in the neighborhood is engrossed by a few great proprietors there are only three or four store- or shipkeepers in the town, besides some sauntering young men, the vacuity of whose countenances unites with the grass-covered streets to give the place a most melancholy aspect. I believe there are not above a dozen houses in the town (Reps 1972: 79).

Regardless of their social standing, farmers in the Rappahannock River valley found themselves confronted in the early years of the nineteenth century by land that was simply worn out by decades of tobacco farming. Meanwhile, the prevailing agricultural practice of crop rotation every three years insured that even wheat and corn depleted the soils at an alarming rate. But it was not long before a small group of far-sighted Virginians dedicated to "scientific agriculture" helped to usher in a new era of productive farming. In his series of essays entitled *Arator*, Caroline County's John Taylor demonstrated the benefits of four-field crop rotation, in which soils could be improved significantly by rotating corn, wheat, fertilizer, and clover. Similarly, in the early 1820s, Edmund Ruffin publicized the effectiveness of marl in reducing soil acidity, a technique that could triple the productivity of Tidewater soils. Other agricultural improvements included contour plowing to reduce erosion, cast iron plows, threshing machines, and corn shellers. To some extent, the improved yields offered by the new farming practices helped staunch the hemorrhaging of the region's population (Kaplan 1993: 87-88).

The introduction of new crops, and advances in farm management and fertilization had a significant effect on settlement patterns in nineteenth-century Tidewater Virginia. Lands formerly considered marginal could now be incorporated into agricultural production, a process accelerated by the increasing subdivision of family farms through inheritance. Regional locational models also suggest that soil type and slope remained the most important factors influencing nineteenth-century settlement patterns. Though a somewhat broader variety of soils could now be brought into production through advances in agricultural practices, areas of prime farmland and gentle slope were still most valued for farming and settlement. The resurgence of the region's agricultural economy in the first half of the nineteenth century prompted a minor industrial boom in the form of gristmills. With increasing amounts of grain for export, local farmers needed a reliable means of grinding their grain. Water-powered mills sprang up across the county, and the economic and social importance of their owners was underscored by the fact that millers were exempted from militia musters. Much official ink also was spilled in ensuring the upkeep of roads leading to mills, the quality of their output, and the accuracy of their measuring equipment (Heath 1999: 53-67; Kaplan 1993: 86).

Just as the tobacco economy had an enormous influence on the built landscape in the colonial period, the emergence of a new consumer culture in the late eighteenth- and early nineteenth centuries had a similarly transformative effect on how people lived. Like refined earthenwares or tea sets, Edward Chappell notes, buildings can also be viewed as "consumer goods." Houses, he claims, "embody attitudes toward material life and are shaped by new domestic activities and changing economic conditions." The size and design of houses say much about their occupants' perceived domestic needs, social priorities, and relative wealth. Scholars of early American architecture have increasingly noted a profound transformation in Chesapeake housing after the American Revolution that appears to correlate with a contemporary "revolution" in consumer behavior. Throughout the eighteenth century, the most common rural house type consisted of a single- or two-room frame building with little or no trim, plaster, or paint. Post-in-ground construction remained evident throughout the century, though this "impermanent" building style increasingly became associated with the most modest buildings, such as slave quarters or poor tenant households. Though the "building revolution" of the late eighteenth and early nineteenth century had more of an impact on urban dwellers and more affluent rural residents, a general change in domestic architecture has been noted archaeologically even in modest vernacular housing during this period. Attitudes towards permanence are reflected in an increasing emphasis on brick or stone foundations as opposed to earthfast building techniques, while an increasing desire for privacy, comfort, and sanitation may be reflected archaeologically by a greater division of interior space and more focused areas of domestic activity (Chappell 1994: 167-232).

During this period, local farmers had considerable success with a variety of crops, particularly corn and wheat, as well as oats and cotton. Despite slow improvements to the internal road network, the Rappahannock River still provided the quickest and most economical way of transporting goods to market, and regular passenger and freight service from Urbanna linked Middlesex County with outside markets, particularly Baltimore. In general, however, this region did not see any significant development of the transportation infrastructure—such as canals, turnpikes, and railroads—which characterized other parts of the state in the antebellum period.

Civil War (1861-1865)

Compared with northern Virginia and the immediate vicinity of Richmond, Middlesex County witnessed relatively little direct military action during the Civil War, and no major battles. Union gunboats regularly patrolled the Rappahannock River, and on one memorable occasion in 1861 fired on the town of Urbanna, the site of a Confederate training camp. Although spared much of the destruction and bloodshed endured elsewhere in Virginia, the residents of this region still suffered considerably during the conflict. The majority of able-bodied Middlesex County men served in units of the Confederate army, leaving farms to languish in their absence. Meanwhile many local enslaved African Americans took advantage of the presence of Union forces to flee their farms and plantations. When the war came to an end in April 1865, the physical, social, and economic landscape of the county had been irreversibly altered (Ryland et al. 1980: 49-50; Atkinson 1990: 96-97; 163).

Reconstruction and Growth (1865-1917)

The combined loss of manpower and draft animals, the neglect of agricultural land, and the emancipation of the slave population had a detrimental effect on the region's economic and social landscape in the postwar era. Property values plummeted over the next several years: land that had sold for $10 per acre before the war now fetched only $1-3. In fact, the real estate market was so depressed that during their 1869-70 session the General Assembly enacted a law prohibiting the sale of land for less than 75 percent of its assessed value (Kaplan 1993: 153-56).

Even the climate appeared to be conspiring against Tidewater farmers. "A severe drought has prevailed here for a long time," noted Cornelius Hart Carlton of neighboring King and Queen County in the summer of 1872.

> I heard a man say lately that the last fall of water he had was the last snow. Our gardens are very bad; the oat crop a failure, and the corn crop set back. . . . It has been very hot for the last seven or eight days. It is so dry that the mills cannot grind (Kaplan 1993: 155).

Despite these many hardships, the region was boosted by the emergence of a strong market for local oysters, fish, and crabs, and in the late nineteenth and early twentieth centuries Urbanna became the center of a profitable seafood industry. Even so, agriculture remained the mainstay of the local economy. By the latter years of the nineteenth century, the face of Tidewater farming had shifted to market gardening. In 1892, Virginia was producing upwards of $7 million in produce. Canneries sprang up to facilitate transportation of these products to distant markets, and by 1900 the Old Dominion ranked third among states engaged in market farming and canning. Principal crops in the region now included corn, wheat, oats, rye, tobacco, potatoes, beans, and peas, as well as peanuts, sorghum, and broom-corn. In a pattern reminiscent of the early nineteenth century, postwar agricultural difficulties prompted many local farmers to seek alternative sources of income. Farm fields neglected since the Civil War had produced stands of mature trees, providing ample resources for an expanding timber industry. While many residents chose to leave the area for jobs in Richmond or elsewhere, those who stayed and continued to farm joined the “Grange,” or “Patrons of Husbandry,” a fraternal order established in 1867 and dedicated to helping farmers learn new agricultural methods. Though Virginians were initially slow to join, by 1876 the organization claimed 18,000 members in Virginia in 685 local chapters. Though the Grange had lost most of its power by the 1890s, it was replaced by similar organizations, including the Farmers’ Assembly and Farmers’ Alliance, and the annual Farmers’ Institutes (Ryland et al. 1980: 79; Kaplan 1993: 155, 176-77, 180-81, 198).

World War I to World War II (1917-1945)

Aside from a few significant changes—chiefly the emancipation of the enslaved population—this region remained much the same in the early twentieth century as it had been before the Civil War. Residents remained relatively isolated on self-sufficient farms, roads were poor, and communication was slow. Daily life revolved around the agricultural schedule, while churches continued to be important social institutions. Despite the rapid progress witnessed in urban America during these years, few in the county would have access to automobiles, electricity, or telephones for many years to come (Kaplan 1993: 199-204).

The New Dominion (1945 to Present)

Despite the rapid spread of the MSX virus that nearly wiped out the Chesapeake’s oyster beds in the 1940s, Urbanna’s well-established seafood industry managed to survive. The town’s reputation as the oyster capital of Virginia has been bolstered by its renowned oyster festival, held annually since 1958. Middlesex County has remained largely rural and agricultural since World War II, its economy bolstered by tourism and property development by non-residents. As part of Tidewater Virginia’s “Gold Coast,” the county has attracted a significant retirement-age population, with the percentage of residents aged 65 and older approximately twice the state average (Edwards and Salmon 1990; Landmark Design Group 2001).

HISTORIC MAP ANALYSIS

The earliest detailed maps of those areas included within project area consist of coastal surveys completed by cartographers of the U.S. Coast Survey in the 1850s and 1860s. According to the 1856 *Map of a Portion of the Rappahannock River*, the proposed Urbanna pump station and associated TFM corridor were well beyond the developed area of the town (Figure 9). And there is no evidence of any buildings or other significant features in the vicinity of the HDD crossing of Urbanna Creek. Similarly, the 1869 *Piankatank River, Virginia* survey does not indicate any built improvements on either the north or south side of the proposed HDD crossing (Figure 10).

The earliest 15’ U.S.G.S. topographic quadrangle maps including the project area were published in 1916 (Kilmarnock) and 1917 (Urbanna) (Figures 11-13). These maps

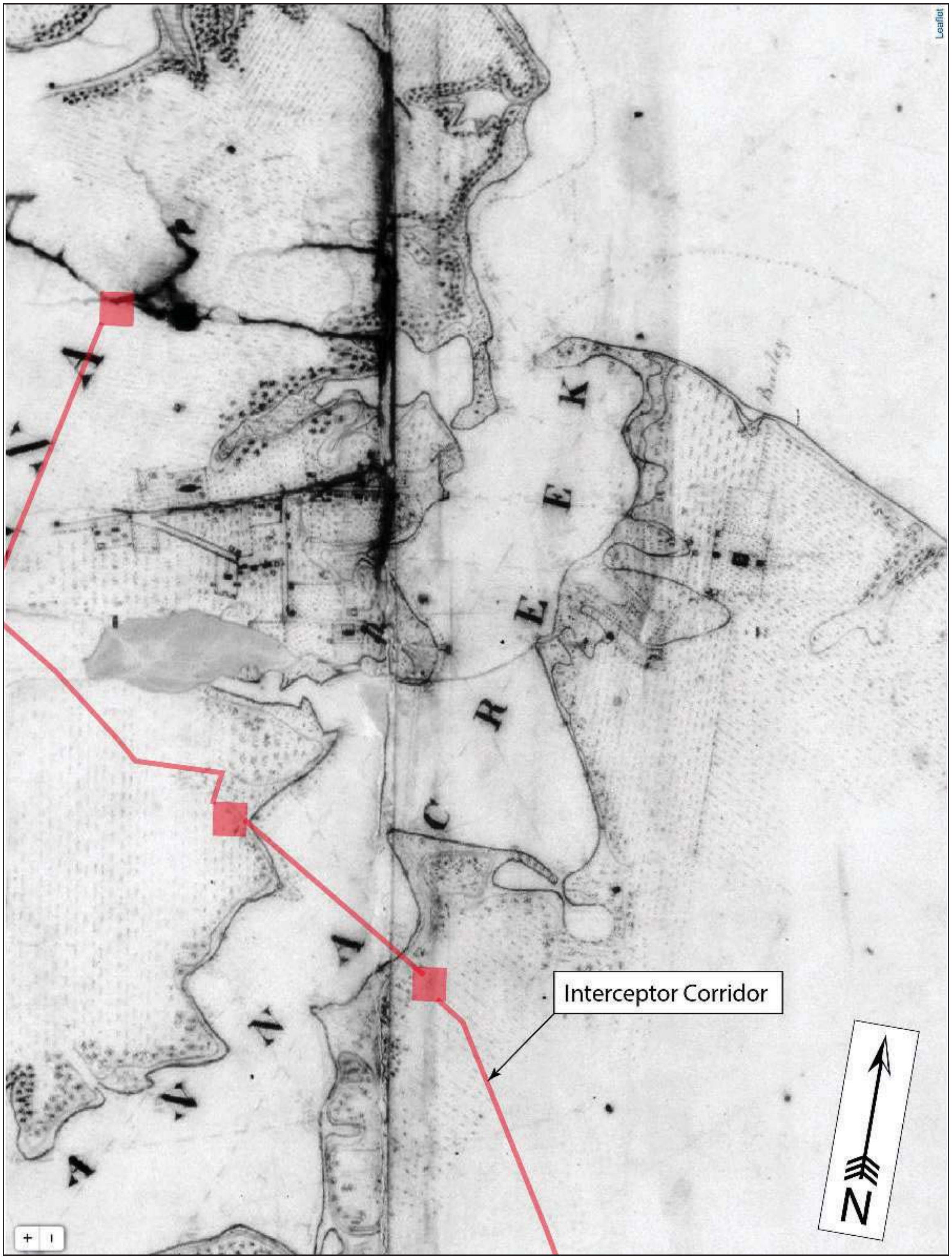


Figure 9. Location of the project corridor on detail of *Map of a Portion of the Rappahannock River*, Sheet No. 12 (Adams 1856).

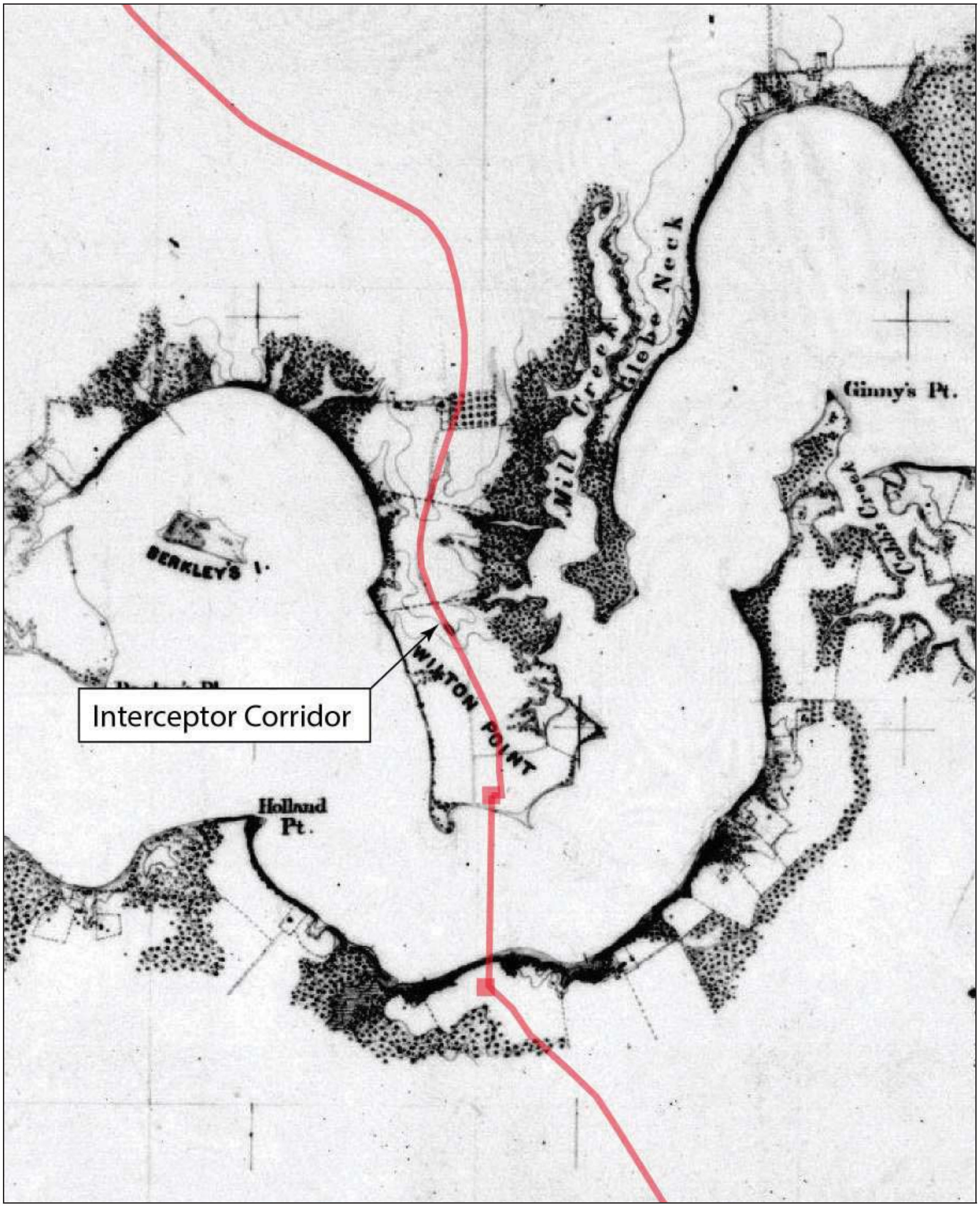


Figure 10. Location of the project corridor on detail of *Piankatank River, Virginia* (Donn 1869).

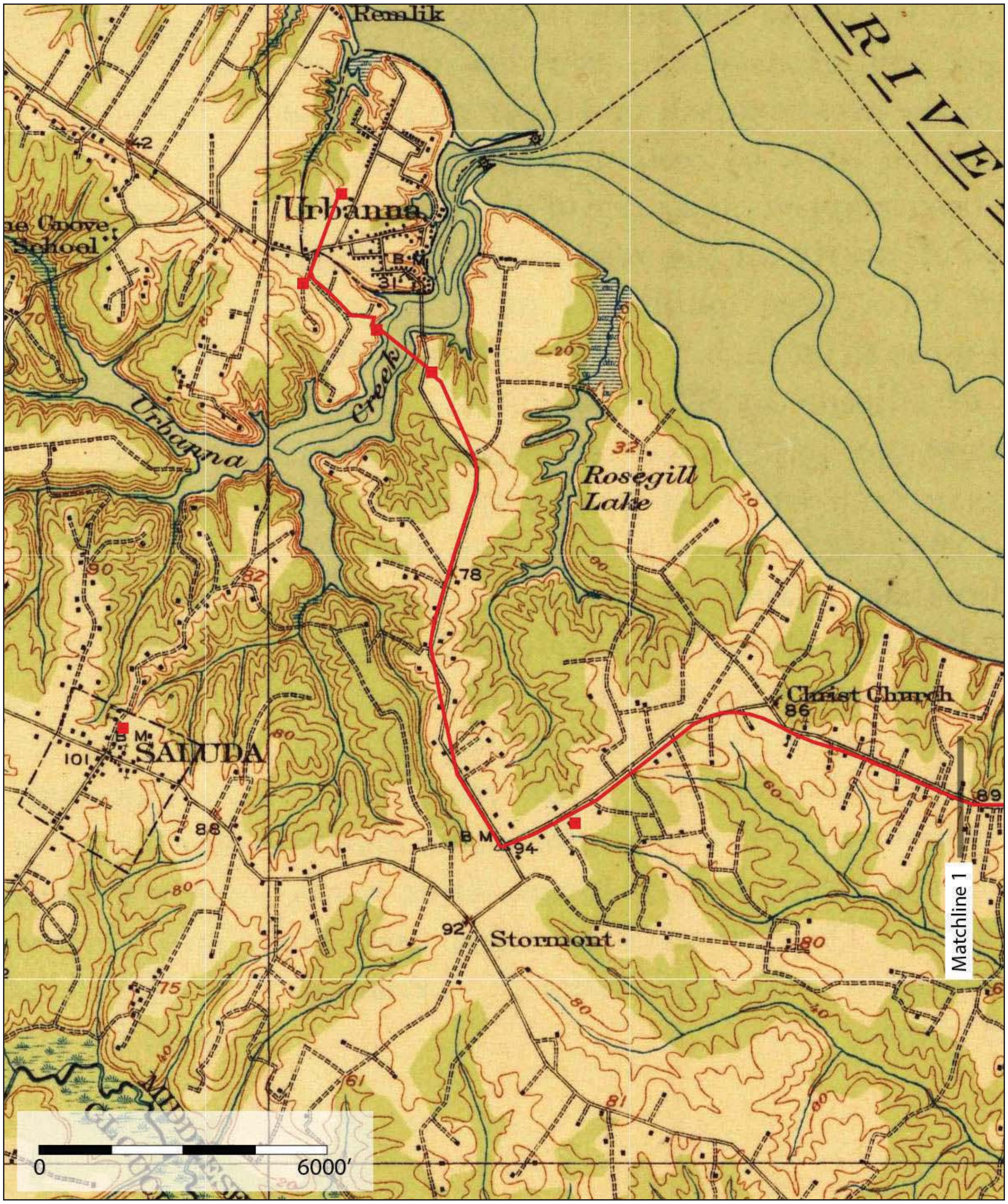


Figure 11. Location of the project corridor on detail of U.S.G.S. 15' Urbanna (1917) topographic quadrangle map.

Figure 12. Location of the project corridor on detail of U.S.G.S. 15' Urbanna (1917) and Kilmarnock (1916) topographic quadrangle maps.

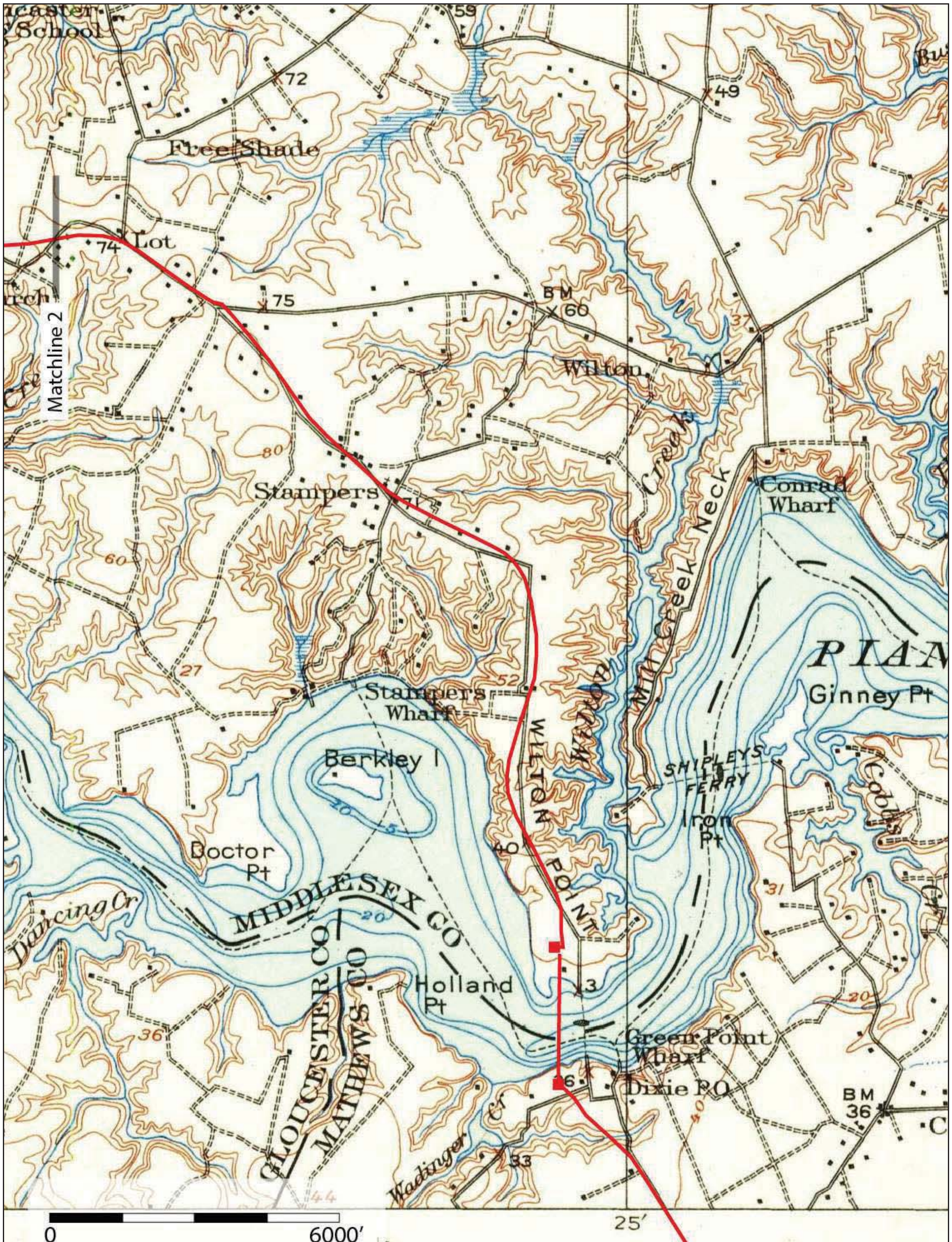


Figure 13. Location of the project corridor on detail of U.S.G.S. 15’ Kilmarnock (1916) topographic quadrangle map.

that, with only some minor deviation, the precursors to the modern Routes 227, 33, and 3 followed essentially the same course as they had since the seventeenth century, when the main east-west thoroughfare, known simply as "The Road," was the main artery linking settlements across the county, extending 35 miles from the northwest corner of Middlesex County to the Chesapeake Bay. The section of the current Route 33 between Cooks Corner and Harmony Village was then a branch of the main road (which followed what is now Route 629). It was known as "the Church Path" because it led to ca. 1712 Christ Church, familiarly called the "Mother Church," of which the Wormeleys of Rosegill were the primary patrons (Galluci et al. 1992: 10).

There are two notable differences between the early twentieth-century transportation routes depicted on these maps and the present. A section of what is now Route 227 immediately south of Urbanna Creek was located to the west of the current right-of-way. And the current Route 3 terminated at the south end of Wilton Point, where Twigg's Ferry crossed the Piankatank River to Mathews County before the John Andrew Twigg Bridge was built in 1953.

III. PREVIOUSLY RECORDED CULTURAL RESOURCES

The following section details all cultural resources (including historic districts, standing structures, and archaeological sites) recorded in the DHR's Virginia Cultural Resource Information System (V-CRIS) within 100 feet of the proposed Saluda, Urbanna, and Cooks Corner pump stations, Middlesex TFM corridor, and associated HDD crossings.

DHR V-CRIS Map 1 (Figure 14)

The proposed location of the Central Middlesex Treatment Plant pump station is in the parking lot adjacent to the existing wastewater treatment plant, which is situated to the north of the Middle Peninsula Regional Security Center. The proposed pump station location is within 100 feet of the northern boundary of the Saluda Historic District (DHR ID# 059-5124) which has been determined eligible for listing in the National Register. There are no other previously recorded archaeological or architectural resources in the immediate vicinity.

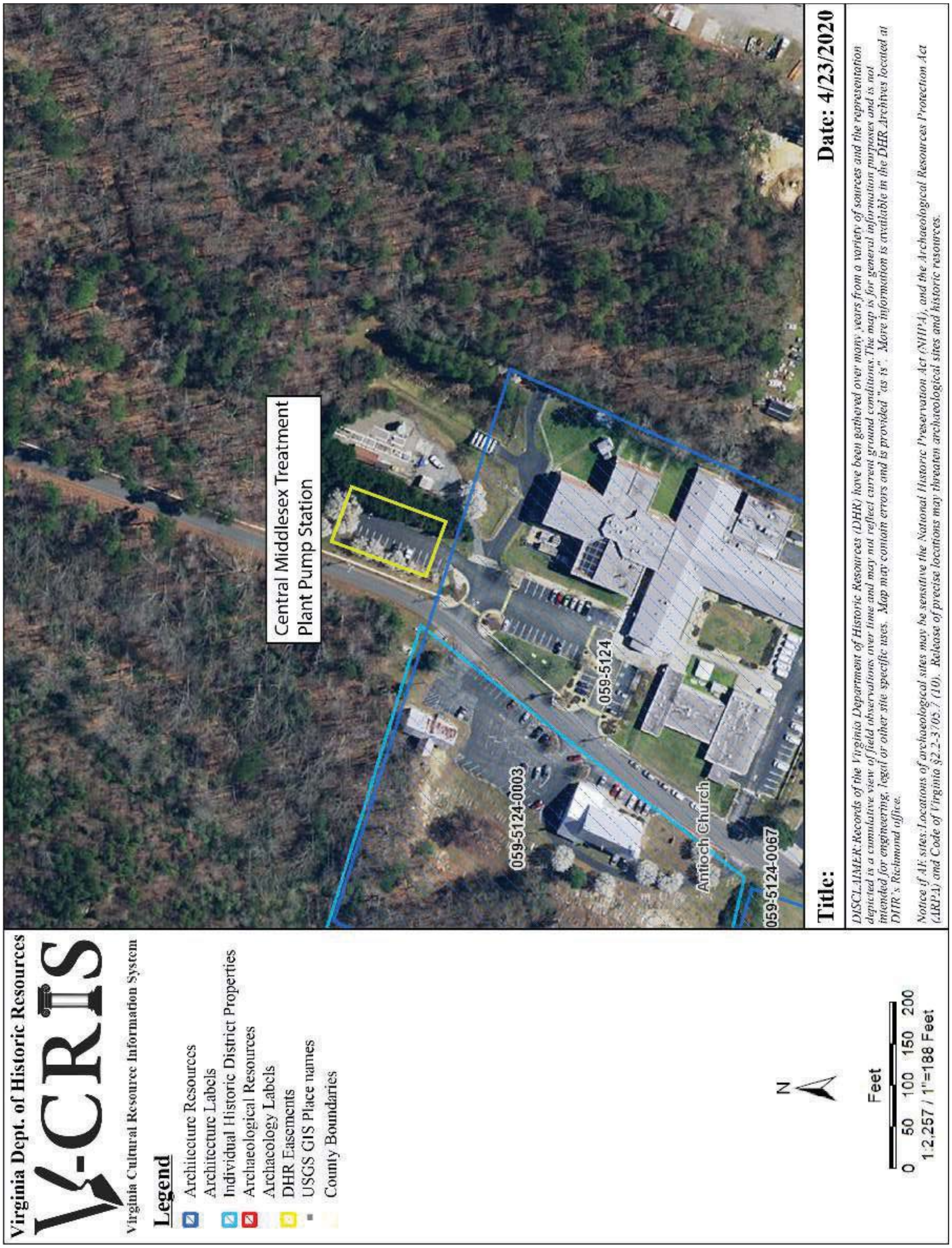


Figure 14. DHR V-CRIS Map 1.

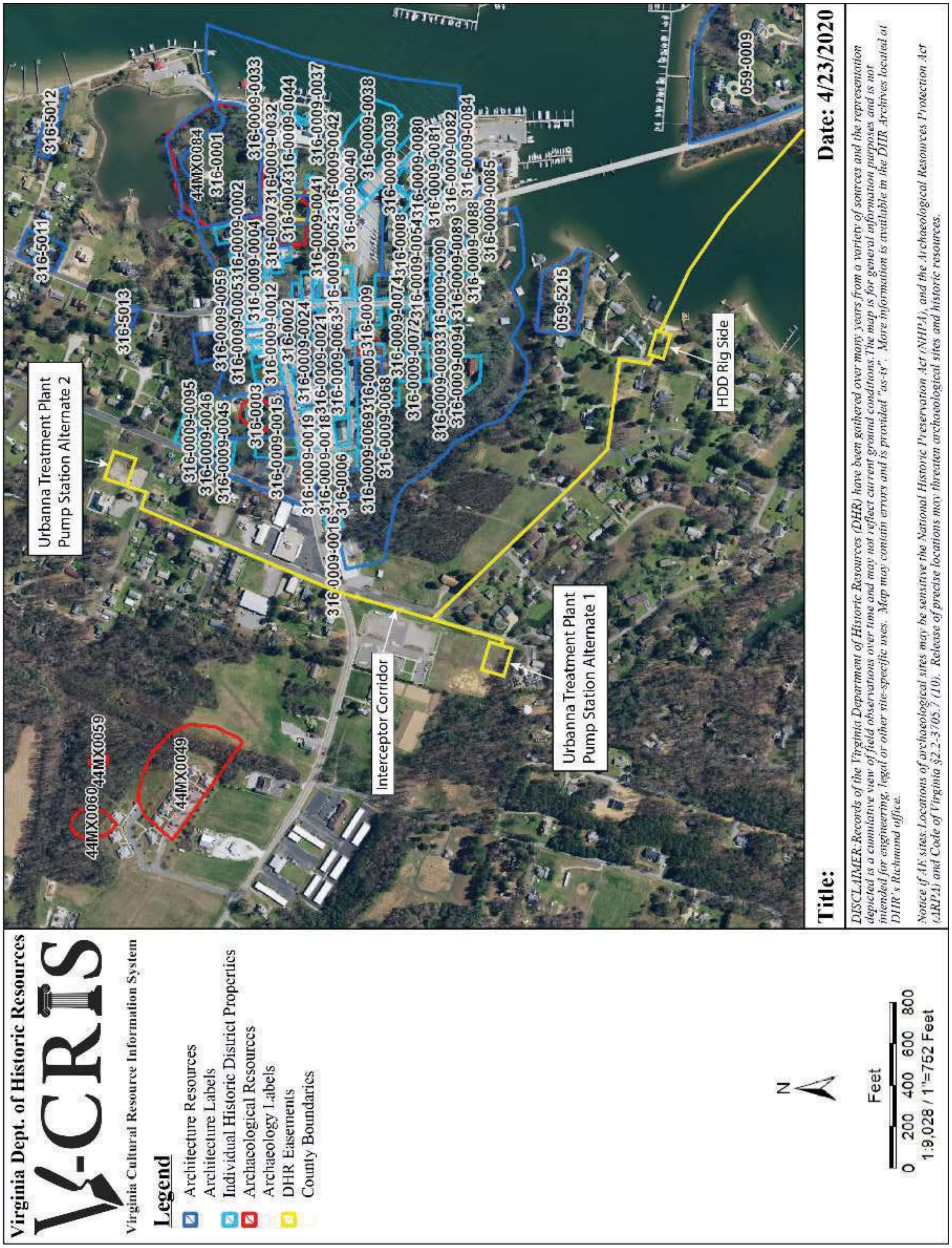


Figure 15. DHR V-CRIS Map 2.

DHR V-CRIS Map 2 (Figure 15)

The proposed location of the Urbanna Treatment Plant pump station (Alternate 2) and the associated TFM corridor within the limits of the Town of Urbanna are situated outside of the boundaries of the Urbanna Historic District (DHR ID# 316-0009), which is listed in the National Register and the Virginia Landmarks Register. On the south of Route 602/Virginia Street, the proposed location of the Urbanna Treatment Plant pump station (Alternate 1), TFM corridor, and HDD rig on the west side of Urbanna Creek do not coincide with any previously recorded archaeological or architectural resources.

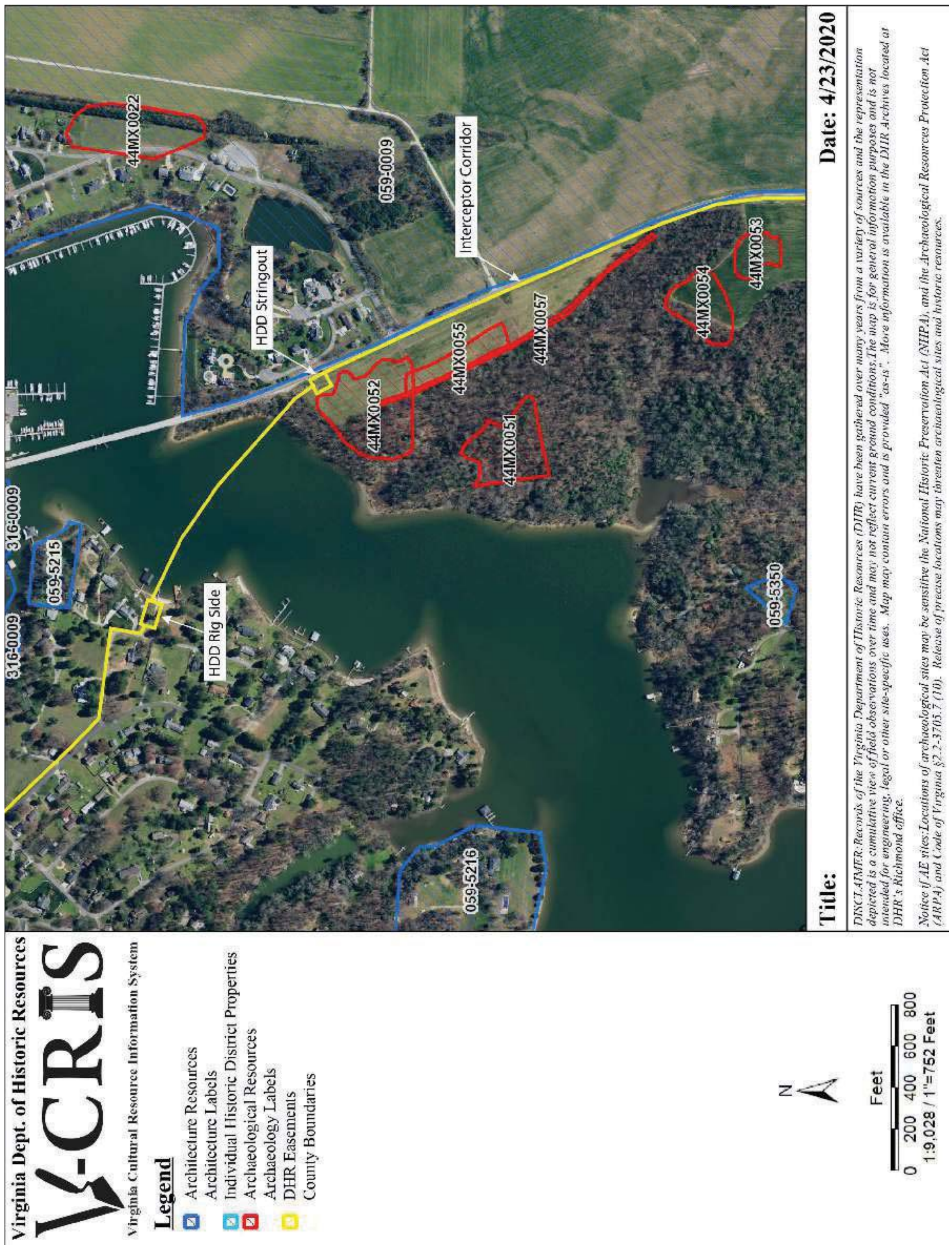


Figure 16. DHR V-CRIS Map 3.

DHR V-CRIS Map 3 (Figure 16)

Archaeological Resources

The proposed location of the HDD stringout on the east side of Urbanna Creek is in the immediate vicinity of previously recorded Site 44MX0052. This site was first recorded in the course of a Phase I surface collection survey of Rosegill completed by Cultural Resources, Inc. (CRI) on behalf of Rosegill Development LLC in 2006. CRI subsequently conducted a Phase II investigation of the site which suggested that it represents a multi-component prehistoric/historic resource with evidence of occupation during the Middle Woodland through Contact periods, and the nineteenth century. Shovel testing and test unit excavation during the Phase I and II investigations yielded a variety of Native American artifacts, including Mockley (Middle Woodland), Roanoke (Contact Period), and unidentified ceramics, debitage/shatter, a biface, groundstone fragments, a cobble tool, and fire-cracked rock. Given the date of the prehistoric artifacts, it is possible that this site is associated with the village of Opiscopank mapped by John Smith, and/or the subsequent Nimcock towns described by Ralph Wormeley (see Figure 6). Based on the results of the Phase II investigation, CRI recommended that the prehistoric Native American site component was eligible for listing in the National Register under Criterion D, but that the historic component was not eligible (Brady et al. 2006). To date, the DHR has not reviewed the CRI Phase II report nor concurred with these recommendations

In the course of their 2006 Phase I survey, CRI also recorded a section of relict road trace corresponding with the precursor to the current Route 227 (see Figure 11). The southern end of the road trace is in the vicinity of the TFM corridor on the west side of Route 227. The National Register eligibility of this resources has not been evaluated.

Architectural Resources

The boundary of the Rosegill property (DHR ID# 059-0009), which is listed in the National Register and Virginia Landmarks Register, runs along the east side of Route 227.

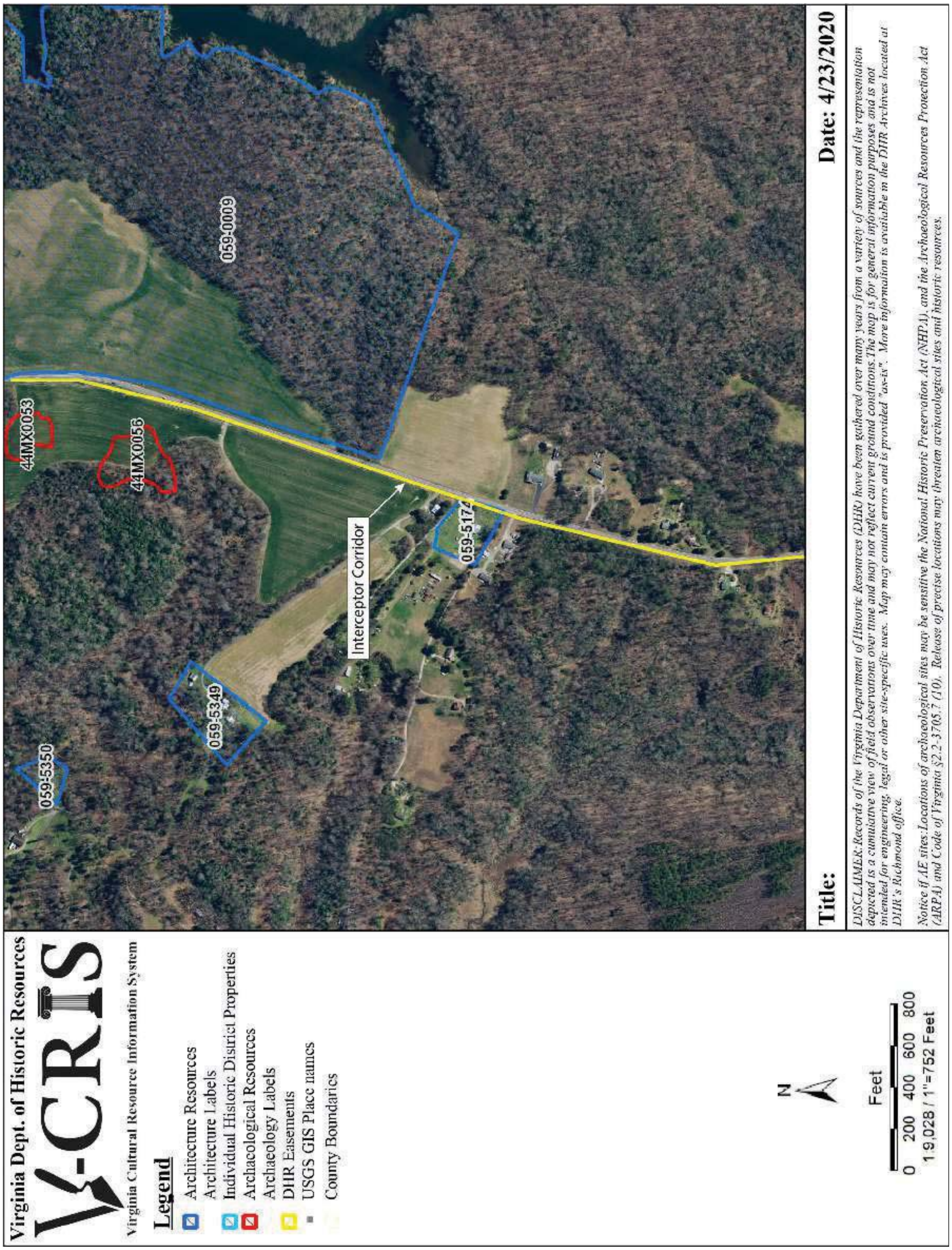


Figure 17. DHR V-CRIS Map 4.

DHR V-CRIS Map 4 (Figure 17)

Architectural Resources

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 227:

- House, 1103 Urbanna Road (DHR ID# 059-5174), ca. 1940, National Register eligibility not evaluated.

Figure 18. DHR V-CRIS Map 5.

DHR V-CRIS Map 5 (Figure 18)

Architectural Resources

The TFM corridor bypasses three previously recorded architectural resources adjacent to the west side of Route 33:

- House, 281 Urbanna Road (DHR ID# 059-5175), ca. 1954, National Register eligibility not evaluated.
- House, 267 Urbanna Road (DHR ID# 059-5176), ca. 1950, National Register eligibility not evaluated.
- Store, 147-165 Urbanna Road (DHR ID# 059-5177), ca. 1950, National Register eligibility not evaluated.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the east side of Route 33:

- G.L. Davis Service Center, Café, and Tavern (DHR ID# 059-5424), pre-1960, National Register eligibility not evaluated.

There are no previously recorded archaeological or architectural resources in the immediate vicinity of the proposed Cooks Corner pump station location.

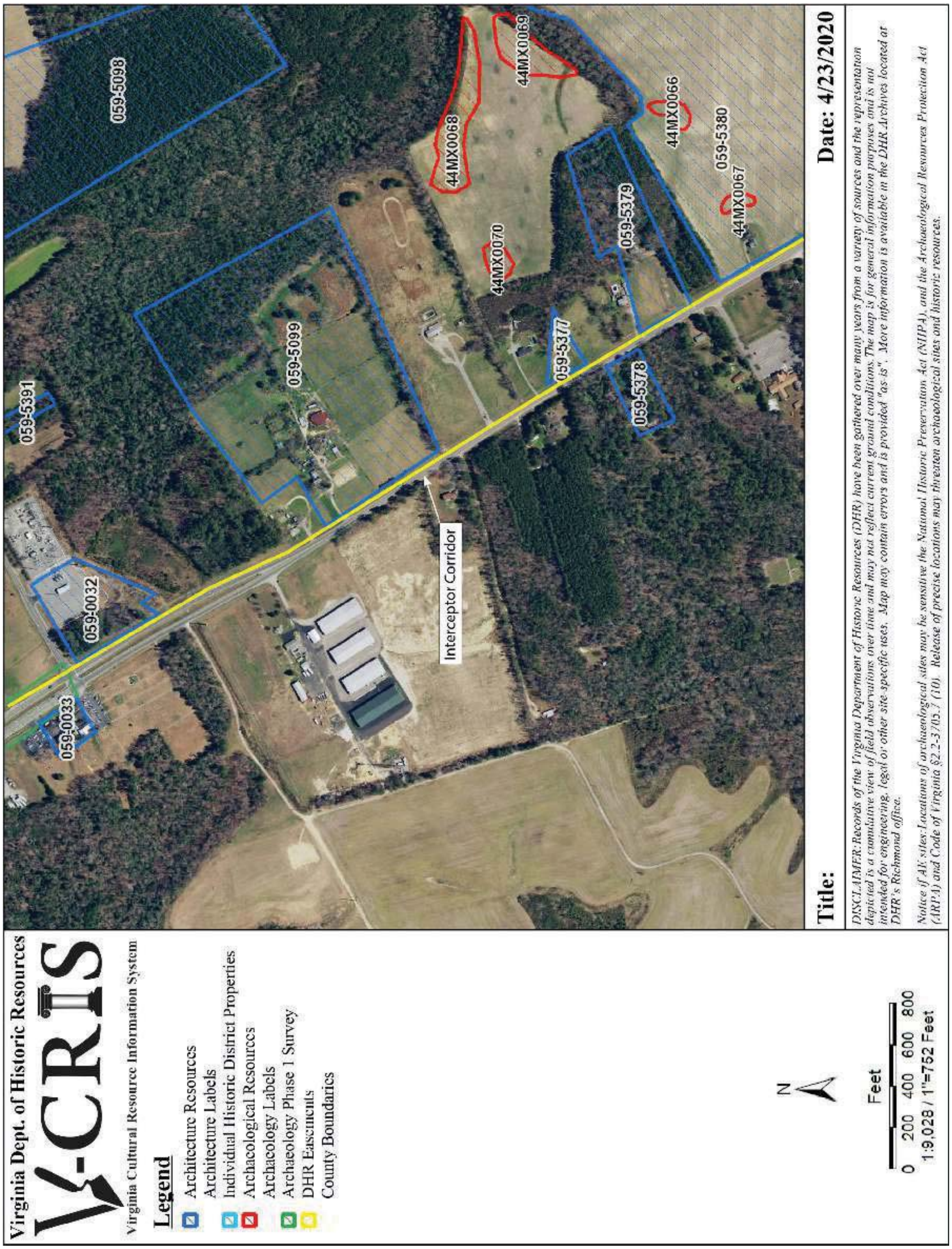


Figure 19. DHR V-CRIS Map 6.

DHR V-CRIS Map 6 (Figure 19)

Architectural Resources

The TFM corridor bypasses four previously recorded architectural resources adjacent to the east side of Route 33:

- House, General Puller Highway (DHR ID# 059-0032), pre-1960, no longer extant.
- Farm, 8049 General Puller Highway (DHR ID# 059-5099), ca. 1928, National Register eligibility not evaluated.
- House, 8307 General Puller Highway (DHR ID# 059-5377), ca. 1952, National Register eligibility not evaluated.
- House, 8433 General Puller Highway (DHR ID# 059-5379), ca. 1964, determined not eligible for the National Register.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 33:

- House, 8364 General Puller Highway (DHR ID# 059-5378), ca. 1920, determined not eligible for the National Register.

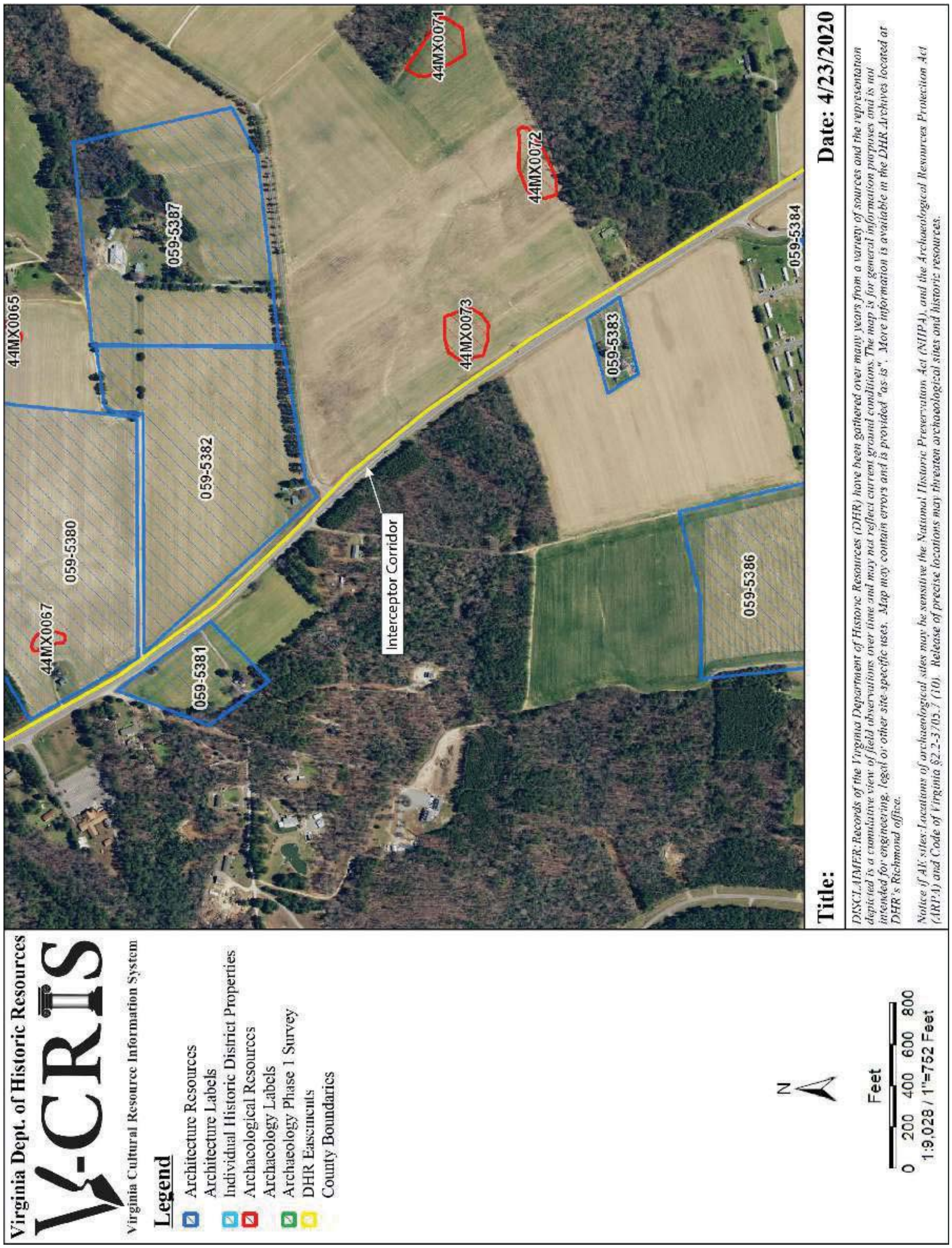


Figure 20. DHR V-CRIS Map 7.

DHR V-CRIS Map 7 (Figure 20)

Archaeological Resources

The TFM corridor bypasses Site 44MX0073, which is located within 100 feet of the east side of Route 33. The site was identified by Dutton + Associates, Inc. in 2017 in the course of a Phase I survey of the proposed Puller Solar project area. The site consisted of a scatter of late nineteenth-/early twentieth-century artifacts, and the DHR concurred that the site is not eligible for listing in the National Register.

Architectural Resources

The TFM corridor bypasses two previously recorded architectural resources adjacent to the east side of Route 33:

- House, 8519 General Puller Highway (DHR ID# 059-5380), ca. 1900, determined not eligible for the National Register.
- House, 9 Bobs Hole Road (DHR ID# 059-5382), ca. 1930, determined not eligible for the National Register.

The TFM corridor bypasses two previously recorded architectural resources adjacent to the west side of Route 33:

- House, 8656 General Puller Highway (DHR ID# 059-5381), ca. 1940, determined not eligible for the National Register.
- House, 9144 General Puller Highway (DHR ID# 059-5383), ca. 1890, determined not eligible for the National Register.

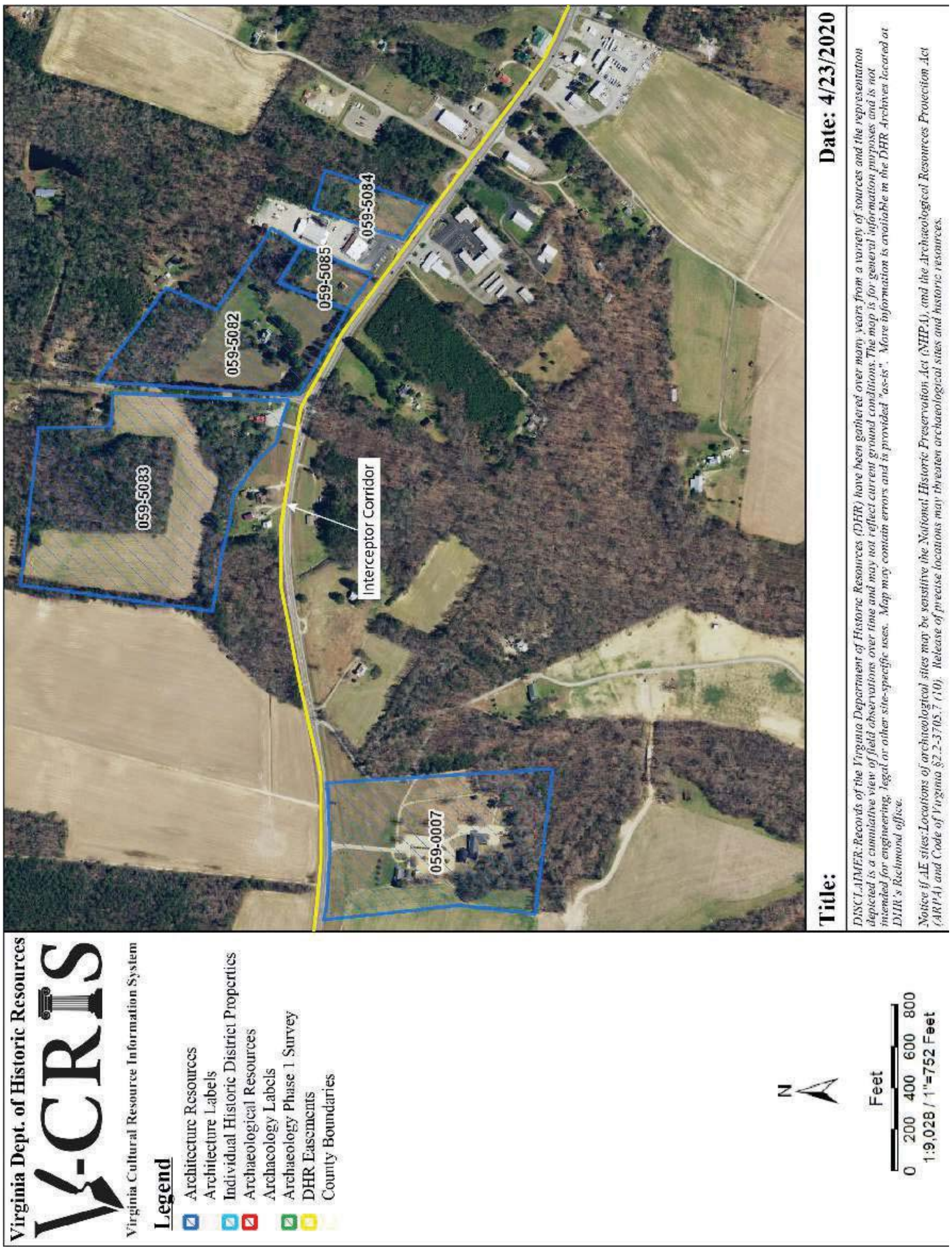


Figure 21. DHR V-CRIS Map 8.

DHR V-CRIS Map 8 (Figure 21)

Architectural Resources

The TFM corridor bypasses four previously recorded architectural resources adjacent to the east side of Route 33:

- Store, 10675 General Puller Highway (DHR ID# 059-5083), ca. 1874, National Register eligibility not evaluated.
- House, 10715 General Puller Highway (DHR ID# 059-5082), ca. 1912, National Register eligibility not evaluated.
- House, 10801 General Puller Highway (DHR ID# 059-5085), ca. 1940, National Register eligibility not evaluated.
- House, 10889 General Puller Highway (DHR ID# 059-5084), ca. 1875, National Register eligibility not evaluated.

The TFM corridor bypasses one previously recorded architectural resource adjacent to the west side of Route 33:

- Lower United Methodist Church (DHR ID# 059-0007), ca. 1717, listed in the National Register/Virginia Landmarks Register.

Figure 22. DHR V-CRIS Map 9.

DHR V-CRIS Map 9 (Figure 22)

Archaeological Resources

The TFM corridor bypasses Site 44MX0050, which is adjacent to the east side of Route 3. The site was identified by WMCAR in 2004 in the course of a Phase I survey for the Route 630 project. The site represented the remains of a store which operated at the site from the 1920s through the 1970s. The DHR concurred that the site is not eligible for listing in the National Register.

Architectural Resources

The TFM corridor bypasses three previously recorded architectural resources adjacent to the east side of Route 3:

- City of Refuge Church, 20 City of Refuge Road (DHR ID# 059-5061), ca. 1920, National Register eligibility not evaluated.
- Kent's Store, Routes 3 and 630 (DHR ID# 059-5007), ca. 1930, determined not eligible for the National Register.
- Thomas House, Routes 3 and 630 (DHR ID# 059-5008), ca. 1945, determined not eligible for the National Register.

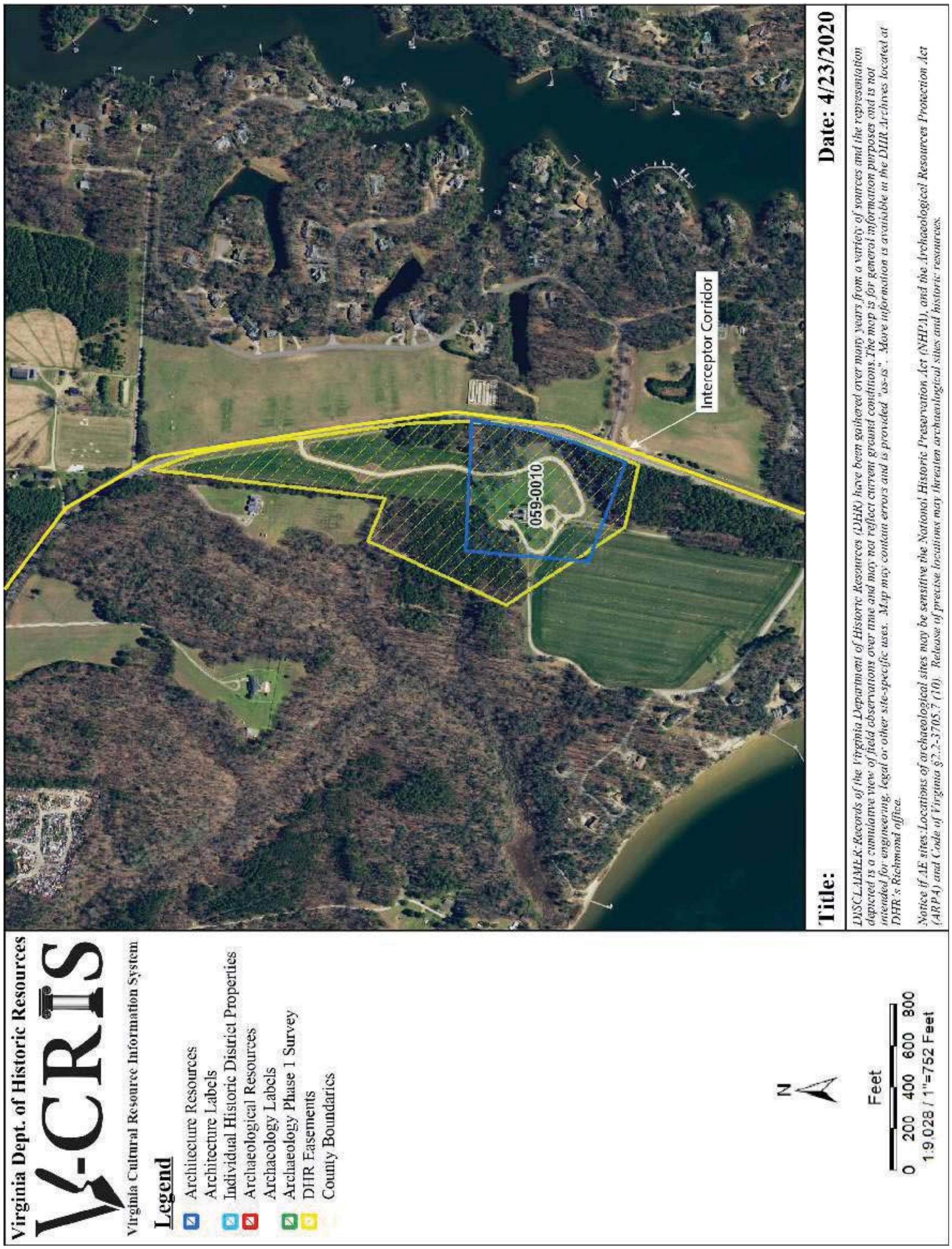


Figure 23. DHR V-CRIS Map 10.

DHR V-CRIS Map 10 (Figure 23)

The boundary of Wilton (DHR ID# 059-0010) runs along the west side of Route 3. This historic property, which dates to 1763, is listed in the National Register/Virginia Landmarks Register, and is subject to an historic preservation easement held by the Virginia Board of Historic Resources.

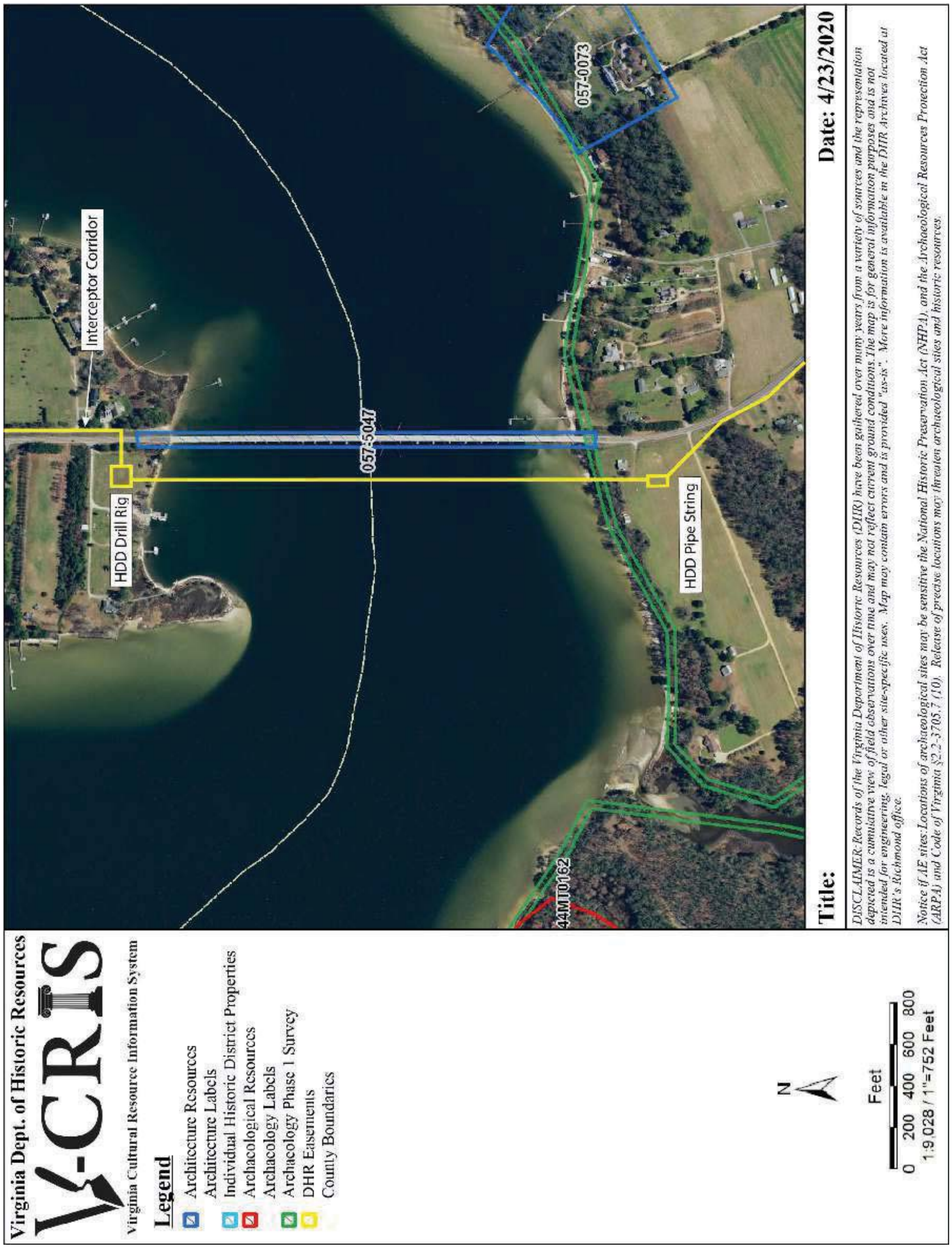


Figure 24. DHR V-CRIS Map 11.

DHR V-CRIS Map 11 (Figure 24)

The HDD drill rig location on the north side of the Piankatank River is adjacent to the ca. 1953 John Andrew Twigg Bridge (DHR ID# 057-5047) which carries Route 3 across the river. The DHR has determined that this resource is not eligible for listing in the National Register.

There are no additional archaeological or architectural resources recorded within the immediate vicinity of the HDD drill rig or pipe string locations. The south shore of the Piankatank River in the vicinity of the HDD pipe string location was investigated by the Chesapeake Watershed Archaeological Research Foundation in 2008 in the course of a Phase I archaeological survey of coastal shorelines in Mathews County (Lowery 2008). The survey identified no archaeological sites along the river shore in this vicinity.

IV. RECOMMENDATIONS

Considering the extent of existing "urban" disturbances within the proposed pump station locations in Saluda, Urbanna, and Cooks Corner, there is relatively low potential for any effects to significant, intact archaeological resources. Similarly, WMCAR identified no new archaeological sites in the course of their 1991 Phase I survey of the 5.3-mile Route 33 right-of-way between Cooks Corner and Harmony Village. "Modern 20th-century debris constituted the largest percentage of material recovered," they reported. "Many areas of the survey were severely disturbed due to modern construction and land use (Gallucci et al. 1992: ii). It is anticipated that conditions within the remainder of the VDOT right-of-way will be similarly disturbed, and JRIA therefore recommends that the potential for identifying significant, intact archaeological resources along the proposed Middlesex TFM is low.

The greatest potential for disturbance to archaeological resources which may be eligible for listing in the National Register will be from the HDD under Urbanna Creek and the Piankatank River. The proposed HDD stringout location on the east side of Urbanna Creek is in the immediate vicinity of Site 44MX0052, which includes evidence of Native American occupation during the Middle and Late Woodland periods, and which may be associated with the Contact Period Opiscopank/Nimcock villages. Considering its situation adjacent to Urbanna Creek, the HDD rig location on the west side of Urbanna Creek may also include prehistoric Native American remains. While there are no previously recorded archaeological sites associated with the proposed HDD impact areas on the north and south sides of the Piankatank River, these riverside locations offer relatively high potential for identifying both prehistoric and historic archaeological sites.

If possible, JRIA recommends that the Middlesex TFM should avoid direct impacts within the defined boundaries of Rosegill (DHR ID# 059-0009), which is listed in the National Register/Virginia Landmarks Register, and Wilton (DHR ID# 059-0010), which is listed in the National Register/Virginia Landmarks Register, and is subject to an historic preservation easement held by the Virginia Board of Historic Resources.

V. REFERENCES

Adams, Hull
1856 *Map of a Portion of the Rappahannock River*, Sheet No. 12. U.S. Coast Survey Map Collection, University of Alabama, Tuscaloosa, Alabama.

Atkinson, Dorothy Francis
1990 *King William County in the Civil War: Along Mangohick Byways*. H.E. Howard, Inc., Lynchburg, Virginia.

Barfield, Eugene B., and Michael B. Barber
1992 "Archaeological and Ethnographic Evidence of Subsistence in Virginia during the Late Woodland Period," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 225-48. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Brady, Ellen, Aimee J. Leithoff, and Kevin Goodrich
2006 *A Phase II Archaeological Evaluation of Sites 44MX0051, 44MX0052, 44MX0053, 44MX0054 and 44MX0056, Proposed Rosegill Development, Middlesex County, Virginia.* Cultural Resources, Inc., Norfolk, Virginia.

Carr, Lois Green, and Lorena S. Walsh
1994 "Changing Lifestyles and Consumer Behavior in the Colonial Chesapeake," in Cary Carson, Ronald Hoffman, and Peter J. Albert (eds.), *Of Consuming Interests: The Style of Life in the Eighteenth Century*, pp. 59-166. University Press of Virginia, Charlottesville.

Chapman, Jefferson, and Andrea Brewer Shea
1981 "The Archaeobotanical Record: Early Archaic Period to Contact in the Lower Little Tennessee River Valley." *Tennessee Anthropologist* VI (1):61-84.

Chappel, Edward A.
1994 "Housing a Nation: The Transformation of Living Standards in Early America," in Cary Carson, Ronald Hoffman, and Peter J. Albert (eds.), *Of Consuming Interests: The Styles of Life in the Eighteenth Century,* pp. 167-232. University Press of Virginia, Charlottesville.

Custer, Jay F.
1990 "Early and Middle Archaic Cultures of Virginia: Cultural Change and Continuity," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Early and Middle Archaic Research in Virginia: A Synthesis*, pp. 1-60. Special Publication No. 22 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Dent, Richard J., Jr.
1995 *Chesapeake Prehistory: Old Traditions, New Directions*. Plenum Press, New York.

Donn, J.W.
1869 *Piankatank River, Virginia*. U.S. Coast Survey Map Collection, University of Alabama, Tuscaloosa, Alabama.

Edwards, David A., and John S. Salmon
1990 National Register of Historic Places Nomination for the Urbanna Historic District (DHR ID# 316-0009). Virginia Department of Historic Resources, Richmond, Virginia.

Egloff, Keith T.
1991 "Development and Impact of Ceramics in Virginia," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Late Archaic and Early Woodland Research in Virginia: A Synthesis*, pp. 243-51. Special Publication No. 23 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Fry, Joshua, and Peter Jefferson
1755 *A Map of the Most Inhabited Part of Virginia Containing the Whole Province of Maryland with a part of Pensilvania* [sic.], *New Jersey and North Carolina*. Library of Congress, Geography and Map Division, Washington, D.C.

Gallucci, Mark, Scott M. Hudlow, and Charles M. Downing
1992 *A Phase I Cultural Resource Survey of the Proposed Route 33 Project, Middlesex County, Virginia*. William and Mary Center for Archaeological Research, The College of William and Mary, Williamsburg, Virginia.

Gardner, William M.
1974 "The Flint Run Paleoindian Complex: A Preliminary Report 1971-1973 Seasons." *Occasional Publication* No. 1, Archeology Laboratory, The Catholic University of America, Washington, D.C.

1977 "Flint Run Paleoindian Complex, its Implication for Eastern North American Prehistory." In *Amerinds and Their Paleoenvironment in Northeastern North America*. edited by W. S. Mewman and B. Salwen, pp 257-263. *Annals of the New York Academy of Sciences* 288.

1981 "Paleoindian Settlement Pattern and Site Distribution in the Middle Atlantic." *Anthropological Careers*, edited by R. H. Landman, L. A. Bennett, A. Brooks, and P. P. Chock, pp. 51-73. Anthropological Society of Washington, Washington, D.C.

1989 "An Examination of Cultural Change in the Late Pleistocene and Early Holocene (circa 9200 to 6800 B.C.)." In *Paleoindian Research in Virginia: A*

Synthesis. edited by J. Mark Wittkofski and Theodore R. Reinhart, pp. 5-52. *Special Publication* No. 19 of the Archeological Society of Virginia.

Geier, Clarence
1990 "The Early and Middle Archaic Periods: Material Culture and Technology," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Early and Middle Archaic Research in Virginia: A Synthesis,* pp. 81-98. Special Publication No. 22 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Gray, Louise E., Evelyn Q. Ryland, and Bettie J. Simmons
1978 *Historic Buildings in Middlesex County, Virginia, 1650-1875*. Delmar Printing Company, Charlotte, North Carolina.

Heath, Barbara J.
1999 "Nineteenth-Century Small Farms and Plantations," in John H. Sprinkle and Theodore R. Reinhart (eds.), *The Archaeology of 19th-Century Virginia*. Special Publication No. 36 of the Archeological Society of Virginia, Spectrum Press, Richmond, Virginia.

Herrman, Augustine
1673 *Virginia and Maryland as it is Planted and Inhabited this Present Year 1670*. Library of Congress, Geography and Map Division, Washington, D.C.

Hodges, Mary Ellen N., and Charles T. Hodges, editors
1994 *Paspahegh Archaeology: Data Recovery Investigations of Site 44JC308 at The Governor's Land at Two Rivers, James City County, Virginia*. Prepared by James River Institute for Archaeology, Inc. Williamsburg, Virginia.

Kaplan, Barbara Beigun
1993 *Land and Heritage in the Virginia Tidewater: A History of King and Queen County*. Cadmus Fine Books, Richmond, Virginia.

Kulikoff, Allan
1986 *Tobacco and Slaves: The Development of Southern Cultures in the Chesapeake, 1680-1800.* University of North Carolina Press, Chapel Hill, North Carolina.

LandMark Design Group
2001 *County of Middlesex Virginia Comprehensive Plan Update 2001: Charting the Course*. Virginia Beach, Virginia.

Lowery, Darrin L.
2008 *Archaeological Survey of the Coastal Shorelines Associated with Mathews County, Virginia: An Erosion Threat Study.* Chesapeake Watershed Archaeological Research Foundation, Easton, Maryland.

Lukezic, Craig
1990 "Soils and Settlement Location in 18th Century Colonial Tidewater Virginia." *Historical Archaeology* 24 (1): 1-17.

McAvoy, Joseph M., and Lynn D. McAvoy
1997 "Archaeological Investigations of Site 44SX202, Cactus Hill, Sussex County, Virginia." *Research Report Series* No. 8, Virginia Department of Historic Resources, Richmond, Virginia.

McCary, Ben C.
1951 "A Workshop of Early Man in Dinwiddie County, Virginia." *American Antiquity* 17(1): 9-17.

1975 "The Williamson Paleoindian Site, Dinwiddie County, Virginia." *The Chesopiean,* 13(3-4): 48-131.

1983 The Paleoindian in Virginia. *Archeological Society of Virginia Quarterly Bulletin* 38(1): 43-70.

Norris, Walter Biscoe Jr.
1983 *Westmoreland County, Virginia, 1653-1983*. Westmoreland County Board of Supervisors, Montross, Virginia.

Nugent, Nell Marion (ed.)
1992 *Cavaliers and Pioneers: Abstracts of Virginia Land Patents and Grants, Vol. 1: 1623-1666*. Virginia State Library and Archives, Richmond, Virginia.

Potter, Stephen R.
1993 *Commoners, Tribute, and Chiefs: The Development of Algonquian Culture in the Potomac Valley*. University Press of Virginia, Charlottesville, Virginia.

Reps, John W.
1972 *Tidewater Towns: City Planning in Colonial Virginia and Maryland*. University Press of Virginia, Charlottesville, Virginia.

Rountree, Helen C.
1989 *The Powhatan Indians of Virginia*. The University of Oklahoma Press, Norman, Oklahoma.

Rutman, Darret B., and Anita H. Rutman
1984 *A Place in Time: Middlesex County, Virginia, 1650-1750*. W. W. Norton & Company, New York.

Ryland, Evelyn Q., Bettie J. Simmons, Larry S. Chowning, Louise E. Gray, and Florence R. Vaughn

1980 *Urbanna: A Port Town in Virginia, 1680-1980*. Delmar Printing Company, Charlotte, North Carolina.

Smith, John

1624 *Virginia Discovered and Discribed* [sic.]. Library of Congress, Geography and Map Division, Washington, D.C.

Stewart, Michael

1992 "Observations on the Middle Woodland Period of Virginia: A Middle Atlantic Region Perspective," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 1-38. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Turner, E. Randolph, III

1989 "Paleoindian Settlement Patterns and Population Distribution in Virginia." In *Paleoindian Research in Virginia: A Synthesis*. Edited by J. Mark Wittkofski and Theodore R. Reinhart, pp. 71-94. *Special Publication* No. 19 of the Archeological Society of Virginia.

1992 "The Virginia Coastal Plain During the Late Woodland Period," in Theodore R. Reinhart and Mary Ellen N. Hodges (eds.), *Middle and Late Woodland Research in Virginia: A Synthesis*, pp. 97-136. Special Publication No. 29 of the Archeological Society of Virginia. The Dietz Press, Richmond, Virginia.

Turner, E. Randolph, III, and Antony F. Opperman

1995 *Searching for Virginia Company Period Sites: An Assessment of Surviving Archaeological Manifestations of Powhatan-English Interactions, A.D. 1607-1624*. Draft manuscript.

United States Geological Survey (U.S.G.S.)

1916 15' Urbanna topographic quadrangle map.

1917 15' Urbanna topographic quadrangle map.

1978 7.5' Urbanna topographic quadrangle map.

1980 7.5' Ware Neck topographic quadrangle map.

1984 1:100,000 Tappahannock topographic quadrangle map.

1984 1:100,000 Williamsburg topographic quadrangle map.

1986 7.5' Saluda topographic quadrangle map.

1992 7.5’ Wilton topographic quadrangle map.

Virginia Department of Historic Resources (DHR)
2010 “Opiscopank—Smith’s Mystery Town.” Historical Highway Marker N-78. Accessed at: <https://vcris.dhr.virginia.gov/HistoricMarkers/>.

Virginia Historic Landmarks Commission (VHLC)
1978 National Register of Historic Places Nomination for Hewick (DHR ID# 059-0006). Virginia Department of Historic Resources, Richmond, Virginia.

Wells, Camille
1994 “Social and Economic Aspects of Eighteenth-Century Housing on the Northern Neck.” Unpublished doctoral dissertation, The College of William and Mary, Williamsburg, Virginia.

Yarnell, Richard A.
1976 “Early Plant Husbandry in Eastern North America.” In *Cultural Change and Continuity: Essays in Honor of James Bennett Griffin*, edited by Charles E. Cleland, Academic Press, New York.

Legend

- Alignment
- 150 Foot Buffer

NWI Wetland Type

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

National Wetland Inventory Map

Prepared For:
Middlesex Interceptor Program Phase II

Prepared By:
Emily Foster

Date:
5/27/2020

Source:
Esri et al. 2020, World Topo Map

Coordinate System: World Geodetic System, 1984
Universal Transverse Mercator, Zone 18 North

U.S. Fish and Wildlife Service

National Wetlands Inventory

HRSD Middlesex IFM

May 27, 2020

Wetlands

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

Soil Map—Mathews County, Virginia, and Middlesex County, Virginia
(Middlesex Interceptor System Program Phase II)

Map Scale: 1:117,000 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 1500, 3000, 6000, 9000

Feet: 0, 5000, 10000, 20000, 30000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mathews County, Virginia
Survey Area Data: Version 11, Sep 16, 2019

Soil Survey Area: Middlesex County, Virginia
Survey Area Data: Version 12, Sep 16, 2019

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Feb 6, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

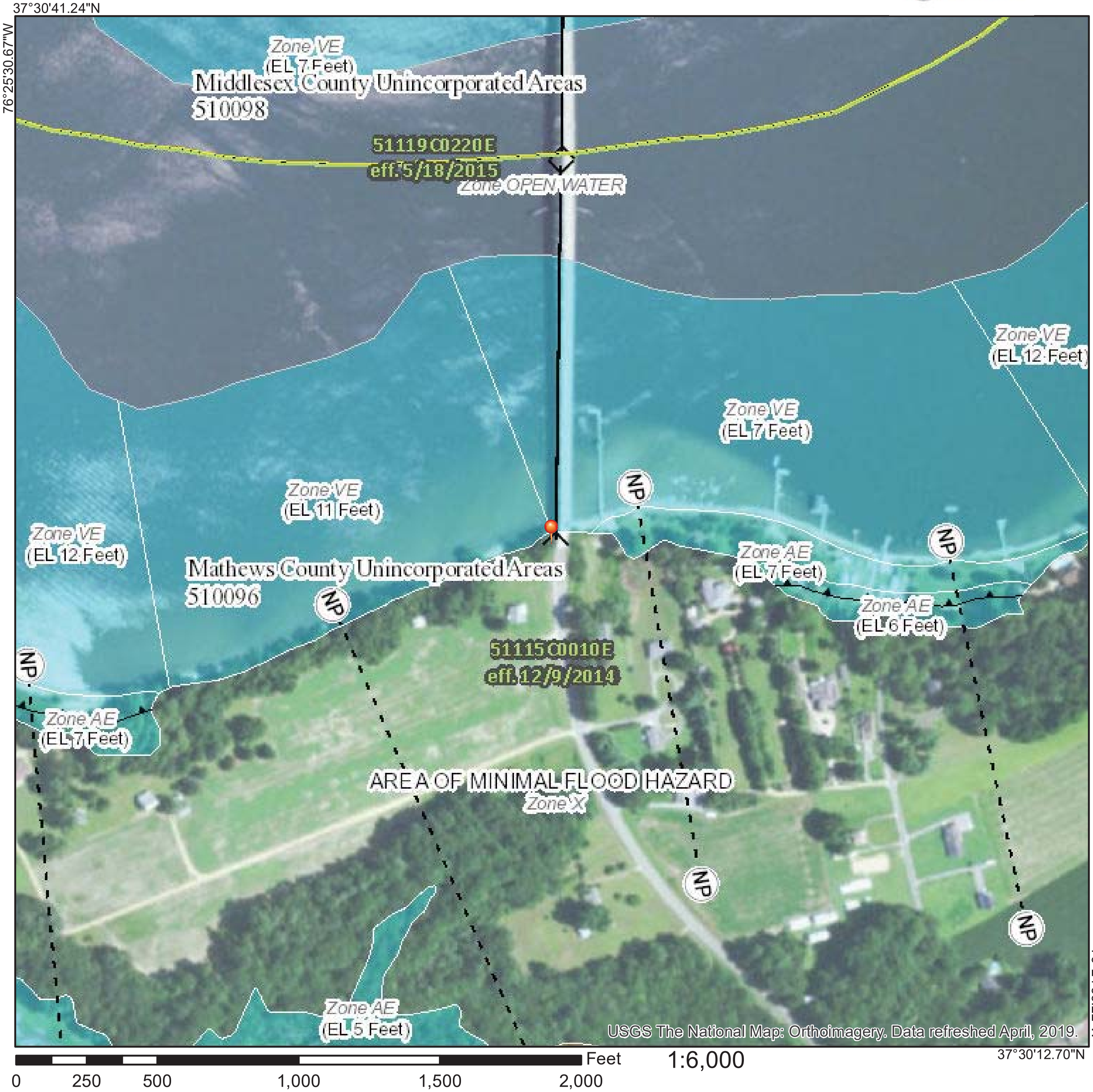
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Dr	Dragston fine sandy loam, shallow	0.0	0.0%
Fa	Fallsington fine sandy loam	1.3	0.2%
KtA	Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes	3.3	0.6%
SaA	Sassafras fine sandy loam, 0 to 2 percent slopes	9.6	1.6%
SdA	Sassafras loamy fine sand, 0 to 2 percent slopes	12.1	2.1%
StE	Steep sandy land	6.2	1.1%
W	Water	7.7	1.3%
Wo	Woodstown fine sandy loam	5.3	0.9%
Subtotals for Soil Survey Area		**45.5**	**7.8%**
Totals for Area of Interest		**581.9**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Bethera and Daleville soils	7.4	1.3%
4	Catpoint loamy sand	1.5	0.3%
5B	Craven silt loam, 2 to 6 percent slopes	2.0	0.3%
6A	Emporia loam, 0 to 2 percent slopes	6.3	1.1%
6B	Emporia loam, 2 to 6 percent slopes	129.8	22.3%
7D	Emporia-Nevarc complex, 6 to 15 percent slopes	18.5	3.2%
7F	Emporia-Nevarc complex, 15 to 45 percent slopes	8.2	1.4%
8	Eunola loam	13.9	2.4%
9A	Kempsville sandy loam, 0 to 2 percent slopes	7.0	1.2%
9B	Kempsville sandy loam, 2 to 6 percent slopes	39.5	6.8%
10	Kenansville fine sand	0.1	0.0%
13	Myatt loam	6.8	1.2%
15	Ochlockonee silt loam	18.7	3.2%
18B	Rumford fine sandy loam, 2 to 6 percent slopes	8.1	1.4%
19A	Slagle silt loam, 0 to 2 percent slopes	68.9	11.8%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19B	Slagle silt loam, 2 to 6 percent slopes	146.6	25.2%
20A	Suffolk fine sandy loam, 0 to 2 percent slopes	2.2	0.4%
20B	Suffolk fine sandy loam, 2 to 6 percent slopes	25.7	4.4%
21D	Suffolk-Remlik complex, 6 to 15 percent slopes	2.5	0.4%
21F	Suffolk-Remlik complex, 15 to 45 percent slopes	4.6	0.8%
22B	Udorthents and Psamments, gently sloping	3.8	0.7%
W	Water	14.3	2.5%
Subtotals for Soil Survey Area		**536.3**	**92.2%**
Totals for Area of Interest		**581.9**	**100.0%**

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

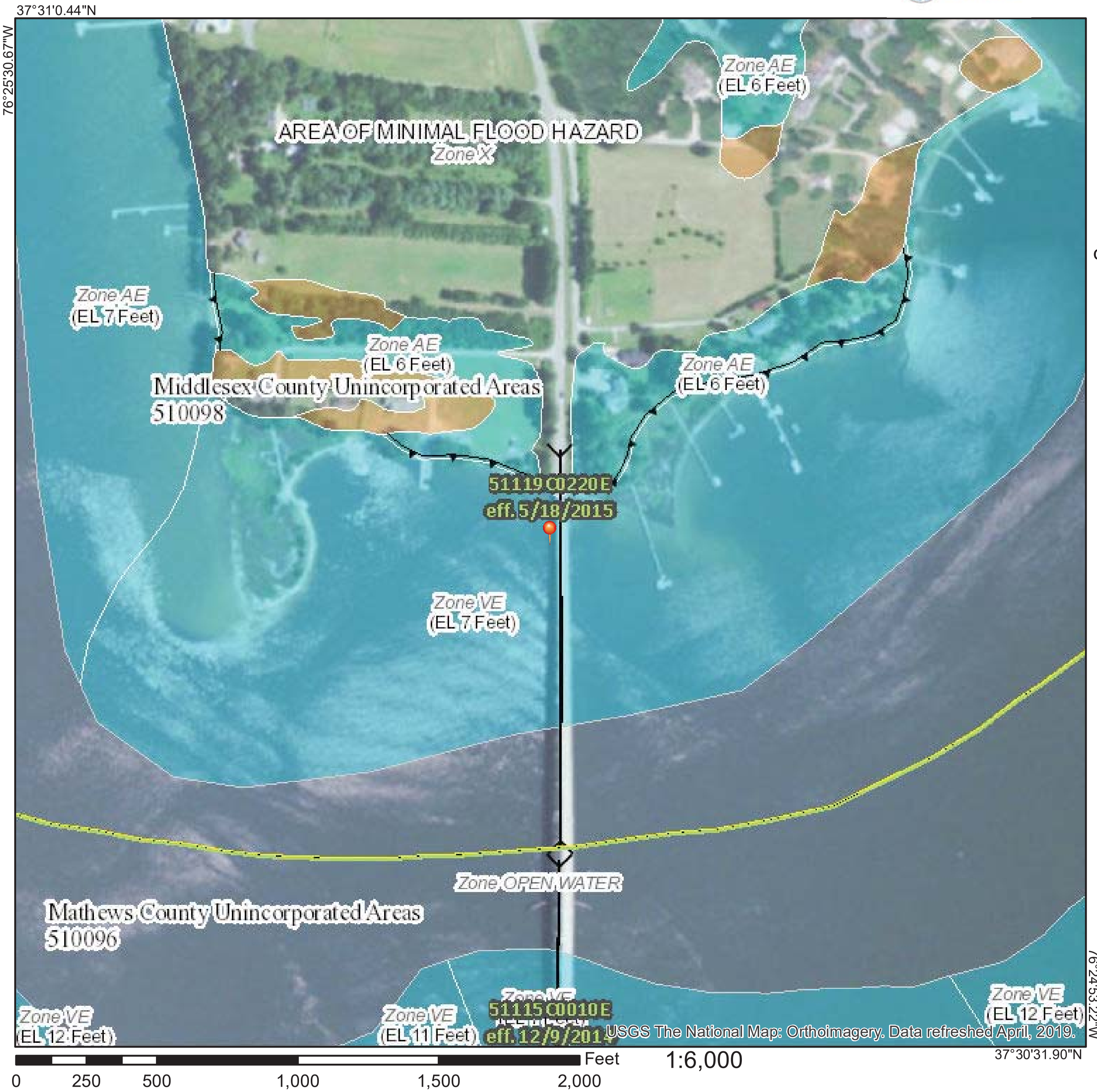
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/27/2020 at 2:54:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) *Zone A, V, A99*
		With BFE or Depth *Zone AE, AO, AH, VE, AR*
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
		Future Conditions 1% Annual Chance Flood Hazard *Zone X*
		Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
		Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
		Effective LOMRs
		Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8	Coastal Transect
	513	Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/27/2020 at 3:01:32 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

37°38'1.68"N

76°34'43.88"W

76°34'6.43"W

37°37'33.19"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/27/2020 at 3:05:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

March 28, 2022

Northern Virginia Regulatory Section
NAO-2020-02102 / VMRC#22-0374 (Piankatank River and Urbanna Creek)

Deborah Painter – Tetra Tech, Inc.
5700 Lake Wright Drive, Suite 102
Norfolk, Virginia 23502
Debbie.Painter@tetratech.com

Dear Ms. Painter:

This is in response to the Tetra Tech, Inc. letter dated September 22, 2021, concerning the study of the proposed construction of the Hampton Roads Sanitation District Middlesex Interceptor System Program Phase II - Urbanna to Mathews Transmission Force Main project.

Upon initial review, we have determined that the project will require a Norfolk District Army Corps of Engineers (Norfolk District) permit for the underwater crossings of the Piankatank River and Urbanna Creek, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). We will review the Preliminary Jurisdiction Determination (PJD) and Joint Permit Application (JPA) received by our office on February 18, 2022 and determine whether the proposed work will also impact waters, including wetlands, regulated by the Norfolk District under Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344)

Federal review requirements may extend beyond the Norfolk District's jurisdiction. Under the Virginia Clean Water Revolving Loan Fund (CWRLF), the U.S. Environmental Protection Agency (EPA) has confirmed that the Virginia Department of Environmental Quality is the lead agency for this project. Virginia CWRLF Regulation 40 C.F.R. *§ 35.3145 Application of other Federal Authorities* states the following:

> (a) Generally. The State must agree to comply and to require all recipients of funds ''directly made available by'' capitalization grants to comply with applicable Federal authorities.
>
> (b) Informing EPA. The State must inform EPA when consultation or coordination by EPA with other Federal agencies is necessary to resolve issues regarding compliance with those requirements.

Furthermore, the project may require coordination with the Virginia Department of Historic Resources and the Federally recognized Tribes, pursuant to Section 106 of the National Historic Preservation Act; and with the U.S. Fish and Wildlife Service and the

National Oceanic and Atmospheric Administration, pursuant to Section 7 of the Endangered Species Act.

We wish to participate in any interagency meetings and field reviews for this project to the extent possible. We request regular coordination with the appropriate state and federal agencies. The Norfolk District further encourages the use of a collaborative process for the study of this project, documenting concurrence of the pertinent federal agencies at important steps, to provide the local governments and the public with a more dependable framework for planning decisions.

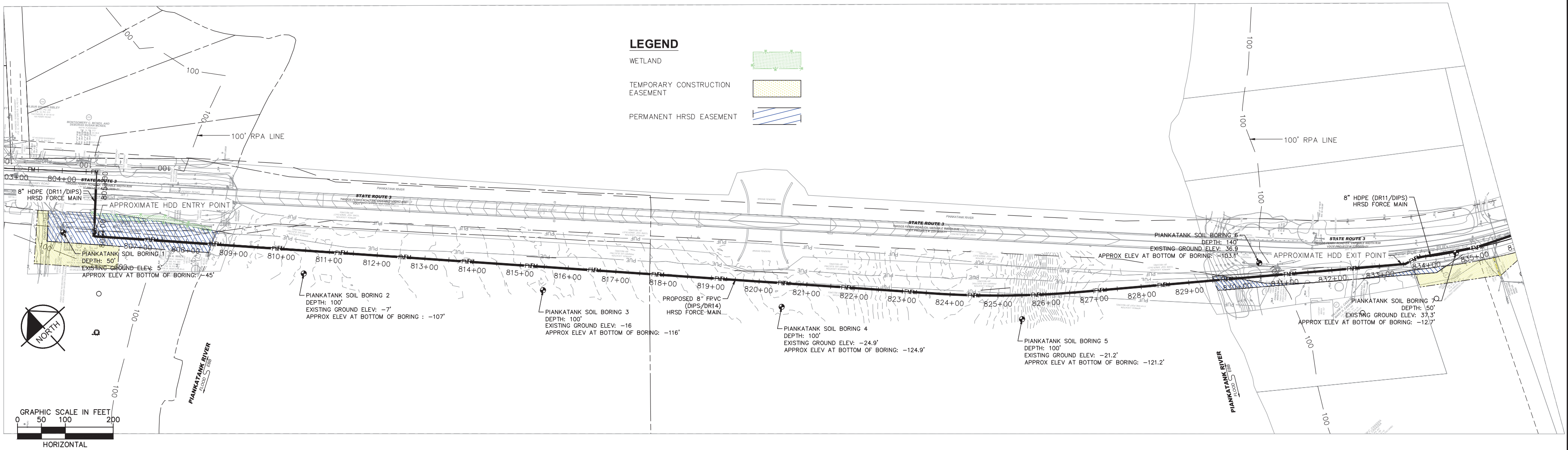
Our regulations require that we consider a full range of public interest factors and conduct an alternatives analysis in order to identify the least environmentally damaging practicable alternative (LEDPA), which is the only alternative we can authorize. In addition to waters, including wetlands, impacts, we must consider factors such as land use (including displacements of homes and businesses), floodplain hazards and values, water supply and conservation, water quality, safety, cost, economics, threatened and endangered species, historic and cultural resources, and environmental justice.

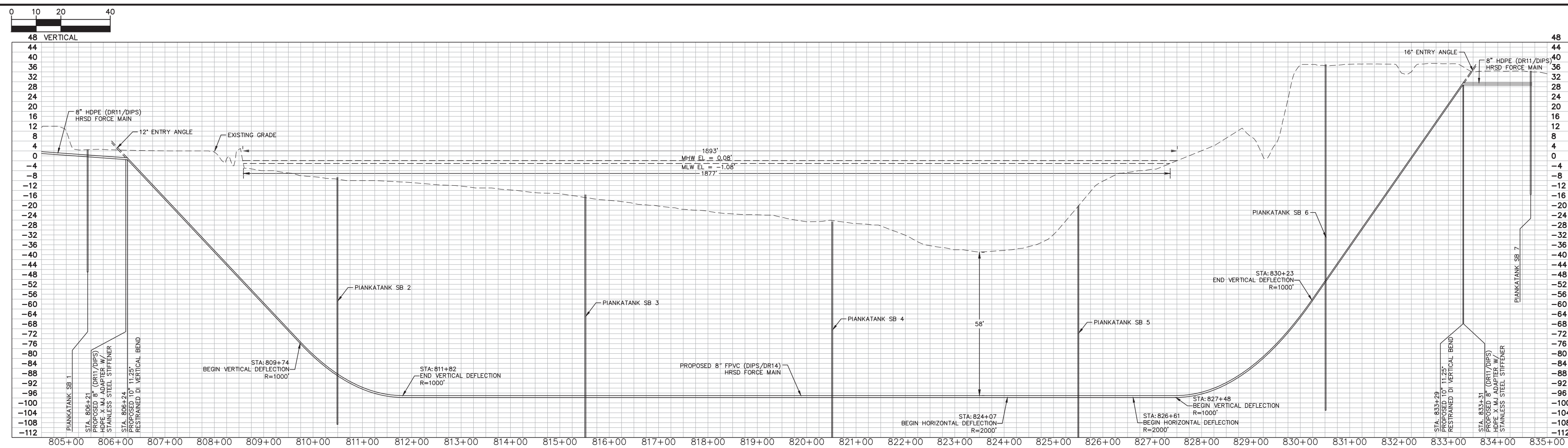
Thank you for the opportunity to submit comments for this project. If you have any questions, you may contact Nancy Davis at nancy.p.davis@usace.army.mil or via telephone at (757) 201-7044.

Sincerely,

Tucker Smith
Section Chief
Northern Virginia Regulatory Section
Norfolk District Corps of Engineers

Copies Furnished:
Magdalene Cunningham – (EPA)





PERMIT DRAWING ONLY

NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

PROPOSED SEWER FORCE MAIN
PIANKATANK RIVER HDD CROSSING

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	JDV	DATE:	SEPTEMBER 2021
DRAWN BY:	JDV	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	
SCALE:	AS NOTED	SHEET NO.:	1

TETRA TECH

19 November 2021

Virginia Marine Resource Commission

Tidewater Joint Permit Application
For VMRC subaqueous Crossing
Piankatank River and Urbanna Creek
Middlesex and Mathews, Virginia

Applicant: Mr. Edward Henifin
Hampton Roads Sanitation District
P.O. Box 5911
Virginia Beach, VA, 23471

Agent: Ms. Emily Foster
Tetra Tech
5700 Lake Wright Drive
Norfolk, VA, 23502

Subject: HRSD – Middlesex Interceptor System Program Phase II; Urbanna to Mathews Transmission Force Main project (MISPPII); NAO-2020-02102

To Whom It May Concern,

On behalf of the Hampton Roads Sanitation District (HRSD), Tetra Tech, Inc. has enclosed a completed Tidewater Joint Permit Application and Jurisdictional Determination Request in support of a proposed project to construct a sewage conveyance system through Mathews and Middlesex Counties, Virginia (HUCs).

The Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design and construction of a sewage conveyance system to serve Middlesex County. A small diameter transmission force main will serve as the system backbone and extend 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

The Project is predominantly co-located within existing roads and easements, and no impacts to wetlands are currently proposed. A wetland delineation was performed for the Project during the 2021 growing season, and a Jurisdictional Determination Request is attached to this application. All wetlands are to be avoided and silt fence will be installed adjacent to wetland boundaries prior to the start of construction. As HRSD intends to utilize funding from the Virginia Clean Water Revolving Loan Fund (CWRLF), an Environmental Assessment (EA) is also being prepared for this Project in accordance with CWRLF requirements.

This Joint Permit Application pertains specifically to the proposed crossings at the Piankatank River and Urbanna Creek, as the design of these Project components are less likely to be significantly altered as the planning and design phase moves forward. Because the Project includes subaqueous crossings of the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD), HRSD is requesting VMRC authorization for the subaqueous crossings and requests concurrence from USACE and VADEQ that no

TETRA TECH

additional CWA Section 401/404 permits are required for these crossing locations. If any impacts to wetlands or waters of the U.S. are anticipated within the linear route or pump station location as design progresses, additional JD requests and JPAs for those locations will be submitted.

To assist the entities involved with the review and approval of this activity, please find the enclosed Tidewater JPA, Jurisdictional Determination Request, Figures, site photos and additional supporting information. Upon receipt and review of this package, please feel free to contact me by phone or e-mail at (540) 841-4752 or emily.foster@tetratech.com.

Respectfully submitted,

Emily Foster, PWS #2718
Environmental Scientist
Tetra Tech, Inc

Enclosure

CC Edward Henifin, HRSD
Scott Funk, P.E., Kimley-Horn
Tim Moore, P.E., Tetra Tech
Brad Sweeney, P.E., Tetra Tech

Attachments:

1. Tidewater JPA Form and Signatures
2. Property Owner Information
3. Jurisdictional Determination Request
4. Proposed Sewer Force Main Piankatank River HDD Crossing (Project Drawings)
5. Proposed Sewer Force Main Urbanna Creek HDD Crossing (Project Drawings)
6. USFWS IPaC Official Species List
7. VDWR VaFWIS Search Report
8. VDCR Natural Heritage Database Explorer Resources Report

ATTACHMENT 1: TIDEWATER JPA

Regulatory Agency Contact Information

Virginia Marine Resources Commission (VMRC)
Habitat Management Division
380 Fenwick Road, Building 96
Fort Monroe, VA 23651
Phone: (757) 247-2200, Fax: (757) 247-8062
Website: http://www.mrc.virginia.gov/hmac/hmoverview.shtm

United States Army Corps of Engineers (USACE)
Norfolk District
803 Front Street, ATTN: CENAO-WR-R
Norfolk, Virginia 23510-1011
Phone: (757) 201-7652, Fax: (757) 201-7678
Website: http://www.nao.usace.army.mil/Missions/Regulatory.aspx

Virginia Department of Environmental Quality (DEQ)
Virginia Water Protection Permit Program
Post Office Box 1105
Richmond, Virginia 23218
Phone: (804) 698-4000
Website: http://www.deq.virginia.gov/

LOCAL WETLANDS BOARD (LWB) CONTACT INFORMATION:
Links to LWB information on the Web can be found at http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html
In addition, the phone numbers listed below can be used to contact the LWB. Please be advised that these phone numbers are subject to change at any time.

Accomack County (757) 787-5721, Cape Charles (757) 331-3259, Charles City County (804) 829-9296, Chesapeake (757) 382-6248, Colonial Heights (804) 520-9275, Essex County (804) 443-4951, Fairfax County (703) 324-1364, Fredericksburg (540) 372-1179, Gloucester County (804) 693-2744, Hampton (757) 727-6140, Hopewell (804) 541-2267, Isle of Wight County (757) 365-6211, James City County (757) 253-6673, King and Queen County (804) 769-4978, King George County (540) 775-7111, King William County (804) 769-4927, Lancaster County (804) 462-5220, Mathews County (804) 725-5025, Middlesex County (804) 758-0500, New Kent County (804) 966-9690, Newport News (757) 247-8437, Norfolk (757) 664-4368, Northampton County (757) 678-0442, Northumberland County (804) 580-8910, Poquoson (757) 868-3040, Portsmouth (757) 393-8836, Prince William County (703) 792-6984, Richmond County (804) 333-3415, Stafford County (540) 658-8668, Suffolk (757) 923-3650, Virginia Beach (757) 427-8246, Westmoreland County (804) 493-0120, West Point (804) 843-3330, Williamsburg (757) 220-6130, York County (757) 890-3538

Tidewater Joint Permit Application (JPA)
For Projects Involving Tidal Waters, Tidal Wetlands and/or Dunes and Beaches in Virginia

This application may be used for most commercial and noncommercial projects involving **tidal waters, tidal wetlands and/or dunes and beaches in Virginia** which require review and/or authorization by Local Wetlands Boards (LWB), the Virginia Marine Resources Commission (VMRC), the Department of Environmental Quality (DEQ), and/or the U. S. Army Corps of Engineers (USACE). This application can be used for:

- **Access-related activities**, including piers, boathouses, boat ramps (without associated dredging or excavation*), moorings, marinas.
- **Shoreline stabilization projects** including living shorelines, riprap revetments, marsh toe stabilization, bulkheads, breakwaters, beach nourishment, groins, and jetties. It is the policy of the Commonwealth that living shorelines are the preferred alternative for stabilizing tidal shorelines (Va. Code § 28.2-104.1).
- **Crossings** over or under tidal waters and wetlands including bridges and utility lines (water, sewer, electric).
- **Aquaculture structures**, including cages and floats except "oyster gardening"**

***Note:** for all dredging, excavation, or surface water withdrawal projects you **MUST** use the Standard JPA form; for noncommercial, riparian shellfish aquaculture projects (i.e., "oyster gardening") you must use the abbreviated JPA found at https://mrc.virginia.gov/forms/2019/VGP3_Aquaculture_form_2019.pdf or call VMRC for a form.

The DEQ and the USACE use this form to determine whether projects qualify for certain General, Regional, and/or Nationwide permits. If your project does not qualify for these permits and you need a DEQ Virginia Water Protection permit or an individual USACE permit, you must submit the Standard Joint Permit application form. You can find this application at http://www.nao.usace.army.mil/Missions/Regulatory/JPA.aspx. Please note that some health departments and local agencies, such as local building officials and erosion and sediment control authorities, do not use the Joint Permit Application process or forms and may have different informational requirements. The applicant is responsible for contacting these agencies for information regarding those permitting requirements.

HOW TO APPLY

Submit one (1) completed copy of the Tidewater JPA to VMRC:

1. If by mail or courier, use the VMRC address provided on page 1.
2. If by electronic mail, address the package to: **JPA.permits@mrc.virginia.gov.** The application must be provided in the .pdf format and should not exceed 10 MB. If larger than 10 MB you may provide a file transfer protocol (ftp) site for download purposes.

The Tidewater JPA should include the following:

1. **Part 1** – General Information
2. **Part 2** – Signatures
3. **Part 3** - Appendices (A, B, C, and/or D as applicable to your project)
4. **Part 4** – Project Drawings.
   The drawings shall include the following for **ALL** projects:
   - Vicinity Map (USGS topographic map, road map or similar showing project location)
   - Plan View Drawing (overhead, to scale or with dimensions clearly marked)
   - Section View Drawing (side-view, to scale or with dimensions clearly marked)

Sample drawings are included at the end of Part 4 of this application to show examples of the information needed to consider your application complete and allow for the timely processing.

When completing this form, use the legal name of the applicant, agent, and/or property owner. For DEQ application purposes, *legal name* means the full legal name of an individual, business, or other organization. For an individual, the legal name is the first name, middle initial, last name, and suffix. For an entity authorized to do business in Virginia, the legal name is the exact name set forth in the entity's articles of incorporation, organization or trust, or formation agreement, as applicable. Also provide the name registered with the State Corporation Commission, if required to register. DEQ issues a permit or grants coverage to the so-named individual or business, who becomes the 'permittee'. Correspondence from some agencies, including permits, authorizations, and/or coverage, may be provided via electronic mail. If the applicant and/or agent wishes to receive their permit via electronic mail, please remember to include an e-mail address at the requested place in the application.

In order for projects requiring LWB authorization to be considered complete (Virginia Code § 28.2-1302); "The permit application shall include the following: the name and address of the applicant; a detailed description of the proposed activities; a map, drawn to an appropriate and uniform scale, showing the area of wetlands directly affected, the location of the proposed work thereon, the area of existing and proposed fill and excavation, the location, width, depth and length of any proposed channel and disposal area, and the location of all existing and proposed structures, sewage collection and treatment facilities, utility installations, roadways, and other related appurtenances of facilities, including those on the adjacent uplands; a description of the type of equipment to be used and the means of access to the activity site; the names and addresses of record of adjacent land and known claimants of water rights in or adjacent to the wetland of whom the applicant has notice; an estimate of cost; the primary purpose of the project; and secondary purpose of the proposed project; a complete description of measures to be taken during and after alteration to reduce detrimental offsite effects; the completion date of the proposed work, project, or structure; and such additional materials and documentation as the wetlands board may require."

You may include signed Adjacent Property Owner (APO) Acknowledgement Forms found at the end of this Short Form. You must provide these addresses in Part 1 whether or not you use the APO forms. VMRC will request comments from APOs for projects that require permits for encroachment over state-owned submerged lands. VMRC or your local wetlands board must notify all APO's of public hearings required for all proposals involving tidal wetlands and dunes/beaches that are not authorized by statute. This information will not be used by DEQ to meet the requirements of notifying riparian land owners.

Regional Permit 17 (RP-17), authorizes the installation and/or construction of open-pile piers, mooring structures/devices, fender piles, covered boathouses/boatslips, boatlifts, osprey pilings/platforms, accessory pier structures, and certain devices associated with shellfish gardening, for private use, subject to strict compliance with all conditions and limitations further set out in the RP-17 enclosure located at http://www.nao.usace.army.mil/Missions/Regulatory/RBregional/. In addition to the information required in this JPA, prospective permittees seeking authorization under RP-17 must complete and submit the 'Regional Permit 17 Checklist' with their JPA. A copy of the 'Regional Permit 17 Checklist' is found on pages 13 and 14 of this application package. If the prospective permittee answers "yes" (or "N/A", where applicable) to all of the questions on the 'Regional Permit 17 Checklist', the permittee is in compliance with RP-17 and will not receive any other written authorization from the Corps but may not proceed with construction until they have obtained all necessary state and local permits. ***Note: If the prospective permittee answers "no" to any of the questions on the 'Regional Permit 17 Checklist' then their proposed structure(s) does not meet the terms and conditions of RP-17 and written authorization from the Corps is required before commencement of any work.***

Note: Land disturbance (grading, filling, etc.) or removal of vegetation associated with projects located in Chesapeake Bay Preservation Areas will require approval from local governments. Certain localities utilize this application during their Bay Act review. Part 5 of this application is included to provide assistance for the applicant to comply with Bay Act /or Erosion and Sediment Control requirements concurrent with this application.

WHAT HAPPENS NEXT

Upon receipt of an application, VMRC will assign a permit application number to the JPA and will then distribute a copy of the application and any original plan copies submitted to the other regulatory agencies that are involved in the JPA process. All agencies will conduct separate but concurrent reviews of your project. Please be aware that each agency must issue a separate permit (or a notification that no permit is required). Note that in some cases, DEQ may be taking an action on behalf of the USACE, such as when the State Program General Permit (SPGP) applies. Make sure that you have received all necessary authorizations, or documentation that no permit is required, from each agency prior to beginning the proposed work.

During the JPA review process, site inspections may be necessary to evaluate a proposed project. Failure to allow an authorized representative of a regulatory agency to enter the property, or to take photographs of conditions at the project site, may result in either the withdrawal or denial of your permit application.

For certain federal and state permit applications, a public notice is published in a newspaper having circulation in the project area, is mailed to adjacent and/or riparian property owners, and/or is posted on the agency's web page. The public may comment on the project during a designated comment period, if applicable, which varies depending upon the type of permit being applied for and the issuing agency. In certain circumstances, the project may be heard by a governing board, such as a Local Wetlands Board, the State Water Control Board, or VMRC in cases where a locality does not have a wetlands board and with certain subaqueous cases. You may be responsible for bearing the costs for advertisement of public notices.

Public hearings that are held by VMRC occur at their regularly scheduled monthly commission meetings under the following situations: Protested applications for VMRC permits which cannot be resolved; projects costing over $500,000 involving encroachment over state-owned subaqueous land; and all projects affecting tidal wetlands and dunes/beaches in localities without a LWB. All interested parties will be officially notified regarding the date and time of the hearing and Commission meeting procedures. The Commission will usually make a decision on the project at the meeting unless a decision for continuance is made. If a proposed project is approved, a permit or similar agency correspondence is sent to the applicant. In some cases, notarized signatures, as well as processing fees and royalties, are required before the permit is validated. If the project is denied, the applicant will be notified in writing.

PERMIT APPLICATION OR OTHER FEES

Do not send any fees with the JPA. VMRC is not responsible for accounting for fees required by other agencies. Please consult agency websites or contact agencies directly for current fee information and submittal instructions.

- USACE: Permit application fees are required for USACE Individual (Standard) permits. A USACE project manager will contact you regarding the proper fee and submittal requirements.

- DEQ: Permit application fees required for Virginia Water Protection permits – while detailed in 9VAC25-20 – are conveyed to the applicant by the applicable DEQ office (http://www.deq.virginia.gov/Locations.aspx). Complete the Permit Application Fee Form and submit it per the instructions to the address listed on the form. Instructions for submitting any other fees will be provided to the applicant by DEQ staff.
- VMRC: An application fee of $300 may be required for projects impacting tidal wetlands, beaches and/or dunes when VMRC acts as the LWB. VMRC will notify the applicant in writing if the fee is required. Permit fees involving subaqueous lands are $25.00 for projects costing $10,000 or less and $100 for projects costing more than $10,000. Royalties may also be required for some projects. The proper permit fee and any required royalty is paid at the time of permit issuance by VMRC. VMRC staff will send the permittee a letter notifying him/her of the proper permit fees and submittal requirements.
- LWB: Permit fees vary by locality. Contact the LWB for your project area or their website for fee information and submittal requirements. Contact information for LWBs may be found at http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html.

FOR AGENCY USE ONLY	
	Notes:
	JPA #

APPLICANTS
Part 1 – General Information

PLEASE PRINT OR TYPE ALL ANSWERS: If a question does not apply to your project, please print N/A (not applicable) in the space provided. If additional space is needed, attach 8-1/2 x 11 inch sheets of paper.

Check all that apply		
Pre-Construction Notification (PCN) ☐ NWP # ____________ *(For Nationwide Permits ONLY - No DEQ-VWP permit writer will be assigned)*	Regional Permit 17 (RP-17) ☐	VMRC Subaqueous Permit

County or City in which the project is located: Mathews and Middlesex County

Waterway at project site: Piankatank River and Urbanna Creek

PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK (Include all federal, state, and local pre application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)

Historical information for past permit submittals can be found online with VMRC - https://webapps.mrc.virginia.gov/public/habitat/ - or VIMS - http://ccrm.vims.edu/perms/newpermits.html

Agency	Action / Activity	Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13)	Date of Action	If denied, give reason for denial
USACE	Pre-Application Request	NAO-2020-02102	10/30/2020	N/A

Part 1 - General Information (continued)

1. Applicant's legal name* and complete mailing address:

   Edward Henifin, HRSD Project Manager
   1434 Air Rail Avenue
   Virginia Beach, VA 23445

   Contact Information:
   Home (____)______________
   Work (____)______________
   Fax (____)______________
   Cell (757) 460-2261
   e-mail ehenifin@hrsd.com

   State Corporation Commission Name and ID Number (if applicable) ______________

2. Property owner(s) legal name* and complete address, if different from applicant: Contact Information:
   Home (____)______________
   Work (____)______________
   Fax (____)______________
   Cell (____)______________
   e-mail ______________

   State Corporation Commission Name and ID Number (if applicable) ______________

3. Authorized agent name* and complete mailing address (if applicable):

   Tetra Tech c/o Emily Foster
   5700 Lake Wright Dr.
   Norfolk VA, 23502

   Contact Information:
   Home (____)______________
   Work (____)______________
   Fax (____)______________
   Cell (540) 841-4752
   e-mail emily.foster@tetratech.com

   State Corporation Commission Name and ID Number (if applicable) ______________

*** If multiple applicants, property owners, and/or agents, each must be listed and each must sign the applicant signature page.**

4. Provide a detailed description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

   On behalf of HRSD, Tetra Tech, Inc. is submitting this Joint Permit Application in support of planned project to design and construct a sewage conveyance system to serve Middlesex County, Virginia (the Project).

   Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design and construction of a sewage conveyance system to serve Middlesex County. A small diameter transmission force main will serve as the system backbone and extend 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

   Because the Project includes crossings under the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD) with no proposed impacts to adjacent delineated wetlands, Tetra Tech is anticipating the need for a subaqueous permit from VMRC and requests concurrence from USACE and VADEQ that no Section 401/404 permits are required. This Joint Permit Application pertains specifically to the proposed crossings at the Piankatank River and Urbanna Creek, as the design of these Project components are less likely to be significantly altered as the planning and design phase moves forward.

Part 1 - General Information (continued)

5. Have you obtained a contractor for the project? ___ Yes* _x_ No. *If your answer is "Yes" complete the remainder of this question and submit the Applicant's and Contractor's Acknowledgment Form (enclosed)

   Contractor's name* and complete mailing address:

   N/A

   Contact Information:
   Home (____)_____________
   Work (____)_____________
   Fax (____)_____________
   Cell (____)_____________
   email ___________________

   State Corporation Commission Name and ID Number (if applicable) _____________________

<u>* If multiple contractors, each must be listed and each must sign the applicant signature page.</u>

6. List the name, address and telephone number of the newspaper having general circulation in the area of the project. Failure to complete this question may delay local and State processing.

   Name and complete mailing address:

   N/A

   Telephone number
   (____) __________________

7. Give the following project location information:
   Street Address (911 address if available)____
   Lot/Block/Parcel#____
   Subdivision____
   City / County___________________________________ ZIP Code_____________________
   Latitude and Longitude at Center Point of Project Site (Decimal Degrees):
   _________________________ / -_________________________ (Example: 36.41600/-76.30733)

   If the project is located in a rural area, please provide driving directions giving distances from the best and nearest visible landmarks or major intersections. *Note: if the project is in an undeveloped subdivision or property, clearly stake and identify property lines and location of the proposed project. A supplemental map showing how the property is to be subdivided should also be provided.*

   N/A - linear project

8. What are the *primary and secondary purposes of and the need for* the project? For example, the primary purpose <u>may</u> be "to protect property from erosion due to boat wakes" and the secondary purpose <u>may</u> be "to provide safer access to a pier."

   See attached property owner information

Part 1 - General Information (continued)

9. Proposed use (check one):
   ___ Single user (private, non-commercial, residential)
   _X_ Multi-user (community, commercial, industrial, government)

10. Describe alternatives considered and the measures that will be taken to avoid and minimize impacts, to the maximum extent practicable, to wetlands, surface waters, submerged lands, and buffer areas associated with any disturbance (clearing, grading, excavating) during and after project construction. *Please be advised that unavoidable losses of tidal wetlands and/or aquatic resources may require compensatory mitigation.*

    Piankatank River, Urbanna Creek

11. Is this application being submitted for after-the-fact authorization for work which has already begun or been completed? ___Yes _X_No. If yes, be sure to clearly depict the portions of the project which are already complete in the project drawings.

12. Approximate cost of the entire project (materials, labor, etc.): $ 27,000,000
    Approximate cost of that portion of the project that is channelward of mean low water:
    $ 900,000

13. Completion date of the proposed work: January - 2025

14. Adjacent Property Owner Information: List the name and complete **mailing address**, including zip code, of each adjacent property owner to the project. (NOTE: If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.) Failure to provide this information may result in a delay in the processing of your application by VMRC.

    See attached property owner information.

Part 2 - Signatures

1. Applicants and property owners (if different from applicant). NOTE: REQUIRED FOR ALL PROJECTS

<u>PRIVACY ACT STATEMENT</u>: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.
CERTIFICATION: I am hereby applying for all permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit. In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Edward Henifin, HRSD Project Manager

Applicant's Legal Name (printed/typed) (Use if more than one applicant)

Applicant's Signature (Use if more than one applicant)

Date

Property Owner's Legal Name (printed/typed) (Use if more than one owner)
(If different from Applicant)

Property Owner's Signature (Use if more than one owner)

Date

Part 2 – Signatures (continued)

2. Applicants having agents (if applicable)

CERTIFICATION OF AUTHORIZATION

I (we), Edward Henifin: HRSD, hereby certify that I (we) have authorized Emily M Foster: Tetra Tech
(Applicant's legal name(s)) (Agent's name(s))
to act on my behalf and take all actions necessary to the processing, issuance and acceptance of this permit and any and all standard and special conditions attached.

We hereby certify that the information submitted in this application is true and accurate to the best of our knowledge.

______________________________ ______________________________
(Agent's Signature) (Use if more than one agent)

____
(Date)

______________________________ ______________________________
(Applicant's Signature) (Use if more than one applicant)

____
(Date)

3. Applicant's having contractors (if applicable)

CONTRACTOR ACKNOWLEDGEMENT

I (we), ______________________, have contracted____
(Applicant's legal name(s)) (Contractor's name(s))
to perform the work described in this Joint Permit Application, signed and dated__________________________.

We will read and abide by all conditions set forth in all Federal, State and Local permits as required for this project. We understand that failure to follow the conditions of the permits may constitute a violation of applicable Federal, state and local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes. In addition, we agree to make available a copy of any permit to any regulatory representative visiting the project to ensure permit compliance. If we fail to provide the applicable permit upon request, we understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all terms and conditions.

____
Contractor's name or name of firm

____
Contractor's or firms address

______________________________ ______________________________
Contractor's signature and title Contractor's License Number

______________________________ ______________________________
Applicant's signature (use if more than one applicant)

____
Date

Part 2 – Signatures (continued)

ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

I (we), ____________________________________, own land next to (across the water
(Print adjacent/nearby property owner's name)

from/on the same cove as) the land of_____________________________________.
(Print applicant's name(s))

I have reviewed the applicant's project drawings dated ________________________
(Date)

to be submitted for all necessary federal, state and local permits.

I HAVE NO COMMENT_______ ABOUT THE PROJECT.

I DO NOT OBJECT ______ TO THE PROJECT.

I OBJECT ______ TO THE PROJECT.

The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.

(Before signing this form be sure you have checked the appropriate option above).

____
Adjacent/nearby property owner's signature(s)

____
Date

Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.

Part 2 – Signatures (continued)

ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

I (we), ______________________________________, own land next to (across the water
(Print adjacent/nearby property owner's name)

from/on the same cove as) the land of____.
(Print applicant's name(s))

I have reviewed the applicant's project drawings dated ___________________________
(Date)

to be submitted for all necessary federal, state and local permits.

I HAVE NO COMMENT_______ ABOUT THE PROJECT.

I DO NOT OBJECT ______ TO THE PROJECT.

I OBJECT ______ TO THE PROJECT.

The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.

(Before signing this form, be sure you have checked the appropriate option above).

____
Adjacent/nearby property owner's signature(s)

____
Date

Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.

Appendix C: Crossings in, on, over, or under, waters, submerged lands, tidal wetlands and/or dunes and beaches, including but not limited to, bridges, walkways, pipelines and utility lines.

1. What is the purpose and method of installation of the crossing?

   Purpose: To install a new transmission force main to provide sanitary sewer service to Middlesex County, using HDD methods to cross the Piankatank River and Urbanna Creek.

2. What is the width of the waterway and/or wetlands to be crossed

   from mean high water to mean high water (tidal waters)? 1,140/1,893 feet. Urbanna Creek/Piankatank River

   from mean low water to mean low water (tidal waters)? 1,127/1,877 feet. Urbanna Creek/Piankatank River

   from ordinary high water to ordinary high water (non-tidal waters)? N/A feet.

3. For bridges (footbridges, golf cart bridges, roadway bridges, etc.), what is the width of the structure over the tidal wetlands, dunes/beaches and/or submerged lands? N/A square feet.

4. For overhead crossings:
   a. What will be the height above mean high water? N/A feet.
   b. If there are other overhead crossings in the area, what is the minimum height? N/A feet.
   c. If the proposed crossing is an electrical line, please confirm the total number of electrical circuits: N/A

5. For buried crossings, what will be the depth below the substrate? 30/58 feet. Will the proposed utility provide empty conduits for any additional utilities that may propose to co-locate at a later date? ____ Yes X No. Urbanna Creek/Piankatank River (minimum depth below substrate)

6. Will there be any excavation or fill required for placement of abutments, piers, towers, or other permanent structures on State-owned submerged lands, tidal wetlands, and dunes/beaches? ____ Yes X No.

   If yes, please provide the following:

   a. Amount of excavation in wetlands — 0 cubic yards; 0 square feet
   b. Amount of excavation in submerged land — 0 cubic yards; 0 square feet
   c. Amount of excavation in dune/beach — 0 cubic yards; 0 square feet
   d. Amount of fill in wetlands — 0 cubic yards; 0 square feet
   e. Amount of fill in submerged lands — 0 cubic yards; 0 square feet
   f. Amount of fill in dune/beach — 0 cubic yards; 0 square feet

Part 4 - Project Drawings

Plan view and cross-sectional view drawings are required for all projects. Application drawings do not need to be prepared by a professional draftsman, but they must be clear, accurate, and should be to an appropriate scale. If a scale is not used, all dimensions must be clearly depicted in the drawings. If available, a plat of the property should be included, with the existing and proposed structures clearly indicated. Distances from the proposed structure(s) to fixed points of reference (benchmarks) and to the adjacent property lines must be shown. A vicinity map (County road map, USGS Topographic map, etc.) must also be provided to show the location of the property. **NOTE:** The sample drawings have been included at the end of this section to provide guidance on the information required for different types of projects. Clear and accurate drawings are essential for project review and compliance determination. Incomplete or unclear drawings may cause delays in the processing of your application.

The following items must be included on ALL project drawings: (plan and cross-sectional, as appropriate)

- **name of project**
- **north arrow**
- **scale**
- **waterway name**
- **existing and proposed structures, labeled as such**
- **dimensions of proposed structures**
- **mean high water and mean low water lines**
- **all delineated wetlands and all surface waters on the site, including the Cowardin classification (i.e., emergent, scrub-shrub, or forested) for those surface waters (if applicable)**
- **limits of proposed impacts to surface waters, such as fill areas, riprap scour protection placement, and dredged areas, and the amount of such impacts in square feet and acres**
- **ebb/flood direction**
- **adjacent property lines and owner's name**
- **distances from proposed structures to fixed points of reference (benchmarks) and adjacent property lines**

Part 5 - Chesapeake Bay Preservation Act Information

All proposed development, redevelopment, land disturbance, clearing or grading related to this Tidewater JPA must comply with the Chesapeake Bay Preservation Area Designation and Management Regulations, which are enforced through locally adopted Chesapeake Bay Preservation Area (CBPA) ordinances. Compliance with state and local CBPA requirements mandates the submission of a ***Water Quality Impact Assessment (WQIA)*** for the review and approval of the local government. Contact the appropriate local government office to determine if a WQIA is required for the proposed activity(ies).

Because the 84 local governments within Tidewater Virginia are responsible for enforcing the CBPA Regulations, the completion of the JPA process does not constitute compliance with the Bay Act Regulations nor does it guarantee that the local government will approve encroachments into the RPA that may result from this project. Applicants should contact their local government as early in the design process as possible to ensure that the final design and construction of the proposed project meets all applicable CBPA requirements. Early cooperation with local government staff can help applicants avoid unnecessary and costly delays to construction. Applicants should provide local government staff with information regarding existing vegetation within the Resource Protection Area (RPA) as well as a description and site drawings of any proposed land disturbance, construction, or vegetation clearing. As part of their review and approval processes, local government staff will evaluate the proposed project and determine whether or not approval can be granted. Once the locality has made a decision on the project, they will advise the Local Wetlands Boards and other appropriate parties of applicable CBPA concerns or issues.

Resource Protection Areas (RPAs) are composed of the following features:

1. **Tidal wetlands;**
2. **Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow;**
3. **Tidal shores;**
4. **Other lands considered by the local government to meet the provisions of subsection A of 9VAC25-830-80 and to be necessary to protect the quality of state waters; and**
5. **A buffer area not less than 100 feet in width located adjacent to and landward of the components listed in subdivisions 1 through 4 above, and along both sides of any water body with perennial flow.**

Notes for all projects in RPAs

Development, redevelopment, construction, land disturbance, or placement of fill within the RPA features listed above requires the approval of the locality and may require an exception or variance from the local Bay Act ordinance. Please contact the appropriate local government to determine the types of development or land uses that are permitted within RPAs.

Pursuant to 9VAC25-830-110, on-site delineation of the RPA is required for all projects in CBPAs. Because USGS maps are not always indicative of actual "in-field" conditions, they may not be used to determine the site-specific boundaries of the RPA.

Notes for shoreline erosion control projects in RPAs

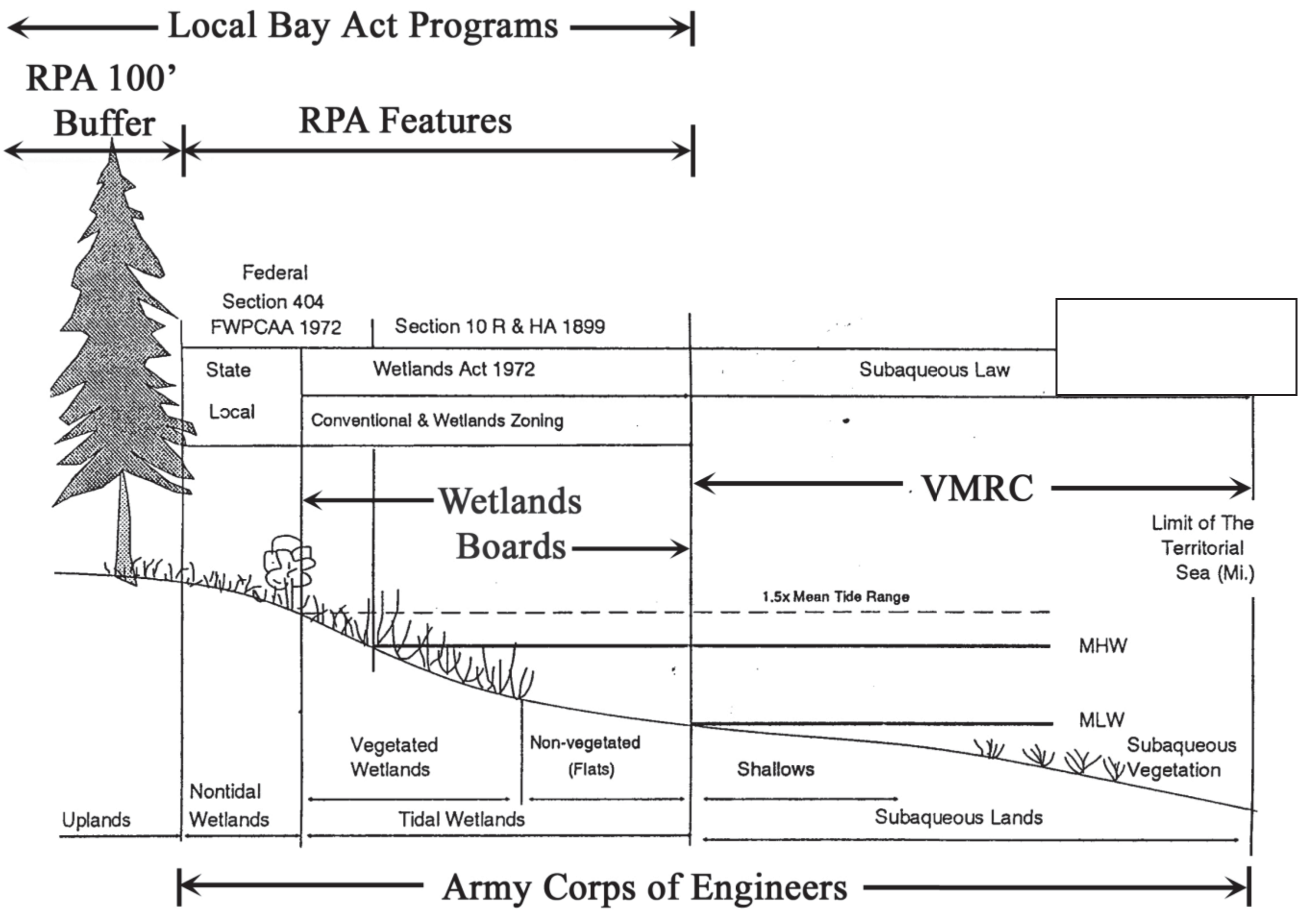
Re-establishment of woody vegetation in the buffer will be required by the locality to mitigate for the removal or disturbance of buffer vegetation associated with your proposed project. Please contact the local government to determine the mitigation requirements for impacts to the 100-foot RPA buffer.

Part 5 - Chesapeake Bay Preservation Act Information (continued)

Pursuant to 9VAC25-830-140 5 a (4) of the Virginia Administrative Code, shoreline erosion projects are a permitted modification to RPAs provided that the project is based on the "best technical advice" and complies with applicable permit conditions. In accordance with 9VAC25-830-140 1 of the Virginia Administrative Code, the locality will use the information provided in this Part V, in the project drawings, in this permit application, and as required by the locality, to make a determination that:

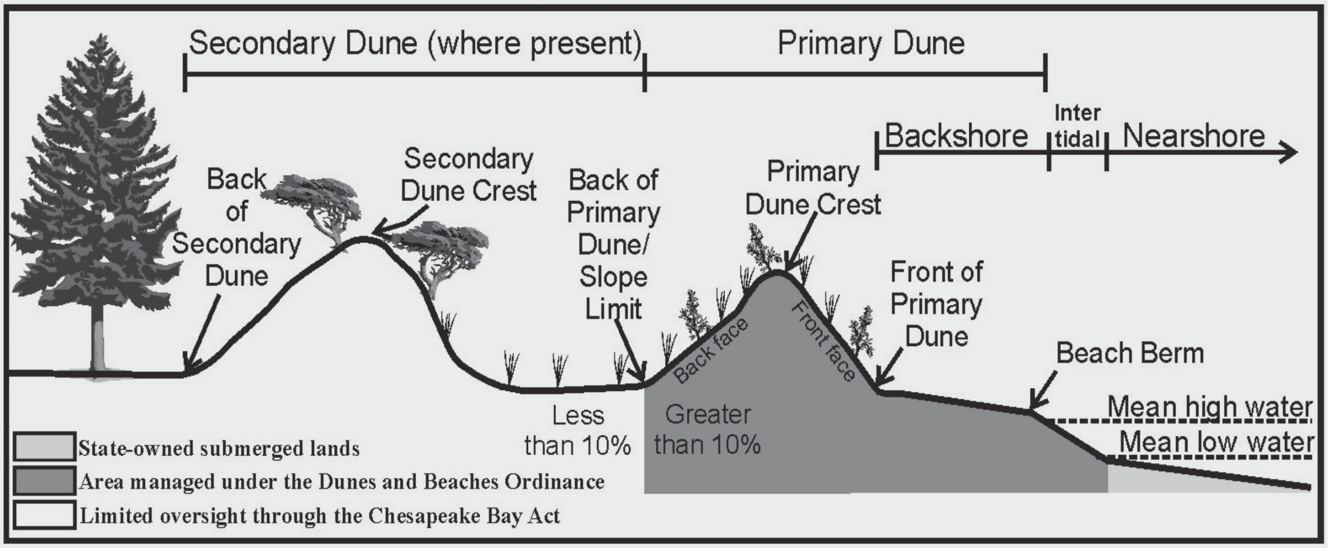
1. Any proposed shoreline erosion control measure is necessary and consistent with the nature of the erosion occurring on the site, and the measures have employed the "best available technical advice"
2. Indigenous vegetation will be preserved to the maximum extent practicable
3. Proposed land disturbance has been minimized
4. Appropriate mitigation plantings will provide the required water quality functions of the buffer (9VAC25-830-140 3)
5. The project is consistent with the locality's comprehensive plan
6. Access to the project will be provided with the minimum disturbance necessary.

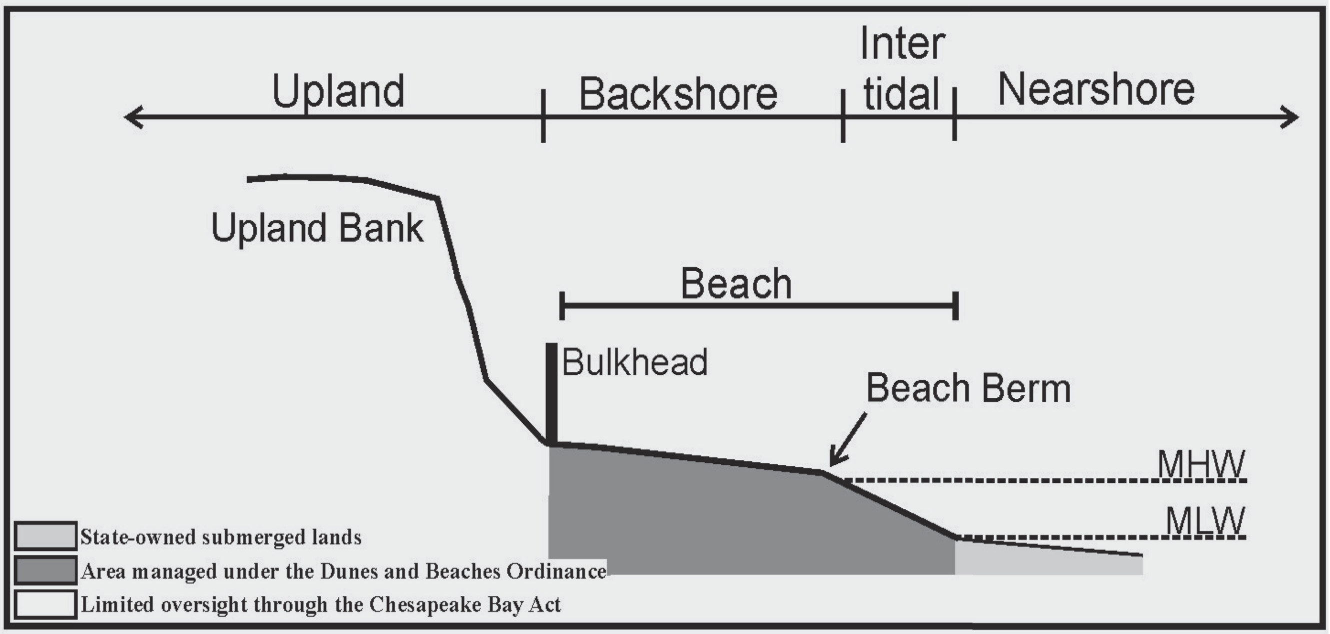
Jurisdictional Boundaries

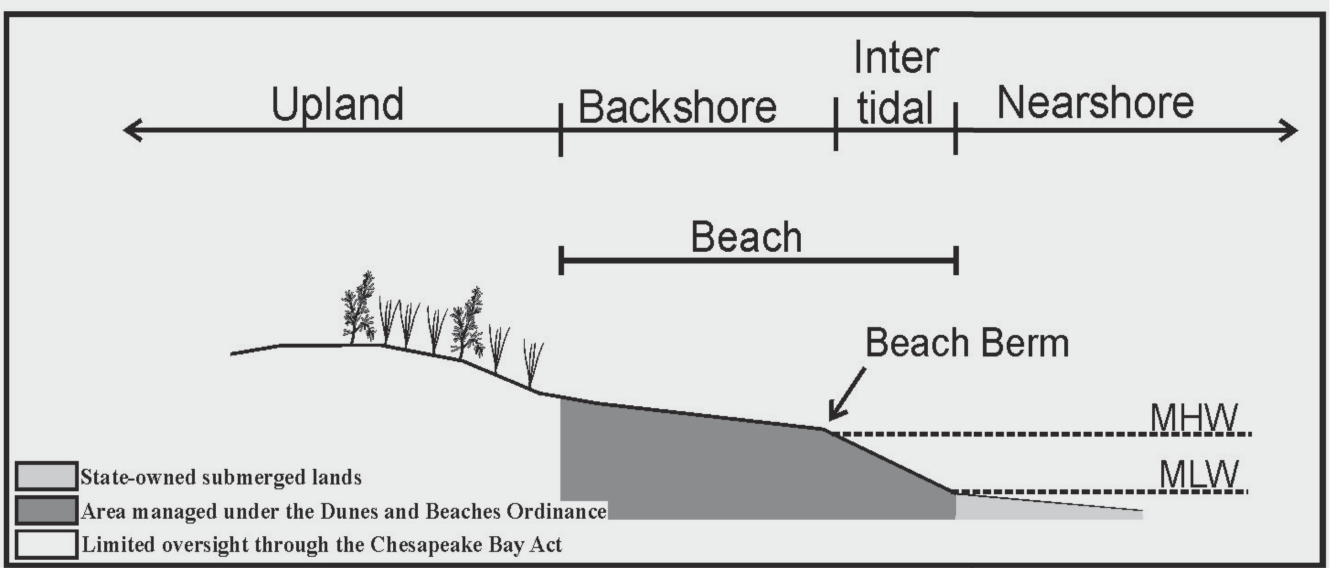


and DEQ (including isolated wetlands)

Dune and Beach Boundaries







ATTACHMENT 2: PROPERTY OWNER INFORMATION

#	Parcel ID	Property Owner/Mailing Address	Property Address	Phone #	Crossing
1	3-1-D	**Mary H. Casassa** 116 Wainwright Manor, Summerville, SC 29485	NA	843-817-0711; mhcwccln4@aol.com	Piankatank River
2	3-A-19	**Mary H. Casassa** 116 Wainwright Manor, Summerville, SC 29485	157 Twiggs Ferry Rd., Dutton, VA 23050	843-817-0711; mhcwccln4@aol.com	Piankatank River
3	3-1-A	**Gaylia K. Hudgins & Hubert Bland Hudgins, Co-Trustees, under the Gaylia K. Hudgins Trust** PO BOX 36 Mathews, VA 23109-0039	145 & 147 Twiggs Ferry Rd., Dutton, VA 23050	804-725-8475 (good #); gaylialee@gmail.com	Piankatank River
4	20B-6-3	**Judith A. & James D. Pitts, Trustees** PO BOX 365 Urbanna, VA 23175-0365	103 Nimcock Rd. Urbanna, VA 23175	804-758-2616 (Home) (804) 815-8964 (Mrs. Pitts' Cell)	Urbanna Creek
5	27-10-1	**Rosegill Development LLC** 2071 Chain Bridge Road #510 Vienna, VA 22182	1818 Urbanna Rd. Saluda, VA 23149	Diane Basheer (703) 849-8700	Urbanna Creek
6	43-6-3	**Carolyn A. Walton** 65 Drum Point Ln. Hartfield, VA 23071	65 Drum Point Ln. Hartfield, VA 23071	804-815-1438	Piankatank River
7	Unknown	****The Heirs of A. J. Chewning, Jr.**	Vacant	Unknown	Urbanna Creek

**HRSD is currently negotiating with the property owners for the easements adjacent to the HDD crossings – this is expected to be finalized by the end of 2021.*

***There is no available/existing information on the property owner. HRSD will be going through condemnation for acquisition of this easement.*

ATTACHMENT 3: JURISDICTIONAL DETERMINATION REQUEST

NORFOLK DISTRICT REGULATORY OFFICE
PRE-APPLICATION AND/OR JURISDICTIONAL WATERS DETERMINATION REQUEST FORM

This form is used when you want to determine if areas on your property fall under regulatory requirements of the U.S. Army Corps of Engineers (USACE). Please supply the following information and supporting documents described below. This form can be filled out online and/or printed and then mailed, faxed, or e-mailed to the Norfolk District. Submitting this request authorizes the US Army Corps of Engineers to field inspect the property site, if necessary, to help in the determination process. **THIS FORM MUST BE SIGNED BY THE PROPERTY OWNER TO BE CONSIDERED A FORMAL REQUEST.**

The printed form and supporting documents should be mailed to:

U.S. Army Corps of Engineers, Norfolk District
Regulatory Branch
803 Front Street
Norfolk, Virginia 23510-1096

Or faxed to (757) 201-7678

Or sent via e-mail to: CENAO.REG_ROD@usace.army.mil

Additional information on the Regulatory Program is available on our website at:
http://www.nao.usace.army.mil/
Please contact us at 757-201-7652 if you need any assistance with filling out this form.

Location and Information about Property to be subject to a Jurisdictional Determination:

1. Date of Request:
2. Project Name: Tetra Tech c/o Emily Foster
   5700 Lake Wright Dr.
   Norfolk VA, 23502
3. City or County where property located: On behalf of HRSD, Tetra Tech, Inc. is submitting this Joint Permit Application in support of planned project to design and construct a sewage conveyance system to serve Middlesex County, Virginia (the Project).
4. Address of property and directions (attach a map of the property location and a copy of the property plat): N/A
5. Coordinates of property (if known): N/A
6. Size of property in acres: N/A - linear project
7. Tax Parcel Number / GPIN (if available): See attached property owner information
8. Name of Nearest Waterway: Piankatank River, Urbanna Creek

9. Brief Description of Proposed Activity, Reason for Preapplication Request, and/or Reason for Jurisdictional Waters Determination Request:
   See attached property owner information.

10. Has a wetland delineation/determination been completed by a consultant or the Corps on the property previously? ☐ YES ☒ NO ☐ UNKNOWN

    If yes, please provide the name of the consultant and/or Corps staff and Corps permit number, if available:

Property Owner Contact Information:

Property Owner Name: See JPA Attachment 2: Property Owner Information
Mailing Address:
City: State: Zip:
Daytime Telephone:
E-mail Address:

If the person requesting the Jurisdictional Determination is **NOT** the Property Owner, please also supply the Requestor's contact information here:

Requestor Name: Edward Henifin, HRSD Project Manager
Mailing Address: 1434 Air Rail Avenue
City: State: Zip: Virginia Beach, VA 23445
Daytime Telephone: (757) 460-2261; ehenifin@HRSD.com
E-mail Address:

Additionally, if you have any of the following information, please include it with your request: wetland delineation map, other relevant maps, drain tile survey, topographic survey, and/or site photographs.

CERTIFICATION: I am hereby requesting a preapplication consultation or jurisdictional waters and/or wetlands determination from the U.S. Army Corps of Engineers, for the property(ies) I have described herein. I agree to allow the duly authorized representatives of the Norfolk District Corps of Engineers and other regulatory or advisory agencies to enter upon the premises of the project site at reasonable times to evaluate inspect and photograph site conditions. This consent to enter the property is superior to, takes precedence over, and waives any communication to the contrary. For example, if the property is posted as "no trespassing" this consent specifically supercedes and waives that prohibition and grants permission to enter the property despite such posting. I hereby certify that the information contained in the Request for a Jurisdictional Determination is accurate and complete:

______________________________ ______________________________
Property Owner's Signature Date

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: Norfolk District

- I am requesting a JD on property located at: multiple: see attached information
  (Street Address)
  City/Township/Parish: ________ County: Middlesex State: VA
  Acreage of Parcel/Review Area for JD: ________
  Section: ______ Township: ______ Range: ______
  Latitude (decimal degrees): 37.510152° Longitude (decimal degrees): -76.420342°
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ☐ I currently own this property. ☐ I plan to purchase this property.
  ☑ I am an agent/consultant acting on behalf of the requestor.
  ☐ Other (please explain): ________.
- Reason for request: (check as many as applicable)
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ☑ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ☑ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ☐ A Corps JD is required in order to obtain my local/state authorization.
  ☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ☐ I believe that the site may be comprised entirely of dry land.
  ☐ Other: ________
- Type of determination being requested:
  ☐ I am requesting an approved JD.
  ☑ I am requesting a preliminary JD.
  ☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: ________ Date: ________

- Typed or printed name: Emily Foster
  Company name: Tetra Tech
  Address: 5700 Lake Wright Drive
  Norfolk, VA 23502
  Daytime phone no.: (540) 841-4752
  Email address: emily.foster@tetratech.com

***Authorities:** Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

Aquatic Resource Report for the HRSD Middlesex Interceptor System Program Phase II

Hampton Roads Sanitation District

Mathews and Middlesex Counties, Virginia

November 2021

Prepared for:

Hampton Roads Sanitation District (HRSD)
1434 Air Rail Avenue
Virginia Beach, VA 23455

Prepared by:

Tetra Tech, Inc.
5700 Lake Wright Drive
Norfolk, VA 23502
Phone: (757) 461-4148

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronyms/Abbreviations	Definition
1987 Manual	Corps of Engineers Wetland Delineation Manual
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
GIS	Geographic Information Systems
GPS	Global Positioning System
HGM	Hydrogeomorphic
HUC	Hydrologic Unit Code
NHD	National Hydrography Dataset
NJD	Non-Jurisdictional
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
NRPWW	Wetlands adjacent to Non-Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High-Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
MISPPII	Middlesex Interceptor System Program Phase II
PSS	Palustrine Scrub-Shrub
PUB	Palustrine Unconsolidated Bottom
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0 (2010)
RPW	Relatively Permanent Waters
RPWWD	Wetlands directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
RPWWN	Wetlands adjacent to but not directly abutting Relatively Permanent Waters that flow directly or indirectly into Traditionally Navigable Waters
Tetra Tech	Tetra Tech, Inc.
TNW	Traditionally Navigable Water
TNWW	Wetlands Adjacent to Traditionally Navigable Waters
UNT	Unnamed Tributary
UPL	Upland

Acronyms/Abbreviations	Definition
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

Hampton Roads Sanitation District (HRSD) proposes to design and construct a sewage conveyance system to serve Middlesex County, referred to as the Middlesex Interceptor System Program Phase II; Urbanna to Mathews Transmission Force Main Project (MISPPII Project). The MISPPII Project is located in Middlesex and Mathews Counties in Virginia (VA), as shown on the United States Geological Survey (USGS) Project Location Map (Figure 1). The Project is in the Great Wicomico-Piankatank and the Lower Rappahannock (Hydrologic Unit Code [HUC] 02080102, 02080104) Watersheds (USGS 2019).

Tetra Tech, Inc. (Tetra Tech), on behalf of HRSD, prepared this Aquatic Resource Report summarizing the results of a field survey of the Project study area for the presence of wetlands and surface water features. Tetra Tech applied the methods detailed in the United States Army Corps of Engineers' (USACE) *Wetland Delineation Manual* (*1987 Manual*; Environmental Laboratory 1987), as amended by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* (*Regional Supplement*; USACE 2012).

2.0 METHODS

The primary objective of the aquatic resource field survey is to identify and map potentially jurisdictional streams and wetlands for avoidance and MISPPII Project permitting.

2.1 FIELD SURVEY

Prior to the start of field surveys, an initial desktop analysis of the Project study area is conducted through a review of available Geographic Information Systems (GIS) resources. Information reviewed includes the following:

- USGS topographic mapping (Figure 1; National Geographic Society, i-cubed 2013).
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017) mapping and data.
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (Figure 2; USFWS 2018).
- National Hydrography Dataset (NHD) Streams mapping (Figure 2; USGS 2021).

All features identified in the field, including stream reaches, wetlands, and wetland upland points, are given unique identification names (i.e. S-ID, W-ID, and W-ID-UPL, respectively). In addition, the NHD stream name (USGS 2021) for field identified streams is recorded on the stream data form (Appendix A) and listed in Table 1. Identified streams without an NHD stream name are named, “Unnamed Tributary (UNT)” of the first named receiving waterbody.

Identified stream reaches are mapped along their entire course within the study area by use of a Global Positioning System (GPS) receiver with sub-meter accuracy or better. The identified streams are shown on the Aquatic Resource Location Map (Figures 3A to 3J). Stream data forms detailing stream characteristics are provided in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features’ respective stream data form.

Wetland delineation involves the establishment of the wetland/upland boundary based on the identification of hydrophytic vegetation, hydric soils, and wetland hydrology indicators. This delineated wetland boundary is mapped in the field by use of a GPS receiver. Delineated wetlands are identified as closed or open boundary systems on the Identified Streams Table (Table 1). Wetlands that continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as open boundary wetland systems. Wetlands that do not continue beyond the delineated boundary shown on the Aquatic Resource Location Map are identified as closed boundary wetland systems. Data collected on vegetation, soils, and hydrology for identified wetlands and their associated upland points are recorded on USACE Wetland Determination Data Forms (Appendix B). Photographs and photograph location maps of each identified wetland are included immediately following each features’ respective USACE Wetland Determination Data Form.

2.2 STREAM IDENTIFICATION

Potentially jurisdictional streams are identified in the field by the presence of a continuous channel that exhibits evidence of frequent or reoccurring water flow such as a defined bed, bank, and an ordinary high-water mark (OHWM; USACE and United States Environmental Protection Agency [USEPA] 2007).

Physical and biological characteristics of the identified streams are evaluated to determine Flow Regime (82 FR 1860, January 6, 2017), USACE Waters Type (USACE and USEPA 2007), and Cowardin classifications (Cowardin et al. 1979). Physical characteristics evaluated include, but are not limited to: channel morphology, substrate size and type, and base flow conditions. Biological characteristics evaluated include, but are not limited to: the presence of fish, aquatic macroinvertebrates, and vegetation rooted within the OHWM. USACE Water Types (USACE and USEPA 2007) include:

- *Traditional Navigable Water (TNW)* – All "navigable waters of the U.S.," defined in 33 CFR Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact.
- *Relatively Permanent Waters (RPW)* – Streams that flow directly or indirectly into TNWs and where the flow of water is continuous year-round or at least seasonally.
- *Non-RPW (NRPW)* – Streams that flow directly or indirectly into TNWs where the flow of water is not continuous at least seasonally.

Flow Regimes (82 FR 1860, January 6, 2017) include:

- *Perennial* – Streams that typically have flow year-round. Most of the hydrology for perennial streams is derived from smaller upstream waters and/or groundwater sources with precipitation as a supplemental hydrologic contributor. Perennial streams are classified as RPW or TNW USACE Waters Types (USACE and USEPA 2007).
- *Intermittent* – Streams with seasonal flow, typically during the wet season (winter through spring). At least a portion of the hydrology for intermittent streams is derived from groundwater sources with precipitation as a supplemental hydrologic contributor. Intermittent streams are classified as an RPW USACE Waters Type (USACE and USEPA 2007).
- *Ephemeral* – Rain-dependent streams flowing only after precipitation event. Precipitation driven run-off from the localized surrounding landscape is the primary source of hydrology. Ephemeral streams are different from non-jurisdictional ditches and drainages due to the presence of an observable OHWM. Ephemeral streams are classified as an NRPW USACE Waters Type (USACE and USEPA 2007).

2.3 WETLAND DELINEATION

Wetland delineations are conducted in accordance with the procedures specified in the *1987 Manual* (Environmental Laboratory 1987) and the *Regional Supplement* (USACE 2012). According to the *1987 Manual* (Environmental Laboratory 1987), an area is defined as a wetland if, under normal circumstances, it meets all three of the following criteria: predominance of hydrophytic vegetation (plants adapted for life in saturated soil conditions); hydric soils (soils formed under water, or in saturated conditions); and wetland hydrology (current or recent inundation or saturated soils at some time during the growing season).

2.3.1 Hydrophytic Vegetation

Hydrophytic vegetation is identified in the field based on protocol outlined in the *Regional Supplement* (USACE 2012). Plant species representative of the habitats within the Project study area are identified to the species taxonomic level and the indicator status for each plant species is identified using *The National Wetland Plant List: 2020 Wetland Ratings* (USACE 2020). Wetland indicator statuses are described below (Reed 1988):

- *Obligate (OBL)* – almost always occurs in wetlands; estimated probability of occurrence in a wetland is greater than 99 percent.
- *Facultative Wetland (FACW)* – usually occurs in wetlands but may occur in non-wetlands; estimated probability of occurrence in a wetland is 67 to 99 percent.
- *Facultative (FAC)* – equally likely to occur in wetlands and non-wetlands; estimated probability of occurrence in a wetland is 34 to 66 percent.
- *Facultative Upland (FACU)* – usually occurs in non-wetlands but may occur in wetlands; estimated probability of occurrence in a wetland is 1 to 33 percent.
- *Upland (UPL)* – rarely occurs in wetlands; estimated probability of occurrence in a wetland is less than 1 percent.

Hydrophytic vegetation includes species with an indicator status of OBL, FACW, or FAC. Hydrophytic vegetation decisions are based on the plant community typically present during the wet portion of the growing season during a normal rainfall year. In areas where human practices or natural events have influenced vegetation, procedures for difficult or problematic situations outlined in the *Regional Supplement* (USACE 2012) are followed.

Wetlands habitat types are based on vegetation strata composition and are classified in accordance with the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979):

- *Palustrine emergent (PEM)* – contain emergent, herbaceous (non-woody) plants which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine scrub-shrub (PSS)* – contain woody plants less than six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage, or, when trees or shrubs alone cover less than 30 percent of an area but in combination cover 30 percent or more. Trees are defined as woody plants at least six meters (20 feet) in height, and shrubs are defined as woody plants less than six meters (20 feet) in height.
- *Palustrine forested (PFO)* – contain woody plants at least six meters (20 feet) in height which are the tallest life form with at least 30 percent aerial coverage.
- *Palustrine unconsolidated bottom (PUB)* – contain all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover of less than 30 percent.

2.3.2 Hydric Soils

Hydric soils are identified in the field based on protocol outlined in the *1987 Manual (*Environmental Laboratory 1987*)*, *Regional Supplement* (USACE 2012), and *Field Indicators of Hydric Soils in the United States* (United States Department of Agriculture [USDA] 2010). Based on prior experience, the presence of field-identified hydric soils does not always align with NRCS mapped hydric soils units. The NRCS soil units represent a large geographic area and are based on broad geologic and historic conditions. The methods used in the *Field Indicators of Hydric Soils in the United States* (USDA 2010) are used to determine hydric soil conditions on a localized scale. A review of the NRCS mapped hydric soils units is used to initially identify areas that have the potential to contain wetlands (See Section 3.2); however, the wetland delineation boundaries are based on the presence of field identified hydric soils. In cases where soils are found to be disturbed or problematic, determinations may rely on the NRCS mapped hydric soil units (USACE 2012).

2.3.3 Wetland Hydrology

Wetland hydrology indicators are identified in the field based on protocol outlined in the *1987 Manual* (Environmental Laboratory 1987) and *Regional Supplement* (USACE 2012). Hydrogeomorphic (HGM) and Water Type classifications are assigned to wetlands based on their hydrologic source and connectivity to streams. HGM classifications are based on *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993); a summary of HGM classifications commonly used in the Project region is described below:

- *Riverine* – Wetlands occur in floodplains and riparian corridors in association with stream channels.
- *Depressional* – Wetlands occur in topographic depressions. Dominant water sources are precipitation ground water discharge, and both interflow and overland flow from adjacent uplands.
- *Slope* – Wetlands normally are found where there is a discharge of ground water to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes.

Wetland USACE Water Types (USACE and USEPA 2007) include:

- *TNWW* – Wetlands adjacent to TNWs.

- *RPWWD* – Wetlands directly abutting RPWs that flow directly or indirectly into TNWs.
- *RPWWN* – Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs.
- *NRPWW* – Wetlands adjacent to NRPWs that flow directly or indirectly into TNWs.
- *Isolate* – Isolated (interstate or intrastate) waters, including isolated wetlands.

Current wetland hydrology indicators, inundation/saturation visible on aerial imagery, and estimates of the effects of ditches and subsurface drainage systems are all considered when making decisions regarding wetland hydrology in areas where human practices or natural events may have altered wetland hydrology.

3.0 RESULTS

Tetra Tech performed field surveys for the MISPPII Project between March and July, 2021. Surveys were limited to the Project study area illustrated on Figures 1 through 3. The field surveys identified 10 stream reaches and 16 wetlands within the Project study area. The Aquatic Resource Location Map (Figures 3A to 3J) illustrates the wetland and stream feature locations in relation to the Project study area. Tables 1 and 2 summarize stream and wetland information for all identified streams reaches and wetlands. Stream data forms are included in Appendix A and Wetland Determination Data Forms for wetlands and their associated upland points are included in Appendix B.

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over determinations made during these surveys rests with the Virginia Department of Environmental Quality (VADEQ) and USACE.

3.1 STREAM IDENTIFICATION

Ten stream reaches were identified in the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment. A summary of the data for each identified stream reach is provided in Table 1. Table 1 shows the stream reach field identification name, the NHD stream name, stream location, Flow Regime classification, Water Type classification, Cowardin classification, flow direction, top of bank width, and Figure 3 sheet location. Stream data forms are provided for each stream reach in Appendix A. Photographs and photograph location maps of each identified stream reach are included immediately following each features' respective stream data form.

3.2 WETLAND DELINEATION

NRCS and USFWS NWI mapping were reviewed for the initial desktop analysis of the Project study area to identify areas that may have the potential to contain wetlands. Appendix C provides the NRCS web soil survey for Middlesex and Mathews Counties. The NRCS soil survey mapping units are shown on Figure 2. A review of the USFWS NWI mapping indicates that 16 NWI wetlands are mapped in the Project study area (Figure 3 Index). One wetland, W5, is correlated with an NWI listed wetland as shown in Figure 2-A.

Sixteen wetlands are located within the Project study area based on our review of available GIS mapping data, evidence collected during field surveys, and best professional judgment.

A summary of each wetland identified and delineated within the Project study area is provided in Table 2. Table 2 shows the wetland identification name, location, Cowardin classification, HGM classification, Waters Type classification, the identity of any associated (i.e. abutting or adjacent) waterbodies, wetland size within the Project study area (in acres and square feet), and whether the wetland boundary is open or closed (see Section 2.1) and Figure 4 sheet location. Wetlands with multiple Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland. The wetland size provided in Table 2 represents the size of the delineated wetland boundary shown on Figures 4A to 4J. Open boundary wetlands continue beyond the delineated wetland boundary shown on Figures 4A to 4J; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in Table 2.

USACE Wetland Determination Data Forms detailing the existing vegetation, soil characteristics, and hydrology for each wetland and its associated upland point are provided in Appendix B. Photographs and photograph location maps of each identified wetland are included immediately following each features' respective USACE Wetland Determination Data Form.

4.0 CONCLUSION

During the field survey of the MISPPII Project, 10 stream reaches, and 16 wetlands were identified within the Project study area. A summary of the identified stream reach and wetland data is provided in Tables 1 and 2, respectively, and locations of all streams and wetlands are shown on the Aquatic Resource Location Map (Figures 3A to 3J).

This Aquatic Resource Report represents our best professional judgment and is based on site conditions at the time of the field survey. However, final authority over the determinations made during this survey rests with the VADEQ and the USACE.

5.0 REFERENCES

Brinson M.M. 1993. *A Hydrogeomorphic Classification for Wetlands*. Technical Report WRP-DE-4. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Cowardin L.M., Carter V., Golet F.C., and LaRoe E.T. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS/OBS-79/31. U.S Fish and Wildlife Service, Washington, D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1. United States Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

National Geographic Society, i-cubed. 2013. *USA Topo Maps*. Available at: http://services.arcgisonline.com/arcgis/rest/services/USA_Topo_Maps/MapServer/0

NRCS (Natural Resource Conservation Service), United States Department of Agriculture. 2017. Web Soil Survey. Updated August 21, 2017. Available at: https://websoilsurvey.sc.egov.usda.gov/

Reed, P.B., Jr. 1988. *National list of plant species that occur in wetlands: 1988 national summary*. Biological report 88(24). Washington, DC: U.S. Fish and Wildlife Service.

USACE (United States Army Corps of Engineers) 202. National Wetland Plant List, version 3.5. U.S. Army Corps of Engineers Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH. Available at: http://wetland-plants.usace.army.mil/ Accessed: November 16, 2021

USACE (United States Army Corps of Engineers) and USEPA (United States Environmental Protection Agency). 2007. *Jurisdictional Determination Form Instructional Guidebook*. Available at: https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Related-Resources/CWA-Guidance/

USACE (United States Army Corps of Engineers). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0,* ed. J.F Berkowitz, J.S. Wakeley, R.W. Lichvar, C.V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA (United States Department of Agriculture), Natural Resources Conservation Services. 2010. *Field Indicators of Hydric Soils in the United States*, Version 7.0. LM. Vasalis, G.W. Hurt, and C.V. Noble (eds.).

USFWS (United States Fish and Wildlife Service). 2018. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Updated October 15, 2018. Available at: http://www.fws.gov/wetlands/

USGS (United States Geological Survey). 2019. National Hydrography Dataset Best Resolution for Virginia. https://viewer.nationalmap.gov/basic/?basemap=b1&category=nhd&title=NHD%20View

FIGURES

Figure 1.
Project Location Map
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 3,000 6,000 12,000 Feet

0 0.5 1 2 Miles

TETRA TECH

Figure 2-Index
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 3,000 6,000 12,000 Feet

0 0.5 1 2 Miles

TETRA TECH

Figure 2A
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

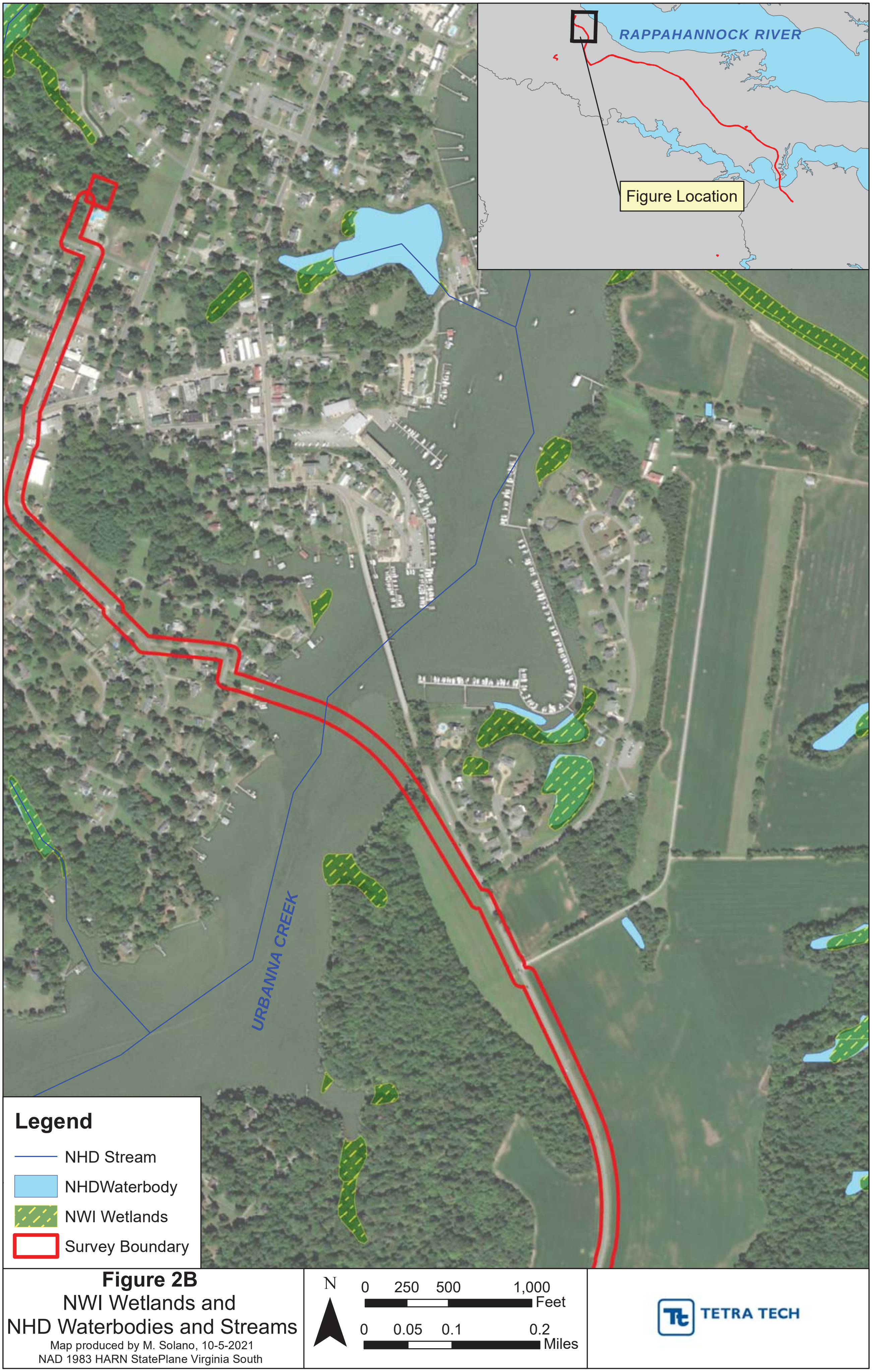


Figure 2B
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

Figure 2C
NWI Wetlands and
NHD Waterbodies and Streams

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 250 500 1,000 Feet

0 0.05 0.1 0.2 Miles

TETRA TECH

Legend

Survey Boundary

Note: Only those locations containing delineated features are shown in the subsequent pages.

Figure 3-Index
Map of Aquatic Resources
Figure Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 3,000 6,000 12,000 Feet

0 0.5 1 2 Miles

TETRA TECH

Figure 3A
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

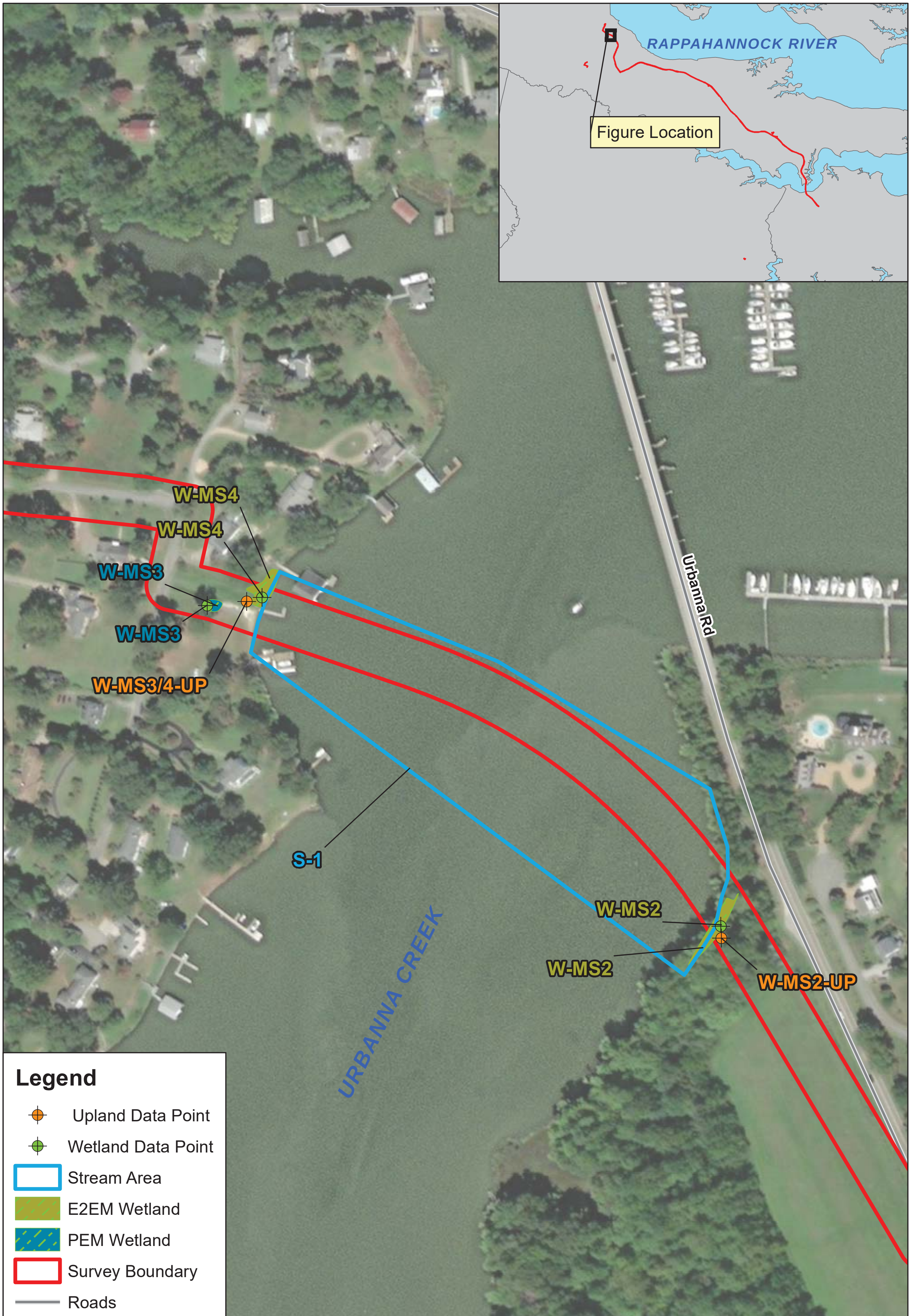


Figure 3B
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 87.5 175 350 Feet

0 0.0175 0.035 0.07 Miles

TETRA TECH

Figure 3C
Aquatic Resources
Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 125 250 500 Feet

0 0.025 0.05 0.1 Miles

TETRA TECH

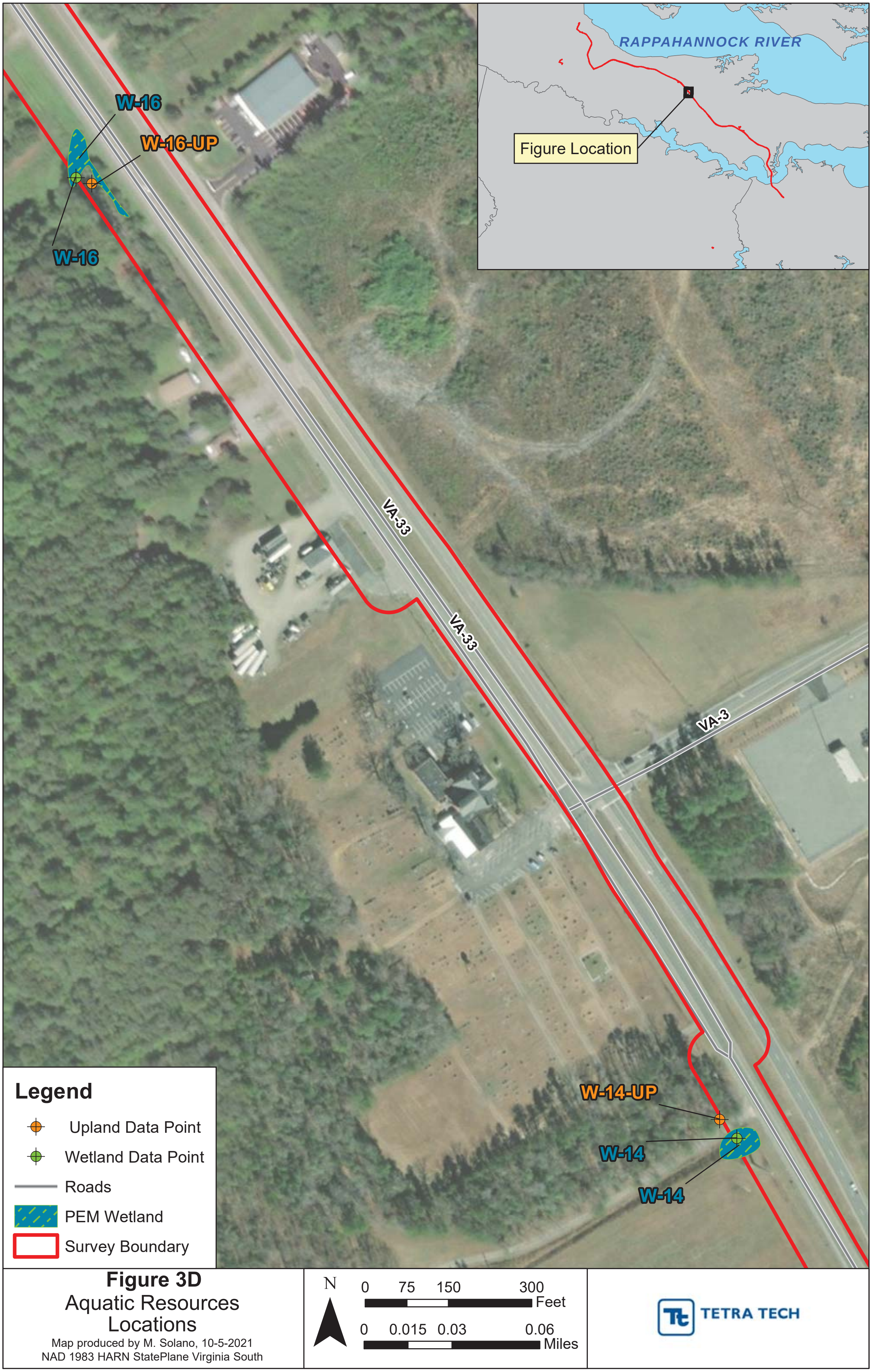


Figure 3D
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

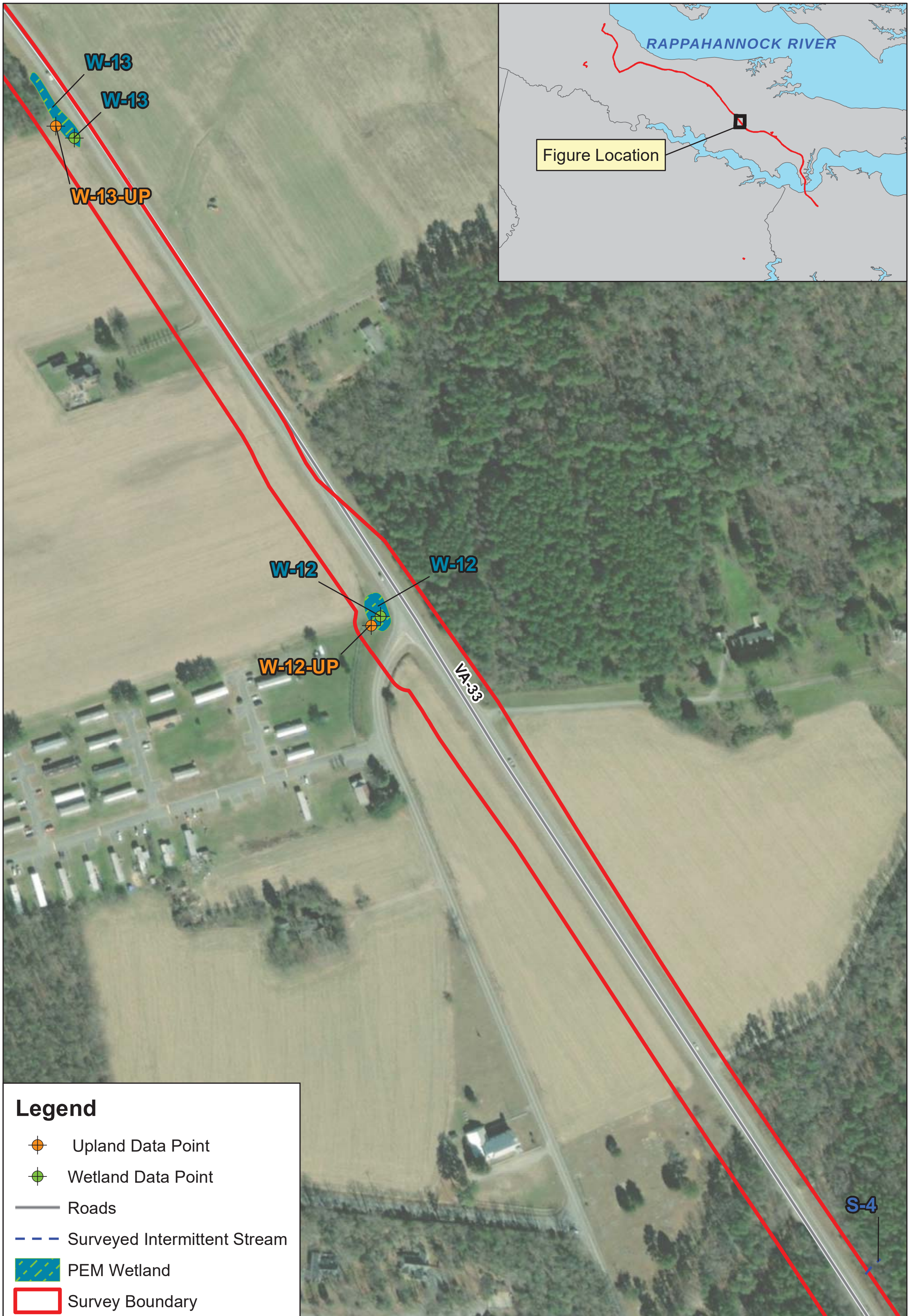


Figure 3E
Aquatic Resources Locations
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N
0 100 200 400 Feet
0 0.02 0.04 0.08 Miles

TETRA TECH

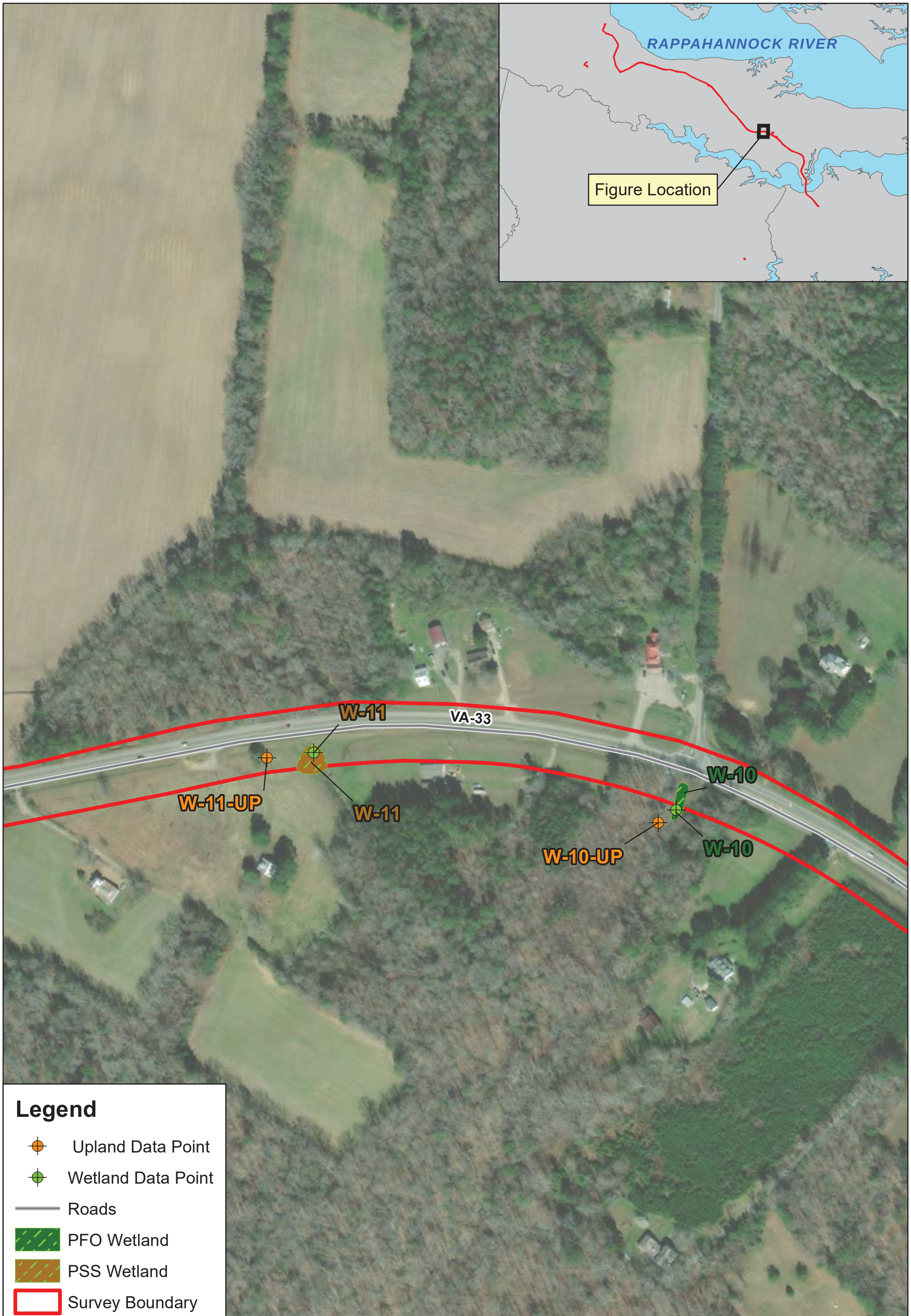


Figure 3F
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 100 200 400 Feet

0 0.02 0.04 0.08 Miles

TETRA TECH

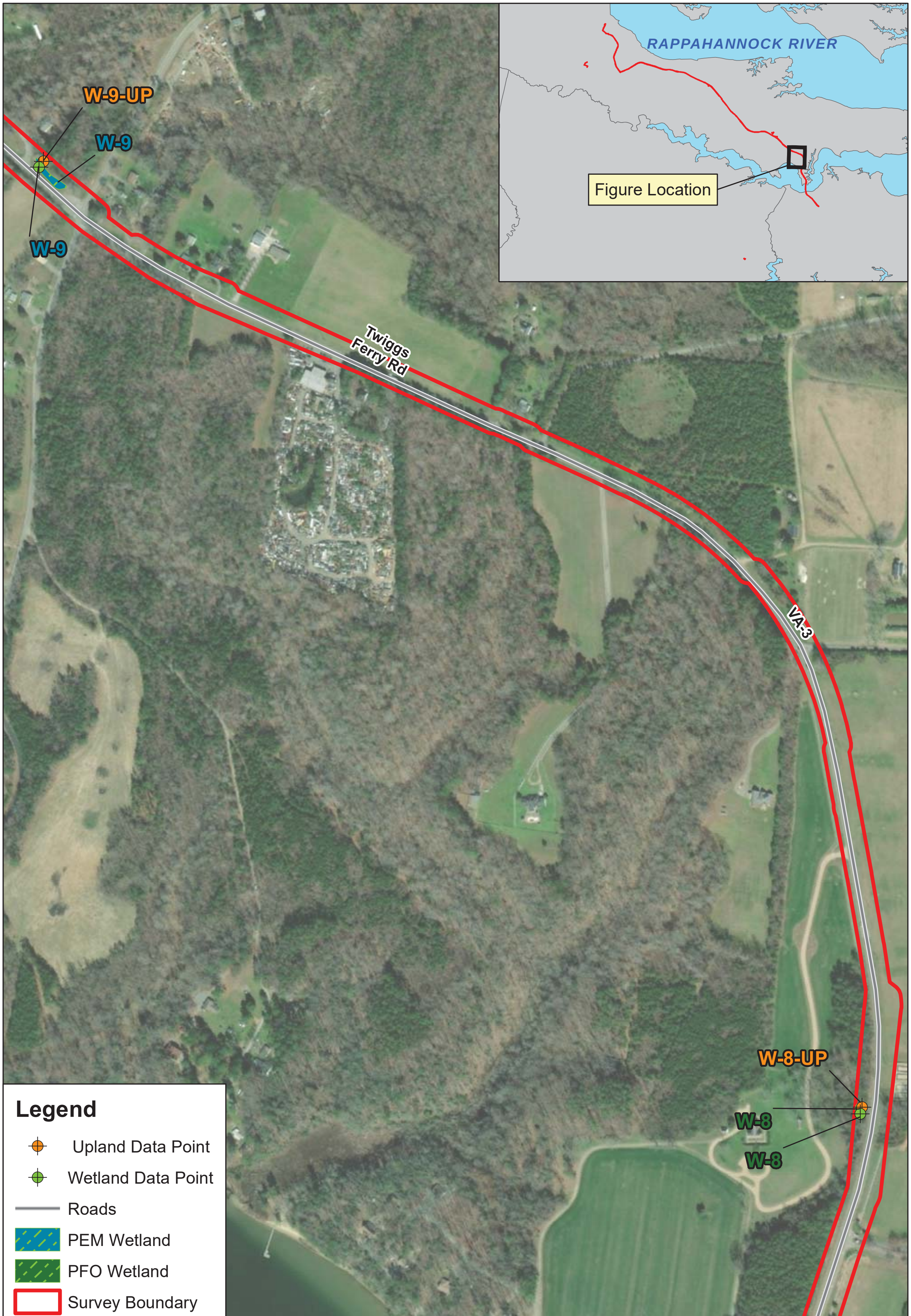


Figure 3G
Aquatic Resources Locations
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

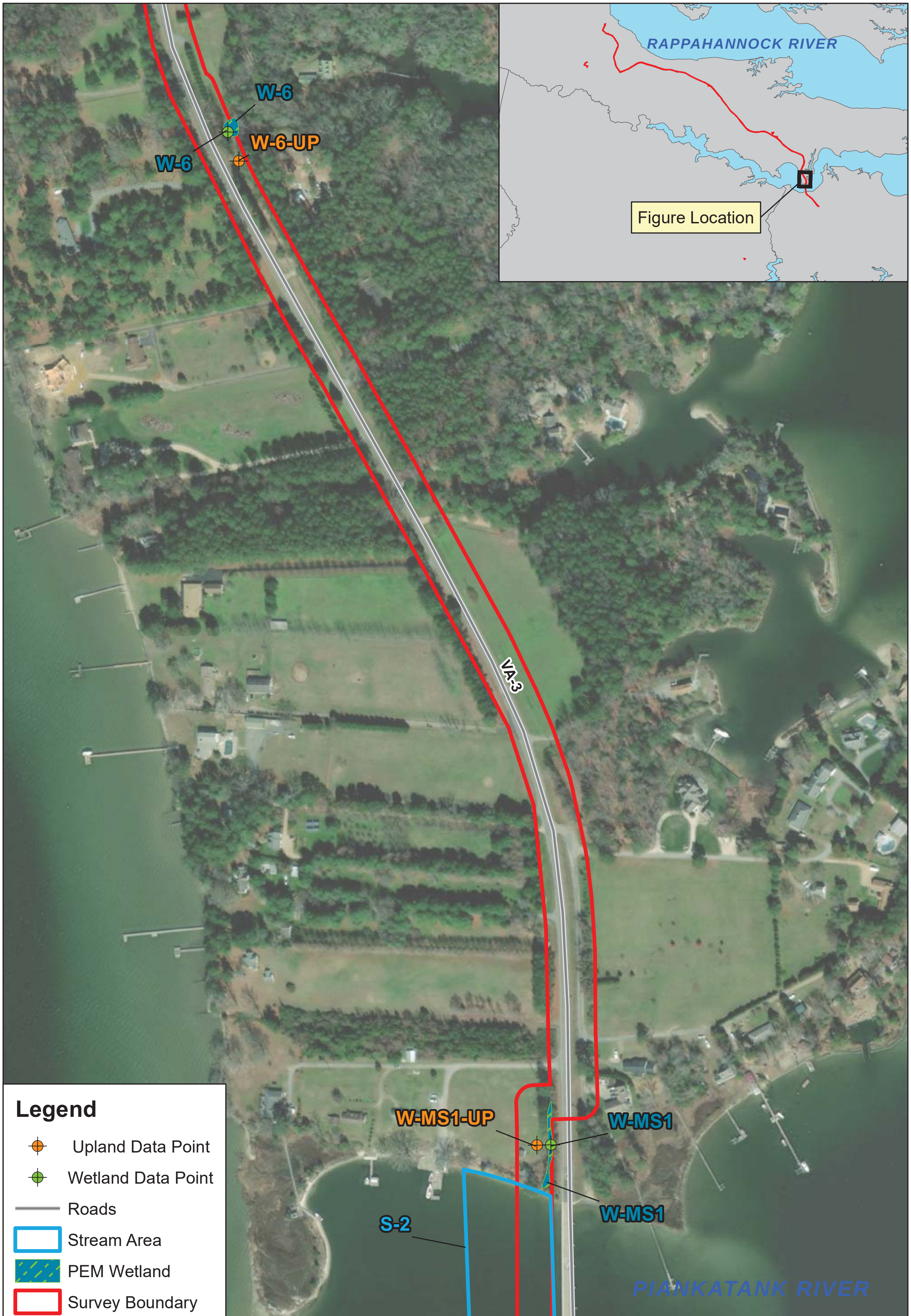


Figure 3H
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N
0 125 250 500 Feet
0 0.025 0.05 0.1 Miles

TETRA TECH

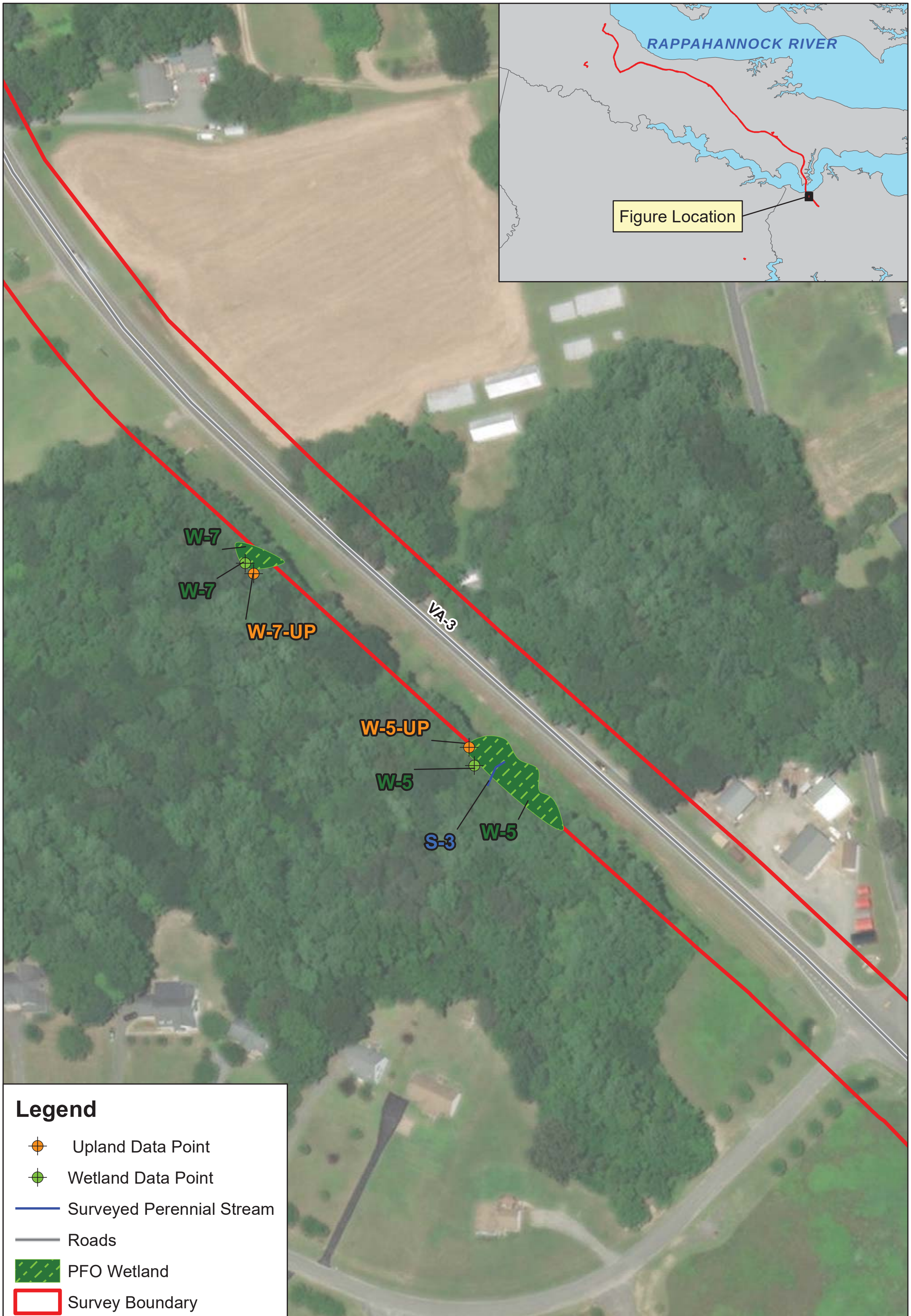


Figure 3I
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 50 100 200 Feet

0 0.01 0.02 0.04 Miles

TETRA TECH

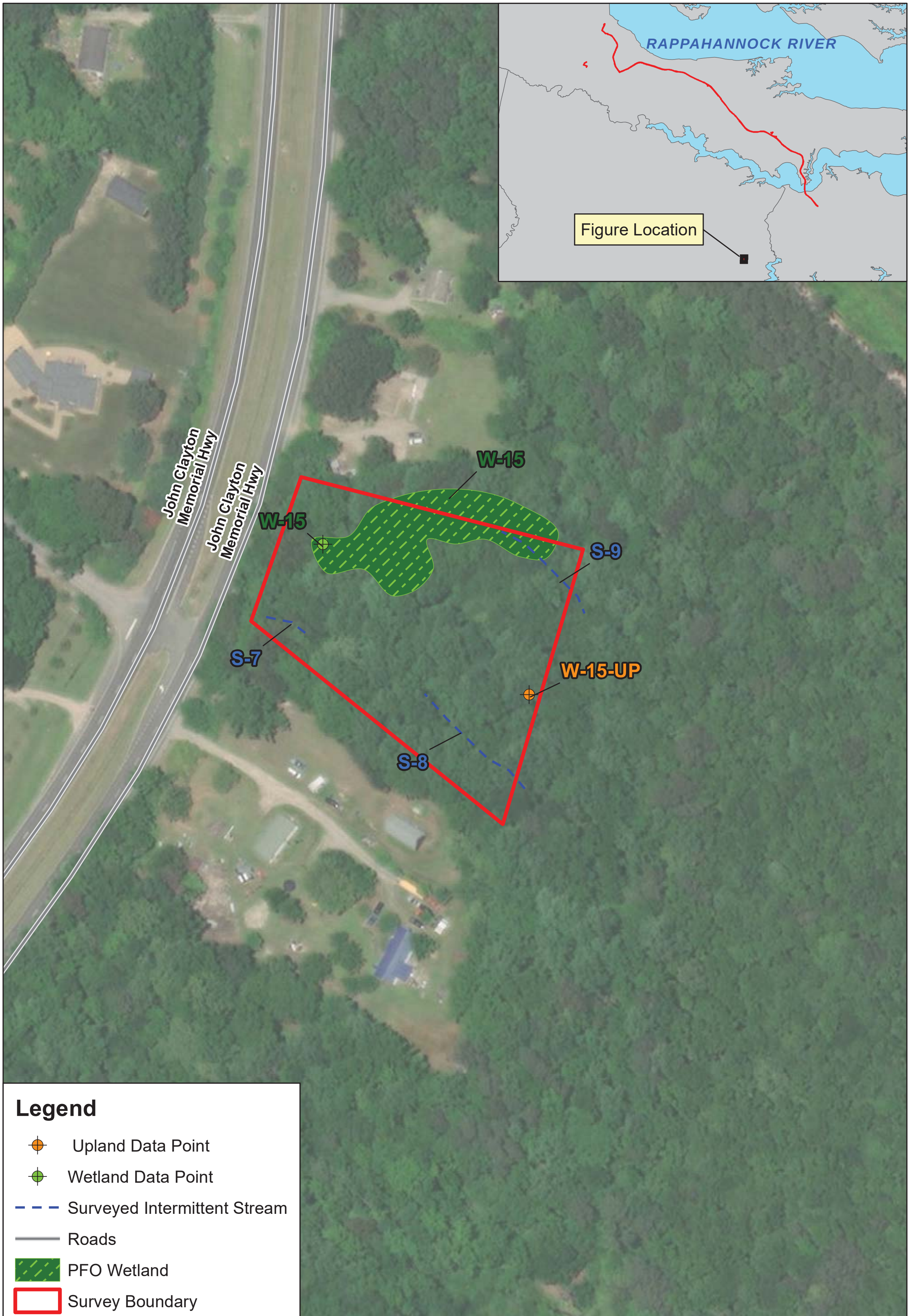


Figure 3J
Aquatic Resources Locations
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N
0 50 100 200 Feet
0 0.01 0.02 0.04 Miles

TETRA TECH

TABLES

Table 1.
Identified Streams

Stream Number[1]	Stream Reach ID	NHD Stream Name[2]	County	Latitude[3]	Longitude[3]	Flow Regime	Water Type[4]	Cowardin Class[5]	Flow Direction	Top of Bank Width (feet)	Figure
1	S1	Piankatank River	Middlesex	37.513154	-76.419896	Perennial	TNW	R3	Northeast	2050.00	3B
2	S2	Urbanna Creek	Middlesex	37.629513	-76.572037	Perennial	TNW	R3	Northeast	1230.00	3H
3	S3	UNT to Wadinger Creek	Matthews	37.503280	-76.417500	Perennial	RPW	R3	South	4.00	3I
4	S4	UNT to Mill Creek	Middlesex	37.558893	-76.468024	Intermittent	RPW	R4	Northeast	5.00	3E
5	S5	UNT to Rosegill Lake	Middlesex	37.618307	-76.569336	Ephemeral	NRPW	R6	East	10.00	3C
6	S6	UNT to Urbanna Creek	Middlesex	37.609903	-76.570838	Ephemeral	NRPW	R6	West	12.00	3C
7	S7	UNT to North River	Gloucester	37.454353	-76.468993	Intermittent	NRPW	R4	Southeast	4.00	3J
8	S8	UNT to North River	Gloucester	37.453852	-76.468088	Ephemeral	NRPW	R6	Southeast	4.50	3J
9	S9	UNT to North River	Gloucester	37.454461	-76.467861	Intermittent	RPW	R4	Southwest	10.00	3J
10	S10	UNT to Perkins Creek	Middlesex	37.639412	-76.578079	Intermittent	RPW	R4	West	13.00	3A

Notes:

1 - Streams with braided channels, streams that have different flow regimes (e.g. ephemeral and intermittent) within the surveyed reach, and NHD named streams with different field stream reach identification names are counted as single streams.

2 - From NHD (USGS 2021); see References. For identified streams without an NHD stream name, the identified stream was given the name, "Unnamed Tributary (UNT)", of the first named receiving waterbody.

3 - In decimal degrees.

4 - RPW = Relatively Permanent Waters
- NRPW = Non-Relatively Permanent Waters
- TNW = Traditional Navigable Waters

5 - From Cowardin et al. 1979; see References.

Table 2.
Identified Wetlands

Wetland Number[1]	Wetland ID	County	Latitude[2]	Longitude[2]	Cowardin Class[3]	HGM[4]	Water Type[5]	Associated Waterbodies	Size (Acres)[6]	Size (square feet)[6]	Open/Closed Boundary	Figure
1	W-MS1	Middlesex	37.513581	-76.420069	PEM	Riverine	TNWW	Piankatank river	0.05780	2,518	Closed	3H
2	W-MS2	Middlesex	37.629363	-76.571996	PEM	Riverine	TNWW	Urbanna Creek	0.06564	2,859	Closed	3B
3	W-MS3	Middlesex	37.631185	-76.575514	PEM	Slope	TNWW	Urbanna Creek	0.01655	721	Closed	3B
4	W-MS4	Middlesex	37.507359	-76.419963	PEM	Depressional	TNWW	Urbanna Creek	0.05758	2,508	Closed	3B
5	W5-PFO	Mathews	37.503319	-76.417549	PFO	Slope	NRPWW	UNT to Wadinger Creek	0.10369	4,517	Open	3I
6	W6-PEM	Middlesex	37.521623	-76.423043	PEM	Depressional	ISOLATE	N/A	0.04142	1,804	Open	3H
7	W7-PFO	Middlesex	37.503972	-76.418445	PFO	Depressional	ISOLATE	N/A	0.02501	1,090	Open	3I
8	W8-PEM	Middlesex	37.529907	-76.421768	PEM	Depressional	ISOLATE	N/A	0.02277	992	Open	3G
9	W9-PEM	Middlesex	37.540568	-76.432867	PEM	Depressional	ISOLATE	N/A	0.08941	3,895	Closed	3G
10	W10-PFO	Middlesex	37.554191	-76.451741	PFO	Depressional	ISOLATE	N/A	0.04350	1,895	Open	3F
11	W11-PSS	Middlesex	37.554596	-76.454609	PSS	Slope	NRPWW	Unknown	0.07185	3,130	Open	3F
12	W12-PEM	Middlesex	37.560321	-76.471869	PEM	Depressional	ISOLATE	N/A	0.08936	3,892	Closed	3E
13	W13-PEM	Middlesex	37.566080	-76.474214	PEM	Depressional	ISOLATE	N/A	0.10993	4,789	Closed	3E
14	W14-PEM	Middlesex	37.579991	-76.486446	PEM	Depressional	ISOLATE	N/A	0.07384	3,216	Open	3D
15	W15-PFO	Gloucester	37.454564	-76.468726	PFO	Depressional	ISOLATE	N/A	0.41918	18,259	Closed	3J
16	W16-PEM	Middlesex	37.584816	-76.490421	PEM	Slope	ISOLATE	N/A	0.08461	3,686	Open	3D

Notes:

1 - Wetlands with multiple contiguous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.
2 - In decimal degrees. Coordinates show wetland test pit locations.
3 - PEM = Palustrine Emergent
- PFO = Palustrine Forested
- PSS = Palustrine Scrub-Shrub
- PUB = Palustrine Unconsolidated Bottom
4 - HGM = Hydrogeomorphic
5 - RPWWD = Wetlands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs)
- RPWWN = Wetlands adjacent but not directly abutting RPWs that flow directly or indirectly into TNWs
- NRPWW = Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands
6 - Size of wetlands with open boundaries may be larger than shown in this table. Wetland size shown is the size of the wetland delineated and illustrated on Aquatic Resource Location Map.

APPENDIX A: STREAM DATA FORMS

STREAM ID S1	**STREAM NAME** Piankatank River
CLIENT HRSD	**PROJECT NAME** Middlesex HRD TFM
LAT 37.513154 **LONG** -76.419896	**STATE** Virginia — **COUNTY** Middlesex
INVESTIGATORS Emily Foster, James Cook	**DATE** 07/09/2021
WATER TYPE TNW ☑ RPW ☐ NRPW ☐	**FLOW REGIME** Perennial ☑ Intermittent ☐ Ephemeral ☐

CHANNEL FEATURES

Estimate Measurements

Top of Bank Width: 2,050 ft

Top of Bank Height:

LB 2.0 ft RB 3.0 ft

Water Depth: ____ ft

Water Width: ____ ft

Ordinary High Water Mark (Width): 2,050 ft

Ordinary High Water Mark (Height): ____ in

Flow Direction: East

Sinuosity ✓ Low __ Medium __ High

Gradient ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft)

Stream Erosion
__ None ✓ Moderate __ Heavy

Artificial, Modified or Channelized
✓ Yes __ No

Within Roadside Ditch
__ Yes ✓ No

Culvert Present __ Yes __ No

Culvert Material: ____

Culvert Size: ____ in

FLOW CHARACTERISTICS

Water Present
- __ No water, stream bed dry
- __ Stream bed moist
- __ Standing water
- ✓ Flowing water

Velocity
__ Fast ✓ Moderate
__ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle __ % Run 100 %
Pool __ %

Turbidity
__ Clear ✓ Slightly turbid __ Turbid
__ Other ____

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	5	Muck-Mud	black, very fine organic (FPOM)	10
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)	90	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES

Predominant Surrounding Landuse
- ✓ Forest __ Commercial
- ✓ Field/Pasture __ Industrial
- __ Agricultural __ Residential
- __ ROW __ Other:

Floodplain Width
✓ Wide > 30ft __ Moderate 15-30ft
__ Narrow <15ft

Canopy Cover
✓ Open __ Partly shaded
__ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Estimated using photos/online data

Photograph Page

Stream ID S1 Date 07/09/2021

Photograph Number 1

Photograph Direction North

Comments:

Photograph Number 2

Photograph Direction SE

Comments:

Photograph Number 3

Photograph Direction

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S2	STREAM NAME Urbanna Creek	
CLIENT HRSD	PROJECT NAME Middlesex HRD TFM	
LAT 37.629513 LONG -76.572037	STATE Virginia	COUNTY Middlesex
INVESTIGATORS Emily Foster, James Cook		DATE 07/09/2021
WATER TYPE TNW ☑ RPW ☐ NRPW ☐	FLOW REGIME Perennial ☑ Intermittent ☐ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
- Top of Bank Width: 1,230 ft
- Top of Bank Height:
- LB _______ ft RB _______ ft
- Water Depth: _______ ft
- Water Width: 1,200. ft
- Ordinary High Water Mark (Width): 1200 ft
- Ordinary High Water Mark (Height): _____ in
- Flow Direction: Northeast

Sinuosity ✓ Low __ Medium __ High

Gradient ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft)

Stream Erosion
__ None ✓ Moderate __ Heavy

Artificial, Modified or Channelized
✓ Yes __ No

Within Roadside Ditch
__ Yes ✓ No

Culvert Present __ Yes __ No

Culvert Material:__________________

Culvert Size: ______in

FLOW CHARACTERISTICS

Water Present
- __ No water, stream bed dry
- __ Stream bed moist
- __ Standing water
- ✓ Flowing water

Velocity
__ Fast ✓ Moderate
__ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle % Run 100 %
Pool %

Turbidity
__ Clear ✓ Slightly turbid __ Turbid
__ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	10
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
- ✓ Forest ✓ Commercial
- ✓ Field/Pasture __ Industrial
- __ Agricultural ✓ Residential
- __ ROW __ Other:

Canopy Cover
✓ Open __ Partly shaded
__ Shaded

Floodplain Width
✓ Wide > 30ft __ Moderate 15-30ft
__ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Estimated using photos/online data

Photograph Page

Stream ID S2 Date 07/09/2021

Photograph Number 1

Photograph Direction NE

Comments: Southeast bank

Photograph Number 2

Photograph Direction SW

Comments: Southeast bank

Photograph Number 3

Photograph Direction North

Comments: Northwest bank

Photograph Number 4

Photograph Direction South

Comments: Northwest bank

STREAM ID S3	STREAM NAME	
CLIENT HRSD	PROJECT NAME Middlesex HRD TFM	
LAT LONG	STATE Virginia	COUNTY Mathews
INVESTIGATORS Emily Foster, James Cook		DATE 7/9/21
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	FLOW REGIME Perennial ☑ Intermittent ☐ Ephemeral ☐	

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 4.5 ft
Top of Bank Height:
LB 1 ft RB 1 ft
Water Depth: 2 in
Water Width: 3 ft
Ordinary High Water Mark (Width): 4 ft
Ordinary High Water Mark (Height): 4 in
Flow Direction: ________

Sinuosity __ Low ✓ Medium __ High

Gradient __ Flat (0.5/100 ft) ✓ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft)

Stream Erosion
✓ None __ Moderate __ Heavy

Artificial, Modified or Channelized
__ Yes ✓ No

Within Roadside Ditch
__ Yes ✓ No

Culvert Present ✓ Yes __ No
Culvert Material: concrete box cuvert
Culvert Size: 24 in

FLOW CHARACTERISTICS

Water Present
__ No water, stream bed dry
__ Stream bed moist
__ Standing water
✓ Flowing water

Velocity
__ Fast ✓ Moderate
__ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 45 % Run 50 %
Pool 5 %

Turbidity
✓ Clear __ Slightly turbid __ Turbid
__ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100		
Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	100
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest __ Commercial
__ Field/Pasture __ Industrial
__ Agricultural __ Residential
__ ROW __ Other:

Canopy Cover
__ Open __ Partly shaded
✓ Shaded

Floodplain Width
__ Wide > 30ft __ Moderate 15-30ft
__ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Flows approx. south southwest. Small minnows and macroinverts.

Photograph Page

Stream ID S3 Date 7/9/21

Photograph Number 1

Photograph Direction NE

Comments: Photograph facing into culvert.

Photograph Number 2

Photograph Direction

Comments:

Photograph Number 3

Photograph Direction

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S4	**STREAM NAME** UNT to Mill Creek
CLIENT HRSD	**PROJECT NAME** HRSD Middlesex TFM
LAT 37.558893 **LONG** -76.468024	**STATE** Virginia **COUNTY** Middlesex
INVESTIGATORS Emily Foster, Katelyn Hoisington	**DATE** 7/15/21
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 5 ft Top of Bank Height: LB 3 ft RB 3 ft Water Depth: 2 in Water Width: 2 ft Ordinary High Water Mark (Width): 2.5 ft Ordinary High Water Mark (Height): 6 in Flow Direction: Northeast	**Sinuosity** ✓ Low __ Medium __ High **Gradient** ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft) **Stream Erosion** ✓ None __ Moderate __ Heavy **Artificial, Modified or Channelized** ✓ Yes __ No **Within Roadside Ditch** __ Yes ✓ No **Culvert Present** ✓ Yes __ No Culvert Material: concrete Culvert Size: 18 in
FLOW CHARACTERISTICS	**Water Present** __ No water, stream bed dry __ Stream bed moist ✓ Standing water __ Flowing water **Velocity** __ Fast __ Moderate __ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle % Run % Pool 100 % **Turbidity** __ Clear __ Slightly turbid ✓ Turbid __ Other

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural __ Residential ✓ ROW __ Other: **Canopy Cover** __ Open __ Partly shaded ✓ Shaded	**Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft __ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Recent timber harvest adjacent to roadside, stream bed disturbed from heavy machinery.

Photograph Page

Stream ID S4 Date 7/15/21

Photograph Number 1

Photograph Direction North

Comments:

Photograph Number 2

Photograph Direction South

Comments:

Photograph Number 3

Photograph Direction East

Comments:

Photograph Number 4

Photograph Direction West

Comments:

STREAM ID S5	**STREAM NAME** UNT to Rosegill Lake
CLIENT HRSD	**PROJECT NAME** MISPII
LAT 37.618307 **LONG** -76.569336	**STATE** Virginia / **COUNTY** Middlesex
INVESTIGATORS Emily Foster	**DATE** 07/29/2021
WATER TYPE TNW ☐ RPW ☐ NRPW ☑	**FLOW REGIME** Perennial ☐ Intermittent ☐ Ephemeral ☑

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 10.0 ft Top of Bank Height: LB 5.0 ft RB 5.0 ft Water Depth: 0.00 in Water Width: 0.0 ft Ordinary High Water Mark (Width): 1.0 ft Ordinary High Water Mark (Height): 6.0 in Flow Direction: East	**Sinuosity** ✓ Low __ Medium __ High **Gradient** __ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) ✓ Severe (10 ft/100 ft) **Stream Erosion** __ None ✓ Moderate __ Heavy **Artificial, Modified or Channelized** __ Yes ✓ No **Within Roadside Ditch** __ Yes ✓ No **Culvert Present** ✓ Yes __ No Culvert Material: Concrete Culvert Size: 12 in
FLOW CHARACTERISTICS	**Water Present** ✓ No water, stream bed dry __ Stream bed moist __ Standing water __ Flowing water **Velocity** __ Fast __ Moderate __ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle % Run % Pool % **Turbidity** __ Clear __ Slightly turbid __ Turbid __ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 0			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural __ Residential __ ROW __ Other: **Canopy Cover** __ Open __ Partly shaded ✓ Shaded	**Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft ✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S5 Date 07/29/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction ______

Comments:

Photograph Number 4

Photograph Direction ______

Comments:

STREAM ID S6	STREAM NAME UNT to Urbanna Creek	
CLIENT HRSD	PROJECT NAME	
LAT 37.609903 LONG -76.570838	STATE Virginia	COUNTY Middledex
INVESTIGATORS Emily Foster, Kristen Walls		DATE 7/29/21
WATER TYPE TNW ☐ RPW ☐ NRPW ☑	FLOW REGIME Perennial ☐ Intermittent ☐ Ephemeral ☑	

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 12 ft Top of Bank Height: LB 7 ft RB 7 ft Water Depth: 0 in Water Width: 0 ft Ordinary High Water Mark (Width): 1 ft Ordinary High Water Mark (Height): 12 in Flow Direction: West	**Sinuosity** ✓ Low ___ Medium ___ High **Gradient** ✓ Flat (0.5/100 ft) ___ Moderate (2 ft/100 ft) ___ Severe (10 ft/100 ft) **Stream Erosion** ___ None ___ Moderate ___ Heavy **Artificial, Modified or Channelized** ___ Yes ___ No **Within Roadside Ditch** ___ Yes ___ No **Culvert Present** ___ Yes ___ No Culvert Material:___ Culvert Size: ___in
FLOW CHARACTERISTICS	**Water Present** ✓ No water, stream bed dry ___ Stream bed moist ___ Standing water ___ Flowing water **Velocity** ___ Fast ___ Moderate ___ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle % Run % Pool % **Turbidity** ___ Clear ___ Slightly turbid ___ Turbid ___ Other___

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	5			
Sand	0.06-2mm (gritty)	75	Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)	20			

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest ___ Commercial ___ Field/Pasture ___ Industrial ___ Agricultural ___ Residential ___ ROW ___ Other: **Canopy Cover** ___ Open ___ Partly shaded ✓ Shaded	**Floodplain Width** ___ Wide > 30ft ___ Moderate 15-30ft ___ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S6 Date 7/29/21

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction ______

Comments:

Photograph Number 4

Photograph Direction ______

Comments:

STREAM ID S7	**STREAM NAME** UNT to North River
CLIENT HRSD	**PROJECT NAME** Middlesex Interconnector Phase II
LAT 37.454353 **LONG** -76.468993	**STATE** Virginia / **COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter	**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☐ NRPW ☐	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 3.0 ft Top of Bank Height: LB 2.0 ft RB 2.0 ft Water Depth: 6.00 in Water Width: 2.0 ft Ordinary High Water Mark (Width): 4.0 ft Ordinary High Water Mark (Height): 4.0 in Flow Direction: Southeast	**Sinuosity** ✓ Low __ Medium __ High **Gradient** __ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft) **Stream Erosion** __ None ✓ Moderate __ Heavy **Artificial, Modified or Channelized** ✓ Yes __ No **Within Roadside Ditch** __ Yes ✓ No **Culvert Present** __ Yes __ No Culvert Material: Concrete Culvert Size: 24 in
FLOW CHARACTERISTICS	**Water Present** __ No water, stream bed dry __ Stream bed moist __ Standing water ✓ Flowing water **Velocity** __ Fast __ Moderate __ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle % Run % Pool 100 % **Turbidity** __ Clear ✓ Slightly turbid __ Turbid __ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	70	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	20			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural ✓ Residential __ ROW __ Other: **Canopy Cover** __ Open __ Partly shaded ✓ Shaded	**Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft ✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Thirty-five feet downstream of culvert, lower bed with bank. Stream appears to go under the surface between S7 and S8.

Weak evidence crayfish burrows.

Flare completely separated from pipe.

Photograph Page

Stream ID S7 Date 09/03/2021

Photograph Number 1

Photograph Direction West

Comments:

Photograph Number 2

Photograph Direction East

Comments:

Photograph Number 3

Photograph Direction West

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S8	**STREAM NAME** UNT to North River
CLIENT HRSD	**PROJECT NAME** Middlesex Interconnector Phase II
LAT 37.453852 **LONG** -76.468088	**STATE** Virginia / **COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter	**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☐ NRPW ☑	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☑

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 3.0 ft Top of Bank Height: LB 3.0 ft RB 2.0 ft Water Depth: 6.00 in Water Width: 2.5 ft Ordinary High Water Mark (Width): 1.0 ft Ordinary High Water Mark (Height): 4.0 in Flow Direction: Southeast	**Sinuosity** __ Low ✓ Medium __ High **Gradient** ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft) **Stream Erosion** __ None ✓ Moderate __ Heavy **Artificial, Modified or Channelized** __ Yes ✓ No **Within Roadside Ditch** __ Yes ✓ No **Culvert Present** __ Yes ✓ No Culvert Material: ________ Culvert Size: ______in
FLOW CHARACTERISTICS	**Water Present** __ No water, stream bed dry __ Stream bed moist __ Standing water ✓ Flowing water **Velocity** __ Fast ✓ Moderate __ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle 0 % Run 75 % Pool 25 % **Turbidity** ✓ Clear __ Slightly turbid __ Turbid __ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100			**ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)**		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)	90	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)				

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural ✓ Residential __ ROW __ Other: **Canopy Cover** __ Open __ Partly shaded ✓ Shaded	**Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft ✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Moderate presence of macroinvertebrates (dragonfly nymph).

Stream goes under the surface (upstream) between S7 and S8.

Photograph Page

Stream ID S8 Date 09/03/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S9	**STREAM NAME** UNT to North River
CLIENT HRSD	**PROJECT NAME** Middlesex Interconnector Phase II
LAT 37.454461 **LONG** -76.467861	**STATE** Virginia / **COUNTY** Gloucester
INVESTIGATORS K. Hoisington, D. Painter	**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐

CHANNEL FEATURES

Estimate Measurements
Top of Bank Width: 2.0 ft
Top of Bank Height:
LB 2.0 ft RB 2.0 ft
Water Depth: 7.00 in
Water Width: 2.0 ft
Ordinary High Water Mark (Width): 1.0 ft
Ordinary High Water Mark (Height): 1.0 in
Flow Direction: Southeast

Sinuosity __ Low __ Medium ✓ High

Gradient ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft)

Stream Erosion
__ None ✓ Moderate __ Heavy

Artificial, Modified or Channelized
__ Yes ✓ No

Within Roadside Ditch
__ Yes ✓ No

Culvert Present __ Yes ✓ No
Culvert Material: ______
Culvert Size: ______in

FLOW CHARACTERISTICS

Water Present
__ No water, stream bed dry
__ Stream bed moist
__ Standing water
✓ Flowing water

Velocity
__ Fast ✓ Moderate
__ Slow

Proportion of Reach Represented by Stream Morphology Types (Only enter if water present)
Riffle 10 % Run 80 %
Pool 10 %

Turbidity
✓ Clear __ Slightly turbid __ Turbid
__ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	10
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES

Predominant Surrounding Landuse
✓ Forest __ Commercial
__ Field/Pasture __ Industrial
__ Agricultural ✓ Residential
__ ROW __ Other:

Floodplain Width
__ Wide > 30ft __ Moderate 15-30ft
✓ Narrow <15ft

Canopy Cover
__ Open __ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

A square concrete structure with shallow bottom is on a concrete platform in the stream. Possibly a "soakaway" once constructed to drain water away for garden or agricultural cultivation?

Many macroinvertebrates.

Iron oxidized bacteria.

Photograph Page

Stream ID S9 Date 09/03/2021

Photograph Number 1

Photograph Direction East

Comments:

Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

Photograph Direction

Comments:

Photograph Number 4

Photograph Direction

Comments:

STREAM ID S10	**STREAM NAME** UNT to Perkins Creek
CLIENT HRSD	**PROJECT NAME** Middlesex Interconnector Phase II
LAT 37.639412 **LONG** -76.578079	**STATE** Virginia — **COUNTY** Middlesex
INVESTIGATORS K. Hoisington, D. Painter	**DATE** 09/03/2021
WATER TYPE TNW ☐ RPW ☑ NRPW ☐	**FLOW REGIME** Perennial ☐ Intermittent ☑ Ephemeral ☐

CHANNEL FEATURES	**Estimate Measurements** Top of Bank Width: 13.0 ft Top of Bank Height: LB 18.0 ft RB 12.0 ft Water Depth: 10.00 in Water Width: 5.0 ft Ordinary High Water Mark (Width): 6.0 ft Ordinary High Water Mark (Height): 4.0 in Flow Direction: West	**Sinuosity** __ Low ✓ Medium __ High **Gradient** ✓ Flat (0.5/100 ft) __ Moderate (2 ft/100 ft) __ Severe (10 ft/100 ft) **Stream Erosion** __ None ✓ Moderate __ Heavy **Artificial, Modified or Channelized** __ Yes ✓ No **Within Roadside Ditch** __ Yes ✓ No **Culvert Present** ✓ Yes __ No Culvert Material: Concrete Culvert Size: 36 in
FLOW CHARACTERISTICS	**Water Present** __ No water, stream bed dry __ Stream bed moist __ Standing water ✓ Flowing water **Velocity** __ Fast __ Moderate ✓ Slow	**Proportion of Reach Represented by Stream Morphology Types** (Only enter if water present) Riffle 0 % Run 20 % Pool 80 % **Turbidity** __ Clear ✓ Slightly turbid __ Turbid __ Other________

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%) 100

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	100
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)

Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	10
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

WATERSHED FEATURES	**Predominant Surrounding Landuse** ✓ Forest __ Commercial __ Field/Pasture __ Industrial __ Agricultural ✓ Residential __ ROW ✓ Other: Recreational **Canopy Cover** __ Open __ Partly shaded ✓ Shaded	**Floodplain Width** __ Wide > 30ft __ Moderate 15-30ft ✓ Narrow <15ft

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Oxidizing bacteria.

Site for the proposed Urbanna Pump Station.

Riprap placed atop concrete culvert.

Photograph Page

Stream ID S10 Date 09/03/2021

Photograph Number 1

Photograph Direction NW

Comments:

Photograph Number 2

Photograph Direction South

Comments:

Photograph Number 3

Photograph Direction

Comments:

Photograph Number 4

Photograph Direction

Comments:

APPENDIX B: USACE WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021
Applicant/Owner: HRSD State: VA Sampling Point: W1 PEM
Investigator(s): Emily Foster, James Cook Section, Township, Range: ____
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 5
Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.513581 Long: -76.420069 Datum: WGS84
Soil Map Unit Name: Eunola loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? 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:
Linear emergent drainage/PEM at north side of Piankatank. Could not access shoreline of south side of Piankatank due to steep cliff. Will have to use top of bank. No tidal wetlands present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 1
Water Table Present?	Yes ___	No ___	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No ___	Depth (inches): ___

Wetland Hydrology Present? Yes x **No** ___

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

Remarks:

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

Sampling Point: W 1 PEM

Tree Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		

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

Sapling/Shrub Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	______ = Total Cover		

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

Herb Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus effusus Soft rush	80	Yes	OBL
2. Poa pratensis Kentucky bluegrass	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

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

Woody Vine Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	______ = Total Cover		

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	20	x 4 =	80
UPL species		x 5 =	
Column Totals:	100 (A)		160 (B)

Prevalence Index = B/A = 1.6

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** x **No** ______

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

SOIL

Sampling Point: W 1 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					sepsis	high organic
3-18	10YR 4/2	98	10YR 5/6	2			sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes x **No** ____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W1 PEM

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction ______

Comments:

Photograph Direction ______

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W1UP

Investigator(s): Emily Foster, James Cook Section, Township, Range: ______

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

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.507361 Long: -76.419958 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Remarks:

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

Sampling Point: W 1 UP

Tree Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

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

Sapling/Shrub Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

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

Herb Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Poa pratensis Kentiucky bluegrass	80	Yes	FACU
2. Taraxacum officinale	10	Yes	FACU
3. Plantago lanceolata Narrowleaf plantain	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover	100		

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

Woody Vine Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ______ **No** x

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

SOIL

Sampling Point: W 1 - UP

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
0-18	10YR 3/3	100					sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W1 - UP

Photograph Direction North

Comments:

Photograph Direction NW

Comments:

Photograph Direction ______

Comments:

Photograph Direction ______

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W2 UP

Investigator(s): Emily Foster, James Cook Section, Township, Range: ____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.629293 Long: -76.571993 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/a

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ____ No x

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

Remarks:

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

Sampling Point: W 2 UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera Tulip Poplar	60	Yes	FACU
2. Acer rubrum Red maple	30	Yes	FAC
3. Platanus occidentalis Sycamore	4	No	FACW
4.			
5.			
6.			
7.			
8.			
	___ = Total Cover		
50% of total cover: ___	20% of total cover: ___		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	___ = Total Cover		
50% of total cover: ___	20% of total cover: ___		
Herb Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	___ = Total Cover		
50% of total cover: ___	20% of total cover: ___		
Woody Vine Stratum (Plot size: 30)			
1. Hedera helix English Ivy	6	No	FACU
2.			
3.			
4.			
5.			
	6 = Total Cover		
50% of total cover: ___	20% of total cover: ___		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species	4	x 2 = 8
FAC species	30	x 3 = 90
FACU species	66	x 4 = 264
UPL species		x 5 =
Column Totals:	100 (A)	362 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 2 UP

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 4/4	100					very fine sand	
6-18	10YR 4/4	100					very fine 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)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W2 UP

Photograph Direction SE

Comments:

Photograph Direction SW

Comments:

Photograph Direction ______

Comments:

Photograph Direction ______

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W2 PEM

Investigator(s): Emily Foster, James Cook Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Tidal shoreline Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.629363 Long: -76.571996 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 1
Water Table Present?	Yes ___	No ___	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes x **No** ___

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

Remarks:

Standing water with bacteria.

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

Sampling Point: W 2 PEM

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30)			
1. Baccharis halimifolia Eastern baccharis	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30)			
1. Phragmites australis Common reed	40	Yes	FACW
2. Peltandra virginica Green arrow arum	20	Yes	OBL
3. Impatiens capensis	15	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75 = Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	20	x 1 = 20
FACW species	55	x 2 = 110
FAC species	25	x 3 = 75
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	205 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 2 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 5/2	100					very fine 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)**
- [ ] 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- [ ] Muck Presence (A8) **(LRR U)**
- [ ] 1 cm Muck (A9) **(LRR P, T)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Coast Prairie Redox (A16) **(MLRA 150A)**
- [ ] Sandy Mucky Mineral (S1) **(LRR O, S)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) **(LRR P, S, T, U)**
- [ ] Polyvalue Below Surface (S8) **(LRR S, T, U)**
- [ ] Thin Dark Surface (S9) **(LRR S, T, U)**
- [ ] Loamy Mucky Mineral (F1) **(LRR O)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Marl (F10) **(LRR U)**
- [ ] Depleted Ochric (F11) **(MLRA 151)**
- [ ] Iron-Manganese Masses (F12) **(LRR O, P, T)**
- [ ] Umbric Surface (F13) **(LRR P, T, U)**
- [ ] Delta Ochric (F17) **(MLRA 151)**
- [ ] Reduced Vertic (F18) **(MLRA 150A, 150B)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W2 PEM

Photograph Direction East

Comments:

Photograph Direction SW

Comments:

Photograph Direction NE

Comments:

Photograph Direction

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W3 UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.631204 Long: -76.57524 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

Upland point associated with W3 & W4

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

Remarks:

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

Sampling Point: W 3 UP

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

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

Herb Stratum (Plot size: 30)			
1. Poa pratensis Kentucky bluegrass	75	Yes	FACU
2. Taraxacum officinale dandelion	15	No	FACU
3. Plantago lanceolata Narrow leaf plantain	10	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: ______)			
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: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	100	x 4 = 400
UPL species		x 5 =
Column Totals:	100 (A)	400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ______ **No** x

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

SOIL

Sampling Point: W 3 UP

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

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

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W3 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W3 PEM

Investigator(s): Emily Foster, James Cook Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.631185 Long: -76.575514 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? 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:

Emergent slope wetland abutting shoreline of the Piankatank River.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes x	No ____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes x	No ____	Depth (inches): 1

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

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

Remarks:

Small areas of ponded water.

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

Sampling Point: W 3 PEM

Tree Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

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

Sapling/Shrub Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

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

Herb Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Juncus effusus Soft rush	25	Yes	OBL
2. Rumex verticillatus Swamp dock	15	Yes	FACW
3. Phragmites australis Common reed	20	Yes	FACW
4. Carex lurida Shallow sedge	20	Yes	OBL
5. Ludwigia alterniflora Seedbox	20	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover	100		

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

Woody Vine Stratum (Plot size: ______)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover			

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	65	x 1 = 65
FACW species	35	x 2 = 70
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	100 (A)	135 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** x **No** ______

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

SOIL

Sampling Point: W 3 PEM

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					mucky mineral	High organics
2-18	10YR 4/2	100					coarse 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)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W3 PEM

Photograph Direction South

Comments:

Photograph Direction North

Comments:

Photograph Direction ______

Comments:

Photograph Direction ______

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 04/02/2021

Applicant/Owner: HRSD State: VA Sampling Point: W4

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.50735900 Long: -76.41996283 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 1

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

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

Remarks:

Thick dark surface.

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

Sampling Point: W 4

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

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Baccharis halimifolia Eastern baccharis	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10		20% of total cover: 4	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Phragmites australis Common reed	70	Yes	FACW
2. Solidago sempervirens Seaside goldenrod	5	No	FACW
3. Hibiscus grandifolia Swamp rosemallow	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
50% of total cover: 40		20% of total cover: 16	

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100					muck	High organic with coarse sand or thick dark surface

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** x **No** ____

Remarks:

Photograph Log

Date: 4/2/21

Feature Name: W4

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/9/2021

Applicant/Owner: HRSD State: VA Sampling Point: W5

Investigator(s): Emily Foster, James Cook Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 5-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503319 Long: -76.417549 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: PFO1A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? 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:
Floodplain PFO adjacent to stream S3. Natural valley. Wetland/stream system does not continue North on the other side of Twiggs Ferry Road.

Observed Classifications:
Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

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

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)
- 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): 8
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes x No ___

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

Remarks:

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

Sampling Point: W5

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	40	Yes	FAC
2. Carpinus caroliniana, American Hornbeam	25	Yes	FAC
3.			
4.			
5.			
6.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)			
1. Woodwardia areolata, Netted Chain Fern	30	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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	30	x 1 = 30
FACW species	0	x 2 = 0
FAC species	65	x 3 = 195
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	95 (A)	225 (B)

Prevalence Index = B/A = 2.37

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W5

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
0-4	7.5yr 2.5/1	100%					Sand	mucky modified
4-12	7.5yr 6/2	100%					Loamy sand	
12-20	7.5yr 6/2	100%					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)
___ 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)**
_x_ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes _x_ No ___

Remarks:

Photograph Log

Date: 7/9/21

Feature Name: W5

Photograph Direction West

Comments:

Photograph Direction North

Comments:

Photograph Direction East

Comments:

Photograph Direction South

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/9/2021

Applicant/Owner: HRSD State: VA Sampling Point: W5-UP

Investigator(s): Emily Foster, James Cook Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 50

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503372 Long: -76.417562 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

Observed Classifications:

Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W5-UP

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba, Northern White Oak	60	x	FACU
2. Fagus grandifolia, American Beech	30	x	FACU
3.			
4.			
5.			
6.			
= Total Cover	90		

50% of total cover: 45 20% of total cover: 18

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	90	x 4 = 360
UPL species	0	x 5 = 0
Column Totals:	90 (A)	360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No __x__

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

SOIL

Sampling Point: W5-UP

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
0-6	10yr 3/4	100%					Sandy loam	
6-12	10yr 4/6	100%					Sandy loam	
12-20	10yr 6/6	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ______ No __x__

Remarks:

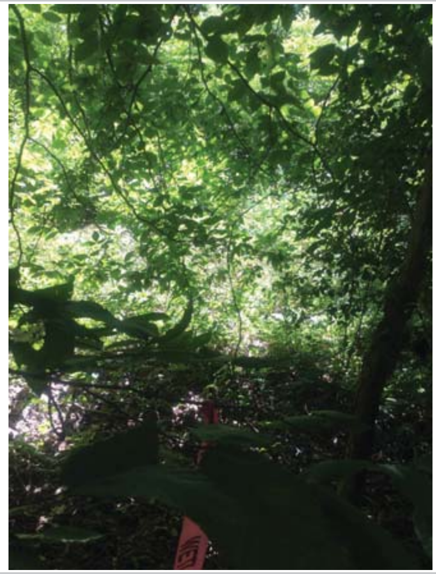
Photograph Log

Date: 7/9/21

Feature Name: W 5 - UP

Photograph Direction North

Comments:



Photograph Direction East

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W6

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 5-25

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.521623 Long: -76.423043 Datum: WGS84

Soil Map Unit Name: Kempsville sandy loam, 2 to 6 percent slopes NWI classification: N/A

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

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

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

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

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

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

Remarks:
PEM adjacent to Twiggs Ferry Road.

Observed Classifications:
Cowardin: ___

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- 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 ___	No x	Depth (inches): 18
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): 15

Wetland Hydrology Present? Yes x No ___

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

Remarks:
Saturation at 15, water table at 18.

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

Sampling Point: W6

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus pensilvanicus, Pennsylvania Blackberry	5	Yes	FAC
2. Acer rubrum, Red Maple	2	Yes	FAC
3. Morella cerifera, Southern Bayberry	2	Yes	FAC
4.			
5.			
6.			
	9 = Total Cover		
50% of total cover: 4.5	20% of total cover: 1.8		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Woodwardia areolata, Netted Chain Fern	60	Yes	OBL
2. Juncus effusus, Lamp Rush	12	No	OBL
3. Parathelypteris noveboracensis, New York Fern	10	No	FAC
4. Osmundastrum cinnamomeum, Cinnamon Fern	3	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (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	72	x 1 = 72
FACW species	3	x 2 = 6
FAC species	19	x 3 = 57
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	94 (A)	135 (B)

Prevalence Index = B/A = 1.44

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W6

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
0-11	10yr 2/1	100%						< 70% soil particles masked
11-18	5y 6/1	60%	10yr 7/8	40%	C	M	Sandy clay	

[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)**
- x Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ___

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W6

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W6-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 20-40

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.521394 Long: -76.422937 Datum: WGS84

Soil Map Unit Name: Kempsville sandy loam, 2 to 6 percent slopes NWI classification: ______

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

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

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

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

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

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

Remarks:
Upland adjacent to Twiggs Ferry Rd., upslope frpm W6 (PEM)

Observed Classifications:
Cowardin: uplands

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W6-UP

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera, Tuliptree	50	Yes	FACU
2. Ilex opaca, American Holly	35	Yes	FAC
3.			
4.			
5.			
6.			
= Total Cover	85		

50% of total cover: 42.5 20% of total cover: 17

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba, Northern White Oak	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
= Total Cover	5		

50% of total cover: 2.5 20% of total cover: 1

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Smilax rotundifolia, Horsebrier	30	Yes	FAC
2. Campsis radicans, Trumpet-Creeper	5	No	FAC
3. Parthenocissus quinquefolia, Virginia-Creeper	5	No	FACU
4.			
5.			
= Total Cover	40		

50% of total cover: 20 20% of total cover: 8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	70	x 3 = 210
FACU species	60	x 4 = 240
UPL species	0	x 5 = 0
Column Totals:	130 (A)	450 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ___ No x

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

SOIL

Sampling Point: W6-UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10yr 4/3	100%					Sandy loam	
12-18	2.5y 7/6	100%					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)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No __x__

Remarks:

Photograph Log

Date: _______________

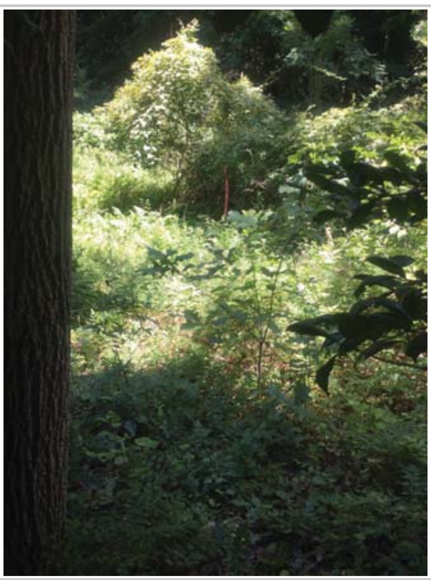
Feature Name:

Photograph Direction North

Comments:

Photograph Direction South

Comments:



Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W7

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 10-45

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503972 Long: -76.418445 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? 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:

PFO adjacent to Tigs Ferry Rd

Observed Classifications:

Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- 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): 12	
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0	**Wetland Hydrology Present? Yes x No ___**

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

Remarks:

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

Sampling Point: W7

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica, Black Tupelo	35	Yes	FAC
2. Ilex opaca, American Holly	30	Yes	FAC
3.			
4.			
5.			
6.			
= Total Cover	65		

50% of total cover: 32.5 20% of total cover: 13

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Carpinus caroliniana, American Hornbeam	15	Yes	FAC
2. Acer rubrum, Red Maple	5	Yes	FAC
3. Magnolia virginiana, Sweet-Bay	5	Yes	FACW
4.			
5.			
6.			
= Total Cover	25		

50% of total cover: 12.5 20% of total cover: 5

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Woodwardia areolata, Netted Chain Fern	30	Yes	OBL
2. Saururus cernuus, Lizard's-Tail	15	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	45		

50% of total cover: 22.5 20% of total cover: 9

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	45	x 1 = 45
FACW species	5	x 2 = 10
FAC species	85	x 3 = 255
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	135 (A)	310 (B)

Prevalence Index = B/A = 2.30

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _x_ No ___

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

SOIL

Sampling Point: W7

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
0-6	10yr 2/2	100%					Sand	< 70% soil particles masked
6-18	7.5yr 4/2	100%					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)
___ 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)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes _x_ No ___

Remarks:

hMucky sand top 2-3 inches.

Photograph Log

Date: 7/14/21

Feature Name: W 7

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Mathews Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W7-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 25-50

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.503938 Long: -76.418407 Datum: WGS84

Soil Map Unit Name: Steep sandy land NWI classification: N/A

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

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

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

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

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

Remarks:

Observed Classifications:
Cowardin: Upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W7-UP

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya glabra, Pignut Hickory	40	Yes	FACU
2. Ilex opaca, American Holly	30	Yes	FAC
3.			
4.			
5.			
6.			
= Total Cover	70		

50% of total cover: 35 20% of total cover: 14

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Ilex opaca, American Holly	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
= Total Cover	10		

50% of total cover: 5 20% of total cover: 2

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (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	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	80 (A)		280 (B)

Prevalence Index = B/A = 3.50

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No x

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

SOIL

Sampling Point: W7-UP

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
0-18	7.5yr 3/2	100%					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)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No x

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W7-UP

Photograph Direction West

Comments:

Photograph Direction East

Comments:

Photograph Direction North

Comments:

Photograph Direction South

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W8

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.5299071 Long: -76.4217679 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x 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:
Sparsely vegetated concave surface upslope from very large box culvert. Drainage patterns. Disturbed roadside area.

Observed Classifications:
Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ 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 x No ___

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

Remarks:

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

Sampling Point: W8

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis occidentalis, Common Hackberry	8	Yes	FACU
2. Ligustrum sinense, Chinese Privet	5	Yes	FAC
3.			
4.			
5.			
6.			
	13 = Total Cover		

50% of total cover: 6.5 20% of total cover: 2.6

Sapling Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)			
1. Microstegium vimineum, Japanese Stilt Grass	3	Yes	FAC
2. Pilea pumila, Canadian Clearweed	2	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 1

Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	8	x 3 =	24
FACU species	8	x 4 =	32
UPL species	0	x 5 =	0
Column Totals:	18 (A)		60 (B)

Prevalence Index = B/A = 3.33

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _x_ No ___

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

SOIL

Sampling Point: W8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5yr 4/2	95%	7.5yr 3/4	5%	C	PL	loamy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ______

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 8

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W8-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 10-30

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.5299789 Long: -76.4217398 Datum: WGS84

Soil Map Unit Name: Suffolk-Remlik complex, 15 to 45 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:
Hillsde upslope from sparsely vegetated concave W8.

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ______ No x

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

Remarks:

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

Sampling Point: W8-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense, Chinese Privet	30	Yes	FAC
2. Celtis occidentalis, Common Hackberry	25	Yes	FACU
3.			
4.			
5.			
6.			
	55 = Total Cover		
50% of total cover: 27.5	20% of total cover: 11		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense, Chinese Privet	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Vitis aestivalis, Summer Grape	35	Yes	FACU
2.			
3.			
4.			
5.			
	35 = Total Cover		
50% of total cover: 17.5	20% of total cover: 7		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	45	x 3 = 135
FACU species	60	x 4 = 240
UPL species	0	x 5 = 0
Column Totals:	105 (A)	375 (B)

Prevalence Index = B/A = 3.57

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No __x__

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

SOIL

Sampling Point: W8-UP

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
0-18	10yr 3/3	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No x

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 8 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W9

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.540568 Long: -76.432867 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 0 to 2 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x 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:

Disturbed roadside PEM in mowed powerline easement.

Observed Classifications:

Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 1
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes x No ___

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

Remarks:

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

Sampling Point: W9

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover			

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

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Murdanna keisak, Wart-Removing Herb	45	Yes	OBL
2. Phalaris arundinacea, Reed Canary Grass	15	Yes	OBL
3. Juncus effusus, Lamp rush	15	Yes	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	75		

50% of total cover: 37.5 20% of total cover: 15

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

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	75	x 1 = 75
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	75 (A)	75 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _X_ No ___

Remarks: (If observed, list morphological adaptations below).
Mowed veg. some species unidentifiable

SOIL

Sampling Point: W9

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
0-1	10yr 2/2	100%					Muck	< 70% soil particles masked
1-18	10yr 5/2	80%	10yr 5/8	20%	C	PL	Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes _x_ No ___

Remarks:

0-1" muck

Photograph Log

Date: 7/14/21

Feature Name: W9

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W9-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.540627 Long: -76.432808 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 0 to 2 percent slopes NWI classification: N/A

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

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? 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 ___ No x
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes ___ No x	

Remarks:

Observed Classifications:

Cowardin: Upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W9-UP

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda, Loblolly Pine	35	Yes	FAC
2. Acer rubrum, Red Maple	20	Yes	FAC
3. Quercus rubra, Northern Red Oak	15	Yes	FACU
4.			
5.			
6.			
	70 = Total Cover		

50% of total cover: 35 20% of total cover: 14

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana, Eastern Red-Cedar	14	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	14 = Total Cover		

50% of total cover: 7 20% of total cover: 2.8

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		

50% of total cover: 0 20% of total cover: 0

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Campsis radicans, Trumpet-Creeper	12	Yes	FAC
2. Rubus pensilvanicus, Pennsylvania Blackberry	10	Yes	FAC
3.			
4.			
5.			
	22 = Total Cover		

50% of total cover: 11 20% of total cover: 4.4

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	0	x 2 = 0
FAC species	77	x 3 = 231
FACU species	29	x 4 = 116
UPL species	0	x 5 = 0
Column Totals:	106 (A)	347 (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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No __

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

SOIL

Sampling Point: W9-UP

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
0-8	10yr 5/4	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** ____ **No** _x_

Remarks:

Photograph Log

Date: 7/14/21

Feature Name: W 9 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W10-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554113 Long: -76.451894 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: Upland

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

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

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

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

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

Remarks:
Upslope from W10

Observed Classifications:
Cowardin: uplands

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W10-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	65	Yes	FAC
2. Magnolia virginiana, Sweet-Bay	5	No	FACW
3.			
4.			
5.			
6.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana, Eastern Red-Cedar	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba, Northern White Oak	5	Yes	FACU
2. Vitis aestivalis, Summer Grape	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Smilax rotundifolia, Horsebrier	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	5	x 2 = 10
FAC species	75	x 3 = 225
FACU species	20	x 4 = 80
UPL species	0	x 5 = 0
Column Totals:	100 (A)	315 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No __x__

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

SOIL

Sampling Point: W10-UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10yr 4/3	100%					Sandy loam	
12-18	10yr 6/6	100%					Loamy 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)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Organic Bodies (A6) **(LRR P, T, U)**
___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
___ Muck Presence (A8) **(LRR U)**
___ 1 cm Muck (A9) **(LRR P, T)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Coast Prairie Redox (A16) **(MLRA 150A)**
___ Sandy Mucky Mineral (S1) **(LRR O, S)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR P, S, T, U)**
___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
___ Thin Dark Surface (S9) **(LRR S, T, U)**
___ Loamy Mucky Mineral (F1) **(LRR O)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Marl (F10) **(LRR U)**
___ Depleted Ochric (F11) **(MLRA 151)**
___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
___ Umbric Surface (F13) **(LRR P, T, U)**
___ Delta Ochric (F17) **(MLRA 151)**
___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 10 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W10

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554191 Long: -76.451741 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

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

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

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

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

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

Remarks:

Small disturbed depression adjacent to General Puller Ave. Filled wirh invasive privet. Narrow linear area with ponding water, but poorly defined bed and bank. Water ends directly outside of survey area to the south. Marginal wetland indicators visible to the south, feature likely continues south to Scroggins Creeks.

Observed Classifications:

Cowardin: PFO

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 2
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): 17

Wetland Hydrology Present? Yes x No ___

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: W10

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	35	Yes	FAC
2. Ligustrum sinense, Chinese Privet	20	Yes	FAC
3. Liriodendron tulipifera, Tuliptree	5	No	FACU
4.			
5.			
6.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Sapling Stratum (Plot size: 30 ft)			
1. Ligustrum sinense, Chinese Privet	25	Yes	FAC
2. Liquidambar styraciflua, Sweet-Gum	15	Yes	FAC
3.			
4.			
5.			
6.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Saururus cernuus, Lizard's-Tail	5	Yes	OBL
2. Woodwardia areolata, Netted Chain Fern	5	Yes	OBL
3. Campsis radicans, Trumpet-Creeper	5	Yes	FAC
4. Toxicodendron radicans, Eastern Poison Ivy	5	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W10

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
0-18	2.5yr 4/2	80%	10yr 5/6	20%	C	PL	Sandy clay loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ______

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 10

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W11

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ____

Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): Concave Slope (%): 0-25

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554596 Long: -76.454609 Datum: WGS84

Soil Map Unit Name: Emporia-Nevarc complex, 15 to 45 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x 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:

Emergent and scrubby vegetation alongside ditch, which likely becomes a stream downslope outside of suvey area. Cannot access ditch bottom due to impenetrably dense vegetation.

Observed Classifications:

Cowardin: PSS

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 along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- x Crayfish Burrows (C8)
- x 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 x	No ___	Depth (inches): 12

Wetland Hydrology Present? Yes x **No** ___

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

Remarks:

Drainage/stream headwaters visible downslope, cant penetrate vegetation and very steep slope prohibits access

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

Sampling Point: W11

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ligustrum sinense, Chinese Privet	30	Yes	FAC
2. Rubus pensilvanicus, Pennsylvania Blackberry	20	Yes	FAC
3. Salix nigra, Black Willow	20	Yes	OBL
4.			
5.			
6.			
= Total Cover	70		
50% of total cover: 35	20% of total cover: 14		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Verbesina alternifolia, Wingstem	25	Yes	FAC
2. Salix nigra, Black Willow	10	Yes	OBL
3. Sorghum halepense, Johnson Grass	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	45		
50% of total cover: 22.5	20% of total cover: 9		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Campsis radicans, Trumpet-Creeper	20	Yes	FAC
2. Vitis aestivalis, Summer Grape	5	Yes	FACU
3.			
4.			
5.			
= Total Cover	25		
50% of total cover: 12.5	20% of total cover: 5		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	140 (A)		375 (B)

Prevalence Index = B/A = 2.68

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W11

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
0-18	10yr 4/2	90%	7.5yr 5/6	10%			Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________

Depth (inches): ______________________

Hydric Soil Present? Yes _x_ No ______

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 11

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W11-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Interstream divide Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.554574 Long: -76.454985 Datum: WGS84

Soil Map Unit Name: Emporia loam, 2 to 6 percent slopes NWI classification: ______

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

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

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

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

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

Is the Sampled Area within a Wetland? **Yes** ___ **No** x

Remarks:
Slope adjacent to W11. abuts General Puller Blvd.

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ **No** x

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

Remarks:

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

Sampling Point: W11-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus resinosa, Red Pine	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1. Poa pratensis, Kentucky Blue Grass	50	Yes	FACU
2. Plantago lanceolata, English Plantain	15	No	FACU
3. Liquidambar styraciflua, Sweet-Gum	10	No	FAC
4. Trifolium pratense, Red Clover	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Woody Vine Stratum (Plot size: 30 ft)			
1. Toxicodendron radicans, Eastern Poison Ivy	10	Yes	FAC
2. Lonicera japonica, Japanese Honeysuckle	10	Yes	FACU
3.			
4.			
5.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	20	x 3 = 60
FACU species		x 4 =
UPL species	0	x 5 = 0
Column Totals:	(A)	(B)

Prevalence Index = B/A = 0.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No x

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

SOIL

Sampling Point: W11-UP

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
0-18	2.5y 5/4	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes ______ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 11 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W12

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.563021 Long: -76.471869 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

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

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

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

Hydrophytic Vegetation Present?	Yes x	No ____
Hydric Soil Present?	Yes x	No ____
Wetland Hydrology Present?	Yes x	No ____

Is the Sampled Area within a Wetland? Yes x No ____

Remarks:
Likely hydrologically isolated PEM adjacent to soybean field and General Puller Blvd. Appears regularly mowed, some ponding.

Observed Classifications:
Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

- x 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)
- x Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- 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): 1-2
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? Yes x No ____

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

Remarks:
Tadpoles observed.

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

Sampling Point: W12

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Eleocharis obtusa, Blunt Spike-Rush	30	Yes	OBL
2. Murdannia keisak, Wart-Removing-Herb	30	Yes	OBL
3. Echinochloa crus-galli, Large Barnyard Grass	25	Yes	FACW
4. Carex vulpinoidea, Common Fox Sedge	15	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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	60	x 1 =	60
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators:

x 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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W12

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
0-18	10yr 4/2	85%	7.5yr 5/6	15%	C	PL	Sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes x No ______

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W12

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/15/2021

Applicant/Owner: HRSD State: VA Sampling Point: W12-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.56296 Long: -76.471939 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: ______

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

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

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

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

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

Remarks:
Mowed uplands

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

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:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: W12-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Poa pratensis, Kentucky Blue Grass	35	Yes	FACU
2. Trifolium repens, White Clover	35	Yes	FACU
3. Plantago lanceolata, English Plantain	30	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	100	x 4 = 400
UPL species	0	x 5 = 0
Column Totals:	100 (A)	400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

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

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ______ No __x__

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

SOIL

Sampling Point: W12-UP

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
0-18	10yr 4/4	100%					Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No x

Remarks:

Photograph Log

Date: 7/15/21

Feature Name: W 12 UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W13

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.56608 Long: -76.474214 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

Are Vegetation x, Soil x, or Hydrology x 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:

Roadside depression adjacent to ag. Field.

Observed Classifications:

Cowardin: PEM

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

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- x 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 x No ___

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

Remarks:

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

Sampling Point: W13

Tree Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Sapling Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Shrub Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Murdannia keisak, Wart-Removing-Herb	30	✓	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	30		

50% of total cover: 15 20% of total cover: 6

Woody Vine Stratum (Plot size: 30 ft)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		

50% of total cover: 0 20% of total cover: 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation
__ 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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

Remarks: (If observed, list morphological adaptations below).
vegetation frequently mowed and unidentifiable

SOIL

Sampling Point: W13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5y 3/2	100%					Muck	< 70% soil particles masked
3-6	2.5y 5/2	70%	7.5yr 5/6	30%	C	PL	Sandy clay	
6-18	2.5y 5/2	50%	10yr 5/6	50%	C	M	Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ______

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W13

Photograph Direction West

Comments:

Photograph Direction East

Comments:

Photograph Direction South

Comments:

Photograph Direction North

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W13-up

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 0-5

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.566157 Long: -76.474355 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: ______

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

Are Vegetation x, Soil x, or Hydrology x 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 ___ No x
Hydric Soil Present?	Yes ___	No x	
Wetland Hydrology Present?	Yes ___	No x	

Remarks:
soybean field adacent to road

Observed Classifications:
Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

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

Sampling Point: W13-up

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua, Sweet-Gum	25	✓	FAC
2. Pinus taeda, Loblolly Pine	20	✓	FAC
3.			
4.			
5.			
6.			
	45	= Total Cover	
50% of total cover: 22.5		20% of total cover: 9	
Sapling Stratum (Plot size: 30 ft)			
1. Juniperus virginiana, Eastern Red-Cedar	10	✓	FACU
2.			
3.			
4.			
5.			
6.			
	10	= Total Cover	
50% of total cover: 5		20% of total cover: 2	
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	
Herb Stratum (Plot size: 30 ft)			
1. soybean			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
50% of total cover: 0		20% of total cover: 0	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 67.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	45	x 3 = 135
FACU species	10	x 4 = 40
UPL species	0	x 5 = 0
Column Totals:	55 (A)	175 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

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

SOIL

Sampling Point: W13-up

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10yr 4/4	100%					Sandy loam	
5-10	7.5yr 4/4	100%					Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No x

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W13-UP

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W14

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0-15

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.579991 Long: -76.486446 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: ______

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

Are Vegetation x, Soil x, or Hydrology x 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:
Excavated drainage ditch with dense hydric vegetation draining southest.

Observed Classifications:
Cowardin: PEM

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes x	No ______	Depth (inches): 2
Water Table Present?	Yes x	No ______	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes x	No ______	Depth (inches): 0

Wetland Hydrology Present? Yes x **No** ______

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

Remarks:

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

Sampling Point: W14

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Sapling Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Shrub Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

Herb Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Typha latifolia, Broad-Leaf Cat-Tail	50	yes	OBL
2. Dichanthelium clandestinum, Deer-Tongue Rosette G	15	yes	FACW
3. Microstegium vimineum, Japanese Stilt Grass	20	yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		

Woody Vine Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		

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	50	x 1 =	50
FACW species	15	x 2 =	30
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	85 (A)		140 (B)

Prevalence Index = B/A = 1.65

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _x_ No ___

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

SOIL

Sampling Point: W14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5y 4/2	70%	5yr 5/6	30%	C	PL	Clay	
12-18	2.5y 6/1	70%	5yr 5/6	30%	C		Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes x No ______

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W14

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction East

Comments:

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex/Middlesex Sampling Date: 7/29/2021

Applicant/Owner: HRSD State: VA Sampling Point: W14-UP

Investigator(s): Emily Foster, Kristen Walls Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 5-10

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.580091 Long: -76.48655 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: ______

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 ___ No x
Hydric Soil Present?	Yes ___	No x	
Wetland Hydrology Present?	Yes ___	No x	

Remarks:

Observed Classifications:

Cowardin: upland

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ______
Water Table Present?	Yes ___	No x	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ______

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: W14-UP

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum, Red Maple	40	Yes	FAC
2. Pinus taeda, Loblolly Pine	25	Yes	FAC
3. Quercus alba, Northern White Oak	20	Yes	FACU
4.			
5.			
6.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Sapling Stratum (Plot size: 30 ft)			
1. Vaccinium formosum, Southern Blueberry	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Herb Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Woody Vine Stratum (Plot size: 30 ft)			
1. Smilax rotundifolia, Horsebrier	15	Yes	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	90	x 3 = 270
FACU species	20	x 4 = 80
UPL species	0	x 5 = 0
Column Totals:	110 (A)	350 (B)

Prevalence Index = B/A = 3.18

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 Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes x No ___

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

SOIL

Sampling Point: W14-UP

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-15	10yr 3/2	100%					Loam	
15-18	10yr 4/4						Sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No x

Remarks:

Photograph Log

Date: 7/29/21

Feature Name: W14

Photograph Direction North

Comments:

Photograph Direction South

Comments:

Photograph Direction West

Comments:

Photograph Direction East

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Beaverdam Pump Station City/County: Gloucester Sampling Date: 09/03/2021

Applicant/Owner: HRSD State: VA Sampling Point: **W15-UP**

Investigator(s): K. Hoisington, D. Painter Section, Township, Range: ______

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 20

Subregion (LRR or MLRA): LRRT Lat: 37.454388 Long: -76.468539 Datum: NAD 83

Soil Map Unit Name: Lumbee sandy loam NWI classification: Upland

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

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

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

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

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

Remarks: Cowardin Code: Upland HGM: Water Type:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No ✓	Depth (inches): ______
Water Table Present?	Yes ___	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ___	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ___ **No** ✓

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

Remarks:

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

Sampling Point: W15-UP

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	70	✓	FAC
2. *Liquidambar styraciflua*	5		
3.			
4.			
5.			
6.			
7.			
8.			
	75	= Total Cover	
50% of total cover: 37.5	20% of total cover: 15.0		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Asimina triloba*	5	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1.0		
Herb Stratum (Plot size: 5)			
1. *Ligustrum sinense*	5	✓	FACU
2. *Vaccinium corymbosum*	5	✓	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	
50% of total cover: 5.0	20% of total cover: 2.0		
Woody Vine Stratum (Plot size: 15)			
1. *Smilax rotundifolia*	5	✓	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1.0		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W15-UP

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
0-6	10YR 4/3	100						sandy loam
6-12	7.5YR 3/3	80	10YR 3/3	20				sandy loam
12-18	7.5YR 3/3	80	10YR 3/3	20				sandy loam

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? Yes ______ No ✓

Remarks:

Photograph Log

Date: 9/3/21

Photograph Number

Photograph Direction North

Comments:

Photograph Number

Photograph Direction East

Comments:

Photograph Number

Photograph Direction South

Comments:

Photograph Number

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 9/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W16

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

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

Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.584816 Long: -76.490421 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: N/A

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ✓	No ____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): 0

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

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

Remarks:

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

Sampling Point: ____

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

Sapling/Shrub Stratum (Plot size: ____)			
1. Liquidambar styraciflua	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover: 2.5		20% of total cover: 1	

Herb Stratum (Plot size: ____)			
1. Mikania scandens	95	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5		20% of total cover: 19	

Woody Vine Stratum (Plot size: ____)			
1. Smilax rotundifolia	5	Y	FAC
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover: 2.5		20% of total cover: 1	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	95	x 2 =	190
FAC species	10	x 3 =	30
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	105 (A)		220 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? **Yes** ✓ **No** ____

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

SOIL

Sampling Point: ___________

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
0-15	10 YR 5/2	90	10 YR 5/8	10			Cl	
15-18	10 YR 5/2	70	10 YR 5/8	30			SaCl	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______________________________

Depth (inches): ______________________

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

Remarks:

Photograph Log

Date: 9/14/21

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

Photograph Direction East

Comments:

Photograph Number ______

Photograph Direction South

Comments:

Photograph Number ______

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM City/County: Middlesex Sampling Date: 9/14/2021

Applicant/Owner: HRSD State: VA Sampling Point: W16-UP

Investigator(s): Emily Foster, Katelyn Hoisington Section, Township, Range: ______

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

Subregion (LRR or MLRA): MLRA 1538 of LRR T Lat: 37.584784 Long: -76.490324 Datum: WGS84

Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes NWI classification: ______

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

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

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

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

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ______	No ______	Depth (inches): ______	
Water Table Present?	Yes ______	No ______	Depth (inches): ______	
Saturation Present? (includes capillary fringe)	Yes ______	No ______	Depth (inches): ______	**Wetland Hydrology Present? Yes** ______ **No** ✓

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

Remarks:

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

Sampling Point: W16-UP

Tree Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	50	Y	FAC
2. Acer rubrum	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	60	= Total Cover	

50% of total cover: 30 20% of total cover: 12

Sapling/Shrub Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	5	N	FAC
2. Acer rubrum	5	N	FAC
3. Ligustrum sinense	10	N	FAC
4. Liriodendron tulipifera	5	N	FACU
5. Phyllostachys aurea	60	Y	ND
6.			
7.			
8.			
	85	= Total Cover	

50% of total cover: 42.5 20% of total cover: 17

Herb Stratum (Plot size: ______)	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	10	Y	FAC
2. Microstegium vimineum	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	= Total Cover	

50% of total cover: 12.5 20% of total cover: 5

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

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

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

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

Definitions of Four Vegetation Strata:

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

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

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

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

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

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

SOIL

Sampling Point: W16-UP

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
0-6	10 YR 3/2	100					CLo	
6-18	10 YR 3/2	50	10 YR 5/8	50			SaCl	Disturbed soil w/ mixed layer dual 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)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ______ No ✓

Remarks:

Photograph Log

Date: 9/14/21

Photograph Number ______

Photograph Direction North

Comments:

Photograph Number ______

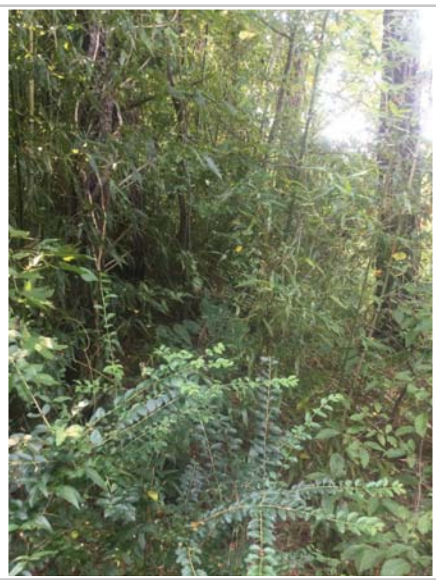
Photograph Direction East

Comments:

Photograph Number ______

Photograph Direction South

Comments:



Photograph Number ______

Photograph Direction West

Comments:

APPENDIX C: NRCS WEB SOIL SURVEY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Mathews County, Virginia, and Middlesex County, Virginia

November 15, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


76° 35' 50" W
76° 23' 34" W
37° 40' 30" N
37° 27' 35" N
360000
363000
366000
369000
372000
375000
4169000
4166000
4163000
4160000
4157000
4154000
4151000
4148000
Map Scale: 1:116,000 if printed on A portrait (8.5" x 11") sheet.
Meters
0 1500 3000 6000 9000
Feet
0 5000 10000 20000 30000
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,800 to 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mathews County, Virginia
Survey Area Data: Version 13, Sep 14, 2021

Soil Survey Area: Middlesex County, Virginia
Survey Area Data: Version 14, Sep 14, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 11, 2019—Oct 15, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Dr	Dragston fine sandy loam, shallow	0.0	0.0%
Fa	Fallsington fine sandy loam	0.4	0.2%
KtA	Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes	1.3	0.5%
SaA	Sassafras fine sandy loam, 0 to 2 percent slopes	4.0	1.6%
SdA	Sassafras loamy fine sand, 0 to 2 percent slopes	4.2	1.7%
StE	Steep sandy land	2.5	1.0%
W	Water	2.5	1.0%
Wo	Woodstown fine sandy loam	2.0	0.8%
Subtotals for Soil Survey Area		**16.8**	**6.7%**
Totals for Area of Interest		**250.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Bethera and Daleville soils	3.4	1.4%
4	Catpoint loamy sand	0.6	0.3%
5B	Craven silt loam, 2 to 6 percent slopes	0.7	0.3%
6A	Emporia loam, 0 to 2 percent slopes	3.9	1.6%
6B	Emporia loam, 2 to 6 percent slopes	55.5	22.2%
7D	Emporia-Nevarc complex, 6 to 15 percent slopes	6.9	2.7%
7F	Emporia-Nevarc complex, 15 to 45 percent slopes	3.3	1.3%
8	Eunola loam	5.2	2.1%
9A	Kempsville sandy loam, 0 to 2 percent slopes	3.2	1.3%
9B	Kempsville sandy loam, 2 to 6 percent slopes	17.7	7.1%
13	Myatt loam	2.6	1.0%
15	Ochlockonee silt loam	5.8	2.3%
18B	Rumford fine sandy loam, 2 to 6 percent slopes	3.1	1.3%
19A	Slagle silt loam, 0 to 2 percent slopes	39.3	15.7%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19B	Slagle silt loam, 2 to 6 percent slopes	62.5	25.0%
20A	Suffolk fine sandy loam, 0 to 2 percent slopes	0.5	0.2%
20B	Suffolk fine sandy loam, 2 to 6 percent slopes	10.5	4.2%
21D	Suffolk-Remlik complex, 6 to 15 percent slopes	1.0	0.4%
21F	Suffolk-Remlik complex, 15 to 45 percent slopes	1.9	0.7%
22B	Udorthents and Psamments, gently sloping	0.7	0.3%
W	Water	4.8	1.9%
Subtotals for Soil Survey Area		**233.2**	**93.3%**
Totals for Area of Interest		**250.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Mathews County, Virginia

Dr—Dragston fine sandy loam, shallow

Map Unit Setting

National map unit symbol: 40b8
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Dragston and similar soils: 85 percent
Minor components: 7 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dragston

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 25 inches: fine sandy loam
H3 - 25 to 75 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 7 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: Yes

Fa—Fallsington fine sandy loam

Map Unit Setting

National map unit symbol: 40bb
Elevation: 0 to 200 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fallsington and similar soils: 85 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fallsington

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 37 inches: sandy clay loam
H3 - 37 to 93 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Elkton

Percent of map unit: 8 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

KtA—Kempsville loamy fine sand, thick surface, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bf
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Kempsville and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 11 inches: loamy fine sand
H2 - 11 to 40 inches: sandy clay loam
H3 - 40 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

SaA—Sassafras fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bk
Elevation: 10 to 330 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sassafras and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sassafras

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 36 inches: sandy clay loam
H3 - 36 to 70 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

SdA—Sassafras loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40bm
Elevation: 10 to 330 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Sassafras and similar soils: 85 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sassafras

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 8 inches: loamy fine sand
H2 - 8 to 36 inches: loam
H3 - 36 to 70 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Fallsington

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

StE—Steep sandy land

Map Unit Setting

National map unit symbol: 40bp
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Steep sandy land: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Steep Sandy Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 6 inches: fine sand
H2 - 6 to 60 inches: sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Wo—Woodstown fine sandy loam

Map Unit Setting

National map unit symbol: 40bv
Elevation: 10 to 120 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodstown and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodstown

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy marine deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 35 inches: sandy clay loam
H3 - 35 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C
Hydric soil rating: No

Middlesex County, Virginia

3—Bethera and Daleville soils

Map Unit Setting

National map unit symbol: 40hl
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Bethera and similar soils: 40 percent
Daleville and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bethera

Setting

Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 34 inches: clay
H3 - 34 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Rare
Available water supply, 0 to 60 inches: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Description of Daleville

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave

Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 60 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Myatt

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

4—Catpoint loamy sand

Map Unit Setting

National map unit symbol: 40hm
Elevation: 0 to 70 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Catpoint and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catpoint

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 11 inches: loamy sand
H2 - 11 to 57 inches: loamy sand
H3 - 57 to 72 inches: sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Hydric soil rating: No

5B—Craven silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hp
Elevation: 0 to 120 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Craven and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Craven

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread

Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 28 inches: clay
H3 - 28 to 66 inches: sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Bethera

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Daleville

Percent of map unit: 2 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

6A—Emporia loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hq
Elevation: 20 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F

Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Emporia and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Hydric soil rating: No

6B—Emporia loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hr
Elevation: 20 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Emporia and similar soils: 75 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

7D—Emporia-Nevarc complex, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 40hs
Elevation: 20 to 300 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Emporia and similar soils: 50 percent
Nevarc and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Nevarc

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 51 inches: clay
H3 - 51 to 64 inches: sandy clay loam

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Hydric soil rating: No

7F—Emporia-Nevarc complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 40ht
Elevation: 20 to 300 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Emporia and similar soils: 50 percent
Nevarc and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Emporia

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: loam
H2 - 14 to 31 inches: clay loam
H3 - 31 to 59 inches: sandy clay loam
H4 - 59 to 66 inches: sandy clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 36 to 54 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Nevarc

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: silt loam
H2 - 14 to 51 inches: clay
H3 - 51 to 64 inches: sandy clay loam

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Hydric soil rating: No

8—Eunola loam

Map Unit Setting

National map unit symbol: 40hv
Elevation: 120 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eunola and similar soils: 80 percent

Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eunola

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 28 inches: clay loam
H3 - 28 to 41 inches: sandy loam
H4 - 41 to 60 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Myatt

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

9A—Kempsville sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hw
Elevation: 100 to 400 feet

Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kempsville and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 31 inches: sandy clay loam
H3 - 31 to 51 inches: sandy loam
H4 - 51 to 62 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

9B—Kempsville sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hx
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kempsville and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kempsville

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 31 inches: sandy clay loam
H3 - 31 to 51 inches: sandy loam
H4 - 51 to 62 inches: sandy clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

13—Myatt loam

Map Unit Setting

National map unit symbol: 40h3
Elevation: 0 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Myatt and similar soils: 80 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Myatt

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 11 inches: loam
H2 - 11 to 40 inches: clay loam
H3 - 40 to 60 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

15—Ochlockonee silt loam

Map Unit Setting

National map unit symbol: 40h5
Elevation: 50 to 800 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Ochlockonee and similar soils: 75 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ochlockonee

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 34 inches: loam
H3 - 34 to 62 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 5 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 4 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

18B—Rumford fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40h9
Elevation: 80 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Rumford and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumford

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 14 inches: fine sandy loam
H2 - 14 to 37 inches: fine sandy loam
H3 - 37 to 60 inches: loamy fine sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

19A—Slagle silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hb
Elevation: 70 to 350 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Slagle and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Slagle

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 24 inches: loam
H3 - 24 to 38 inches: loam
H4 - 38 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Hydric soil rating: No

19B—Slagle silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hc
Elevation: 70 to 350 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Slagle and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Slagle

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 24 inches: loam
H3 - 24 to 38 inches: loam
H4 - 38 to 60 inches: loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Hydric soil rating: No

20A—Suffolk fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 40hd
Elevation: 30 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Suffolk and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

20B—Suffolk fine sandy loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 40hf
Elevation: 30 to 150 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Suffolk and similar soils: 80 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

21D—Suffolk-Remlik complex, 6 to 15 percent slopes

Map Unit Setting

National map unit symbol: 40hg
Elevation: 10 to 450 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Suffolk and similar soils: 45 percent
Remlik and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Remlik

Setting

Landform: Marine terraces

Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 27 inches: loamy sand
H2 - 27 to 38 inches: sandy loam
H3 - 38 to 70 inches: loamy fine sand

Properties and qualities

Slope: 6 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

21F—Suffolk-Remlik complex, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 40hh
Elevation: 10 to 450 feet

Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Suffolk and similar soils: 45 percent
Remlik and similar soils: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Suffolk

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 12 inches: fine sandy loam
H2 - 12 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: loamy sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Remlik

Setting

Landform: Marine terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 27 inches: loamy sand
H2 - 27 to 38 inches: sandy loam
H3 - 38 to 70 inches: loamy fine sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Bibb

Percent of map unit: 3 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Kinston

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

22B—Udorthents and Psamments, gently sloping

Map Unit Setting

National map unit symbol: 40hj
Elevation: 0 to 100 feet
Mean annual precipitation: 40 to 55 inches
Mean annual air temperature: 47 to 70 degrees F
Frost-free period: 182 to 210 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Psamments and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities

Slope: 0 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Description of Psamments

Setting

Landform: Marine terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Marine deposits

Typical profile

H1 - 0 to 6 inches: fine sand
H2 - 6 to 60 inches: sand

Properties and qualities

Slope: 0 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

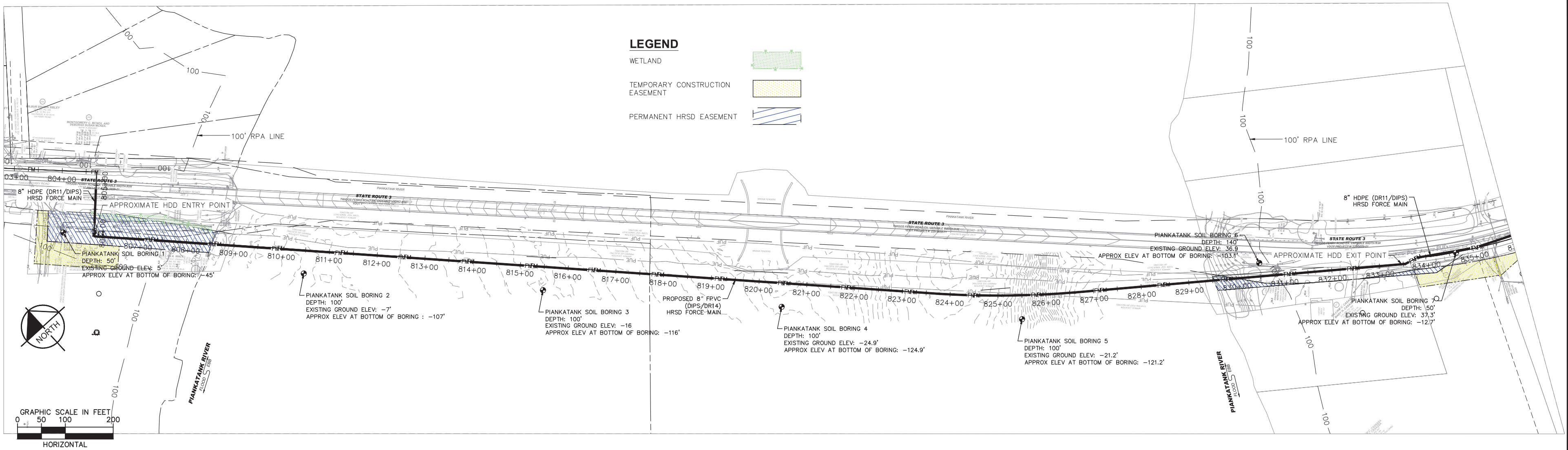
United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

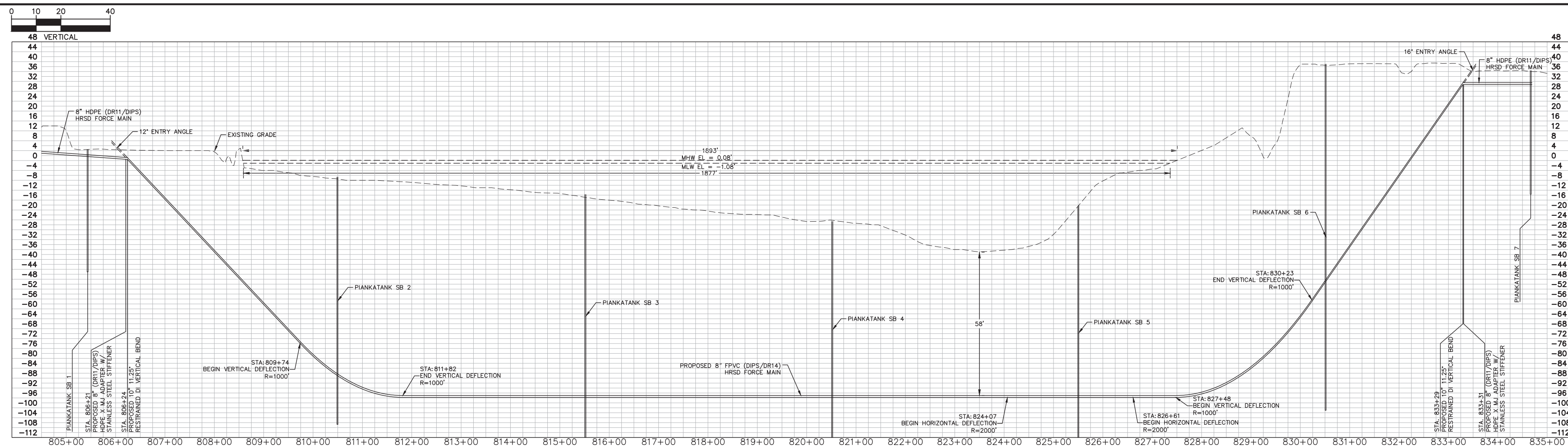
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 4: PIANKATANK RIVER HDD CROSSING PROJECT DRAWINGS





PERMIT DRAWING ONLY

NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

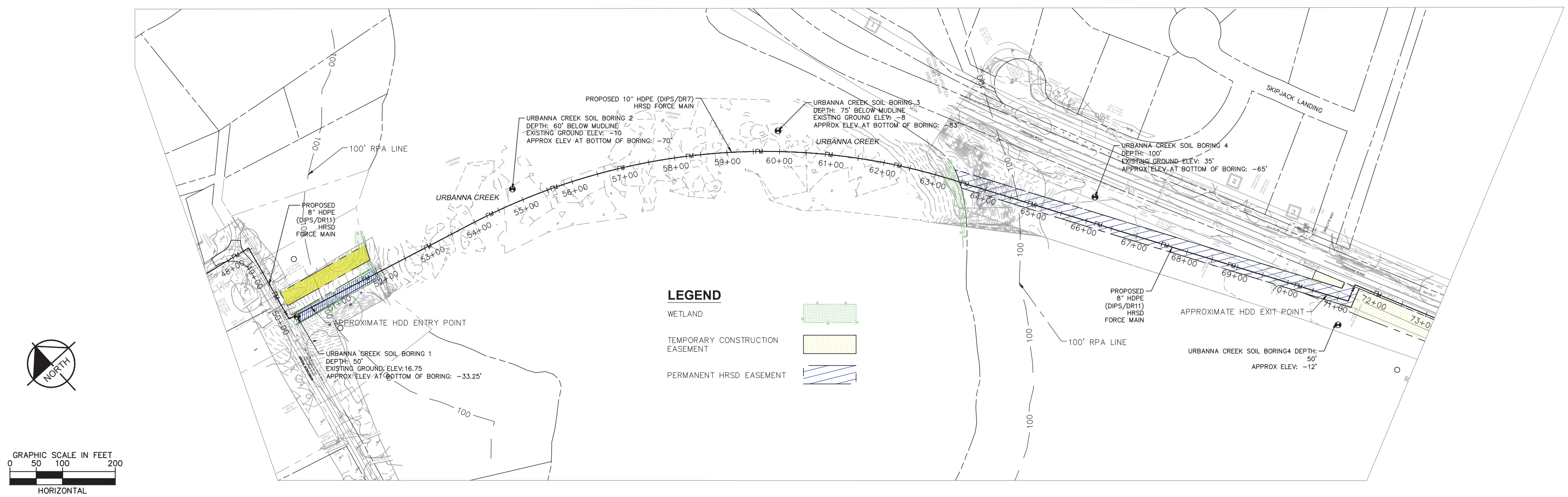
PROPOSED SEWER FORCE MAIN
PIANKATANK RIVER HDD CROSSING

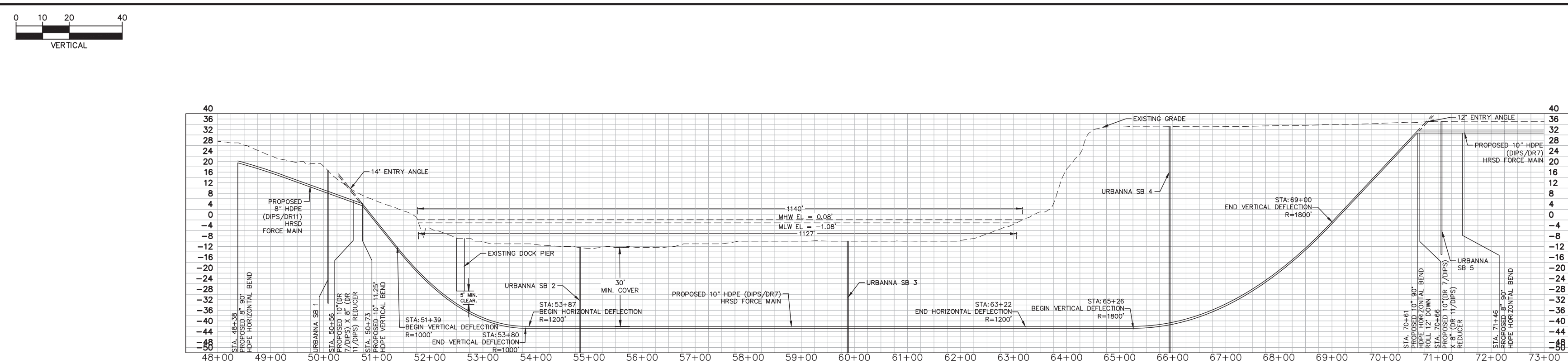
HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	JDV	DATE:	SEPTEMBER 2021
DRAWN BY:	JDV	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	
SCALE:	AS NOTED	SHEET NO.:	1

ATTACHMENT 5: URBANNA CREEK HDD CROSSING PROJECT DRAWINGS





PERMIT DRAWING ONLY

NOT FOR CONSTRUCTION

COMM. NO. ######.###

Kimley»Horn

© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
4525 MAIN STREET, SUITE 1000, VIRGINIA BEACH, VA 23462
PHONE: 757-213-8600 FAX: 757-213-8601
WWW.KIMLEY-HORN.COM

HRSD

Cleaning wastewater every day for a better Bay

NO.	DATE	BY	REVISION

PROPOSED FORCE MAIN CROSSING OF URBANNA CREEK

HAMPTON ROADS SANITATION DISTRICT

Middlesex Interceptor System Program Phase II-
Urbanna to Matthews Transmission Force Main

DESIGNED BY:	JDV	DATE:	SEPTEMBER 2021
DRAWN BY:	JDV	FILE NO.:	116320057
CHECKED BY:	GSF	DRAWING NO.:	
SCALE:	AS NOTED	SHEET NO.:	1

ATTACHMENT 6: USFWS IPAC OFFICIAL SPECIES LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: November 17, 2021
Consultation Code: 05E2VA00-2022-SLI-0804
Event Code: 05E2VA00-2022-E-02701
Project Name: HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

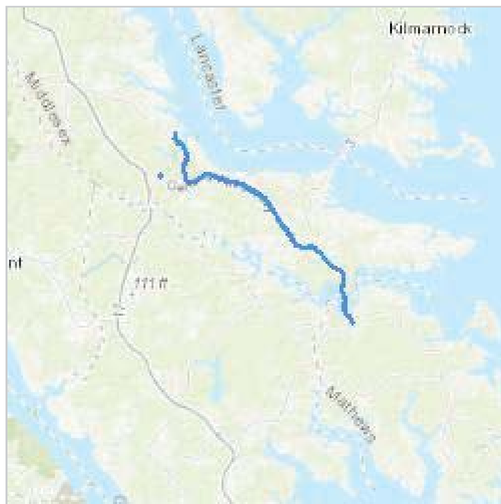
This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2022-SLI-0804
Event Code: Some(05E2VA00-2022-E-02701)
Project Name: HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main
Project Type: WASTEWATER PIPELINE
Project Description: This Project proposes to construct a Sanitary Sewer Force Main in Middlesex and Mathews Counties, VA, to serve Middlesex County.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.4542212,-76.4683398930837,14z



Counties: Gloucester, Mathews, and Middlesex counties, Virginia

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: November 17, 2021
Consultation code: 05E2VA00-2022-TA-0804
Event Code: 05E2VA00-2022-E-02702
Project Name: HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main

Subject: Verification letter for the 'HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Emily Foster:

The U.S. Fish and Wildlife Service (Service) received on November 17, 2021 your effects determination for the 'HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Monarch Butterfly *Danaus plexippus* Candidate

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

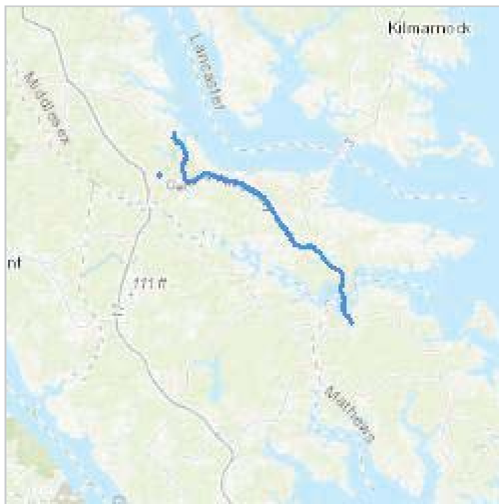
HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main

2. Description

The following description was provided for the project 'HRSD Middlesex Interceptor Phase II Transmission Sanitary Sewer Force Main':

> This Project proposes to construct a Sanitary Sewer Force Main in Middlesex and Mathews Counties, VA, to serve Middlesex County.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.4542212,-76.4683398930837,14z



Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service’s PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service’s PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require

ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service’s January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have “no effect” on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type ‘0’ in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type ‘0’ in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type ‘0’ in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type ‘0’ in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

ATTACHMENT 7: VDWR VAFWIS SEARCH REPORTS

Site Location

37,30,38.5 -76,25,12.1
is **the Search Point**

Show Position Rings
◉ Yes ○ No
1 mile and 1/4 mile at the
Search Point

Show Search Area
◉ Yes ○ No
2 Search distance miles radius

Search Point is at map center

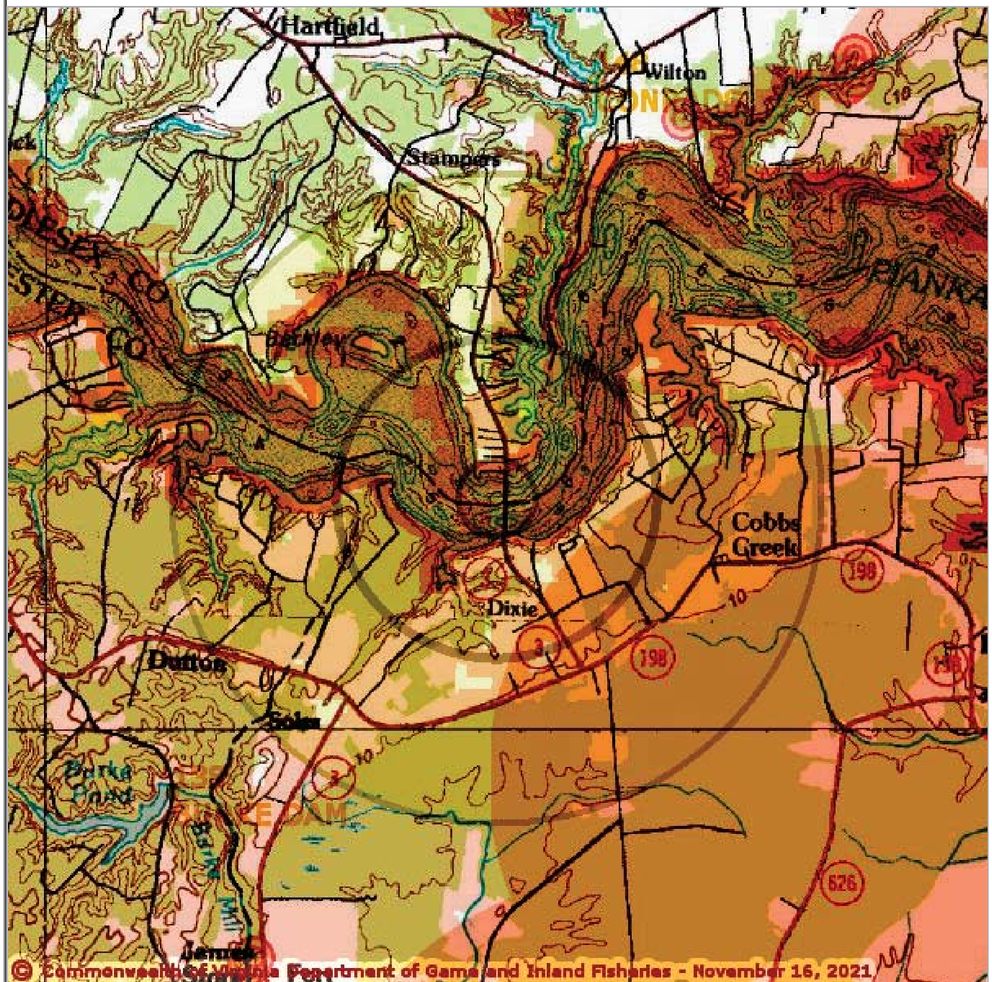
Base Map [Choices]
Topography

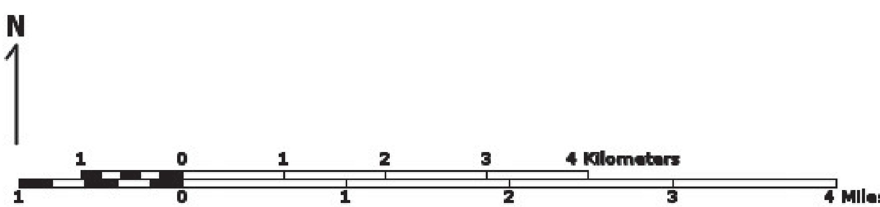
Map Overlay [Choices]
Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

[Refresh Browser Page]

Map Click: Pan | Id | M   Map Scale: In | Zoom | Out   Screen Size: Small | Size | Big   [Help]





Point of Search 37,30,38.5 -76,25,12.1
Map Location 37,30,38.5 -76,25,12.1

Select **Coordinate System:** ◉ Degrees,Minutes,Seconds Latitude - Longitude
○ Decimal Degrees Latitude - Longitude
○ Meters UTM NAD83 East North Zone
○ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see [Microsoft terraserver-usa.com] for details)

Map projection is UTM Zone 18 NAD 1983 with left 369700 and top 4157275. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5

T & E Waters

Federal

State

Predicted Habitat
WAP Tier I & II

Aquatic

Terrestrial

Trout Waters

Class I - IV

Class V - VI

Anadromous Fish Reach

Confirmed

Potential

123 Impediment

Position Rings
1 mile and 1/4 mile at the Search Point

2 mile radius
Search Area

Bald Eagle
Concentration Areas
and Roosts

square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2021-11-16 19:47:30 (qa/qc March 21, 2016 12:20 - tn=1148840.0
dist=3218.688 I)
$poi=37.5106944 -76.4200278

| DGIF | Credits | Disclaimer | Contact vafwis_support@dgif.virginia.gov |Please view our privacy policy |

VaFWIS Search Report Compiled on 11/16/2021, 7:46:23 PM

Help

Known or likely to occur within a **2 mile radius around point 37,30,38.5 -76,25,12.1** in **073 Gloucester County, 115 Mathews County, 119 Middlesex County, VA**

View Map of Site Location

497 Known or Likely Species ordered by Status Concern for Conservation (displaying first 32) (32 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010031	FESE	Ia	Sturgeon, shortnose	Acipenser brevirostrum		BOVA
030074	FESE	Ia	Turtle, Kemp's ridley sea	Lepidochelys kempii		BOVA,HU6
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus		BOVA
030075	FESE	Ic	Turtle, leatherback sea	Dermochelys coriacea		BOVA
030071	FTST	Ia	Turtle, loggerhead sea	Caretta caretta		BOVA
040110	FTSE	Ia	Rail, eastern black	Laterallus jamaicensis jamaicensis		BOVA,HU6
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
030072	FTST	Ib	Turtle, green sea	Chelonia mydas		BOVA
040120	FTST	IIa	Plover, piping	Charadrius melodus		BOVA
100361	FTST	IIa	Beetle, northeastern beach tiger	Cicindela dorsalis dorsalis		BOVA,HU6
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
020052	SE	IIa	Salamander, eastern tiger	Ambystoma tigrinum	Potential	BOVA,Habitat,HU6
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii		HU6
020044	ST	IIa	Salamander, Mabee's	Ambystoma mabeei	Potential	BOVA,Habitat,HU6
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
030067	CC	IIa	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	Potential	BOVA,Habitat,HU6
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA,HU6
040040		Ia	Ibis, glossy	Plegadis falcinellus		BOVA,HU6
020002		IIa	Treefrog, barking	Hyla gratiosa		BOVA,HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6

040033		IIa	Egret, snowy	Egretta thula		BOVA
040029		IIa	Heron, little blue	Egretta caerulea caerulea		BOVA
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040114		IIa	Oystercatcher, American	Haematopus palliatus		BOVA,HU6
040181		IIa	Tern, common	Sterna hirundo		BOVA,HU6
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA,HU6
040140		IIa	Woodcock, American	Scolopax minor		BOVA,HU6
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA

To view **All 497 species** View 497

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.;
b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams (2 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C61	Piankatank river	Confirmed	5		IV	Yes
P181	Wilton creek	Potential	0			Yes

Impediments to Fish Passage

N/A

Colonial Water Bird Survey (3 records)

View Map of All Query Results Colonial Water Bird Survey

Colony_Name	N Obs	Latest Date	N Species			View Map

			Different Species	Highest TE*	Highest Tier**	
Western Shore, Wilton, Gloucester	1	May 17 2013	1			Yes
Western Shore, Wilton, Mathews	1	May 17 2013	1			Yes
Dancing Creek	1	May 7 2003	1			Yes

Displayed 3 Colonial Water Bird Survey

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (10 records)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
425681	SppObs	Nov 8 2005	VCU - INSTAR	3		III	Yes
1916	SppObs	Oct 10 1990	Patricia L. Pies	1		III	Yes
333743	SppObs	Jan 1 1970	VIMS-B-VA. INST. MARINE SCI.	1		III	Yes
302878	SppObs	Oct 27 2003	Sheree Ruhl	1			Yes
302877	SppObs	Oct 24 2003	Sheree Ruhl	4			Yes
302873	SppObs	Oct 1 2003	Sheree Ruhl	3			Yes

302872	SppObs	Sep 30 2003	Sheree Ruhl	3			Yes
302871	SppObs	Sep 29 2003	Sheree Ruhl	5			Yes
55374	SppObs	May 28 1998	R. Browder, , DEQ	3			Yes
366105	SppObs	Jan 1 1900		1			Yes

Displayed 10 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species

N/A

Habitat Predicted for Terrestrial WAP Tier I & II Species (3 Species)

View Map of Combined Terrestrial Habitat Predicted for 3 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
020052	SE	IIa	Salamander, eastern tiger	Ambystoma tigrinum	Yes
020044	ST	IIa	Salamander, Mabee's	Ambystoma mabeei	Yes
030067	CC	IIa	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	Yes

Virginia Breeding Bird Atlas Blocks (4 records)

View Map of All Query Results Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
59082	Ware Neck, NE	60		III	Yes
59081	Ware Neck, NW	1			Yes
59096	Wilton, SE	67		III	Yes
59095	Wilton, SW	1			Yes

Public Holdings:

N/A

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
073	Gloucester	409	FESE	I
115	Mathews	372	FESE	I
119	Middlesex	386	FESE	I

USGS 7.5' Quadrangles:
Ware Neck
Wilton

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
CB10	Piankatank River-Carvers Creek	74	SS	I
CB11	Piankatank River-Hills Bay	69	FESE	I
CB12	Lower Chesapeake Bay-Milford Haven	67	FESE	I
CB16	North River	69	SE	I

Compiled on 11/16/2021, 7:46:23 PM I1148840.0 report=all searchType= R dist= 3218.688 poi= 37,30,38.5 -76,25,12.1

PixelSize=64; Anadromous=0.022894; BBA=0.032128; BECAR=0.016991; Bats=0.017033; Buffer=0.062437; County=0.061158; HU6=0.058855; Impediments=0.018096; Init=0.090737; PublicLands=0.024298; Quad=0.032867; SppObs=0.239396; TEWaters=0.020556; TierReaches=0.021191; TierTerrestrial=0.037252; Total=0.927254; Tracking_BOVA=0.17916; Trout=0.020313; huva=0.030593

Site Location

37,37,55.5 -76,34,20.5
is **the Search Point**

Show Position Rings
Yes No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
Yes No
2 Search distance miles radius

Search Point is at map center

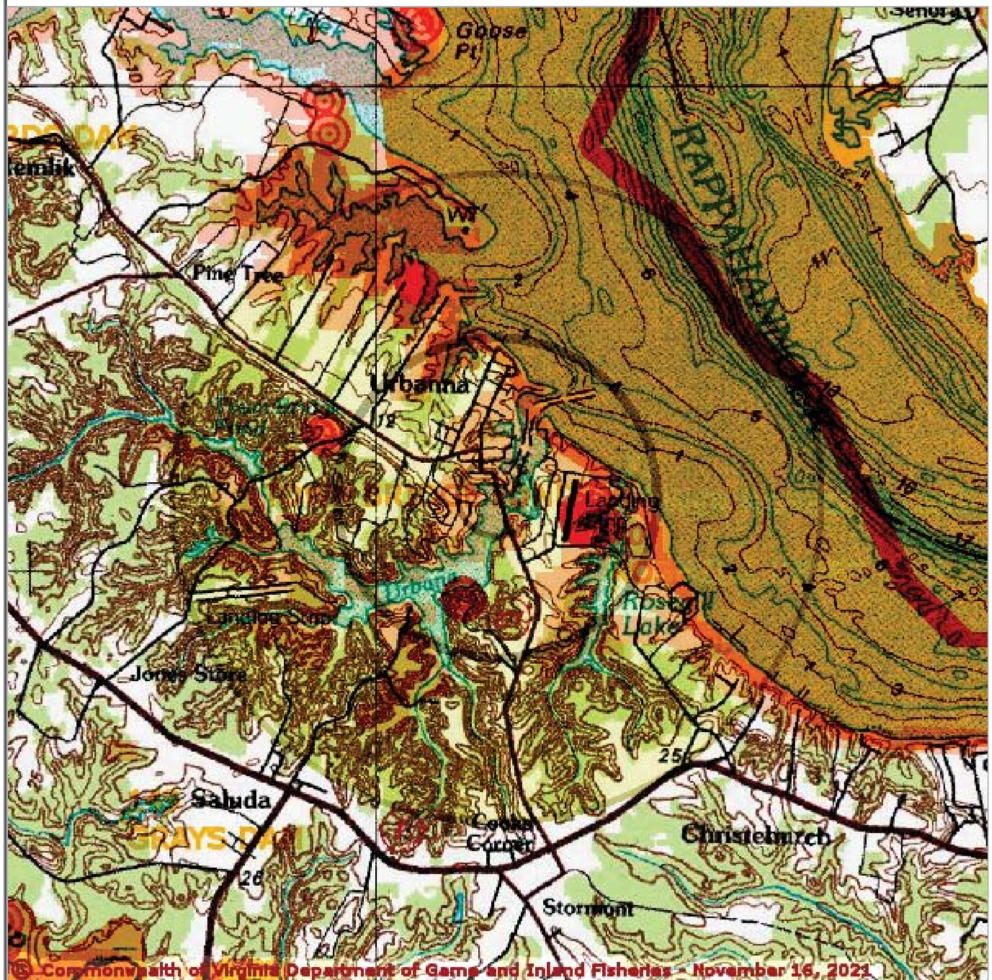
Base Map Choices
Topography

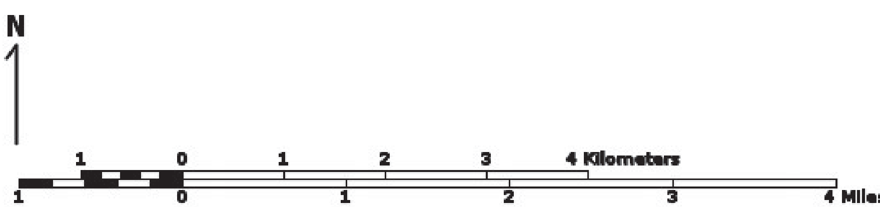
Map Overlay Choices
Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

Refresh Browser Page

Map Click: Pan Id M | Map Scale: In Zoom Out | Screen Size: Small Size Big | Help





Point of Search 37,37,55.5 -76,34,20.5
Map Location 37,37,55.5 -76,34,20.5

Select **Coordinate System:**
- Degrees,Minutes,Seconds Latitude - Longitude
- Decimal Degrees Latitude - Longitude
- Meters UTM NAD83 East North Zone
- Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 356462 and top 4170958. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5

T & E Waters

Federal

State

Predicted Habitat WAP Tier I & II

Aquatic

Terrestrial

Trout Waters

Class I - IV

Class V - VI

Anadromous Fish Reach

Confirmed

Potential

123 Impediment

Position Rings 1 mile and 1/4 mile at the Search Point

2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

square miles.

Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2021-11-16 19:50:44 (qa/qc March 21, 2016 12:20 - tn=1148841.0 dist=3218.688 I)
$poi=37.6320833 -76.5723611

| DGIF | Credits | Disclaimer | Contact vafwis_support@dgif.virginia.gov |Please view our privacy policy |

VaFWIS Search Report Compiled on 11/16/2021, 7:50:22 PM

Help

Known or likely to occur within a **2 mile radius around point 37,37,55.5 -76,34,20.5** in **103 Lancaster County, 119 Middlesex County, VA**

View Map of Site Location

461 Known or Likely Species ordered by Status Concern for Conservation (displaying first 27) (27 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
010031	FESE	Ia	Sturgeon, shortnose	Acipenser brevirostrum		BOVA
030074	FESE	Ia	Turtle, Kemp's ridley sea	Lepidochelys kempii		BOVA
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes	BOVA,TEWaters,Habitat,HU6
030071	FTST	Ia	Turtle, loggerhead sea	Caretta caretta		BOVA
040110	FTSE	Ia	Rail, eastern black	Laterallus jamaicensis jamaicensis		BOVA
050022	FTST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
030072	FTST	Ib	Turtle, green sea	Chelonia mydas		BOVA
100361	FTST	IIa	Beetle, northeastern beach tiger	Cicindela dorsalis dorsalis		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	SE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
030067	CC	IIa	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	Potential	BOVA,Habitat,HU6
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA,HU6
040040		Ia	Ibis, glossy	Plegadis falcinellus		BOVA,HU6
070148		Ic	Amphipod, Lancaster County	Crangonyx baculispina		BOVA,HU6
020002		IIa	Treefrog, barking	Hyla gratiosa		HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6

040033		IIa	Egret, snowy	Egretta thula		BOVA
040029		IIa	Heron, little blue	Egretta caerulea caerulea		BOVA
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040114		IIa	Oystercatcher, American	Haematopus palliatus		BOVA
040181		IIa	Tern, common	Sterna hirundo		BOVA,HU6
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA,HU6
040140		IIa	Woodcock, American	Scolopax minor		BOVA,HU6
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA

To view **All 461 species** View 461

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.;
b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams (1 records)

View Map of All Anadromous Fish Use Streams

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE*	Highest Tier**	
C69	Rappahannock river 1	Confirmed	6		IV	Yes

Impediments to Fish Passage (3 records)

View Map of All Fish Impediments

ID	Name	River	View Map
75	LOWER ROSEGILL LAKE DAM	RAPPAHANNOCK RIVER	Yes
70	ROSEGILL UPPER DAM	TR-RAPPAHANNOCK	Yes
74	TOWN BRIDGE POND DAM	TOWN BRIDGE SWAMP	Yes

Colonial Water Bird Survey (4 records)

[View Map of All Query Results Colonial Water Bird Survey]

Colony_Name	N Obs	Latest Date	N Species			View Map
			Different Species	Highest TE*	Highest Tier**	
Western Shore, Saluda, Middlesex	1	May 10 2013	1			Yes
Western Shore, Urbanna, Middlesex	1	May 10 2013	1			Yes
Town Bridge Pond	1	May 7 2003	1			Yes
Urbanna Creek	2	May 7 2003	1			Yes

Displayed 4 Colonial Water Bird Survey

Threatened and Endangered Waters (3 Reaches)

[View Map of All Threatened and Endangered Waters]

Stream Name	T&E Waters Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Rappahannock River (043895)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Rappahannock River (057307)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Rappahannock River (063157)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests (7 records)

[View Map of All Query Results Bald Eagle Nests]

Nest	N Obs	Latest Date	DGIF Nest Status	View Map
MI0501	4	Apr 23 2006	HISTORIC	Yes
MI0602	7	Apr 30 2008	Unknown	Yes
MI0603	4	Apr 28 2007	Unknown	Yes

MI0809	1	Apr 30 2008	UNKNOWN	Yes
MI8002	5	May 11 1985	HISTORIC	Yes
MI8601	14	Apr 26 2000	HISTORIC	Yes
MI9201	14	Jan 1 2001	HISTORIC	Yes

Displayed 7 Bald Eagle Nests

Species Observations (21 records - displaying first 20) **View Map of All Query Results Species Observations**

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
425989	SppObs	Aug 15 2003	VCU - INSTAR	11		III	Yes
52136	SppObs	Sep 18 1997	Carroll VanLandingham, DOH	1		III	Yes
9152	SppObs	Sep 27 1996	Harold O. Leinbach, Alliance for the Chesapeake Bay	1		III	Yes
9166	SppObs	Jul 14 1996	Russ Russell, Alliance for the Chesapeake Bay	1		III	Yes
615464	SppObs	May 21 2011	David ; Perry| Kevin; Hopkins	1			Yes
609129	SppObs	Oct 22 2010	Yancey; Powell	3			Yes
609127	SppObs	Oct 21 2010	Yancey; Powell	2			Yes
609124	SppObs	Oct 20 2010	Yancey; Powell	2			Yes
609121	SppObs	Oct 19 2010	Yancey; Powell	2			Yes
609118	SppObs	Oct 18 2010	Yancey; Powell	3			Yes
609115	SppObs	Oct 15 2010	Yancey; Powell	2			Yes
609113	SppObs	Oct 14 2010	Yancey; Powell	1			Yes
609110	SppObs	Oct 13 2010	Yancey; Powell	3			Yes
609108	SppObs	Oct 12 2010	Yancey; Powell	2			Yes
316486	SppObs	Jul 24 2006	Rick Browder	4			Yes
67855	SppObs	Jun 28 2001	Rick Browder (Principle Permittee)	3			Yes
10136	SppObs	Nov 13 1976	M. Murray and Van Hoose	3			Yes

335629	SppObs	Jan 1 1976	ODU-B-OLD DOMINION UNIV.	5			Yes
335630	SppObs	Jan 1 1976	ODU-B-OLD DOMINION UNIV.	4			Yes
365776	SppObs	Jan 1 1900		1			Yes

Displayed 20 Species Observations

Selected 21 Observations View all 21 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species (1 Reach)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species						View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name					
Rappahannock River (20801041)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes
Rappahannock River (20801041)	FESE	010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

BOVA Code	Status*	Tier**	Common Name	Scientific Name	View Map
030067	CC	IIa	Terrapin, northern diamond-backed	Malaclemys terrapin terrapin	Yes

Virginia Breeding Bird Atlas Blocks (4 records)

View Map of All Query Results Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
58092	Saluda, NE	1			Yes
58091	Saluda, NW	2			Yes
58106	Urbana, SE	70		III	Yes
58105	Urbana, SW	1			Yes

Public Holdings:

N/A

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
103	Lancaster	361	FESE	I
119	Middlesex	386	FESE	I

USGS 7.5' Quadrangles:
Saluda
Urbana

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
CB09	Dragon Swamp-Meggs Bay	67	SS	II
CB10	Piankatank River-Carvers Creek	74	SS	I
RA69	Rappahannock River-Lagrange Creek	53	FESE	I

Compiled on 11/16/2021, 7:50:22 PM I1148841.0 report=all searchType= R dist= 3218.688 poi= 37,37,55.5 -76,34,20.5

PixelSize=64; Anadromous=0.023512; BBA=0.033242; BECAR=0.01837; Bats=0.017591; Buffer=0.062124; County=0.059343; HU6=0.061168; Impediments=0.020169; Init=0.091569; PublicLands=0.023538; Quad=0.032841; SppObs=0.277645; TEWaters=0.02833; TierReaches=0.042481; TierTerrestrial=0.034678; Total=1.018315; Tracking_BOVA=0.197042; Trout=0.02175; huva=0.031085

ATTACHMENT 8: VDCR NHDE SPECIES/COMMUNITY SEARCH REPORTS

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Global Conservation Status Rank: Select All

State Conservation Status Rank: Select All

Federal Legal Status: Select All

State Legal Status: Select All

Watershed (8 digit HUC): 02080102 - Great Wicomico-Piankatank

Subwatershed (12 digit HUC): CB10 - Piankatank River-Carvers Creek,CB11 - Piankatank River-Hills Bay

Search Run: 11/16/2021 19:55:10 PM

Result Summary

Total Species returned: 1

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Great Wicomico-Piankatank								
Piankatank River-Hills Bay								
COLEOPTERA (BEETLES)								
Northeastern Beach Tiger Beetle	Cicindela dorsalis dorsalis	Cicindela dorsalis dorsalis	G3G4T2	S2	LT	LT	18	Y

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

Natural Heritage Resources

Your Criteria

Taxonomic Group: Select All

Global Conservation Status Rank: Select All

State Conservation Status Rank: Select All

Federal Legal Status: Select All

State Legal Status: Select All

Watershed (8 digit HUC): 02080104 - Lower Rappahannock River

Subwatershed (12 digit HUC): RA69 - Rappahannock River-Lagrange Creek

Search Run: 11/16/2021 19:56:57 PM

Result Summary

Total Species returned: 1

Total Communities returned: 0

Click scientific names below to go to NatureServe report.

Click column headings for an explanation of species and community ranks.

Common Name/Natural Community	Scientific Name	Scientific Name Linked	Global Conservation Status Rank	State Conservation Status Rank	Federal Legal Status	State Legal Status	Statewide Occurrences	Virginia Coastal Zone
Lower Rappahannock								
Rappahannock River-Lagrange Creek								
VASCULAR PLANTS								
Sensitive Joint-vetch	Aeschynomene virginica	Aeschynomene virginica	G2	S2	LT	LT	22	Y

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

For Additional Information on locations of Natural Heritage Resources please submit an information request.

19 November 2021

Virginia Marine Resource Commission

Tidewater Joint Permit Application
For VMRC subaqueous Crossing
Piankatank River and Urbanna Creek
Middlesex and Mathews, Virginia

Applicant: Mr. Edward Henifin
Hampton Roads Sanitation District
P.O. Box 5911
Virginia Beach, VA, 23471

Agent: Ms. Emily Foster
Tetra Tech
5700 Lake Wright Drive
Norfolk, VA, 23502

Subject: HRSD – Middlesex Interceptor System Program Phase II; Urbanna to Mathews Transmission Force Main project (MISPPII); NAO-2020-02102

To Whom It May Concern,

On behalf of the Hampton Roads Sanitation District (HRSD), Tetra Tech, Inc. has enclosed a completed Tidewater Joint Permit Application and Jurisdictional Determination Request in support of a proposed project to construct a sewage conveyance system through Mathews and Middlesex Counties, Virginia (HUCs).

The Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design and construction of a sewage conveyance system to serve Middlesex County. A small diameter transmission force main will serve as the system backbone and extend 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

The Project is predominantly co-located within existing roads and easements, and no impacts to wetlands are currently proposed. A wetland delineation was performed for the Project during the 2021 growing season, and a Jurisdictional Determination Request is attached to this application. All wetlands are to be avoided and silt fence will be installed adjacent to wetland boundaries prior to the start of construction. As HRSD intends to utilize funding from the Virginia Clean Water Revolving Loan Fund (CWRLF), an Environmental Assessment (EA) is also being prepared for this Project in accordance with CWRLF requirements.

This Joint Permit Application pertains specifically to the proposed crossings at the Piankatank River and Urbanna Creek, as the design of these Project components are less likely to be significantly altered as the planning and design phase moves forward. Because the Project includes subaqueous crossings of the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD), HRSD is requesting VMRC authorization for the subaqueous crossings and requests concurrence from USACE and VADEQ that no additional CWA Section 401/404 permits are required for these crossing locations. If any impacts to wetlands or waters of the U.S. are anticipated within the linear route or pump station location as design progresses, additional JD requests and JPAs for those locations will be submitted.

To assist the entities involved with the review and approval of this activity, please find the enclosed Tidewater JPA, Jurisdictional Determination Request, Figures, site photos and additional supporting information. Upon receipt and review of this package, please feel free to contact me by phone or e-mail at (540) 841-4752 or emily.foster@tetratech.com.

Respectfully submitted,

Emily Foster, PWS #2718
Environmental Scientist
Tetra Tech, Inc

Enclosure

CC Edward Henifin, HRSD
Scott Funk, P.E., Kimley-Horn
Tim Moore, P.E., Tetra Tech
Brad Sweeney, P.E., Tetra Tech

Attachments:

1. Tidewater JPA Form and Signatures
2. Property Owner Information
3. Jurisdictional Determination Request
4. Proposed Sewer Force Main Piankatank River HDD Crossing (Project Drawings)
5. Proposed Sewer Force Main Urbanna Creek HDD Crossing (Project Drawings)
6. USFWS IPaC Official Species List
7. VDWR VaFWIS Search Report
8. VDCR Natural Heritage Database Explorer Resources Report

ATTACHMENT 1: TIDEWATER JPA

Regulatory Agency Contact Information

Virginia Marine Resources Commission (VMRC)
Habitat Management Division
380 Fenwick Road, Building 96
Fort Monroe, VA 23651
Phone: (757) 247-2200, Fax: (757) 247-8062
Website: http://www.mrc.virginia.gov/hmac/hmoverview.shtm

United States Army Corps of Engineers (USACE)
Norfolk District
803 Front Street, ATTN: CENAO-WR-R
Norfolk, Virginia 23510-1011
Phone: (757) 201-7652, Fax: (757) 201-7678
Website: http://www.nao.usace.army.mil/Missions/Regulatory.aspx

Virginia Department of Environmental Quality (DEQ)
Virginia Water Protection Permit Program
Post Office Box 1105
Richmond, Virginia 23218
Phone: (804) 698-4000
Website: http://www.deq.virginia.gov/

LOCAL WETLANDS BOARD (LWB) CONTACT INFORMATION:
Links to LWB information on the Web can be found at
http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html
In addition, the phone numbers listed below can be used to contact the LWB. Please be advised that these phone numbers are subject to change at any time.

Accomack County (757) 787-5721, Cape Charles (757) 331-3259, Charles City County (804) 829-9296, Chesapeake (757) 382-6248, Colonial Heights (804) 520-9275, Essex County (804) 443-4951, Fairfax County (703) 324-1364, Fredericksburg (540) 372-1179, Gloucester County (804) 693-2744, Hampton (757) 727-6140, Hopewell (804) 541-2267, Isle of Wight County (757) 365-6211, James City County (757) 253-6673, King and Queen County (804) 769-4978, King George County (540) 775-7111, King William County (804) 769-4927, Lancaster County (804) 462-5220, Mathews County (804) 725-5025, Middlesex County (804) 758-0500, New Kent County (804) 966-9690, Newport News (757) 247-8437, Norfolk (757) 664-4368, Northampton County (757) 678-0442, Northumberland County (804) 580-8910, Poquoson (757) 868-3040, Portsmouth (757) 393-8836, Prince William County (703) 792-6984, Richmond County (804) 333-3415, Stafford County (540) 658-8668, Suffolk (757) 923-3650, Virginia Beach (757) 427-8246, Westmoreland County (804) 493-0120, West Point (804) 843-3330, Williamsburg (757) 220-6130, York County (757) 890-3538

Tidewater Joint Permit Application (JPA)
For Projects Involving Tidal Waters, Tidal Wetlands and/or Dunes and Beaches in Virginia

This application may be used for most commercial and noncommercial projects involving **tidal waters, tidal wetlands and/or dunes and beaches in Virginia** which require review and/or authorization by Local Wetlands Boards (LWB), the Virginia Marine Resources Commission (VMRC), the Department of Environmental Quality (DEQ), and/or the U. S. Army Corps of Engineers (USACE). This application can be used for:

- **Access-related activities**, including piers, boathouses, boat ramps (without associated dredging or excavation*), moorings, marinas.
- **Shoreline stabilization projects** including living shorelines, riprap revetments, marsh toe stabilization, bulkheads, breakwaters, beach nourishment, groins, and jetties. It is the policy of the Commonwealth that living shorelines are the preferred alternative for stabilizing tidal shorelines (Va. Code § 28.2-104.1).
- **Crossings** over or under tidal waters and wetlands including bridges and utility lines (water, sewer, electric).
- **Aquaculture structures**, including cages and floats except "oyster gardening"**

***Note:** for all dredging, excavation, or surface water withdrawal projects you **MUST** use the Standard JPA form; for noncommercial, riparian shellfish aquaculture projects (i.e., "oyster gardening") you must use the abbreviated JPA found at https://mrc.virginia.gov/forms/2019/VGP3_Aquaculture_form_2019.pdf or call VMRC for a form.

The DEQ and the USACE use this form to determine whether projects qualify for certain General, Regional, and/or Nationwide permits. If your project does not qualify for these permits and you need a DEQ Virginia Water Protection permit or an individual USACE permit, you must submit the Standard Joint Permit application form. You can find this application at http://www.nao.usace.army.mil/Missions/Regulatory/JPA.aspx. Please note that some health departments and local agencies, such as local building officials and erosion and sediment control authorities, do not use the Joint Permit Application process or forms and may have different informational requirements. The applicant is responsible for contacting these agencies for information regarding those permitting requirements.

HOW TO APPLY

Submit one (1) completed copy of the Tidewater JPA to VMRC:

1. If by mail or courier, use the VMRC address provided on page 1.
2. If by electronic mail, address the package to: **JPA.permits@mrc.virginia.gov**. The application must be provided in the .pdf format and should not exceed 10 MB. If larger than 10 MB you may provide a file transfer protocol (ftp) site for download purposes.

The Tidewater JPA should include the following:

1. **Part 1** – General Information
2. **Part 2** – Signatures
3. **Part 3** - Appendices (A, B, C, and/or D as applicable to your project)
4. **Part 4** – Project Drawings.
   The drawings shall include the following for **ALL** projects:
   - Vicinity Map (USGS topographic map, road map or similar showing project location)
   - Plan View Drawing (overhead, to scale or with dimensions clearly marked)
   - Section View Drawing (side-view, to scale or with dimensions clearly marked)

Sample drawings are included at the end of Part 4 of this application to show examples of the information needed to consider your application complete and allow for the timely processing.

When completing this form, use the legal name of the applicant, agent, and/or property owner. For DEQ application purposes, *legal name* means the full legal name of an individual, business, or other organization. For an individual, the legal name is the first name, middle initial, last name, and suffix. For an entity authorized to do business in Virginia, the legal name is the exact name set forth in the entity's articles of incorporation, organization or trust, or formation agreement, as applicable. Also provide the name registered with the State Corporation Commission, if required to register. DEQ issues a permit or grants coverage to the so-named individual or business, who becomes the 'permittee'. Correspondence from some agencies, including permits, authorizations, and/or coverage, may be provided via electronic mail. If the applicant and/or agent wishes to receive their permit via electronic mail, please remember to include an e-mail address at the requested place in the application.

In order for projects requiring LWB authorization to be considered complete (Virginia Code § 28.2-1302); "The permit application shall include the following: the name and address of the applicant; a detailed description of the proposed activities; a map, drawn to an appropriate and uniform scale, showing the area of wetlands directly affected, the location of the proposed work thereon, the area of existing and proposed fill and excavation, the location, width, depth and length of any proposed channel and disposal area, and the location of all existing and proposed structures, sewage collection and treatment facilities, utility installations, roadways, and other related appurtenances of facilities, including those on the adjacent uplands; a description of the type of equipment to be used and the means of access to the activity site; the names and addresses of record of adjacent land and known claimants of water rights in or adjacent to the wetland of whom the applicant has notice; an estimate of cost; the primary purpose of the project; and secondary purpose of the proposed project; a complete description of measures to be taken during and after alteration to reduce detrimental offsite effects; the completion date of the proposed work, project, or structure; and such additional materials and documentation as the wetlands board may require."

You may include signed Adjacent Property Owner (APO) Acknowledgement Forms found at the end of this Short Form. You must provide these addresses in Part 1 whether or not you use the APO forms. VMRC will request comments from APOs for projects that require permits for encroachment over state-owned submerged lands. VMRC or your local wetlands board must notify all APO's of public hearings required for all proposals involving tidal wetlands and dunes/beaches that are not authorized by statute. This information will not be used by DEQ to meet the requirements of notifying riparian land owners.

Regional Permit 17 (RP-17), authorizes the installation and/or construction of open-pile piers, mooring structures/devices, fender piles, covered boathouses/boatslips, boatlifts, osprey pilings/platforms, accessory pier structures, and certain devices associated with shellfish gardening, for private use, subject to strict compliance with all conditions and limitations further set out in the RP-17 enclosure located at http://www.nao.usace.army.mil/Missions/Regulatory/RBregional/. In addition to the information required in this JPA, prospective permittees seeking authorization under RP-17 must complete and submit the 'Regional Permit 17 Checklist' with their JPA. A copy of the 'Regional Permit 17 Checklist' is found on pages 13 and 14 of this application package. If the prospective permittee answers "yes" (or "N/A", where applicable) to all of the questions on the 'Regional Permit 17 Checklist', the permittee is in compliance with RP-17 and will not receive any other written authorization from the Corps but may not proceed with construction until they have obtained all necessary state and local permits. ***Note: If the prospective permittee answers "no" to any of the questions on the 'Regional Permit 17 Checklist' then their proposed structure(s) does not meet the terms and conditions of RP-17 and written authorization from the Corps is required before commencement of any work.***

Note: Land disturbance (grading, filling, etc.) or removal of vegetation associated with projects located in Chesapeake Bay Preservation Areas will require approval from local governments. Certain localities utilize this application during their Bay Act review. Part 5 of this application is included to provide assistance for the applicant to comply with Bay Act /or Erosion and Sediment Control requirements concurrent with this application.

WHAT HAPPENS NEXT

Upon receipt of an application, VMRC will assign a permit application number to the JPA and will then distribute a copy of the application and any original plan copies submitted to the other regulatory agencies that are involved in the JPA process. All agencies will conduct separate but concurrent reviews of your project. Please be aware that each agency must issue a separate permit (or a notification that no permit is required). Note that in some cases, DEQ may be taking an action on behalf of the USACE, such as when the State Program General Permit (SPGP) applies. Make sure that you have received all necessary authorizations, or documentation that no permit is required, from each agency prior to beginning the proposed work.

During the JPA review process, site inspections may be necessary to evaluate a proposed project. Failure to allow an authorized representative of a regulatory agency to enter the property, or to take photographs of conditions at the project site, may result in either the withdrawal or denial of your permit application.

For certain federal and state permit applications, a public notice is published in a newspaper having circulation in the project area, is mailed to adjacent and/or riparian property owners, and/or is posted on the agency's web page. The public may comment on the project during a designated comment period, if applicable, which varies depending upon the type of permit being applied for and the issuing agency. In certain circumstances, the project may be heard by a governing board, such as a Local Wetlands Board, the State Water Control Board, or VMRC in cases where a locality does not have a wetlands board and with certain subaqueous cases. You may be responsible for bearing the costs for advertisement of public notices.

Public hearings that are held by VMRC occur at their regularly scheduled monthly commission meetings under the following situations: Protested applications for VMRC permits which cannot be resolved; projects costing over $500,000 involving encroachment over state-owned subaqueous land; and all projects affecting tidal wetlands and dunes/beaches in localities without a LWB. All interested parties will be officially notified regarding the date and time of the hearing and Commission meeting procedures. The Commission will usually make a decision on the project at the meeting unless a decision for continuance is made. If a proposed project is approved, a permit or similar agency correspondence is sent to the applicant. In some cases, notarized signatures, as well as processing fees and royalties, are required before the permit is validated. If the project is denied, the applicant will be notified in writing.

PERMIT APPLICATION OR OTHER FEES

Do not send any fees with the JPA. VMRC is not responsible for accounting for fees required by other agencies. Please consult agency websites or contact agencies directly for current fee information and submittal instructions.

- ❖ USACE: Permit application fees are required for USACE Individual (Standard) permits. A USACE project manager will contact you regarding the proper fee and submittal requirements.

- DEQ: Permit application fees required for Virginia Water Protection permits – while detailed in 9VAC25-20 – are conveyed to the applicant by the applicable DEQ office (http://www.deq.virginia.gov/Locations.aspx). Complete the Permit Application Fee Form and submit it per the instructions to the address listed on the form. Instructions for submitting any other fees will be provided to the applicant by DEQ staff.
- VMRC: An application fee of $300 may be required for projects impacting tidal wetlands, beaches and/or dunes when VMRC acts as the LWB. VMRC will notify the applicant in writing if the fee is required. Permit fees involving subaqueous lands are $25.00 for projects costing $10,000 or less and $100 for projects costing more than $10,000. Royalties may also be required for some projects. The proper permit fee and any required royalty is paid at the time of permit issuance by VMRC. VMRC staff will send the permittee a letter notifying him/her of the proper permit fees and submittal requirements.
- LWB: Permit fees vary by locality. Contact the LWB for your project area or their website for fee information and submittal requirements. Contact information for LWBs may be found at http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html.

FOR AGENCY USE ONLY	
	Notes:
	JPA #

APPLICANTS
Part 1 – General Information

PLEASE PRINT OR TYPE ALL ANSWERS: If a question does not apply to your project, please print N/A (not applicable) in the space provided. If additional space is needed, attach 8-1/2 x 11 inch sheets of paper.

Check all that apply		
Pre-Construction Notification (PCN) ☐ NWP # ____________________ *(For Nationwide Permits ONLY - No DEQ-VWP permit writer will be assigned)*	Regional Permit 17 (RP-17) ☐	VMRC Subaqueous Permit

County or City in which the project is located: Mathews and Middlesex County

Waterway at project site: Piankatank River and Urbanna Creek

PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK (Include all federal, state, and local pre application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)

Historical information for past permit submittals can be found online with VMRC - https://webapps.mrc.virginia.gov/public/habitat/ - or VIMS - http://ccrm.vims.edu/perms/newpermits.html

Agency	Action / Activity	Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13)	Date of Action	If denied, give reason for denial
USACE	Pre-Application Request	NAO-2020-02102	10/30/2020	N/A

Part 1 - General Information (continued)

1. Applicant's legal name* and complete mailing address:

Edward Henifin, HRSD Project Manager
1434 Air Rail Avenue
Virginia Beach, VA 23445

Contact Information:
Home (____)______________
Work (____)______________
Fax (____)______________
Cell (757) 460-2261
e-mail ehenifin@hrsd.com

State Corporation Commission Name and ID Number (if applicable) ______________

2. Property owner(s) legal name* and complete address, if different from applicant: Contact Information:
Home (____)______________
Work (____)______________
Fax (____)______________
Cell (____)______________
e-mail ______________

State Corporation Commission Name and ID Number (if applicable) ______________

3. Authorized agent name* and complete mailing address (if applicable):

Tetra Tech c/o Emily Foster
5700 Lake Wright Dr.
Norfolk VA, 23502

Contact Information:
Home (____)______________
Work (____)______________
Fax (____)______________
Cell (540) 841-4752
e-mail emily.foster@tetratech.com

State Corporation Commission Name and ID Number (if applicable) ______________

<u>* If multiple applicants, property owners, and/or agents, each must be listed and each must sign the applicant signature page.</u>

4. Provide a <u>detailed</u> description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

On behalf of HRSD, Tetra Tech, Inc. is submitting this Joint Permit Application in support of planned project to design and construct a sewage conveyance system to serve Middlesex County, Virginia (the Project).

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design and construction of a sewage conveyance system to serve Middlesex County. A small diameter transmission force main will serve as the system backbone and extend 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 from Cook's Corner to the connection to HRSD's Mathews Transmission force main near the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198). The Project will consist of a new force main to convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The Project also includes installation of pump stations and equalizer tanks.

Because the Project includes crossings under the Piankatank River and Urbanna Creek via Horizontal Direction Drill (HDD) with no proposed impacts to adjacent delineated wetlands, Tetra Tech is anticipating the need for a subaqueous permit from VMRC and requests concurrence from USACE and VADEQ that no Section 401/404 permits are required. This Joint Permit Application pertains specifically to the proposed crossings at the Piankatank River and Urbanna Creek, as the design of these Project components are less likely to be significantly altered as the planning and design phase moves forward.

Part 1 - General Information (continued)

5. Have you obtained a contractor for the project? ___ Yes* _x_ No. *If your answer is "Yes" complete the remainder of this question and submit the Applicant's and Contractor's Acknowledgment Form (enclosed)
   Contractor's name* and complete mailing address:
   N/A

   Contact Information:
   Home (____)____________
   Work (____)____________
   Fax (____)____________
   Cell (____)____________
   email ________________

   State Corporation Commission Name and ID Number (if applicable) ____________________

<u>* If multiple contractors, each must be listed and each must sign the applicant signature page.</u>

6. List the name, address and telephone number of the newspaper having general circulation in the area of the project. Failure to complete this question may delay local and State processing.

   Name and complete mailing address:
   N/A

   Telephone number
   (____) ________________

7. Give the following project location information:
   Street Address (911 address if available)______________________________
   Lot/Block/Parcel#______________________________
   Subdivision______________________________
   City / County________________________ ZIP Code__________________
   Latitude and Longitude at Center Point of Project Site (Decimal Degrees):
   ____________________ / -____________________ (Example: 36.41600/-76.30733)

   If the project is located in a rural area, please provide driving directions giving distances from the best and nearest visible landmarks or major intersections. *Note: if the project is in an undeveloped subdivision or property, clearly stake and identify property lines and location of the proposed project. A supplemental map showing how the property is to be subdivided should also be provided.*

   N/A - linear project

8. What are the *primary and secondary purposes of and the need for* the project? For example, the primary purpose <u>may</u> be "to protect property from erosion due to boat wakes" and the secondary purpose <u>may</u> be "to provide safer access to a pier."

   See attached property owner information

Part 1 - General Information (continued)

9. Proposed use (check one):
   ___ Single user (private, non-commercial, residential)
   _X_ Multi-user (community, commercial, industrial, government)

10. Describe alternatives considered and the measures that will be taken to avoid and minimize impacts, to the maximum extent practicable, to wetlands, surface waters, submerged lands, and buffer areas associated with any disturbance (clearing, grading, excavating) during and after project construction. *Please be advised that unavoidable losses of tidal wetlands and/or aquatic resources may require compensatory mitigation.*

    Piankatank River, Urbanna Creek

11. Is this application being submitted for after-the-fact authorization for work which has already begun or been completed? ___Yes _X_No. If yes, be sure to clearly depict the portions of the project which are already complete in the project drawings.

12. Approximate cost of the entire project (materials, labor, etc.): $27,000,000
    Approximate cost of that portion of the project that is channelward of mean low water:
    $900,000

13. Completion date of the proposed work: January - 2025

14. Adjacent Property Owner Information: List the name and complete **mailing address**, including zip code, of each adjacent property owner to the project. (NOTE: If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.) Failure to provide this information may result in a delay in the processing of your application by VMRC.

    See attached property owner information.

Part 2 - Signatures

1. Applicants and property owners (if different from applicant).
NOTE: REQUIRED FOR ALL PROJECTS

<u>PRIVACY ACT STATEMENT</u>: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.
CERTIFICATION: I am hereby applying for all permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit. In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Edward Henifin, HRSD Project Manager

Applicant's Legal Name (printed/typed) (Use if more than one applicant)

Applicant's Signature (Use if more than one applicant)

Date

Property Owner's Legal Name (printed/typed) (Use if more than one owner)
(If different from Applicant)

Property Owner's Signature (Use if more than one owner)

Date

Part 2 – Signatures (continued)

2. Applicants having agents (if applicable)

CERTIFICATION OF AUTHORIZATION

I (we), Edward Henifin: HRSD, hereby certify that I (we) have authorized Emily M Foster: Tetra Tech
(Applicant's legal name(s)) (Agent's name(s))
to act on my behalf and take all actions necessary to the processing, issuance and acceptance of this permit and any and all standard and special conditions attached.

We hereby certify that the information submitted in this application is true and accurate to the best of our knowledge.

______________________________ ______________________________
(Agent's Signature) (Use if more than one agent)

____
(Date)

______________________________ ______________________________
(Applicant's Signature) (Use if more than one applicant)

____
(Date)

3. Applicant's having contractors (if applicable)

CONTRACTOR ACKNOWLEDGEMENT

I (we), _______________________, have contracted____
(Applicant's legal name(s)) (Contractor's name(s))
to perform the work described in this Joint Permit Application, signed and dated__________________________.

We will read and abide by all conditions set forth in all Federal, State and Local permits as required for this project. We understand that failure to follow the conditions of the permits may constitute a violation of applicable Federal, state and local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes. In addition, we agree to make available a copy of any permit to any regulatory representative visiting the project to ensure permit compliance. If we fail to provide the applicable permit upon request, we understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all terms and conditions.

____
Contractor's name or name of firm

____
Contractor's or firms address

______________________________ ______________________________
Contractor's signature and title Contractor's License Number

______________________________ ______________________________
Applicant's signature (use if more than one applicant)

____
Date

Part 2 – Signatures (continued)

ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

I (we), ___________________________________, own land next to (across the water
(Print adjacent/nearby property owner's name)

from/on the same cove as) the land of____________________________________.
(Print applicant's name(s))

I have reviewed the applicant's project drawings dated ________________________
(Date)

to be submitted for all necessary federal, state and local permits.

I HAVE NO COMMENT_______ ABOUT THE PROJECT.

I DO NOT OBJECT ______ TO THE PROJECT.

I OBJECT ______ TO THE PROJECT.

The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.

(Before signing this form be sure you have checked the appropriate option above).

____
Adjacent/nearby property owner's signature(s)

____
Date

Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.

Part 2 – Signatures (continued)

ADJACENT PROPERTY OWNER'S ACKNOWLEDGEMENT FORM

I (we), ___________________________________, own land next to (across the water
(Print adjacent/nearby property owner's name)

from/on the same cove as) the land of______________________________________.
(Print applicant's name(s))

I have reviewed the applicant's project drawings dated ________________________
(Date)

to be submitted for all necessary federal, state and local permits.

I HAVE NO COMMENT_______ ABOUT THE PROJECT.

I DO NOT OBJECT ______ TO THE PROJECT.

I OBJECT ______ TO THE PROJECT.

The applicant has agreed to contact me for additional comments if the proposal changes prior to construction of the project.

(Before signing this form, be sure you have checked the appropriate option above).

____
Adjacent/nearby property owner's signature(s)

____
Date

Note: If you object to the proposal, the reason(s) you oppose the project must be submitted in writing to VMRC. An objection will not necessarily result in denial of the project; however, valid complaints will be given full consideration during the permit review process.

Appendix C: Crossings in, on, over, or under, waters, submerged lands, tidal wetlands and/or dunes and beaches, including but not limited to, bridges, walkways, pipelines and utility lines.

1. What is the purpose and method of installation of the crossing?

   Purpose: To install a new transmission force main to provide sanitary sewer service to Middlesex County, using HDD methods to cross the Piankatank River and Urbanna Creek.

2. What is the width of the waterway and/or wetlands to be crossed
   from mean high water to mean high water (tidal waters)? 1,140/1,893 feet. Urbanna Creek/Piankatank River
   from mean low water to mean low water (tidal waters)? 1,127/1,877 feet. Urbanna Creek/Piankatank River
   from ordinary high water to ordinary high water (non-tidal waters)? N/A feet.

3. For bridges (footbridges, golf cart bridges, roadway bridges, etc.), what is the width of the structure over the tidal wetlands, dunes/beaches and/or submerged lands? N/A square feet.

4. For overhead crossings:
   a. What will be the height above mean high water? N/A feet.
   b. If there are other overhead crossings in the area, what is the minimum height? N/A feet.
   c. If the proposed crossing is an electrical line, please confirm the total number of electrical circuits: N/A

5. For buried crossings, what will be the depth below the substrate? 30/58 feet. Will the proposed utility provide empty conduits for any additional utilities that may propose to co-locate at a later date? _____Yes X No. Urbanna Creek/Piankatank River (minimum depth below substrate)

6. Will there be any excavation or fill required for placement of abutments, piers, towers, or other permanent structures on State-owned submerged lands, tidal wetlands, and dunes/beaches? ____Yes X No.

   If yes, please provide the following:

   a. Amount of excavation in wetlands — 0 cubic yards; 0 square feet
   b. Amount of excavation in submerged land — 0 cubic yards; 0 square feet
   c. Amount of excavation in dune/beach — 0 cubic yards; 0 square feet
   d. Amount of fill in wetlands — 0 cubic yards; 0 square feet
   e. Amount of fill in submerged lands — 0 cubic yards; 0 square feet
   f. Amount of fill in dune/beach — 0 cubic yards; 0 square feet

Part 4 - Project Drawings

Plan view and cross-sectional view drawings are required for all projects. Application drawings do not need to be prepared by a professional draftsman, but they must be clear, accurate, and should be to an appropriate scale. If a scale is not used, all dimensions must be clearly depicted in the drawings. If available, a plat of the property should be included, with the existing and proposed structures clearly indicated. Distances from the proposed structure(s) to fixed points of reference (benchmarks) and to the adjacent property lines must be shown. A vicinity map (County road map, USGS Topographic map, etc.) must also be provided to show the location of the property. **NOTE:** The sample drawings have been included at the end of this section to provide guidance on the information required for different types of projects. Clear and accurate drawings are essential for project review and compliance determination. Incomplete or unclear drawings may cause delays in the processing of your application.

The following items must be included on <u>ALL</u> project drawings: (plan and cross-sectional, as appropriate)

- **name of project**
- **north arrow**
- **scale**
- **waterway name**
- **existing and proposed structures, labeled as such**
- **dimensions of proposed structures**
- **mean high water and mean low water lines**
- **all delineated wetlands and all surface waters on the site, including the Cowardin classification (i.e., emergent, scrub-shrub, or forested) for those surface waters (if applicable)**
- **limits of proposed impacts to surface waters, such as fill areas, riprap scour protection placement, and dredged areas, and the amount of such impacts in square feet and acres**
- **ebb/flood direction**
- **adjacent property lines and owner's name**
- **distances from proposed structures to fixed points of reference (benchmarks) and adjacent property lines**

Part 5 - Chesapeake Bay Preservation Act Information

All proposed development, redevelopment, land disturbance, clearing or grading related to this Tidewater JPA must comply with the Chesapeake Bay Preservation Area Designation and Management Regulations, which are enforced through locally adopted Chesapeake Bay Preservation Area (CBPA) ordinances. Compliance with state and local CBPA requirements mandates the submission of a ***Water Quality Impact Assessment (WQIA)*** for the review and approval of the local government. Contact the appropriate local government office to determine if a WQIA is required for the proposed activity(ies).

Because the 84 local governments within Tidewater Virginia are responsible for enforcing the CBPA Regulations, the completion of the JPA process does not constitute compliance with the Bay Act Regulations nor does it guarantee that the local government will approve encroachments into the RPA that may result from this project. Applicants should contact their local government as early in the design process as possible to ensure that the final design and construction of the proposed project meets all applicable CBPA requirements. Early cooperation with local government staff can help applicants avoid unnecessary and costly delays to construction. Applicants should provide local government staff with information regarding existing vegetation within the Resource Protection Area (RPA) as well as a description and site drawings of any proposed land disturbance, construction, or vegetation clearing. As part of their review and approval processes, local government staff will evaluate the proposed project and determine whether or not approval can be granted. Once the locality has made a decision on the project, they will advise the Local Wetlands Boards and other appropriate parties of applicable CBPA concerns or issues.

Resource Protection Areas (RPAs) are composed of the following features:

1. **Tidal wetlands;**
2. **Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow;**
3. **Tidal shores;**
4. **Other lands considered by the local government to meet the provisions of subsection A of 9VAC25-830-80 and to be necessary to protect the quality of state waters; and**
5. **A buffer area not less than 100 feet in width located adjacent to and landward of the components listed in subdivisions 1 through 4 above, and along both sides of any water body with perennial flow.**

Notes for all projects in RPAs

Development, redevelopment, construction, land disturbance, or placement of fill within the RPA features listed above requires the approval of the locality and may require an exception or variance from the local Bay Act ordinance. Please contact the appropriate local government to determine the types of development or land uses that are permitted within RPAs.

Pursuant to 9VAC25-830-110, on-site delineation of the RPA is required for all projects in CBPAs. Because USGS maps are not always indicative of actual "in-field" conditions, they may not be used to determine the site-specific boundaries of the RPA.

Notes for shoreline erosion control projects in RPAs

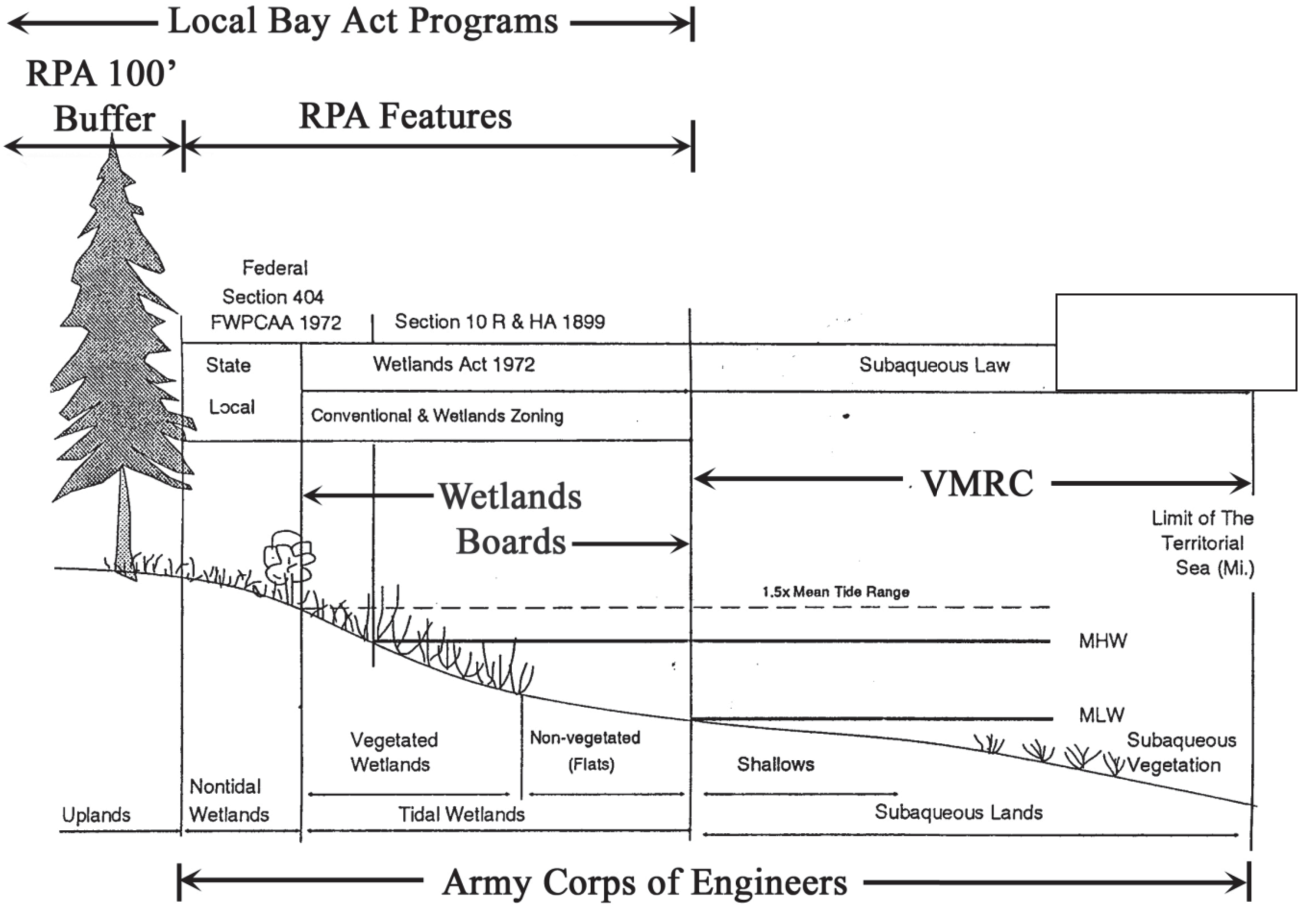
Re-establishment of woody vegetation in the buffer will be required by the locality to mitigate for the removal or disturbance of buffer vegetation associated with your proposed project. Please contact the local government to determine the mitigation requirements for impacts to the 100-foot RPA buffer.

Part 5 - Chesapeake Bay Preservation Act Information (continued)

Pursuant to 9VAC25-830-140 5 a (4) of the Virginia Administrative Code, shoreline erosion projects are a permitted modification to RPAs provided that the project is based on the "best technical advice" and complies with applicable permit conditions. In accordance with 9VAC25-830-140 1 of the Virginia Administrative Code, the locality will use the information provided in this Part V, in the project drawings, in this permit application, and as required by the locality, to make a determination that:

1. Any proposed shoreline erosion control measure is necessary and consistent with the nature of the erosion occurring on the site, and the measures have employed the "best available technical advice"
2. Indigenous vegetation will be preserved to the maximum extent practicable
3. Proposed land disturbance has been minimized
4. Appropriate mitigation plantings will provide the required water quality functions of the buffer (9VAC25-830-140 3)
5. The project is consistent with the locality's comprehensive plan
6. Access to the project will be provided with the minimum disturbance necessary.

Jurisdictional Boundaries



and DEQ (including isolated wetlands)