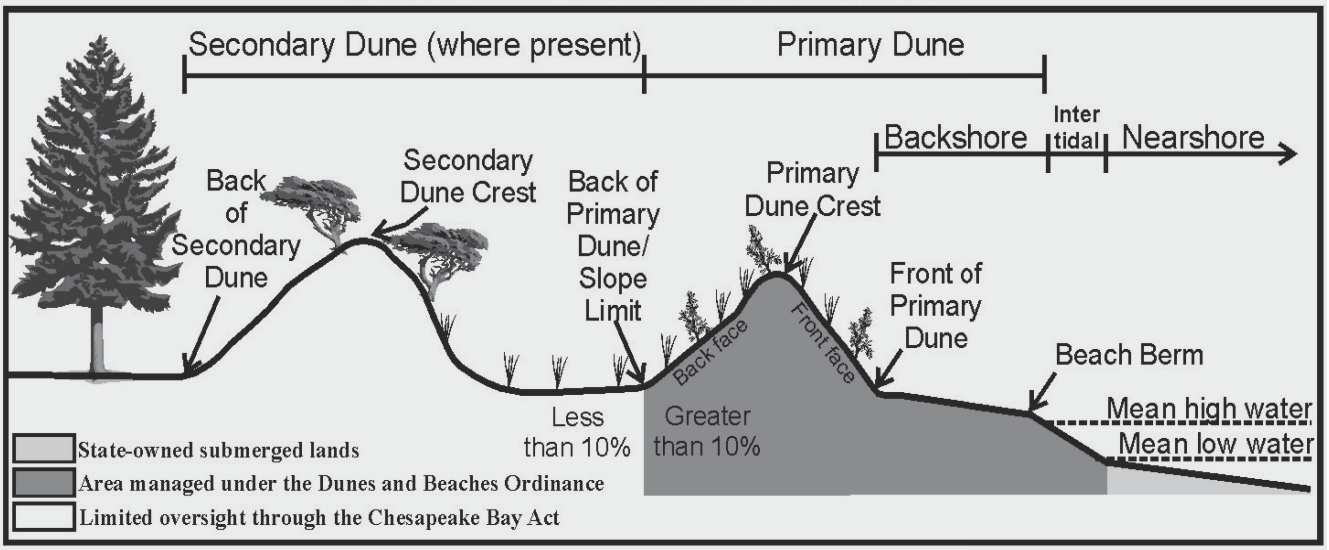
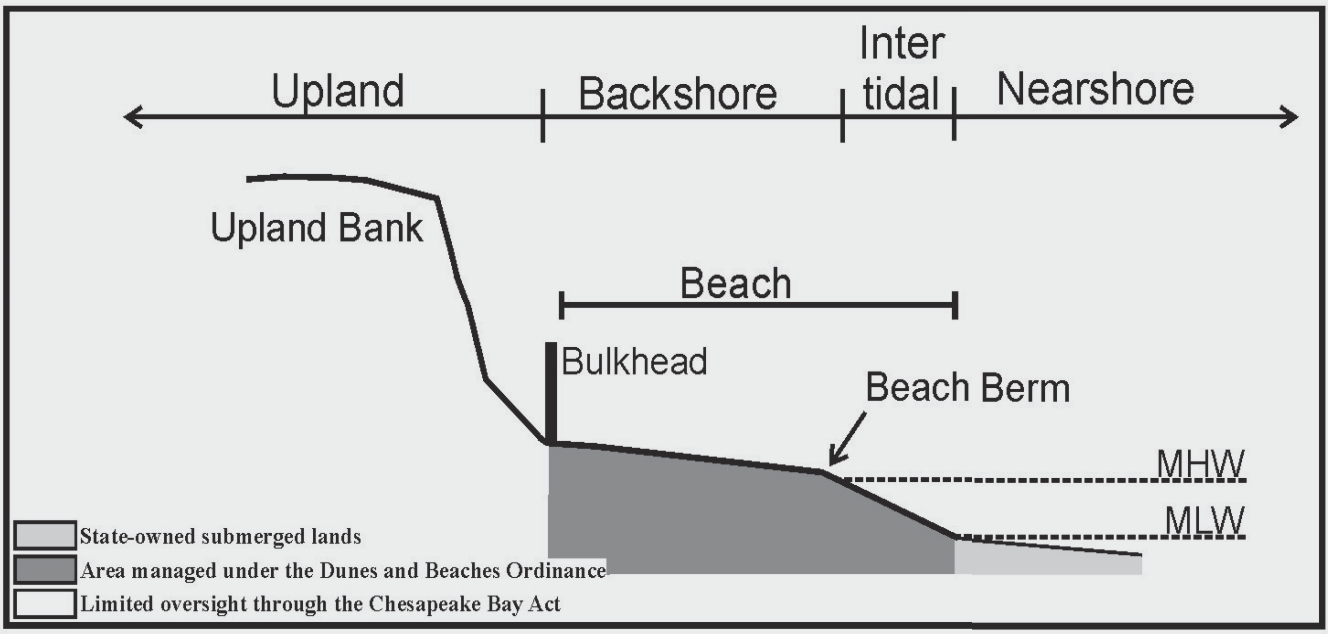
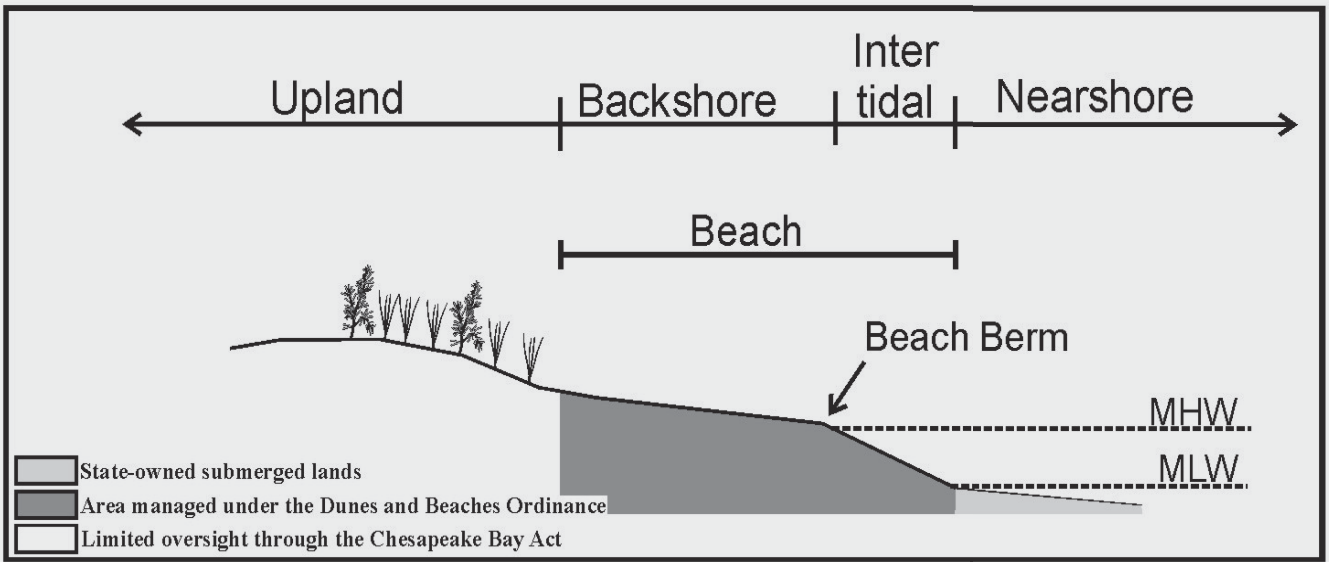
Dune and Beach Boundaries







ATTACHMENT 2: PROPERTY OWNER INFORMATION

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

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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 two NWI wetlands are mapped in the Project study area (Figure 3). Two delineated wetlands, W5 and W15, are correlated with NWI wetlands shown in Figures 2-A and 2-C, respectively.

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

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FIGURES

Figure 1.
Project Location Map
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

Figure 2-Index
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

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

N

0 250 500 1,000 Feet

0 0.05 0.1 0.2 Miles

TETRA TECH

Figure 2B
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

Figure 2C
NWI Wetlands and
NHD Waterbodies and Streams
Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

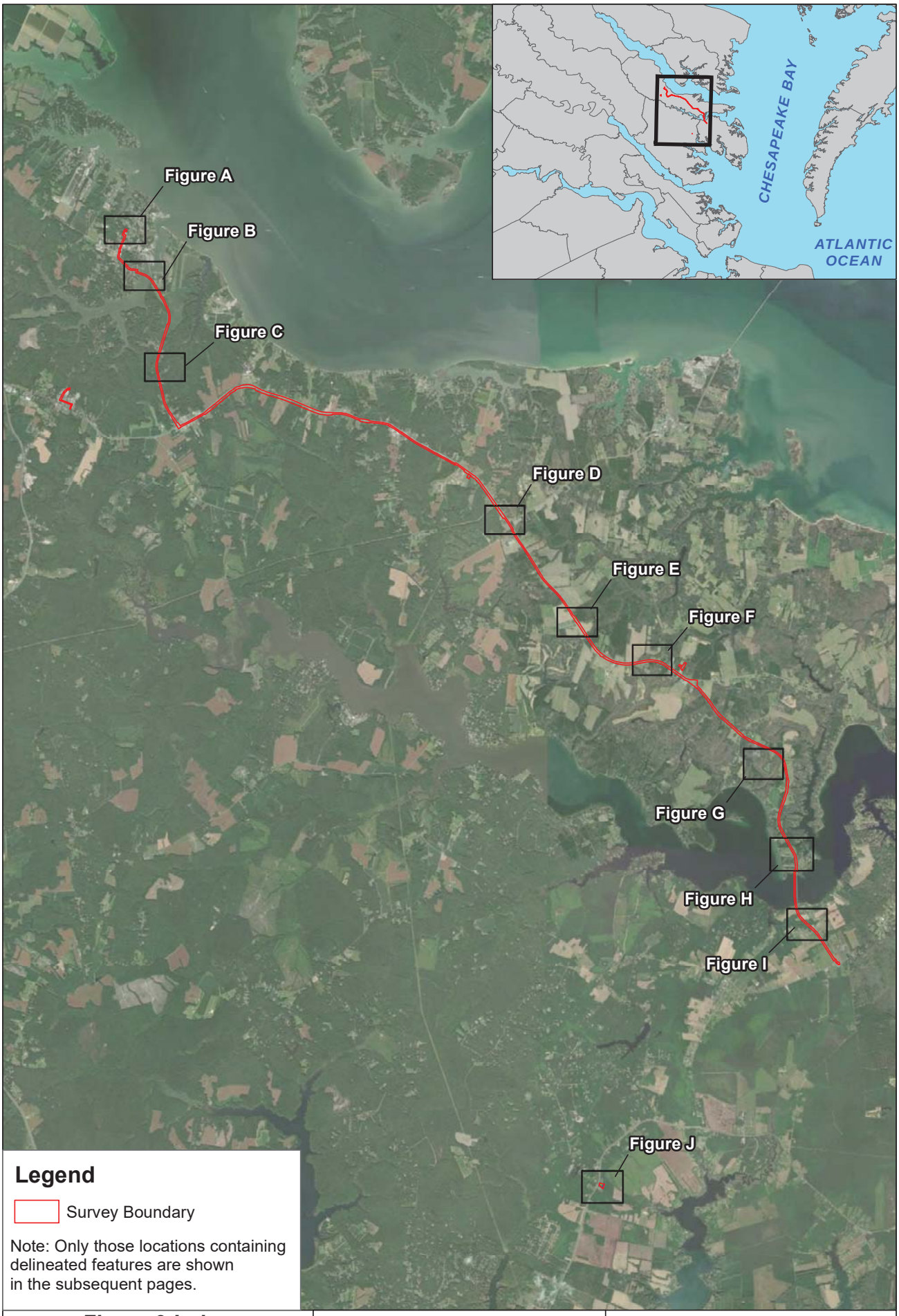


Figure 3-Index
Map of Aquatic Resources Figure Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

Figure 3A
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

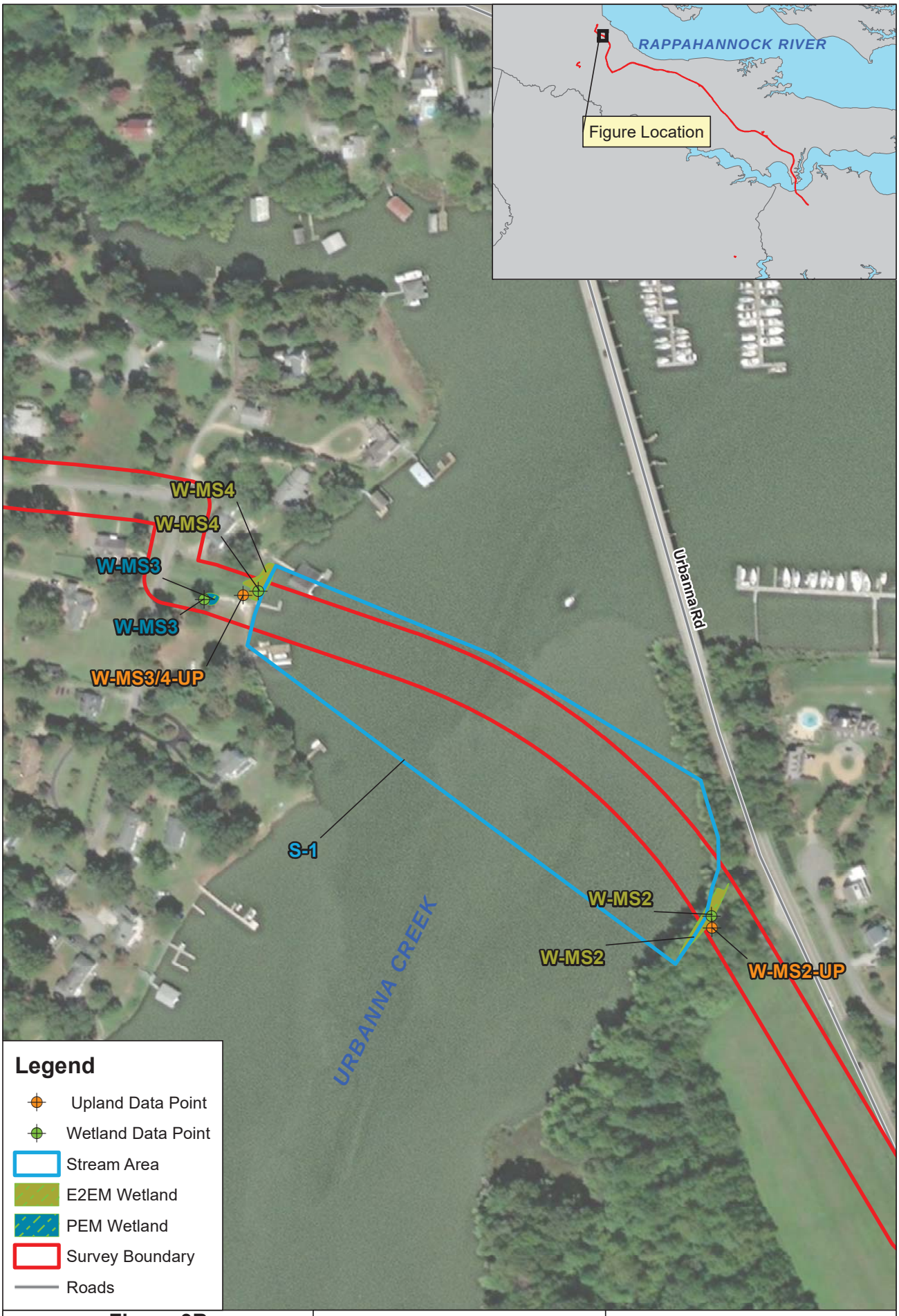


Figure 3B
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

Figure 3C
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

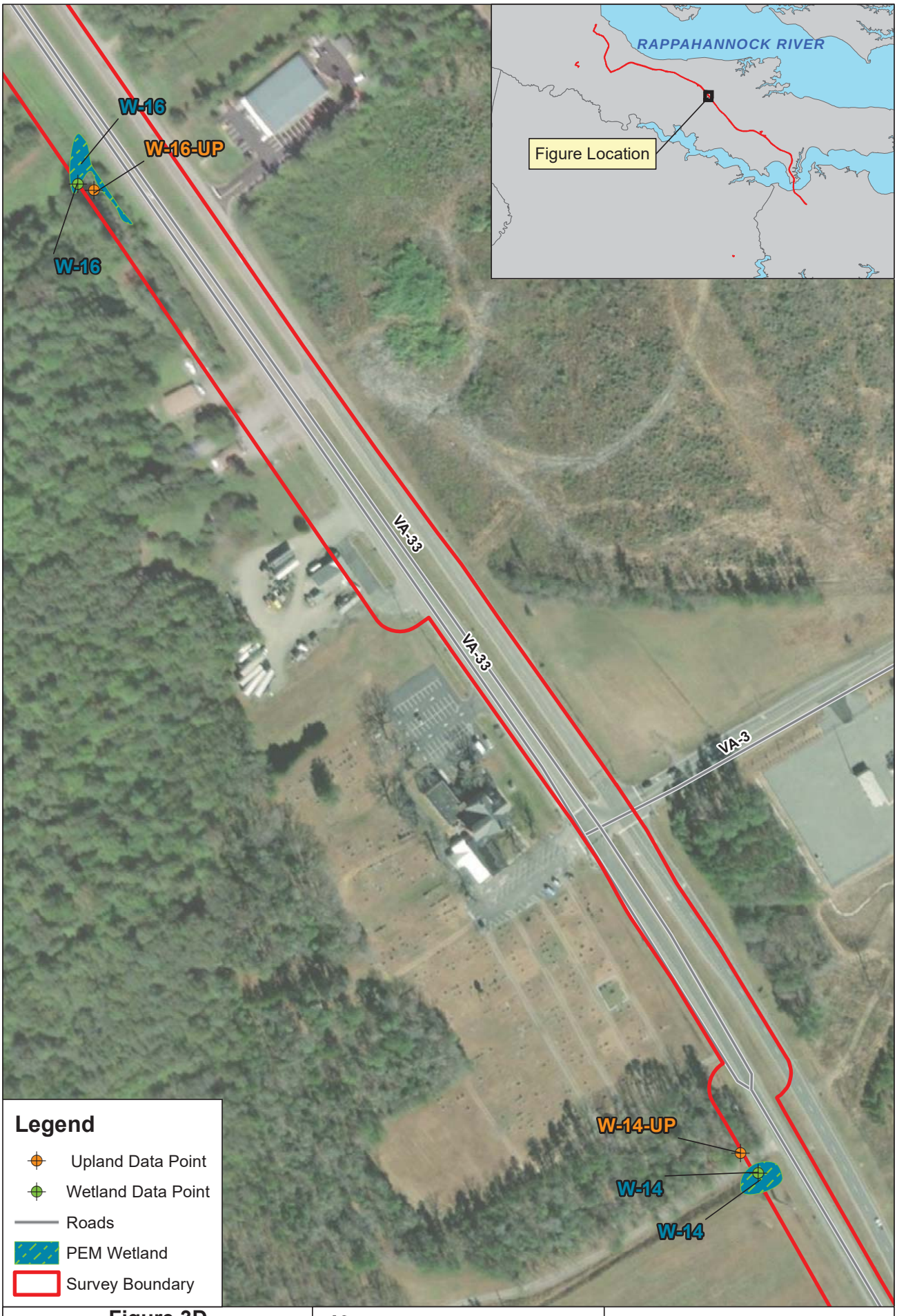


Figure 3D
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

N

0 75 150 300 Feet

0 0.015 0.03 0.06 Miles

TETRA TECH

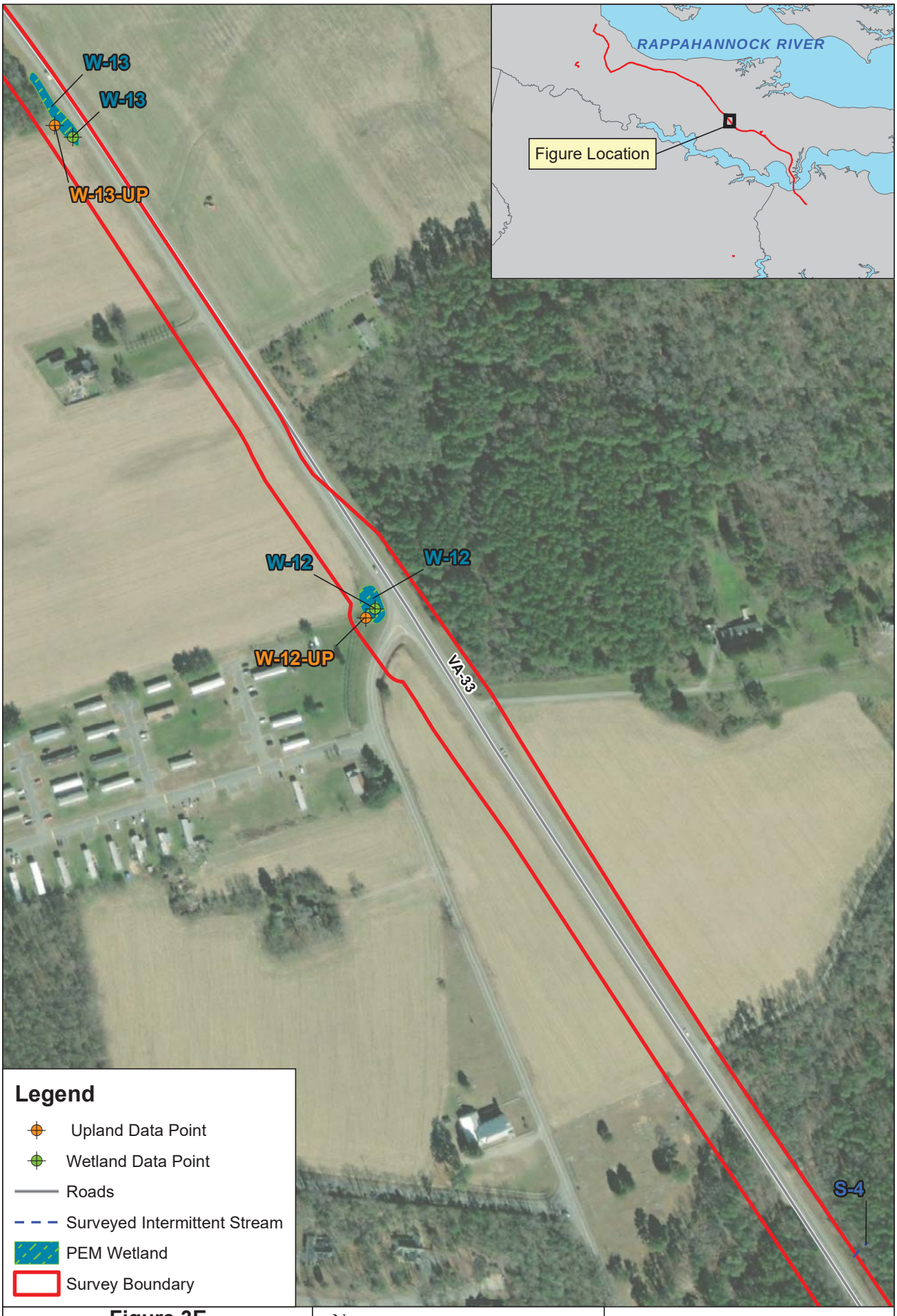


Figure 3E
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

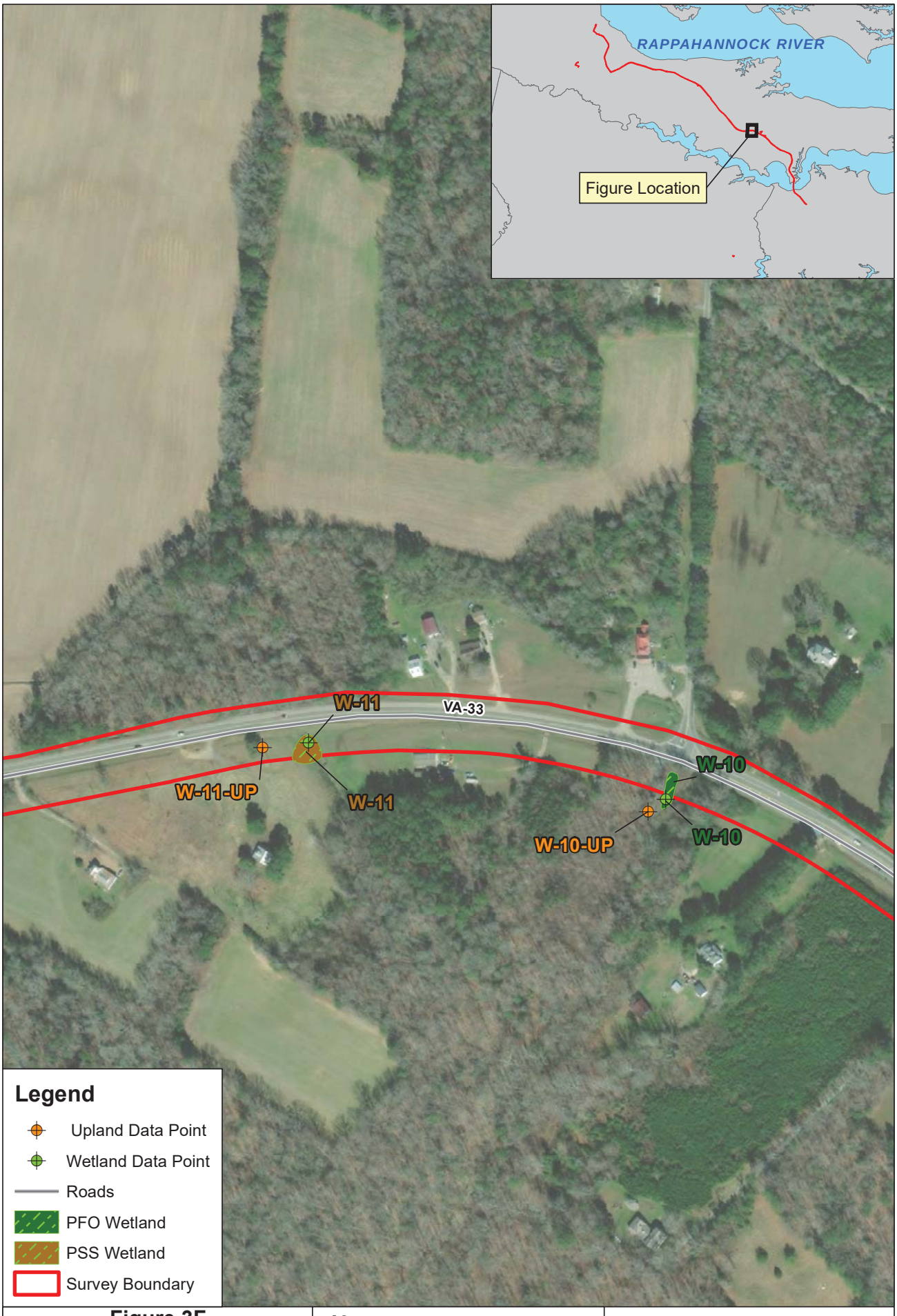


Figure 3F
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

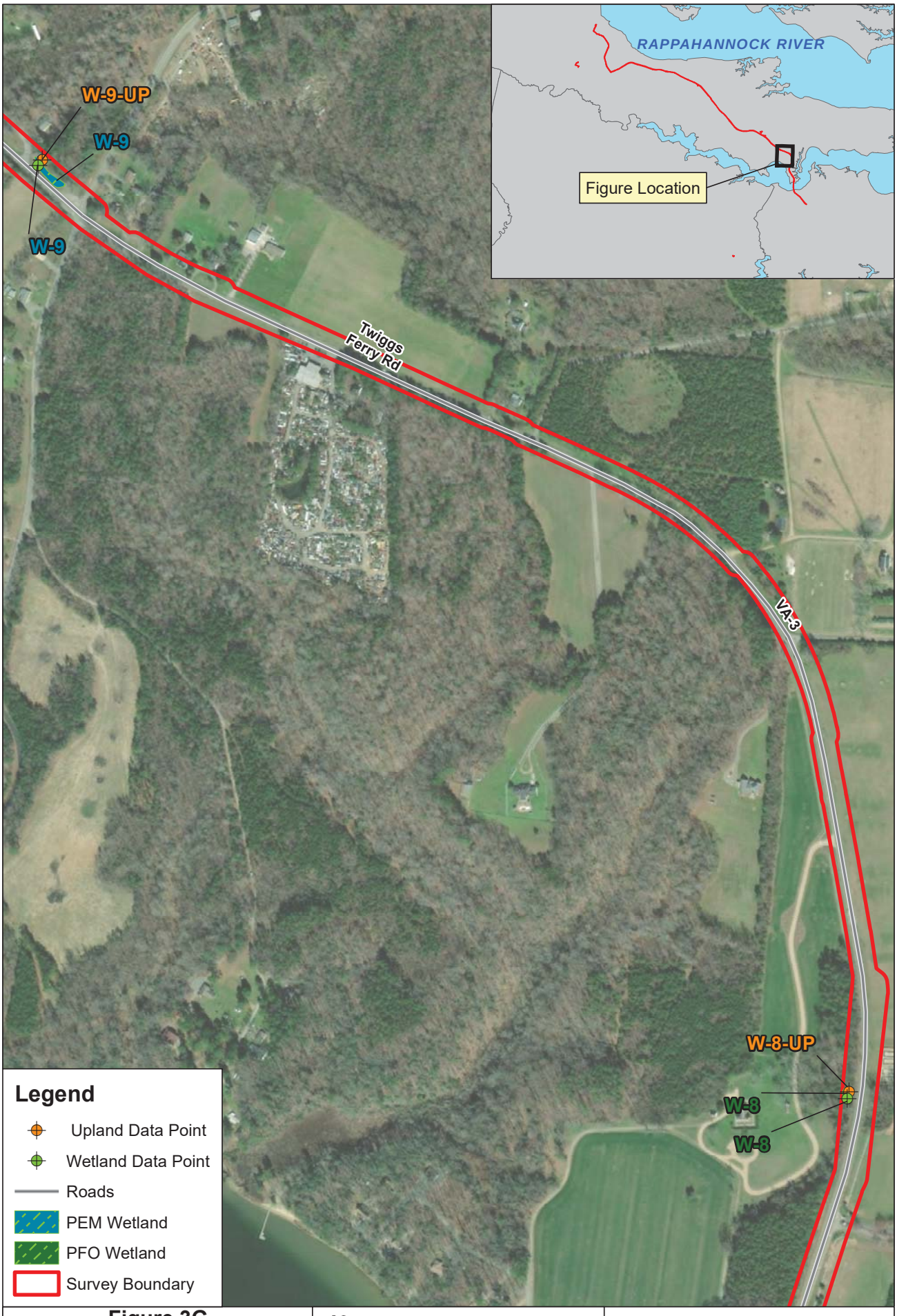


Figure 3G
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

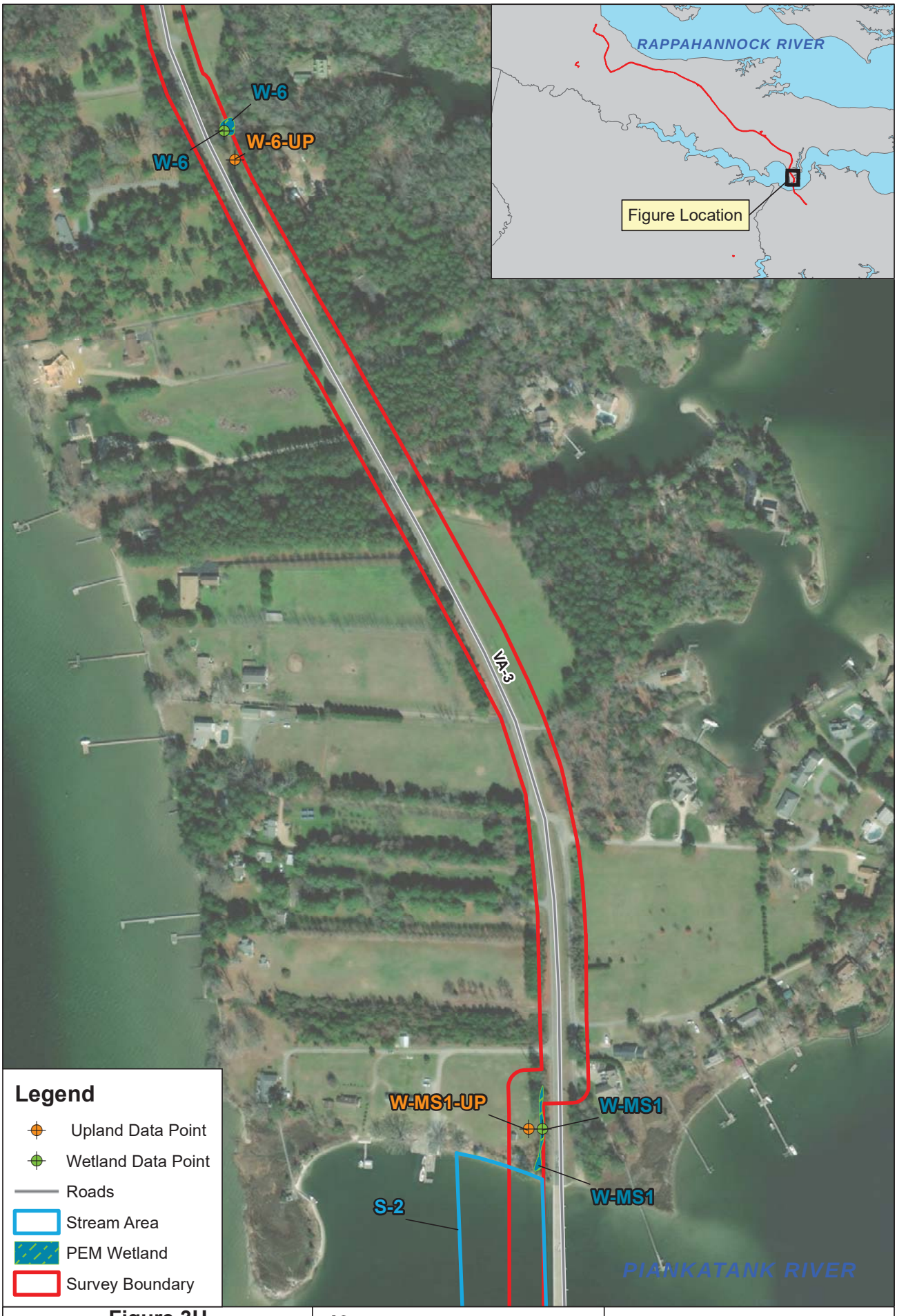


Figure 3H
Aquatic Resources Locations

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

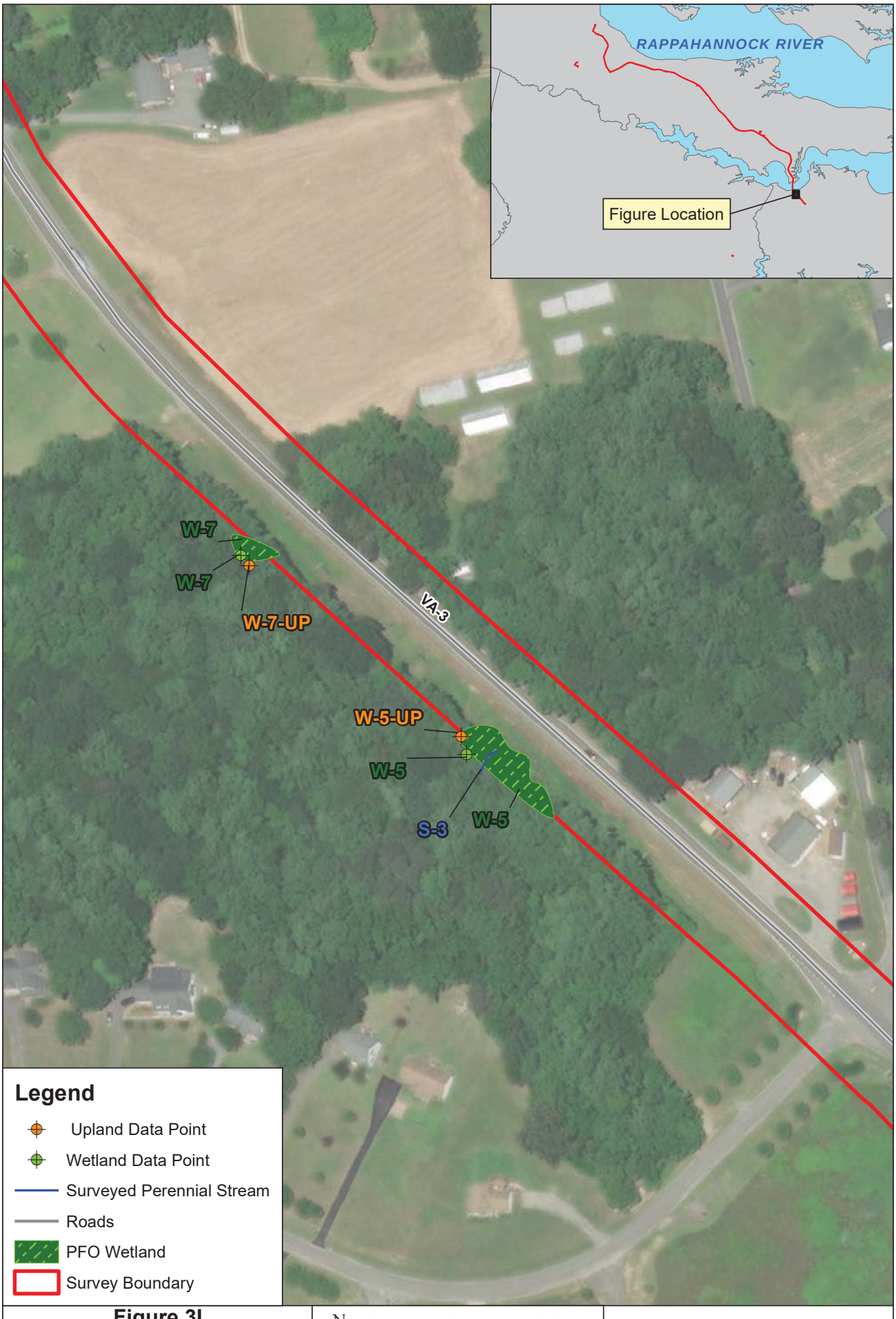


Figure 3I
Aquatic Resources Locations

Map produced by M. Solano, 10-5-2021
NAD 1983 HARN StatePlane Virginia South

TETRA TECH

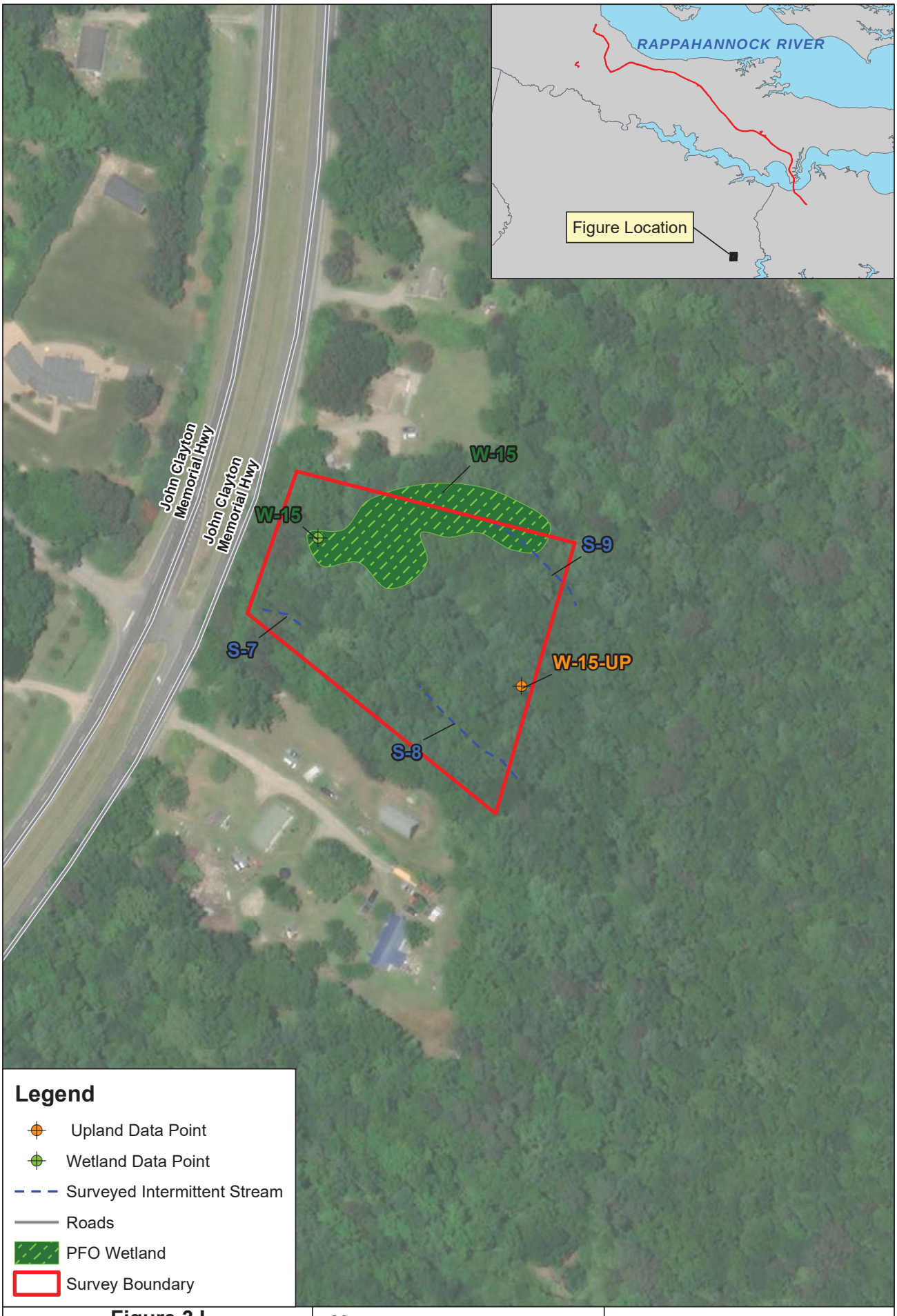


Figure 3J
Aquatic Resources Locations

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

Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5"-10")	5
Gravel	2-64 mm (0.1"-2.5")	
Sand	0.06-2mm (gritty)	90
Silt	0.004-0.06 mm	5
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:

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:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

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

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)	
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

Photograph Page

Stream ID S 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

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")	5
Sand	0.06-2mm (gritty)	75
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	20

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:

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
___ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

Photograph Page

Stream ID S 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

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")	10
Sand	0.06-2mm (gritty)	70
Silt	0.004-0.06 mm	20
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:

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 9/ 3/2 21

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

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)	5
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

Moderate presence of macroinvertebrates (dragonfly nymph).

Stream goes under the surface (upstream) between S7 and S8.

Photograph Page

Stream ID S Date 9/ 3/2 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 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:

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

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 9/ 3/2 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 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

Floodplain Width
___ Wide > 30ft ___ Moderate 15-30ft
✓ Narrow <15ft

Canopy Cover
___ Open ___ Partly shaded
✓ Shaded

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 S1 Date 9/ 3/2 21

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:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size:)			
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:)			
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:)			
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 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.			
	100 = 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: 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 (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
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)

- ☑ 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 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 Features %	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)
- ☒ 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 Features %	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:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

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

Herb Stratum (Plot size: 30)			
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.			
	100 = 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: 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)			
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)			
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:)			
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 Features %	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)
- 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): 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 (inches)	Matrix Color (moist)	%	Redox Features 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.			
	90	= Total Cover	
50% of total cover: 45	20% of total cover: 18		

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.			
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: 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)	%	Redox Features Color (moist)	%	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:

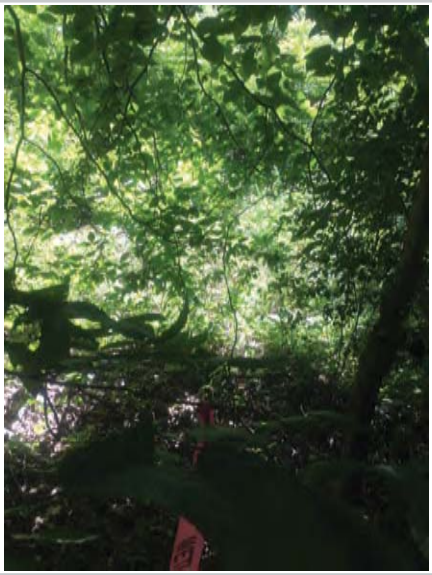
Photograph Log

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 _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	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)			
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)			
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	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)			
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)	%	Redox Features Color (moist)	%	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	**Is the Sampled Area within a Wetland?** Yes _____ No x
Hydric Soil Present?	Yes _____	No x	
Wetland Hydrology Present?	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.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Sapling Stratum (Plot size: 30 ft)			
1. Quercus alba, Northern White Oak	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.			
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	30	Yes	FAC
2. Campsis radicans, Trumpet-Creeper	5	No	FAC
3. Parthenocissus quinquefolia, Virginia-Creeper	5	No	FACU
4.			
5.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 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)	%	Redox Features Color (moist)	%	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: _____

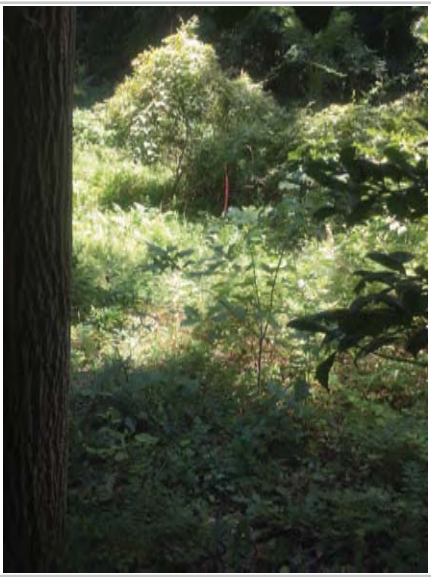
Feature Name:

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.			
	65	= Total Cover	
50% of total cover: 32.5	20% of total cover: 13		
Sapling Stratum (Plot size: 30 ft)			
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.			
	25	= Total Cover	
50% of total cover: 12.5	20% of total cover: 5		
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. Saururus cernuus, Lizard's-Tail	15	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45	= Total Cover	
50% of total cover: 22.5	20% of total cover: 9		
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: 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)	%	Redox Features Color (moist)	%	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.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
Sapling Stratum (Plot size: 30 ft)			
1. Ilex opaca, American Holly	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.			
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: 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)	%	Redox Features Color (moist)	%	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)
- ___ 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)
- 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)			
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. 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)			
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)	%	Redox Features Color (moist)	%	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)
- ___ 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): 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)			
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. 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.			
	75 = Total Cover		
50% of total cover: 37.5	20% of total cover: 15		
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	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)	%	Redox Features Color (moist)	%	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)			
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)			
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. 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)	%	Redox Features Color (moist)	%	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)			
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)			
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. 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)			
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)	%	Redox Features Color (moist)	%	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 _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	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)	%	Redox Features Color (moist)	%	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.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
Sapling Stratum (Plot size: 30 ft)			
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.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		
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. 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.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size: 30 ft)			
1. Campsis radicans, Trumpet-Creeper	20	Yes	FAC
2. Vitis aestivalis, Summer Grape	5	Yes	FACU
3.			
4.			
5.			
	25 = Total Cover		
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)	%	Redox Features Color (moist)	%	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	**Is the Sampled Area within a Wetland?** Yes ____ No x
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	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 (inches)	Matrix Color (moist)	%	Redox Features 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 _____	**Is the Sampled Area within a Wetland?** Yes x No _____
Hydric Soil Present?	Yes x No _____	
Wetland Hydrology Present?	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)			
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. 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)			
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)	%	Redox Features Color (moist)	%	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)
- ___ 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: W12-UP

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
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)			
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. 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)			
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)	%	Redox Features Color (moist)	%	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.			
	0 = Total Cover		
50% of total cover: 0	20% of total cover: 0		
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. Murdannia keisak, Wart-Removing-Herb	30	✓	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: 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)	%	Redox Features Color (moist)	%	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)	%	Redox Features Color (moist)	%	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

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
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)			
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. 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)			
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)	%	Redox Features Color (moist)	%	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)	%	Redox Features Color (moist)	%	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)
- ___ 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: **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)	%	Redox Features Color (moist)	%	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 1538 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:)			
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:)			
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:)			
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.

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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.

Custom Soil Resource Report
Soil Map

Map Scale: 1:116,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 1500 3000 6000 9000

Feet
0 5000 10000 20000 30000

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.

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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

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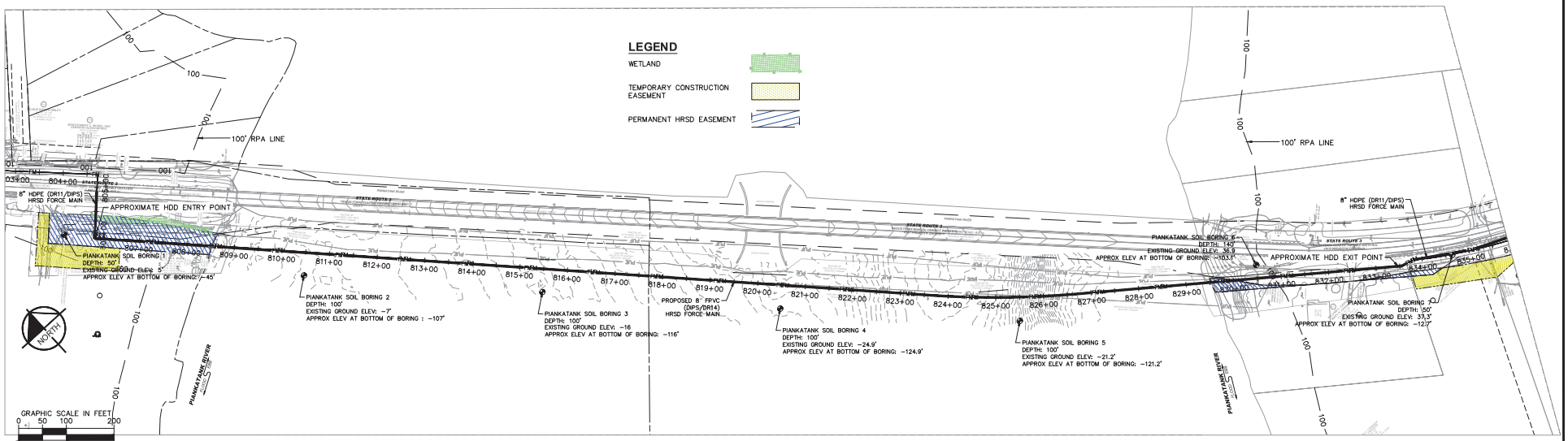
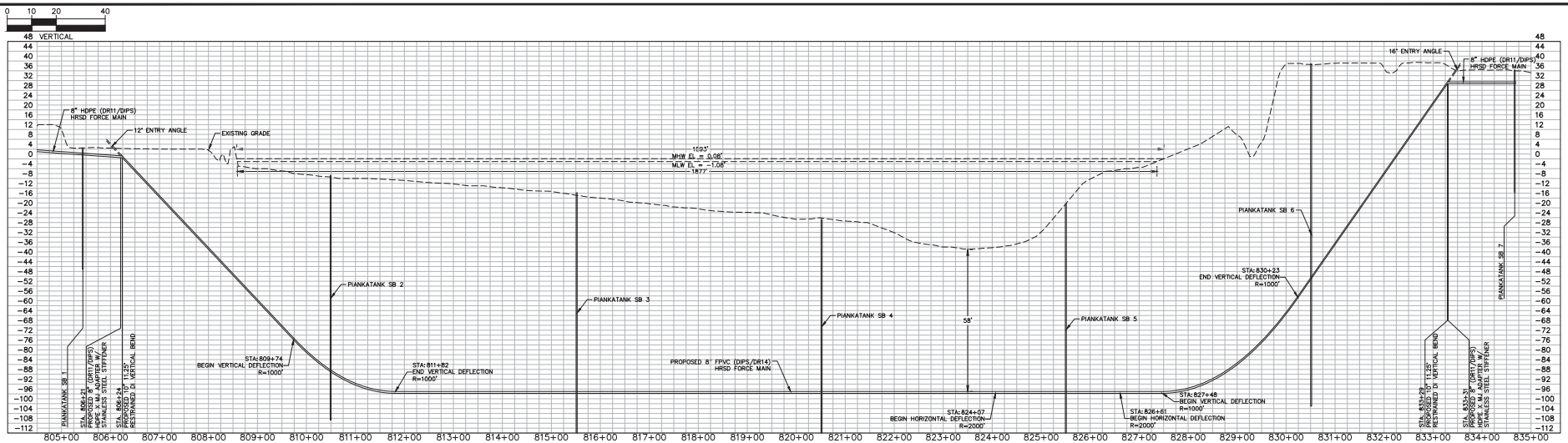
United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 4: PIANKATANK RIVER HDD CROSSING PROJECT DRAWINGS





PERMIT DRAWING ONLY

NOT FOR CONSTRUCTION

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

Kimley»Horn
© 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

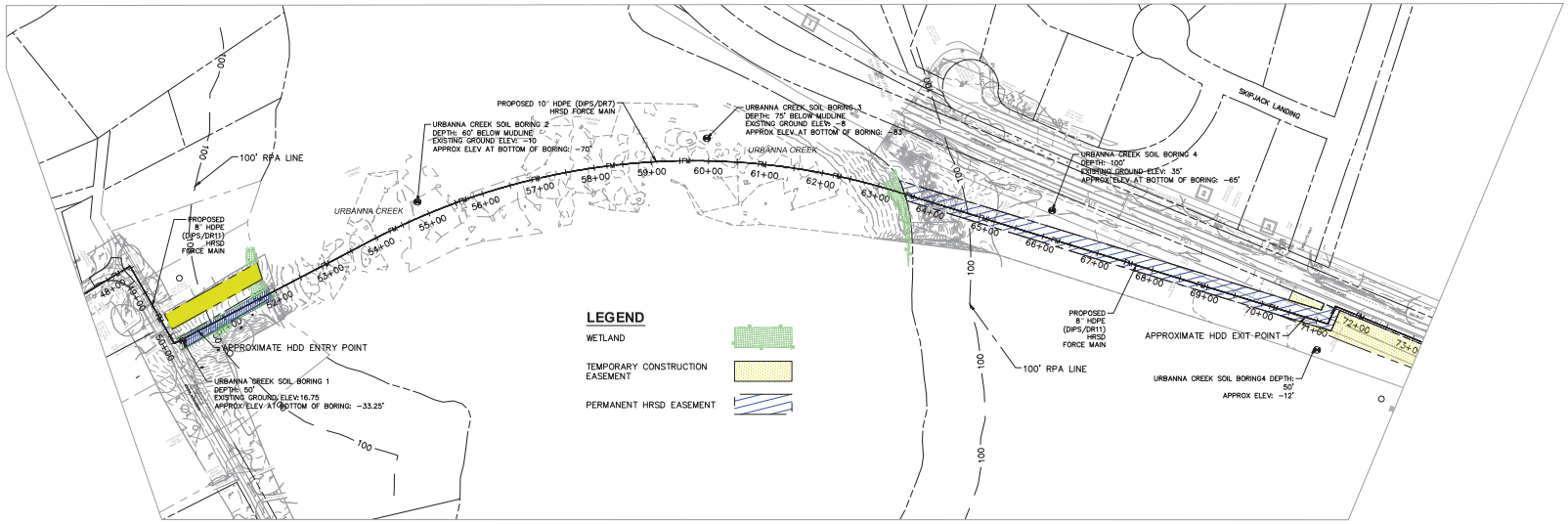
PROPOSED SEWER FORCE MAIN
PIANKATANK RIVER HDD CROSSING

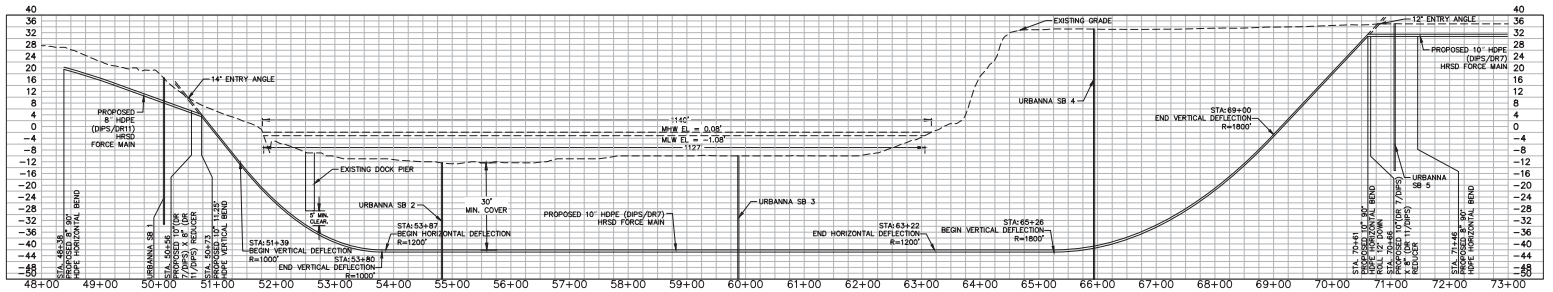
HAMPTON ROADS SANITATION DISTRICT

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





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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

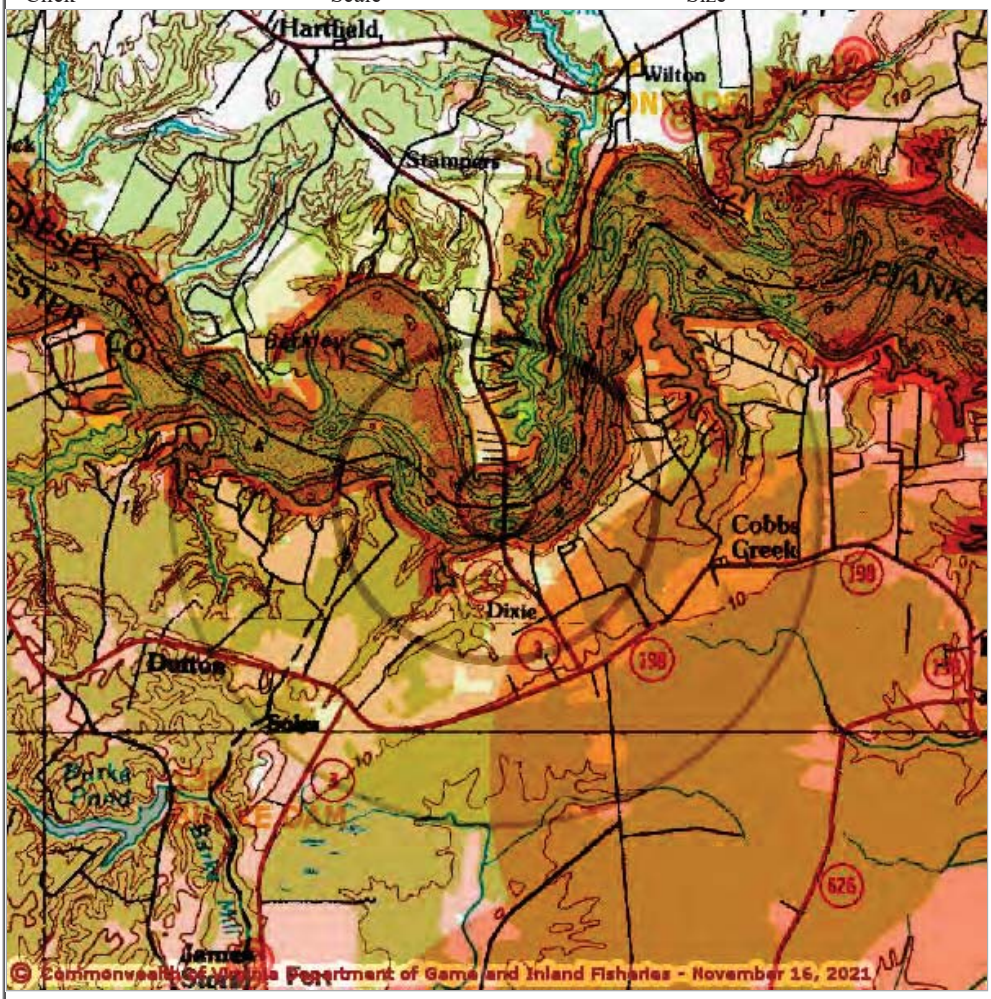
Base Map Choices
Topography

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

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

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

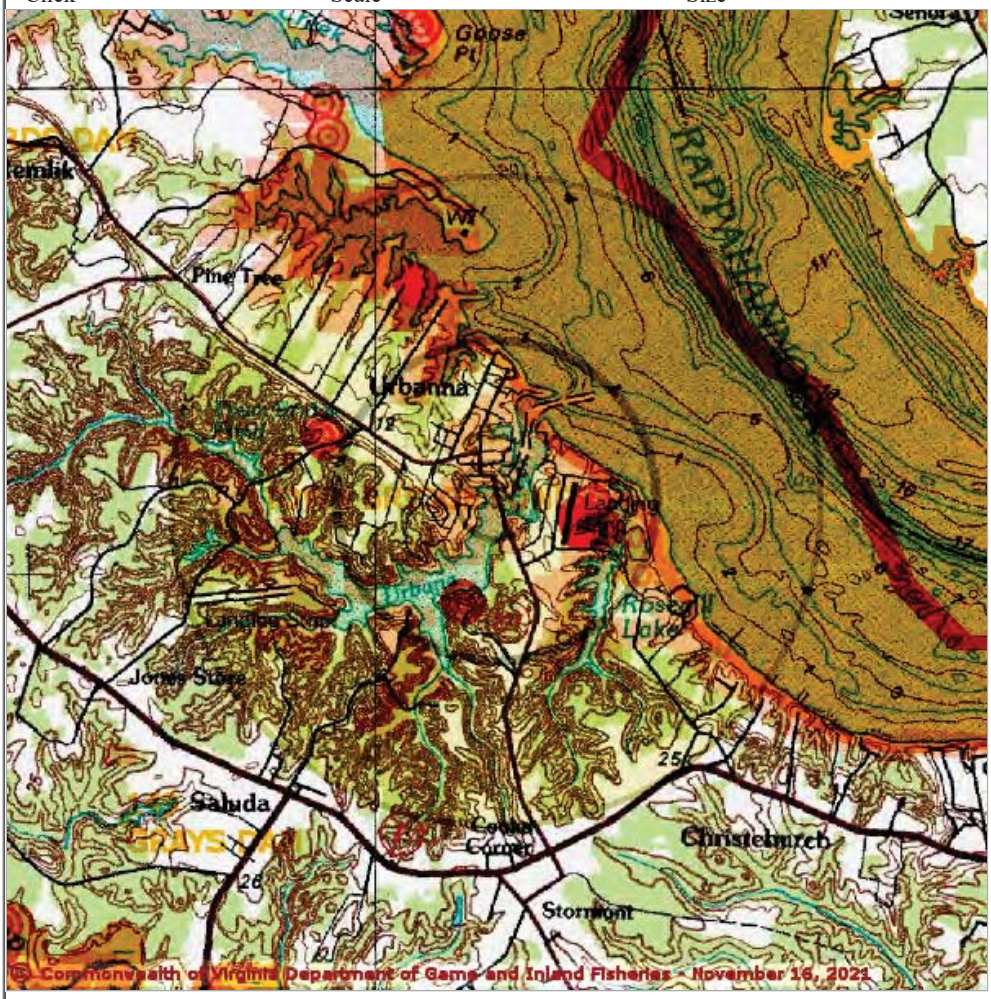
Base Map Choices
Topography

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

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

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.

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: 11/16/2021

- 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.

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Ann F. Jennings
Secretary of Natural and Historic Resources

Steven G. Bowman
Commissioner

October 19, 2021

Tetra Tech, Inc.
Attn: Deborah Painter
5700 Lake Wright Drive Suite 102
Norfolk, Virginia 23502

Re: HRSD Middlesex Interceptor System Program Phase II

Dear Ms. Painter,

This will respond to the request for comments regarding the Middlesex Interceptor System Program Phase II in Middlesex, Virginia. Specifically, HRSD has proposed to construct a sewage conveyance system to serve Middlesex and Mathews Counties. We reviewed the provided documents and found that the proposed project is within the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and will require a permit from this agency.

Please be advised that the VMRC pursuant to §28.2-1200 et seq of the Code of Virginia administers permits required for submerged lands, tidal wetlands, and beach and dunes. Any jurisdictional impacts will be reviewed by the VMRC during the Joint Permit Application process. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

Please contact me at (757) 247-8032 or by email at jay.woodward@mrc.virginia.gov if you have any questions. Thank you for the opportunity to comment.

Sincerely,

Jay Woodward
Environmental Engineer, Habitat Management

JW/cg
HM

From: Allison Hammer
Sent: Thursday, October 28, 2021 3:20 PM
To: Painter, Debbie
Subject: RE: Farmland Conversion Impact Rating coordination for a National Environmental Policy Act document coordination request

Hello Ms. Painter,

Is this project being conducted with a federal agency? If no federal agencies are providing assistance, then a farmland conversion impact rating does not need to be completed.
If a federal agency is providing assistance, then the agency listed on the form should be that federal agency. Also, the numerical values in Part III cannot be zero and I need either a shapefile which outlines the impacted acres or a farmland classification map for the impacted acres which can be generated in Web Soil Survey. Please see the website linked below for more information on what I will need in order to complete this request and feel free to reach out to me with questions. Thank you!
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/va/technical/landuse/?cid=nrcseprd1639414

Regards,
Allison Hammer
Area Resource Soil Scientist | 310 Shea Dr. | Chesapeake, VA 23322 | M: 757-477-0520 |
allison.hammer@usda.gov

USDA United States Department of Agriculture
Natural Resources Conservation Service
USDA is an equal opportunity provider, employer, and lender.

From: Combs, Michael - NRCS, Quinton, VA <michael.combs@usda.gov>
Sent: Thursday, October 28, 2021 2:17 PM
To: Allison Hammer <Allison.Hammer@usda.gov>
Cc: Painter, Debbie <Debbie.Painter@tetratech.com>
Subject: FW: Farmland Conversion Impact Rating coordination for a National Environmental Policy Act document coordination request

Hello Allison,

I received a prime farmland packet to complete.

Thanks

Mike

From: Painter, Debbie <Debbie.Painter@tetratech.com>
Sent: Wednesday, October 27, 2021 10:45 AM
To: Combs, Michael - NRCS, Quinton, VA <michael.combs@usda.gov>

Subject: Farmland Conversion Impact Rating coordination for a National Environmental Policy Act document coordination request

Dear Mr. Combs,

Please see the attached letter requesting completion of the Farmland Conversion Impact Rating NRCS CPA-106, enclosed.

Sincerely,

Deborah Painter | Senior Environmental Scientist | Tetra Tech
Direct **+1 (757) 478-3574** | Business **+1 (757) 278-6664** | Debbie.Painter@tetratech.com

COMMONWEALTH of VIRGINIA

Ann Jennings
Secretary of Natural and Historic Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

October 21, 2021

Deborah Painter
Tetratech
1436 Aspen Ct.
Suffolk, VA 23434

Re: HRSD Middlesex Interceptor System Program Phase II - Urbanna to Mathews Transmission Force Main
Mathews and Middlesex, Counties
DHR File No. 2020-5020

Dear Ms. Painter,

We have received your request for comments on the project referenced above. The project, as described in the submission, consists of the construction of a 3.2-mile force main from and a 13-mile force main to the existing Mathews Transmission Force Main in Mathews County. In accordance with the provisions of the Virginia Clean Water Revolving Loan Fund (VCWRLF), administered by the Virginia Department of Environmental Quality (DEQ), a National Environmental Policy Act (NEPA) Environmental Assessment is being prepared (EA). Our comments are provided as assistance to DEQ.

A review of our inventory files indicates that there are cultural resources located within the area of potential effects (APE). There is also potential that unrecorded resources may be located within the APE. Consistent with our previous letter (dated February 3, 2021), we recommend that a Phase I cultural resources survey be conducted within the APE to identify historic properties that may be affected by this undertaking. The survey must be conducted by qualified professionals in accordance the *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44716-42) and DHR's *Guidelines for Conducting Historic Resources Survey in Virginia* (2017).

The proposed undertaking has the potential to directly and indirectly affect historic architectural properties listed in or eligible for listing in the NRHP. There appear to be a number of previously surveyed architectural properties fifty years old or older within the APE of the planned transmission forced main line corridor. Most of these recorded architectural properties have not yet been evaluated for their eligibility in the NRHP. The project proponent should evaluate and make recommendations to DHR on the NRHP eligibility of those previously documented properties.

Additionally, it is our understanding that the project's scope includes demolishing the existing HRSD Central Middlesex Treatment Plant and HRSD Urbanna Treatment Plant. If these properties are fifty years old or older, they will need to be surveyed and evaluated for NRHP-eligibility in consultation with DHR.

Of particular interest to DHR are Rosegill (DHR ID# 059-0009) and Wilton (DHR ID# 059-0010), both of which are listed in the NRHP. We recommend avoiding encroaching on these properties and their NRHP boundaries.

If you have any questions at this time, please do not hesitate to contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,

Jenny Bellville-Marrion, Project Review Archaeologist
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Phase I Archaeological Investigation

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main

July 2022
DHR File No. 2020-5020

Prepared for

HRSD

1434 Air Rail Avenue
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Acronyms and Abbreviations

APE	Area of Potential Effect
GIS	Geographic Information System
GPS	Global Positioning System
HRSD	Hampton Roads Sanitation District
NRHP	National Register of Historic Places
PS	Pump Station
ST	Shovel Test
SU	Survey Unit
VCRIS	Virginia Cultural Resources Information System
VDHR	Virginia Department of Historic Resources

1.0 INTRODUCTION

Tetra Tech, Inc (Tetra Tech) was contracted by Kimley Horn and Hampton Roads Sanitation District (HRSD) to undertake a Phase I archaeological investigation for the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (Project) (Figure 1). The Project includes the design and construction of a sewage conveyance system to serve Middlesex County, Virginia. 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 new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plan and enable decommissioning of both the HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and equalization tanks. New pump stations are proposed at the two existing treatment plants that will be decommissioned in addition to three new booster pump stations along the proposed force main alignment and installation of a new "booster" pump situation along HRSD's existing Mathew's interceptor force main.

In a letter dated February 3, 2021, the Virginia Department of Historic Resources (VDHR) recommended that in order to identify historic properties that may be affected by this undertaking, a Phase I cultural resources survey should be conducted within the area of potential effects (APE). The Phase I archaeological investigation that was undertaken included background research and an archaeological field survey. A desktop review of the VCRIS archaeological site files for the Project and surrounding one mile area was conducted to assemble a list of known archaeological, historic, and cultural properties that might be affected by the proposed transmission force main and pump stations and reviewed the extent of prior surveys performed in the APE. The results of the desktop assessment informed the strategy for the Phase I field survey. Tetra Tech sent VDHR a letter dated March 17, 2022, to begin discussions on the survey strategies for the Project. On March 22, 2022, Tetra Tech had a virtual meeting with Roger Kirchen and Marc Holma from VDHR to discuss the Project, APEs for archaeology and historic architecture, and to discuss Tetra Tech's approach to the surveys. VDHR approved of Tetra Tech's approach to survey. The Phase I field survey was initiated on June 15, 2022 and was completed on June 28, 2022. A historic architecture survey was also performed and will be discussed in a separate report.

Supervisory personnel for this survey exceeded the professional qualifications listed in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Fed. Reg. 44716) for principal investigators in archaeology. Key personnel have previous experience in archaeology of Virginia. Adam Maskevich, Ph.D., RPA serves as the principal investigator for the Project. Fieldwork was conducted by Dr. Maskevich, Rachael Smith, Nathan Matthews, and Ryan Donnelly. This report was prepared by Gail Ostapczuk, M.A., RPA, and the Project was supervised by Dr. Sydne Marshall, Ph.D., RPA.

1.1 Area of Potential Effect (APE)

The APE for the Project was designed to include all portions of the Project where terrestrial archaeological resources may be subject to direct effects from construction, operations and maintenance, and decommissioning of the Project. The APE includes multiple locations along the Force Main (12.22 acres) where boring will occur as well as all newly proposed Pump Stations (PS), which

includes Urbanna PS, Locust Hill PS, Hartsfield PS, and Gloucester PS. The APE along the Force Main is located along Urbanna Road to Cooks Corner and Route 33 and primarily within the road ROW shoulder, with some locations extending onto private parcels.

1.2 Survey Methods

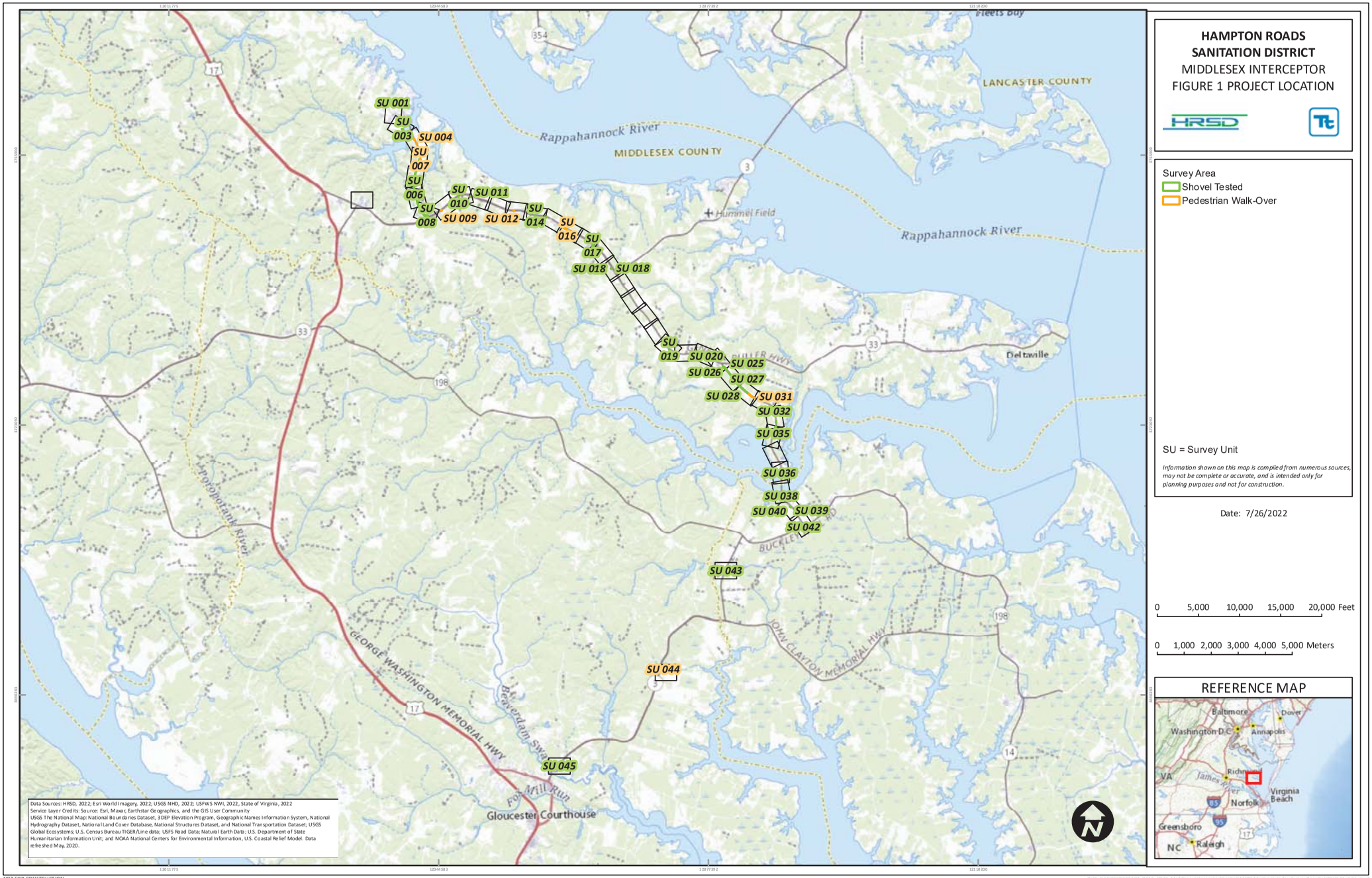
A Phase I archaeological survey was conducted between June 15, 2022 and June 28, 2022 on the portions of the project area that are previously undisturbed adjacent to the Force Main right-of-way (ROW) of Route 227, Route 33, and Route 3, as well as the areas of proposed pump stations Urbanna, Locust Hill, Hartsfield, and Gloucester. Survey was not conducted in areas where the Force Main ROW is within a paved road or within extant pump stations Central Middlesex and Beaver Dam. Results of the archaeological survey can be seen in the attached mapbook (Appendix D).

The APE was divided into 45 discrete Survey Units (SU). Testing consisted of gridded shovel tests, and, where surface visibility permitted, a close-interval pedestrian survey to identify and recover archaeological resources. In accordance with VDHR guidelines, shovel tests (ST) were arrayed at intervals of 50 feet (15 meters). The STs were hand-excavated and typically measured approximately 30 to 40 centimeters in diameter at the surface. They were excavated to a depth below which archaeological deposits were not likely to occur or until an impasse was reached below which hand excavation was not possible. Soil was screened through 0.25-inch mesh sieves to facilitate systematic artifact recovery. Each ST was assigned a unique, project-specific identifier and the results of each ST, including its stratigraphy or soil horizons, were recorded on a digital tablet, using standard terminology, such as USDA soil texture categories and Munsell color codes.

When the APE coincided with agricultural field where plowing and disking produced ground visibility of at least 75 percent, a pedestrian survey was performed in lieu of shovel testing. The pedestrian survey was undertaken at 15-foot (5-meter) intervals between transects across appropriate portions of the direct effects APE. Archaeological artifacts were collected and logged within discrete SUs established at the time of the pedestrian survey. Artifacts collected during the pedestrian survey were returned to Tetra Tech's archaeological lab for cleaning, identification, and inventory.

In SUs where shovel testing was being conducted, if a portion of the APE could not be tested due to impediments such as slope, waterlogged soils, or standing water, that portion of the APE between STs was pedestrian reconnoitered to ascertain if there was any cultural material visible on the surface.

The location of the STs, pedestrian survey transects, and any other cultural features relevant to this survey were recorded using an Eos Arrow 100 handheld Global Positioning System (GPS) combined with an Apple iPad. These units generally provide sub-meter accuracy. Data from the STs, including artifacts, stratigraphy, and soil texture and color, were recorded digitally using the Apple iPad.



HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
FIGURE 1 PROJECT LOCATION

Survey Area
Shovel Tested
Pedestrian Walk-Over

SU = Survey Unit

Information shown on this map is compiled from numerous sources, may not be complete or accurate, and is intended only for planning purposes and not for construction.

Date: 7/26/2022

0 5,000 10,000 15,000 20,000 Feet

0 1,000 2,000 3,000 4,000 5,000 Meters

REFERENCE MAP

NOT FOR CONSTRUCTION

2.0 ENVIRONMENTAL SETTING, CULTURAL CONTEXTS, AND PREVIOUS SURVEYS

The following sections provide a brief overview of the environmental setting, pre-contact context, post-contact context, Project area history, and previous archaeological investigations relative to the Project Area.

2.1 Environmental Setting

2.1.1 Physiography and Geology

The Project is located within the Dissected Upland and Upland hydrogeomorphic regions of the Coastal Plain physiographic region on the Virginia Middle Peninsula. The Project area lies within the Outer Coastal Plain which is nearly entirely flat landscape not exceeding 18 meters (60 feet) in elevation made up of ancient Pleistocene shorelines (VDCR DNH 2021). Located to the north of the Project is the Rappahannock River and located to the south of the Project is the Piankatank River.

The Coastal Plain is underlain by deeply buried igneous and metamorphic basement rocks dating to the Precambrian and Paleozoic eras. Beginning in the Late Cretaceous period, glacial advance and retreat led to the repeated inundation of the Coastal Plain resulting in sedimentation and subsidence, which lasted through the Miocene Epoch. Fluvial and estuarine activity beginning in the Pleistocene, and continuing throughout the Quaternary period, resulted in the deposition of clays, silts, sands, and gravels that characterize the soils of the Coastal Plain today. The topography of the eastern portion of the Coastal Plain is characterized by a series of low terraces rising approximately 5 to 15 ft (1.5 to 4.6 m) above the surrounding landscape. (Onuschak 1973; Teifke 1973; Dietrich 1990; Fichter and Baedke 1999; McFarland and Bruce 2006).

2.1.2 Soils

Ultisol soils, infertile, heavily leached mineral soils with a red or yellow-red clay horizon are present in the Coast Plain physiographic province. These are generally acidic soils containing calcium, potassium, magnesium, and iron oxides. Entisols, unconsolidated alluvial sand soils, histosols, poorly drained organic soils, and spodosols, leached organic and aluminum heavy soils, are present in scattered patched throughout the Coast Plain (VDCR DNH 2021). The mostly common soil type is the well-drained Emporia Loam with less than 6 percent slope (6A and 6B) at 10.5 percent. The next most common soil at 9.1 percent is Emporia-Nevarc complex with slopes between 6 percent and 45 percent (7D and 7F) which contains well-drained sandy clay loam. Slagle silt loam at less than 6 percent slope (19A and 19B) makes up 8.5 percent of the soil types and is a moderately well-drained soil. Suffolk fine sandy loam with less than a 6 percent is a well-drained soil comprising 8.5 percent of soil types. Kempsville sandy loam with less than 6 percent slope (9A and 9B) at 7.7 percent is also well-drained. The Suffolk-Remlik complex with slopes between 6 percent and 45 percent makes up 7.6 percent of soils and are made of well-drained sandy loams (USDA 2022).

2.1.3 Hydrology

The Project area lies within two drainage areas: The Lower Rappahannock and Great Wicomico-Pakatan (DCR 2022). These drain into the Rappahannock and Piankatank Rivers which then connect to the Chesapeake Bay. Several unnamed tributaries of the Rappahannock River cross the Project Area.

2.2 Pre-contact Context

2.2.1 Paleoindian Period (14,950 – 9950 B.P.)

The Paleoindian period in Virginia is characterized by small, likely kin-based, highly mobile bands engaged in generalized foraging (Gingerich 2011; Grayson and Meltzer 2003). Mobility and/or trade among Paleoindian groups is suggested by the distribution of high-quality lithic material, particularly cryptocrystalline chert, jasper, and chalcedony, far from their sources. The fluted points that characterize the early Paleoindian period were manufactured from both of these high-quality materials as well as more readily available, but coarser grained, materials such as quartz and quartzite (Boyd 1989; Gardner 1974, 1989; Goodyear 1979).

The discovery in the 1920s of a Clovis point in association with extinct paleofauna at the Blackwater Draw site in New Mexico led archaeologists to recognize the antiquity of this widely distributed point type. The Blackwater Draw find and others in the Great Plains provided direct evidence of big game hunting as a Paleoindian subsistence stratagem, and it was long assumed that eastern Clovis groups also practiced a specialized hunting adaptation to megafauna or herd animals, despite the absence of identified kill sites or large mammal faunal remains at eastern sites (Ritchie 1980:3). The belief that megafauna hunting was the focus of Clovis subsistence practices suggested that human predation and overkill was a causative agent of much of the genera extinction that occurred in North America at the close of the Pleistocene (Martin 1967). Both of these assumptions (specialized hunting adaptation and megafauna overkill) have been strongly challenged over the past few decades, and it is now generally conceded that Clovis and other Paleoindian groups resident in eastern North America relied on a broad range of subsistence resources, including fruiting seeds, fish, and small animals, as well as herd game (Dent 2007:127-129). Recent analysis suggests that megafauna had mostly vanished from the northeast by the time Paleoindians arrived (Boulanger and Lyman 2014).

Biface technology during the final thousand-year interval of the Paleoindian period displays basic continuity with earlier forms; large lanceolate points, parallel flaking, and preference for high quality stone. Late Paleoindian points differed from their predecessors by generally lacking the channel flute, and sometimes exhibiting basal tangs. Toolkits from northeastern late Paleoindian sites often do not include the formal endscrapers that characterized the Clovis and other fluted point assemblages. Expedient flake tools begin to appear among toolkits, leading some researchers to postulate that late Paleoindian groups were “settling in” to local environments resulting in reduced range mobility and greater reliance on local lithic sources (Lothrop et al. 2016:237-238).

2.2.2 Archaic Period (9950 – 3150 B.P)

The Archaic Period, which is subdivided into Early (9950–8450 B.P.), Middle (8450–4950 B.P.), and Late (4950–3150 B.P.) phases, is characterized by climate warming that gradually resulted in greater

biodiversity in the resource base. Modification of tool technology, increased site size, and changing site distribution reflect utilization of a broader spectrum of resources and ecological zones. Glacial retreat at the end of the Pleistocene led to a shift from a cooler, wetter climate to a warmer, drier one in the Holocene. Concurrently, rising sea levels during this period eventually created the general geography, hydrology, and ecology of the region as it is currently known with mixed conifer-deciduous forests and essentially modern flora (Barber 2003; Brush 1986; Webb 1988). Seasonal variability also became more pronounced (Dent 1995), which led to more mobile subsistence strategies as populations followed changing resources over the course of the year. Innovations in the Archaic assemblage include celts, net sinkers, pestles, pecked stones, and axes, which reflect an increase of the use of ground stone technology in their manufacture (McLearen 1991).

During the Early Archaic Period, regional stylistic differences in the lithic assemblage become more pronounced with an increase in the amount of locally available material used for their manufacture (Custer 1990; Ford 1974; Sassaman et al. 1988). Common forms during the Early Archaic Period include side and corner notched points with serrated blades, including Palmer and Kirk Corner-Notched. Bifurcate base projectile points are also seen, of which LeCroy points are the most common form in this region (Dent 1995; Justice 1995).

The Middle Archaic period roughly corresponds with an extended warm and dry interval during the mid-Holocene. This climatic trend established the oak-chestnut forest as the dominant vegetational cover in the region, although excessive drought conditions probably introduced grassland prairies to some inter-drainage uplands (Sassaman 2010:23). Whether tied to this environmental shift or independent of it, use of locally sourced lithic raw materials becomes more pronounced and biface technology markedly changed from notched to stemmed forms at the onset of the Middle Archaic. New forms include broad Morrow Mountain and Stanley stemmed varieties and small notched point and narrow stemmed types, such as Bare Island, Claggett and Halifax (Justice 1987). Other common types in this region include LeCroy, Stanly, Morrow Mountain, Guilford, and side-notched Halifax (Amick and Carr 1996; Blanton 1996; Dent 1995; Justice 1995). This change of form in bifacial tools may reflect stylistic variations introduced by in-migrating groups, or a technological adaptation to a shifting resource base, or both.

Fishing and shell fishing are seen in the archaeological record toward the latter part of the Middle Archaic, as sea level rise slowed, and estuaries and riverine habitats stabilized. While it appears unlikely that shellfish (or fish) had become a specialized focus of Middle Archaic subsistence, resident populations were nonetheless aware of these resources, and capable of exploiting them.

The Late Archaic Period sees a profusion of sites throughout the region, which is likely indicative of a population increase and concurrent reduction in mobility (Klein and Klatka 1991). Elongated stemmed and notched forms, such as Savannah River, Susquehanna, and Perkiomen, are indicative of this period (Dent 1995; Justice 1995; Ritchie 1971). Appearing around the same time as broadspears, cooking vessels carved from the mineral steatite (also called soapstone) were in wide use across the eastern seaboard. Steatite was quarried from outcroppings in the Ridge and Valley province extending from Alabama to Maine, and fashioned into rectangular, straight sided vessels. Steatite use peaked from between circa 2000 to 1000 B.C., although it is present in dated contexts as early as 4300 B.C. (Truncer 2004:506). Steatite vessel distribution is closely mapped to the area of nut-producing deciduous forests

and may have functioned as stone-boiling containers for processing hickory, oak, and other nuts (Truncer 2004:507). These bowls were both labor intensive to manufacture and widely exchanged, indicating incipient trade networks in the region (McLearen 1991; Stewart 1989). Ceremonialism grew in importance, with more elaborate, formalized burial practices and the presence of exotic raw materials as symbols of enhanced status and rank (Fiedel 2001).

2.2.3 Woodland Period (3150 – 350 B.P)

The Woodland Period, which is also subdivided into Early (3150–2450 B.P), Middle (2450–1050 B.P.), and Late (1050–350 B.P.) phases, is broadly characterized by a more sedentary population with a subsistence strategy increasingly reliant on plant cultivation and the widespread manufacture of ceramics.

The Early Woodland Assemblage remains somewhat ill-defined with similarities to both the preceding Late Archaic Period and following Middle Woodland Period. Tools including drills, perforators, scrapers, small bifaces, hammerstones, net sinkers, mortars, and pestles are common in assemblages of this period (McLearen 1991; Stewart 1998a). Projectile points associated with the Early Woodland Period include Calvert and Fishtail, Potts Corner-Notched, Vernon, and Claggett projectile point types (Inashima 2008; Stephenson 1963). Early Woodland ceramic types include Marcey Creek, Accokeek Creek, and Elk Island (Egloff 1991; Klein 2003; Klein and Stevens 1996). Of note is an apparent decrease in long-distance trade during the Early Woodland Period of the type that characterized the previous Late Archaic period (Klein 2003).

Subsistence strategies in the Middle Woodland Period continued to focus primarily on hunting and gathering predicated on a seasonally mobile lifestyle. However, the appearance of large middens and houses at some sites suggests that certain groups, while not sedentary, were somewhat less mobile than in the Early Woodland Period (Gallivan 2003, 2016). Often, sites of this period occur on the banks of both major rivers and their tributaries. There is evidence for the emergence of horticulture during the Middle Woodland Period, but little indication it played any significant role in subsistence strategies (Blanton 2003; Mouer 1991; Smith 2007, 2011; Stewart 1995). The emergence of elaborate burials, the creation of labor-intensive non-utilitarian objects, and the resumption of long distance trade all hint at social changes that may have been occurring in Middle Woodland populations of the region (Knepper et al. 2006; McLearen 1992; Stewart 1992, 1998b).

Stemmed and notched points continue to be seen in the Middle Woodland lithic assemblage, though with a significant variation in forms (Custer 1989; McLearen 1992). Ceramic manufacture increases during this period (Brown 1986, 1989) with types including Popes Creek net-impressed (Blanton 1992; Egloff and Potter 1982) and the related Prince George and Varina types (Mouer et al. 1986). Later Mockley ware, with surface treatments that include plain, net impressed, and cord marked, becomes common (Johnson 2001).

The Late Woodland Period is characterized by significant changes in society and economy, particularly in its later phase. These include the introduction of maize agriculture, population growth, the establishment of villages, an intensification of regional trade, and the emergence of stratified societies (Curry 2015; Gallivan 2003, 2005, 2016; Gold 2004; Hodges 2003; Klein and Magoon 2017; Mahoney 2009; Shephard 2015). While hunting and gathering of wild resources, particularly aquatic, remained the

major dietary component, cultivation of maize, beans, and squash became increasingly important during the Late Woodland Period (Gremillion 2018; McKnight and Gallivan 2007). The need for arable land by growing populations fueled by a diet increasingly dependent on the cultivation of these domesticated plants may have been an impetus for villages, some of which were palisaded, to coalesce on the floodplains of major rivers during this period (Dent 1995; Potter 1993). These major changes likely predicated the rise of hereditary chiefdoms, and their attendant social inequality, which are first identified during the Late Woodland Period (Gallivan 2003, 2005, 2016; Potter 1993).

The Late Woodland lithic assemblage is typified by small, triangular projectile points, likely indicative of the introduction of the bow and arrow. Common types include Levanna, Madison, Roanoke, and Clarksville (Coe 1964; Potter 1993; Ritchie 1971). Ceramics of this period are diverse with Gaston ware and Roanoke ware common in the Project Area (Gallivan 2003; Turner 1992). Non-utilitarian goods, possibly linked with the development of stratified societies, are also common in the Late Woodland Period. These include, most prominently, shell and copper beads, the latter obtained through long distance trade. Ceramic tobacco pipes and shell gorgets and pendants are also seen (Magoon 1999; Stephenson 1963).

Late pre-contact economy in the Virginia Coastal Plain shifted from a focus on hunting and foraging to maize-bean-squash horticulture situated on floodplains and was accompanied by a parallel shift toward semi-sedentism and increased population density (Gallivan 2006). By the late sixteenth century, Algonquian-speaking groups throughout the Tidewater had coalesced into a hierarchical polity led by hereditary chiefs, werowances, who received tribute from subordinate groups and redistributed surplus goods and food to overlords and non-elites. Standing paramount within this socio-political system was Wahunsunacock, or Powhatan, whose powerful rule lent his name to the thirty-some bands comprising the Powhatan Chiefdom. Among the largest of these bands were the Pamunkey, Chickahominy, Mattaponi, and Nansemond, and in all, the Powhatan population in A.D. 1600 was approximately 14,000 (Moretti-Langholtz 2006).

2.3 Post-contact Context

2.3.1 Settlement to Revolution

Virginia's economic development encountered serious barriers in the seventeenth century that nearly stifled its development into the wealthiest of England's colonies by the mid-1700s. One gauge of the hurdles to its early growth was the 40-year delay between the founding of Jamestown in 1607 and the settling of what would become Middlesex County. After extraordinary violence ensued between Native American and English communities in the 1620s and 1630s, English settlers were, by treaty, barred from the lands of the Middle Peninsula, but treaty violations became rampant in the mid-1640s and were very difficult to enforce. In 1648, restriction on settlement was lifted and English settlers began occupying the shorelines of the Rapphannock and Piankatank rivers (Rutman and Rutman 1984:45; Taylor 2001).

In 1649, Ralph Wormeley patented 3,200 acres where Urbanna Creek flowed into the Rappahannock River and called his estate Rosegill. The estate is included in Virginia Cultural Resources System (VCRIS) as VDHR No. 059-0009. Rosegill, VDHR No. 059-0009, was listed on the Virginia Landmarks Register (VLR) on 2/10/1973 and on the National Register of Historic Places (NRHP) on 11/27/1973.

Wormeley's son doubled the size of the property, which by 1700 extended along four miles of the Rappahannock River. Over the next 125 years, five generations of Wormeleys established Rosegill as one of the most important plantations in the Middle Peninsula. Agricultural products from the estate included tobacco, wheat, corn, beef, and pork (Rutman and Rutman 1984:153, 235).

For much of the first hundred years of English settlement, the population of the Middle Peninsula remained low. This can be explained, in part, by its relative isolation as a peninsula, separated from Jamestown and Williamsburg by the York River and from settlements in the North Neck by the Rappahannock River. Not until 1669 was the population sufficient to justify the establishment of Middlesex County from Lancaster County, though even by 1700 the county contained only 13 persons per square mile (Table 2.3.1). In fact, there was limited incentive or opportunity for yeoman farmers to settle in Middlesex County despite its productive soils. In the highly stratified Tidewater society of the colonial period, most of the best lands were in the hands of the elites, such as the Wormeleys of Rosegill, the Lees of Lansdowne, and the Churchills of Wilton (VDHR No. 059-0010). Population growth in the late seventeenth and eighteenth centuries was largely a result of the lucrative tobacco trade and the large-scale importation of enslaved Africans to plant and harvest the crop. As tobacco became the predominant economic driver of the Tidewater, by the turn of the eighteenth century fully 30 percent of Middlesex County's inhabitants were enslaved and of African descent. In 1701, Rosegill produced around 50,000 pounds of tobacco for export from the labor of 85 enslaved persons (Rutman and Rutman 1984:153, 206).

The dispersed agricultural farms and estates of Middlesex County lacked a market town until Urbanna was settled at the mouth of Urbanna Creek in 1704. With Urbana's location on the Rappahannock River and the passage of the Tobacco Warehouse Acts of 1713 and 1730 which mandated public warehouses and inspection of tobacco, Urbanna assumed the role of regional tobacco entrepôt, and became the center of commerce for the county. In 1748 colonial authorities funded the construction of a courthouse, solidifying Urbana's position as principal town of the county (Edwards and Salmon 1990).

At the time of American independence, Virginia was by many measures (population, value of domestic product, improved acreage) the most dynamic of the thirteen states. Four of the first five American presidents were Virginians which reflects the outsize influence the Old Dominion had in the nation's economic and political life.

Table 2.3.1 Population Data for Middlesex County, Virginia

Year	Population	Year	Population
1700	1,771	1910	8,852
1790	4,140	1920	8,157
1800	4,203	1930	7,273
1810	4,414	1940	6,673
1820	4,057	1950	6,715
1830	4,122	1960	6,319
1840	4,392	1970	6,295
1850	4,394	1980	7,719
1860	4,364	1990	8,653
1870	4,981	2000	9,932

Table 2.3.1 Population Data for Middlesex County, Virginia

Year	Population	Year	Population
1880	6,252	2010	10,959
1890	7,458	2020	10,625
1900	8,220		

Source: US Census Bureau 1996 and 2022

2.3.2 Independence and Civil War

Middlesex County witnessed no major battles during the Revolutionary War, but the British naval blockade of the Tidewater and shortages of labor, money, and goods had a long-term effect on the regional economy. These impacts were greatly exacerbated by the decline of tobacco cultivation in the Tidewater, including Middlesex County. Because tobacco had generated huge profits, planters tended to ignore signs of soil exhaustion and instead simply cleared new ground when productivity fell. By the turn of the nineteenth century, depleted soils in the Tidewater had made tobacco farming there a losing proposition, resulting in out-migration of white population to the Piedmont, which became Virginia's new center of tobacco cultivation. A labor shortage caused by the migration of non-elite, skilled whites was offset by the increase in enslaved labor, which accounted for 56 percent of the Middlesex County population in 1860 (Hergesheimer and Leonhardt 1861). The overall county population decline lasted from the 1810s until the late 1860s (Table 2.3.1).

Agriculture diversified in Middlesex County during the nineteenth century, with corn, wheat, and cattle the principal products (Table 2.3.2). Butter was produced largely for home consumption and illustrates a degree of self-sufficiency in the local agrarian regime. By 1840, the first year in which the federal census recorded agricultural production, tobacco had all but disappeared from the fields of Middlesex County, as it did elsewhere in the Middle Peninsula. Corn, for human and animal consumption, thrived on the poor soils and farmers gradually adopted improved practices, including crop rotation, better manuring, and use of marl to counteract the acidic soils of the region (Craven 1965:101).

Table 2.3.2 Selected Agricultural Data for Middlesex County, Virginia

Year	Wheat (bu)	Corn (bu)	Tobacco (lb)	Butter (lb)	Beans (bu)*
1840	17,027	122,145	1,345	N/A	N/A
1850	30,762	134,253	N/A	26,277	N/A
1860	59,939	163,467	21,950	25,755	N/A
1870	19,650	86,967	30	13,754	N/A
1880	17,987	93,433	1,512	28,473	112
1890	11,717	112,093	431	73,094	81
1900	14,140	153,570	320	64,418	53
2021	*167,000*	*1.04 million*	*N/A*	*N/A*	*343,000*

*-1880-1900 undifferentiated "dry beans"; 2021-soybeans.
Sources: USDA 2019 and 2022

The physical isolation that stalled settlement in Middlesex County during the seventeenth century continued to hinder development of infrastructure and industry during the nineteenth century. Bridges over the Rappahannock River and lower reach of the Piankatank River were not built until the twentieth century; railroads never penetrated further east into the Middle Peninsula than West Point, in King and

Queen County. Of industries, the 1840 census enumerated several gristmills, sawmills and tanneries in Middlesex County, employing a total of 32 men; absent were forges, furnaces, or workshops (USDA 2019). Aside from timber, natural resources were also scant. This isolation and lack of resources did, however, shield Middlesex County from armed conflict during the Civil War as the area was of little strategic value. The Union naval blockade of the Chesapeake and Atlantic ports and the exigencies of war caused widespread deprivation in Middlesex County.

2.3.3 Reconstruction and Growth

The aftermath of the Civil War affected all levels of society with the end of the plantation system and a shift to smaller, family farming. This transformation led to steep and lingering decline in production of wheat and corn as shortages in seed, fertilizer and labor caused disruptions to the agrarian economy (Table 2.3.2). Butter production also declined sharply after the war but reclaimed its pre-war level by 1880 and saw a near-tripling of production by 1890, reflecting a shift to dairying as an important component of the new economy.

In the decades after the war, steamships plied the Rappahannock and Piankatank rivers, connecting Middlesex County farmers and businesses with markets in Norfolk and Baltimore. These new connections led to the development of a thriving oyster industry. Later, the advent of refrigeration in the early twentieth century allowed oyster packing houses to become Urbana's largest industry (Edwards and Salmon 1990). River work in the oyster and shipping industries provided reliable employment opportunities for the region's African Americans. By 1910, Middlesex County's population had doubled from its antebellum levels, reflecting the creation of jobs and businesses based on the demand for fresh oysters in urban centers (Table 2.3.1).

2.3.4 Decline and Rebirth

Depression struck the rural economy long before the stock market crash of 1929. Beginning in the 1910s, Middlesex County's population entered a steep and enduring decline, losing almost 30 percent by 1970 as farmers and laborers left for urban employment in Norfolk, Richmond, and Baltimore. The lucrative oyster industry collapsed in the 1920s due to overexploitation and predatory snails, and never fully recovered (Schulte 2017:6). A paradox of the out-migration from Middlesex County during much of the twentieth century was the state's program of secondary road improvement that began in the 1930s. The John Andrew Twigg Bridge (recorded in VCRIS as VDHR No. 057-5047) conveys Virginia Route 3 across the Piankatank River was built in 1953, connecting Middlesex and Mathews counties. In 1959, the Robert O. Norris, Jr. Bridge carried Virginia Route 3 over the Rappahannock River, joining Middlesex and Lancaster counties. These improvements in transportation infrastructure led eventually to a revival in population and agricultural production in the region. With improved farming practices and less costly access to regional markets via the bridges and road system, wheat, soybeans, and corn have become mainstays of the modern agrarian economy (Table 2.3.2). From its nadir in 1970, Middlesex County's population increased 69 percent as of 2020. Improved access and a tourism industry based on the county's 135 miles of shoreline and numerous marinas have been the impetus for this revival.

2.4 Previous Cultural Resources Surveys

A search for previously identified archaeological sites utilizing VCRIS, was undertaken in January 2022. As HRSD refined their project layout, the original archives search was updated to account for updates to the APE and reassessment of the previously identified sites that are within one mile of the APE.

The assessment of previously identified archaeological sites determined that a total of 60 sites are located within one mile of the Project, only one of which is located within the APE. The one site located within the APE has not been evaluated by VDHR for the NRHP. Table 2.4.1 presents a summary of the previously identified archaeological sites and the NRHP determination status of all sites located within one mile of the Project.

Table 2.4.1. Previously Identified Archaeological Sites within One Mile of the Project

DHR ID	Site Name	Site Type	Time Period	NRHP Determination Status
44GL0031	Jenkin- Owens Property	Trash pit	Prehistoric	Undetermined
44GL0036	Ware Church	Church	Historic	Undetermined
44GL0114	Hael Western	Other	N/A	Undetermined
44GL0115	N/A	Other	Historic	Undetermined
44GL0117	John Clayton Building	Other	Historic	Undetermined
44GL0118	Debtor's Jail	Jail, Other	Historic	Undetermined
44GL0119	Gloucester Courthouse	County courthouse	Historic	Undetermined
44GL0155	N/A	Camp, Other	Prehistoric	Undetermined
44GL0156	N/A	Camp, Other	Historic	Undetermined
44GL0158	N/A	Camp	Prehistoric	Undetermined
44GL0161	N/A	Camp	Prehistoric	Undetermined
44GL0165	Hogge Site	Camp	Prehistoric & Historic	Undetermined
44GL0173	N/A	Camp	Prehistoric	Undetermined
44GL0225	N/A	N/A	Historic	Undetermined
44GL0227	N/A	N/A	Historic	Undetermined
44GL0443	Patriots Walk Cemetery	Cemetery	Historic	Undetermined
44GL0445	T.C. Walker House	Dwelling, single	Historic	Undetermined
44GL0451	Tucker Store Site	Store	Historic	Undetermined
44GL0455	Gloucester Courthouse Circle	County courthouse, Jail, Office building, Other, Tavern/Inn, Village/Town	Historic	Undetermined
44GL0469	Edge Hill House/Gloucester Woman's Club	Dwelling, single, Meeting hall, School	Historic	Undetermined
44MT0116	Muddy Creek Site	Camp	Prehistoric	Undetermined
44MT0117	Haynes Upper Field	Camp	Prehistoric & Historic	Undetermined
44MT0161	Windsor / John Clayton House Site	Camp, Dwelling, single, Farmstead, Garden, Smokehouse	Prehistoric & Historic	Undetermined
44MT0162	Old Office Site	Camp, Dwelling, single, Farmstead	Historic	Undetermined
44MX0001	N/A	N/A	Prehistoric	Undetermined
44MX0012	N/A	Dwelling, single	Historic	Undetermined
44MX0013	N/A	N/A	Historic	Undetermined

Table 2.4.1. Previously Identified Archaeological Sites within One Mile of the Project

DHR ID	Site Name	Site Type	Time Period	NRHP Determination Status
44MX0014	N/A	Dwelling, single, Other	Prehistoric & Historic	Undetermined
44MX0015	N/A	Lawn	Historic	Undetermined
44MX0016	N/A	Camp, temporary	Prehistoric	Undetermined
44MX0017	N/A	Lawn	Historic	Undetermined
44MX0022	N/A	Shell midden	Prehistoric	Undetermined
44MX0024	N/A	Other	Historic	Undetermined
44MX0025	N/A	Other	Historic	Undetermined
44MX0026	N/A	Other	Historic	Undetermined
44MX0027	N/A	Other	Historic	Undetermined
44MX0028	N/A	Kitchen	Historic	Undetermined
44MX0030	N/A	Other	Historic	Undetermined
44MX0031	N/A	Other	Historic	Undetermined
44MX0032	N/A	Other	Historic	Undetermined
44MX0033	N/A	Other	N/A	Undetermined
44MX0034	N/A	Other	Historic	Undetermined
44MX0035	N/A	Other	Historic	Undetermined
44MX0040	N/A	Tavern/Inn	Historic	Undetermined
44MX0041	N/A	Cemetery, Church	Historic	Undetermined
44MX0042	N/A	Outbuilding	Historic	Undetermined
44MX0049	N/A	Trash scatter	Historic	Undetermined
44MX0051	N/A	Camp	Prehistoric	Undetermined
44MX0052	N/A	Camp	Prehistoric & Historic	Undetermined
44MX0053	N/A	Dwelling, single	Prehistoric & Historic	Undetermined
44MX0054	N/A	Dwelling, single	Prehistoric & Historic	Undetermined
44MX0055	N/A	Trash scatter	Prehistoric & Historic	Undetermined
44MX0056	N/A	Other	Historic	Undetermined
44MX0057	N/A	Road	Historic	Undetermined
44MX0061	Old Tobacco Warehouse	Tobacco warehouse	Historic	Undetermined
44MX0084	Sandwich Property	Village/Town	Prehistoric & Historic	Undetermined
44MX0085	Gressett House	Dwelling, single	Historic	Undetermined
44MX0086	Lister Property	Artifact scatter, Dwelling, single, Grave/burial, single	Prehistoric & Historic	Undetermined
44MX0087	N/A	Dwelling, single	Historic	Undetermined
44MX0088	N/A	Other	Historic	Undetermined

Bold denotes within Project APE
VCRIS 2022

Additionally, VCRIS indicated 19 Phase I Archaeological surveys have been performed within one mile of the Project. Four of the surveys were located within the Project APE. Table 2.4.2 presents a summary of the previous surveys conducted within one mile of the Project.

Table 2.4.2. Phase I Archaeological Surveys within One Mile of the Project

CRM ID	County	Title	Author	Company	Year
GL-017	Gloucester	Review and Compliance Phase I Reconnaissance Summary, Route 616, Gloucester County, Virginia	Keith Bott	Virginia Research Center for Archaeology	1980
GL-071	Gloucester	An Archaeological Survey of the T.C. Walker Property Site 44GL445, Gloucester County, Virginia	Thane Harpole, David Brown	DATA Investigations, LLC (David Brown Co.)	2007
GL-097	Gloucester	A Cultural Resources Survey for the Proposed Burkes Pond Bridge Replacement, Gloucester County, Virginia	Aimee Leithoff, Sandra DeChard, Ellen Brady	Cultural Resources, Inc.	2012
GL-098	Gloucester	An Archaeological Survey and Evaluation of Edge Hill House/The Gloucester Woman's Club, Site 44GL0469, Gloucester County, Virginia	Thane Harpole, David Brown, et al	DATA Investigations, LLC (David Brown Co.)	2011
GL-124	Gloucester	Phase I Cultural Resources Survey of the ±81.5 hectare (±201-acre) Gloucester Solar Project, Gloucester County, Virginia	David H. Dutton, Robert J. Taylor, Jr., Arthur P. Striker	Dutton & Associates	2017
GL-132	Gloucester	An Archaeological Survey and Test Excavations of the Tucker Store Property, (Site 44GL451) Between 2001 and 2018, Gloucester County, Virginia	Meredith A.H. Mahoney, Thane H. Harpole, David A. Brown	DATA Investigations, LLC (David Brown Co.)	2018
MT-017	Mathews	Phase I Archaeological Survey in Support of the Proposed Fort Nonsense Park Project, Mathews County, Virginia	Robert Clarke, John Quarstein, Bradley McDonald	Gray and Pape, Inc.	2009
MT-018	Mathews	Archaeological Survey of the Coastal Shorelines Associated with Mathews County, Virginia: An Erosion Threat Study	Darrin L. Lowery	Chesapeake Bay Watershed Archaeological Research Foundation	2008
MT-020	Mathews	Phase I Archaeological Survey of Fort Nonsense (44MT0004/057-0013), Mathews County, Virginia: Addendum Report	Thane Harpole, David Brown, Jennifer Ogborne	DATA Investigations, LLC (David Brown Co.)	2011
MX-003	Middlesex	Review and Compliance Phase I Reconnaissance Summary, Route 669, Middlesex County, Virginia	Keith Bott	Virginia Research Center for Archaeology	1980
MX-005	Middlesex	A Phase I Cultural Resource Survey of the Proposed Route 33 Project, Middlesex County, Virginia	Mark Gallucci, Scott M. Hudlow, Charles M. Downing	(College of) William and Mary Center for Archaeological Research	1992
MX-007	Middlesex	Archaeological Identification Survey of the Proposed Middlesex County 202 Apartments Project, Middlesex County, Virginia	Joe B. Jones	(College of) William and Mary Center for Archaeological Research	2002
MX-008	Middlesex	The Phase I Archaeological Investigation of a 0.759-Acre Tract for the Proposed Southside Bank Branch, Urbanna, Middlesex County, Virginia	Robert M. Adams, Martha W. McCartney, James G. Harrison, III	Harrison and Associates	1992
MX-010	Middlesex	An Archaeological Survey of the Proposed Route 630 Project, Middlesex County, Virginia	William H. Moore	(College of) William and Mary Center for Archaeological Research	2004

Table 2.4.2. Phase I Archaeological Surveys within One Mile of the Project					
CRM ID	County	Title	Author	Company	Year
MX-011	Middlesex	A Phase I Cultural Resources Survey of Approximately 8 Acres at the Proposed Port Town Village, Phase 2 and 3, Located in Middlesex County, Virginia	Garrett Fesler, Matt Laird	James River Institute for Archaeology	2007
MX-012	Middlesex	Archaeological Investigation of Proposed Underground Utilities Installation at the Tobacco Warehouse Site, Town of Urbanna, Virginia	Dane T. Magoon, Ellen M. Brady	Cultural Resources, Inc.	2009
MX-015	Middlesex	Phase I Cultural Resources Survey of the Puller Solar Project, Middlesex County, Virginia	David H. Dutton, Robert J. Taylor, Jr., Arthur Striker	Dutton & Associates	2017
MX-023	Middlesex	Phase I Cultural Resource Survey of the ±7.4 hectare (±18.24 acre) Drake Power Supply Project Area, Middlesex County, Virginia	Lauren Gryctko, Robert J. Taylor, Jr., Dara Friedberg	Dutton & Associates	2021
MX-024	Middlesex	Phase I Archaeological Survey of Approximately 122 Acres at Rosegill, Middlesex County, Virginia	Robert Taft Kiser, Katherine Lee Priddy, Ellen M. Brady, M. Amanda Lee, Aimee J. Leithoff	CRI	2006
Bold denotes within Project APE VCRIS 2022					

3.0 ARCHAEOLOGICAL FIELD SURVEY

Archaeological field investigations were conducted within the Project APE between June 15, 2022 and June 28, 2022. The APE was divided in 45 discrete survey units (SUs) (SU001 – SU045) and a total of 222 STs were dug. SUs 001, 003 to 016, 018 to 022, and 024 to 042 are located along the Force Main and SUs 002, 017, 023, and 043 to 045 are at pump stations. Survey locations and results can be viewed in the attached Mapbook (Appendix D). Information on the individual STs, including descriptions of the soils observed, is contained in the Shovel Test Catalog (Appendix B). Eleven historic period isolates were identified in SU 006, one prehistoric period isolate was recorded in SU 025 and nine historic period artifacts were found in SU 038. The artifacts identified in SU 038 are a part of newly identified site 44MT0185. Information on the individual artifacts is contained in the Artifact Catalog (Appendix C).

3.1 Results

3.1.1 Force Main

The Force Main comprises 12.22 acres of APE. The Force Main was divided into 39 survey units (SUs 001, 003-016, 018-022, and 024-042). Each SU within the Force Main portion of the Project is described individually.

SU 001

Survey Unit SU 001 (Appendix D, page 1) is an approximately 0.16 acre irregularly shaped area located along and north of Taber Lane, Urbana, Middlesex County, Virginia. A total of two (2) STs were placed in SU 001) Topsoil in the STs was dark grayish brown 10YR4/2 sandy clay and the subsoil was a brown 10YR5/3 sandy clay. No cultural material was identified in SU 001, no further work is recommended.

SU 003

Survey Unit SU 003 (Appendix D, page 2) is an area of approximately 0.08 acres located east of Nimcock Road. The SU is covered mostly with short residential lawn grasses. The western portion of the SU slopes east towards the water at a slope greater than 15 percent. Two (2) STs were placed within the SU with both reaching a gravel or concrete impasse at 5cmbs which is likely a continuation of the concrete ramp at the water. The topsoil layer was a brown 10YR5/3 sandy clay. No cultural material was identified in SU 003. No further work is recommended.

SU 004

Survey Unit SU 004 (Appendix D, page 3) is an area of approximately 0.59 acres of a grassy field and dense woodland brush. A small portion of the SU overlaps with the location of archaeological site 44MX0052, as indicated in VCRIS. This area was previously surveyed in 2006 and reported by Robert Taft Kiser, Katherine Lee Priddy, Ellen M. Brady, M. Amanda Lee, and Aimee J. Leithoff (CRI). The report entitled *Phase I Archaeological Survey of Approximately 122 Acres at Rosegill, Middlesex County, Virginia* described the site as a multi component site consisting of a woodland/possible contact period Native American Site and that the site integrity has been impacted due to the plowing in the field and was recommended as not eligible. No shovel tests were placed within this SU. Visual inspection of the SU

did not encounter any cultural features or artifacts at the surface. No cultural material was identified in SU 004, no further work is recommended.

SU 005

Survey Unit SU 005 (Appendix D, page 3) is an area of approximately .06 acres within a corn field to the east of Urbana Road. This area is within the 2006 archaeological survey reported by Robert Taft Kiser, Katherine Lee Priddy, Ellen M. Brady, M. Amanda Lee, and Aimee J. Leithoff (CRI) entitled *Phase I Archaeological Survey of Approximately 122 Acres at Rosegill, Middlesex County, Virginia*, and the Rosegill Plantation (059-0009). Ground visibility was over 75 percent during Tetra Tech's survey and pedestrian survey was conducted of the area. No cultural material was identified in SU 005, no further work is recommended.

SU 006

Survey Unit SU 006 is partially located within the 2006 archaeological survey reported by Robert Taft Kiser, Katherine Lee Priddy, Ellen M. Brady, M. Amanda Lee, and Aimee J. Leithoff (CRI) entitled *Phase I Archaeological Survey of Approximately 122 Acres at Rosegill, Middlesex County, Virginia*. The SU extended 1.4 miles along the western side of Urbana Road and is approximately 1.8 acres (Appendix D, pages 4–7). No STs were placed within the portion of the SU that is located within the 2006 survey boundary. Forty-two STs were placed within SU 006. Three (3) STs were positive for historic period cultural material. Shovel tests 008, 013, and 042 were positive for bottle glass shards, a brass ornament, and a whiteware rim sherd. All artifacts were identified in the first, level of the STs with depths ranging from 15 to 35 centimeters below surface (cmbs). The positive STs were located along an approximately 1.3 mile stretch of Urbanna Road. They were determined to be isolated finds and do not possess archaeological significance and not to constitute an archaeological site. No other cultural material was identified in SU 006, and no further work is recommended.

SU 007

Survey Unit SU 007 is an approximately .06 acre area located east of Urbana Road (Appendix D, page 4). This SU is located within a agricultural field of standing corn, partially within the Rosegill Plantation (059-0009). At the time of the Tetra Tech survey, ground visibility was over 75 percent and pedestrian survey was conducted of the area. No cultural material was identified in SU 007and no further work is recommended.

SU008

Survey Unit SU 008 is an approximately 0.94 acre area located on the northeastern side of the intersection of Urbana Road and General Puller Highway (Appendix D, page 7). SU 008 is within architectural resource 059-0080. Much of the SU is covered by a gravel driveway, parking lot, store structure, and boats. Six (6) STs were placed within the grassy lawn area north of the buildings. Most of the STs contained one level of brown 10YR5/3 silty clay, the STs next to the corn field had a topsoil of dark yellowish brown 10YR4/4 silty clay and a subsoil of brown 10YR5/3 silty clay. None of the STs contained cultural material, no further work is recommended in SU 008.

SU 009

Survey Unit SU 009 is an approximately .02 acre area located on the south side of General Puller Highway (Appendix D, page 8). SU 009 encompasses a soybean agricultural field. Ground visibility was over 75 percent. Systematic pedestrian survey was conducted of the area. No cultural material was identified in SU 009 and no further work is recommended.

SU 010

Survey Unit SU 010 is an area of approximately 0.03 acres located within an agricultural field of tall grass with no visibility, south of General Puller Highway (Appendix D, page 9). One ST was placed in SU 010. The topsoil was a dark yellowish brown 10YR4/4 silty clay and the subsoil was brown 10YR5/3 silty clay. No cultural material was identified in SU 010, no further work is recommended.

SU 011

Survey Unit SU 011 is an area of approximately 0.03 acres within the front lawn of a residence southwest of General Puller Highway (Appendix D, page 9 and 10). One (1) ST was placed in SU 011. The topsoil was a dark yellowish brown 10YR4/4 silty clay and the subsoil was brown 10YR5/3 silty clay. No cultural material was identified, and no further work is recommended.

SU 012

Survey Unit SU 012 is an approximately .03 acre area located on the south side of General Puller Highway (Appendix D, page 12). SU 012 encompasses a soybean agricultural field. Ground visibility was over 75 percent. Pedestrian survey was conducted of the area. No cultural material was identified in SU 012. , No further work is recommended.

SU 013

Survey Unit SU 013 is an area of approximately 0.03 acres within an agricultural field, southwest of General Puller Highway (Appendix D, page 13). One (1) ST was placed in SU 013. The topsoil was a very dark grayish brown 10YR3/2 silty clay loam and the subsoil was a dark yellowish brown 10YR4/6 silty clay. No cultural material was identified, and no further work is recommended.

SU 014

Survey Unit SU 014 is an area of approximately 0.1 acres within a wooded location south of General Puller Highway and west of an unnamed road (Appendix D, page 13). One (1) ST was placed within a small portion of short grass in SU 014. The ST contained one level with a brown 10YR5/3 silty clay subsoil at the surface. No cultural material was identified, and no further work is recommended.

SU 015

Survey Unit SU 015 is an area of approximately .06 acres within a short grass field, south of General Puller Highway and west of a commercial building (Appendix D, page 14). One (1) ST was placed in SU 015. The topsoil was a dark yellowish brown 10YR4/4 silty clay with charcoal flecking at the transition between topsoil and subsoil, the subsoil was a brown 10YR5/3 silty clay. No cultural material was identified, and no further work is recommended.

SU 016

Survey Unit SU 016 is an area approximately 0.38 miles long immediately adjacent to the southwest side of General Puller Highway, located between Queens Point Drive and Whiting Creek Road (Appendix D, pages 14 and 15). SU 016 primarily consists of an extant drainage ditch. Due to previous ground disturbance from the drainage ditch, no STs were placed in SU 016. Pedestrian survey was conducted and no cultural material was identified, no further work is recommended.

SU 018

Survey Unit SU 018 is located within a landscaped lawn covered in mown grass and is approximately 0.13 acres, southwest of General Puller Highway (Appendix D, page 18). One (1) ST was dug in SU 018. The ST contained one layer of deflated soils consisting of light brownish gray 10YR6/2 silty clay. No cultural material was identified, no further work is recommended.

SU 019

Survey Unit SU 019 is within a landscaped lawn covered in mown grass and is approximately 0.03 acres, located at the intersection of General Puller Highway and Grafton Church Road (Appendix D, page 23). One (1) ST was dug in SU 019. The topsoil was a brown 10YR3/2 silty clay and the subsoil was a yellowish brown 10YR5/6 silty clay. No cultural material was identified, no further work is recommended.

SU 020

Survey Unit 020 is an approximately 2.19 acre area located southwest of General Puller Highway (Appendix D, page 25 and 26). An informant reported to HRSD that there may be an unmarked cemetery located within this area. On June 2, 2022 Tetra Tech's architectural historian conducted a pedestrian reconnaissance of the parcel. The parcel contains dense, secondary growth pines on a generally flat ground surface. Two walkover passes of the parcel were made, during which no headstones, fence, or other obvious indications of a cemetery or graves were identified. The absence of obvious graves does not necessarily imply that there aren't human remains in the referenced parcel, only that no indications of such features were identified during reconnaissance.

Archaeologists dug thirty-seven (37) STs within SU 020, none of which contained any cultural material. STs in this SU were all one layer comprised of subsoil extending to a maximum depth of 26 cmbs. The soils in the planted pine area were a light brownish gray 10YR6/2 silty clay, while the soils in the yard and tall grass areas were a yellowish brown 10YR5/6 sandy clay. Shovel test survey in this SU confirmed the lack of grave identifiers in the area reported as a result of the initial walkover. As long as construction is confined to the surveyed APE, no further archaeological survey is recommended in SU 020. Tetra Tech recommends development of an Unanticipated Discoveries Plan be drafted in case human or cultural resources remains are identified during construction.

SU 021

Survey Unit SU 021 is an area of approximately .37 acres that contains an asphalt parking lot, landscaped lawns, utility poles, and a fire hydrant (Appendix D, pages 25 and 26). Four (4) STs were placed within the landscaped lawn portion of the SU. The soils in the topsoil were a brown 10YR4/3 silty

clay loam and the soils in the subsoil were a yellowish brown 10YR5/6 silty clay. None of the STs contained cultural material and no further work is recommended.

SU 022

Survey Unit SU 022 is located at the intersection of General Puller Highway and Wood Brothers Road (Appendix D, page 25 and 26). The area is approximately 0.27 acres and consists of a gravel parking pad and dense planted pine. The wooded area is strewn with trash; mostly tires and plastic bottles, seemingly used as an unofficial dumping ground. Four (4) STs were placed within the wooded section of the SU. All of the STs contained deflated soils consisting of yellowish brown 10YR5/6 sandy clay. None of the STs contained cultural material and no further work is recommended.

SU 024

Survey Unit SU 024 is an area of approximately 0.041 acres located southwest of Twiggs Ferry Road and consists of sparce secondary growth woods with standing water and waterlogged soils (Appendix D, page 26). One (1) ST was dug within SU 024. The ST contained one level of light brownish gray 10YR6/2 sandy clay. No cultural material was identified, no further work is recommended.

SU 025

Survey Unit SU 025 is located immediately to the northeast of Twiggs Ferry Road and consists of a grass covered field on a low rise (Appendix D, page 26 and 27). Eleven (11) STs were dug in SU 025. The topsoil consisted of yellowish brown 10YR5/4 silty clay loam, and the subsoil consisted of yellowish brown 10YR5/6 silty clay. One ST contained a single non-diagnostic quartz biface. The artifact was identified in the first level of the ST, which went to a depth of 44 cmbs. Radial STs excavated at 7.5 meter distance surrounding the positive ST contained no cultural material. The one artifact recovered is an isolated find. None of the remaining STs dug in SU 025 contained cultural material. No further work is recommended in SU 025.

SU 026

Survey Unit SU 026 is an approximately 0.41 acre area located immediately northeast of Twiggs Ferry Road (Appendix D, page 27). The SU consists of a cornfield and bare ground containing utility poles and utility boxes. Seven (7) STs were dug in SU 026 in an area where ground visibility was low. Topsoils were a yellowish brown 10YR5/6 silty clay loam and subsoils were a brownish yellow 10YR6/8 silty clay. No cultural material was identified in any of the seven STs. A portion of the SU was pedestrian surveyed where visibility was 75 percent or greater. No cultural material was identified during pedestrian survey. No further work is recommended in SU 026.

SU 027

Survey Unit SU 027 is an approximately 0.73 acre area located northeast of Twiggs Ferry Road (Appendix D, page 27). Fourteen (14) STs were placed in SU 027. The entire length of SU 027 contains numerous utility poles, utility boxes, markers for buried utilities, and flagging for buried electrical lines. Many areas within SU 027 have significant ground disturbance due to the road berm, drainage ditch, and utilities,

and areas where subsoil is visible on the surface. None of the STs dug contained cultural material. No further work is recommended in SU 027.

SU 028

Survey Unit SU 028 is an approximately 0.61 acre area located between Twiggs Ferry Road and the City of Refuge Road (Appendix D, page 27 & 28). The entire length of SU 028 contains numerous utility poles, utility boxes, markers for buried utilities, and flagging for buried electrical lines. Many areas within SU 028 have significant ground disturbance and areas where subsoil is visible on the surface. Eighteen (18) STs were dug in SU 028, none of which contained cultural material. Soils in the STs consisted of yellowish brown 10YR5/4 silty clay. No further work is recommended in SU 028.

SU 029

Survey Unit SU 029 is an approximately 0.11 acre area located northeast of Twiggs Ferry Road between City of Refuge Road and Stampers Bay Road (Appendix D, page 28). This area consists of wetlands with standing water, utility poles, and a parking pad. Due to the conditions, no STs were placed in SU 029. The length of SU 029 was observed from the edge of the APE due to standing water, no cultural material was identified. No further work is recommended in SU 029.

SU 030

Survey Unit SU 030 is a 0.02 acre area located at the intersection of Twiggs Ferry Road and Stampers Bay Road (Appendix D, page 28). The SU consist of a landscaped yard containing utility poles and a utility box. This area was previously surveyed as part of a 2004 survey reported by William H. Moore (William and Mary Center for Archaeological Research) titled *An Archaeological Survey of the proposed Route 630 Project, Middlesex County, Virginia*. Due to the utility installations and previous survey, no STs were placed in the SU. No further work is recommended in SU 030.

SU 031

Survey Unit SU 031 is an approximately 0.11 acre area situated between Twiggs Ferry Road and a drainage ditch (Appendix D, page 28). The area has been extensively disturbed by buried utilities, residential construction, landscaping, and gravel driveways. Due to the severe ground disturbance no STs were placed in this SU. The area was pedestrian surveyed and no cultural material was identified. No further work is recommended in SU 031

SU 032

Survey Unit SU 032 is an approximately 0.11 acre area east-northeast of Twiggs Ferry Road bisected by White Pine lane (Appendix D, page 29 & 30). The area consists of mown grass, planted pine, and a field of low grass. Ten (10) STs were placed in SU 032, none of which contained cultural material. Soils in SU 032 consisted of deflated yellowish brown 10YR5/4 silty clay and light brownish gray 10YR6/2 sandy clay. No further work is recommended in SU 032

SU 033

Survey Unit SU 033 is an approximately 0.22 acre area located east of Twiggs Ferry Road and consists of a broad field covered in low grass adjacent to the road berm (Appendix D, page 30). Five (5) STs were dug in SU 033, none of which contained cultural material. Soils consisted of brownish yellow 10YR68 loamy sand. No Further work is recommended in SU 033.

SU 034

Survey Unit SU 034 is an approximately 0.31 acre area located between Twiggs Ferry Road and Blue Heron Drive (Appendix D, page 30 & 31). The SU consists of a level field covered in mown grass containing a fence and utility poles. Six (6) STs were dug in SU 034, none of which contained cultural material. Soils consisted of deflated brownish yellow 10YR6/8 loamy sand. No further work is recommended.

SU 035

Survey Units SU 035 is an area measuring approximately 0.28 acres located east-southeast of Twiggs Ferry Road and south of Blue Heron Drive adjacent to a road berm and drainage ditch (Appendix D, page 31). The SU consists of a level field covered in mown grass containing ornamental planting, a fence, and utility poles. Eleven (11) STs were dug in SU 035, none of which contained cultural material. Soils consisted of deflated brownish yellow 10YR6/8 loamy sand. No further work is recommended in SU 035.

SU 036

Survey Unit SU 036 is a 0.68 acre area located between Drum point lane and Twiggs Ferry Road, with the Piankatank River to the south (Appendix D, page 33). The SU consists primarily of a level field covered in mown grass as well as utility poles and associated installation. The southern section of the SU contains a sandy path leading to the river interspersed with large asphalt fragments. Seven (7) STs were dug in SU 036, none of which contained cultural material. Soils consisted of a grayish brown 10YR5/2 sandy clay loam topsoil and a yellowish brown 10YR5/8 loamy sand subsoil. The southern STs contained a single layer of subsoil. No further work is recommended.

SU 037

Survey Unit SU 037 is an area measuring approximately 0.15 acres bordered by the Piankatank River and Twiggs Ferry Road (Appendix D, page 34). The northern area of the SU slopes down sharply northward towards the river and the remaining SU consists of a landscaped residential yard. Much of SU 037 was included in a previous 2008 survey conducted by Darrin L. Lowery of the Chesapeake Bay Watershed Archaeological Research Foundation and reported in *Archaeological Survey of the Coastal Shorelines Associated with Mathews County, Virginia: An Erosion Threat Study.* Due to the slope, previous survey, and disturbance caused by landscaping and residential utilities, no STs were placed within SU 037. The SU was pedestrian surveyed and no cultural material was identified. No further work is recommended.

SU 038

Survey Unit SU 038 is an area that measure approximately 0.085 acres (Appendix D, page 34). The SU sits between a gravel driveway and a gravel road adjacent to a grassy slope leading to wetlands. SU 038 consists of an agricultural field covered in tall corn. Seven (7) STs were dug in SU 038; four primary STs and three radial STs. Three of the STs in SU 038 contained ceramics (whiteware and stoneware), brick, bottle glass, window glass, and nails. STs 203. 203B, and 204 make up the newly identified site 44MT0185. Artifacts were identified in Level 1 of the STs, with depths ranging from 26 to 33 cmbs. The artifacts likely represent a low-density nineteenth or early twentieth century domestic trash scatter. Since they were recovered from an agricultural field, the artifacts represent secondary or tertiary context. The artifacts have minimal research potential and the site is recommended as not eligible to the NRHP. None of the remaining STs contained cultural material, and no further work is recommended.

SU 039

Survey Unit SU 039 is an area that measures approximately 0.068 acres and is located at the intersection of Twiggs Ferry Road and Dixie Drive (Appendix D, page 35). The SU consists of a level field of tall grass adjacent to a drainage ditch. Three (3) STs were dug in SU 039.Topsoil consisted of a dark yellowish brown 10YR4/4 sandy clay loam and the subsoil was a yellowish brown 10YR5/6 loamy sand. None of the STs contained cultural material, and no further work is recommended.

SU 040

Survey Unit SU 040 is an approximately 0.025 acre area that is located at the intersection of Twiggs Ferry Road and Dixie Drive (Appendix D, page 35). The SU consist of a level field adjacent to a drainage ditch with mown grass and tall grass. One (1) ST was dug in SU 040. It did not contain any cultural material. No further work is recommended in SU 040.

SU 041

Survey Unit SU 041 is an area that measures approximately 0.074 acres and is located between Twiggs Ferry Road and Buckley Hall Road (Appendix D, page 36). The SU consists of a level area of landscaping covered in mown grass adjacent to a drainage ditch. Two (2) STs were dug in SU 041, neither of which contained any cultural material. Topsoils consisted of dark yellowish brown 10YR4/4 sandy clay loam and subsoils consisted of a brownish yellow 10YR6/8 loamy sand. No further work is recommended.

SU 042

Survey Unit SU 042 is an approximately 0.15 acre area that is located between Buckley hall Road and a gravel parking lot (Appendix D, page 36). The SU consists of a landscaped yard covered in mown grass in front of the North Machine Shop. Four (4) STs were dug in SU 042, none of which contained cultural material. Topsoils consisted of a dark yellowish brown 10YR4/4 sandy clay loam and subsoils were a brownish yellow 10YR6/8 loamy sand. No further work is recommended.

3.1.2 Pump Stations

3.1.2.1 Urbanna Pump Station

SU002

Survey Unit SU 002 is the Urbana Pump Station. This SU is a 0.25-acre parcel located east of Linden Ave in Urbana (Appendix D, page 1). The vegetation is mostly short residential lawn grasses with tall vegetation bordering the boundaries. In the center of the SU is a single level house and a shed to the south of the house. Only one (1) ST was placed within SU 002. The soils in the one ST consisted of dark grayish brown 10YR4/2 silty clay topsoil and brown 10YR5/3 sandy clay subsoil. No cultural material was identified at the proposed Urbana PS and no further work is recommended.

3.1.2.2 Locust Hill Pump Station

SU 017

Survey Unit SU 017 is a 0.51- acre area at the location of the proposed Locust Hill PS, adjacent to the southwest side of General Puller Highway (Appendix D, page 16 and 17). This area encompasses an abandoned commercial building, an asphalt parking lot, and a man-hole, all indicative of significant ground disturbance. Two (2) STs were placed within SU 017. Both STs contained deflated soils with a single layer of yellowish brown 10YR5/8 sand. No cultural material was identified at the proposed Locust Hill PS, and no further work is recommended.

3.1.2.3 Hartfield Pump Station

SU 023

Survey Unit 023 is a 0.51-acre area located at the proposed Hartfield PS, immediately southeast of Wood Brothers Road (Appendix D, page 25). The area is made up of a recent construction site consisting of recently cleared and graded land and heavy machinery, an area of low cut grass and a secondary growth forest with a ground cover of thick brush and vegetation. Six (6) STs were dug in SU 023. All of the STs contained deflated yellowish brown 10YR5/6 silty clay soils. None of the six STs contained cultural material, and no further work is recommended.

3.1.2.4 County Line Pump Station

SU 043

Survey Unit SU 043 is the County Line PS located east-southeast of Windsor Road (Appendix D, page 38). County line PS is an existing utility box, and the area has been heavily disturbed by previous construction and landscaping. SU 043 was pedestrian surveyed. No cultural material was identified and no further work is recommended.

3.1.2.5 Gloucester Pump Station

SU 044

Survey Unit SU 044 is an area located at the proposed Gloucester PS, immediately south-southwest of Waverley Lane (Appendix D, page 39). The area is made up of a gently rolling field of low grass which is used as a leach field for a septic system. No STs were dug in SU 044 and the area was pedestrian surveyed. No cultural material was identified, and no further work is recommended.

3.1.2.6 Beaver Dam Pump Station

SU 045

Survey Unit SU 045 is the Beaver Dam PS located east-southeast of John Clayton Memorial Highway (Appendix D, page 40). Beaver Dam PS is an extant pump station, and the area has been heavily disturbed by previous construction and landscaping. SU 045 was pedestrian surveyed. No cultural material was identified and no further work is recommended.

3.1.2.7 Central Middlesex Pump Station

The Central Middlesex PS is an extant pump station. No survey was conducted due to ground disturbance. No further work is recommended.

4.0 SUMMARY AND RECOMMENDATIONS

A total of 14.2 acres of the Middlesex Interceptor Project APE, where proposed construction activities will result in subsurface disturbance, were surveyed during this Phase I archaeological investigation. The APE was divided in 45 discrete SUs . A total of 222 STs were dug during this survey.

Eleven historic period artifacts, mainly bottle glass, were identified in three STs throughout SU 006. These artifacts are interpreted as isolated finds. One prehistoric artifact, a non-diagnostic quartz biface was found in a ST within SU 025. Radial STs placed around the find did not reveal any additional cultural material. The artifact is interpreted as an isolated find.

In SU 038, Site 44MT0185, a historic period artifact scatter, was identified. The site assemblage includes ceramics such as whiteware and stoneware, bottle glass, nails, window glass, and brick. The site is interpreted as a secondary artifact scatter. Tetra Tech recommends that the site does not possess qualities that meet the criteria to be eligible to the NRHP. Tetra Tech recommends no further archaeological investigation within SU 038.

In SU 020, a cemetery was purported to be located in the APE. Pedestrian reconnaissance and subsequent shovel testing found no indication of graves within the APE. Tetra Tech recommends no further work within the area that comprises SU 020.

Tetra Tech recommends development of an Unanticipated Discoveries Plan for the Project. This plan would outline steps to be taken in the event that human remains or a cultural site is revealed during construction.

If HRSD changes the Project area, further survey may be needed.

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APPENDIX A: INVENTORY FORMS

Snapshot

Date Generated: July 06, 2022

Site Name: No Data
Site Classification: Terrestrial, open air
Year(s): No Data
Site Type(s): Artifact scatter
Other DHR ID: No Data
Temporary Designation: 001

Site Evaluation Status
Not Evaluated

Locational Information

USGS Quad: WILTON
County/Independent City: Mathews (County)
Physiographic Province: Coastal Plain
Elevation: No Data
Aspect: No Data
Drainage: Lower Chesapeake
Slope: No Data
Acreage: 0.020
Landform: Other
Ownership Status: Private
Government Entity Name: No Data

Site Components

Component 1

Category: Domestic
Site Type: Artifact scatter
Cultural Affiliation: Euro-American
Cultural Affiliation Details: No Data
DHR Time Period: Reconstruction and Growth, The New Dominion, World War I to World War II
Start Year: No Data
End Year: No Data
Comments: No Data

Bibliographic Information

Bibliography:
No Data
Informant Data:
No Data

CRM Events

Event Type: Survey:Phase I

Project Staff/Notes:
No Data

Project Review File Number: 2020-5020
Sponsoring Organization: No Data
Organization/Company: Tetra Tech, Inc.
Investigator: Adam Maskevich
Survey Date: 6/27/2022
Survey Description:
The majority of this survey area is an agricultural field covered in tall form. Three shovel tests in this survey area contained historic period material.

Current Land Use	Date of Use	Comments
Agricultural field	6/17/2022 12:00:00 AM	Corn

Threats to Resource: Development, Public Utility Expansion
Site Conditions: Site Condition Unknown
Survey Strategies: Subsurface Testing, Surface Testing
Specimens Collected: Yes
Specimens Observed, Not Collected: No
Artifacts Summary and Diagnostics:
Stoneware body sherd, clear window glass, nails
Summary of Specimens Observed, Not Collected:
No Data
Current Curation Repository: Tetra Tech, Inc.
Permanent Curation Repository: Tetra Tech, Inc. or Landowner
Field Notes: No
Field Notes Repository: No Data
Photographic Media: Digital
Survey Reports: Yes
Survey Report Information:
Phase I Archaeological Investigation, Middlesex Interceptor System Program Phase II - Urbanna to Mathews Transmission Force Main
Survey Report Repository: VDHR
DHR Library Reference Number: No Data
Significance Statement: Artifacts within site were recovered from an agricultural field. Artifacts are likely from a secondary or tertiary context and suggest minimal research potential.
Surveyor's Eligibility Recommendations: Recommended Not Eligible
Surveyor's NR Criteria Recommendations, : No Data
Surveyor's NR Criteria Considerations: No Data

Virginia Dept. of Historic Resources

V-CRIS

Virginia Cultural Resource Information System

Legend

- Architecture Resources
- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- County Boundaries

N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

Title: Archaeological Resources **Date: 7/6/2022**

DISCLAIMER:Records of the Virginia Department of Historic Resources (DHR) have been gathered over many years from a variety of sources and the representation depicted is a cumulative view of field observations over time and may not reflect current ground conditions.The map is for general information purposes and is not intended for engineering, legal or other site-specific uses. Map may contain errors and is provided "as-is". More information is available in the DHR Archives located at DHR's Richmond office.

Notice if AE sites:Locations of archaeological sites may be sensitive the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARPA) and Code of Virginia §2.2-3705.7 (10). Release of precise locations may threaten archaeological sites and historic resources.

APPENDIX B: SHOVEL TEST CATALOG

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
001	1	I	0-20	10YR4/2	-	Silty Clay	0	0	0	-
001	2	I	0-15	10YR4/3	-	Sandy Clay	1-R	0	0	-
002	3	I	0-25	10YR4/2	-	Silty Clay	0	0	0	1 glass shard noted and discarded
003	4	I	0-5	10YR5/2	-	Sand	0	0	0	Terminated at shell/gravel impasse
003	5	I	0-5	10YR5/2	-	Sand	0	0	0	Terminated at cement impasse
006	6	I	0-40	10YR4/4	-	Silty Clay	0	0	0	1 plastic frag, 1 non diagnostic glass frag noted and discarded
006	7	I	0-20	10YR4/4	-	Silty Clay	0	0	0	3 non diagnostic glass shards noted and discarded One level
006	8	I	0-35	10YR4/4	-	Silty Clay	0	0	7	1 metal trunk clasp 3 shards of green bottle glass 2 shards clear bottle glass 1 brown bottle glass
006	9	I	0-28	10YR4/4	-	Silty Clay	0	0	0	-
006	10	I	0-30	10YR4/4	-	Silty Clay	0	0	0	2 brown bottle glass shards, 1 clear bottle glass shard
006	11	I	0-25	10YR4/4	-	Silty Clay	0	0	0	-
006	12	I	0-30	10YR4/4	-	Silty Clay	0	0	0	1 clear non diagnostic bottle glass noted and discarded
006	13	I	0-30	10YR4/4	-	Silty Clay	0	0	4	1 grey and white glazed rim sherd 3 clear bottle glass shards
006	14	I	0-40	10YR4/4	-	Silty Clay	0	0	0	Sundry modern trash noted and discarded
006	15	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	16	I	0-15	10YR4/4	-	Silty Clay	0	0	0	-
006	17	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	18	I	0-10	10YR5/3	-	Silty Clay	0	0	0	-
006	19	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface
006	20	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub at surface One level
006	21	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	22	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	23	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub at surface
006	24	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	25	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	26	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	27	I	0-10	10YR5/3	-	Silty Clay	0	0	0	-
006	28	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	29	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	30	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub at surface One level
006	31	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	32	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	33	I	0-10	10YR5/2	-	Silty Clay	0	0	0	Sub on surface One level
006	34	I	0-10	10YR4/4	-	Silty Clay	0	0	0	Brown bottle glass noted and discarded
006	35	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Screwtop brown bottle glass shards found directly under sod cap noted and discarded 1 clear bottle glass shard also noted and discarded Sub on surface One level
006	36	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	37	I	0-10	10YR5/8	10YR6/2	Silty Clay	0	0	0	Disturbed One level
006	38	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
006	39	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	40	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	41	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Offset 3m south of tree Sub on surface One level
006	42	I	0-15	10YR4/3	-	Silty Clay	0	0	1	Molded ornamental glass frag
006	43	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	44	I	0-20	10YR4/4	-	Silty Clay	0	0	0	-
006	45	I	0-30	10YR4/4	-	Silty Clay	0	0	0	-
006	46	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	47	I	0-10	10YR4/4	-	Silty Clay	0	0	0	-
006	48	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
006	49	I	0-28	10YR4/4	-	Silty Clay	0	0	0	Deteriorated brick near surface
006	50	I	0-15	10YR4/4	-	Silty Clay	0	0	0	Shells noted and discarded
006	51	I	0-15	10YR4/4	-	Silty Clay	0	0	0	-
008	52	I	0-15	10YR4/4	-	Silty Clay	0	0	0	-
008	53	I	0-30	10YR4/4	-	Silty Clay	0	0	0	Oyster shell noted and discarded
008	54	I	0-20	10YR4/4	-	Silty Clay	0	0	0	-
010	55	I	0-20	10YR4/4	10YR5/3	Silty Clay	0	0	0	Also mottled with 10YR 5/8
011	56	I	0-10	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
013	57	I	0-30	10YR3/2	-	Silty Clay Loam	0	0	0	-
014	58	I	0-15	10YR5/3	-	Silty Clay	0	0	0	Sub on surface One level
015	59	I	0-5	10YR4/4	-	Silty Clay	0	0	0	Charcoal
017	60	I	0-20	10YR5/8	-	Sand	0	0	0	Sub on surface
017	61	I	0-20	10YR5/8	-	Sand	0	0	0	Sub on surface
018	62	I	0-23	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
019	63	I	0-30	10YR3/2	-	Silty Clay Loam	0	0	0	-
020	64	I	0-23	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	65	I	0-26	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	66	I	0-18	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	67	I	0-15	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	68	I	0-17	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	69	I	0-14	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	70	I	0-20	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	71	I	0-23	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	72	I	0-23	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	73	I	0-24	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	74	I	0-17	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	75	I	0-14	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	76	I	0-17	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	77	I	0-18	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	78	I	0-16	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	79	I	0-19	10YR5/6	-	Silty Clay	0	0	0	Sub on surface

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
020	80	I	0-16	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	81	I	0-17	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	82	I	0-19	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
020	83	I	0-20	10YR5/6	-	Sand	0	0	0	Sub on surface
020	84	no data	no data	no data	no data	no data	no data	no data	no data	no data
020	85	I	0-18	10YR5/6	-	Sand	0	0	0	Sub on surface
020	85	I	0-22	10YR5/6	-	Sand	0	0	0	Sub on surface
020	86	I	0-17	10YR5/6	-	Sand	0	0	0	Sub on surface
020	87	I	0-15	10YR5/6	-	Sand	0	0	0	Sub on surface
020	88	I	0-23	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
020	89	I	0-18	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
020	90	I	0-20	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	91	I	0-16	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	92	I	0-21	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	93	I	0-19	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	94	I	0-16	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	95	I	0-17	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	96	I	0-15	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	97	I	0-21	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	98	I	0-20	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	99	I	0-16	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
020	100	I	0-22	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
021	101	I	0-15	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
021	102	I	0-17	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
021	103	I	0-19	10YR5/2	-	Silty Clay	0	0	0	Sub on surface
021	104	I	0-14	10YR4/3	-	Silty Clay Loam	0	0	0	-
022	105	I	0-14	10YR6/6	-	Sandy Clay	0	0	0	Sub on surface
022	106	I	0-20	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
022	107	I	0-14	10YR5/6	-	Sandy Clay	0	0	0	Sub on surface
022	108	I	0-22	10YR6/6	-	Sandy Clay	0	0	0	-
023	109	I	0-14	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
023	110	I	0-25	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
023	111	I	0-23	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
023	112	I	0-22	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
023	113	I	0-14	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
023	114	I	0-23	10YR5/6	-	Silty Clay	0	0	0	Sub on surface
024	115	I	0-23	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
025	116	I	0-44	10YR5/4	-	Silty Clay Loam	0	1	0	Quartz Biface
025	116A	I	0-25	10YR5/4	-	Silty Clay Loam	1-A	0	0	-
025	116B	I	0-17	10YR5/6	-	Silty Clay Loam	1-A	0	0	-
025	116C	I	0-16	10YR5/6	-	Silty Clay Loam	1-A	0	0	-

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
025	116D	I	0-13	10YR5/6	-	Silty Clay Loam	0	0	0	-
025	117	I	0-16	10YR5/4	-	Silty Clay Loam	0	0	0	-
025	118	I	0-10	10YR5/4	-	Silty Clay Loam	0	0	0	-
025	119	I	0-14	10YR5/6	-	Silty Clay Loam	0	0	0	-
025	120	I	0-5	10YR5/6	-	Silty Clay Loam	0	0	0	-
025	121	I	0-15	10YR5/6	-	Silty Clay Loam	0	0	0	-
025	122	I	0-9	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	123	I	0-15	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	124	I	0-5	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	125	I	0-10	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	126	I	0-12	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	127	I	0-15	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	128	I	0-15	10YR5/6	-	Silty Clay Loam	0	0	0	-
026	129	I	0-12	10YR5/6	-	Silty Clay Loam	0	0	0	-
027	130	I	0-14	10YR6/4	-	Silty Clay	0	0	0	Sub on surface
027	131	I	0-16	10YR6/4	-	Silty Clay	0	0	0	Sub on surface
027	132	I	0-23	10YR4/6	-	Silty Clay Loam	0	0	0	Oyster shell
027	133	I	0-22	10YR4/8	-	Silty Clay Loam	0	0	0	-
027	134	I	0-9	10YR4/8	-	Silty Clay Loam	0	0	0	-
027	135	I	0-10	10YR4/8	-	Silty Clay Loam	0	0	0	-
027	136	I	0-12	10YR4/8	-	Silty Clay Loam	0	0	0	-
027	137	I	0-16	10YR6/2	-	Silty Clay	0	0	0	Sub on surface. In yard
027	138	I	0-17	10YR6/2	-	Silty Clay	0	0	0	Sub on surface. In yard
027	139	I	0-19	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
027	140	I	0-15	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
027	141	I	0-18	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
027	142	I	0-15	10YR6/2	-	Silty Clay	3-A	0	0	Sub on surface
027	143	I	0-18	10YR6/2	-	Silty Clay	0	0	0	Sub on surface
028	144	I	0-18	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	145	I	0-15	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	146	I	0-8	10YR5/4	-	Silty Clay	0	0	0	-
028	147	I	0-17	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	148	I	0-16	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	149	I	0-22	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	150	I	0-15	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	151	I	0-5	10YR5/4	-	Silty Clay	3-A	0	0	Gravel impass
028	152	I	0-17	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	153	I	0-16	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	154	I	0-16	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	155	I	0-18	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
028	156	I	0-15	10YR5/4	-	Silty Clay	0	0	0	Sub on surface

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
028	157	I	0-19	10YR5/4	-	Silty Clay	0	0	0	-
028	158	I	0-7	10YR5/4	-	Silty Clay	3-A	0	0	Sub on surface. Gravel impass
028	159	I	0-9	10YR5/4	-	Silty Clay	3-A	0	0	Sub on surface. Gravel impass
028	160	I	0-6	10YR5/4	-	Silty Clay	3-A	0	0	Sub on surface. Gravel impass
028	161	I	0-6	10YR5/4	-	Silty Clay	3-A	0	0	Sub on surface. Gravel impass
032	162	I	0-18	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
032	163	I	0-24	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
032	164	I	0-15	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
032	165	I	0-17	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
032	166	I	0-15	10YR5/4	-	Silty Clay	0	0	0	Sub on surface
032	167	I	0-17	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
032	168	I	0-19	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
032	169	I	0-19	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
032	170	I	0-15	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
032	171	I	0-16	10YR6/2	-	Sandy Clay	0	0	0	Sub on surface
033	172	I	0-23	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
033	173	I	0-18	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
033	174	I	0-16	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
033	175	I	0-17	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
033	176	I	0-19	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
034	177	I	0-22	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
034	178	I	0-17	10YR6/6	-	Loamy Sand	2-A	0	0	Sub on surface
034	179	I	0-16	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
034	180	I	0-16	10YR6/6	-	Loamy Sand	2-A	0	0	Sub on surface
034	181	I	0-15	10YR6/6	-	Loamy Sand	2-A	0	0	Sub on surface
034	182	I	0-16	10YR6/6	-	Loamy Sand	2-A	0	0	Sub on surface
035	183	I	0-18	10YR4/1	-	Loamy Sand	2-A	0	0	-
035	184	I	0-16	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	185	I	0-18	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	186	I	0-15	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	187	I	0-17	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	188	I	0-18	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	189	I	0-17	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	190	I	0-18	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	191	I	0-16	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	192	I	0-15	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
035	193	I	0-16	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
036	194	I	0-23	10YR5/8	-	Loamy Sand	0	0	0	Sub on surface
036	195	I	0-28	10YR5/2	-	Sandy Clay Loam	0	0	0	-
036	196	I	0-45	10YR5/2	-	Sandy Clay Loam	0	0	0	-
036	197	I	0-15	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

Survey Unit	Shovel Test #	Stratum	Depth (cm)	Soil Color	Mottling	Soil Texture	Rock Shape/ Abundance	Prehistoric Count	Historic Count	Comments
036	198	I	0-5	10YR6/8	-	Gravel	3-A	0	0	Sub on surface. Gravel impass
036	199	I	0-5	10YR6/8	-	Gravel	3-A	0	0	Sub on surface. Gravel impass
036	200	I	0-15	10YR6/8	-	Loamy Sand	0	0	0	Sub on surface
038	201	I	0-26	10YR6/4	-	Sandy Clay Loam	0	0	0	-
038	202	I	0-20	10YR6/4	-	Sandy Clay Loam	0	0	0	-
038	203	I	0-26	10YR6/4	-	Sandy Clay Loam	0	0	3	1 Brick, 1Whiteware, 1 Glass
038	203A	I	0-30	10YR6/4	-	Sandy Clay Loam	0	0	0	-
038	203B	I	0-32	10YR6/4	-	Sandy Clay Loam	0	0	4	2 whiteware body sherd, 1 olive body glass shard, 1 Nail
038	204	I	0-33	10YR6/4	-	Silty Clay Loam	0	0	4	1 Glass, 1 Shell, 1 Stoneware, 1 Nail
038	204A	I	0-35	10YR6/4	-	Sandy Clay Loam	0	0	0	-
039	205	I	0-36	10YR4/4	-	Sandy Clay Loam	0	0	0	-
039	206	I	0-18	10YR4/4	-	Sandy Clay Loam	0	0	0	-
039	207	I	0-28	10YR5/6	-	Loamy Sand	0	0	0	Sub on surface
040	208	I	0-34	10YR4/4	-	Sandy Clay Loam	0	0	0	-
041	209	I	0-25	10YR4/4	-	Sandy Clay Loam	0	0	0	-
041	210	I	0-27	10YR4/4	-	Sandy Clay Loam	0	0	0	-
042	211	I	0-35	10YR4/4	-	Sandy Clay Loam	0	0	0	-
042	212	I	0-32	10YR4/4	-	Sandy Clay Loam	0	0	0	Gravel impass
042	213	I	0-25	10YR4/4	-	Sandy Clay Loam	0	0	0	-
042	214	I	0-27	10YR4/4	-	Sandy Clay Loam	0	0	0	-

** Note: 1 rare, 2 common, 3 abundant,*
R rounded, SA sub-angular, A angular

APPENDIX C: ARTIFACT CATALOG

Catalog #	Period	SU	ST	Level	Site	Type	Material	Object	Portion	Color	Count	Exterior	Interior	Comments
001	Historic	006	008	I		Vessel	Glass	Bottle	Body	Clear	2	-	-	
002	Historic	006	008	I		Vessel	Glass	Bottle	Body	Brown	1	-	-	
003	Historic	006	008	I		Vessel	Glass	Bottle	Body	Green	3	-	-	
004	Historic	006	008	I		Furniture	Brass	Ornament	Complete	-	1	Abstract geometric motif	Clamps	Lunate with a spade-shaped appendage
005	Historic	006	013	I		Vessel	Glass	Bottle	Body	Clear	2	Molded lettering	-	1) "…[T]…" 2) "OZ"
006	Historic	006	013	I		Ceramic	Whiteware	Unidentified	Rim	White	1	Clear glaze	Clear glaze	Burned
007	Historic	006	042	I		Vessel	Glass	Unidentified	Unidentified	Clear	1	Faceted	Faceted	Rounded handle or finial fragment
008	Prehistoric	025	116	I	Isolate	Lithic	Quartz	Biface	Complete	Gray	1	-	-	Possible Scraper
009	Historic	038	203	I	44MT0185	Ceramic	Whiteware	Unidentified	Body	White	1	Clear Glaze	Clear Glaze	
010	Historic	038	203	I	44MT0185	Building	Brick	Brick	Fragment	Red	1	-	-	
011	Historic	038	203	I	44MT0185	Building	Glass	Window	Fragment	Clear	1	-	-	
012	Historic	038	203B	I	44MT0185	Ceramic	Whiteware	Unidentified	Body	White	2	Clear Glaze	Clear Glaze	
013	Historic	038	203B	I	44MT0185	Vessel	Glass	Bottle	Body	Olive	1	-	-	Wine bottle
014	Historic	038	203B	I	44MT0185	Building	Iron	Nail	Shank	-	1	-	-	
015	Historic	038	204	I	44MT0185	Ceramic	Salt-glazed Stoneware	Unidentified	Body	Gray paste	1	Clear salt glaze	Buff slip	
016	Historic	038	204	I	44MT0185	Building	Iron	Nail	Head and shank	-	1	-	-	
017	Historic	038	204	I	44MT0185	Building	Glass	Window	Fragment	Clear	1	-	-	

APPENDIX D: MAPBOOK

Mapbook Survey Unit Page Number Index

Survey Unit (SU)	Mapbook Page Number	Survey Unit (SU)	Mapbook Page Number
SU 001	1	SU 023 Start	25
SU 002	1	SU 023 End	26
SU 003	2	SU 024	26
SU 004	3	SU 025 Start	26
SU 005	3	SU 025 End	27
SU 006 Start	4	SU 026	27
SU 006 End	7	SU 027	27
SU 007	4	SU 028 Start	27
SU 008	7	SU 028 End	28
SU 009	8	SU 029	28
SU 010	9	SU 030	28
SU 011 Start	9	SU 031	28
SU 011 End	10	SU 032 Start	29
SU 012	12	SU 032 End	30
SU 013	13	SU 033	30
SU 014	13	SU 034 Start	30
SU 015	14	SU 034 End	31
SU 016 Start	14	SU 035	31
SU 016 End	15	SU 036	33
SU 017 Start	16	SU 037	34
SU 017 End	17	SU 038	34
SU 018	18	SU 039	35
SU 019	23	SU 040	35
SU 020 Start	25	SU 041	36
SU 020 End	26	SU 042	36
SU 021 Start	25	SU 043	38
SU 021 End	26	SU 044	39
SU 022 Start	25	SU 045	40
SU 022 End	26		

HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

SURVEY RESULTS MAPBOOK

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PS Pump Station

001 Shovel Test No.

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Date: 7/26/2022

0 100 200 300 400 Feet

0 25 50 75 100 Meters

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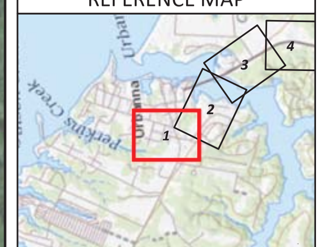

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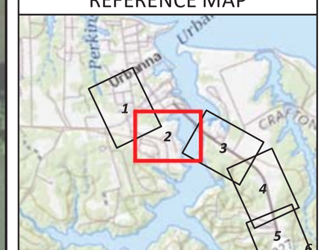

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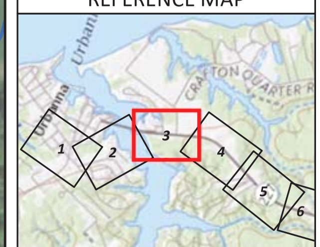

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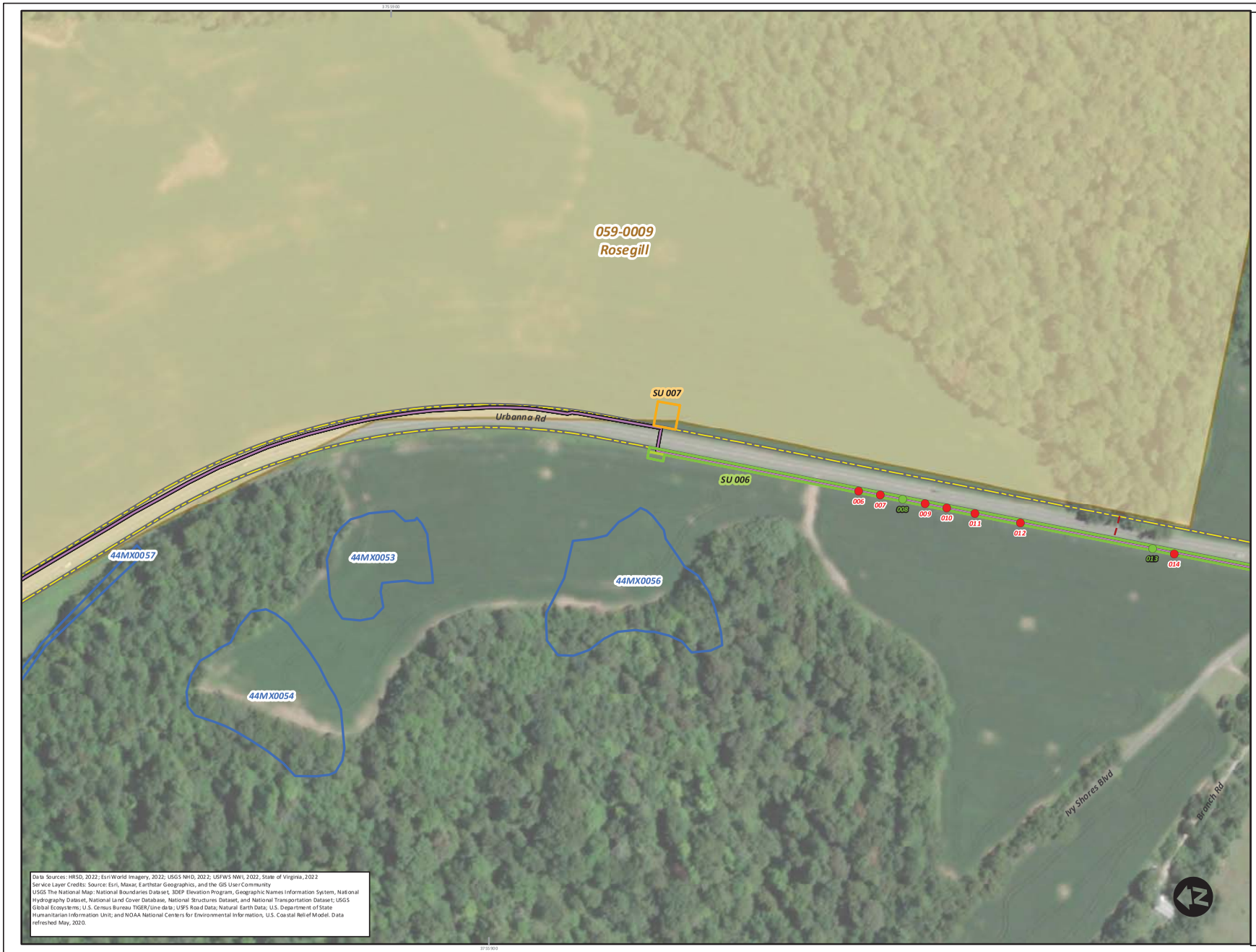

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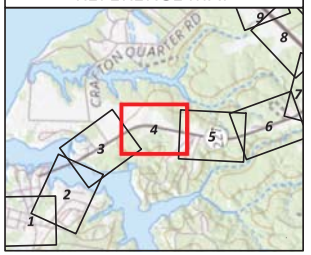

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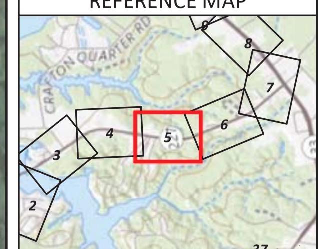

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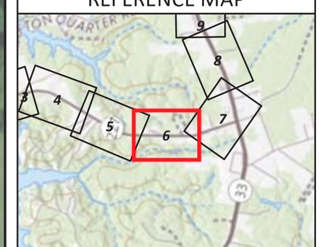

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HAMPTON ROADS SANITATION DISTRICT

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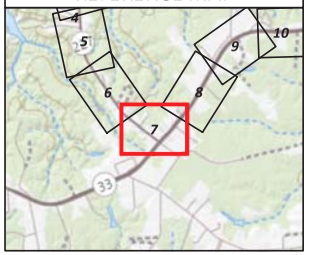

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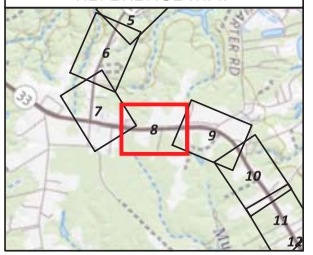

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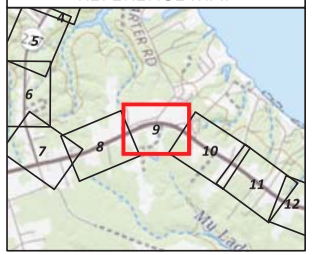

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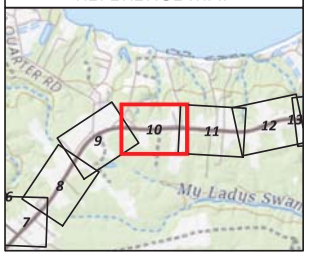

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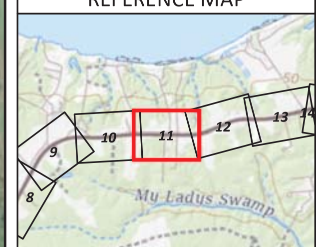

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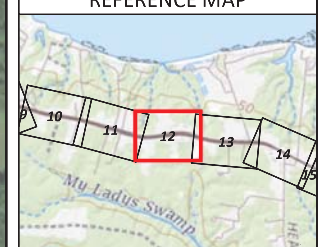

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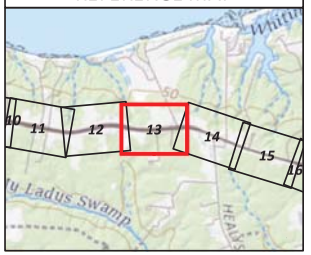
Date: 7/26/2022

0 100 200 300 400 Feet

0 25 50 75 100 Meters

REFERENCE MAP



HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK

PS Pump Station
001 Shovel Test No.
Shovel Test
- Negative
- Positive

SU1 Survey Unit No. SU = Survey Unit
Recently-Identified Archaeological Site
Survey Area
- Shovel Tested
- Pedestrian Walk-Over
- VDHR Archaeological Resource
- Channel (HRSD)
- Line (HRSD)
- Force Main (HRSD)
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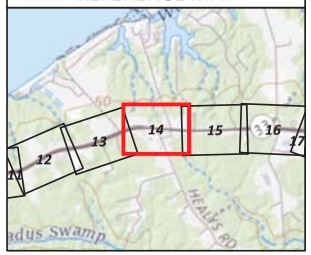

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PS Pump Station
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0 100 200 300 400 Feet
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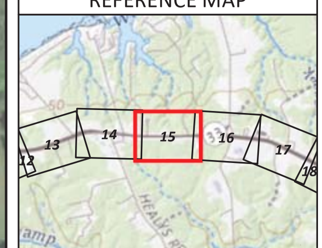

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

SURVEY RESULTS MAPBOOK

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PS Pump Station

001 Shovel Test No.

Shovel Test

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Survey Area

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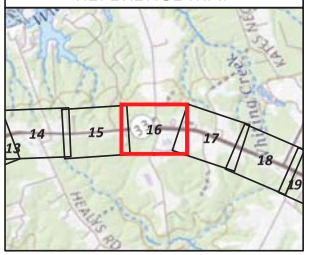

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

SURVEY RESULTS MAPBOOK

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HRSD

PS Pump Station

001 Shovel Test No.

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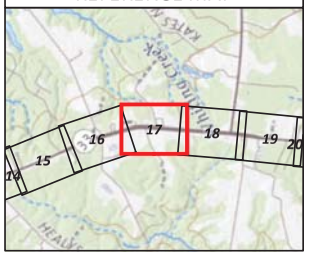

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
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Data Sources: HRSD, 2022; Esri World Imagery, 2022; USGS NHD, 2022; USFWS NWI, 2022, State of Virginia, 2022
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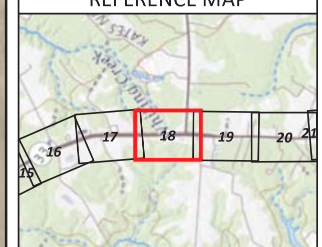

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
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PS Pump Station
001 Shovel Test No.
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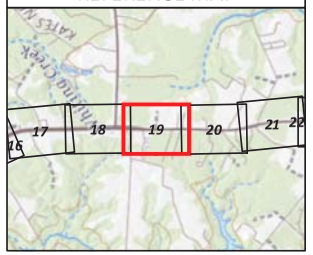

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HAMPTON ROADS SANITATION DISTRICT

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SURVEY RESULTS MAPBOOK
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0 100 200 300 400 Feet

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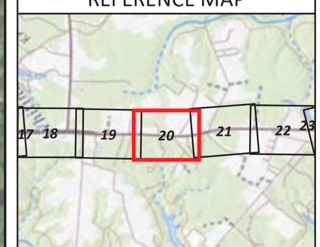

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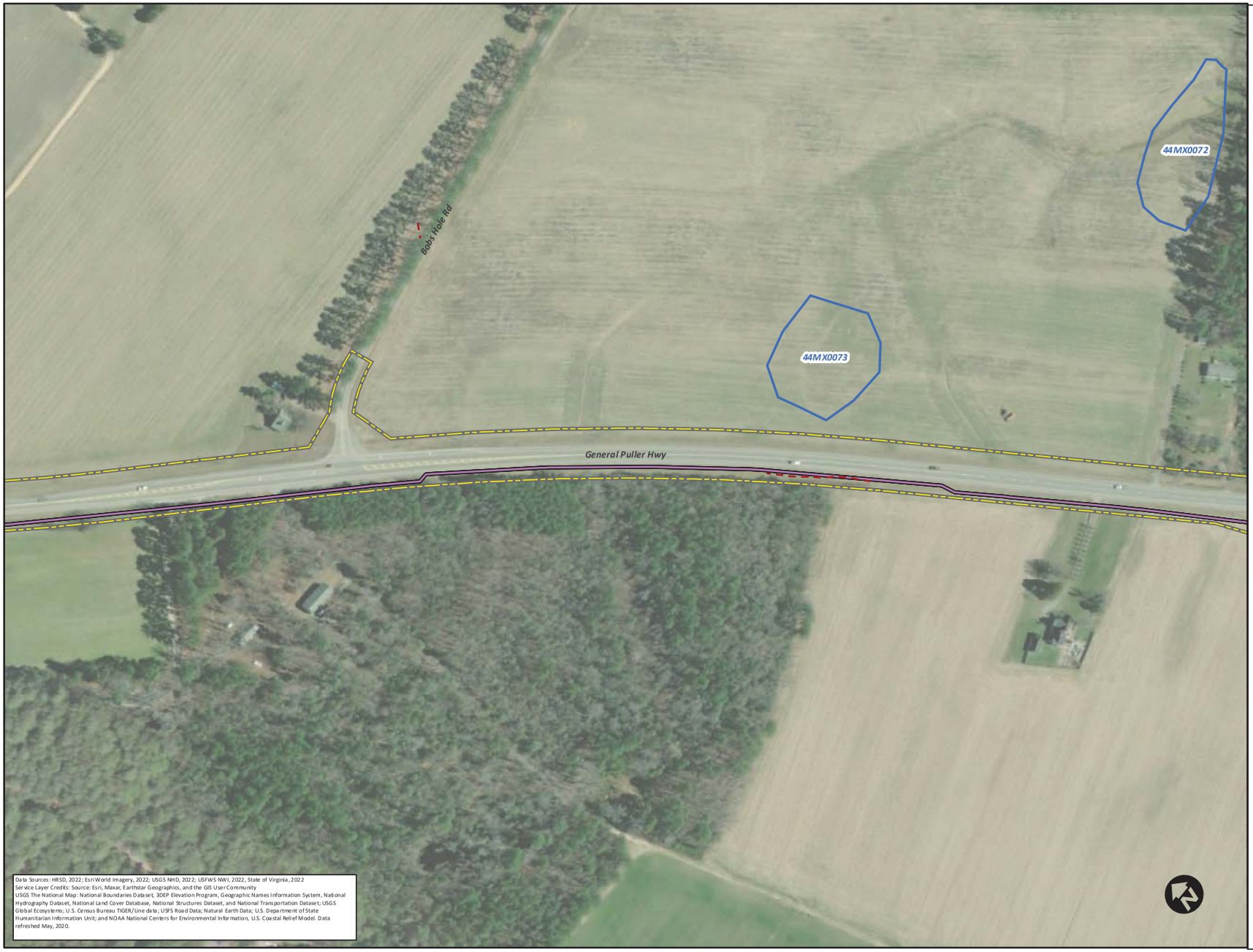

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
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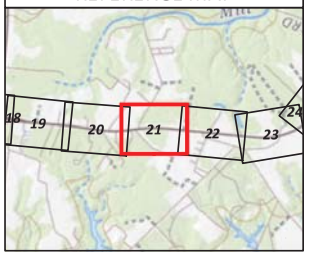

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR SURVEY RESULTS MAPBOOK

PAGE 22 OF 40

PS Pump Station
001 Shovel Test No.
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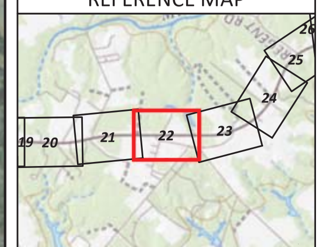

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR SURVEY RESULTS MAPBOOK

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0 100 200 300 400 Feet

0 25 50 75 100 Meters

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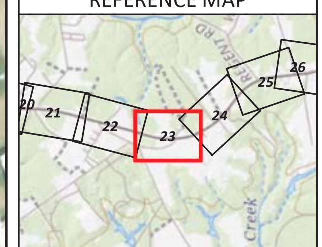

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
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PS Pump Station
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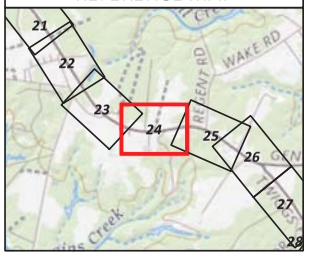

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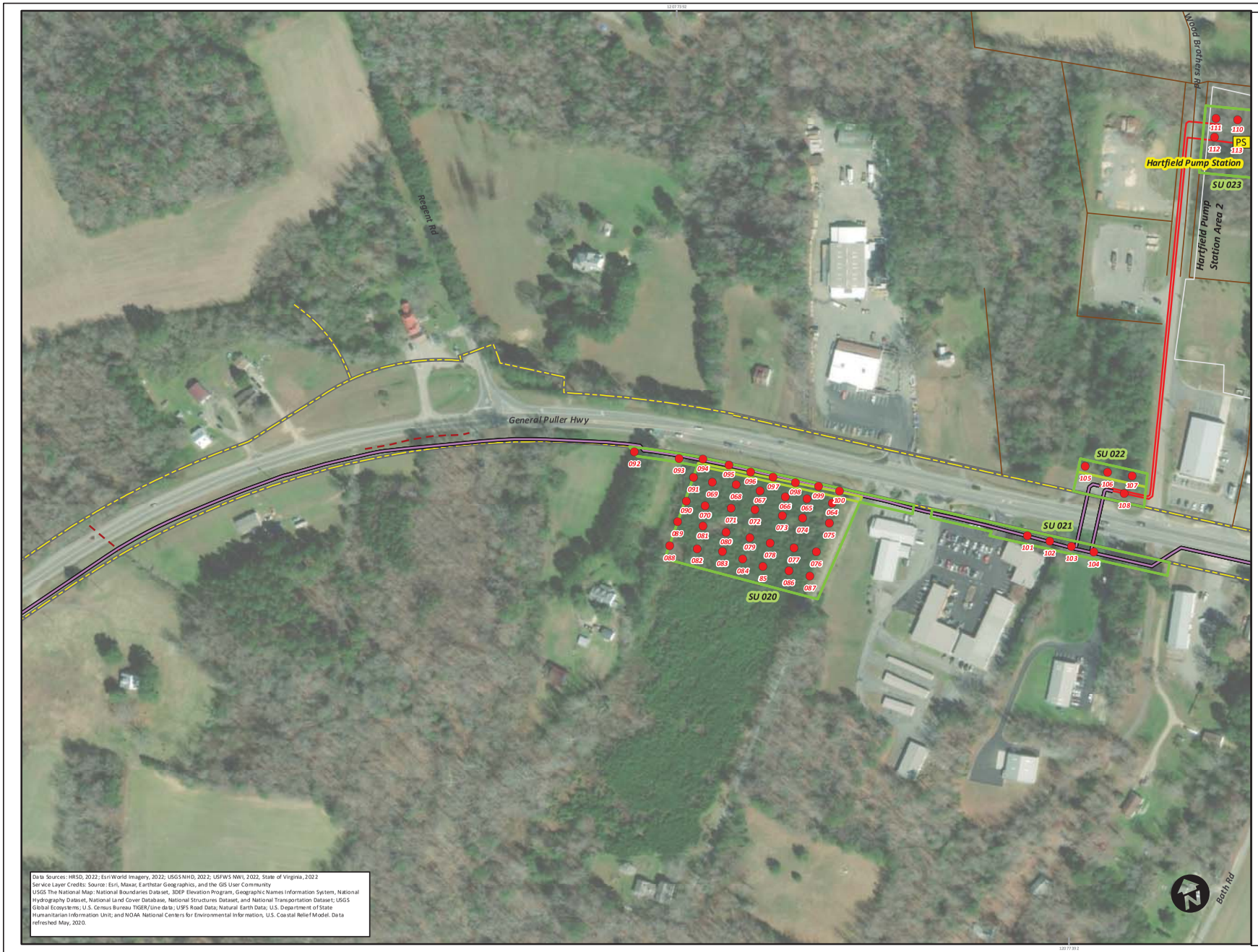

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
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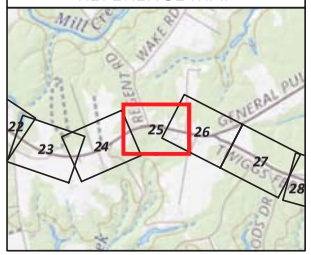

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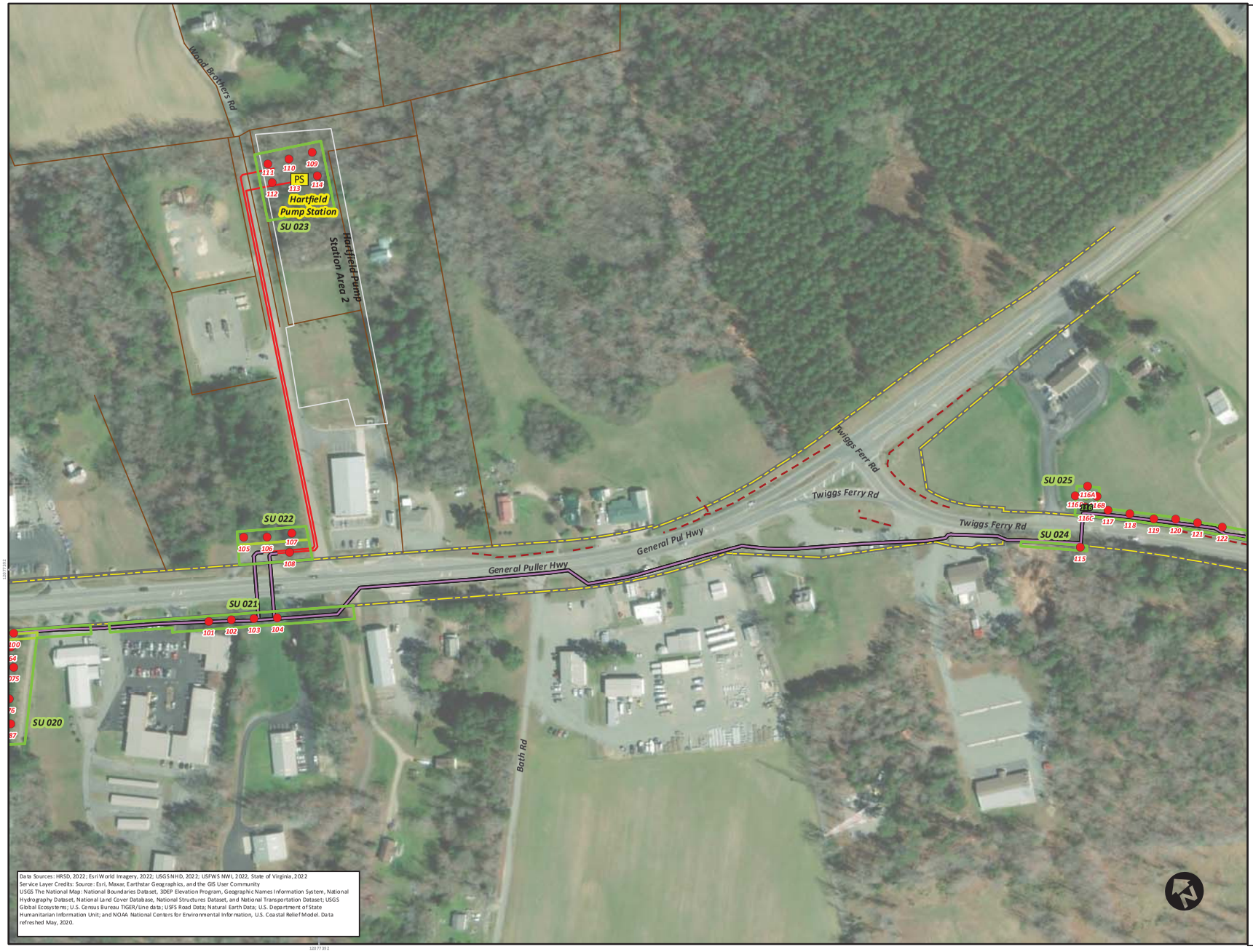

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MIDDLESEX INTERCEPTOR
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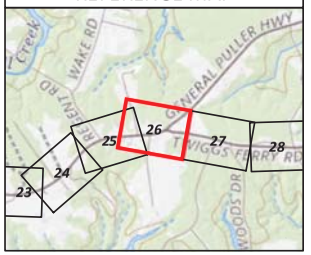

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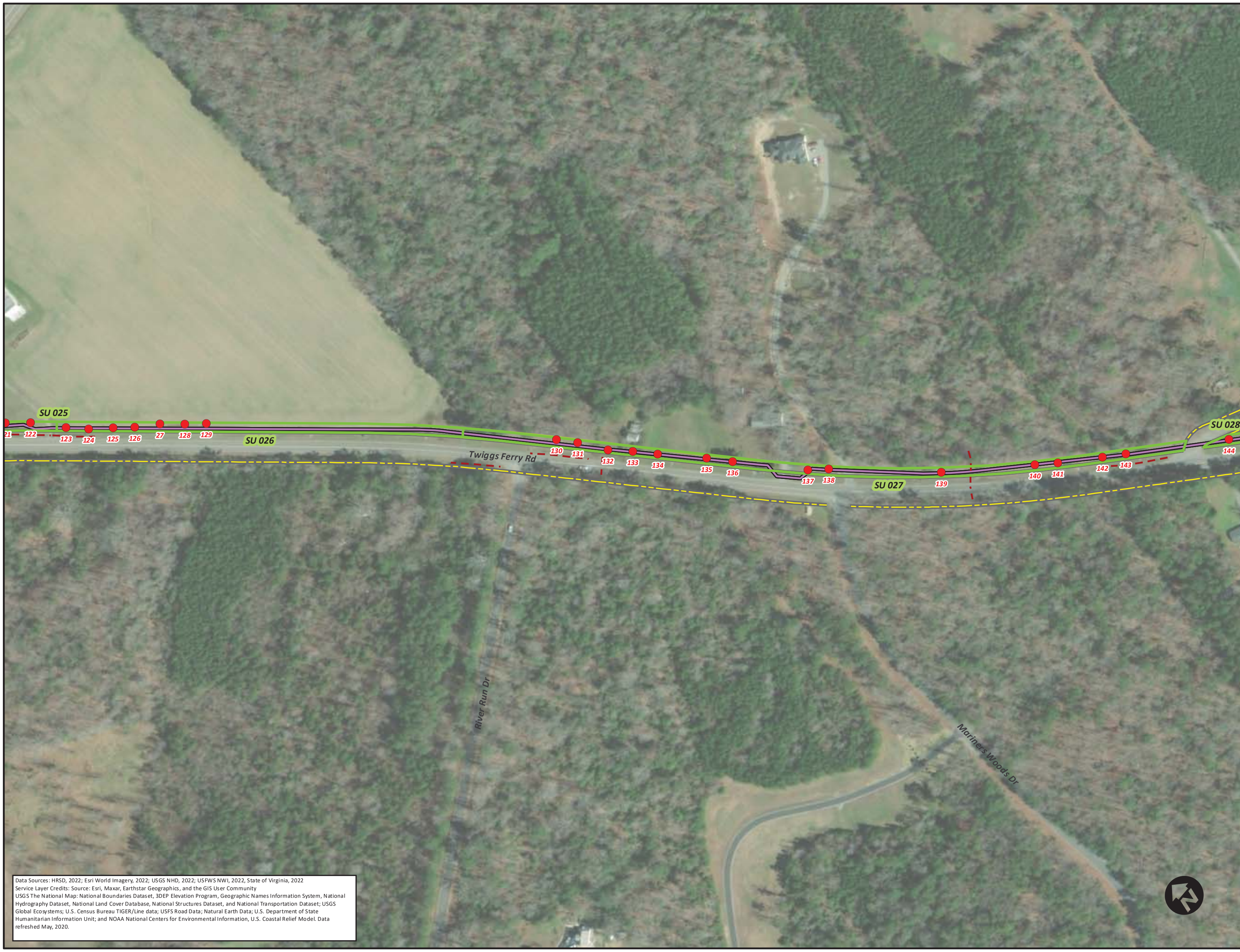
HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

SURVEY RESULTS MAPBOOK

PAGE 27 OF 40



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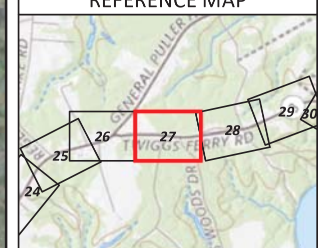

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK

- PS Pump Station
- 001 Shovel Test No.

Shovel Test
- Negative
- Positive
- SU1 Survey Unit No. SU = Survey Unit
- Recently-Identified Archaeological Site

Survey Area
- Shovel Tested
- Pedestrian Walk-Over
- VDHR Archaeological Resource
- Channel (HRSD)
- Line (HRSD)
- Force Main (HRSD)
- Parcel Line (HRSD)
- Property Line (HRSD)
- Hartfield Alignment (HRSD)
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- VDHR Architectural Resource (Approximated)

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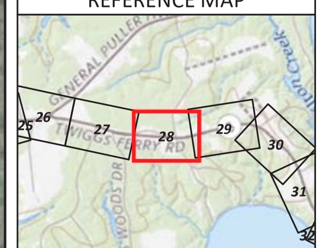
Date: 7/26/2022

0 100 200 300 400 Feet
0 25 50 75 100 Meters

REFERENCE MAP



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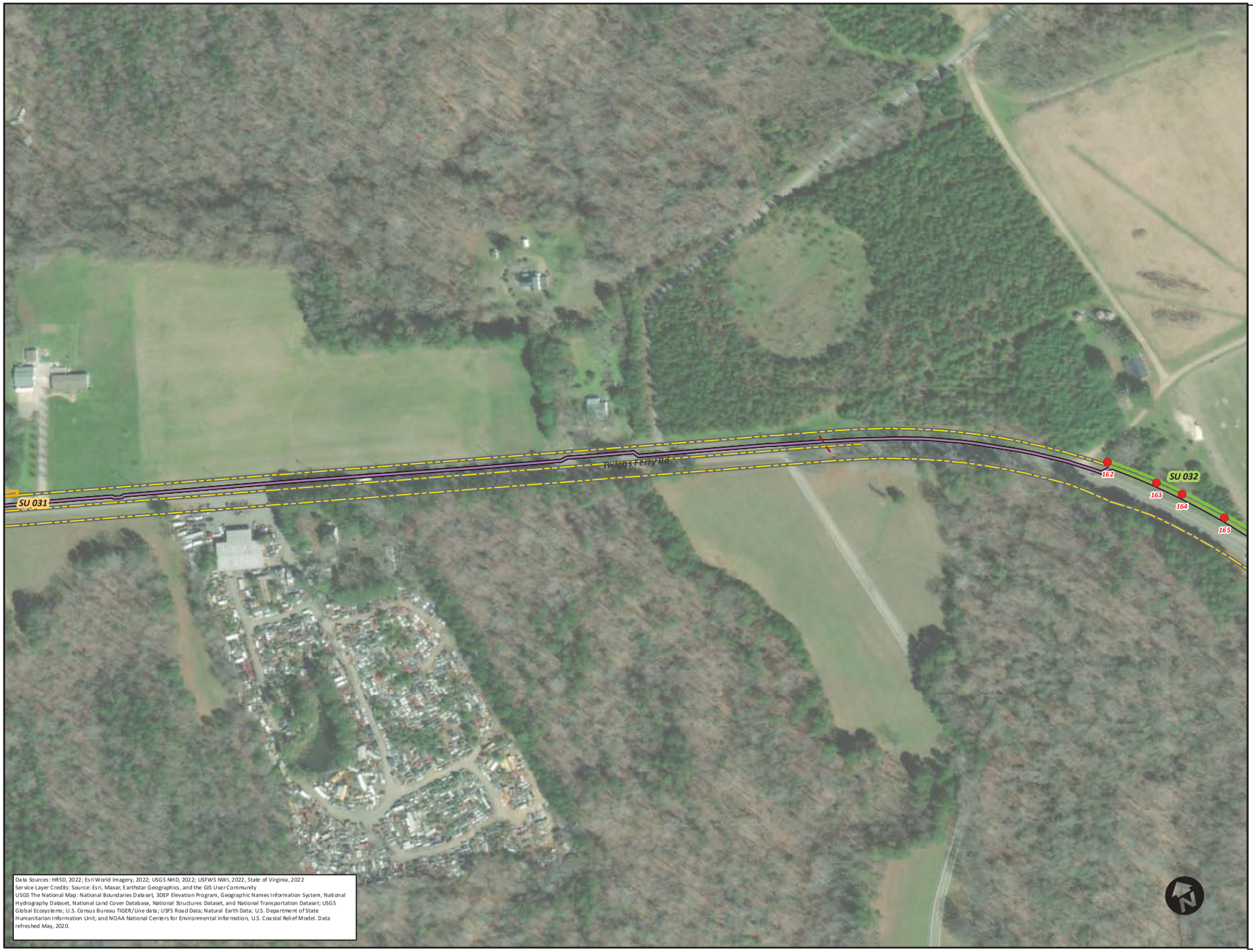

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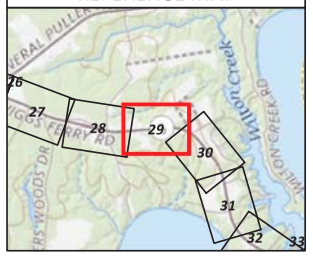

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
PAGE 30 OF 40

HRSD

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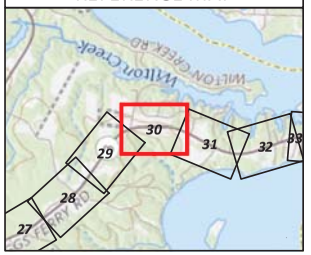

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
PAGE 31 OF 40

PS Pump Station
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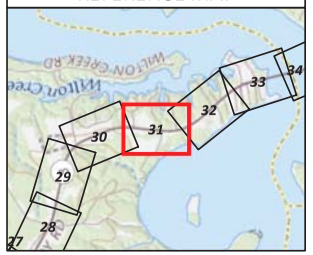

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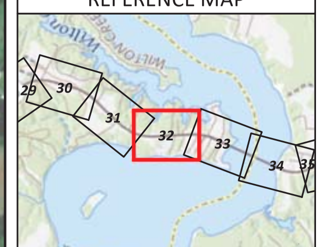

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
PAGE 33 OF 40

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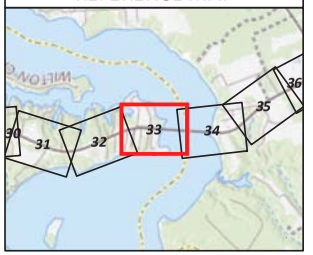

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
PAGE 34 OF 40

PS Pump Station
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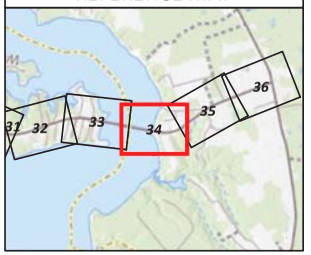

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
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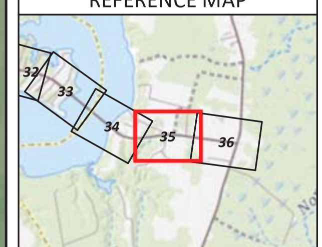

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
SURVEY RESULTS MAPBOOK
PAGE 36 OF 40

HRSD

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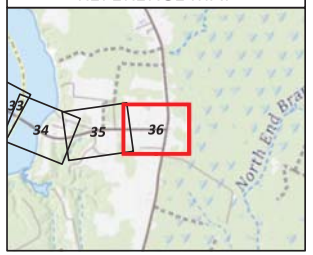

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

SURVEY RESULTS MAPBOOK

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PS Pump Station

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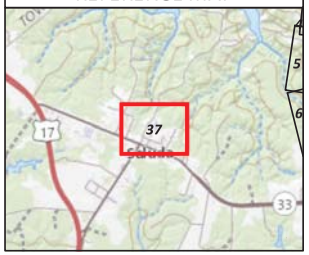

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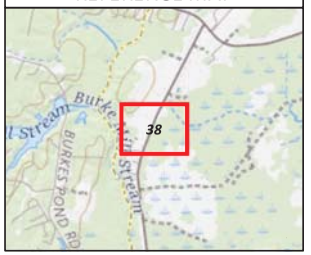

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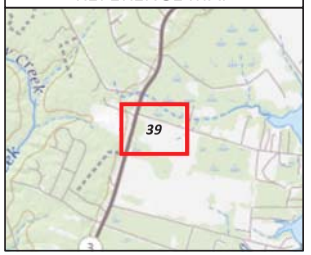

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HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR SURVEY RESULTS MAPBOOK

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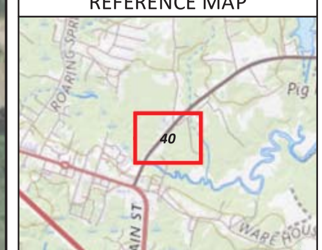

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APPENDIX E: RESUMES

TETRA TECH

Gail Ostapczuk, RPA
Social Scientist

EXPERIENCE SUMMARY

Gail Ostapczuk has worked on multiple cultural resource investigations throughout the Northeast and has also supported projects elsewhere in the United States in her 8 years of experience in cultural resource management. She has been involved in archaeological research projects that include historic, prehistoric, and urban resources. Her responsibilities include preparation of technical reports and artifact cleaning, storing, analysis, and prepping artifact collection for curation for diverse federal and state agencies including U.S. Army Corps of Engineers, National Park Service, Federal Energy Regulatory Commission, U.S. Forest Service, NJ Department of Environmental Protection, and NJ Department of Community Affairs and private clients such as NextEra Energy, Capital Power, Equitrans, and Glenn Springs Holding, Inc. She is responsible for data management and analysis, document review and production, and preparation of site forms and related materials. Additional tasks include performing background research, including site file searches and research for historic contexts, researching online data sources and materials available from state historic preservation offices, local museums, libraries, and other locations. Additionally, she is familiar with historic preservation and the National Historic Preservation Act Section 106 process. Mrs. Ostapczuk also utilizes Geographic Information Systems (GIS) to assist with field efforts and report drafting. In addition to working as field technician for archaeological surveys performing shovel testing, pedestrian surveys, and GPS mapping, she also conducts cultural resources reconnaissance to assess the need for Phase IB archaeological survey for projects.

CORPORATE PROJECT EXPERIENCE

Cultural Resources Specialist, March 2021–Present
Coastal Virginia Offshore Wind Commercial Project, Virginia Beach, VA

Cultural resource specialist for a proposed offshore wind commercial project. Responsibilities included reviewing historic maps, background literature, and state-maintained files to identify known archaeological resources up to 1 mile from the project and inventoried historic architectural resources up to 0.5 mile away. Additional responsibilities included utilizing Esri online databases for data management and electronic forms for field use.

Cultural Resources Specialist, May 2020–August 2020
LS Power Grid New York, Marcy to New Scotland Upgrade Project, Oneida, Herkimer, Montgomery, Schenectady, and Albany Counties, NY

Cultural resources specialist for a 93-mile-long transmission line upgrade project in New York State. Responsibilities included, but were not limited to, background research, subsurface testing and pedestrian survey of the entire existing corridor and substations, data and technology management, artifact analyses, as well as assisting with report preparation.

Cultural Resources Specialist, October 2018–June 2019
PSE&G AWL Transmission Line Project, Cultural Resources

EDUCATION

MA, Anthropology, Monmouth University, 2019

BS, Evolutionary Anthropology, Rutgers University, 2014

AREA OF EXPERTISE

Cultural Resource Management

Report Preparation

Artifact Collection and Analysis

Data Management

REGISTRATIONS/ CERTIFICATIONS

Registered Professional Archaeologist, NJ, Number 17986, Earned 6/7/19

TRAINING

ArcGIS Training; Rutgers University; 2015

CPR/First Aid/AED Training; 2019

Focus Four Training; 2018

New Jersey Historic Preservation Research Training; 2016

Project Management Level 1 Training; Tetra Tech; 2020

Sacred Sites Training; 2018

OSHA 10-Hour Construction Training; 2021

OFFICE

Parsippany, NJ

YEARS OF EXPERIENCE

8

YEARS WITHIN FIRM

7

Background Review, Cranford, Roselle, Linden, and Elizabeth, Union County, NJ

Cultural resource specialist for Phase IA cultural resources background review of the Aldene-Warinanco-Linden VFT (AWL) electric transmission project. Responsibilities included reviewing historic maps, background literature, and state-maintained files to identify known archaeological resources up to 1 mile from the project and inventoried historic architectural resources up to 0.5 mile away. Performed a cultural resources reconnaissance of the transmission corridor to assess the need, if any, for a Phase IB archaeological survey of the direct effects area of potential effects and/or for a reconnaissance-level architectural survey within 0.5 mile to assess indirect effects that might result from the AWL transmission line upgrade. Responsible for preparing the Phase IA report.

Cultural Resources Specialist, March 2018–April 2018
Waretown Family Apartments, Phase IB Archaeological Reconnaissance Survey, Waretown, NJ

Cultural resources specialist for studies of a multifamily housing project on approximately 4.2 acres in the Town of Waretown, Ocean County, New Jersey–known as the Waretown Family Apartment Project. Assignment include performing Phase IB archaeological reconnaissance survey within the identified area of potential effects. Assignments also include background research and site file review, field data management and analysis, report composition and production, as well as GIS support for figures within the final report.

Cultural Resources Specialist, April 2017–May 2017
USACE/Bloomsbury Dam Removal, Cultural Resources Survey, NJ

Cultural resources specialist support for cultural resource studies of the removal of the Bloomsbury Dam, on approximately 0.5 acre in the Borough of Bloomsbury, Hunterdon County, and Greenwich Township, Warren County, New Jersey. Assignments include performing Phase IB archaeological survey within the equipment staging area on the north bank of the Musconetcong River. Assignments also included creating mapping for use in the field, field data management and analysis, as well as document review and production.

Cultural Resources Specialist, April 2016–June 2017
Capital Power/Black Fork Wind Project, Cultural Resources Surveys, OH

Cultural resources specialist support preparation for cultural resource studies of a 180-megawatt wind project on approximately 20,000 acres in Crawford and Richland counties, Ohio. Assignments include field data management and analysis, document review and production, as well as cleaning, storing, and preparing collections of artifacts for curation as they come in from the field. Assignments also include performing Phase IB archaeological survey within the Project's direct Area of Potential Effects (APE).

Cultural Resources Specialist, April 2016–May 2016
NTE Connecticut, LLC/Killingly Energy Center, Cultural Resources Surveys, CT

Cultural resources specialist supporting preparation for cultural resource studies of a 550-megawatt electric generating facilities on approximately 72 acres in the Town of Killingly, Windham County, Connecticut. Assignments include performing Phase IB archaeological reconnaissance surveys within the identified archaeologically sensitive areas as well as undisturbed, non-wetland areas with slopes of less than 15 percent. Assignments also included field data management and analysis, document review and production, as well as cleaning, storing, and preparing collections of artifacts for curation as they come in from the field.

Cultural Resources Specialist, February 2015–present
Equitrans/Mountain Valley Pipeline LLC., Cultural Resources Surveys, WV and VA

Cultural resources specialist supporting preparation for cultural resource studies of a proposed 300-mile natural gas pipeline between Wetzel County, WV and Pittsylvania County, VA. Assignments include performing Phase IB archaeological reconnaissance survey's within the identified archaeologically sensitive areas as well as undisturbed, non-wetland areas with slopes of less than 15 percent, field data management and analysis, complying with FERC regulations and guidelines, data management, document review and production, preparation of site forms, as well as cleaning, storing, and preparing collections of artifacts for curation as they come in from the field. Assignments also include report composition and artifact analysis.

TETRA TECH

Adam S. Maskevich
Archaeologist

EXPERIENCE SUMMARY

Dr. Maskevich has more than twenty years of experience in all aspects of archaeological excavation, analysis, and report production. He has worked on a wide variety of both prehistoric and historic sites throughout the eastern United States as well as numerous projects abroad, primarily in the Middle East. Dr. Maskevich also has extensive teaching experience in archaeology at the university level. His experience in the classroom has helped him hone effective communication skills for interacting with the wide variety of clients, colleagues, stakeholders, and members of the public he encounters in the course of his work.

CORPORATE PROJECT EXPERIENCE

Principal Investigator, July 2021 – Present Dominion Energy, Coastal Virginia Offshore Wind, Virginia

Principal Investigator responsible for Phase IA and IB background research and archaeological testing of proposed onshore cable routes in Virginia Beach and Chesapeake, Virginia. The survey area covers 613 acres in the cities of Virginia Beach and Chesapeake, Virginia, including the cable landing location, onshore export cable route corridor, switching station, interconnection cable route corridor, and onshore substations. The initial Phase IA assessment involved reviews of site files and archaeological survey reports on file at the Virginia Department of Historic Resources, review of environmental and cartographic information relevant to the Project vicinity, and a pedestrian reconnaissance of accessible portions of the Area of Potential Effects. The Phase IB assessment, which commenced in July 2021 and is ongoing, includes both pedestrian survey and subsurface testing of all proposed cable routes and facility locations as well as study and curation of all artifacts recovered. The survey area encompasses a variety of landscapes including residential neighborhoods, military bases, industrial sites, agricultural fields, and woodlands. To date 2006 shovel tests have been dug along approximately 20 miles of the proposed route which have produced almost 500 artifacts.

Archaeologist, January 2018 – August 2022 Glenn Springs Holdings, Inc., Remedial Design Lower 8.3 Miles of the Lower Passaic River, Operable Unit 2, Essex, Hudson, Bergen and Passaic counties, Phase IA Terrestrial Archaeology Study, New Jersey

Conducted research on the history of manufacturing along the lower Passaic River from the 17th to the 20th centuries. This research, which included a variety of primary and secondary sources, focused on the environmental impact of industrial activities along the Passaic River. The information from this research was included in Tetra Tech's report of their remediation efforts. Also conducted archaeological monitoring including observation of subsurface disturbance and evaluation of those areas for the presence of archaeologically sensitive material. Both the areas of subsurface disturbance

EDUCATION

PhD, Near Eastern Archaeology, Johns Hopkins University, 2014

MA, Near Eastern Archaeology, Johns Hopkins University, 2004

BA, Anthropology, Rutgers University, 2000

AREA OF EXPERTISE

Archaeological Survey

Archaeological Excavation

Historical Research

REGISTRATIONS/ CERTIFICATIONS

Register of Professional Archaeologists, 17997, 2019

TRAINING

Red Cross Certified Wilderness First Aid Training, 2016

Forty-hour HAZWOPER Training, 2019

Ten-Hour OSHA Construction Training, 2021

Thirty-Hour OSHA Construction Training, 2021

Eight-hour HAZWOPER Refresher, 2021

First Aid CPR AED Training, 2021

National Safety Council Defensive Driver Course 2021

OFFICE

Parsippany, NJ

YEARS OF EXPERIENCE

25

YEARS WITHIN FIRM

7

and nearby architecture were recorded and photographed, and a report detailing the monitoring work was prepared for the client.

Field Director, May 2020 – March 2022 LS Power Grid New York LLC, Marcy to New Scotland Upgrade Project, New York

Field Director responsible for Phase IB archaeological testing of approximately 93 miles of existing utility-owned transmission line corridor in Oneida, Herkimer, Montgomery, Schenectady, and Albany Counties, New York. The purpose of this testing was to obtain information concerning archaeological resources to support both the client's application to the New York State Public Service Commission and the role of the Office of Parks, Recreation and Historic Preservation as a party to certification proceedings. Archaeological survey, primarily shovel testing, was conducted at 258 discrete locations determined to have high archaeological sensitivity based on computer modeling. Work on this project also involved contributions to a final report submitted to SHPO.

Archaeological Monitor, September 2020 – Present Confidential Client on a Historic Property listed as a National Historic Landmark in Manhattan, New York

Conducted archaeological monitoring including observation of work that involved subsurface disturbance and evaluation of those areas for the presence of archaeologically sensitive material. Both the areas of subsurface disturbance and nearby architecture were recorded and photographed, and a report detailing the monitoring work was prepared for the client.

Field Director, November – December 2020 Greens Corners Solar LLC, New York

Field Director responsible for Phase IB archaeological testing covering approximately 2,656 acres of privately-owned land consisting principally of agricultural cropland and woodland in Watertown and Hounsfield, Jefferson County, New York. The survey was conducted in advance of the construction of a solar facility consisting of solar panels on single-axis tracker racking, an electrical substation, underground cabling, access roads, and perimeter fencing. The purpose of this testing was to obtain information concerning archaeological resources to support both the client's application to the New York State Public Service Commission and the role of the Office of Parks, Recreation and Historic Preservation as a party to certification proceedings. Archaeological survey consisting of shovel testing and pedestrian reconnaissance was conducted at locations where construction would result in substantial subsurface disturbance and which were determined to have high archaeological sensitivity based on computer modeling. Work on this project also involved writing the final report submitted to SHPO.

Field Director, September – November 2019 Rising Solar LLC, New York

Field Director responsible for the Phase IB archaeological testing of a proposed 139-acre solar array in Orange County, New York. The Phase IB survey consisted of subsurface testing and pedestrian survey of the project area with particular attention to portions that would be subject to significant disturbance by construction activities. After the completion of fieldwork contributed to the final report submitted to SHPO.

Field Director, October 2015 – October 2019 Mountain Valley Pipeline Project, Virginia and West Virginia

Field Director in charge of Phase I and Phase II archaeological testing for 100 miles of proposed pipeline corridor in southwest Virginia portion of the Project since October 2015. The entire proposed pipeline covers approximately 303 miles in VA and WV. Testing strategy includes pedestrian survey, shovel testing, and, when warranted, limited excavation. Numerous prehistoric and historic sites have been identified along the length of the proposed pipeline corridor. Responsibilities include organizing and executing fieldwork, coordinating with subcontractors and other environmental surveys, and engaging with landowners, law enforcement, and local stakeholders, artifact laboratory analysis, report preparation, and monitoring of culturally sensitive areas during construction. Work has been performed in compliance with Section 106 of the National Historic Preservation Act, 1966, as amended.

Archaeologist, June 2018 Summit Ridge Energy LLC, Solar Projects, Cultural Assessment and Phase I Survey, Illinois

Conducted environmental, geological, and historical background research on two potential solar farm sites for Summit Ridge Energy in Lee County, Illinois. Coordinated Phase I archaeological survey at both sites and prepared the subsequent report submitted to SHPO.

TETRA TECH

Sydne Marshall, PhD, RPA
Consulting Social Scientist

EXPERIENCE SUMMARY

Dr. Marshall has over 40 years of experience in the investigation and management of cultural resources including archeological and architectural properties. She serves as Cultural Resources Discipline Lead, responsible for evaluating technical requirements of projects and assisting project managers in addressing cultural resources issues on their projects. Her technical responsibilities include performing NHPA Section 106 review studies, developing National Register of Historic Places nominations for significant historic properties, designing and implementing field investigations, performing peer reviews of staff and subcontracted deliverables, providing environmental input to engineers, and developing project impact assessments. Management activities include project management, responsibility for technical work completed by staff and subcontractors, and coordination of cultural resources studies with multidisciplinary environmental analyses. Dr. Marshall has more than 20 years of experience as a Community Outreach Specialist. Responsibilities include a full range of community relations activities associated with numerous USEPA Superfund sites, USACE Installation Restoration Programs (IRPs), USFWS and commercial client projects.

SELECTED CORPORATE PROJECT EXPERIENCE

Equinor, Empire Wind Project, Kings and Nassau Counties, NY and Monmouth County, NJ

Provide oversight of upland archaeological and historic architecture program for this offshore wind project. Multiple routes and landfalls under consideration to transmit energy from offshore turbines to three upland substations. At least one route extends through a National Register Historic District. Project involves reviews by State Historic Preservation Offices in NY and NJ.

PennEast Pipeline Company, LLC., PennEast Pipeline Third-Party FERC EIS, PA and NJ

Cultural resources lead for this third-party EIS written under direction of the Federal Energy Regulatory Commission in compliance with NEPA and Section 106 of the National Historic Preservation Act. Project comprises 120 miles of 36-inch-diameter natural gas pipeline. Cultural resources issues addressed numerous rural historic districts, archaeological sites, aboveground resources eligible or listed in the National Register of Historic Places, and many concerns expressed by local stakeholders regarding cultural resources Project impacts.

U.S. Army Corps of Engineers U.S. Army Corps of Engineers, Philadelphia District, Phase I Cultural Resources Investigation, Bloomsbury Dam Removal Cultural Resources Investigation, NJ

Lead cultural resources specialist and Project Manager for this review of potential effects to archeological and aboveground cultural resources that may result from the implementation of plans to remove the Bloomsbury Dam from the Musconetcong River, Bloomsbury, Hunterdon County and Greenwich Township, Warren County, New Jersey. Field tasks included

EDUCATION

PhD, Anthropology, Columbia University, 1981

MPhil, Anthropology, Columbia University, 1975

MA, Anthropology, Columbia University, 1974

BA, Anthropology, The American University, 1972

AREA OF EXPERTISE

Cultural resource management

NHPA Section 106 reviews

Archaeology and historic architecture studies

Project management

Community outreach

REGISTRATIONS/ CERTIFICATIONS

Registered Professional Archaeologist, Earned 8/6/85

TRAINING

24-Hour Federal Bureau of Investigation Location of Human Remains Training Course; 1991

Environmental Review and Compliance for Natural Gas Facilities; Federal Energy Regulatory Commission; 2013

40-Hour OSHA Hazardous Waste Health and Safety Training; 1986

8-Hour OSHA Hazardous Waste Health and Safety Refresher Course; 2022

8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training; 2022

OFFICE

Parsippany, NJ

YEARS OF EXPERIENCE

48

YEARS WITHIN FIRM

39

archaeological and historic architectural surveys. A report was provided for review by both the U.S. Army Corps of Engineers rand the New Jersey Historic Preservation Office.

Equitrans, LP, Mountain Valley Pipeline Project (MVP), WV and VA

Cultural resources lead for this 300-mile, 42-inch-diameter natural gas pipeline. The project is a joint venture of Equitrans, LP with NextEra Energy Resources. Cultural resources support includes consultation with the State Historic Preservation Offices in WV and VA, development of scopes of work for archaeology studies and historic architecture studies and overseeing the implementation of these scopes, Native American outreach, and consultation with the US Forest Service–Jefferson and Washington National Forests and the National Park Service–Blue Ridge Parkway Unit. Work is performed in compliance with the state guidelines of WV and VA and guidelines of the Federal Energy Regulatory Commission (FERC). Tetra Tech staff will develop Resource Report 4, as required by FERC, based on the results of all studies performed. Also participated in 14 community outreach meetings throughout the Project area.

Dominion Energy Services, Inc., Tazewell Hybrid Energy Center, Tazewell County, VA

Lead for cultural resources program for this combined pumped storage and solar energy project. Overseeing Dominion's cultural resources contractor. Phase I survey performed to identify presence of cultural resources that may be eligible to the NRHP. Also assisting Dominion with outreach to Native American tribes who may have cultural concerns about the proposed Project. Preparing documents for submission as part of FERC permit application.

U.S. Army Corps of Engineers Philadelphia District, Phase IA Cultural Resources Investigations, Beneficial Use of Dredged Material for the Delaware River, Delaware Bay Coast, DE

Lead cultural resources specialist and project manager for study of potential effects of dune and berm construction from dredged material to provide coastal storm damage reduction at eight beaches in the state of Delaware along the Delaware Bay Coast. The project involved cultural resources file reviews; research of archaeology, historic community development (including consideration of historic architecture), and research related to shoreline changes over time; assessment of the archaeological sensitivity of areas to be affected; and recommendations for further research. Report produced was provided for review and comment to the U.S. Army Corps of Engineers and the Delaware State Historic Preservation Office.

Glenn Springs Holdings, Inc., Remedial Design – Lower 8.3 Miles of Lower Passaic River, OU2 of Diamond Alkali Superfund Site, Essex, Hudson, Bergen and Passaic Counties, NJ

Lead for cultural resources program to assist EPA in demonstrating substantive compliance with ARARs including Section 106 of National Historic Preservation Act. Cultural resources tasks include consultation with NJ Historic Preservation Office, and performance of studies to address potential Project effects to terrestrial archaeology, aboveground cultural resources, and marine archaeology. Terrestrial archaeology and historic architecture concerns focused on consideration of placement of sedimentation processing facility within location of a National Register of Historic Places Historic District. Stage IA underwater evaluation identified 13 potential cultural sites of interest. Subsequent Stage IB diving determined that the targets do not meet the criteria to be eligible to the NRHP. Area of potential effects includes 8.3 river miles shore to shore of Passaic River, upland areas where facilities will be constructed to process dredged river sediment, and proximal areas where the Project may affect National Register of Historic Places –listed and eligible properties

PROFESSIONAL ACCOMPLISHMENTS

Recipient of '2010 Award Towards Excellence' from Greater Hudson Heritage Network, For the innovative website The Army's Century on Davids Island: Fort Slocum, New Rochelle, NY'. The award was in recognition of the collaborative effort to preserve, document and make accessible an important part of New Rochelle history. Website address - http://davidsisland.westchesterarchives.com.

Awarded Commander's Certificate of Appreciation in recognition of outstanding dedication and lasting contribution to Davids Island/Fort Slocum Restoration in December 2008 from US Army Corps of Engineers New York District.

Awarded Certificate of Appreciation for Assistance in implementing community outreach efforts in October 1999 from the United States Fish and Wildlife Service.

Phase I Reconnaissance Level Historic Architectural Survey

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main Project, Middlesex, Mathews, and Gloucester Counties, Virginia

VDHR File # 2020-5020

Prepared for

HRSD

1434 Air Rail Avenue
Virginia Beach, Virginia 23455

Prepared by

TETRA TECH

6 Century Drive, Suite 300
Parsippany, New Jersey 07054

July 2022

EXECUTIVE SUMMARY

Tetra Tech, Inc. (Tetra Tech), under contract to the Hampton Roads Sanitation District (HRSD), has prepared this Phase I Reconnaissance Level Historic Architectural Survey Report to assist HRSD in the managementf potential Project impacts to historic architectural resources that are listed in the National Register of Historic Places (NRHP), are NRHP-eligible or potentially eligible for listing. HRSD proposes to construct the Middlesex Interceptor System Program II – Urbanna to Mathews Transmission Force Main Project in Middlesex, Mathews, and Gloucester counties, Virginia. As HRSD intends to utilize funding from the Virginia Clean Water Revolving Loan Fund (CWRLF), a National Environmental Policy Act (NEPA) Environmental Assessment is being prepared for this project in accordance with CWRLF requirements. Tetra Tech is assisting HRSD with a Tidewater Joint Permit Application and Jurisdictional Determination Request. In its letter of February 3, 2021 to E. Foster (Tetra Tech), Virginia Department of Historic Resources (VDHR) directed HRSD to perform a Phase I reconnaissance level historic architecture survey to identify potential NRHP-listed and -eligible properties that may be impacted by the Project. The project is being reviewed by VDHR as File No. 2020-5020 under section 106 of the National Historic Preservation Act (NHPA), as amended.

Tetra Tech documented 56 historic resources 50 years old or older that may have views of the Project in proximity to the five proposed pump stations and along sections of the proposed force main that represent new Virginia Department of Transportation (VDOT) easements. Tetra Tech documented 29 newly identified historic architectural resources plus 27 historic architectural resources already recorded in VDHR's Virginia Cultural Resources Information System (V-CRIS), its online database of recorded cultural resources.

Based on analysis of resource characteristics and criteria of eligibility, Tetra Tech recommends two previously recorded resources (VDHR Nos. 059-0042 and 059-5061) for further research to determine whether they possess the qualities of significance to be eligible for listing in the NRHP. Five resources (059-5124, 316-0009, 059-0009, 059-0010, and 059-0078) already have been listed or determined eligible for listing in the NRHP, and no change is recommended in the NRHP status of these resources. Four resources (059-5124-0003 [Antioch Baptist Church, cemetery, and school] and 316-0009-0095) previously have been recommended as contributing resources to historic districts and have not been individually evaluated for eligibility. Tetra Tech recommends that these four resources retain their present status. The remaining 45 documented resources are recommended not eligible for listing in the NRHP. VDHR numbers for the 29 newly identified resources are pending.

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Acronyms and Abbreviations

APE	Area of Potential Effects
CWRLF	Clean Water Revolving Loan Fund
HRSD	Hampton Roads Sanitation District
NRHP	National Register of Historic Places
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
VCRIS	Virginia Cultural Resources Information System
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation

1.0 INTRODUCTION

On behalf of the Hampton Roads Sanitation District (HRSD), Tetra Tech, Inc. (Tetra Tech) conducted a Phase I reconnaissance level architectural survey for the proposed Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project, located in Middlesex, Mathews, and Gloucester counties, Virginia (Figure 1). The survey, conducted in June 2022, included five pump station locations and easements along public rights-of-way in Middlesex and Gloucester counties. As HRSD intends to utilize funding from the Virginia Clean Water Revolving Loan Fund (CWRLF), a National Environmental Policy Act (NEPA) Environmental Assessment is being prepared for this project in accordance with CWRLF requirements. Tetra Tech is assisting HRSD with a Tidewater Joint Permit Application and Jurisdictional Determination Request. In its letter of February 3, 2021 to E. Foster (Tetra Tech), VDHR directed HRSD to perform a Phase I reconnaissance level historic architecture survey to identify potential NRHP-listed and -eligible properties that may be impacted by the Project. The project is being reviewed by the Virginia Department of Historic Resources (VDHR) as File No. 2020-5020 under Section 106 of the National Historic Preservation Act (NHPA), as amended.

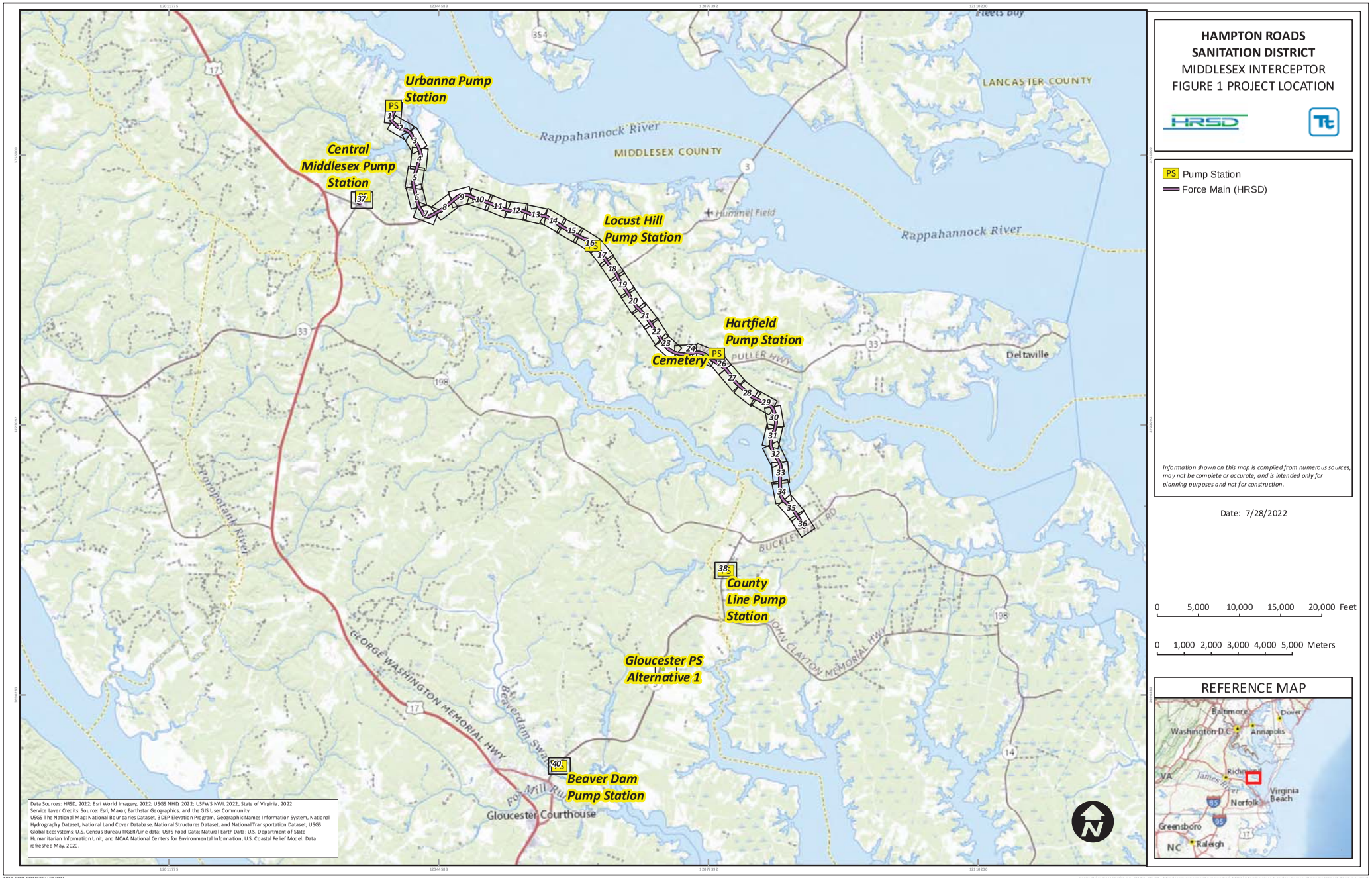
1.1 Description of Undertaking

The project will consist of a new sewage conveyance system that includes a small diameter transmission force main that extends 3.2 miles from Urbanna to Cook's Corner and approximately 13 miles along Route 33 (General Puller Highway) 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 new force main will convey wastewater from Middlesex County to HRSD's York River Treatment Plant and enable decommissioning of both the existing HRSD Urbanna and Central Middlesex Wastewater Treatment Plants. The new system will consist of a transmission force main, pump stations, and equalization tanks. The project will also provide for future connections to the Topping Service Area near the Route 3/Route 33 intersection, Christchurch Service Area, and the Deltaville Service Area near Hartfield along General Puller Highway.

From the southern terminus of the project at the intersection of Twiggs Ferry Road and Buckley Hall Road (Route 3/198), flows from the Middlesex Transmission Force Main discharge into the Mathews Transmission Force Main and then into the Gloucester Interceptor Force Main before discharging into the Yorktown Interceptor Force Main and the York River Influent Force Main to the York River Wastewater Treatment Plant.

Because of the long distances required to convey the wastewater, the Middlesex Interceptor System Program Phase II will require new pump stations and equalization along the force main, as well as upgrades at existing pump stations along the route to provide optimum operation of the proposed Middlesex Interceptor System. The proposed force main comprised of 8-inch DR11 HDPE (continuous joint-less pipe) is designed to be placed at a depth of no more than 14 feet and located within and parallel to the Virginia Department of Transportation (VDOT) right-of-way. The force main will be placed utilizing horizontal directional drilling where it crosses Urbanna Creek and the Piankatank River.

The Central Middlesex Wastewater Treatment Plant in Saluda, Virginia, will be decommissioned and replaced with a pump station and force main from the site on the Middlesex Regional Jail property,



HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR

FIGURE 1 PROJECT LOCATION

PS Pump Station

Force Main (HRSD)

Information shown on this map is compiled from numerous sources, may not be complete or accurate, and is intended only for planning purposes and not for construction.

Date: 7/28/2022

0 5,000 10,000 15,000 20,000 Feet

0 1,000 2,000 3,000 4,000 5,000 Meters

REFERENCE MAP

NOT FOR CONSTRUCTION

along Oakes Landing Road to the intersection with Bowden Street, and east on Bowden Street to a connection with an existing 3-inch HDPE force main. New pumps and controls will be required at the Cook's Corner Pump Station to meet the new operating conditions.

The Urbanna Wastewater Treatment Plant will be decommissioned and replaced with a gravity sewer system and pump station located adjacent to Tabor Park near Linden Avenue in the Town of Urbanna. The proposed locations of the new pump stations are: Locust Hill which is to be located off of General Puller Highway east of Clare Walker Middle School; Hartfield which is to be located off of Wood Brothers Road; and Gloucester, which is to be located on the eastern side of the intersection of John Clayton Memorial Highway and Waverley Lane (Route 694) (Figure 1).

1.2 Area of Potential Effects (APE)

The Area of Potential Effects (APE) for historic architectural resources (including historic structures, districts, landscapes and cemeteries) consists of geographical areas where the pipeline may have direct or indirect effects. Direct effects may occur where the pipeline crosses the boundary of a National Register of Historic Places (NRHP) listed or eligible property. Indirect effects may occur outside NRHP boundaries but still have the potential to affect historic resources. Indirect effects include the introduction of visual, audible, or atmospheric elements that are incompatible with a resource's historic character. In the case of the Middlesex Interceptor project, indirect effects would primarily be visual ones, where the pipeline or cleared easement would be visible from a listed or eligible property and diminish the special qualities that qualify the resource for the NRHP.

The APE for historic architectural resources for the project comprised those areas that would have a direct line-of-sight to the project. During a meeting held on March 22, 2022 to discuss the project, Tetra Tech and VDHR agreed that the historic architecture survey would inventory properties within a 0.25-mile radius (the "Study Area" comprising approximately 55.5 acres) of each proposed pump station, although the actual APE could well be far smaller in size than implied by the defined Study Area. The APE for new easements along VDOT rights-of-way encompassed properties immediately adjacent to the project alignment.

2.0 BACKGROUND RESEARCH AND SURVEY METHODOLOGY

2.1 Purpose and Methods

The purpose of the Phase I reconnaissance level survey was to document all historic architectural properties within the APE that are 50 years old or older and to make recommendations for NRHP eligibility or further investigations. First, Tetra Tech conducted a review of VDHR's Virginia Cultural Resources Information System (V-CRIS), its online database of recorded cultural resources.to identify previously recorded architectural properties within the APE. V-CRIS contained records of 27 architectural properties within the APE, including two historic districts (Urbanna and Saluda) two large estates (Rosegill and Wilton), plus 23 individual architectural properties. The identified property locations were compared with historic and current aerial imagery to determine whether they had undergone significant modifications in footprint, or if still extant.

In addition to gathering information on previously documented architectural properties, Tetra Tech reviewed property data from the Middlesex County GIS website to identify architectural properties within the APE with build dates of 1972 or earlier, the age threshold for NRHP eligibility. Together, the V-CRIS and Middlesex County databases provided the information necessary to identify those architectural properties which would be documented by this survey report.

Background research was conducted to place the project area within a historical context from which to draw inferences about the built environment in terms of the development of neighborhoods, hamlets, and towns within the vicinity of the APE. Historic maps, census data, and county histories were reviewed. Based on the data gathered from these various sources, Geographic Information System (GIS) field maps were developed depicting the locations of previously recorded and potential historic architectural resources within the APE for survey documentation.

The Tetra Tech architectural historian drove public rights-of-way to visit each resource or potential resource identified during the literature and file review. Documentation of properties was limited to building exteriors visible from the public right-of-way. Information collected included physical descriptions, locational data, and photographs of each documented property. Appendix A depicts the location of each documented resource. Field data was used to update existing VDHR site records and to create records for previously undocumented resources. V-CRIS database entries for each identified resource including photographs and site maps are presented in Appendix B.

2.2 NRHP Evaluation Criteria

Each of the surveyed properties was evaluated for their eligibility for listing on the NHRP. Cultural resources are evaluated based on criteria for NRHP eligibility specified in the Department of Interior Regulations 36 CFR Part 60: National Register of Historic Places. Cultural resources can be defined as significant if they "possess integrity of location, design, setting, materials, workmanship, feeling, and association," and if they are 50 years of age or older and:

A) are associated with events that have made a significant contribution to the broad patterns of our history (history); or

B) are associated with the lives of persons significant in our past (person); or

C) embody the distinctive characteristic of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that components may lack individual distinction (architecture); or

D) have yielded, or may be likely to yield, information important in prehistory or history (archaeology).

Ordinarily, cemeteries; birthplaces or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years are not considered eligible for the NRHP. However, such properties will qualify if they are integral parts of historic districts that do meet the criteria or if they fall within the following categories:

- Criteria Consideration A: a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- Criteria Consideration B: a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- Criteria Consideration C: a birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his productive life; or
- Criteria Consideration D: a cemetery which derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- Criteria Consideration E: a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- Criteria Consideration F: a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
- Criteria Consideration G: a property achieving significance within the past 50 years if it is of exceptional importance.

2.3 Environmental Setting of the APE

The Project traverses the Middle Peninsula of Tidewater Virginia, a portion of the Coastal Plain physiographic province that is bounded by the Rappahannock River to the north, the York River to the south, and extends to Chesapeake Bay in the east. The region is characterized by generally level terrain not exceeding 120 feet above mean sea level, short and steeply dissected stream courses with sluggish, marshy sections, and tidal effects along stream mouths. The landform consists of three distinct marine terraces, each exhibiting intermixing of marine sediments and landward sediments eroding from the Piedmont (Newhouse et al 1985:1-2). Soils that developed on the lowest marine terrace are generally poorly drained, while the upper two terraces exhibit moderately well-drained to mostly well-drained soils that have traditionally supported agricultural pursuits. Approximately half of the land surface of Middlesex County remains forested.

2.4 Historic Context of the Project

Settlement to Revolution

At the time of American independence, Virginia was by many measures (population, value of domestic product, improved acreage) the most dynamic of the thirteen states. That four of the first five American presidents were Virginians reflects the outsize influence the Old Dominion had in the nation's economic and political life. Virginia's economic takeoff, however, encountered serious barriers in the seventeenth century that nearly stifled its development into the wealthiest of England's colonies by the mid-1700s. One gauge of the hurdles to its early growth was the 40-year delay between the founding of Jamestown in 1607 and the settling of what would become Middlesex County. After extraordinary violence ensued between Indian and English communities in the 1620s and 1630s, English settlers were, by treaty, barred from the lands of the Middle Peninsula, but treaty violations became rampant in the mid-1640s and were, anyway, very difficult to enforce. In 1648, this restriction on settlement was lifted and English settlers began occupying the shorelines of the Rapphannock and Piankatank rivers (Rutman and Rutman 1984:45; Taylor 2001).

In 1649, Ralph Wormeley patented 3,200 acres where Urbanna Creek flowed into the Rappahannock River and called his estate Rosegill (VDHR No. 059-0009). Wormeley's son doubled the size of the property, which by 1700 extended along four miles of the Rappahannock River. Over the next 125 years, five generations of Wormeleys established Rosegill as one of the most important plantations in the Middle Peninsula. Agricultural products from the estate included tobacco, wheat, corn, beef, and pork (Rutman and Rutman 1984:153, 235).

For much of the first hundred years of English settlement, the population of the Middle Peninsula remained low. This can be explained, in part, by its relative isolation as a peninsula, separated from Jamestown and Williamsburg by the York River and from settlements in the North Neck by the Rappahannock River. Not until 1669 was the population sufficient to justify the establishment of Middlesex County from Lancaster County, though even by 1700 the county contained only 13 persons per square mile (Table 1). In fact, there was limited incentive or opportunity for yeoman farmers to settle in Middlesex County despite its productive soils. In the highly stratified Tidewater society of the colonial period, most of the best lands were in the hands of the elites, such as the Wormeleys of Rosegill,

the Lees of Lansdowne, and the Churchills of Wilton (VDHR No. 059-0010). Population growth in the late seventeenth and eighteenth centuries was largely a result of the lucrative tobacco trade and the large-scale importation of enslaved Africans to plant and harvest the crop. As tobacco became the predominant economic driver of the Tidewater fully 30 percent of Middlesex County's inhabitants were enslaved and of African descent by the turn of the eighteenth century. In 1701, Rosegill produced around 50,000 pounds of tobacco for export from the labor of 85 enslaved persons (Rutman and Rutman 1984:153, 206).

The dispersed agricultural farms and estates of Middlesex County lacked a market town until Urbanna was settled at the mouth of Urbanna Creek in 1704. With Urbanna's location on the Rappahannock River and the passage of the Tobacco Warehouse Acts of 1713 and 1730 which mandated public warehouses and inspection of tobacco, Urbanna assumed the role of regional tobacco entrepôt, and became the center of commerce for the county. In 1748 colonial authorities funded the construction of a courthouse, solidifying Urbanna's position as principal town of the county (Edwards and Salmon 1990).

Table 1. Population Data for Middlesex County, Virginia.

Year	Population	Year	Population
1700	1,771	1910	8,852
1790	4,140	1920	8,157
1800	4,203	1930	7,273
1810	4,414	1940	6,673
1820	4,057	1950	6,715
1830	4,122	1960	6,319
1840	4,392	1970	6,295
1850	4,394	1980	7,719
1860	4,364	1990	8,653
1870	4,981	2000	9,932
1880	6,252	2010	10,959
1890	7,458	2020	10,625
1900	8,220		

Source: US Census Bureau 1996 and 2022

Independence and Civil War

Middlesex County witnessed no major battles during the Revolutionary War, but the British naval blockade of the Tidewater and shortages of labor, money, and goods had a long-term effect on the regional economy. These impacts were greatly exacerbated by the decline of tobacco cultivation in the Tidewater, including Middlesex County. Because tobacco had generated huge profits, planters tended to ignore signs of soil exhaustion and instead simply cleared new ground when productivity fell. By the turn of the nineteenth century, depleted soils in the Tidewater had made tobacco farming there a losing proposition, resulting in out-migration of white population to the Piedmont, which became Virginia's new center of tobacco cultivation. A labor shortage caused by the migration of non-elite, skilled whites was offset by the increase in enslaved labor, which accounted for 56 percent of the Middlesex County population in 1860 (Hergesheimer and Leonhardt 1861). The overall county population decline lasted from the 1810s till the late 1860s (Table 1).

Agriculture diversified in Middlesex County during the nineteenth century, with corn, wheat, and cattle the principal products (Table 2). Butter was produced largely for home consumption and illustrates a degree of self-sufficiency in the local agrarian regime. By 1840, the first year in which the federal census recorded agricultural production, tobacco had all but disappeared from the fields of Middlesex County, as it did elsewhere in the Middle Peninsula. Corn, for human and animal consumption, thrived on the poor soils and farmers gradually adopted improved practices, including crop rotation, better manuring, and use of marl to counteract the acidic soils of the region (Craven 1965:101).

Table 2. Selected Agricultural Data for Middlesex County, Virginia

Year	Wheat (bu)	Corn (bu)	Tobacco (lb)	Butter (lb)	Beans (bu)*
1840	17,027	122,145	1,345	N/A	N/A
1850	30,762	134,253	N/A	26,277	N/A
1860	59,939	163,467	21,950	25,755	N/A
1870	19,650	86,967	30	13,754	N/A
1880	17,987	93,433	1,512	28,473	112
1890	11,717	112,093	431	73,094	81
1900	14,140	153,570	320	64,418	53
2021	*167,000*	*1.04 million*	*N/A*	*N/A*	*343,000*

*-1880-1900 undifferentiated "dry beans"; 2021-soybeans.
Sources: USDA 2019 and 2022

The physical isolation that stalled settlement in Middlesex County during the seventeenth century continued to hinder development of infrastructure and industry during the nineteenth century. Bridges over the Rappahannock River and lower reach of the Piankatank River were not built until the twentieth century; railroads never penetrated further east into the Middle Peninsula than West Point, in King William County. Of industries, the 1840 census enumerated several gristmills, sawmills and tanneries in Middlesex County, employing a total of 32 men; absent were forges, furnaces, or workshops (USDA 2019). Aside from timber, natural resources were also scant. This isolation and lack of resources did, however, shield Middlesex County from armed conflict during the Civil War as the area was of little strategic value. The Union naval blockade of the Chesapeake and Atlantic ports and the exigencies of war, nonetheless, caused widespread deprivation in Middlesex County.

Reconstruction and Growth

The aftermath of the Civil War affected all levels of society with the end of the plantation system and a shift to smaller, family farming. This transformation led to steep and lingering decline in production of wheat and corn as shortages in seed, fertilizer and labor caused disruptions to the agrarian economy (Table 2). Butter production also declined sharply after the war but reclaimed its pre-war level by 1880 and saw a near-tripling of production by 1890, reflecting a shift to dairying as an important component of the new economy.

In the decades after the war, steamships plied the Rappahannock and Piankatank rivers, connecting Middlesex County farmers and businesses with markets in Norfolk and Baltimore. These new connections led to the development of a thriving oyster industry. Later, the advent of refrigeration in the early twentieth century allowed oyster packing houses to become Urbanna's largest industry

(Edwards and Salmon 1990). River work in the oyster and shipping industries provided reliable employment opportunities for the region's African Americans not available to them elsewhere. By 1910, Middlesex County's population had doubled from its antebellum levels, reflecting the creation of jobs and businesses based on the demand for fresh oysters in urban centers (Table 1).

Decline and Rebirth

Depression struck the rural economy long before the stock market crash of 1929. Beginning in the 1910s, Middlesex County's population entered a steep and enduring decline, losing almost 30 percent by 1970 as farmers and laborers left for urban employment in Norfolk, Richmond, and Baltimore. The lucrative oyster industry collapsed in the 1920s due to overexploitation and predatory snails, and never fully recovered (Schulte 2017:6). A paradox of the out-migration from Middlesex County during much of the twentieth century was the state's program of secondary road improvement that began in the 1930s. The John Andrew Twigg Bridge (VDHR No. 057-5047) conveying VA Rt 3 across the Piankatank River was built in 1953, connecting Middlesex and Mathews counties. In 1959, the Robert O. Norris, Jr. Bridge carried VA Rt 3 over the Rappahannock River, joining Middlesex and Lancaster counties. These improvements in transportation infrastructure would lead, eventually to a revival in population and agricultural production in the region. With improved farming practices and less costly access to regional markets via the bridges and road system, wheat, soybeans, and corn have become mainstays of the modern agrarian economy (Table 2). From its nadir in 1970, Middlesex County's population has increased 69 percent as of 2020. Improved access and a tourism industry based on the county's 135 miles of shoreline and numerous marinas have been the impetus for this revival.

3.0 RESULTS OF THE PHASE I SURVEY

The survey identified 56 resources within the APE for historic architectural resources including 27 previously documented resources (Table 3). Individual property descriptions are contained within Section 3.1 and depicted on Appendix A, Map Sheets 1 to 38.

Of the 29 newly identified resources, 26 are dwellings, two are commercial buildings, and one is a private clubhouse. Two of the houses date from the last decades of the nineteenth century, four from the period between 1930 and 1940, nineteen from the post-Second World War era, and one is undetermined. The two commercial buildings were constructed between 1950 and 1960, and the clubhouse (an American Legion post) dates from 1940. Among the 27 previously recorded resources are included two historic districts (Saluda and Urbanna), two large estates (Rosegill and Wilton), twelve dwellings, three churches, two cemeteries, two commercial buildings, two vehicle service stations, and a school. The residential structures date from the mid-nineteenth to mid-twentieth centuries, the churches from the late-nineteenth to mid-twentieth centuries, and the commercial buildings and services stations from the mid-twentieth century. The periods of significance for the historic districts and estates are: Urbanna (1680 to 1940); Saluda (1837 to 1968); Rosegill (1649 to 1855); and, Wilton (1700-1799).

Table 3. Resources Identified During the Phase I Reconnaissance Survey

Tetra Tech ID No.	Map Sheet (Appendix A)	Name	Location	Build Date	VDHR No.
1	37	Saluda Historic District	Saluda	1839-1968	059-5124
2	37	Antioch Baptist Church	159 Oakes Landing Road, Saluda	1895	059-5124-0003
3	37	Antioch Baptist Cemetery	159 Oakes Landing Road, Saluda	c. 1875	059-5124-0003
4	37	Antioch Elementary School	159 Oakes Landing Road, Saluda	c. 1870	059-5124-0003
5	1	House	430 Bonner Street, Urbanna	1969	
6	1	House	410 Bonner Street, Urbanna	c. 1970	
7	1	House	181 Linden Avenue, Urbanna	1963	
8	1	House	188 Linden Avenue, Urbanna	1969	
9	1	House	214 Linden Avenue, Urbanna	1972	
10	1	House	211 Linden Avenue, Urbanna	1973	
11	1	House	210 Linden Avenue, Urbanna	1970	
12	1	Urbanna Historic District	Urbanna	Period of Significance: 1680-1940	316-0009
13	1	Rappahannock Avenue Cemetery	Rappahannock Avenue, Urbanna	c. 1800	316-0009-0095
14	4	Rosegill Plantation	1824 Urbanna Road, Saluda	Settled 1649	059-0009
15	5	House	863 Urbanna Road, Saluda	1945	
16	5	House	819 Urbanna Road, Saluda	N/A	
17	5	House	928 Urbanna Road, Saluda	1970	
18	5	House	1103 Urbanna Road, Saluda	1940	059-5174
19	6	G.L. Davis Service Center	374 Urbanna Road, Saluda	c. 1940	059-5424
20	6	House	453 Urbanna Road, Saluda	1947	
21	6	House	382 Urbanna Road, Saluda	1937	
22	6	House	409 Urbanna Road, Saluda	1949	
23	6	House	307 Urbanna Road, Saluda	1946	

Tetra Tech ID No.	Map Sheet (Appendix A)	Name	Location	Build Date	VDHR No.
24	7	House	267 Urbanna Road, Saluda	1950	059-5176
25	7	House	281 Urbanna Road, Saluda	1954	059-5175
26	7	House	218 Urbanna Road, Saluda	1930	
27	7	House	235 Urbanna Road, Saluda	1952	
28	7	House	147 Urbanna Road, Saluda	c. 1940	059-5177
29	7	House	51 Urbanna Road, Saluda	1950	
30	7	House	76 Urbanna Road, Saluda	1940	
31	7	Commercial Building	2635 General Puller Hwy, Saluda	c. 1940	059-0080
32	8	Middlesex County Training School – bus garage	2941 General Puller Hwy, Saluda	c. 1930	059-0078
33	8	House	2970 General Puller Hwy, Saluda	1937	
34	8	House	3036 General Puller Hwy, Saluda	1959	
35	8	House	3092 General Puller Hwy, Saluda	1959	
36	14	Commercial Building	49 Queens Point Drive, Locust Hill	c. 1930	059-0047
37	14	House	49 Queens Point Drive, Locust Hill	1900	059-0046
38	15	House	6181 General Puller Hwy, Locust Hill	1948	
39	15	Commercial Building	6247 General Puller Hwy, Locust Hill	c. 1950	
40	16	House	6277 General Puller Hwy, Locust Hill	c. 1940	
41	16	House	6744 General Puller Hwy, Locust Hill	c. 1860	059-0042
42	16	Commercial Building	6914 General Puller Hwy, Locust Hill	1960	
43	16	House	7056 General Puller Hwy, Locust Hill	1900	059-0039
44	16	House	6863 General Puller Hwy, Locust Hill	1889	059-0041
45	17	House	6961 General Puller Hwy, Locust Hill	1850	059-0040
46	25	House	10801 General Puller Hwy, Hartfield	1940	059-0085

Tetra Tech ID No.	Map Sheet (Appendix A)	Name	Location	Build Date	VDHR No.
47	25	House	10889 General Puller Hwy, Hartfield	1875	059-5084
48	28	House	172 City of Refuge Road, Hartfield	1880	
49	28	House	2570 Twiggs Ferry Road, Hartfield	1961	
50	28	House	2535 Twiggs Ferry Road, Hartfield	1900	
51	28	City of Refuge Church	20 City of Refuge Road, Hartfield	c. 1900	059-5061
52	28	House	2376 Twiggs Ferry Road, Hartfield	1944	059-5008
53	28	House	2346 Twiggs Ferry Road, Hartfield	1972	
54	30	Wilton	Twiggs Ferry Road, Hartfield	1763	059-0010
55	33	John Andrew Twigg Bridge	Rt 3, Middlesex and Mathews Counties	1953	057-5047
56	38	Zion Methodist Church	9496 John Clayton Memorial Hwy, Gloucester	1960	036-0130

3.1 Resource Descriptions

The 56 documented resources are described below, with details of style, form, materials, and dating for standing structures, and context, setting, and significant dates for historic districts and estates. Build dates for standing structures were acquired from the Middlesex County Property Cards database, a publicly accessible online site (Middlesex County 2022). The county property database also included information about the building foundation, exterior wall, and roofing materials. This information was utilized when a resource was some distance from the public right-of-way and details of its construction could not be discerned by the surveyor's direct observation.

4.0 SUMMARY AND RECOMMENDATIONS

Tetra Tech documented 56 historic resources 50 years old or older that may have views of the Project in proximity to the five proposed pump stations and along sections of the proposed force main that represent new Virginia Department of Transportation (VDOT) easements. Tetra Tech documented 29 newly identified historic architectural resources plus 27 historic architectural resources already recorded in V-CRIS).

Based on analysis of resource characteristics and criteria of eligibility, Tetra Tech recommends two previously recorded resources for further research to determine whether they possess qualities of significance to be eligible for listing in the NRHP:

- a circa 1860 Greek Revival house in Locust Hill (VDHR Nos. 059-0042), and
- the City of Refuge Church in Hartfield (059-5061)

Five resources already have been listed or determined eligible for listing in the NRHP, and no change is recommended in the NRHP status of these resources:

- Saluda Historic District (059-5124)
- Urbanna Historic District (316-0009)
- Rosegill Plantation (059-0009)
- Wilton Plantation (059-0010), and
- Middlesex Training School-Bus Garage (059-0078)

Four resources[1] previously have been recommended as contributing resources to historic districts and have not been individually evaluated for eligibility. Tetra Tech recommends that these four resources retain their present status:

- Antioch Baptist Church, cemetery, and elementary school (059-5124-0003), and
- Rappahannock Avenue Cemetery (316-0009-0095)

The remaining 45 documented resources are recommended not eligible for listing in the NRHP and are pending VDHR numbers. Table 4 presents recommendations for NRHP status and additional work for the 56 inventoried resources.

Tetra Tech recommends that the Project will have no adverse effects upon any of the 56 documented resources.

[1] 059-5124-0003 has been documented in this survey as three separate resources.

Table 4. Summary of Survey Findings and Recommendations

VDHR No.	Name	Location	NRHP Recommendation	Recommendation for Additional Work
059-5124	Saluda Historic District	Saluda	Listed	None
059-5124-0003	Antioch Baptist Church	159 Oakes Landing Road, Saluda	Contributing resource Saluda Historic District; not individually evaluated	None
059-5124-0003	Antioch Baptist Cemetery	159 Oakes Landing Road, Saluda	Contributing resource Saluda Historic District; not individually evaluated	None
059-5124-0003	Antioch Elementary School	159 Oakes Landing Road, Saluda	Contributing resource Saluda Historic District; not individually evaluated	None
	House	430 Bonner Street, Urbanna	Recommended Not Eligible	None
	House	410 Bonner Street, Urbanna	Recommended Not Eligible	None
	House	181 Linden Avenue, Urbanna	Recommended Not Eligible	None
	House	188 Linden Avenue, Urbanna	Recommended Not Eligible	None
	House	214 Linden Avenue, Urbanna	Recommended Not Eligible	None
	House	211 Linden Avenue, Urbanna	Recommended Not Eligible	None
	House	210 Linden Avenue, Urbanna	Recommended Not Eligible	None
316-0009	Urbanna Historic District	Urbanna	Listed	None
316-0009-0095	Rappahannock Avenue Cemetery	Rappahannock Avenue, Urbanna	Contributing resource Urbanna Historic District; not individually evaluated; Recommended contributing resource to district	None
059-0009	Rosegill Plantation	1824 Urbanna Road, Saluda	Listed	None
	House	863 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	819 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	928 Urbanna Road, Saluda	Recommended Not Eligible	None
059-5174	House	1103 Urbanna Road, Saluda	Not evaluated; Recommended Not Eligible	None
059-5424	G.L. Davis Service Center	374 Urbanna Road, Saluda	Not evaluated; Recommended Not Eligible	None
	House	453 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	382 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	409 Urbanna Road, Saluda	Recommended Not Eligible	None

VDHR No.	Name	Location	NRHP Recommendation	Recommendation for Additional Work
	House	307 Urbanna Road, Saluda	Recommended Not Eligible	None
059-5176	House	267 Urbanna Road, Saluda	Not evaluated; Recommended Not Eligible	None
059-5175	House	281 Urbanna Road, Saluda	Not evaluated; Recommended Not Eligible	None
	House	218 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	235 Urbanna Road, Saluda	Recommended Not Eligible	None
059-5177	House	147 Urbanna Road, Saluda	Not evaluated; Recommended Not Eligible	None
	House	51 Urbanna Road, Saluda	Recommended Not Eligible	None
	House	76 Urbanna Road, Saluda	Recommended Not Eligible	None
059-0080	Commercial Building	2635 General Puller Hwy, Saluda	Not Eligible	None
059-0078	Middlesex County Training School – bus garage	2941 General Puller Hwy, Saluda	Eligible	None
	House	2970 General Puller Hwy, Saluda	Recommended Not Eligible	None
	House	3036 General Puller Hwy, Saluda	Recommended Not Eligible	None
	House	3092 General Puller Hwy, Saluda	Recommended Not Eligible	None
059-0047	Commercial Building	49 Queens Point Drive, Locust Hill	Not Eligible	None
059-0046	House	49 Queens Point Drive, Locust Hill	Not Eligible	None
	House	6181 General Puller Hwy, Locust Hill	Recommended Not Eligible	None
	Commercial Building	6247 General Puller Hwy, Locust Hill	Recommended Not Eligible	None
	House	6277 General Puller Hwy, Locust Hill	Recommended Not Eligible	None
059-0042	House	6744 General Puller Hwy, Locust Hill	Previously determined Not Eligible; Recommended Potentially Eligible	Further survey
	Commercial Building	6914 General Puller Hwy, Locust Hill	Recommended Not Eligible	None
059-0039	House	7056 General Puller Hwy, Locust Hill	Not Eligible	None
059-0041	House	6863 General Puller Hwy, Locust Hill	Not Eligible	None
059-0040	House	6961 General Puller Hwy, Locust Hill	Not Eligible	None
059-0085	House	10801 General Puller Hwy, Hartfield	Not evaluated; Recommended Not Eligible	None
059-5084	House	10889 General Puller Hwy, Hartfield	Not evaluated; Recommended Not Eligible	None

VDHR No.	Name	Location	NRHP Recommendation	Recommendation for Additional Work
	House	172 City of Refuge Road, Hartfield	Recommended Not Eligible	None
	House	2570 Twiggs Ferry Road, Hartfield	Recommended Not Eligible	None
	House	2535 Twiggs Ferry Road, Hartfield	Recommended Not Eligible	None
059-5061	City of Refuge Church	20 City of Refuge Road, Hartfield	Not evaluated; Recommended Potentially Eligible	Further Survey
059-5008	House	2376 Twiggs Ferry Road, Hartfield	Not Eligible	None
	House	2346 Twiggs Ferry Road, Hartfield	Recommended Not Eligible	None
059-0010	Wilton	Twiggs Ferry Road, Hartfield	Listed	None
057-5047	John Andrew Twigg Bridge	Rt 3, Middlesex and Mathews Counties	Not Eligible	None
036-0130	Zion Methodist Church	9496 John Clayton Memorial Hwy, Gloucester	Not Eligible	None

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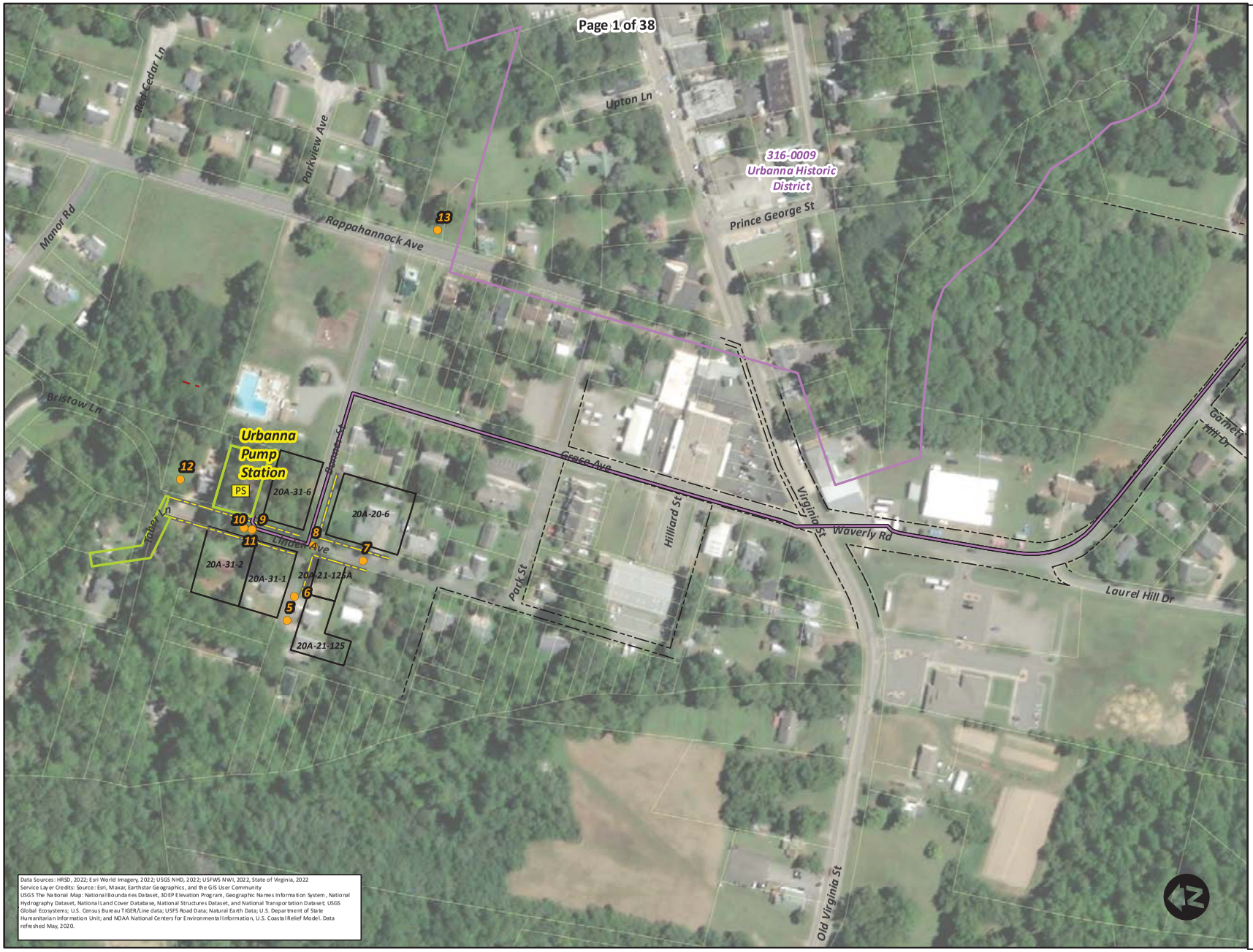
APPENDIX A: HISTORIC ARCHITECTURAL SURVEY MAPBOOK



HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
ARCHITECTURE SURVEY
RESULTS MAPBOOK

- Surveyed Architectural Resource
- PS Pump Station
- VDHR Architecture Resource
- New VDOT Easement
- Channel (HRSD)
- Line (HRSD)
- Force Main (HRSD)
- Parcel Line (HRSD)
- Property Line (HRSD)
- Hartfield Alignment (HRSD)
- ROW Line (HRSD)
- Architectural Resource Parcel Line
- Parcel Line
- VDHR Resource (Approximated)

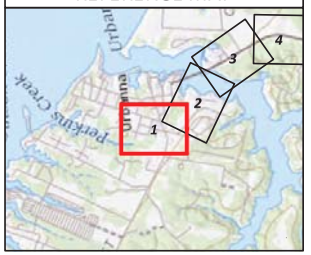
Information shown on this map is compiled from numerous sources, may not be complete or accurate, and is intended only for planning purposes and not for construction.

Date	7/19/2022
Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

0 100 200 300 400 Feet

0 25 50 75 100 Meters

REFERENCE MAP



NOT FOR CONSTRUCTION

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
ARCHITECTURE SURVEY
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- Surveyed Architectural Resource
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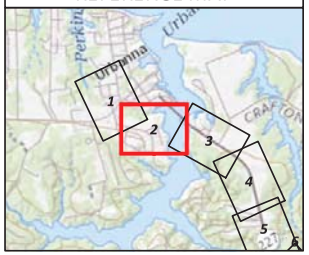
Date	7/19/2022
Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

0 100 200 300 400 Feet

0 25 50 75 100 Meters

REFERENCE MAP



NOT FOR CONSTRUCTION

Data Sources: HRSD, 2022; Esri World Imagery, 2022; USGS NHD, 2022; USFWS NWI, 2022, State of Virginia, 2022
Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.

HAMPTON ROADS SANITATION DISTRICT
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Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

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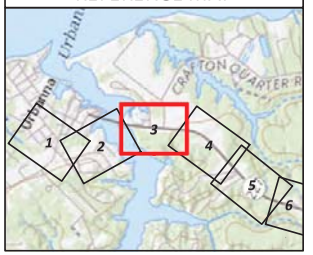
0 25 50 75 100 Meters

REFERENCE MAP



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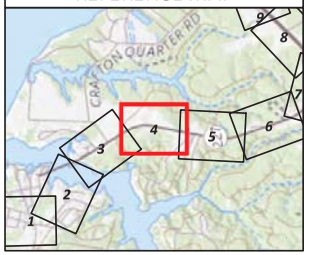

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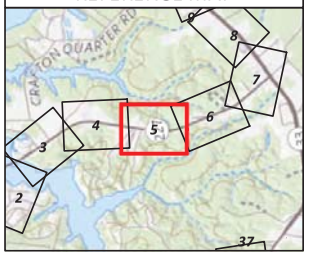

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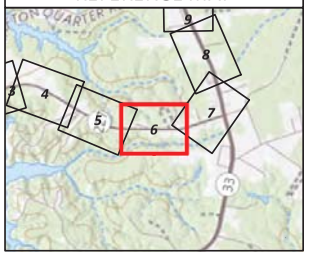

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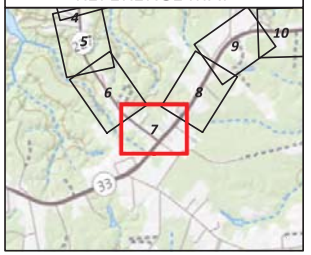

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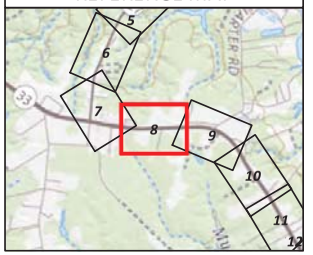

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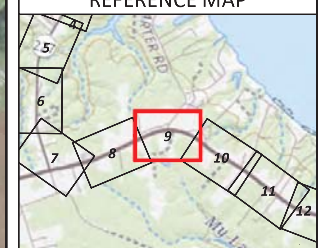

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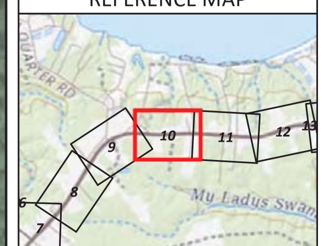

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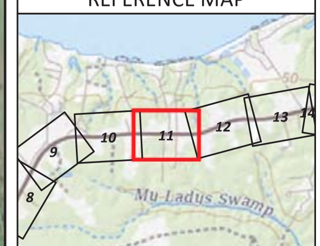

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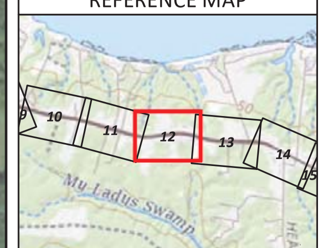

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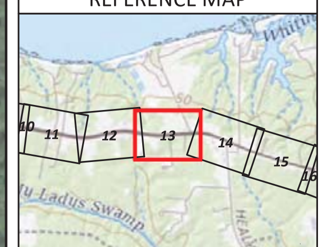

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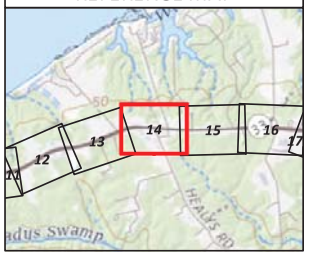

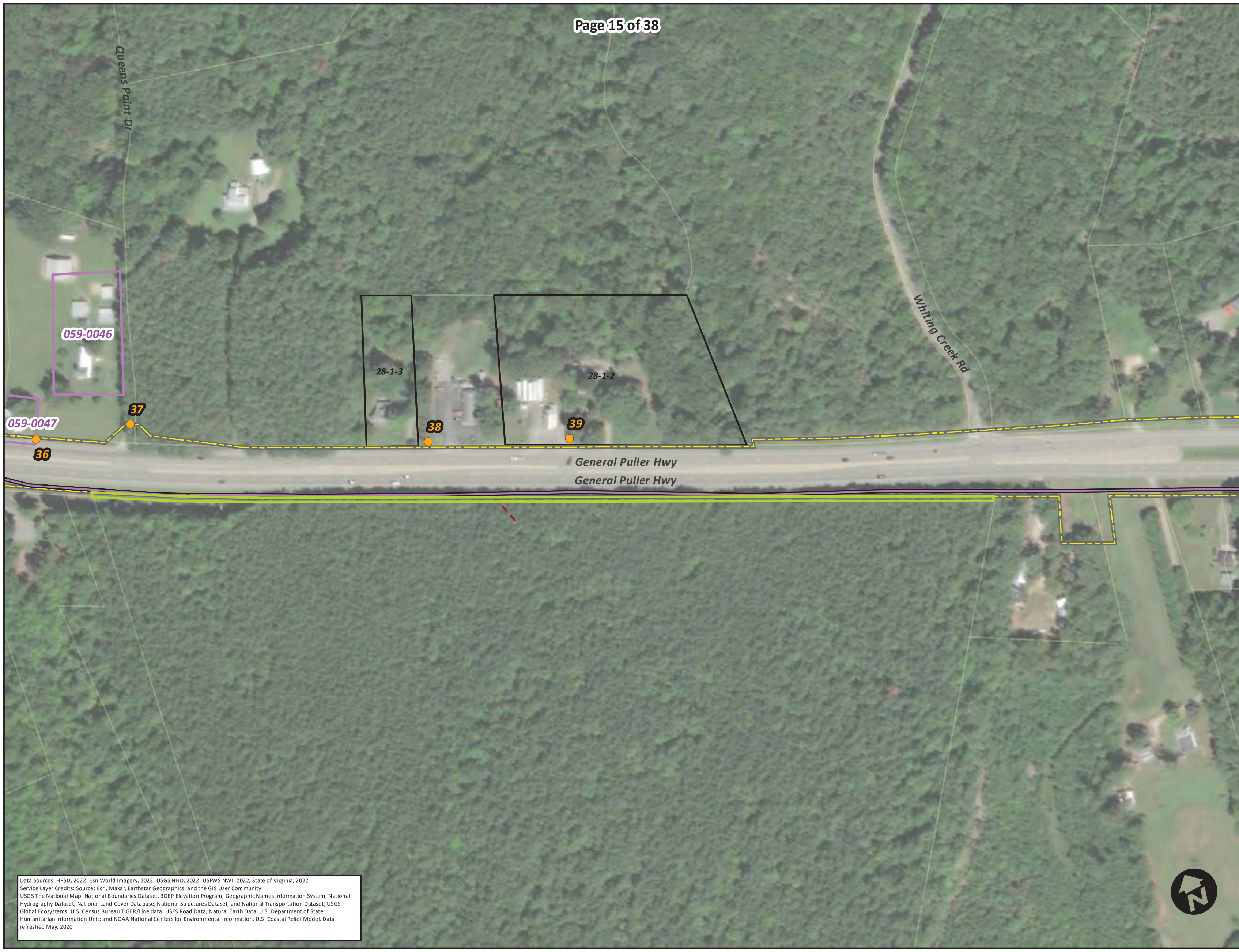

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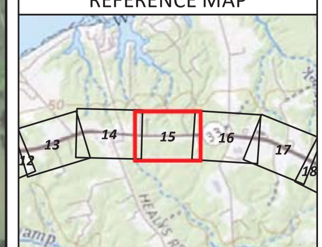

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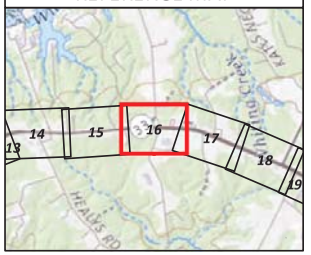

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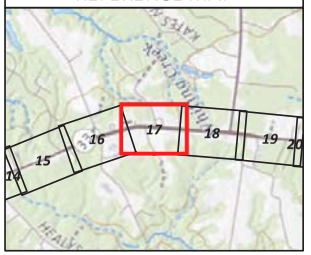

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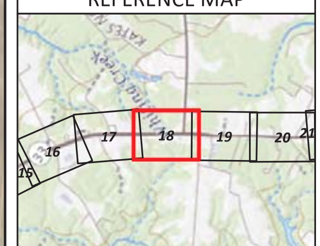

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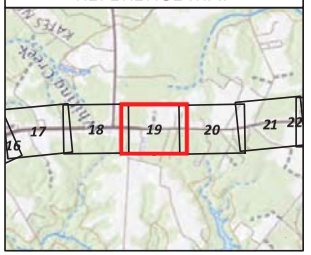

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR ARCHITECTURE SURVEY RESULTS MAPBOOK

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Date	7/19/2022
Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

0 100 200 300 400 Feet

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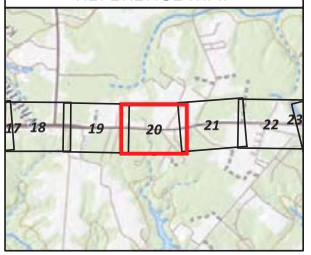

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HAMPTON ROADS SANITATION DISTRICT
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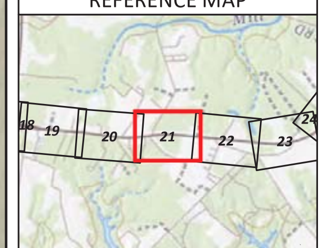

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HAMPTON ROADS SANITATION DISTRICT
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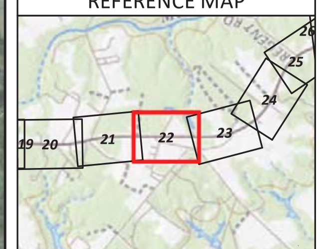

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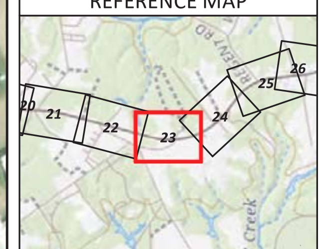

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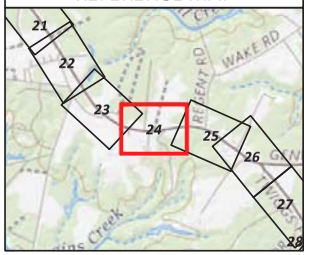

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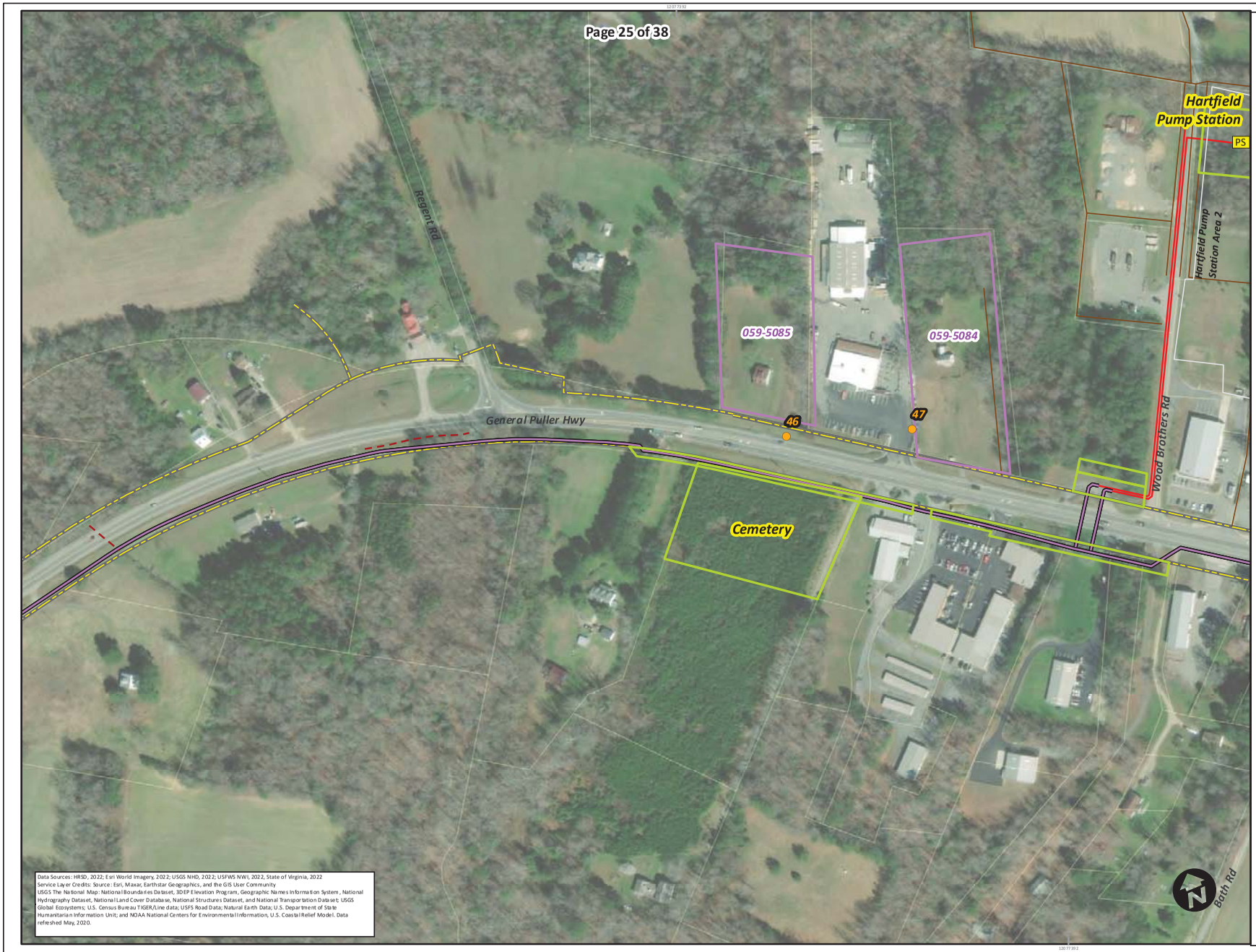

HAMPTON ROADS SANITATION DISTRICT
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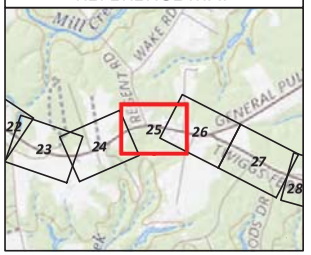

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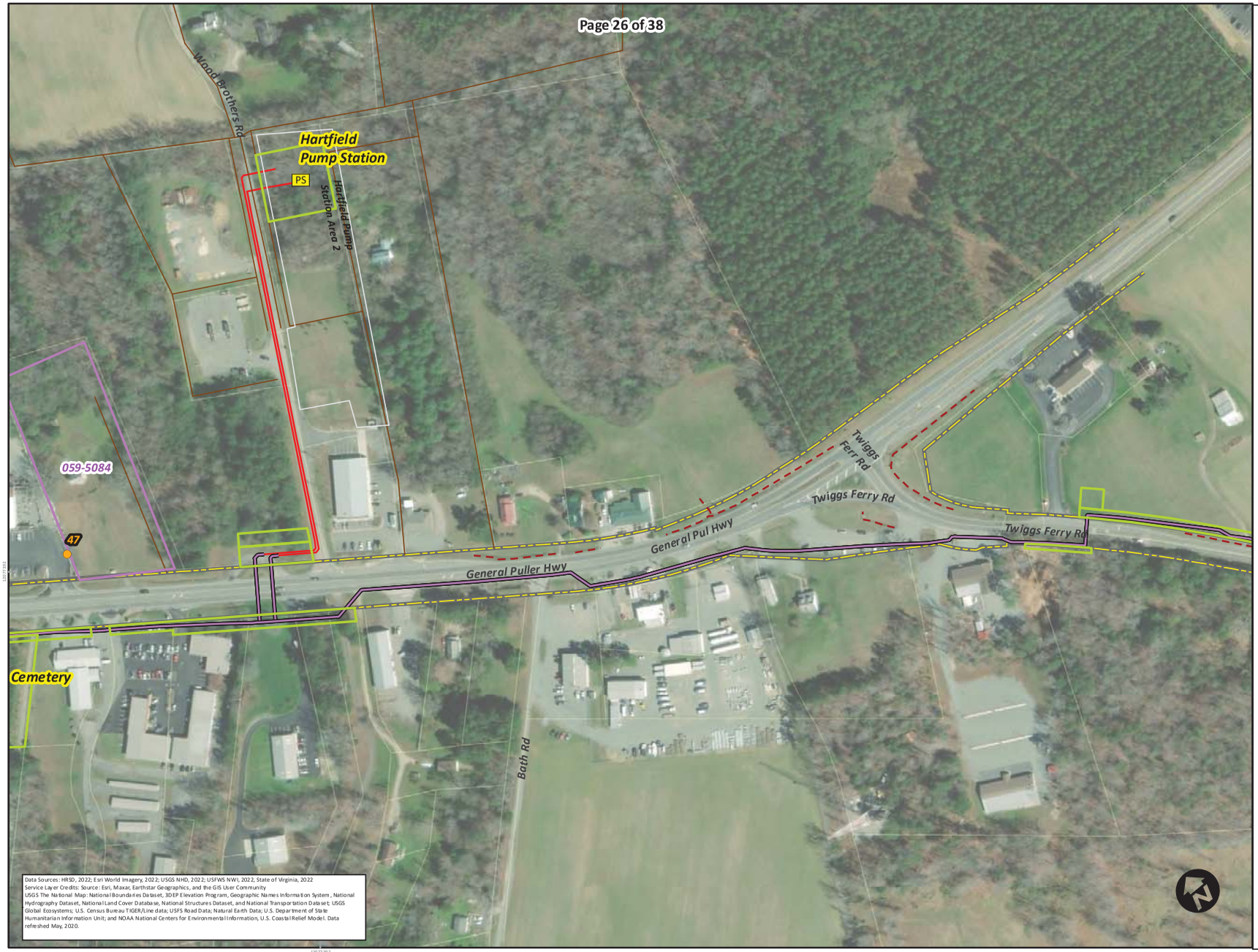

HAMPTON ROADS SANITATION DISTRICT
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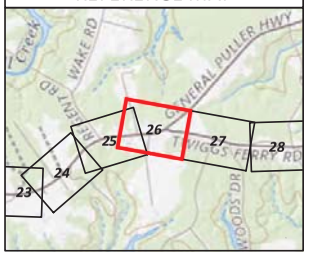

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HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
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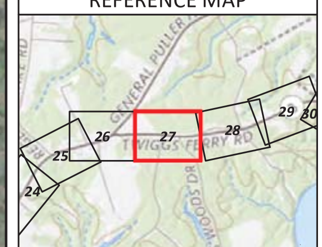

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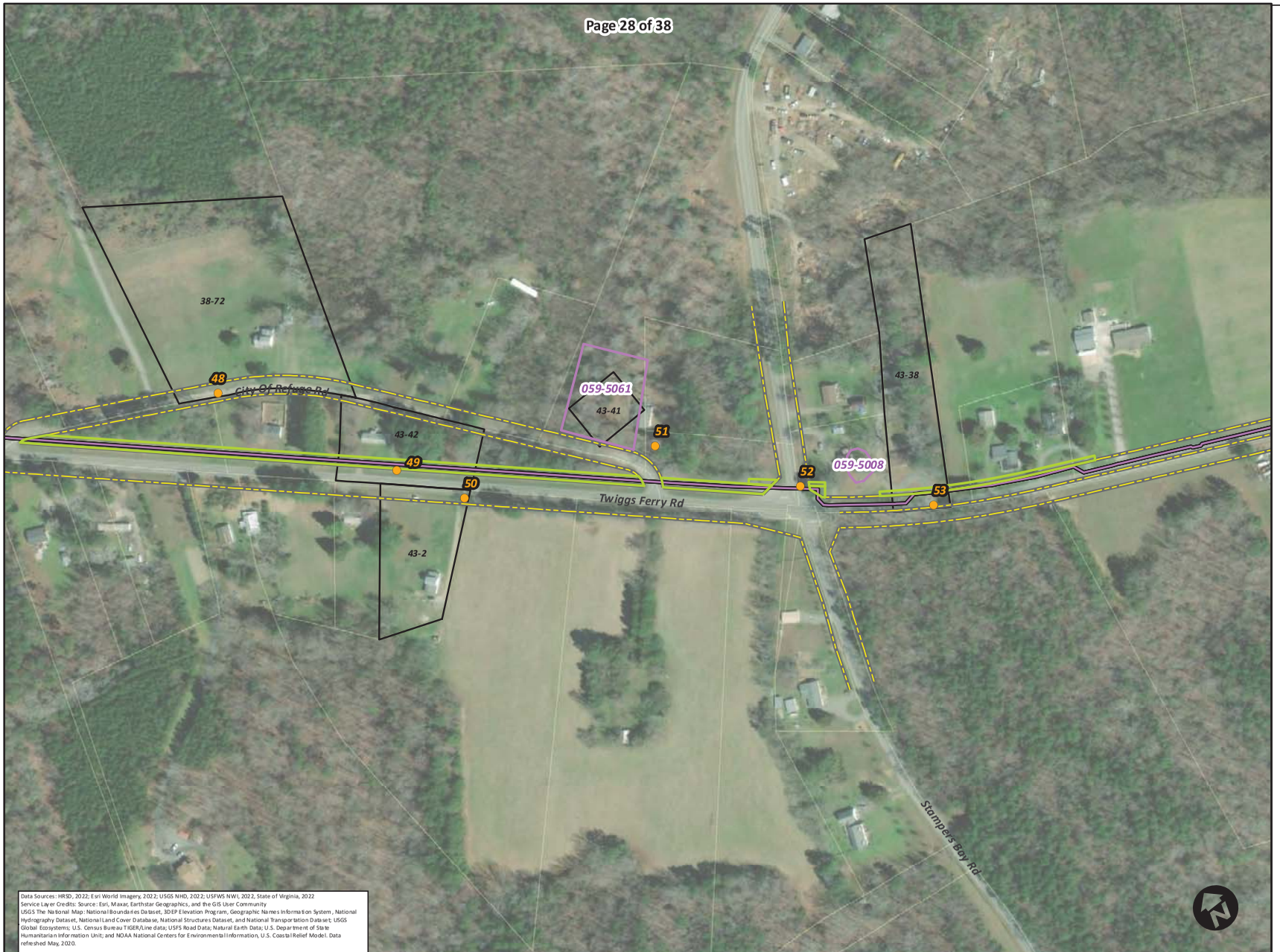

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR ARCHITECTURE SURVEY RESULTS MAPBOOK

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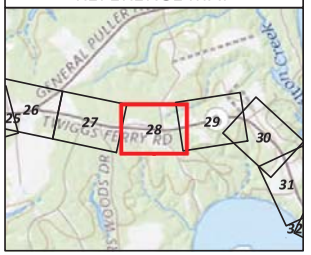

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MIDDLESEX INTERCEPTOR
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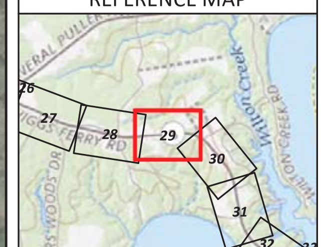

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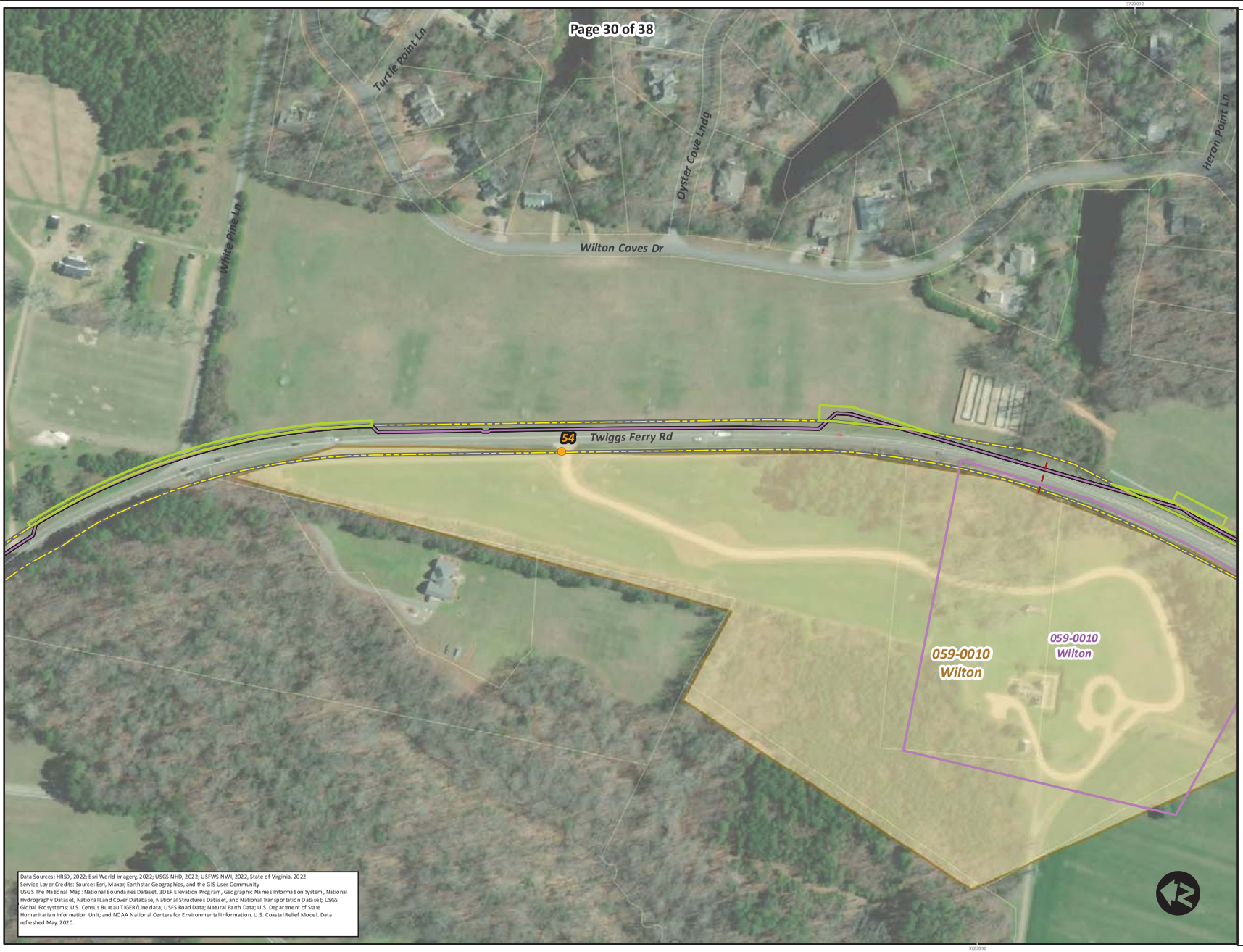

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HAMPTON ROADS SANITATION DISTRICT

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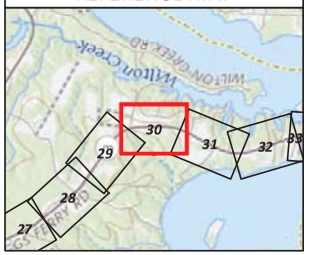

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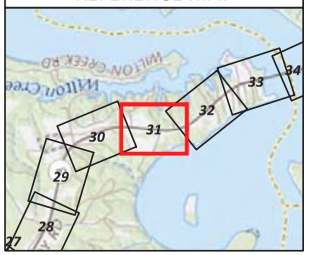

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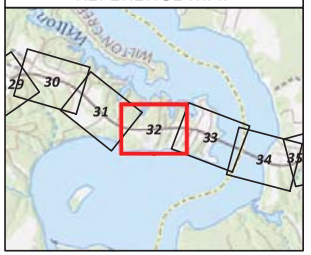

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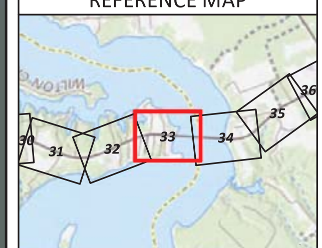

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USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR ARCHITECTURE SURVEY RESULTS MAPBOOK

- Surveyed Architectural Resource
- PS Pump Station
- VDHR Architecture Resource
- New VDOT Easement
- Channel (HRSD)
- Line (HRSD)
- Force Main (HRSD)
- Parcel Line (HRSD)
- Property Line (HRSD)
- Hartfield Alignment (HRSD)
- ROW Line (HRSD)
- Architectural Resource Parcel Line
- Parcel Line
- VDHR Resource (Approximated)

Information shown on this map is compiled from numerous sources, may not be complete or accurate, and is intended only for planning purposes and not for construction.

Date	7/19/2022
Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

0 100 200 300 400 Feet

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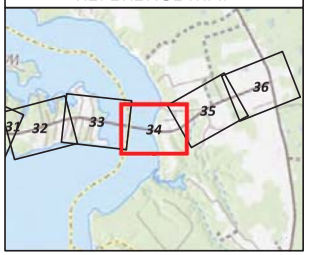
REFERENCE MAP



NOT FOR CONSTRUCTION

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
ARCHITECTURE SURVEY
RESULTS MAPBOOK

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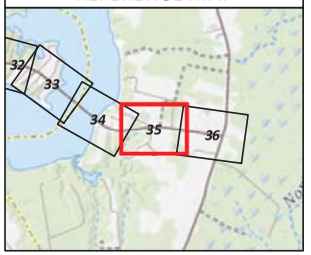
REFERENCE MAP



HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR
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Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

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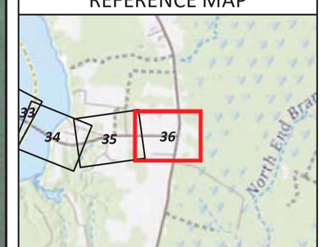
REFERENCE MAP



Data Sources: HRSD, 2022; Esri World Imagery, 2022; USGS NHD, 2022; USFWS NWI, 2022, State of Virginia, 2022
Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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NOT FOR CONSTRUCTION

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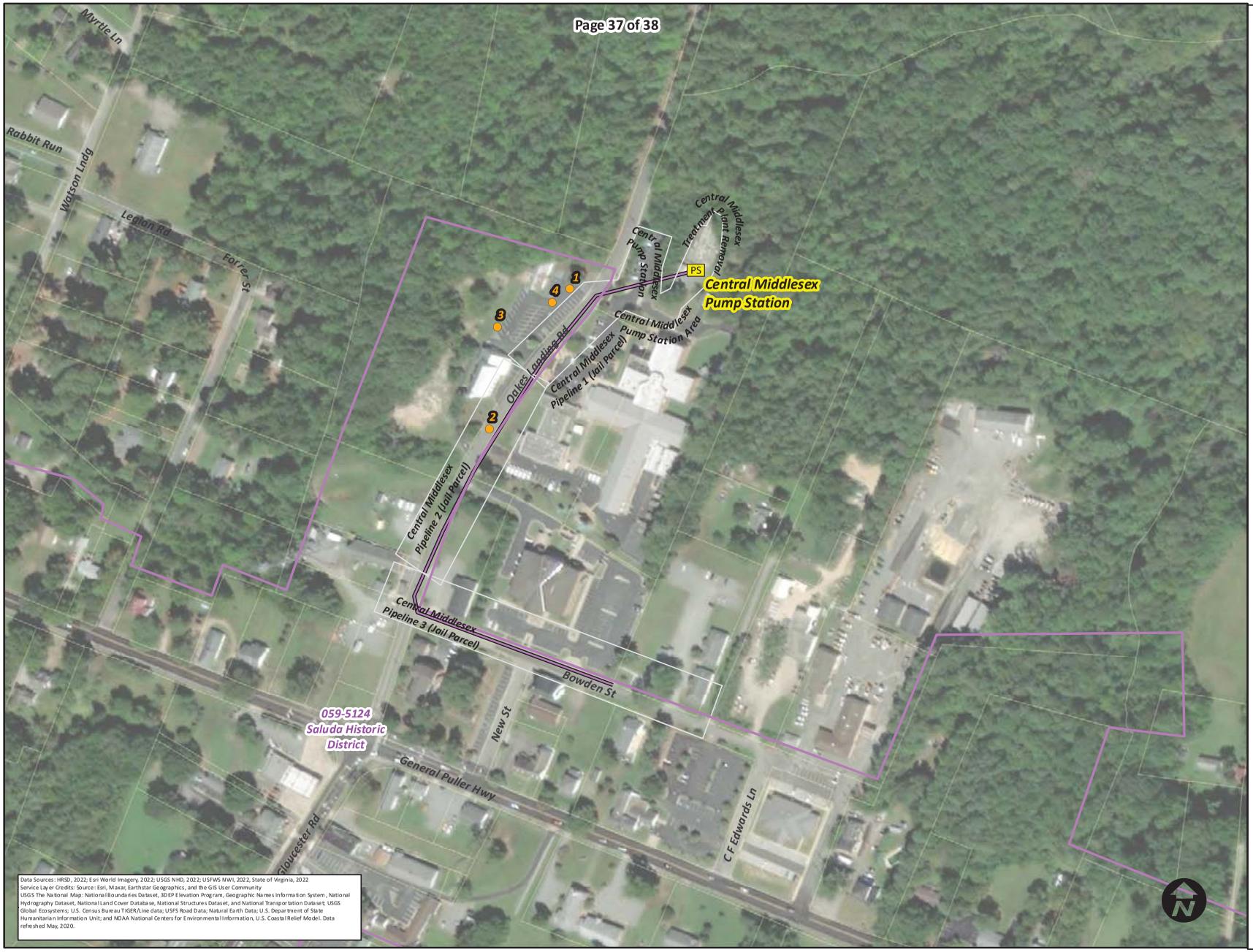

HAMPTON ROADS SANITATION DISTRICT
MIDDLESEX INTERCEPTOR ARCHITECTURE SURVEY RESULTS MAPBOOK

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Date	7/19/2022
Project No.	194-0112-0031
Personnel	Figure Prepared by: Tetra Tech GIS Staff

0 100 200 300 400 Feet

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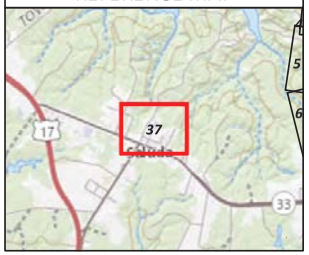
REFERENCE MAP



NOT FOR CONSTRUCTION

HAMPTON ROADS SANITATION DISTRICT

MIDDLESEX INTERCEPTOR ARCHITECTURE SURVEY RESULTS MAPBOOK

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Date	7/19/2022
Project No.	194-0112-0031
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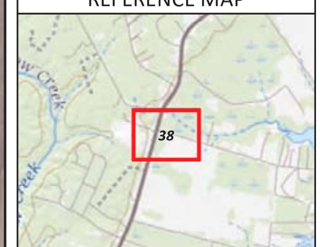
REFERENCE MAP



NOT FOR CONSTRUCTION

APPENDIX B: VDHR RESOURCE FORMS FOR PROPERTIES IDENTIFIED IN PHASE I SURVEY

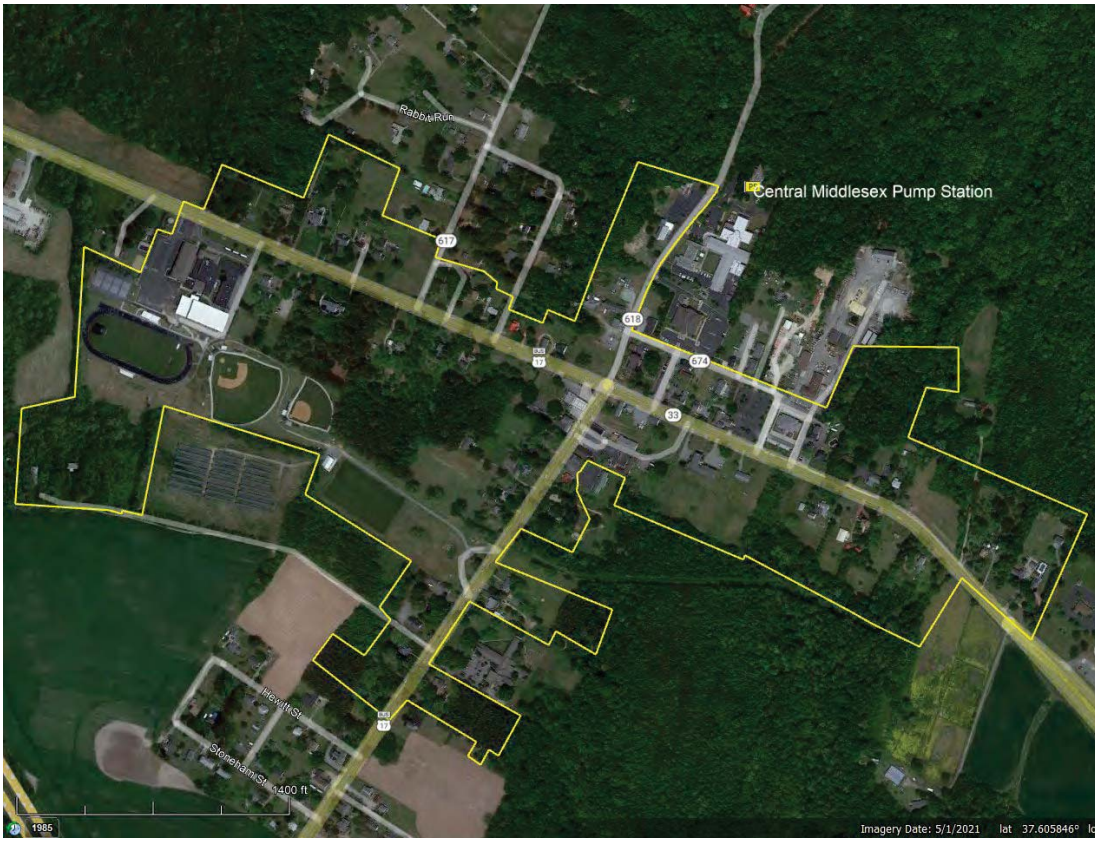
Saluda Historic District – Saluda, Middlesex County
VDHR No. 059-5124
Tetra Tech ID No. 1/ Map Sheet 37

The Saluda Historic District encompasses 258 acres in the village of Saluda, centered around the junction of General Puller Highway (State Route 33) and Gloucester Road (US 17 Business). The district contains 102 contributing resources dating from the period of significance, 1837 to 1968, and is listed on the NRHP at the local level under Criterion A and C. Under Criterion A, areas of significance include government, commerce, education, ethnic heritage, and law.

The town of Urbanna had been the site of the county courthouse for a century but was isolated on the west side of Urbanna Creek, making it difficult for citizens from the lower part of the county to conduct official business. In 1849, county voters decided to move the courthouse to a more central location along the main county road (Rt 33) where an enterprising landowner, John C. Bristow, offered to donate a 2.5-acre parcel for the courthouse. The courthouse was completed in 1852. By 1889, the village numbered around 100 and supported three hotels, five sawmills, a grain mill, six general merchants, three saloons and two undertakers (Kirchen 2020:8/46).

The proposed pump station will be located to the rear of the Middle Peninsula Regional Security Center. Tetra Tech concludes that the project will not introduce visual effects that would diminish or alter the significance of the NRHP-listed resource.

View to north. County courthouse, built 1849, at left; annex, built 1965, at right. June 1, 2022. R. Jacoby



VCRIS No:	059-5124
Location:	Saluda, Middlesex County
Resource Type:	Saluda Historic District
NRHP Status:	listed
Tt ID No./Map Sheet	1/37

Resource Plan View

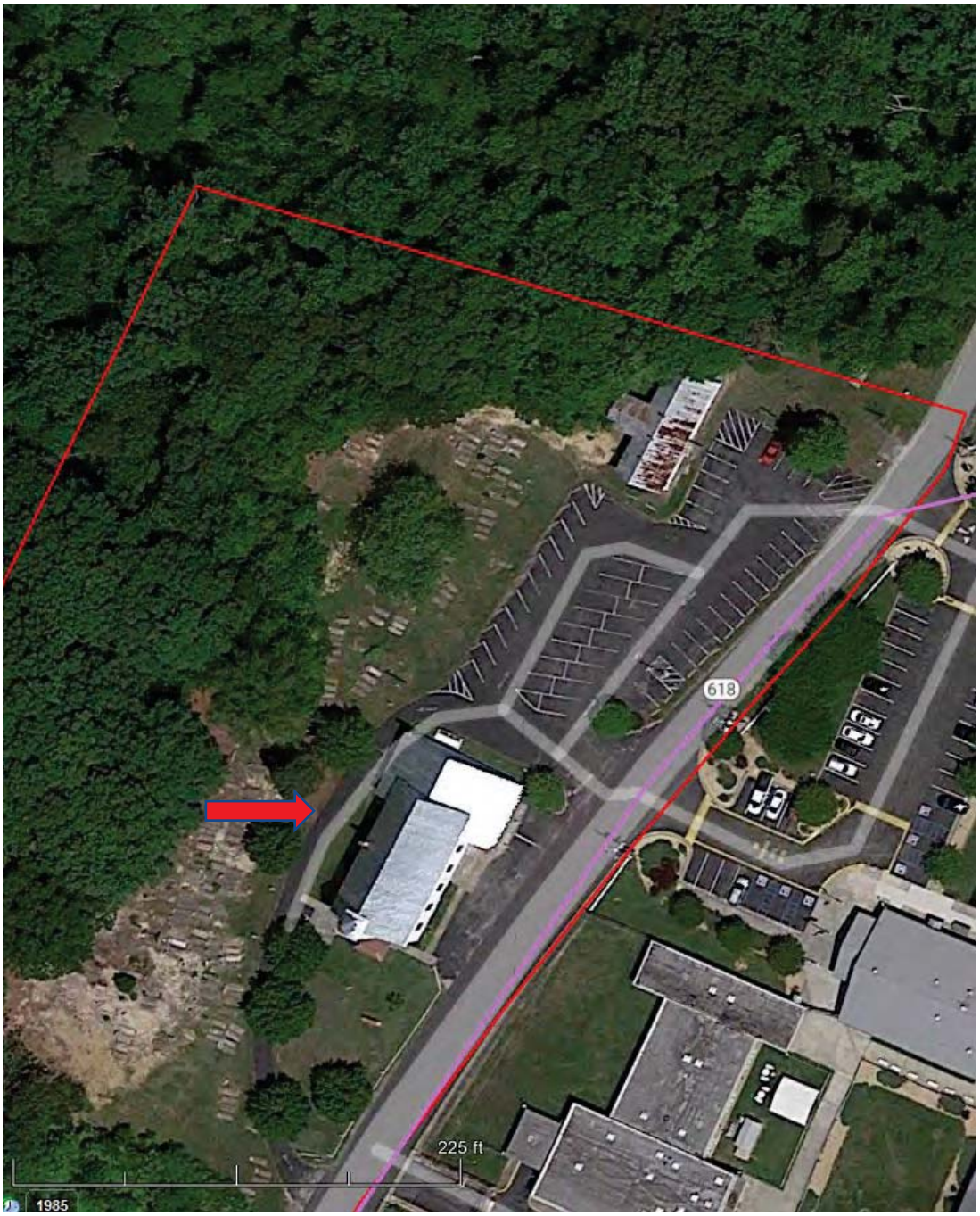
N

Antioch Baptist Church – 159 Oakes Landing Road, Saluda, Middlesex County
VDHR No. 059-5124-0003
Tetra Tech ID No. 2/ Map Sheet 37

The Antioch Baptist Church was organized in 1867 by recently freed African Americans seeking to establish a congregation of their own. The original building burned and the current structure dates to 1895. The structure is a simplified version of the classic church designs of Wren and Gibbs. The bell tower projects through the front gable and supports a six-sided cupola at its apex. Gothic-revival inspired windows grace the front elevation and side elevations, and feature stained glass. Aluminum siding has replaced the original clapboard. Standing seam metal covers a very steeply sloped roof, as well as the cupola. The foundation is brick. A two and a half-story addition is located at the rear and appears to have been constructed in the mid-twentieth century. The church grounds contain a cemetery and an elementary school for the education of Black students during the segregated Jim Crow era.

The church is a contributing resource to the Saluda Historic District. Tetra Tech recommends that the Antioch Baptist Church retain its status as not individually eligible for listing in the NRHP under Criterion A, B, or C.

View to north. 2018. David Hoffman, on Flickr.



VCRIS No:	059-5124-0003
Location:	159 Oakes Landing Road Saluda, Middlesex County
Resource Type:	Antioch Baptist Church
NRHP Status:	contributing to Saluda Historic District
Tt ID No./Map Sheet	2/37

Resource Plan View

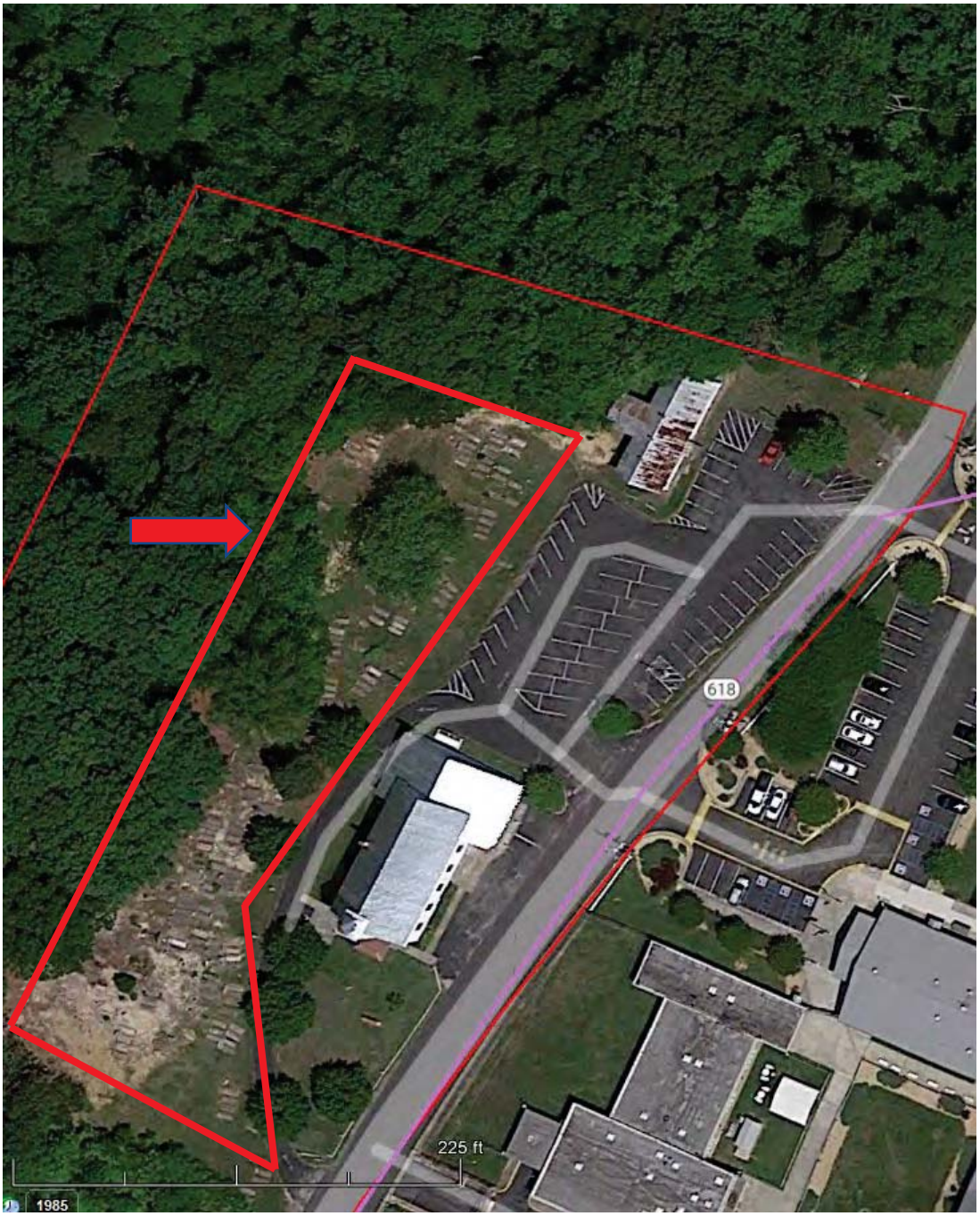
N

Antioch Baptist Cemetery – 159 Oakes Landing Road, Saluda, Middlesex County
VDHR No. 059-5124-0003
Tetra Tech ID No. 3/ Map Sheet 37

After the Antioch Baptist Church was organized in 1867 by recently freed African Americans, the congregation established an associated cemetery. Arrayed to the north, west, and southwest of the church building, the cemetery contains approximately 100 burials, dating from the turn of the twentieth century to the present. Most headstones consist of horizontal slabs covering the grave, while more recent burials tend to be represented by vertical stones.

The church and cemetery are contributing resources to the Saluda Historic District. The cemetery features no distinctive funereal statuary, landscaping, or organization. Tetra Tech recommends that the Antioch Baptist Church retain its status as not eligible for individual listing in the NRHP under Criterion A, B, or C.

View to northwest. June 1, 2022. R. Jacoby



VCRIS No:	059-5124-0003
Location:	159 Oakes Landing Road Saluda, Middlesex County
Resource Type:	Antioch Baptist Church Cemetery
NRHP Status:	contributing to Saluda Historic District
Tt ID No./Map Sheet	3/37

Resource Plan View

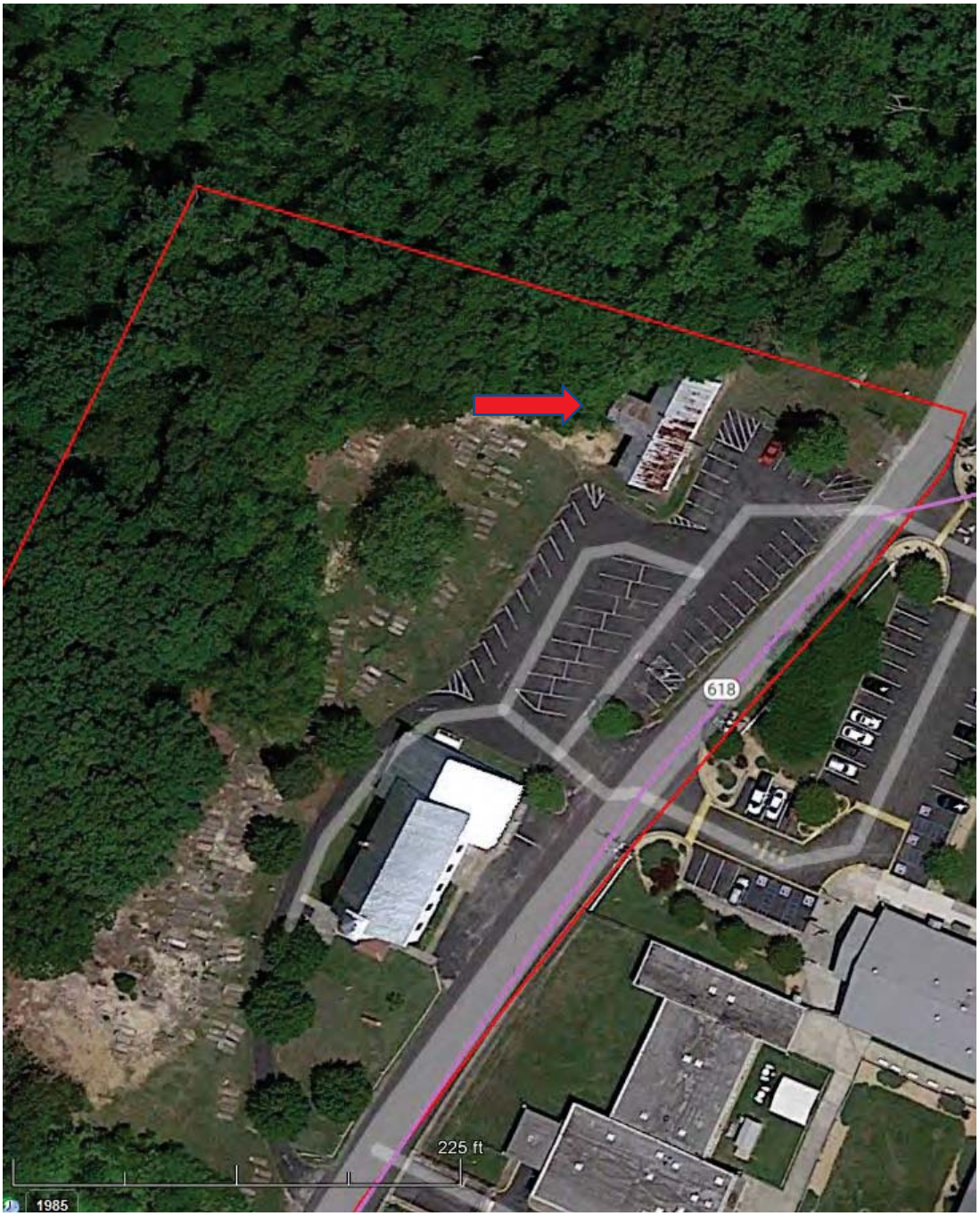
N

Antioch Elementary School – 159 Oakes Landing Road, Saluda, Middlesex County
VDHR No. 059-5124-0003
Tetra Tech ID No. 4/ Map Sheet 37

In 1867, a group of recently freed African Americans left the Clark's Neck Baptist Church to form the Antioch Baptist Church in Saluda. In the era of segregated public facilities, classes for Black children were held in the church. In the early 1870s, a one-room house was donated and moved to the church for use as a school. A classroom was added around 1907 and another circa 1920 (Kirchen 2020:8.39-8.40). The gable-end structure is clad with clapboard, sits on brick piers, and has a standing seam metal roof. Three small, brick chimneys extend from the ridgeline, likely venting wood-burning Franklin stoves in each of the three classrooms. The school closed in 1962 as the Jim Crow era was nearing its end.

The Antioch Baptist Church, cemetery and the school are contributing resources to the Saluda Historic District. The Antioch Elementary School retains its original fabric, has been little altered since the last classroom was added circa 1920, and overall is in good condition. While other buildings served as "Colored" Schools in the period from 1865 to 1965, few remain standing in Middlesex County. The school was determined to be individually not eligible for listing in the NRHP by VDHR. Tetra Tech recommends that the former school building remain a contributing resource to the Saluda Historic District, and retain its present status as not individually eligible for listing in the NRHP.

View to northwest. June 1, 2022. R. Jacoby



VCRIS No:	059-5124-0003
Location:	159 Oakes Landing Road Saluda, Middlesex County
Resource Type:	Antioch Elementary School
NRHP Status:	contributing to Saluda Historic District
Tt ID No./Map Sheet	4/37

Resource Plan View

N

House – 430 Bonner Street, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 5/ Map Sheet 1

This resource, built in 1969, is a one-story gable-front house, organized into three rooms with shotgun entry. The house exhibits vinyl siding, cinderblock foundation, and asphalt shingle roofing. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The structure is typical of low-cost housing constructed in the post-Second World War period and displays no distinctive architectural features. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	430 Bonner Street Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	5/1

Resource Plan View

N

House – 430 Bonner Street, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 5/ Map Sheet 1

This resource, built in 1969, is a one-story gable-front house, organized into three rooms with shotgun entry. The house exhibits vinyl siding, cinderblock foundation, and asphalt shingle roofing. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The structure is typical of low-cost housing constructed in the post-Second World War period and displays no distinctive architectural features. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	430 Bonner Street Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	5/1

Resource Plan View

N

House – 181 Linden Avenue, Urbanna, Middlesex County
VDHR No.

Tetra Tech ID No. 7/ Map Sheet 1

This resource, built in 1963, is a one-story gable-end ranch house. The house features vinyl siding, brick foundation, and asphalt shingle roofing. The structure's footprint and roofline have been little altered since construction. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The building is an unremarkable residential structure typical of the post Second World War period and displays no distinctive architectural design elements. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southeast. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	181 Linden Avenue Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	7/1

Resource Plan View

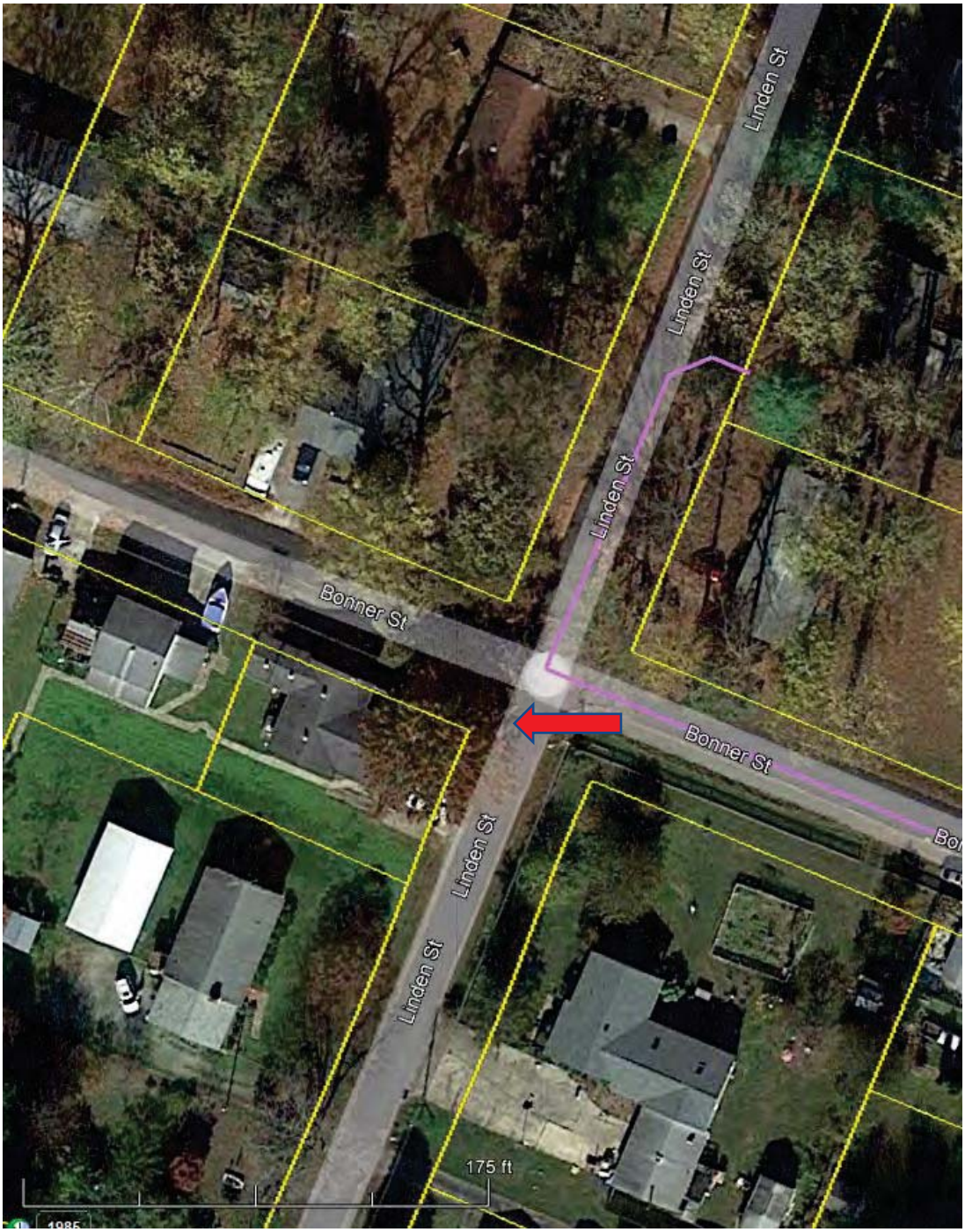
N

House – 188 Linden Avenue, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 8/ Map Sheet 1

This resource, built in 1969, is a one-story gable-front and wing house. The house features vinyl siding, cinderblock foundation, and asphalt shingle roofing. The structure's footprint and roofline have been little altered since construction. A small wood deck has been added to the elbow of the front gable and wing. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The building is typical of the post-Second World War period and does not possess architectural or historical significance. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 1, 2022. R. Jacoby



VCRIS No:	pending
Location:	188 Linden Avenue Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	8/1

Resource Plan View

N

House – 214 Linden Avenue, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 9/ Map Sheet 1

This resource, built in 1972, is a one-story side-gabled ranch house. The house features vinyl siding, brick foundation, and asphalt shingle roofing. Brick cladding extends from the foundation upward to the window sills. The structure's footprint and roofline have been little altered since construction except for a small wing added to the north gable. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The building is an unremarkable example of the post-Second World War period and does not exhibit distinctive architectural features of the sort that would lend this resource significance. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to northwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	214 Linden Avenue Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	9/1

Resource Plan View

N

House – 211 Linden Avenue, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 10/ Map Sheet 1

This resource, built in 1973, is a one-story gable-end ranch house. The house features clapboard siding, brick foundation, and asphalt shingle roofing. The structure's footprint and roofline have been little altered since construction. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The building is typical of residential construction in the post-Second World War period and possesses neither architectural nor historical significance. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southeast. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	211 Linden Avenue Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	10/1

Resource Plan View

N

House – 210 Linden Avenue, Urbanna, Middlesex County
VDHR No.
Tetra Tech ID No. 11/ Map Sheet 1

This resource, built in 1970, is a one-story gable-end ranch house. The house features vinyl siding, brick foundation, and asphalt shingle roofing. An overhang extends streetward from the front elevation and is supported by two plain metal posts. The footprint and roofline have been little altered since construction. The house is situated within a suburban-like residential neighborhood in the town of Urbanna.

The building is typical of residential construction in the post-Second World War period and possesses neither architectural or historical significance. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	210 Linden Avenue Urbanna, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	11/1

Resource Plan View

N

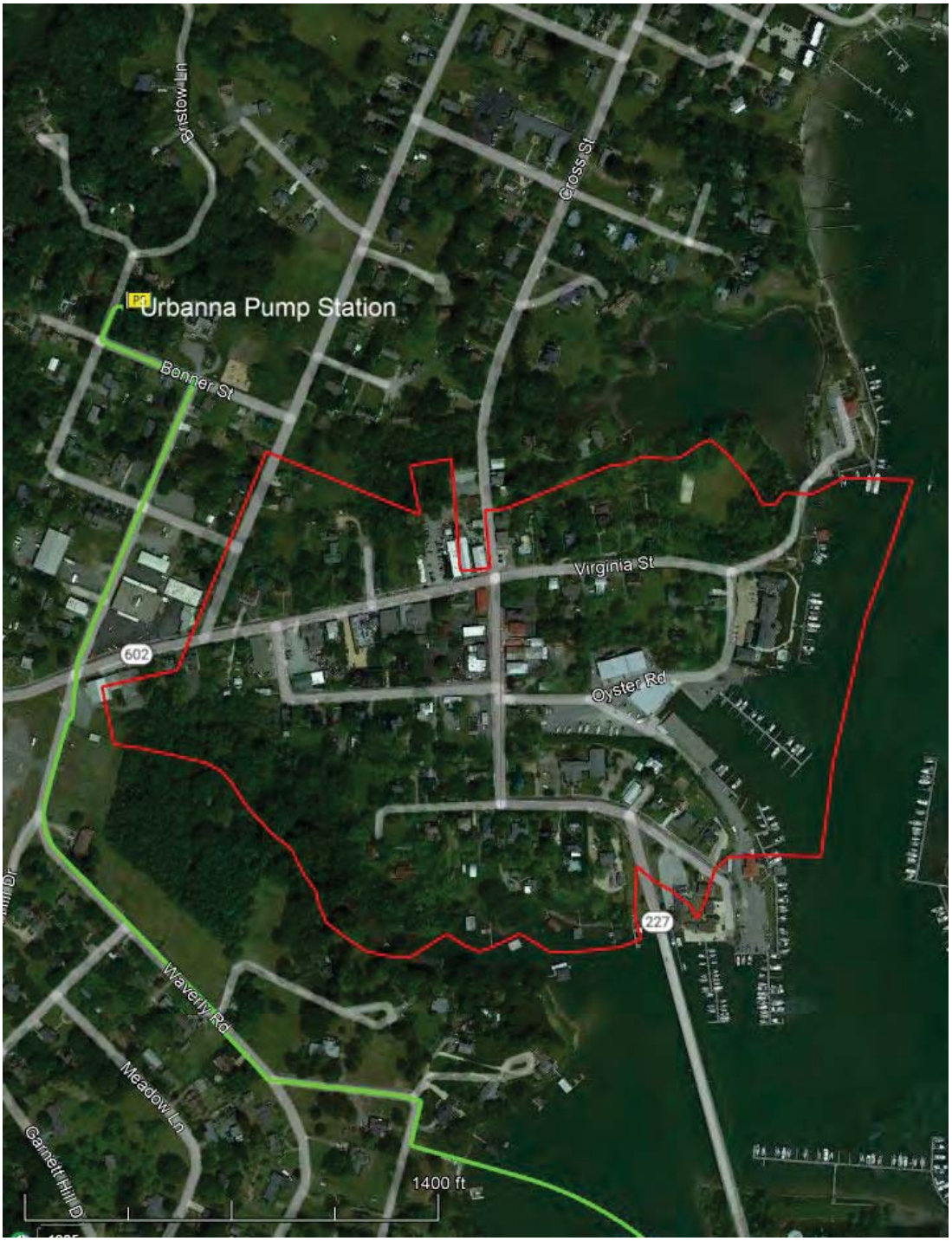
Urbanna Historic District – Urbanna, Middlesex County
VDHR No. 316-0009
Tetra Tech ID No. 12/ Map Sheet 1

The Urbanna Historic District encompasses 72 acres in the heart of the town Urbanna, incorporating the business district along Virginia Street and extending to the harbor on Urbanna Creek. The district contains 66 contributing resources dating from the period of significance, 1680 to 1940, and is listed on the NRHP at the statewide level under Criteria A and C. Under Criterion A, areas of significance include exploration/settlement, commerce, politics/government, and maritime history.

Urbanna was settled by English colonists in 1704 and became the Middlesex County courthouse (county seat) in 1748. With passage of the tobacco warehouse acts of 1713 and 1730, and harborage at the junction of Urbanna Creek and the Rappahannock River, Urbanna became the regional center of tobacco trade. In 1849, county voters decided to move the county to the main road south of Urbanna Creek, in the village of Saluda. Despite the loss of the governmental business, Urbanna's location on the river and an expanding oyster industry ensured a continuation of commerce until about 1940.

The proposed pump station will be located about 700 feet northwest of the nearest edge of the historic district. Tetra Tech concludes that the project will not introduce visual effects to the district that would diminish or alter the significance of the NRHP-listed resource.

View to northwest. June 1, 2022. R. Jacoby



VCRIS No:	316-0009
Location:	Urbanna, Middlesex County
Resource Type:	Urbanna Historic District
NRHP Status:	listed
Tt ID No./Map Sheet	12/1

Resource Plan View

N

House – Rappahannock Avenue Cemetery, Urbanna, Middlesex County
VDHR No. 316-0009-0095
Tetra Tech ID No. 13/ Map Sheet 1

This small cemetery, situated about 75 feet from the east side of Rappahannock Avenue in the Town of Urbanna, contains several graves of the Lee family, one of the most prominent families in Virginia since the colonial period. The branch of the family headed by Arthur Lee resided in the Urbanna estate of Lansdowne during the late eighteenth century. Arthur Lee was a diplomat who negotiated the treaty that established France as an American ally during the Revolutionary War, and who later served in the Virginia House of Delegates. His grave, along with several of his family, is within this resource. The cemetery includes a black wrought iron fence and a small copse of mature trees.

The Rappahannock Avenue Cemetery is associated with the Urbanna Historic District and has not been evaluated for individual eligibility to the NRHP. Generally, cemeteries and gravesites are not considered eligible for listing in the NRHP except if associated with an eligible church, within a historic district, or qualified by Criterion Consideration D (see Section 2.2). While Lee was an important figure during the American Revolution, his stature in American history is not transcendent, and therefore Tetra Tech recommends that this resource is not eligible for listing in the NRHP under Criterion A or Criterion Consideration B.

View to southeast. June 1, 2022. R. Jacoby

VCRIS No:	316-0009-0095
Location:	Rappahannock Avenue Urbanna, Middlesex County
Resource Type:	Rappahannock Avenue Cemetery
NRHP Status:	recommended contributing to Urbanna HD
Tt ID No./Map Sheet	13/1 **Resource Plan View**

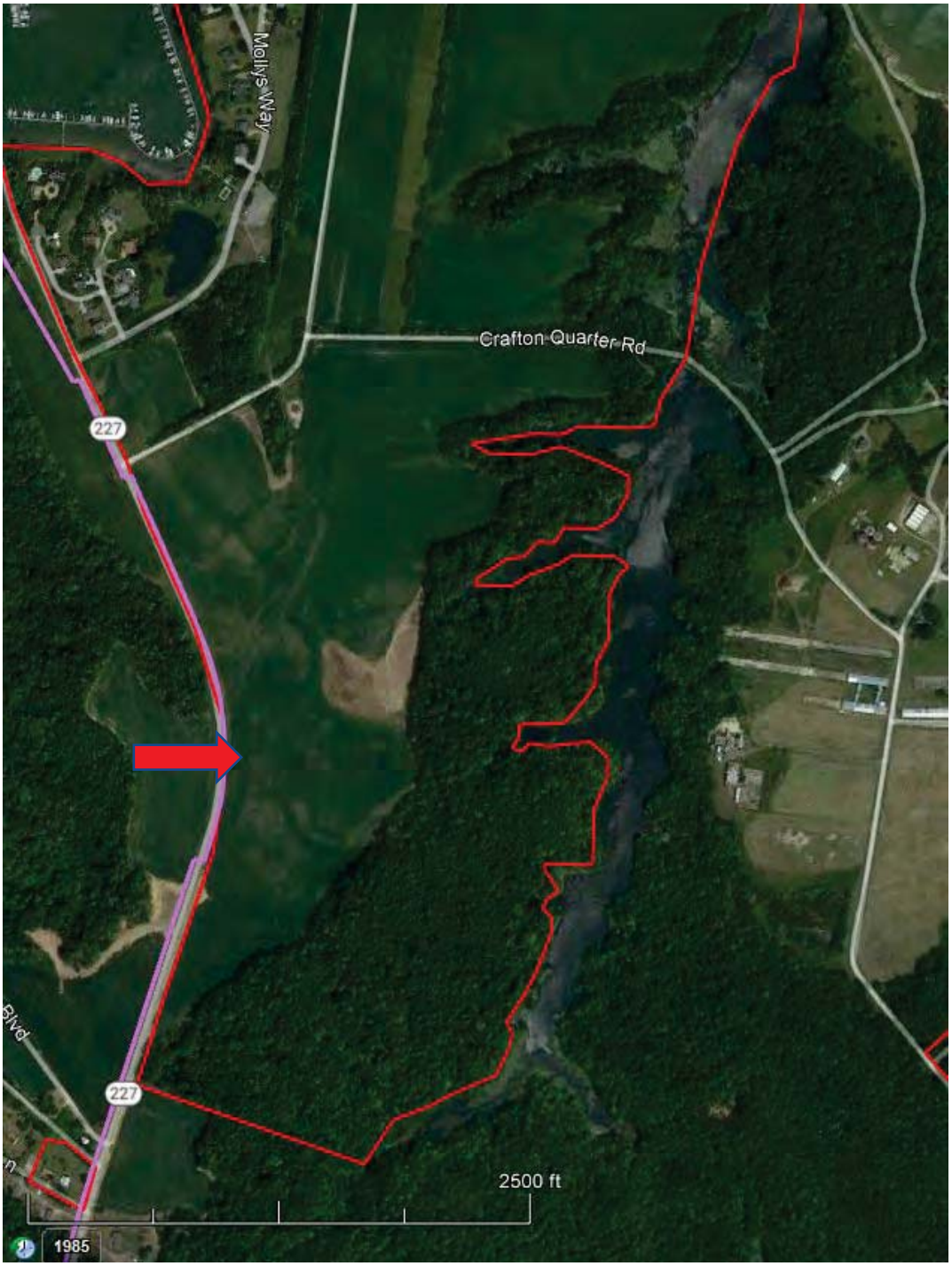
N

Rosegill Plantation, Saluda, Middlesex County
VDHR No. 059-0009
Tetra Tech ID No. 14/ Map Sheet 4

Rosegill is a large estate that was established in 1649 by Ralph Wormeley, the first of five successive heads of family with that name. The estate has, for more than 350 years, represented the archetypal Tidewater agricultural complex. Encompassing 3,200 acres when established, the present bounds of the NRHP-listed property measures approximately 400 acres, consisting of agricultural fields, woodlots, and the residential complex that includes four associated brick structures: main house, kitchen, wash house, and storage house. These structures all date to the mid-eighteenth century. Rosegill was listed in the Virginia Landmarks Register (VLR) and the NRHP in 1973.

The Rosegill standing structures are approximately 3,000 feet northeast of the Project, screened from any potential visual effects by extensive woodlots. Portions of the resource that would have temporary views of the Project include agricultural fields along the east side of Urbanna Road. Tetra Tech recommends that the Project will not alter or diminish the characteristics that endow Rosegill with significance and will not introduce direct or indirect adverse effects to the resource.

View to north. June 2, 2022. R. Jacoby



VCRIS No:	059-0009
Location:	Urbanna Road Saluda, Middlesex County
Resource Type:	Rosegill Plantation
NRHP Status:	listed
Tt ID No./Map Sheet	14/4

Resource Plan View

N

House – 863 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 15/ Map Sheet 5

This resource is a 1 ½-story side-gabled cottage in a rural district of Middlesex County. The structure is set back about 75 feet from the road and is backed by a thick woodlot. Built in 1945, this residence features asbestos siding, cinderblock foundation, and asphalt shingle roof. Single-window twin dormers are present roadward. The dual-pitched roof is a common feature of cottage design in the Tidewater. Interior, twin brick chimneys are located along the ridgeline.

This resource is an unremarkable example of housing construction since the Second World War and possesses no features that are architecturally or historically significant. Tetra Tech recommends that the house is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	863 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	15/5

Resource Plan View

N

House – 819 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 16/ Map Sheet 5

This resource is not visible from the public right-of-way. A review of the Middlesex County tax parcel data revealed an absence of relevant building information in its file, suggesting abandonment of the property. A review of historic USGS quadrangle maps indicates that this resource was built prior to 1972.

Tetra Tech recommends that this resource be considered undetermined with respect to NRHP eligibility.

View to west. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	819 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	16/5

Resource Plan View

N

House – 928 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 17/ Map Sheet 5

This resource, built in 1970, is a one-story side-gabled house with a small porch addition on the south gable. Exterior walls are cinderblock, with cinderblock foundation, and asphalt shingle roofing. Aside from the porch, the resources footprint and roofline have not been altered since construction. The house is situated within a semi-rural district in the town of Saluda and is partially enclosed by mature forest.

The structure is typical of low-cost housing constructed in the post-Second World War period and displays no distinctive architectural features. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southeast. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	928 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	17/5

Resource Plan View

N

House – 1103 Urbanna Road, Saluda, Middlesex County
VDHR No. 059-5174
Tetra Tech ID No. 18/ Map Sheet 5

This resource, built in 1940, is a 1 ½-story side-gabled house. The house is three bays wide and three bays deep. Exterior walls are clad with clapboard, the foundation is cinderblock, and the roof material is standing-seam metal. Triple-window dormers are present on the front and rear, extending outward to meet the exterior wall elevations. The front entry is offset to the north and is approached via five wood steps ascending to a small landing. A single brick chimney extends from the inner corner of the front dormer. The footprint and roofline of the house have not been altered since construction. The house is situated within a semi-rural district in the town of Saluda and is surrounded by lawn with plantings.

The structure is typical of mid-twentieth century residential construction and possesses no distinctive architectural features or known historical associations. The V-CRIS-recorded NRHP-status is undetermined. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	059-5174
Location:	1103 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	not evaluated
Tt ID No./Map Sheet	18/5

Resource Plan View

N

G.L. Davis Service Center, 374 Urbanna Road, Saluda, Middlesex County
VDHR No. 059-5424
Tetra Tech ID No. 19/ Map Sheet 6

This resource, built in 1948, is a one-story former vehicle service center, located midway between the town of Urbanna and the crossroads hamlet of Cooks Corner. Constructed of cinderblock on concrete slab, the flat roof was sealed with tar and gravel. Now abandoned, the fabric of the structure is in a ruinous state.

The structure is typical of service stations across the country and possesses no distinctive architectural features or known historical associations. The V-CRIS-recorded NRHP-status is undetermined. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southeast. June 1, 2022. R. Jacoby

VCRIS No:	059-5424
Location:	374 Urbanna Road Saluda, Middlesex County
Resource Type:	G.L. Davis Service Center
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	19/6

Resource Plan View

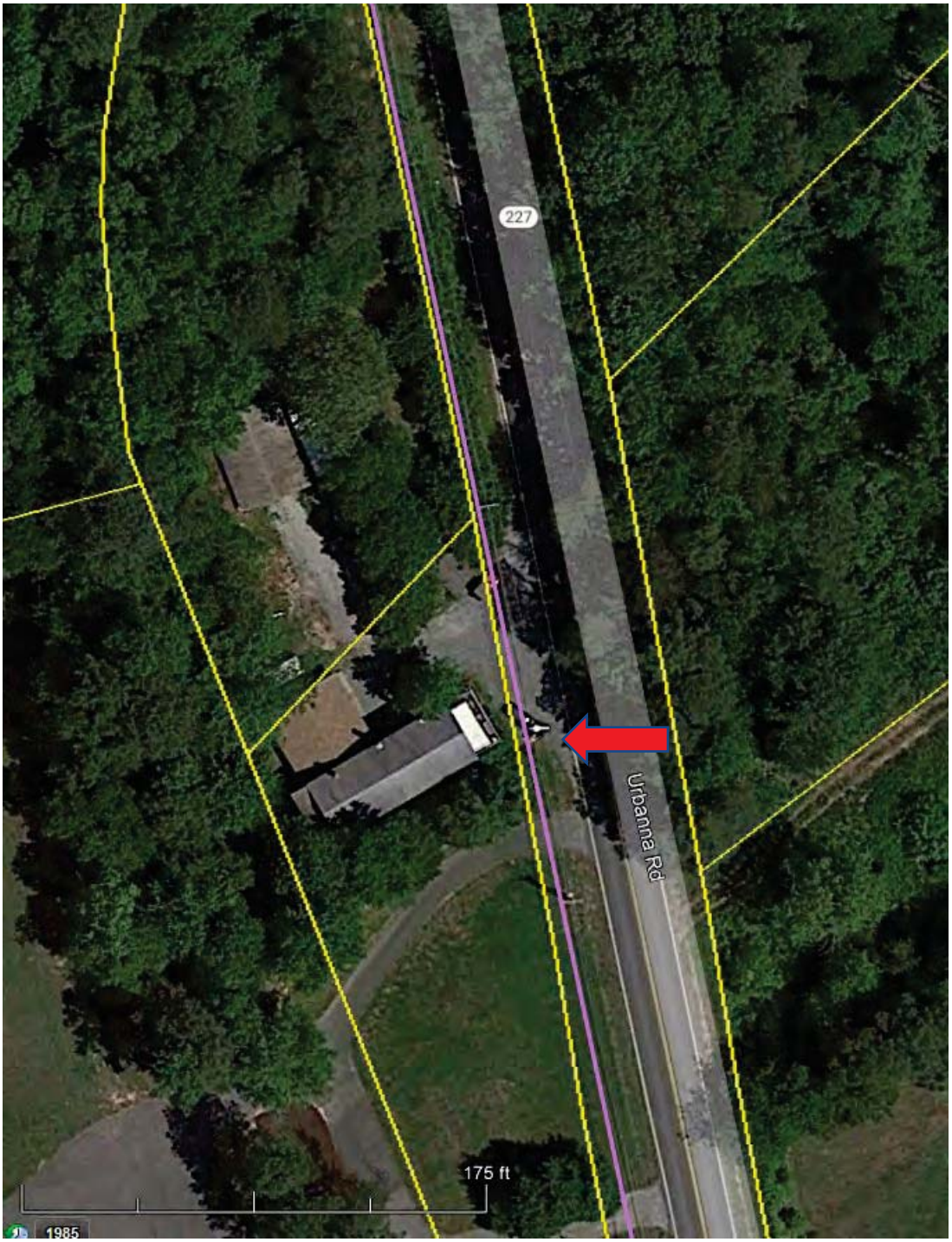
N

House – 453 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 20/ Map Sheet 6

This resource, built in 1947, is a two-story gable-front house. Materials include vinyl siding, cinderblock foundation, and asphalt shingle roof. Two exterior cinderblock chimneys are present on the north façade. A second-floor deck has been added to the front gable, supported by cinderblock and wood posts, creating a ground floor loggia. The deck supports an enclosed solarium. An unattached two-car garage is located north of the house.

The resource is typical of housing constructed after the Second World War and possesses no distinctive architectural features or known historical associations. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby



VCRIS No:	pending
Location:	453 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	20/6

Resource Plan View

N

House – 382 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 21/ Map Sheet 6

This resource, built in 1937, is a 2 ½-story American Foursquare house. Consistent with the style are a pyramidal roof, front-facing dormer, and a front porch with brick piers supporting paired square wood posts that support the porch roof. A porch skirt extends across the front. Brick steps lead up to the front entry which is offset to the left. Building fabric includes aluminum siding, cinderblock foundation, and standing-seam metal roof. Two interior brick chimneys extend through the roof near the side elevations. The open porch subsequently has been enclosed.

The resource is typical of housing constructed in the first third of the twentieth century and possesses no distinctive architectural features or known historical associations. The enclosed porch and aluminum siding have altered the integrity of the building. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to north. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	382 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	21/6

Resource Plan View

N

House – 409 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 22/ Map Sheet 6

Built in 1949, this resource is a one-story ranch with front and side gables. Building fabric includes vinyl siding, brick foundation, and asphalt shingle roof. An unattached garage sits to the rear of the house. The residence is located in a semi-rural district on the outskirts of the crossroads hamlet of Cooks Corner. The house is close to the road, includes lawns with minimal landscaping and several mature trees, and dense woodland to the rear.

The resource is typical of housing constructed in the post-Second World War period and exhibits no distinctive architectural features or known historical associations. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to northwest. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	409 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	22/6

Resource Plan View

N

House – 307 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 23/ Map Sheet 6

This resource is a 1 ½-story side-gabled cottage. Built in 1946, the cottage features a dual-pitched roof, front dormer with twin windows, and an enclosed front porch. Building fabric includes asbestos siding, cinderblock foundation, and a standing-seam metal roof. A brick chimney is observed extending through the roof to the rear of the ridgeline. The residence is located in a semi-rural district on the outskirts of the crossroads hamlet of Cooks Corner. Surrounding the house is lawn with some landscaping and mature trees to the rear.

The resource is typical of housing constructed in the post-Second World War period and exhibits no distinctive architectural features or known historical associations. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to southwest. June 2, 2022. R. Jacoby

VCRIS No:	pending
Location:	307 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	23/6

Resource Plan View

N

House – 267 Urbanna Road, Saluda, Middlesex County
VDHR No. 059-5176
Tetra Tech ID No. 24/ Map Sheet 7

This resource, built in 1950, is a 1 ½-story side-gabled cottage. Typical of the form, this cottage features a dual-pitched roof, single-window twin dormers on front and rear, and an enclosed front porch. Materials include vinyl siding on the gables from the base of the windows to the roof, brick cladding from the foundation to the window sills, brick foundation, and a standing-seam metal roof. A brick chimney is observed extending through the roof to the rear of the ridgeline. The residence is in a semi-rural district on the outskirts of the crossroads hamlet of Cooks Corner. Surrounding the house is lawn with a few mature trees.

The resource is an unremarkable example of the sort of housing constructed in the post-Second World War period and exhibits no distinctive architectural features or known historical associations. The property is recorded in V-CRIS as undetermined NRHP eligibility. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 1, 2022. R. Jacoby

VCRIS No:	059-5176
Location:	267 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	24/7

Resource Plan View

N

House – 281 Urbanna Road, Saluda, Middlesex County
VDHR No. 059-5175
Tetra Tech ID No. 25/ Map Sheet 7

Built in 1954, this resource is a 1 ½-story side-gabled cottage. Typical of the form, this cottage features a dual-pitched roof, single-window twin dormers on the front facade, twin-window single dormer to the rear, and an enclosed front porch. The house is clad with brick, has a brick foundation, and a standing-seam metal roof. An overhang, supported by thin posts, extends over an open, rear porch. The structure's footprint and roofline have remained unchanged since construction. Situated in a semi-rural district on the outskirts of the crossroads hamlet of Cooks Corner, the cottage is surrounded by lawn with a few mature trees in the yards. A small shed is visible to the rear of the house.

The resource is an unremarkable example of the sort of housing constructed in the post-Second World War period and exhibits no distinctive architectural features or known historical associations. As recorded in V-CRIS, the property's NRHP-status is undetermined. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 1, 2022. R. Jacoby

VCRIS No:	059-5175
Location:	281 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	25/7

Resource Plan View

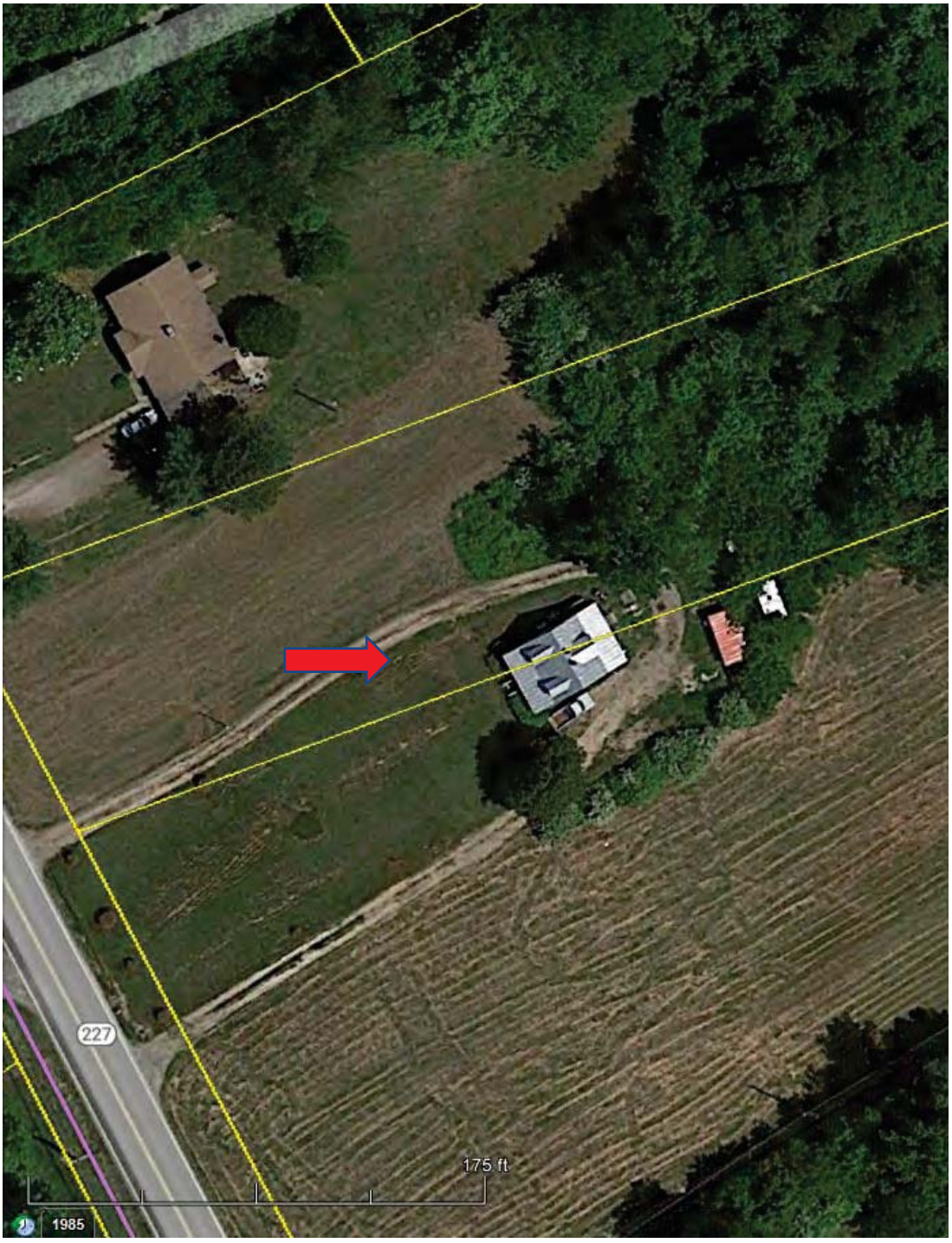
N

House – 218 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 26/ Map Sheet 7

This resource is a 1 ½-story side-gabled cottage built in 1930. Typical of the form, this cottage features a dual-pitched roof, single-window twin dormers on the front facade, a twin-window single dormer to the rear, and front porch. The porch has been enclosed at some point. The house is clad with clapboard, sits on cinderblock piers, and has a standing-seam metal roof. Twin brick chimneys pierce the roof immediately rearward of the ridgeline. The structure's footprint and roofline have remained unchanged since construction. Set back approximately 200 feet from Urbanna Road, the cottage is situated at the edge of a very broad woodlot which extends rearward about a quarter-mile within a semi-rural district on the outskirts of the hamlet of Cooks Corner. A narrow lawn extends to the road. Three oil tanks are supported on trestles on the north side of the house.

The resource is typical of residential construction during the inter-war period and exhibits no distinctive architectural features or known historical associations. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to east. June 1, 2022. R. Jacoby



VCRIS No:	pending
Location:	218 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	26/7

Resource Plan View

N

House – 235 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 27/ Map Sheet 7

This resource, built in 1952, is a 1 ½-story side-gabled cottage. As with many residences of this form, it features a dual-pitched roof, twin-window single dormers facing front and rear, and an open front porch. The overhanging portion of the rear roof has been enclosed. The house is clad with clapboard, sits on cinderblock piers, and has an asphalt shingle roof. Twin brick chimneys extend through the ridgeline to either side of the dormers. The structure's footprint and roofline appear to have remained unchanged since its construction. Set close to the road, the cottage is situated about a quarter-mile northwest of the crossroads around the hamlet of Cooks Corner. Surrounding the cottage is lawn and a copse of mature trees.

Similar to many other residential structures in the vicinity built in the mid-twentieth century, this house possesses no distinctive architectural features or known historical associations. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	235 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	not evaluated
Tt ID No./Map Sheet	27/7

Resource Plan View

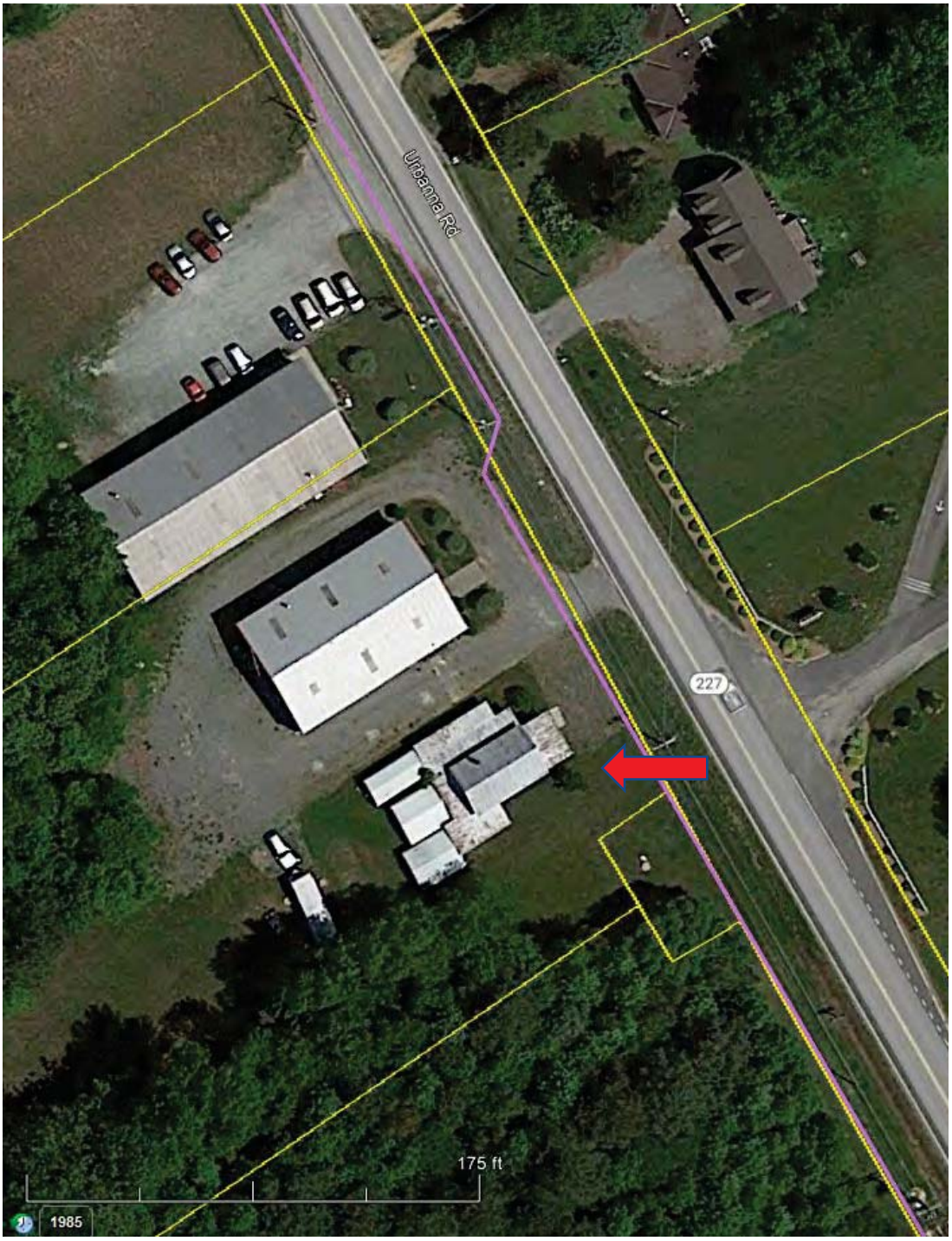
N

House – 147 Urbanna Road, Saluda, Middlesex County
VDHR No. 059-5177
Tetra Tech ID No. 28/ Map Sheet 7

Built circa 1940, this resource is a two-story gable-front house. The house is clad with clapboard, rests on a cinderblock foundation, and is roofed with standing-seam metal. The structure's footprint and roofline have been altered numerous times, with at least five additions to the sides and rear visible. A shed roof overhang extends over the front entry, supported by three undecorated posts. Set close to the road, the resource is situated about 700 feet northwest of the crossroads hamlet of Cooks Corner. The property exhibits sparse landscaping.

The fabric and form of this resource has undergone significant alteration and its integrity is quite low. It possesses no distinctive architectural features or known historical associations and was recorded previously in V-CRIS as undetermined status regarding NRHP eligibility. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to west. June 1, 2022. R. Jacoby



VCRIS No:	059-5177
Location:	147 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	not evaluated
Tt ID No./Map Sheet	28/7

Resource Plan View

N

House – 51 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 29/ Map Sheet 7

This 1950 ranch house features a short gable-front with long side-gabled wing. Cladded with aluminum siding on a cinderblock foundation, this one-story house contains asphalt shingles on a low-pitch roof. A brick chimney extends from the long axis ridgeline. Louvered windows on the front façade form a sunroom facing northeast. Several sheds or garages are evident from aerial imagery to the rear and north of the house. The resource appears to retain its original footprint and roofline. Situated close to the junction of General Puller Highway and Urbanna Road, the ranch house is one of few residences in the hamlet of Cooks Corner. Lawns and a woodlot are present to the rear of the property.

The ranch style was a popular post-Second World War house form across the United States and is found throughout the Project vicinity. This example exhibits no architectural or historical significance at the local or state level. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to south-southwest. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	51 Urbanna Road Saluda, Middlesex County
Resource Type:	house
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	29/7

Resource Plan View

N

American Legion Hall – 76 Urbanna Road, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 30/ Map Sheet 7

This resource is the American Legion Hall, Post 241 in the hamlet of Cooks Corner. A 1 ½-story side-gabled structure, its structural walls and foundation are comprised of cinderblock. The roof is sheathed with standing-seam metal. A rear addition with a lower-pitched roof is also constructed of cinderblock. Built in 1940, the front entry is sheltered by a simple gable-front overhang. Aside from the rear addition, the resource appears little altered from its original construction. Windows are two over two double hung sash.

Utilitarian in design and function, cinderblock, or concrete masonry unit (CMU) buildings offered low maintenance and long-term utilization. This meeting hall displays no architectural or historical significance. Tetra Tech recommends that this resource is not eligible for listing on the NRHP under Criterion A, B, or C.

View to north. June 1, 2022. R. Jacoby

VCRIS No:	pending
Location:	76 Urbanna Road Saluda, Middlesex County
Resource Type:	American Legion hall
NRHP Status:	recommended not eligible
Tt ID No./Map Sheet	30/7

Resource Plan View

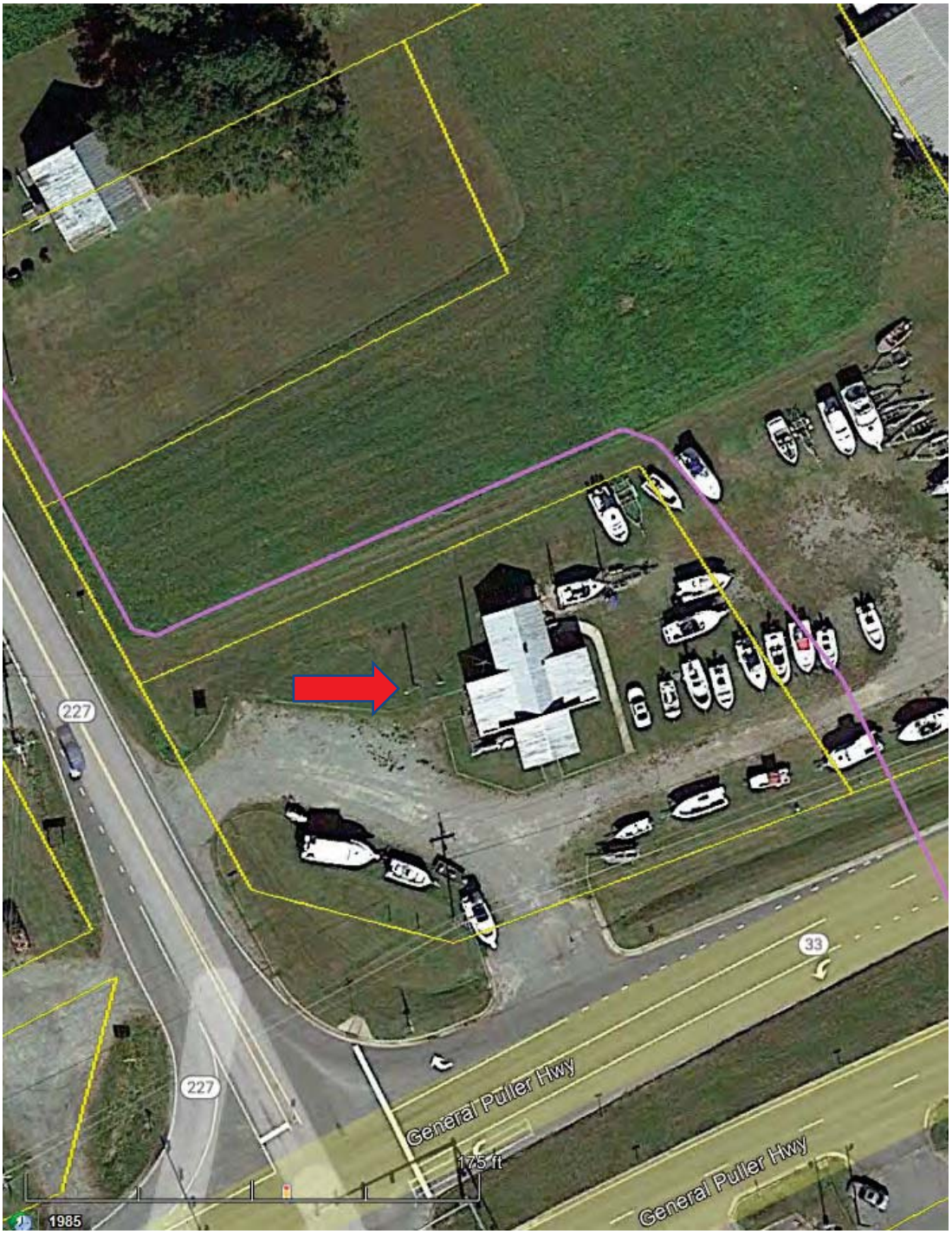
N

Commercial Building – 2635 General Puller Hwy, Saluda, Middlesex County
VDHR No. 059-0080
Tetra Tech ID No. 31/ Map Sheet 7

Built sometime around 1940, this resource is a one-story commercial building at the crossroads hamlet of Cooks Corner. In outline, the central gable-front section and wings take the shape of a cruciform. The front gable is hidden behind a parapeted wall extending in step-like fashion, above the roofline. Materials include vinyl siding, cinderblock foundation, and standing-seam metal roof. The roof on the wings is at a lower pitch than the main block. A long, gabled overhang supported by brick piers and wood posts covers the main entry. The building houses a boating supply business, an integral feature of the Middle Peninsula with its multiple accesses to the water. Several boats are present on the premises, for sale and rent.

The resource displays simplicity, functionality, and accessibility provided by the junction of General Puller Highway and Urbanna Road. This property exhibits no architectural or historical significance at the local or state level. The property is recorded in VCRIS and has been determined not eligible for NRHP listing. Tetra Tech recommends that this resource retain its ineligible status under Criterion A, B, or C.

View to northeast. June 1, 2022. R. Jacoby



VCRIS No:	059-0080
Location:	2635 General Puller Hwy Saluda, Middlesex County
Resource Type:	commercial building
NRHP Status:	not eligible
Tt ID No./Map Sheet	31/7

Resource Plan View

N

Middlesex County Training School, Workshop Building – 2941 General Puller Hwy, Saluda, Middlesex County
VDHR No. 059-0078
Tetra Tech ID No. 32/ Map Sheet 8

The Middlesex County Training School complex represents a Jim Crow era segregated school for African American students that had its beginnings circa 1917 and is associated with the Rosenwald Schools in Virginia Multiple Property Document (VDHR No. 012-5041). The resource was built circa 1940 as a workshop, and later reused as a bus garage and then storeroom. With its long axis toward General Puller Highway, the L-shaped building presents a side-gabled perspective to the road. The resource is clad with clapboard, sits on a brick foundation, and has standing-seam metal roofing. A large garage door is present along the north gable, providing entry to vehicles within the large, one-bay garage. A brick chimney extends through the roof below the ridgeline. Two doors face the road; the west door is approached via two brick steps and has a small gabled overhang supported by diagonal posts. A series of 8 x 3-ft windows provided copious light for the workers inside, with five windows on the south gable and east façade, and two flanking the garage door on the north gable. These windows are presently boarded up. The school property is recorded in VCRIS as an NRHP-eligible historic district under Criterion A as an example of twentieth century African American schools prior to the desegregation of Virginia's educational system in 1969. Tetra Tech recommends that the former workshop is a contributing resource to the eligible historic district.

View to northeast. June 2, 2022. R. Jacoby

VCRIS No:	059-0078
Location:	2941 General Puller Hwy Saluda, Middlesex County
Resource Type:	bus garage
NRHP Status:	eligible
Tt ID No./Map Sheet	32/8

Resource Plan View

N

House – 2970 General Puller Hwy, Saluda, Middlesex County
VDHR No.
Tetra Tech ID No. 33/ Map Sheet 8

This resource is a 1 ½-story, side-gabled cottage with side wings. Constructed in 1937, the main block exhibits a dual-pitched roof, which is, along with the single-pitched wing roofs, sheathed with standing-seam metal. Exterior walls and the foundation are composed of brick laid in a running bond. A three-window dormer with a shed roof projects from the front façade. The first-floor front elevation supports a continuous band of sliding windows, likely replacement. A wood deck has been added to the elbow between the main block and the north wing, where the main entry is approached. An open-sided carport is present to the rear.

Typical of the cottage form popular in the 1930s to 1950s, this resource does not possess any distinctive architectural features or historical associations. Tetra Tech recommends that the property is not eligible for listing in the NRHP under Criterion A, B, or C.

View to south. June 2, 2022. R. Jacoby