Middlesex Interceptor System Program Phase II (MP013710, MP013720 and MP013730/ C-515663G)

Draft Environmental Assessment

Prepared For:



By:





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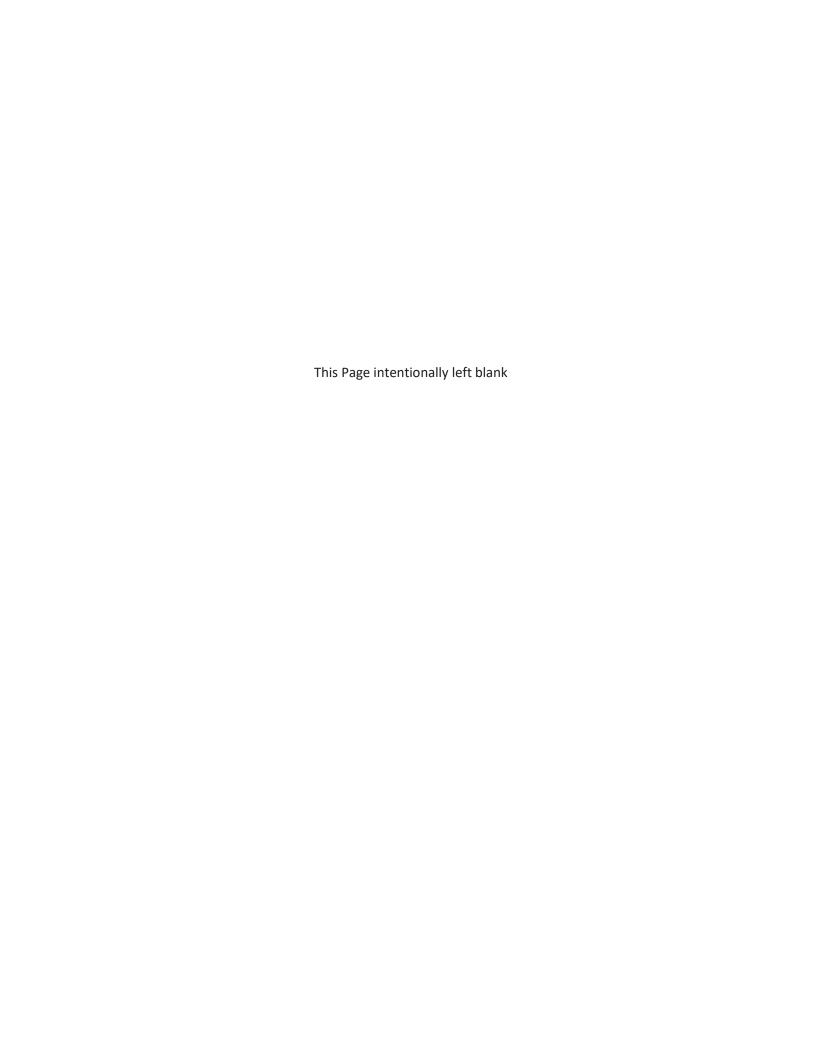


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Acronyms

°C degrees Celsius

°F degrees Fahrenheit

AADT Annual Average Daily Traffic

ACAM Air Conformity Applicability Model

ACHP Advisory Council on Historic Preservation

ACM Asbestos Containing Material

AOC Area of Concern

APE Area of Potential Effect

BMP best management practice

CAA Clean Air Act

CEQ Council on Environmental Quality

CFR Code of Federal Regulations

CO carbon monoxide

CO₂ carbon dioxide

CWA Clean Water Act

dB decibels

DIP ductile iron pipe

EA Environmental Assessment

EIAP Environmental Impact Analysis Process

EM Electromagnetic

EPA Environmental Protection Agency

EO Executive Order

FEMA Federal Emergency Management Agency

FS Feasibility Study

GHG Greenhouse gas

GPR Ground Penetrating Radar

HASP Health and Safety Plan

HDD Horizontal Directional Drilling

HRSD Hampton Roads Sanitation District

Middlesex Interceptor System Program Phase II (MP013710, MP013720 and MP013730/ C-515663G)

IDP Installation Development Plan

IICEP Interagency and Intergovernmental Coordination for Environmental Planning

JPA Joint Permit Application

LBP Lead-Based Paint

LCP Lead Containing Paint

LOD Limits of Disturbance

LOS Level of service

Mini-HDD Mini-Horizontal Directional Drilling

NAAQS National Ambient Air Quality Standards

NEPA National Environmental Policy Act

NFA No Further Action

NHPA National Historic Preservation Act

NHRP National Register of Historic Places

NO_x oxides of nitrogen

O₃ ozone

OSHA Occupational Safety and Health Administration

PA Programmatic Agreement

PCB Polychlorinated Biphenyl

PM₁₀ particulate matter less than 10 microns in diameter

PM_{2.5} particulate matter less than 2.5 microns in diameter

POI Point of Interest

RCRA Resource Conservation and Recovery Act

ROM Rough Order of Magnitude

RONA Record of Non-Applicability

RPA Resource Protection Area

SA Source Area

SAV Submerged Aquatic Vegetation

SER Statement of Environmental Review

SF square feet

SHPO State Historic Preservation Office

Middlesex Interceptor System Program Phase II (MP013710, MP013720 and MP013730/ C-515663G)

SI Supplemental Investigation

SO₂ sulfur dioxide

SRM Sustainment, Restoration, and Modernization

SVOC Semi-Volatile Organic Compound

TCLP Toxicity Characteristic Leaching Procedure

TNT Tri-nitrotoluene

TPH Total Petroleum Hydrocarbons

U.S. United States

UFC Unified Facilities Criteria

USACE United States Army Corps of Engineers

USC United States Code

USCB United States Census Bureau

USDOT United States Department of Transportation

USEPA United States Environmental Protection Agency

USFWS United States Fish and Wildlife Service

USHUD United States Department of Housing and Urban Development

UST Underground Storage Tank

UXO Unexploded Ordnance

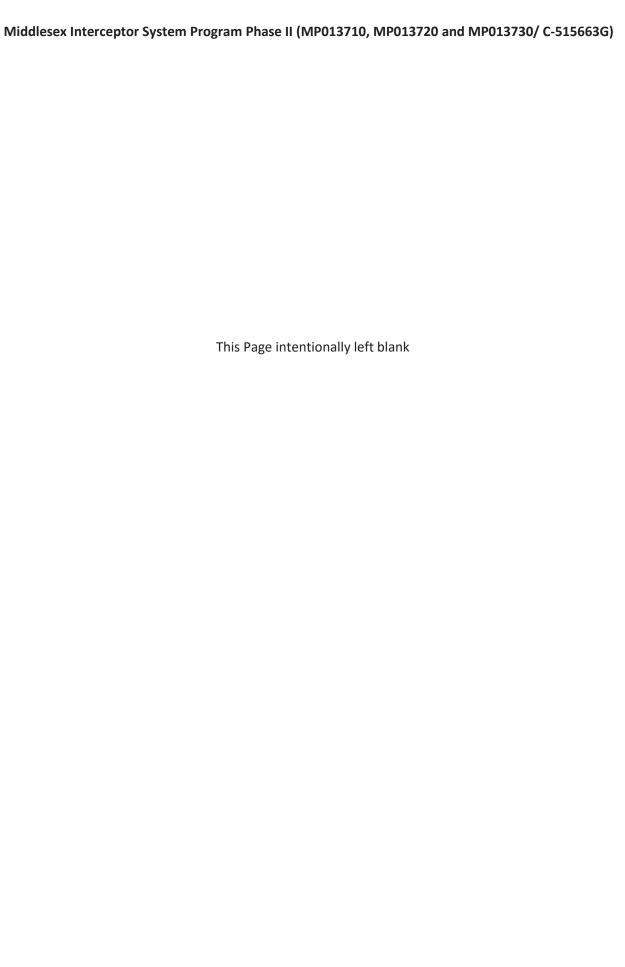
VDEQ Virginia Department of Environmental Quality

VDOT Virginia Department of Transportation

VMRC Virginia Marine Resources Commission

VOC Volatile Organic Compound

WWTP Wastewater Treatment Plant



Executive Summary

The Hampton Roads Sanitary District (HRSD) is proposing to decommission the Central Middlesex and Urbanna wastewater treatment plants and reroute the wastewater from these treatment plants to the York River wastewater treatment plant. The Middlesex Interceptor System Program Phase II — Urbanna to Mathews Transmission Force Main project (MISPPII) includes design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and the connection to HRSD's Mathews Transmission force main. The new force main will convey wastewater from Middlesex County and will consist of transmission force mains, pump stations, and potential offline storage tanks.

This Environmental Assessment (EA) has been prepared to consider the potential effects to the human and natural environment associated with a new sewage conveyance system within the counties of Middlesex and Mathews, with new pump stations at four locations within two of the counties (Middlesex and Gloucester). This EA also identifies applicable management actions and best management practices that would avoid or minimize effects relevant to the implementation of the MISPPII and the No Action Alternative. This EA has been prepared according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ). The lead agency for this NEPA analysis is the VDEQ.

Environmental consequences for all assessed parameters of the MSIPPII are expected to be negligible. However, because the project is still in the design phase, impacts to water resources and cultural resources are being determined through targeted studies. A draft Aquatic Resources Delineation Report has been prepared for submittal to the USACE, and a Joint Permit Application is being prepared in anticipation of permit requirements for impacts to waters of the United States. A Phase I Cultural Resources Survey was performed per the recommendation of the Virginia Department of Historical Resources (DHR) in their letter dated October 21, 2021, and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources.

Per the findings of this report and careful review of the environmental and human effects, this EA concludes that the MSIPPII would not have a significant impact on the quality of the human or natural environment.

Disclosure Statement

This Draft Environmental Assessment (EA) is provided for public comment following the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) NEPA Regulations (40 Code of Federal Regulations [CFR] §§1500-1508), and 32 CFR §989, Environmental Impact Analysis Process (EIAP) and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ).

The EA provides an opportunity for public input on the Hampton Roads Sanitation District's (HRSD) decision-making, allows the public to offer inputs on alternative ways for HRSD to accomplish what it is proposing, and solicits comments on HRSD's analysis of environmental effects.

Public commenting allows HRSD to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfil requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

Statement of Environmental Review

Environmental Assessment for the HRSD Middlesex Interceptor Program Phase II

Middlesex, Mathews and Gloucester Counties, Virginia

1.0 Introduction

This Environmental Assessment (EA) has been prepared to consider the potential effects to the human and natural environment associated with the Middlesex Interceptor System Program Phase II (MISPPII). The project includes a new sewage conveyance system within the counties of Middlesex and Mathews, with new pump stations at five locations within two of the counties (Middlesex and Gloucester). This EA also identifies applicable management actions and best management practices that would avoid or minimize effects relevant to the implementation of the HRSD MISPPII and the No Action Alternative. This EA has been prepared according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Review Process of the Clean Water Financing and Assistance Program (CWFAP) of Department of Environmental Quality (VDEQ). The lead agency for this NEPA analysis is the VDEQ.

The purpose of the MISPPII is to provide reliable sanitary sewer service to Middlesex County and allow two existing HRSD wastewater treatment plants in Middlesex County to be decommissioned, thus providing enhanced water quality in the region. To accomplish this goal the HRSD must supplement the existing Mathews system which cannot accommodate anticipated 2030 flows from the proposed Middlesex system.

A preliminary analysis of environmental effects determined that the MISPPII could have greater than negligible effects on several resource areas, including biological resources, cultural resources, hazardous materials and waste, farmland and open space, irretrievable resources, and water resources.

2.0 HRSD Middlesex Interceptor System Program Phase II Proposed Action

The MISPPII incorporates all projects. The full implementation of all projects within all three concepts was carried forward for analysis as the reasonable upper bound of effects. Impacts would be less than those identified in the EA because not all alternatives will be implemented. The HRSD could implement any projects or project alternatives assessed in the EA.

3.0 Alternatives to the HRSD Middlesex Interceptor System Program Phase II

During the Preliminary Engineering Report (PER) phase, various alternatives were evaluated for the MISPPII project. The Selected Concept is the Preferred Alternative. Other Alternative Concepts were evaluated with the Desired Alternative being the second most favored alternative.

The process for selecting projects to be analyzed is initiated with a review of all projects to determine if they can be met with operational or engineering solutions while minimizing potential environmental effects on natural and man-made environments.

Two alternatives were in consideration for the location of the proposed Central Middlesex Pump Station. For Alternative 1, the pump station is proposed to be located in an existing parking lot north of the Middle Peninsula Regional Security Center (MPRSC) at Saluda, inside a 0.21-acre chain-linked fenced area. Currently, the Central Middlesex Treatment Plant receives influent wastewater via an 8-inch Ductile Iron Pipe (DIP) gravity sewer. The flow will be re-directed to the proposed pump station by inserting a new manhole in the existing gravity sewer line.

For Alternative 2, the selected alternative, the pump station is proposed to be on the same site as the existing Central Middlesex Wastewater Treatment Plant WWTP. The pump station will receive the wastewater from the 8-inch DIP gravity sewer via a new manhole, which is proposed to be 5-ft. deep and located between two manholes immediately upstream of the existing treatment plant. Construction at the existing wastewater treatment plant site will require the relocation of the existing chlorine feed tank, installation of a temporary electrical and control panel for the new pump station, and installation of shoring immediately adjacent to the treatment system to allow for the excavation and installation of the new pump station facilities.

The Locust Hill location is a parcel adjacent to the St. Clare Walker Middle School in Middlesex County. For the Gloucester pump stations, only preliminary locations were identified using the hydraulic model and coordination with Matthews County. The location of the Hartfield Pump Station is to be on the northern edge of the soil lot on the eastern side of Wood Brothers Road in Hartfield.

Six sites are in consideration for the location of Urbanna Pump Station. The first site is on or adjacent to Tabor Park, and the second site is adjacent to the existing Urbanna WWTP. Four (4) different alternatives are proposed for the Tabor Park site layout. These include:

- Alternative 1: a 200-ft. x 50-ft. site located on park property along the west property line.
- Alternative 2: a 100-ft. X 100-ft. site located on park property and including a new 16-ft. access road along the west property line and demolition of the existing pump station.
- Alternative 3: a 150-ft. X 150-ft. site in the vacant parcel next to the park, which was recently purchased from the Urbanna Oyster Festival.
- Alternative 4: a 100-ft. x 100-ft. site located within the vacant parcel next to the park.
- Alternative 5: a 150-ft. x 150-ft. site adjacent to the existing Urbanna WWTP on a parcel that is privately owned. The site would be located on the northwest corner of the property and have an easement for the influent and effluent force mains.
- Alternative 6: the selected alternative. It is an approximately 0.365 acre residential property off
 of Linden Street. The residence is to be demolished.

There are five Alternatives considered for the Gloucester Pump Station.

- Alternative 1 is located on 9375 John Clayton Memorial Highway. The parcel is 70 acres in area. The proposed site is 400-ft. x 350-ft. in total area.
- Alternative 2 is located at 9316 John Clayton Memorial Highway. The parcel is 5 acres in total area.
- Alternative 3 is located at Tax Map I. D. 26-22 John Clayton Memorial Highway. The parcel is 8.5 acres in total area.
- Alternative 4 is located at Tax Map I. D. 26-117B and is several thousand feet north of the Route 14 intersection with Rangtang Road, Route 661. The parcel is 2 acres in total area.
- Alternative 5, the selected alternative, is located at Tax Map I. D. 26-109 and is located at 8210 Waverly Lane. The parcel is 20.85 acres in total area.

The new sewage conveyance system 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 force main will be installed beneath Urbanna Creek and the Piankatank River. Flows from the Middlesex Transmission Force Main will ultimately be conveyed from the main corridor through the Mathews transmission force main south to HRSD's Gloucester Interceptor Force Main across the York River to the York River Treatment Plant.

A Dominion Power circuit, a Verizon fiber optic cable, and a Metrocast fiber optic cable were installed along the same alignment as the proposed Middlesex line which is 220 ft. from the south side of the Piankatank River and 250 ft. from the north side of the Piankatank to avoid impacts to the shoreline. It will be installed in depth such that the construction of the proposed main line does not impact the utilities.

Horizontal directional drilling has been analyzed. Two different methods may be used and are being considered for planning and design purposes.

Constructed Horizontal Directional Drilling

Horizontal Directional Drilling (HDD) is needed from 40,000 pounds to over 100,000 pounds of thrust pullback. These ranges represent significant support equipment to include mud mixers, mud recycling units, control rigs, and medium to large drilling rigs. Staging areas can be 150-ft. x 250-ft. in size. Drilling mud is necessary for lubrication.

These units are capable of installing larger diameter force mains well over 2,000 linear ft. and at significant depth. The life cycle of the pipeline is 50 years.

Mini-Horizontal Directional Drilling Systems

The Mini-Horizontal Directional Drilling (Mini-HDD) systems are far smaller and may be used for shorter and shallower pipeline installations. Installing depths of no deeper than 14 ft. may be achieved with pipes up to 12 inches in diameter and using drill segments less than 1,000 ft. in length. Rigs typically have a pull force capacity of up to 30,000 pounds, Small quantities of drilling mud are necessary for lubrication, but the staging area is much smaller, as there typically is no additional support necessary other than the drilling unit.

Mini-HDD rigs should not be used in soils with significant cobbles, boulders, and obstructions greater than 4 inches in diameter. Due to the minimal number of interconnects on the project, installation by mini-HDD will be conducted on a case-by-case basis during the design phase of the project.

3.1 No Action Alternative

The CEQ regulation 40 CFR Section 1502.14(d) specifically requires analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, HRSD would not implement the MSIPPII as described above. HRSD would maintain its existing facilities and would not construct new facilities, upgrade its infrastructure, or demolish existing facilities. Under the No Action Alternative, the deficiencies identified in Chapter 2 would continue to impair the HRSD's ability to fulfill the greater community's needs. Although the No Action alternative does not meet any of the selection criteria or fulfill the purpose and need of the action, it has been carried forward for detailed analysis in this EA as required under NEPA.

4.0 Environmental Effects

Air Quality

The MISPPII would have short- and long-term less than significant effects on air quality. There would be short-term minor adverse effects from fugitive dust and the use of heavy equipment during construction, renovation, and demolition. There would be long-term negligible adverse effects for the MISPPII. The MISPPII does not include any new major stationary sources of air emissions but may include some small stationary sources of air emissions such as stand-by generators. The direct and indirect emissions from the MISPPII would be below the de minimis thresholds and would be located in an attainment area; therefore, the general conformity rules do not apply. No past, present, or reasonably foreseeable projects have been identified that when combined with the MISPPII, would have significant cumulative effects on air quality. The No Action Alternative would have no effects on air quality.

Biological Resources

Construction and demolition activities include facility construction, addition or alterations to existing facilities, and parking areas. These activities would have site-specific short-and long-term less than significant effects on biological resources. The proposed activities would require vegetation removal, but it would primarily be mowed and landscaped vegetation. Construction activities would displace locally common wildlife species that are adapted to high levels of human activity and disturbance. However,

any wildlife disturbed by construction activities could theoretically temporarily or permanently relocate to similar habitat nearby. There are no natural heritage areas or conservation/managed areas on public or private lands. All ground disturbed would be reseeded or planted with appropriate vegetation. These effects would be less than significant.

The proposed construction projects also include directional drilling under the Piankatank River and Urbanna Creek. The process is designed to avoid and minimize impacts to surface areas of the sediment, including sand, silt, and clay, to the extent practicable. Since the proposed project areas are in previously developed areas and other utilities have previously been installed via directional drilling in the same corridor, there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources.

Operational Effects

There would be less than significant effects on biological resources due to the maintenance and operations associated with the MISPPII. The MISPPII would have few additional effects on vegetation, wildlife, or threatened and endangered species when compared to existing conditions; therefore, long-term effects on biological resources would be negligible.

The co-location and consolidation of facilities and functions specified in the MISPPII would provide operational efficiencies. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on biological resources would be negligible.

Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing activities at the facilities.

Cultural Resources

A Phase I Cultural Resources Survey was performed in June and July 2022 per the recommendation of the Virginia DHR in their letter dated October 21, 2021 and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources. The MISPPII will have no adverse effect upon identified archaeological or architectural resources.

Hazardous Materials and Wastes

The HRSD MISPPII would have short- and long-term less than significant adverse effects concerning hazardous materials and wastes. Short-term minor adverse effects would be due to the use of hazardous materials and the generation of wastes during construction, renovation, and demolition activities. Long-term minor adverse effects would not occur during operation. The HRSD MISPPII would not (1) substantially increase the quantity or toxicity of hazardous substances, (2) increase risk to human health or the environment, or (3) generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills. Based on the findings of the Environmental Data Resources report prepared in 2020 for the MISPPII, a targeted Phase II Environmental Site Assessment (ESA) is not recommended for this proposed activity. No past, present, or reasonably foreseeable projects have been identified that, when combined with the HRSD MISPPII, would have significant cumulative effects on

hazardous materials and wastes. The No Action Alternative would have no effects on hazardous materials and wastes.

Water Resources

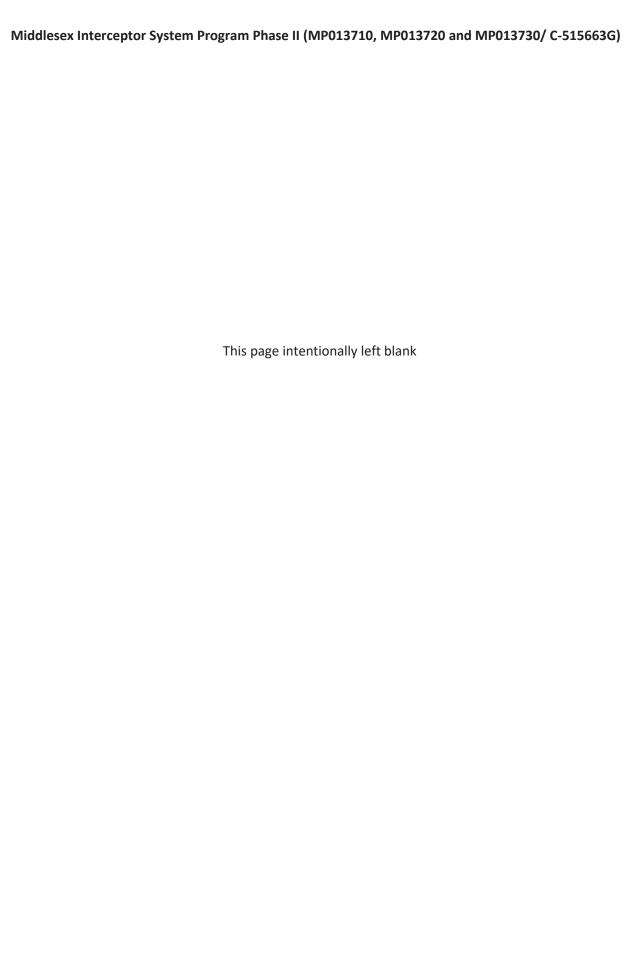
The HRSD MISPPII would have short- and long-term less than significant adverse effects on water resources. Short-term minor adverse effects would be due to site-specific temporary changes in surface hydrology and the potential for soil erosion and transport during construction, renovation, and demolition activities. Long-term minor adverse effects would be due to an incremental increase in impervious surfaces from new construction. Effects to water resources would not reduce water availability or supply, exceed the safe annual yield of water supplies, adversely affect water quality, threaten, or damage hydrology, or violate water resources laws or regulations. No past, present, or reasonably foreseeable projects have been identified that, when combined with the HRSD MISPPII, would have significant cumulative effects on water resources. The No Action Alternative would have no effects on water resources.

5.0 Public Notice

NEPA, 40 CFR §§1500-1508, and 32 CFR Part 989 require public review of the EA before approval of the SER and implementation of the HRSD MISPPII. A Notice of Availability for public review of the Final EA will be published in the *Southside Sentinel* and the *Daily Press*. The Final EA will be made available for public review at the Middlesex, Gloucester, and Mathews public libraries. Through the Interagency and Intergovernmental Coordination for Environmental Planning process, the HRSD will notify relevant federal, state, and local agencies and allow 30 days to make known their environmental concerns specific to the MSIPPII. Copies of all current correspondence and agency letters received are provided in Appendix A.

6.0 Statement of Environmental Review

After a careful review of the potential effects of this document, I ha not have a significant impact on the quality of the human or natural controversy. Accordingly, the requirements of the NEPA, CEQ regu have been fulfilled, and an Environmental Impact Statement is not	l environment or generate significant llations, and 32 CFR Part 989, et seq.
Title	Date



1.0 Introduction

This Environmental Assessment (EA) has been prepared to consider the potential consequences to the human and natural environment associated with the HRSD Middlesex Interceptor System Program Phase II (MISPPII) project. The proposed project 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) and includes upgrades to existing pump stations at Cooks Corner and Central Middlesex, and new pump stations at Urbanna, Central Middlesex, Hartfield, Locust Hill, and Gloucester. The existing HRSD County Line, Hartfield and Beaver Dam Pump Stations will be receiving upgrades. This EA also identifies applicable management actions, mitigation measures, and best management practices (BMPs) that would avoid or minimize effects relevant to the implementation of the HRSD MISPPII and alternatives (to include the No Action Alternative).

The HRSD has prepared this EA according to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508) (CEQ 2005), and the Environmental Impact Analysis Process (EIAP) (32 CFR 989). The lead agency for this NEPA analysis is the VDEQ.

Based on the analysis in this EA, the VDEQ will determine whether to issue a Statement of Environmental Review (SER) and then proceed with the HRSD MISPPII, prepare an Environmental Impact Statement, or abandon the HRSD MISPPII. As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed projects and be available to inform decision-makers of the potential environmental effects of selecting the HRSD MISPPII, reasonable alternatives, or no action alternative.

1.1 Purpose and Need

The purpose of the HRSD MISPPII is to provide reliable sanitary sewer service to Middlesex County and allow two existing HRSD wastewater treatment plants in Middlesex County to be decommissioned, thus providing enhanced water quality in the region. To accomplish this goal the HRSD must supplement the existing Mathews system which cannot accommodate anticipated 2030 flows from the proposed Middlesex system.

Pump upgrades are necessary at the existing Mathews County Line, the Hartfield, and Beaver Dam pump stations to convey projected flows from Mathews and Middlesex Counties and convey excess flow during wet weather. Discussion of the necessary improvements in the Mathews system is included in the following section. The proposed construction and infrastructure projects, as well as the elimination of excess and inefficient structures, would conserve energy and resources through consolidation and modernization.

All of the proposed construction would meet the purpose of and need for the HRSD MISPPII. The period of construction, demolition, and renovation activities would be approximately 2 years.

1.2 Location and Description of ACTION

The Central Middlesex Treatment Plant is located on a 0.93-acre parcel inside an approximately 0.15-acre fenced area north of the Central Middlesex Correctional Facility. The treatment plant consists of an aeration packaged unit from Purestream Inc. with an electrical/control building, a backup generator, and a storage building.

The Urbanna Treatment Plant is located on a 1.07-acre plot on Laurel Hill Drive. The treatment plant receives wastewater from the town of Urbanna and Bethpage campground via a 4-inch force main.

Currently, the Central Middlesex Treatment Plant receives influent wastewater via an 8-inch Ductile Iron Pipe (DIP) gravity sewer. The flow would be re-directed to the proposed pump station by inserting a new manhole in the existing gravity sewer line.

For Alternative 1, the pump station is proposed to be located in an existing parking lot north of the Middle Peninsula Regional Security Center (MPRSC) at Saluda, inside a 0.21-acre chain-linked fenced area. For Alternative 2, the selected alternative, the pump station is proposed to be on the same site as the existing Central Middlesex Wastewater Treatment Plant WWTP. The pump station will receive the wastewater from the 8-inch DIP gravity sewer via a new manhole, which is proposed to be 5-ft. deep and located between two manholes immediately upstream of the existing treatment plant. Construction at the existing wastewater treatment plant site will require the relocation of the existing chlorine feed tank, installation of a temporary electrical and control panel for the new pump station, and installation of shoring immediately adjacent to the treatment system to allow for the excavation and installation of the new pump station facilities.

The Locust Hill location is a parcel adjacent to the St. Clare Walker Middle School in Middlesex County. The location of the Hartfield Pump Station is to be on the northern edge of the soil lot on the eastern side of Wood Brothers Road in Hartfield.

Six sites have been in consideration for the location of Urbanna Pump Station. Several sites are on or adjacent to Tabor Park, and the remaining are adjacent to or bordering the existing Urbanna WWTP. Four (4) different alternatives are proposed for the Tabor Park site layout. These include:

- Alternative 1: a 200-ft. x 50-ft. site located on park property along the west property line.
- Alternative 2: a 100-ft. X 100-ft. site located on park property and including a new 16-ft. access road along the west property line and demolition of the existing pump station. This alternative was eliminated due to lack of access.
- Alternative 3: a 150-ft. X 150-ft. site in the vacant parcel next to the park, which was recently purchased from the Urbanna Oyster Festival.
- Alternative 4: a 100-ft. x 100-ft. site located within the vacant parcel next to the park.
- Alternative 5: 150-ft. x 150-ft. site adjacent to the existing Urbanna WWTP on a parcel that is privately owned. The site would be located on the northwest corner of the property and have an easement for the influent and effluent force mains.

• Alternative 6: the selected alternative. It is an approximately 0.365 acre residential property on Linden Street which is to be demolished.

There were five alternatives considered for the Gloucester Pump Station.

- Alternative 1 is located on 9375 John Clayton Memorial Highway. The parcel is 70 acres in area.
 Only the northwest corner of the parcel is being considered. This corner of the parcel is 400-ft.
 x 350-ft. in total area.
- Alternative 2 is located at 9316 John Clayton Memorial Highway. The parcel is 5 acres in total area.
- Alternative 3 is located at Tax Map I. D. 26-22 John Clayton Memorial Highway. The parcel is 8.5 acres in total area.
- Alternative 4 is located at Tax Map I. D. 26-117B and is several thousand ft. north of the Route 14 intersection with Rangtang Road, Route 661. The parcel is 2 acres in total area.
- Alternative 5, the selected alternative, is located at Tax Map I. D. 26-109 and is located at 8210 Waverly Lane. The parcel is 20.85 acres in total area.

The new sewage conveyance system 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 force main will be installed beneath Urbanna Creek and the Piankatank River. Flows from the Middlesex Transmission Force Main will ultimately be conveyed from the main corridor through the Mathews transmission force main south to HRSD's Gloucester Interceptor Force Main across the York River to the York River Treatment Plant.

A Dominion Power circuit, a Verizon fiber optic cable, and a Metrocast fiber optic cable were installed along the same alignment as the proposed Middlesex Interceptor. Record drawings indicate that the existing utility cables were installed via Horizontal Directional Drilling approximately 220 ft. from the south side of the Piankatank River and 250 ft. from the north side of the Piankatank to avoid impacts to the shoreline. The remainder of the utility lines were installed via drivers at an approximate depth of 3-ft. The proposed Middlesex Interceptor will be installed at a depth such that the construction of the proposed main line does not impact the utilities.

For the installation of the Middlesex Interceptor, HDD has been analyzed. Two different methods may be used and are being considered.

Constructed Horizontal Directional Drilling

Constructed HDD is needed from 40,000 pounds to over 100,000 pounds of thrust pullback. These ranges represent significant support equipment to include mud mixers, mud recycling units, control rigs, and

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medium to large drilling rigs. Staging areas can be 150-ft. x 250-ft. in size. Drilling mud is necessary for lubrication.

These units are capable of installing larger diameter force mains well over 2,000 linear ft. and at significant depth. The life cycle of the pipeline is 50 years.

Mini-Horizontal Directional Drilling Systems

The Mini-Horizontal Directional Drilling (Mini-HDD) systems are far smaller and may be used for shorter and shallower pipeline installations. Installing depths of no deeper than 14 ft. may be achieved with pipes up to 12 inches in diameter and using drill segments less than 1,000 ft. in depth. Rigs typically have a pull force capacity of up to 30,000 pounds, Small quantities of drilling mud are necessary for lubrication, but the staging area is much smaller, as there typically is no additional support necessary other than the drilling unit.

Mini-HDD rigs should not be used in soils with significant cobbles, boulders, and obstructions greater than 4 inches in diameter. Due to the minimal number of interconnects on the project, installation by mini-HDD will be conducted on a case-by-case basis during the design phase of the project.

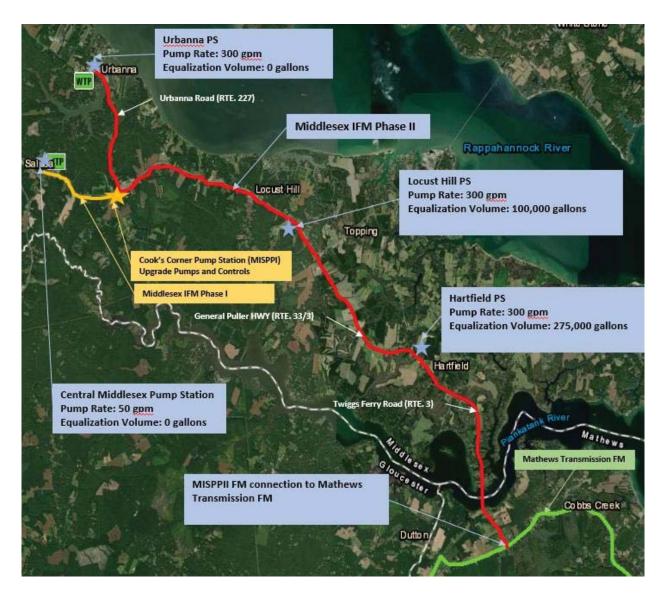


Figure 1. Middlesex Location Map



Figure 2. Mathews and Gloucester Location Map

1.3 Summary of Key Environmental Study Requirements

1.3.1 National Environmental Policy Act

NEPA requires Federal agencies to take into consideration the potential environmental consequences of the proposed HRSD MISPPII in their decision-making process. NEPA intends to protect, restore, and enhance the environment through well-informed Federal decisions. The CEQ was established under NEPA to implement and oversee Federal policy in this process. The CEQ subsequently issued the *Regulations for Implementing the Procedural Provisions of the NEPA* (40 CFR Sections 1500–1508) (CEQ 2005). The activities addressed within this document constitute a Federal action and therefore must be assessed following NEPA.

1.3.2 Air Conformity Requirements

The Clean Air Act (CAA) (42 USC §§ 7401-7671q, as amended) provided the authority for the U.S. Environmental Protection Agency (USEPA) to establish nationwide air quality standards to protect public health and welfare. Federal agencies are required (40 CFR § 51, Subpart W) to determine the HRSD MISPPII's conformity with the CAA and its 1990 amendments, which require each state to prepare a State Implementation Plan for the achievement of air quality standards.

1.3.3 Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 (16 USC § 470) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation outlining procedures for the management of cultural resources in projects using state funds. Cultural resources can include archaeological remains, architectural structures, and traditional cultural properties such as ancestral settlements, historic trails, and places where significant historical events occurred. NHPA requires federal agencies to consider potential effects to cultural resources that are listed, nominated to, or eligible for listing on the NRHP; designated as a National Historic Landmark; or valued by modern Native Americans for maintaining their traditional culture. Section 106 of NHPA requires federal agencies to consult with State Historic Preservation Officers if their undertakings might affect such resources.

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470aa-mm) was created to protect archaeological resources and sites on public and Native American lands in addition to encouraging cooperation and exchange of information between governmental authorities, professionals, and private individuals. The act establishes civil and criminal penalties for the destruction and alteration of cultural resources.

1.3.4 Irretrievable Resources

The Procedural Guidelines for the Virginia Clean Water Revolving Loan Fund establishes that the NEPA document shall include a discussion of the impacts of the HRSD MISPPII on irretrievable resources, those that if used, will not be recovered. These include paleontological resources and geological resources such as minerals, oil, and gas. These also include prime farmland which, if converted to non-agricultural use, will not be recovered. The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs).

1.3.5 Endangered Species Act

The Endangered Species Act of 1973 (16 USC §§ 1531-1544, as amended) established measures for the protection of plant and animal species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects and impacts of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment and can require formal consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Act.

1.3.6 Water Resources

The Clean Water Act (CWA) of 1977 (33 USC § 1251 *et seq.*) regulates pollutant discharges that could affect aquatic life forms or human health and safety. Sections 404 and 401 of the CWA regulate dredge and fill activities in Waters of the United States (U.S.), including wetlands. Executive Order (EO) 11990, *Protection of Wetlands*, directs federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The U.S. Army Corps of Engineers (USACE) and/or state agencies with delegated authority are responsible for the implementation of the Section 404 program. Section 10 of The Rivers and Harbors Act of 1899 ((33 U.S.C. 403), regulates all construction, including excavation, in navigable waterways.

EO 13690 (January 30, 2015) updated EO 11988, *Floodplain Management*, and established a Federal Flood Risk Management Standard and a process for further soliciting and considering stakeholder input. The new standard gives agencies the flexibility to select one of three approaches for establishing the flood elevation and hazard area they use in siting, design, and construction. Federal agencies are directed to consider the proximity of their actions to or within floodplains.

1.3.7 Other Executive Orders

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that citizens in either of these categories are not disproportionately affected by federal action. Additionally, potential health and safety effects that could disproportionately affect children are considered under the guidelines established by EO 13045, Protection of Children from Environmental Health Risks and Safety Risks.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13693, *Planning for Federal Sustainability into the Next Decade*, were enacted to address GHGs in detail, including GHG emissions inventory, reduction, and reporting.

1.4 Detailed Analysis

1.4.1 Aesthetics and Visual Resources

The HRSD MISPPII is not anticipated to have appreciable effects to aesthetics or visual resources. The existing view is a rural area, the small urban area of the town of Urbanna and the suburban community at the town of Saluda, and tidal waterways. The existing communities have lighting in the urbanized areas and at entrances and parking areas for businesses, municipal buildings, the HRSD facilities themselves, schools, recreation areas, and places of worship. During the construction and demolition activities, the visual and aesthetic characteristics of areas undergoing land-disturbing activities would be temporarily altered by the use of construction equipment, and the delivery and stockpiling of construction materials. Following completion of construction, the proposed new pump stations and associated infrastructure would remain as permanent visual features within the viewshed; however, the principal visual features of the facility would remain consistent with existing conditions. These effects would be negligible.

1.4.2 Noise

Noise is sound that is produced at levels that can be harmful and may be considered unwanted by the surrounding community, properties, and residences. The Noise Control Act of 1972 and EO 12088 require that federal agencies assess the impact of noise on the environment. The distance rapidly attenuates noise; therefore, it is not anticipated that the proposed stormwater diversion operations will occur close enough to existing residential areas to the north and the west of the Project area to cause disturbances. In addition, stormwater diversion operations would occur during daytime hours when residents are away from their homes and would be less disturbed than nighttime hours; therefore, those living in the vicinity are not likely to be affected by noise generated by the Project. Because only five noise-sensitive land uses (i.e., religious, commercial, retail, residential, recreational, and educational) are in the immediate vicinity the Project is not expected to impact noise-sensitive land uses.

The MISPPII would not result in any appreciable changes in the noise environment. The construction and demolition activities would require the use of heavy equipment that would generate short-term increases in noise near the project sites. Construction will be within a predominantly rural area. There would be no new permanent sources of noise associated with the MISPPII, and there would be no permanent changes in daily traffic operations. Therefore, no long-term changes in the noise environment would be expected. Overall, these effects would be negligible.

1.4.3 Socioeconomics and Environmental Justice

The MISPPII would not have appreciable effects to the local or regional socioeconomic environment. Environmental justice considers sensitive minority and low-income populations in the community to determine whether the MISPPII and its alternatives may have a disproportionately high and adverse human health or environmental effect on those populations. Environmental justice analysis is conducted in compliance with Executive Order (EO) 12898. The 2020 U.S. Census Bureau (USCB) data has been examined to determine minority and low-income population percentages in the affected area of the Project to facilitate the qualitative assessment of potential environmental justice impacts from the Project. The U. S. Department of Housing and Urban Development (USHUD) data assists in determining eligibility for their low-income housing tax credits which focus upon the low-income minority, low-

income seniors, and low-income under the age of 18. "Environmental justice communities" are communities wherein there is a population of low-income minority, low-income children under 18, and/or low-income seniors over 65 that exceeds percentages for the county, state, or United States. Census tracts within the project area were found to be below average for poverty level and below state levels for Hispanic, black, American Indian, Hawaiian native, Asian, and Alaskan native for several census tracts. None of the census tracts in Gloucester, Mathews, or Middlesex had above-average levels for these five categories according to the USCB census tract data. The seven census tracts have not met the criteria for environmental justice. With these considerations, the implementation of the preferred alternative should have no effect on environmental justice for the surrounding residential communities.

The 2020 mean personal (per capita) income for Gloucester County was \$33,697. For Middlesex, the mean personal income is \$31,502 and for Mathews County, it is \$35,731. The mean personal income for the Commonwealth of Virginia is \$39,278. The MISPPII would have some minor beneficial effects associated with the employment of construction personnel and transportation of goods and materials to the construction sites. There would be no permanent change in sales volume, income, employment, or population as a result of the MISPPII. There would be no effects on law enforcement, fire protection services, medical services, schools, family support services, shopping, or recreation facilities.

Consideration of environmental justice and the protection of children is done to ensure that no groups of people should bear a disproportionate share of the negative environmental consequences resulting from federal actions. The short-term economic benefits to the local economy would not disproportionately affect minority or low-income populations. The 2020 poverty level for Gloucester County, Virginia as a whole was 6.8 percent, for Middlesex County it was 13.8, significantly higher than the state level, and for Mathews, it was 8.8 (the Virginia poverty level was 9.9 percent) and the minority population for the three counties was 12.2, 19.9 percent, and 11.9 percent (Virginia minority level was 30.6 percent) (U.S. Census Bureau 2020). None of the three counties meet the U.S. Census Bureau definition of an environmental justice community area.

Children would not have access to construction sites. No effects on environmental justice would be expected, and the MISPPII would not result in disproportionate adverse environmental or health effects on low-income or minority populations. These effects would be minor and beneficial.

1.4.4 Transportation

The MISPPII is not expected to result in any appreciable changes in traffic or transportation resources. Traffic levels in the project areas would not increase substantially or degrade the level of service (LOS) on any nearby roadway or intersection. The construction and demolition activities would require the use of heavy equipment and worker commutes that would generate short-term increases in traffic. The local roadway infrastructure in all three counties would be sufficient to support these activities. Because most of the work would take place on-site, road closures or detours would not be expected. All construction vehicles would be equipped with backing alarms, two-way radios, and "Slow Moving Vehicle" signs when appropriate. Although these effects would be negligible, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize these already limited effects. These effects would be negligible.

1.4.5 Land Use

The MISPPII is not expected to result in any appreciable effects on land use. The project area is agricultural and silvicultural with limited fisheries and with light industrial and residential use. Urbanized areas are within the town of Urbanna. Portions of the MISPPII cross the Piankatank River and Urbanna Creek. The MISPPII has been designed and sited to be compatible with current land use. These effects would be negligible.

1.4.6 Geological Resources

The MISPPII is not expected to result in any appreciable effects on geological resources. Ground-disturbing activities would be temporary and would occur on previously disturbed or developed land except for the construction of the proposed Urbanna pump station and the four proposed alternative Gloucester pump stations. In addition, standard erosion control measures implemented as part of the MISPPII would reduce or eliminate any potential impacts. The topography has approximately 60 ft. in elevational change from both the beginning of the project and the end of the project, not including the separate location of the proposed five alternatives in Gloucester County with a mean elevation of 30 to 70 ft. above mean sea level. Proposed activities would not alter the topography of the existing terrain nor would they be located near identified geological hazards such as sinkholes. These effects would be negligible.

1.5 Public and Agency Review of Environmental Assessment

The HRSD provides opportunities for the public to participate in the NEPA process to promote open communication and improve their decision-making process. All persons and organizations with an interest in the MISPPII and Alternatives are encouraged to participate in the process.

EO 12372, Intergovernmental Review of Federal Programs, requires intergovernmental notifications before making any detailed statement of environmental effects. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the project proponent must notify concerning federal, state, and local agencies and allow them sufficient time to evaluate potential environmental effects of the MISPPII.

NEPA, 40 CFR §§1500-1508, and 32 CFR Part 989 require public review of the EA before approval of the SER and implementation of the MSIPPII. A Notice of Availability for public review of the Final EA will be published in the *Southside* Sentinel and the Daily *Press*. The Final EA will be made available for public review at the public libraries in Middlesex, Gloucester, and Mathews Counties. The HRSD will notify relevant federal, state, and local agencies and allowed them 30 days to make known their environmental concerns specific to the MSIPPII. Copies of all correspondence and agency letters received are provided in Appendix A.

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2.0 Description of HRSD Middlesex Interceptor System Program Phase II and Alternatives

This chapter presents a detailed description of the MISPPII. The details of the MISPPII form the basis for the analysis of potential environmental effects presented in Chapter 3 of this EA. This chapter includes a discussion of considerations used to identify reasonable alternatives and also discusses the No Action Alternative.

The HRSD could implement any projects or project alternatives assessed in this EA.

2.1 HRSD Middlesex Interceptor System Program Phase II (Preferred Alternative)

The action being evaluated is discussed in Section 1.2.

2.2 Alternatives Considered but Eliminated

The HRSD considered reasonable alternatives to the MISPPII to formulate alternatives for analysis. Some projects might not have any reasonable alternatives because they are identified as site-specific. This collaborative effort consolidates functions and efficiencies while providing flexibility for future sewage conveyance and treatment requirements and environmental protection.

2.2.1 Selection Criteria

During the Preliminary Engineering Report (PER) of the MISPPII, alternatives were evaluated against numerous screening criteria. Specifically, the MISPPII must:

- Meet the purpose of the MISPPII, to remedy deficiencies in the infrastructure.
- Address the need to provide and maintain the infrastructure that is adequate to support the HRSD and applicable State, and Federal requirements.
- Make as much use as possible of existing land and facilities, avoid creating or maintaining redundant space or infrastructure, avoid or minimize operational inefficiencies, and represent the most cost-effective and sustainable alternative.
- Be consistent with all zoning requirements, applicable installation architectural compatibility guides, and relevant legal and regulatory requirements, and must accommodate applicable, known, man-made, and natural development constraints.
- Maintain or improve the quality of life enjoyed by the greater community,
- Provide for construction without significant environmental effects or development constraints that would result in excessive costs or schedule delays.
- Include only individual components that meet the program's need.

The MISPPII meets all of the selection criteria outlined above and has been carried forward for detailed analysis in this EA. For an alternative to the MISPPII to be considered viable, it must meet all of these selection criteria as well.

2.3 No Action Alternative

The CEQ regulation 40 CFR Section 1502.14(d) specifically requires analysis of the "No Action" alternative in all NEPA documents. Under the No Action Alternative, the HRSD would not implement the MISPPII. The HRSD would maintain their existing facilities and would not construct new facilities, upgrade infrastructure, or demolish existing facilities. Under the No Action Alternative, the deficiencies identified in Chapter 2 would impair the HRSD's ability to serve the greater community. Although the No Action alternative does not meet any of the selection criteria or fulfill the purpose of and need for the action, it has been carried forward for detailed analysis in this EA as required under NEPA.

3.0 Affected Environment and Environmental Consequences

This section describes relevant and existing environmental conditions for resources potentially affected by the MISPPII and the environmental consequences of implementing the MISPPII and No Action alternatives.

A description of the affected environment and the detailed evaluation of environmental consequences on these resource areas are provided in the following sections.

3.1 Air Quality

3.1.1 Definition of Resource

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life. Air quality as a resource incorporates components that describe air pollution within a region, sources of air emissions, and regulations governing those emissions. The following sections include a discussion of the existing conditions, a regulatory overview, and a summary of GHGs and global warming and if they are relevant to the MISPPII.

3.1.2 Affected Environment

The USEPA Region 3 and VDEQ regulate air quality in Virginia. The CAA (42 U.S.C. 7401-7671q), as amended, assigns the USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as both particulate matter less than 10 microns in diameter [PM₁₀] and particulate matter less than 2.5 microns in diameter [PM_{2.5}]), sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the Federal program, the State of Virginia has accepted the federal standards.

3.1.2.1 LOCAL AIR QUALITY

Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. Those which were in nonattainment for ozone in previous years but now are considered *maintenance* are in an area that has formerly been designated nonattainment but is now recognized by EPA as meeting the NAAQS. A maintenance area must have an approved "maintenance plan" to meet and maintain air quality standards. Middlesex, Mathews, and Gloucester County (and therefore all areas associated with the MISPPII) are designated by the EPA as in maintenance for all criteria pollutants (USEPA 2016a). The USEPA monitors levels of criteria pollutants at representative sites in each region. For reference purposes, Table 3-1 shows the concentrations of criteria pollutants at the monitoring location in Hanover, Virginia, 7345 McClellan Road, at latitude 37.60613, longitude -77.2188 closest to

the MISPPII. Ozone is the sole atmospheric component/criteria pollutant measured. This data is updated hourly.

Historical Data Concentration

Table 3.1-1. Air Quality Standards and Monitored Data

Hour	AQI	Class	Responsible Pollutant	Activity Caution
11:00	24	Good	Ozone	None
10:00	8	Good	Ozone	None
09:00	13	Good	Ozone	None
08:00	12	Good	Ozone	None
07:00	11	Good	Ozone	None

3.1.2.2 CLIMATE AND GREENHOUSE GASES

Greenhouse gases are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. Most occur naturally in the atmosphere but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO₂), methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Whether or not rainfall will increase or decrease remains difficult to project for specific regions (USEPA 2016c and IPCC 2014).

The CEQ recently released its final guidance on when and how federal agencies should consider GHG emissions and climate change in NEPA analyses. The guidance is primarily focused on larger projects that have large air quality implications which will not apply to this project.

3.1.3 Environmental Consequences

3.1.3.1 SIGNIFICANCE CRITERIA

Effects would not exceed the significance criteria for air quality unless the emissions would exceed the general conformity rule *de minimis* (of minimal importance) threshold values, would exceed the greenhouse gases threshold, or would contribute to a violation of any federal, state, or local air regulation.

3.1.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

There would be short-term less-than-significant adverse, and long-term beneficial effects to air quality. Short-term effects would be from fugitive dust and the use of heavy equipment during construction, renovation, and demolition. Long-term effects would be from space optimization and consolidation of

facilities and operations. Emissions would not exceed the general conformity rule *de minimis* threshold values, would not exceed the greenhouse gas threshold in the draft CEQ guidance, and the MISPPII would not contribute to a violation of any federal, state, or local air regulation.

The MISPPII and Alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and directional drilling at the Piankatank River and Urbanna Creek. There would be some minor adverse effects to air quality from individual projects and project alternatives; however, each was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects on air quality. A description of effects to air quality from the full implementation of the preferred alternative including all projects and project alternatives outlined is provided below. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Construction Effects

The MISPPII is within a region that the USEPA has designated as a maintenance area for the NAAQS and the general conformity rule does not apply since there will be no increase in emission in the maintenance area from the federal or state action that could cause new violations of the standards and/or no increase in the frequency or severity of previous violations. The proposed project will not result in either the increase or the decrease of emissions of Greenhouse gases. Standard equipment and standard emissions controls will be used during demolition and construction. The implementation of the proposed construction and demolition will not increase air emissions or exceed regulated standards. The Virginia Administrative Code (VAC) has outlined requirements with which the HRSD must comply. Controlled actions will include the control of fugitive dust emissions. "Fugitive dust emissions" means particulate matter that does not pass through a process stack or vent and that is generated within RIC property boundaries from activities such as unloading and loading areas, process areas, stockpiles, stockpile working, parking lots, and roads (including access roads and haul roads). Methods to minimize fugitive dust include: limiting dusty work on windy days, watering or sweeping roadways often to ensure that vehicle traffic is not spreading dust, reducing speed limits on unpaved surfaces within construction and demolition sites to ten miles per hour, and enclosing storage piles and handling areas if dusty materials are frequently loaded and unloaded. With the above considerations, the operations associated with construction and demolition are not expected to impact air quality, either locally or regionally.

Operational Effects

There would be no appreciable net change in new permanently heated areas or other emissions. There would be no changes in vehicle emissions from changes in commuting.

Sensitive receptors to odors generated by the MISPPII are schools, housing, and playground structures. The proposed improvements to the pump stations and new pump stations are all located at a sufficient distance from schools, housing and playground structures that odor is not likely to affect sensitive receptors.

The MISPPII does not include any new major stationary sources of air emissions but may include some small stationary sources such as stand-by generators. Any new stationary sources of air emissions could be subject to federal and state air permitting regulations. Any new stationary sources of air emissions

would be reviewed on a case-by-case basis and added to the installation's air operating permit as necessary. Both a new source construction permit and a modification to the existing operating permit could be required. By upgrading and consolidating facilities and using new and more efficient heating and cooling systems and backup generators, there would be a net decrease in emissions from these sources.

3.1.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur. The need to maintain existing facilities and not upgrade infrastructure deficiencies identified in Chapter 2 would not allow the HRSD to continue to deliver services efficiently. Existing conditions would remain unchanged and there would be no long-term beneficial effects to air quality.

3.2 Displacement of Residences and Businesses

3.2.1 Definition of Resource

For impacts that are assessed under NEPA, the level of impact is expressed in terms of whether it is not adverse, potentially adverse, or adverse. NEPA assessments often do not have specific impact criteria and documents typically do not specify whether impacts are significant. Under a general definition of significance, residences and businesses are considered displaced when they can no longer fulfill their intended purposes due to a portion of the parcels under consideration being cut off from egress or ingress or, for example, be unable to be farmed, rented, or made into an industrial or commercial property.

3.2.2 Affected Environment

A total of 93 parcels are anticipated to be impacted based on the recommended alternatives. This total is based on assumption that easements will be needed along Twiggs Ferry Road between General Puller Highway and the Piankatank River bridge where there is uncertainty as to whether the existing road is within a prescriptive right of way. Easements in this area may not be needed; however, this cannot be determined until the design phase when property research is conducted with the survey effort. Temporary easements total 3.89 acres, and permanent easements total 12.26. One parcel, parcel 25, will result in a significant portion of land acquired as a permanent easement. Four parcels, 22, 23, 24, and 25 belonging to this property owner will have some acreage reduced. Parcel 90 will have a significant portion of land acquired as a permanent easement. The residential property at 215 Linden Street in Urbanna has been purchased by HRSD.

3.2.3 Environmental Consequences

There are a small number of parcels that will have permanent easements that will result in a significant amount of land acquisition.

3.2.3.1 SIGNIFICANCE CRITERIA

The significance criteria applied is based upon total parcels acquired.

3.2.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

There would be short-term less-than-significant adverse, and long-term beneficial effects to existing land acquisition.

3.2.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur. The need to maintain existing facilities and not upgrade infrastructure deficiencies identified in Chapter 2 would continue to impair the HRSD's ability to meet the greater community's needs. Existing conditions would remain unchanged and there would be no long-term benefits or adverse impacts

3.3 Aesthetics

3.3.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). Final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values. Defining aesthetics concerning planning takes into account color, surface, texture, slope, form (shape and size, particularly in respect to the existing landscape and architectural elements), pollution in the form of debris creation, changes in the color of soil or water, and integration with cultural resources. The Degradation of Aesthetics Beneficial Use Impairment (BUI) tool used in this document is more subjective than the other beneficial use impairments.

3.3.2 Affected Environment

The affected environment is the entirety of the MISPPII. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek.

3.3.3 Environmental Consequences

The project will have short-term visual impacts during construction due to ground disturbance and the directional drilling beneath Piankatank River and Urbanna Creek, which will be visible from the bridge crossings of these two waterways. Changes to the color of the soil or water will be avoided due to the implementation of Best Management Practices. Long-term impacts will include the removal of some trees, particularly in the construction of the pump stations at Locust Hill, Urbanna, and for the Gloucester alternative selected at 8210 Waverly Lane. A wooded area within a former residential parcel, now the property of the HRSD is located at 215 Linden Street near Taber Park is the location of the Urbanna pump station preferred alternative. This property will have trees removed. The site is 0.365 acres in total area and is adjacent to Taber Park at the intersection of Rappahannock Road and Park Street in the town of Urbanna, zip code 23175. The site is adjacent to the western property line for Taber Park which features a parking area, a fenced swimming pool, a locker room and changing area, wooden bleachers behind the pool, mowed lawn, landscaped shrubs, a playground, and an electrical station. There are no other existing

parklands that surround the project. The Taber Park property is owned by the Middlesex County Department of Parks and Recreation. There will be right of way acquisition of private property at the 215 Linden Street site. No municipal park property is now anticipated to be required under the preferred alternative. The following activities take place on the Taber Park property: Pedestrian use, landscaped shrubs, children's playground, fenced swimming pool (currently closed to the public due to safety issues), locker room and changing area, bleachers (currently closed to the public), and mowed lawn. The swimming pool is to reopen in the future once necessary repairs are implemented by the County. No planned or organized activities, either educational or recreational, take place in the privately owned parcel acquired. The Taber Park property is accessed by pedestrian and vehicular traffic and has usage of over 2,000 users/visitors per year. There are no hiking or jogging trails and there are no improvements to the wooded area behind the Park. The only unusual characteristic of the wooded lot is a deeply incised stream with vegetated banks up to 11 ft. on one flank of the intermittent stream. The stream is partially culverted. On April 6, 2022 it was announced that The Urbanna Oyster Festival Foundation removed 2.5 acres of underbrush in a vacant lot it purchased on Rappahannock Avenue to the east of and adjacent to Taber Park. This property is designated recreational open space acquired in part via a grant from the Virginia Outdoors Foundation and is now converted to parkland.

James River Archaeology, Inc. reviewed reports in addition to archaeological site files and architectural survey files at the Virginia Department of Historic Resources (VDHR) in Richmond. The earliest detailed maps of those areas included within the project area consist of coastal surveys completed by cartographers of the U.S. Coast Survey in the 1850s and 1860s. According to the 1856 Map of a Portion of the Rappahannock River, the proposed Urbanna pump station and associated transmission force main corridor were well beyond the developed area of the town. The proposed location of the Urbanna Treatment Plant pump station (Alternative 2) and the associated transmission force main corridor within the limits of the Town of Urbanna are situated outside of the boundaries of the Urbanna Historic District (DHR ID# 316-0009), which is listed in the National Register and the Virginia Landmarks Register. The above survey is included as Attachment 7 of the Draft HRSD Middlesex Joint Permit Application in Appendix A: Agency Correspondence as well as in Attachment A of the Final Preliminary Engineering Report included as Appendix B of this Final EA. Recommendations made by the VDHR included in addition to this earlier survey a Phase I Cultural Resources study. This study, which included both archaeological and architectural survey, was performed in June and July 2022 for selected components of the MISPPII as requested by the VDHR on October 21, 2021. The surveys are included in Appendix A.

3.3.3.1 SIGNIFICANCE CRITERIA

Significance criteria are based upon the removal of elements such as historic districts, a form of architectural elements, slope, and removal of vegetation. It is also based upon additions of elements that are incompatible with existing architectural elements, recreational use, color, and slope used by the BUI tool.

3.3.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on aesthetics. Fill material for land-based excavation, when brought in from an outside source, will be clean and non-erodible soil. The MISPPII would have short- and long-term less than significant effects on aesthetics resources.

3.3.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on aesthetics.

3.4 Wild and Scenic Rivers

3.4.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest. This includes impacts upon wild and scenic rivers.

3.4.2 Affected Environment

The affected environment is the entirety of the MISPPII. There are no designated wild and scenic rivers in the Commonwealth of Virginia.

3.4.3 Environmental Consequences

There will be no environmental consequences regarding wild and scenic rivers.

3.4.3.1 SIGNIFICANCE CRITERIA

Significance criteria and the threshold is based on the project's design and seating within proximity to designated wild and scenic rivers in the Commonwealth of Virginia.

3.4.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have no impact upon wild and scenic rivers.

3.4.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no impacts to wild and scenic rivers as none exist within the Commonwealth.

3.5 Biological Resources

3.5.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur. These include vegetation; wildlife; and threatened, endangered, or sensitive species in a given area.

Biological resources are integral to ecosystem integrity. The existence and preservation of biological resources are intrinsically valuable to society for aesthetic, recreational, and socioeconomic purposes.

3.5.2 Affected Environment

The project area is largely comprised of rural residential areas and agricultural operations with some silvicultural operations, limited industrial operations and fisheries, mostly recreational, and some small urban areas.

3.5.2.1 VEGETATION

Historically, maple (*Acer rubrum*), loblolly pine (*Pinus taeda*) sweetgum (*Liquidambar styraciflua*), mixed oak forest, and tidal wetlands consisting of saltmarsh cordgrass and black needle rush were the dominant vegetative communities present before the counties were mostly cleared for agricultural purposes in the 17th through the 20th centuries. Today the vegetative communities include disturbed grassland, deciduous forest, coniferous forest, agricultural species, and palustrine forested, emergent nontidal, and emergent and scrub-shrub tidal wetlands. Vegetation includes turf, manicured grasses, and ornamental species in landscaped areas.

The wetland delineation methods used are 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). Wetlands within the project area and the 100-ft. buffer that was utilized during the 2021 wetland and stream survey are characterized as scrubshrub, emergent, mixed, and forested wetland.

Ten separate streams were identified and surveyed. They include ephemeral, intermittent, and perennial streams. Seventeen separate wetland polygons were identified and surveyed. These include palustrine emergent wetlands within ditches parallel to the roadway corridors, palustrine forested slope wetlands classed as tributaries of drainages, depressional wetlands that were both isolated and non-isolated, palustrine emergent slope wetlands, one spring-fed wetland, palustrine scrub-shrub wetlands whose association with tributaries of the Piankatank or the Urbanna was not known. Identified stream reaches were 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 in the report.

The USACE Nationwide Permit 58 (recently revised from Nationwide Permit 12) will potentially be required. For both temporary and permanent impacts to palustrine tributaries of drainages, isolated and non-isolated depressional wetlands, and palustrine scrub-sbrub wetlands. Please see Appendix A.

3.5.2.2 WILDLIFE, INCLUDING MARINE SPECIES

The MISPPII does not impact marine habitats.

Typical mammal species include eastern cottontail (*Sylvilagus flordianus*), white-tailed deer (*Odocoileus virginianus*) and northern short-tailed shrew (*Blarina brevicauda*). Bat species big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lastionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and eastern pipistrelle (*Perimyotis subflavus*) (HRSDB 2019a). Typical bird species

include American robin (*Turdus migratorius*), Amphibian species observed include American toad (*Anaxyrus americanus*) and reptiles include the garter snake (*Thamnophis sirtalis*). The insects typical of the area include black swallowtail (*Papilio poluxenes*) and fine-lined emerald (*Somatochlora filosa*).

3.5.2.3 THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Federal

Northern Long-eared Bat (*Myotis septentrionalis*). The northern long-eared bat is listed as threatened under the ESA anywhere it is found, and critical habitat is not established. White-nose syndrome is the main threat to this species causing significant losses to the population (USFWS 2021c). It is a medium-sized (3 to 3.7 inches body length) bat that is distinguished from other species in the genus by its long ears (USFWS 2020b). Caves and mines serve as winter habitats; in the summer they roost in colonies or singly under peeling bark or cavities in trees. At dusk, northern long-eared bats hunt for insects in the understory of forested areas (USFWS 2020b). There is limited roosting habitat for the species in the MISPPII corridor or alternative sites. In 2023 the status of *M. septentrionalis* will change from threatened to endangered. The impending change will potentially affect construction that involves tree clearing after 2023.

Monarch Butterfly (Danaus plexippus). The monarch butterfly is a candidate for Federal listing. It occurs where habitat suitable for milkweed (genus *Asclepias*), its primary food source, occurs. No milkweed has been documented within the MISPPII corridor or alternative sites.

Small whorled pogonia (Isotria medeoloides). The small whorled pogonia, an orchid, is listed as threatened under the ESA anywhere it is found. When in flower the individual plants are 10 inches tall and about 14 inches when bearing fruit. The plant is named for the whorl of five or six leaves near the top of the stem and beneath the flower. The leaves are grayish-green, somewhat oblong and 1 to 3.5 inches long. The single or paired greenish-yellow flowers are about 0.5 to 1 inch long and appear in May or June. The fruit, an upright ellipsoid capsule, appears later in the year. The favored habitat is small light gaps, or canopy breaks, and grows in areas with sparse to moderate ground cover. Too many other plants in an area can be harmful to this plant. This orchid typically grows under canopies that are relatively open or near features that create long-persisting breaks in the forest canopy such as a road or a stream. It grows in mixed-deciduous or mixed-deciduous/coniferous forests that are generally in second- or third-growth successional stages. The soils in which it lives are acidic and moist, and have very few nutrients. The small whorled pogonia requires certain species of soil and leaf detritus fungi that are commonly associated with beech species. Habitat alteration is the primary threat to this species. Secondary threats are pesticide use and physical trampling by humans or domestic livestock.

The canopy cover in wooded areas in the MISPPII are primarily oak species, tulip poplar, loblolly pine, box elder, and sweetgum. Appropriate habitat including beeches is absent.

Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). The northeastern beach tiger beetle is listed as threatened under the ESA anywhere it is found. Critical habitat has been established, Consultation with the preeminent expert in the northeastern beach tiger beetle and related beach tiger beetles on the East Coast of the United States, Dr. C. Barry Knisley, disclosed all surveys he has conducted along the Western Shore of the Chesapeake Bay since 2017. There are no suitable beach dune habitats

for this species in Mathews or Middlesex Counties. They do not occur in these smaller tidal tributaries. Correspondence is included in Appendix A.

Table 3.5-1. Protected Species in Gloucester, Middlesex and Mathews Counties with Potential to Occur within the Project Area

Common Name	Scientific Name	Federal Status ¹	Occurrence in Project Area		
Mammals					
Northern long- eared bat	Myotis septentrionalis	Т	Unlikely, limited roosting habitat		
Insects					
Monarch butterfly	Danaus plexippus	С	Unlikely, no milkweed habitat		
Plants					
Small whorled pogonia	Isotria medeoloides	Т	Unlikely, no habitat with favored tree species		

¹ E: endangered; T: threatened. C: candidate ² Source: USFWS 2021

Migratory Birds

There are twenty migratory bird species protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act that potentially occur in Gloucester, Middlesex, and Mathews Counties. The twenty species are bald eagle (Haliaeetus leucocephalus), Golden eagle (Aquila chrysaetos), cerulean warbler (Setophaga (Dendroica) cerulea), Canada warbler (Cardinellina canadensis), Kentucky warbler (Opoornis formosus), prairie warbler (Dendroica discolor), prothonotary warbler (Protonotaria citrea), blue winged warbler (Vermivora pinus), rusty blackbird (Euphagus carolinus), red headed woodpecker (Malanerpes erythrocephalus), American oystercatcher (Haematopus palliatus), willet (Tringa semipalmata), lesser yellowlegs (Tringa flavipes), glossy ibis (Plegadis falcinellus), ruddy turnstone (Arenaria interpres morinella), piping plover (Charadrius melodus), short-billed dowitcher (Limnodromus griseus), wood thrush (Hylocichla mustelina), bobolink (Dolichonyx oryzivorus), and migrant loggerhead shrike (Lanius ludovicianus migrans). The bald eagle is protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940. The Center for Conservation Biology has created an online map of surveyed bald and golden eagle nesting sites in Virginia. No bald or golden eagles nest within a mile or greater in the project corridor within the three counties of Gloucester, Middlesex, and Mathews.

State-Listed Species

The migrant loggerhead shrike (*Lanius Iudovicanus migrans*) and the barking treefrog (*Hyla gratiosa*) have been listed by the Virginia Department of Game and Inland Fisheries as occurring within two miles of the MISPPII area. However, the appropriate habitat for these species of farm fields with tree firebreaks and undisturbed large, forested wetland tracts, respectively, do not occur within the MISPPII area.

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations. Within the Urbanna and the Saluda Quadrangles, the VDCR has furnished the following conclusions.

Alternative 1, Alternative 2, Alternative 3 and Alternative 5 (Gloucester County)

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources.

Alternative 4 (Gloucester County)

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources.

In addition, the proposed project will intersect Ecological Core C 5 as identified in the Virginia Landscape Assessment (https://www.dcr.virginia.gov/naturalheritage/vaconvisvnla), one of a suite of tools in Virginia ConservationVision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer (http://vanhde.org/content/map).

According to the information currently in Biotics, natural heritage resources have not been documented elsewhere within the submitted project boundary including a 100-ft. buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitats for natural heritage resources. Within the Wilton Quadrangle and the Ware Neck Quadrangle, according to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-ft. buffer. Please note, a predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on the DCR biologist's review of the proposed project a survey is not recommended for the resource. For all quadrangles, if tree clearing occurs, the proposed project may fragment Ecological Cores (C3, C4, C5) as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/naturalheritage/vaconvisvnla), one of a suite of tools in Virginia Conservation Vision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer (http://vanhde.org/content/map). Ecological Cores are areas of unfragmented natural cover with at least 100 acres of the interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection

and erosion prevention), and air quality (including carbon sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain. The Project Action is present in two of these Ecological Core rankings: C3 (high), C4 (moderate), and C5 (general). Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation, and egg parasitism, and increased invasion by weedy species.

Therefore, minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments, and design the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns). Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on the state listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

3.5.3 Environmental Consequences

3.5.3.1 SIGNIFICANCE CRITERIA

Biological resources effects would be considered significant if construction or operation activities would reduce the distribution or viability of species or habitats of concern, including the taking of a listed species.

3.5.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MISPPII would have short- and long-term less than significant effects on biological resources. Ecological cores, where present, are of the C4 and C5 rankings due to the already fragmented ecological structures. Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing maintenance activities of the pump stations and treatment plants. Proposed activities would not significantly affect native vegetation or aquatic and terrestrial wildlife resources, including threatened and endangered species. Effects on biological resources would not reduce the distribution or viability of species or habitats of concern or violate biological resources laws or regulations. There would be less than significant effects regarding loss, degradation, or fragmentation of wildlife habitat. The concurrence and consultation with the USFWS and VDCR are provided in Appendix A.

The projects and project alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, repair, alterations, and additions); demolition of buildings, pavement, and a directional drilling crossing of the Piankatank River and Urbanna Creeks. There would be some minor adverse effects to biological resources from individual projects and project alternatives; however, each

was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects on biological resources. A description of effects to biological resources including all projects and project alternatives is provided in this section. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Construction Effects

Construction and demolition activities would have site-specific temporary effects on biological resources. The proposed activities would require vegetation removal, but it would primarily be mowed and landscaped vegetation. Construction activities would displace locally common wildlife species that are adapted to high levels of human activity and disturbance. However, any wildlife disturbed by construction activities could theoretically temporarily or permanently relocate to similar habitat nearby. There are no natural heritage areas or conservation/managed areas on public or private lands. All ground disturbed would be reseeded or planted with appropriate vegetation. These effects would be less than significant.

The proposed construction projects also include directional drilling under the Piankatank River and Urbanna Creek. The process is designed to avoid and minimize impacts to surface areas of the sediment, including sand, silt, and clay, to the extent practicable. Since the proposed project areas are in previously developed areas and previously directionally drilled areas for the installation of other utilities there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources. The proposed repair and renovation projects include modifications to existing facilities. Since the proposed project areas are in previously developed areas there would be no appreciable loss of wildlife habitat from the proposed construction activities. These activities would have short- and long-term less than significant effects on biological resources.

Operational Effects

There would be less than significant effects on biological resources due to the maintenance and operations associated with the MISPPII. The MISPPII would have few additional effects on vegetation, wildlife, or threatened and endangered species when compared to existing conditions. Therefore, long-term effects on biological resources would be negligible.

The co-location and consolidation of facilities and functions specified in the MISPPII would provide operational efficiencies. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on biological resources would be negligible. Short-term minor adverse effects would be due to site-specific temporary disturbance during construction. Long-term minor adverse effects would be due to ongoing activities at the facilities.

3.5.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation as proposed would be unmet. The HRSD would be unable to fulfill its responsibilities to the greater community. Existing conditions would remain unchanged and there would be no effects on biological resources. Construction, renovation, and demolition activities would have site-specific temporary effects on the biological

resources. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MISPPII, would have substantial cumulative effects on biological resources. Therefore, cumulative effects on biological resources would be less than significant. The No Action Alternative would have no effects on biological resources.

3.6 Irretrievable Resources

3.6.1 Definition of Resource

- 43 U. S. Code §4332 states that Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered following the policies outlined in this chapter, and (2) all agencies of the Federal Government shall-
- (A) utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment;
- (B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by subchapter II of this chapter, which will ensure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;
- (C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on-
- (i) the environmental impact of the MISPPII,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the MISPPII,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources that would be involved in the MISPPII should it be implemented.

These irretrievable commitments of resources that are irreversible include paleontological resources such as fossils and geological resources such as minerals, oil, and gas which, if used, will not be recovered. These also include prime farmland which, if converted to non-agricultural use, will not be recovered. The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The corridor and the pump stations will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

3.6.2 Affected Environment

The geology of the landscape within the proposed MISPPII is Coastal Plain sediments and is represented by the late Tertiary Period and the early Quaternary Period of the Cenozoic Era. The deposits are mostly estuarine and marine in origin. They thickly overlay the older Cretaceous Period sand and clay. The western terminus of the MISPPII (the site of the proposed Central Middlesex pump station Alternative 2) is underlain by the Quaternary-Tertiary Period Windsor Formation, composed of gravel and sand. This Formation continues along State Route 227 until the crossing at Urbanna Creek. Thereafter the geologic unit exposed at or near the surface becomes the Quaternary-Tertiary Period Tabb Formation, Sedgefield member. Sand is the predominant mineral resource. The site of the proposed Urbanna pump station alternatives is also the Quaternary-Tertiary Tabb Formation, Sedgefield member, comprised of sand. Along State Route 3 south of the crossing of Twiggs Ferry Road and White Pine Lane the geologic unit is the Quaternary Period Shirley Formation, composed of sand. The Locust Hill pump station location is located within the Windsor Formation. Gravel and sand are the predominant mineral resources. At Wilton Point, it is the Quaternary Tabb Formation, Lynnhaven and Poquoson members, undifferentiated Quaternary sand, and silt. Immediately south of the northern abutment for the bridge over the Piankatank River, the geologic unit is the Quaternary Shirley Formation, comprised of gravel and sand. Just south of State Route 198 the geologic unit is the Quaternary Tabb Formation, Sedgefield member. It is Quaternary age sand. Following State Route 3 to John Clayton Memorial Highway (State Route 14) the unit is seen to be once more gravel and sand of the Quaternary-Tertiary Windsor Formation. This is the southernmost terminus of the main corridor. The five alternative sites for the proposed Gloucester pump stations, including the three alternatives near Waverley Lane and the site of the proposed Gloucester Pump Station Alternative 4 (not selected) include the Quaternary Tabb Formation, Lynnhaven and Poquoson members. The Formation is undifferentiated sand with a secondary silt component. Included also is the Tertiary Windsor Formation.

There are two active permitted mines permitted by Virginia Energy (formerly known as the Virginia Division of Mines, Minerals, and Energy) within five miles of the MISPPII: James Holmes Pit, permit number 90363AA C03243, owned by James and William Holmes, an open pit sand and gravel mine located one mile northwest of the town of Urbanna on State Route 602 (Old Virginia Street) in Middlesex County; and Mine # 1, permit number 13118AA C00594, owned by William H. Wright, an open pit sand mine located on State Route 3, three miles west of the unincorporated community of Topping on State Route 33 in Middlesex County.

A Pleistocene-epoch oyster fossil site is located on private property along the southern Piankatank River shoreline at Holland Point in Mathews County approximately 1.8 miles west of the State Route 3 bridge over the Piankatank River. A rich invertebrate fossil bed of Neogene-Pleistocene age is located at Mitchem Pit west of Ridge Road (State Route 626) in Mathews County approximately 8 miles from the MISPPII. Both sites are over one mile from the MISPPII area.

There are no Federal lands within five miles of the MISPPII area wherein disturbance of paleontological resources is prohibited. All paleontological resources are located on privately owned properties.

3.6.3 Prime Farmland

The project is located in a predominantly rural and rural residential area of the Commonwealth of Virginia with limited fisheries industry and one urban area. The MISPPII includes one semi-rural area in Saluda, Middlesex, and one urban area, Urbanna, also in Middlesex. The remainder of the MISPPII is located in an area of timber production, agriculture, small businesses, residences, public schools, nontidal streams and wetlands, and beaches and tidal waterbodies.

Prime farmland is identified by the U. S. Department of Agriculture/Natural Resources Conservation Service as land having the best combination of chemical and physical characteristics for producing food, fiber, and forage, permeable, with adequate water supply from precipitation or irrigation, favorable temperature, and levels of acidity or alkalinity and few or no rocks. Urban areas do not have prime farmland mapped. It does not occur in undrained areas or areas that flood frequently although it can be well-drained hydric soils.

The United States Department of Agriculture's Natural Resources Conservation Service publishes soil surveys of all counties and municipalities in Virginia. They have been evaluated according to morphology, physical composition, hue, chroma, and value at varying depths of the soil column to 60 inches, erodibility, and suitability for various crops or timber production. Associated soil mapping units that can occur with each unit are listed. Soils are identified as hydric soils and nonhydric soils, as well as their status as prime farmland, farmland of statewide importance, or neither of these. The following soil mapping units are documented within the Project Action.

Table 3.6-1. Soils Within the HRSD Middlesex Interceptor System Program Phase II

USDA Designated Soil Mapping Unit	Hydric (Yes/No)	Prime Farmland or Farmland of Statewide Importance (Yes/No)
3 Bethera and Daleville	Yes	No
3B Craven silt loam	No	Yes, Prime Farmland
4 Catpoint loamy sand	No	No
4A Dogue fine sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
4B Dogue fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
5B Emporia sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
6A Emporia loam, 0-2 percent slopes	No	Yes, Prime Farmland
6B Emporia loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
7D Emporia-Nevarc complex, 6 to 15 percent slopes	No	Yes Farmland of Statewide Importance
7F Emporia-Nevarc complex, 15 to 45 percent slopes	No	No
8 Eunola Ioam	No	Yes, Prime Farmland
9A Kempsville sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
9B Kempsville sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
10 Kenansville fine sand	No	No
11 Kinston-Bibb complex	Yes	No
11 Johns variant loamy sand	No	No
13 Myatt loam	Yes	Yes, Prime Farmland if Drained
13B Kempsville fine sandy loam, 2 to 6 percent slopes	Yes	Yes, Prime Farmland
15 Ochlockonee silt loam	No	No

USDA Designated Soil Mapping Unit	Hydric (Yes/No)	Prime Farmland or Farmland of Statewide Importance (Yes/No)
16 Pactolus loamy fine sand	No	No
16 Lumbee sandy loam	Yes	Yes Prime Farmland if Drained
17 Pocaty muck	Yes	No
18 Meggett sandy loam	Yes	Yes, Prime farmland if drained
18B Rumford fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
19A Slagle silt loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
19B Slagle silt loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
20A Suffolk fine sandy loam, 0 to 2 percent slopes	No	Yes, Prime Farmland
20B Suffolk fine sandy loam, 2 to 6 percent slopes	No	Yes, Prime Farmland
21D Suffolk-Remlik complex, 6 to 15 percent slopes	No	Yes, Farmland of Statewide Importance
21F Suffolk-Remlik complex, 15 to 45 percent slopes	No	No
22B Udorthents and Psamments, gently sloping	No	No
25 Pamlico and Portsmouth muck	Yes	No
29C Suffolk fine sandy loam, 6 to 10 percent slopes	No	Yes, Farmland of statewide importance
Dr. Dragston fine sandy loam	No	Yes, Prime Farmland if Drained
Fa Fallsington fine sandy loam	Yes	Yes, Prime Farmland if Drained
SaA Sassafras fine sandy loam 0 t0 2 percent slopes	Yes	Yes, Prime Farmland if Drained
SdA Sassafras loamy fine sand, 0 to 2 percent slopes	Yes	Yes, Prime Farmland if Drained
StE Steep sandy land	No	No
Wo Woodstown fine sandy loam	No	Yes, Prime Farmland if Drained

The above prime farmland and soils of statewide importance soil mapping units are present along-the main transmission force main corridor except for the following. Present at the location of the proposed pump stations at 8210 Waverly Lane, Tax Map number 26-109, 9375 John Clayton Memorial Highway, 9316 John Clayton Memorial Highway and Tax Map number 26-22 John Clayton Memorial Highway, are these prime farmland and soils of statewide importance soil mapping units: 7D, Emporia-Nevarc complex, 6 to 15 percent slopes, 13B, Kempsville fine sandy loam, 16, Lumbee sandy loam, 18, Maggett sandy loam, 18B, Rumford fine sandy loam, 19A, Slagle silt loam. 0 to 2 percent slopes, and 29C, Suffolk fine sandy loam. At 9375 John Clayton Memorial Highway, most surrounding lots are now devoted to solar farm use and removed from agricultural production permanently. Only 400 feet by 350 feet of this parcel are planned as a location for the pump station and access road. The 5 acres at 9316 John Clayton Memorial Highway (Alternative 4) are in timber production and have not been used for agricultural production for many decades. It is conceivable that they could be returned to agricultural production but not likely since the current property owner is expanding a residential area to the west. The 8.5 acres at Tax Map number 26-22 are in timber production and have not been used for agricultural production for many decades. It is conceivable that the acreage could be returned to agricultural production, but not likely since they are mostly surrounded by residential areas. It is present at the location of one of the alternative sites for a proposed new pump station, proposed Gloucester Pump Station Alternative. This location is unlikely to be farmed in the future as it has been in timber for many decades. The following prime farmland and farmland of statewide importance soil mapping units are present at the location of 26-22, within the proposed pump station at 215 Linden Street in Urbanna in Middlesex County: 6A, Emporia loam, 0 to 2 percent slopes, 7D, Emporia-Nevarc complex, 6 to 15 percent slopes, 8, Eunola loam, 9A, Kempsville sandy loam, 19A, Slagle silt loam, 20A, and Suffolk fine sandy loam, 0 to 2 percent slopes. The property at 215 Linden Street is within the town limits and is zoned Residential-Medium Density, It has thus been removed from potential agricultural production permanently.

The prime farmland soil mapping units along the main transmission force main corridor are within disturbed soils already present within the Virginia Department of Transmission right of way.

The USDA Chesapeake Service Area office responded to a request for a Farmland Conversion Impact Rating on October 28, 2021. The project would require a rating if it received Federal funding or assistance. However, as the project receives no Federal funding or assistance. a Farmland Conversion Impact Rating is not required.

3.6.4 Environmental Consequences

The soils present along the main transmission force main corridor will not be used for the cultivation of food, fiber, and forage in the foreseeable future as they have been removed from agricultural production permanently. The MISPPII will not affect the availability of prime farmland for cultivation, as three of the alternatives along John Clayton Memorial Highway in Gloucester County are planned for future residential and solar farm land use and one is currently in timber and has been in timber for many decades

The resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The corridor will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

Significance Criteria

43 U. S. Code §4332 makes limited provisions for the determination of significance in a short- or long-term impact. An impact may be beneficial or adverse or be of no impact. An adverse impact on geological resources or formations, or prime farmland, might be due to grading or otherwise modifying existing topography in such a manner that access to these resources is permanently removed. Other adverse impacts include the removal of the resource. In the case of prime farmland, the addition of soil for grading, or extensive excavation, removes the soil mapping unit and converts it permanently to a mapping unit commonly considered urban land.

3.6.4.1 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will not impact fossil shell beds or other paleontological resources via filling or excavation of said resources and there will be no impact on oil and gas resources or mineral resources. Fill material for land-based excavation, when brought in from an outside source, will be clean and non-erodible soil. The MISPPII would have short- and long-term less than significant effects on irretrievable resources. The MISPPII would not affect known minerals, gas, oil, or paleontological resources. As discussed in Section 3.6.4., the MISPPII will not affect the availability of prime farmland for cultivation, as the four alternatives along John Clayton Memorial Highway in Gloucester County are planned for future residential and solar farm land use. There is a low probability that the MISPPII could affect the availability of prime farmland if the proposed pump station is built at the proposed site at Gloucester Pump Station Alternative 4 along the John Clayton Memorial Highway. The land, currently in timber, could be converted to cultivated land as it is currently not under cultivation and has not been cultivated for decades.

Resources also include Chesapeake Bay Preservation Area buffers (offset by BMPs). The MISPPII will occupy the Chesapeake Bay Preservation Area Buffers at the crossings of the Piankatank River and Urbanna Creek. Not more than approximately 0.20 acre of potential impact is anticipated.

3.6.4.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on irretrievable resources.

3.7 Cultural Resources

3.7.1 Definition of Resource

Cultural resources are defined as prehistoric or historic districts, sites, buildings, structures, or objects considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. They include archaeological, architectural, and traditional resources. Archaeological resources contain artifacts, features, or other archaeological indications of past human life or activities from which archaeologists interpret information about history or prehistory. Architectural resources include buildings, structures, landscapes, and objects that document the history of an area and possibly the history that predates the area. These could include underwater resources.

Sections 106 and 110 of the NHPA of 1966, as amended, require federal agencies to identify whether any historic or architectural resources that are listed or eligible for listing, on the NRHP could potentially be affected by the MISPPII. Generally, historic properties must be more than 50 years old to be considered for inclusion in the NRHP but may also include the Cold War era (resources constructed before 1990), and Native American cultural properties.

3.7.2 Affected Environment

A total of 14.2 acres of the MISPPII, where proposed construction activities will result in subsurface disturbance, were surveyed during the Phase I archaeological investigation conducted in June 2022, DHR File No. 2020-5020. The Area of Potential Effect (APE) was divided in 45 discrete Survey Units . A total of 222 shovel tests were dug during this survey. Three survey units, SU 006, SU 025 and SU 038. yielded artifacts. Eleven historic period artifacts, mainly bottle glass, were identified in three shovel tests 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.

Additionally, in the survey unit identified as 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. For this survey unit 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. The survey recommends a finding by the Virginia DHR of "No Adverse Effect" to archaeological resources with the inclusion of this Unanticipated Discoveries Plan in construction documents. A 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, was conducted. The 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 MISPPII 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. 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).

Tetra Tech documented 56 historic resources 50 years of age or older that may have views of the MISPPII 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 the Virginia Cultural Resources. 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 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.

Previous cultural resources surveys, inventories, and assessments performed by James River Archaeology, Incorporated for the MISPPII had identified NRHP eligible, or potentially eligible, archeological sites and NRHP-historic architectural resources that are not within or near the MISPPII. The undertakings within the MISPPII consist of interior renovation, addition or alteration of the buildings, and demolition of buildings. Phase I investigation and subsequent review indicate that the project will have no adverse effect upon any of the 56 documented resources detailed during the analysis. These structures are included in the 2022 Phase I Reconnaissance Level survey. The surveys are included as Attachment 7 in the Draft HRSD Middlesex Joint Permit Application in Appendix A, Agency Correspondence, as well as Appendix A of the Final Preliminary Engineering Report in Appendix B of this Final EA.

3.7.3 Environmental Consequences

3.7.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the HRSD did not conduct and complete proper coordination with the Virginia SHPO before physically altering, damaging, or destroying all or part of a cultural resource or introducing visual or audible elements that are out of character with a historically sensitive property.

Under Section 106 of the NHPA, an action might have no effects on historic properties (no historic properties finding), no adverse effects on historic properties, or adverse effects on historic properties. An adverse effect under Section 106 of the NHPA would not necessarily be significant under NEPA if effects were not considered substantial and could be mitigated. Measures developed to minimize or mitigate adverse effects on historic properties under Section 106 of the NHPA could result in an action having no significant impacts on cultural resources under NEPA. Mitigation consists of the inclusion of an Unanticipated Discoveries Plan in construction documents.

3.7.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MISPPII is expected to have no adverse effects on cultural resources. A Phase I Cultural Resources Survey was performed per the recommendation of the Virginia DHR in their letter dated October 21, 2021 and provided data on any additional archaeological/architectural resources not yet identified in previous studies to ensure no significant impacts to these resources.

The projects and project alternatives outlined in Chapter 2 consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and directional drilling. There would be some minor adverse effects to cultural resources from individual projects and project alternatives; however, each was reviewed on a case-by-case basis, and none of the projects would have potential effects on cultural resources. This is considered the reasonable upper bound of effects, and impacts would be less than those described herein.

Archaeological Resources

The Phase I Archaeological Investigation recommended by the Virginia DHR in their letter dated October 21, 2021 was conducted in June 2022. A desktop review of the Virginia Cultural Resource Information System (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 Area of Potential Effect (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 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.

The MSIPPII would not affect known archaeological resources because there are no known archaeological resources that are within the proposed project areas, surveys across the base indicate the probability of undiscovered resources is low, and if resources are uncovered during construction, the HRSD has guidelines for stopping construction to allow professional archaeologists to survey the area. Although no subsurface cultural resources have been identified, if such resources were uncovered during construction, renovation, or demolition, activities would be suspended until a qualified archeologist could determine the significance of the resources. These effects would be less than significant.

Architectural Resources

The MISPPII includes the demolition of structures. The HRSD will be assessing all of the structures that are 50 years old and older during the Phase I Cultural Resources Survey to be performed in 2022.

The HRSD consulted with the Virginia SHPO under Section 106 of the NHPA, providing them with information on the undertaking. The SHPO correspondence is provided in Appendix A. The Virginia DHR recommended a Phase I Cultural Resources study for selected components of the MISPPII in their letter dated October 21, 2021. A Phase I reconnaissance level architectural survey and a Phase I archaeological survey were performed in June and July 2022. The results were forwarded to the SHPO and included in this Final EA.

Traditional Cultural Resources

The MSIPPII is not expected to affect known traditional cultural resources because there are no known traditional cultural resources within the proposed project areas. There are no Federally recognized tribes in the area of the MISPPII as confirmed during the Phase I cultural resources survey.

3.7.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects would not occur and the need to meet current and future HRSD objectives would not be possible. Existing conditions would remain unchanged and there would be no effects on cultural resources.

3.8 Noise

3.8.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, noise.

The primary measure of noise impacts on people and land uses is the Federal standard cumulative metric. It is a measure of the overall noise experienced in an area during a full 24-hour day. The metric factors in the increase of duration of noise events, the number of noise events in the 24 hour day, takes into account the increased sensitivity to noise occurring at night, allows a composite measurement of all sources of noise both within and outside an airport and allows quantitative comparisons of noise from various sources. Decibel Scale is used as the Federal standard. Sound is measured in units called decibels (dB). The higher the decibel level, the louder the noise. On the decibel scale, the level increase of 10 means that a sound is 10 times more intense, or powerful. The 65 decibels (dB) contour is the lower limit for defining significant noise impact on the human ear. The exposure of 1.5 dB or greater to the human ear is considered a significant addition of noise. The problem to be addressed is if the project increases noise by 1.5 dB or more for a noise-sensitive area that is exposed to noise at or above the 65 dB noise exposure level, or that will be exposed at or above the 65 dB level due to a 1.5 dB or greater increase when compared to the no-action alternative for the same timeframe. Noise-sensitive areas include schools, cemeteries, churches, and hospitals.

3.8.2 Affected Environment

The affected environment is the entirety of the MISPPII project area. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek. There are five noise-sensitive areas within the Project Action: Calvary Baptist Church, at 3971 General Puller Highway, Harmony Grove Baptist Church at 7722 General Puller Highway, Apostolic Faith Church at 7320 General Puller Highway, Christchurch School at 49 Seahorse Lane, and Grafton Church at 425 Grafton Church Road.

3.8.3 Environmental Consequences

Noise impacts during the construction of the proposed projects are associated with an increase in ambient noise levels from the construction equipment. Grading and scraping operations are the noisiest activities with equipment generating noise levels as high as 70 to 95 A-weighted in decibels (dBA) within 50 feet of their operation. Distance would rapidly attenuate noise, and it is not anticipated that construction will occur close enough to existing noise-sensitive areas to cause disturbances. In addition, construction would occur during daytime hours when residents are away from their homes and would be less disturbed than nighttime hours when most church activities would also take place; therefore, those living and worshipping in the vicinity are not likely to be affected by construction noise. Noise impacts are generally localized in the vicinity of the construction and demolition sites. Earthmoving equipment, tree removal equipment, asphalt pavers, drilling, and other construction machinery and vehicles will create localized increases in noise levels. These temporary noise impacts should not disrupt normal church or school operations. Noise levels generally dissipate as the distance from their origin increases. Distance from the construction sites must be considered when evaluating potential noise impacts to land uses adjacent to or near the construction.

3.8.3.1 SIGNIFICANCE CRITERIA

The Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), developed the significance criteria for the evaluation of noise impacts. Adverse effects or no effects are the criteria categories. The Noise Control Act of 1972 and EO 12088 require that federal agencies assess the impact

of noise on the environment by assessing the duration, the number of events and sensitivity of certain groups and times of day, and noise receptors. An effect is considered adverse when all three factors are significantly impacted.

3.8.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on noise. The MSIPPII would have short- and long-term less than significant effects on aesthetics resources.

3.8.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on noise levels.

3.9 Traffic Circulation and Traffic Pattern Disruptions

3.9.1 Definition of Resource

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government uses all practicable means to ensure all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA), in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, changes to traffic patterns, and alteration in surface traffic patterns, or a noticeable increase in surface traffic congestion or decrease in Level of Sound (LOS).

3.9.2 Affected Environment

The affected environment is the entirety of the MSIPPII. The land use is currently agricultural, silvicultural, and light industrial, with some fisheries and rural residential. Portions of the project corridor involve crossing the Piankatank River and Urbanna Creek. Those roadways identified by the Virginia Department of Transportation (VDOT) as being within the project corridor are Route 227, Route 14 at John Clayton Memorial Highway near its intersection with Waverley Lane (Route 694) Route 33, Route 3 from Route 33 to the crossing of the Piankatank River, and Route 3 from the Middlesex County line to the Route 3/198 intersection. All of these would be impacted by the proposed construction. The Commonwealth of Virginia Annual Average Daily Traffic Volumes data for 2019 lists Annual Average Daily Traffic. At Waverley Lane, Ware Neck Road and SR 14, the nearest intersections to the proposed Gloucester Pump Station Alternatives 1, 2, 3 and, and the existing Beaver Dam Pump Station which will receive upgrades, the AADT is 21,000. At the intersection of 3 and 33, the AADT is 7,300. The AADT for Route 3 from Route 33 to the crossing of the Piankatank River (the Mathews County line) is 7,300 AADT, Route 3 at its intersection with SR 14 has an AADT of 12,000,and the main corridor Route 3 to the Route 31/Route 98 intersection is 2,500 AADT.

In its comments to the HRSD dated September 28, 2021, VDOT stated that there are no known or proposed programmed improvements at these above routes at the present time.

3.9.3 Environmental Consequences

The traffic volumes will have little impact from construction activities. Traffic levels in the project areas are light and would not increase substantially or degrade the LOS on any nearby roadway or intersection. The construction and demolition activities would require the use of heavy equipment and worker commutes that would generate short-term increases in traffic. The local roadway infrastructure in all three counties would be sufficient to support these activities. Because most of the work would take place on-site, road closures or detours would not be expected. All construction vehicles would be equipped with backing alarms, two-way radios, and "Slow Moving Vehicle" signs when appropriate. Although these effects would be negligible, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize these already limited effects. These effects would be negligible.

3.9.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the proposed project produced a permanent increase in traffic or resulted in a decrease in LOS.

3.9.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The project will have a less than significant impact on traffic. The MSIPPII would have short- and long-term less than significant effects on traffic. The criteria for which significance is evaluated are twofold. One is a cumulative increase in traffic, and the second is whether roadways leading to and from the state roadways listed in Section 3.9.2 exhibit short- and long-term decreases in LOS. There are no proposed or programmed improvements planned along the routes within the MISPPII at the present time.

3.9.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on traffic in the area.

3.10 Socio-Economic Changes

3.10.1 Definition of Resource

EO 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was enacted in 1994 to focus the Federal agency's attention on the environmental and human health conditions in minority communities and low-income communities to achieve environmental protection for all communities. Under this EO, Federal agencies must identify and address the human health or environmental effects of its actions on disproportionately minority and low-income populations.

Based on guidance from the CEQ, several definitions must be clarified to understand what an environmental justice community is. Minority populations should be identified where either (a) the minority population of the area exceeds 50 percent (%), or (b) the minority population percentage of the

affected area is meaningfully greater than the minority population percentage in the general population or other appropriate units of geographic analysis (CEQ 1997). Hispanic or Latino populations are defined not as a racial designation, but rather an ethnic population. Hispanics or Latinos may be white, black, or any race. Low-income populations are defined as those below the Federal poverty thresholds (\$12,880 U. S. dollars per capita per year) identified using statistical poverty thresholds from the U.S. Census. EPA guidance states, "The composition of the population should be compared to the characteristics of the population, e.g., percentage of minority populations residing near a proposed project versus the percentage of minority populations located within a single or multiple-county area surrounding the proposed project" (EPA 1998). Applying this methodology, the percentage of low-income and minority populations within the Census Tracts where the project area is located is compared to the percentage of low-income and minority populations located within the Commonwealth of Virginia. Specifically, a low-income or minority population is identified when an area has a poverty rate or minority population percentage that is significantly greater than the state. 2020 USCB data were examined to determine minority and low-income population percentages in the project area to facilitate the qualitative assessment of potential environmental justice impacts.

3.10.2 Affected Environment

The data used in this analysis is obtained from the USCB Census 2020. The Gloucester County component of the project area is in both Census Tract 1002.03, zip code 23061, and Census Tract 1002.01, zip code 23061. (USCB, 2021). For Census Tract 1002.03 the population is 37,348, approximately 87.8% of which is Caucasian or white. Approximately 8.0% is black, 0.6% is Native American, 0.9% is Asian, 0.1% is Native Hawaiian, approximately 2.7% is two or more races, and 3.8% is Hispanic or Latino. The data indicate in Census Tract 1002.03, 8.6% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than either Gloucester County or the state. Census Tract 1002.3 has a lower percentage of minority population than the state, at 69.4%. The mean per capita income according to July 2017 Census data for Census Tract 1002.03 is \$33,697. For the state of Virginia, the mean per capita income is \$39,278, significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is \$230,000. The Census Tract median home price is significantly less than the state median home price of \$273,100. A statistical testing tool is available from the USCB. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 1002.03 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.6% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (2.1% as compared with 9.9% for the state). Census Tract 1002.03 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 1002.03.

For Census Tract 1002.01 the population is 6,078, approximately 81.5% of which is Caucasian or white. Approximately 9.2% is black, 0.1% is Native American, 0.6% is Asian, 0.4% is Native Hawaiian,

approximately 7.3% is two or more races, and 3.7% is Hispanic or Latino. The data indicate in Census Tract 1002.01, 6.1% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than either Gloucester County or the state. Census Tract 1002.1 has a lower percentage of minority population than the state, at 69.4%. The mean per capita income according to July 2017 Census data for Census Tract 1002.01 is \$35,211. For the state of Virginia, the mean per capita income is \$39,278, significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is \$208,100. The Census Tract median home price is significantly less than the state median home price of \$273,100. A statistical testing tool is available from the USCB. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 1002.01 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.7% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (3.9% as compared with 9.9% for the state). Census Tract 1002.01 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 1002.01.

The Middlesex County component of the project area is in Census Tracts 9509, 9510, 9511, and 9512, zip codes 23071, 23169, 23149, and 23175. (USCB, 2021). The population is 10,582, approximately 80.1% of which is Caucasian or white. Approximately 16.6% is black, 0.5% is Native American, 0.5% is Asian, 0.1% is Native Hawaiian, approximately 2.2% is two or more races, and 2.9% is Hispanic or Latino. Taking a mean percentage in these four Census Tracts, we see that 13.8% of the individuals live below the Federal poverty level, a higher percentage of the low-income population than the state. Census Tracts 9509, 9510, 9511, and 9512 have a lower percentage of the minority population. The mean per capita income according to July 2017 Census data for these census tracts is \$31,592. For the state of Virginia, the mean per capita income is \$39,278, significantly more than the mean per capita income for these four census tracts.

The median home price in the census tracts studies is \$261,900. The Census Tract median home price is not significantly less than the state median home price of \$273,100. A statistical testing tool is available from the U.S. Census Bureau. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

These four Middlesex County census tracts do have a higher percentage of children under the age of 18 living in poverty compared to that of the state (10.9% average as compared with 9.9% for the state) and have a higher percentage of adults aged 65 and over living in poverty (13.9% average as compared with 9.9% for the state). These census tracts are not, however, classed as Housing and Urban Development Qualified Census Tracts, which bases its evaluations on environmental justice community criteria. Based upon the percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tracts 9509, 9510, 9511, and 9512.

The Mathews County component of the project area is in Census Tract 9513.01, zip code 23035. (USCB, 2021). The population is 8,834, approximately 88.1% of which is Caucasian or white. Approximately 8.5% is black, 0.3% is Native American, 0.9% is Asian, 0.1% is Native Hawaiian, approximately 2.1% is two or more races, and 2.7% is Hispanic or Latino. The data indicate in Census Tract 9513.01, 8.8% of the individuals live below the Federal poverty level, a lower percentage of the low-income population than the state. Census Tract 9513.01 has a lower percentage of minority population than the state, and a lower population of minorities compared with the state. The mean per capita income according to July 2017 Census data for Census Tract 9513.01 is \$35,731. For the state of Virginia, the mean per capita income is \$39,278, not significantly more than the mean per capita income for the Census Tract.

The median home price in the Census Tract is \$230,000. The Census Tract median home price is significantly less than the state median home price of \$273,100. A statistical testing tool is available from the U.S. Census Bureau. This testing tool was applied to Census Tract rankings for home prices to ascertain the statistical significance of variations in-home prices.

Census Tract 9513.01 does not have a higher percentage of children under the age of 18 living in poverty compared to that of the state (8.6% as compared with 9.9% for the state) or a higher percentage of adults aged 65 and over living in poverty (2.1% as compared with 14.1% for the state). Census Tract 9513.01 is not classed as a Housing and Urban Development Qualified Census Tract, which bases its evaluations on environmental justice community criteria. Based upon the small percentage of children and seniors living in poverty and the lower percentages of minority populations in the Census Tract as compared to Commonwealth of Virginia data, the criteria for an environmental justice community are not met in Census Tract 9513.01.

3.10.3 Environmental Consequences

No impacts to vehicular, bicycle, or foot traffic access to medical facilities, school, or employment are anticipated, nor are access to food and fiber production or firewood (fuel) to be impacted. No disproportionately high adverse impacts to human health or the environment of a minority or low-income populations are expected. No conflicts with known (documented) residential communities are anticipated.

3.10.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the HRSD did not conduct and complete proper coordination with the USCB before public involvement.

3.10.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

According to EQ12898, an action might have no effect, no adverse effects on environmental justice communities or adverse effects on environmental justice communities. An adverse effect would not necessarily be significant under NEPA if effects were not considered substantial and could be mitigated. Measures developed to minimize or mitigate adverse effects could result in an action having no impact on environmental justice communities under NEPA.

3.10.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functions would not occur. The need to meet current and future community needs would be unmet. Existing conditions would remain unchanged and there would be no effects on communities.

3.11 Hazardous materials and Wastes

3.11.1 Definition of Resource

Hazardous materials are defined by 49 CFR 171.8 as a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of subchapter C. Transportation of hazardous materials is regulated by the USDOT regulations within 49 CFR Parts 105 to 108.

Hazardous wastes are defined by Resource Conservation and Recovery Act (RCRA) at 42 USC §6903(5), as amended by the Hazardous and Solid Waste Amendments, as solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material, polychlorinated biphenyls, and lead-based paint. The USEPA is given authority to regulate these special hazard substances by the Toxic Substances Control Act Title 15 USC Chapter 53.

3.11.2 Affected Environment

The United States Environmental Protec EPA Envirofacts database and an Environmental Data Resources Incorporated report have listed the following eleven registered facilities: Western Fiberglass Incorporated facility at 7519 Ware Neck Road, Gloucester, Virginia 23061, VA 000000510730001 for volatile organic compounds, complies and is more than one mile from the project site. The Ginney Point Marina, at 222 Ginney Point Lane, VA R051216, ICIS and NPDES, VAR051216 is in a significant category of noncompliance and is more than one mile from the project site. The HRSD Central Middlesex STP at 170 Oak Landing Road, Saluda Virginia 23149 is at the project site. The Facility Registry ID is 110009116599, National Pollutant Discharge Elimination System (NPDES) registration VA0073318 for sewerage systems. The facility is currently in compliance as of January 1, 2020, and has a previous three-year compliance history of identified violations, from July 9, 2009, to December 31, 2019. No formal or informal enforcement actions are recorded.

The Middle Peninsula Regional Security facility at the TY Center, Middlesex, Virginia 23149 is approximately 0.23 miles from the project site and downgradient. The VPDES permit VA0073318 for a sludge pipe expired December 31, 2016.

The HRSD Urbanna STP at 110 Laurel Hill Road, Urbanna, Virginia 23175 is at the project site. The Facility Registry ID is 110009768493, National Pollutant Discharge Elimination System (NPDES) registration VA0026263 and VAN020034 for sewerage systems. The facility is currently in compliance as of March 31, 2021, and has a previous three-year compliance history of no violations.

J. T. and C. A. Thrift, Incorporated, at 2742 General Puller Highway, Saluda, Plant I. D. 110007319543 is within one-tenth of a mile of the project site and upgradient. It complies.

Middle Peninsula Cremation Services, LLC, at 15 C. F. Edwards Lane, Saluda, Virginia 23149 is within one-third of a mile of the project site and complies.

Middlesex County High School, at 458 General Puller Highway, Saluda, Virginia 23149 is within 0.12 miles of the project site and is upgradient. It has an active air permit, I. D. 5111900007. AIRS/ATS. The data source is ICUS October 17, 2014. It is an RCRA handler of ignitable waste, ethene, 1. 1'-OXTBIS-0) or ethyl ether (1). The handler I. D, for the facility, is VA 0000902254. It complies and no violations were noted.

Christchurch School, at 49 Seahorse Lane, Christchurch, Virginia 23031 is 0.19 miles north of the project site and is upgradient. An ICIS-air facility permit number VA000000511900012, is regulated by the Safe Drinking Water Information System. The relevant permit number is VA4119400 and is an RCRA registered facility, VAR000007430, for an unspecified generation. It is in compliance. No violations were noted.

Meherrin AG & Chemical, at 5730 General Puller Highway, Locust Hill, Virginia 23092 is 0.10 miles south of the project site and upgradient. It is an RCRA Generator of hazardous waste and has a Handler I. D. number of VAP 508201512. No violations were noted. The former Parvins Super Market, 5041 General Puller Highway, Locust Hill, Virginia 23092 is 0.021-mile north-northeast and upgradient. Three registered gasoline underground storage tanks, one registered and one unregistered diesel underground storage tank and one unregistered kerosene underground storage tank were removed from the ground. No releases were reported.

Those sites which have ongoing noncompliance issues are at a minimum of one mile from the proposed project area.

The U.S. EPA National Radon Database lists the counties of Middlesex, Mathews, and Gloucester as being in Zone 2 for radon potential, with average predicted indoor screening levels less than 2 picoCuries per liter (pCi/L), which is below the EPA action level of 4 pCi/L. The EPA recommends that indoor radon levels be measured to determine actual concentrations in a particular building. Radon assessments were not part of the scope or purpose of this Environmental Assessment.

There are no landfills, mines, or quarries located within one mile of the project site. There are no military facilities, Indian reservations, or Department of Homeland Security sites within one mile of the project site.

3.11.3 Environmental Consequences

3.11.3.1 SIGNIFICANCE CRITERIA

Effects would be considered significant if the MSIPPII would substantially increase the quantity or toxicity of hazardous substances, substantially increase the risk to human health or the environment, or generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills.

3.11.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The MSIPPII would have short- and long-term less than significant adverse effects concerning hazardous materials and wastes. Short-term minor adverse effects would be due to the use of hazardous materials and the generation of wastes during construction, renovation, and demolition activities. The MSIPPII would not include acquiring, using, or generating any additional hazardous materials or wastes, or changing the disposal of any wastes when compared to existing conditions; therefore, long-term effects would be negligible. The proposed activities would not require subsurface soil excavation to depths that could impact groundwater. The MSIPPII would not substantially increase the quantity or toxicity of hazardous materials, substantially increase the risk to human health or the environment, or generate solid waste in amounts that would appreciably decrease capacity or life span at receiving landfills. Implementation of these plans would ensure the safe handling of hazardous materials and wastes.

The projects and project alternatives outlined in the Description of MSIPPII consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and installation of the force main. There would be some minor adverse effects to hazardous materials and wastes from individual project components and project alternatives; however, each was reviewed on a case-by-case basis, and none in and of themselves would have appreciable adverse effects to hazardous materials and wastes.

Construction Effects

The use of hazardous materials and the generation of wastes at the construction, renovation, and demolition areas would occur; however, the increase in hazardous materials and wastes would be limited and temporary. The safe handling, storage, and use procedures managed under the Hazardous Waste Management Plan, following all federal, state, and local regulations, would be implemented. Any effects would be less than significant.

The proposed construction projects include both new construction and demolition of existing structures and pavement. Demolition and construction activities would be performed following state and federal regulations and policies. These activities would have short- and long-term less than significant effects on hazardous materials and wastes.

The proposed repair and renovation projects include modifications to existing facilities. Buildings would be surveyed for asbestos and lead-based paint by a certified inspector to ensure appropriate measures were taken to reduce potential exposure and release of asbestos and lead following federal, state, and local regulations.

Operational Effects

The use, generation, or disposal of hazardous materials and wastes after implementation of the MISPPII would be similar to the levels under the existing conditions. Long-term, negligible, beneficial impacts on hazardous materials and petroleum product management could occur concerning storage conditions because the older buildings would be replaced with new facilities that have modern hazardous material and petroleum product storage areas. The proposed activities would not result in substantially different operational activities; therefore, the MSIPPII would result in less than significant adverse effects concerning hazardous materials and wastes.

3.11.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation necessary for the project would not occur. The need to meet current and future requirements for sanitary sewer operations would be unmet. Existing conditions would remain unchanged and there would be no effects on hazardous materials and wastes.

3.12 Water Resources

3.12.1 Definition of Resource

Water resources include groundwater, surface water, wetlands, floodplains, and waters of the U.S. Hydrology concerns the distribution of water through the processes of evapotranspiration, atmospheric transport, precipitation, surface runoff and flow, and subsurface flow.

Groundwater. Groundwater is water that exists in the saturated zone beneath the earth's surface and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater features include depth from the surface, aquifer or well capacity, quality, recharge rate, and surrounding geologic formations.

Surface Water. Surface water generally consists of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Waters of the U.S. are defined within the CWA, as amended, and jurisdiction is addressed by the USEPA and the USACE (33 CFR Part 328). Section 401 of the CWA requires that any applicant for a federal license or permit to conduct an activity that could result in a discharge into waters of the U.S. provide the permitting agency a certification from the state in which the discharge originates certifying that the license or permit complies with CWA requirements, including applicable state water quality standards.

Wetlands. Wetlands are identified as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The USACE regulates the discharge of dredged or fill material into waters and wetlands of the U.S. according to Section 404 of the CWA. Notably, Section 401 of the CWA also applies to wetlands. A Request for the Corps Preliminary Jurisdictional Determination has been filed on behalf of the HRSD for impacts to wetlands and streams within the 100-ft. buffer.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters subject to periodic or infrequent inundation due to rain or melting snow. The risk of flooding typically depends on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines flood hazard areas as the area that will be inundated by the flood event having a 1 percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. The 500-year flood zone is characterized as a 0.2 percent annual chance flood hazard. Federal, state, and local regulations often limit floodplain development to passive uses such as recreational and preservation activities to reduce the risks to human health and safety.

3.12.2 Affected Environment

The project area has more than one acre (0.40 hectares) that have been delineated as jurisdictional wetlands and waters of the United States. Open boundary wetlands continue beyond the delineated wetland boundary shown in Figures 4A to 4J of the Draft Aquatic Resources Delineation Report for the HRSD Middlesex Interceptor System Program Phase II; therefore, the total wetland size of open boundary wetlands may be larger than the size provided in the report. The MISPPII is still in the preliminary design phase, and it is anticipated that any unavoidable impacts to wetlands will be less than one acre (0.40 hectares). Similarly, there may be more than one acre (0.40 hectares) of the 100-year floodplain that will be determined in more detail before the MSIPPII's Joint Permit Application submission. Two pump station alternatives that were considered at the time of the first Draft EA and eliminated from consideration have brought the total acreage of temporary and permanent impacts to waters of the U.S. to a lower quantity. At the time of this Final EA, the Preliminary Jurisdictional Request was being reviewed by the HRSD in anticipation of submittal to the USACE. The Virginia Marine Resources Commission (VMRC) has deemed that it has jurisdiction in some waters and wetlands within the MSIPPII. Specifically, VMRC regulates impacts and encroachments to activities in, on, or under State-owned submerged lands, tidal wetlands, and dunes/beaches under Code of Virginia Title 28.2, Chapters 12, 13, and 14. When issuing permits, VMRC considers effects on other reasonable and permissible uses of state waters and state-owned bottomlands, marine and fisheries resources of the Commonwealth, tidal wetlands, adjacent and nearby properties, water quality, and submerged aquatic vegetation.

The Piankatank River and Urbanna Creek crossings proposed for this project will require the submission of a JPA which is used by the USACE, VMRC, VDEQ, and the LWB(s) for permitting purposes. Submarine crossings are normally permitted by VMRC as long as reasonable measures are taken to protect aquatic resources and other uses of the waterway.

VMRC regulated private oyster ground leases occur within the project area at the Piankatank River and Urbanna Creek crossings. Per the VMRC subaqueous guidelines, any alteration of submerged aquatic vegetation (in Virginia, the species *Ruppia martima*, widgeon grass, and *Zostera marina*, eelgrass, are the predominant species), shellfish beds, and wetlands should be minimized wherever possible in the planning and location of submerged structures. In general, HDD methodologies are preferred by VMRC over trenching.

The VMRC provided comments on January 6, 2022 with regard to the draft EA for the HRSD MISPPII project, 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. The VMRC advised that, pursuant to Chapters 12, 13 and 14 of Title 28.2 of the Code of Virginia, administers permits required for submerged lands, tidal wetlands, and beaches 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.

The Virginia Institute of Marine Science (VIMS), an advisory agency with the College of William and Mary, furnished comments on the MISPPII on December 17, 2021. As proposed, the force main is proposed to be installed via either horizontal directional drilling (HDD) or mini-HDD methods. In order to minimize impacts, we recommend that all tidal wetlands and streams also be crossed via HDD or mini-HDD rather than open cut methods. Doing so should avoid direct impacts to these areas. With any HDD/mini-HDD project there is the potential for an inadvertent release of drilling fluids (i.e. frac-out), so we recommend development of an inadvertent release/frac-out plan. In wetlands, this should include restoring elevations and plants to pre-construction states. VIMS has mapped submerged aquatic vegetation (SAV) within 2 of the 5 years that currently define an SAV bed (2016–2020) within the Limits of Disturbance (LOD) for the Piankatank River. SAV is vulnerable to sedimentation, so those beds are areas of particular concern should a frac-out (or other turbidity plume) occur. (SAV mapping data can be accessed here: https://www.vims.edu/research/units/programs/sav/access/index.php

The 2022 VIMS mapping does not depict beds of SAV in the vicinity of the Route 3 crossing of the Piankatank River or the Route 227 crossing of Urbanna Creek.

HRSD will assure that a frac-out plan is provided by the contractor in all bid documents.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Middlesex County and Mathews County (Panels 51115C0045E, 51115C0010E, 51119C0220E, 51119C0215E, 51119C05E, 51119C0185E, 51119C0180E, and 51119C0114E), portions of the project area lie within Zone AE (EL 6 Feet) at Urbanna Creek, and portions of the project area lie within Zone VE (EL 7 and 11 Feet), AE (EL 6 Feet), and X-shaded (0.2 Percent Annual Chance Flood Hazard) at the Piankatank River. The remainder of the project are lies in the Zone X Area of Minimal Flood Hazard.

These floodplain mapping units are located at the crossings of the Piankatank River and Urbanna Creek.

3.12.3 Environmental Consequences

3.12.3.1 SIGNIFICANCE CRITERIA

Water resources effects would be considered significant if the proposed activities would reduce water availability or supply, exceed the safe annual yield of water supplies, increase flooding potential, adversely affect water quality, threaten or damage hydrology, or violate water resources laws or regulations.

3.12.3.2 HRSD MIDDLESEX INTERCEPTOR SYSTEM PROGRAM PHASE II

The projects and project alternatives consist of construction (including new construction, renovations, alterations, and additions), demolition of buildings and pavement, and crossing of two tidal waterways.

The MSIPPII will have short- and long-term less than significant adverse effects on water resources. Short-term minor adverse effects would be due to site-specific temporary changes in surface hydrology, and the potential for soil erosion and transport during construction, renovation, and demolition activities. Long-term minor adverse effects would be due to an incremental increase in impervious surfaces from new construction. Effects to water resources would not reduce water availability or supply, exceed the safe annual yield of water supplies, adversely affect water quality, threaten or damage hydrology, or violate water resources laws or regulations. If uncontrolled, construction activities have the potential to cause erosion and sedimentation that can impact water quality. The project will result in some new, impervious surface area. Potential impacts to water quality associated with construction will be avoided by employing Best Management Practices (BMPs). Specifically, erosion control measures as required by Middlesex, Mathews, and Gloucester Counties will be implemented. Contractors will be required to provide an erosion and sediment control plan that complies with the latest version of the Virginia Erosion and Sediment Control Law and General Criteria, including the Virginia Erosion activities will be required.

Construction Effects

Construction, renovation, and demolition activities would have site-specific temporary effects on water resources. Temporary effects could cause soil erosion and sedimentation. There are surface waters and wetlands in the MSIPPII. Only directional drilling for the force main would occur within the floodplain. Construction activities, including grading and clearing, would result in ground surface disturbance and could cause soil erosion and subsequent transport of sediment via stormwater. However, potential effects would be minimized through proper implementation of environmental protection measures such as silt fencing, following policies and procedures as detailed in erosion-and-sediment control plans, and regulatory agency coordination for required permits before ground-breaking activities. The depth of excavation during construction would generally not reach the depth of groundwater. There would be negligible effects to surface waters.. As a mitigative measure HRSD will assure that a frac-out plan is provided by the contractor in all bid documents.

A variety of stormwater management practices would be incorporated, to the maximum extent technically feasible, in the proposed development and redevelopment projects to maintain or restore predevelopment site hydrology. Therefore, the MSIPPII would have less than significant effects on water resources.

The MSIPPII would result in short- or long-term effects on wetlands and streams that are less than significant. The MSIPPII lies partially within a 100-year floodplain.

Per review of all construction activities, in consideration of the aforementioned specific impacts, the project would have short- and long-term less than significant effects on water resources.

Operational Effects

There would be less than significant effects on water resources due to the maintenance and operations associated with the MSIPPII. The efficiencies gained from construction, renovation, and demolition would reduce the maintenance and operational requirements of facilities and project areas; therefore, the operational effects on water resources would be minor.

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3.12.3.3 NO ACTION ALTERNATIVE

Under the No Action Alternative, the construction, demolition, and renovation projects proposed to improve HRSD functionality and future needs would be unmet. Existing conditions would remain unchanged and there would be no effects on water resources.

4.0 Cumulative Effects

Cumulative effects on environmental resources result from the incremental effects of action when combined with other past, present, and reasonably foreseeable future projects in the area (40 CFR § 1508.7). Cumulative effects can result from individually minor but collectively substantial actions taken over some time. Following NEPA, a discussion of cumulative effects is required (CEQ 1997). This section describes past, present, and reasonably foreseeable actions in the area, and evaluation of potential cumulative effects.

4.1 Cumulative Effects Analysis

4.1.1 Air Quality

The State of Virginia takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan. The state accounts for all significant stationery, area, and mobile emission sources in the development of this plan. Estimated emissions generated by the MSIPPII would be *de minimis* and it is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects on air quality. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII, would have substantial cumulative effects on air quality. All new air permits will be obtained for new facilities. Therefore, cumulative effects on air quality would be less than significant.

4.1.2 Biological Resources

Construction, renovation, and demolition activities would have site-specific temporary effects on the biological resources within the MSIPPII. There are no records of rare species, significant natural heritage areas, or conservation/managed areas. The USFWS coordination and other coordination are provided in Appendix A. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII area, would have substantial cumulative effects on biological resources. Therefore, cumulative effects on biological resources would be less than significant.

4.1.3 Cultural Resources

It is not anticipated that the proposed construction, renovation, or demolition projects would have potential effects on cultural resources. The HRSD consulted with the Virginia SHPO under Section 106 of the NHPA, providing them with information on the undertaking and arranged for a Phase I field cultural resources survey for potentially affected components, recommending a finding of "no adverse effect" upon cultural resources. The SHPO concurrence will be provided in Appendix A once the 30 day comment period for the Final EA is completed. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII area, would have substantial cumulative effects on cultural resources. Therefore, no cumulative effects will occur to cultural resources..

4.1.4 Hazardous Materials and Wastes

Minor cumulative effects to hazardous materials and wastes could occur within the MSIPPII area as a result of a temporary increase in the storage, use, or generation of hazardous materials and wastes

during construction, renovation, and demolition activities. Spill Prevention, Control, and Countermeasure Plans; Asbestos Management Plan; and Lead-Based Paint Management Plans will be implemented. Past projects have been identified that, when combined with the MSIPPII, would have less than significant cumulative effects on hazardous materials and wastes.

4.1.5 Water Resources

Minor cumulative effects on water resources could occur from the incremental increase in impermeable surfaces. All planned construction would be required to obtain air permits, develop, and implement project-specific plans (e.g., Stormwater Pollution Prevention Plan), and adhere to all applicable permitting regulations and BMPs to minimize potential effects to water resources. No past, present, or reasonably foreseeable projects have been identified that, when combined with the MSIPPII, would have substantial cumulative effects on water resources. Therefore, cumulative effects on water resources would be less than significant.

5.0 Management Actions / Special Procedures

This section summarizes special operating procedures associated with this EA. Evaluations contained in this EA have determined that no significant environmental effects would result from the implementation of the MSIPPII. Special operating procedures are defined as measures that would be implemented to address minor potential environmental effects associated with the implementation of the MSIPPII. The environmental protection measures described in this EA include standard BMPs such as the implementation of control measures for reducing fugitive dust emissions, engineering, and site development to account for soil constraints, conforming to all federal, state, and local requirements related to stormwater pollution prevention during construction activities, and safe removal of potentially hazardous materials would be applied. Environmental protection measures are those actions that are used to minimize impacts that are not required as a part of statutes, regulations, or to fulfill permitting requirements, but are typically taken during the design and construction phases of a project to reduce impacts on the environment. BMPs are actions required by statutes or regulations, or to fulfil permitting requirements, that reduce potential impacts. None of the environmental protection measures or BMPs are needed to bring an effect below the threshold of significance. Since the implementation of the preferred alternative would result in less than significant effects on the resources evaluated, recommendations for special procedures are unnecessary.

Middlesex Interceptor System Pro	gram Phase II (MP0:	13710, MP013720 a	nd MP013730/ C-5	515663G)
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Middlesex Interceptor System Program Phase II (MP013710, MP013720 and MP013730/ C-515663G)	
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7.0 List of Preparers

James Cook, Environmental Scientist, Tetra Tech, Inc. *Land Use and Biological Resources*M.S., Environmental Science

B.S., Biology

Years of Experience: 13

Deborah R. Painter, Senior Environmental Scientist, Tetra Tech Inc, NEPA Project Manager
M. S., Biology and Education
B. S., Biology and Geophysical Sciences
Years of Experience: 29

Melissa Cushing, Environmental Scientist III, Tetra Tech, Inc. GIS/Geologic and Socioeconomic Resources M.S., Environmental Health B.S., Geology Years of Experience: 13

Emily Foster, Environmental Scientist, Tetra Tech, Inc. Water Resources and Biological Resources
M.S., Environmental Science
B.S., Biology

Years of Experience: 12

Beverly Keys, Administrative Assistant, Tetra Tech Inc. *Administrative Record*B.A.S, Business Administration

Years of Experience: 17

Middlesex Interceptor System Prog	gram Phase II (MP0	13710, MP013720 a	and MP013730/ C-	515663G)
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Appendix A: Agency Correspondence

Ann Jennings Secretary of Natural and Historic Resources and Chief Resilience Officer

Clyde E. Cristman *Director*



Rochelle Altholz Deputy Director of Administration and Finance

Nathan Burrell Deputy Director of Government and Community Relations

> Darryl M. Glover Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

> > Thomas L. Smith
> >
> > Deputy Director of
> >
> > Operations

November 17, 2021

Deborah Painter Tetra Tech, Inc. 5700 Lake Wright Drive, Suite 102 Norfolk, VA 23505

Re: HRSD Middlesex Interceptor System Program Phase II

Dear Ms. Painter:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Urbanna Quadrangle, Saluda Quadrangle,

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Wilton Quadrangle, Ware Neck Quadrangle

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. Please note, a predictive model identifying potential habitat for natural heritage resources intersects the project boundary. However, based on DCR biologist's review of the proposed project a survey is not recommended for the resource.

All Quads

In addition, if tree clearing occurs, the proposed project may fragment Ecological Cores (C3, C4, C5) as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla), one of a suite of tools in Virginia Conservation Vision that identify and prioritize lands for conservation and protection. Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of unfragmented natural cover with at least 100 acres of interior that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Cores also provide benefits in terms of open space, recreation, water quality (including drinking water protection and erosion prevention), and air quality (including carbon

sequestration and oxygen production), along with the many associated economic benefits of these functions. The cores are ranked from C1 to C5 (C5 being the least ecologically relevant) using many prioritization criteria, such as the proportions of sensitive habitats of natural heritage resources they contain.

Fragmentation occurs when a large, contiguous block of natural cover is dissected by development, and other forms of permanent conversion, into one or more smaller patches. Habitat fragmentation results in biogeographic changes that disrupt species interactions and ecosystem processes, reducing biodiversity and habitat quality due to limited recolonization, increased predation and egg parasitism, and increased invasion by weedy species.

Therefore minimizing fragmentation is a key mitigation measure that will reduce deleterious effects and preserve the natural patterns and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining fragments, retain natural corridors that allow movement between fragments and designing the intervening landscape to minimize its hostility to native wildlife (natural cover versus lawns).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on statelisted threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of \$30.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov.

Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyle Meade

Natural Heritage Locality Liaison



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/



May 10, 2020

In Reply Refer To:

Consultation Code: 05E2VA00-2020-TA-3693

Event Code: 05E2VA00-2020-E-10395

Project Name: HRSD Middlesex Interceptor Phase 2

Subject: Verification letter for the 'HRSD Middlesex Interceptor Phase 2' 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 May 10, 2020 your effects determination for the 'HRSD Middlesex Interceptor Phase 2' (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" 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.

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 2

2. Description

The following description was provided for the project 'HRSD Middlesex Interceptor Phase 2':

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and 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 HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/ Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to new booster pump stations along the force main alignment.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W



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. 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.

Estimated total acres of forest conversion:
 If known, estimated acres of forest conversion from April 1 to October 31
 If known, estimated acres of forest conversion from June 1 to July 31

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 $\it 0$
- 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 $\it 0$
- 9. If known, estimated acres of prescribed fire from June 1 to July 31 σ

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)? θ

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information. extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g.,

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

HRSD Alternatives for Gloucester Pump Stations (Middlesex Interceptor System Program Phase II)

LOCATION

Gloucester County, Virginia



DESCRIPTION

Some(Three alternatives for the Gloucester County component of the project have been identified. They are 9375 John Clayton Memorial Highway, 9316 John Clayton Memorial Highway, and Tax Map number 26-22, John Clayton Memorial Highway.)

Local office

Virginia Ecological Services Field Office

€ (804) 693-6694 **■** (804) 693-9032

Gloucester, VA 23061-4410 6669 Short Lane

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be fully determine any potential effects to species, additional site-specific and project-specific information is often required. The primary information used to generate this list is the known or expected range of each species. Additional areas of

conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Log in to IPaC.
- 2. Go to your My Projects list.
- 3. Click PROJECT HOME for this project.
- 4. Click REQUEST SPECIES LIST.

Listed species and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are not shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

- candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are 1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are regulated by USFWS (see FAQ).
- 2. 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.

The following species are potentially affected by activities in this location:

Mammals

NAME Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened	1
utterfly Danaus plexippus and al habitat has been designated for this species. cos.fws.gov/ecp/species/9743	STATUS Candidate	

Flowering Plants

small Whorled Pogonia Isotria medeoloides	Threatened
No critical habitat has been designated for this species.	
https://ecos.fws.gov/ecp/species/1890	

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act $^{\perp}$ and the Bald and Golden Eagle Protection Act 2 .

habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/ birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-
- conservation-measures.php

Nationwide conservation measures for birds

http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the <u>USFWS Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public

Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date elative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the migratory bird report, can be found below.

migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Breeds Oct 15 to Aug 31

Bald Eagle Haliaeetus leucocephalus

because of the Eagle Act or for potential susceptibilities in offshore areas from certain This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention

types of development or activities.

https://ecos.fws.gov/ecp/species/1626

Breeds May 1 to Jun 30

Blue-winged Warbler Vermivora pinus

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Bobolink Dolichonyx oryzivorus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

Canada Warbler Cardellina canadensis	Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	

and Alaska. This is a

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Cerulean Warbler Dendroica cerulea and Alaska.

Breeds Apr 29 to Jul 20

Breeds elsewhere because of the Eagle Act or for potential susceptibilities in offshore areas from certain This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention https://ecos.fws.gov/ecp/species/2974 types of development or activities. Golden Eagle Aquila chrysaetos

Breeds Apr 20 to Aug 20 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Kentucky Warbler Oporornis formosus https://ecos.fws.gov/ecp/species/1680

Lesser Yellowlegs Tringa flavipes and Alaska.

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA https://ecos.fws.gov/ecp/species/9679 and Alaska.

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Prairie Warbler Dendroica discolor and Alaska.

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA Prothonotary Warbler Protonotaria citrea and Alaska.

Breeds Apr 1 to Jul 31

Breeds May 1 to Jul 31

Red-headed Woodpecker Melanerpes erythrocephalus	Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	
and Alaska.	

Ruddy Turnstone Arenaria interpres morinella	Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions	
(BCRs) in the continental USA	

Rusty Blackbird Euphagus carolinus	Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions	
(BCRs) in the continental USA	

Snort-billed Dowltcner Limnodromus griseus This is a bird of Consociation Consocia (PCC) throughout its sound in the continuation 1150
vation concern (be

https://ecos.fws.gov/ecp/species/9480

Willet Tringa semipalmata	Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	
and Alaska.	

Wood Thrush Hylocichla mustelina	Breeds
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	
and Alaska.	

May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (

particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

- 1. The probability of presence for each week is calculated as the number of survey events in the week where the species was events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey
- probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is 2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the 0.05/0.25 = 0.2
- 3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (=)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys

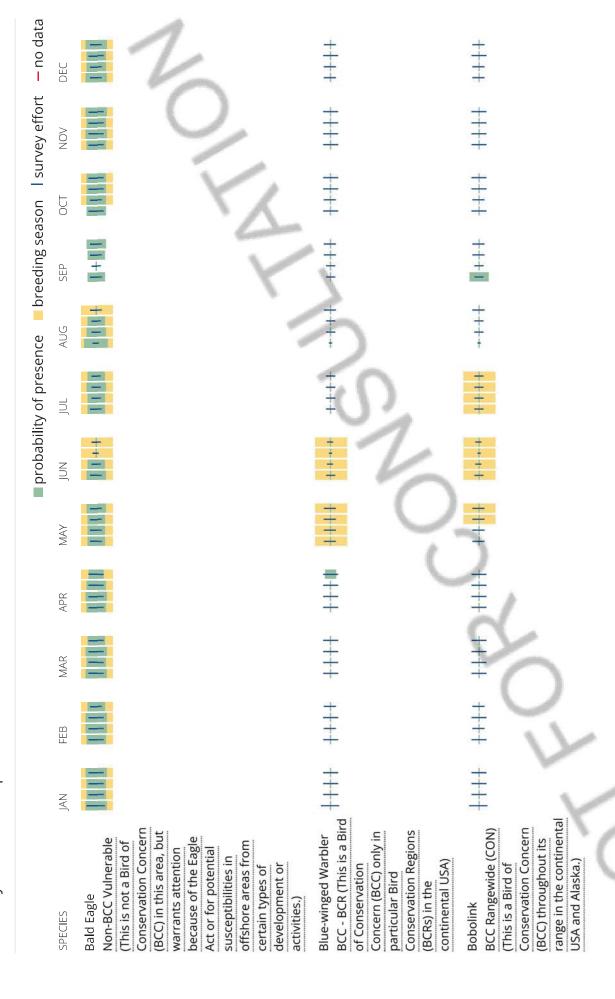
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

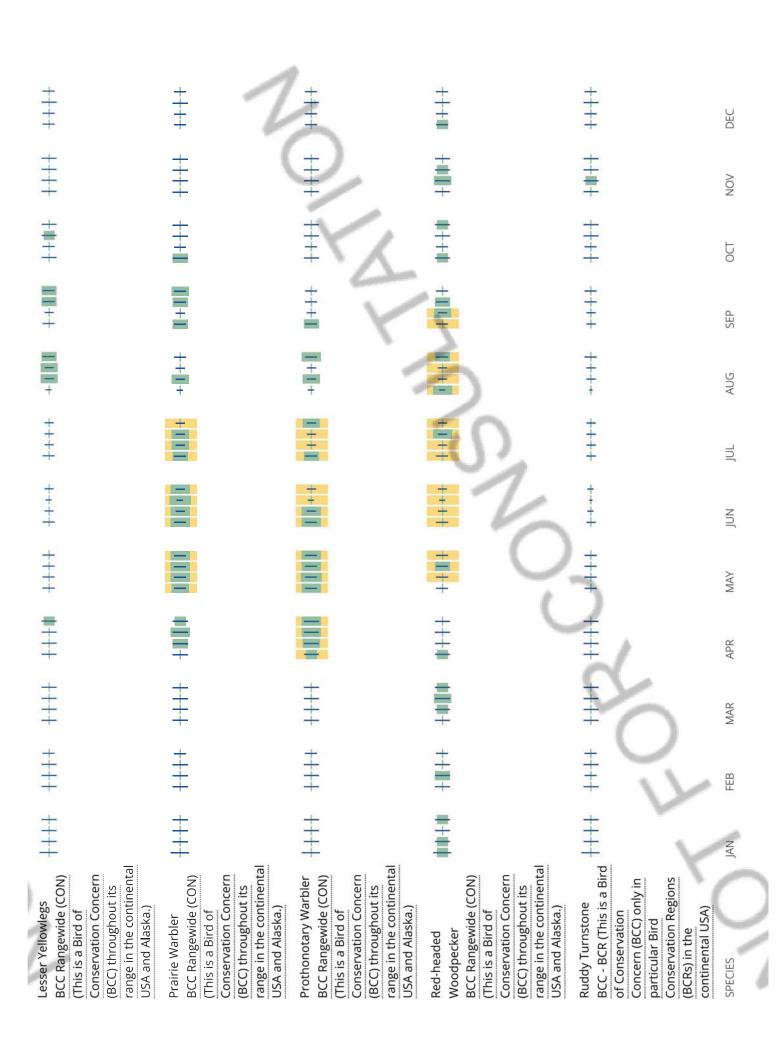
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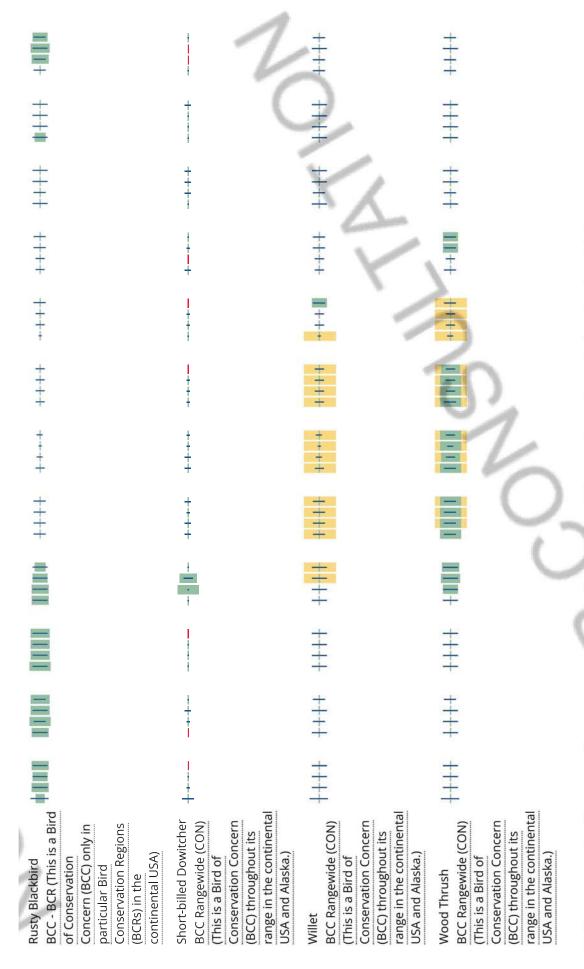
Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Canada Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	Cerulean Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	Golden Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)	Kentucky Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

σ The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets

probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
 - 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and

3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing) Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your Atlantic Outer Continental Shelf project webpage. Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study, and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look

helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns. Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers District.</u>

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the <u>NWI map</u> to view wetlands at this location.

Data limitations

hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and result in revision of the wetland boundaries or classification established through image analysis. The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source magery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site,

Data exclusions

source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data from the inventory. These habitats, because of their depth, go undetected by aerial imagery

Data precautions

intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities. U.S. Fish & Wildlife Service

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information. extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g.,

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Alternative Urbanna Pump Station Urbanna, Virginia

LOCATION

Middlesex County, Virginia



DESCRIPTION

Some(Alternative Pump Station at 215 Linden Avenue, Urbanna, Virginia and immediate environs)

Local office

Virginia Ecological Services Field Office

€ (804) 693-6694**■** (804) 693-9032

Gloucester, VA 23061-4410 6669 Short Lane

http://www.fws.gov/northeast/virginiafield/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be fully determine any potential effects to species, additional site-specific and project-specific information is often required. The primary information used to generate this list is the known or expected range of each species. Additional areas of

conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Log in to IPaC.
- 2. Go to your My Projects list.
- 3. Click PROJECT HOME for this project.
- 4. Click REQUEST SPECIES LIST.

Listed species and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are not shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

- candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are 1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are regulated by USFWS (see FAQ).
- 2. 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.

The following species are potentially affected by activities in this location:

Mammale

Mailliais		
NAME	STATUS	ø
Northern Long-eared Bat Myotis septentrionalis Wherever found	Threatened	1
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	2	p.
	. / \ \	
Insects		
NAME	STATUS	
Monarch Butterfly Danaus plexippus Wherever found	Candidate	
No critical habitat has been designated for this species.		

https://ecos.fws.gov/ecp/species/9743

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act 1 and the Bald and Golden Eagle Protection Act 2 .

habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/ birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-
- conservation-measures.php
- http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf Nationwide conservation measures for birds

Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your The birds listed below are birds of particular concern either because they occur on the <u>USFWS Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date that every bird on this list will be found in your project area. To see exact locations of where birders and the general public elative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the migratory bird report, can be found below

migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to are most likely to be present and breeding in your project area.

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BREEDING SEASON (IF A BREEDING
SEASON IS INDICATED FOR A BIRD ON
YOUR LIST, THE BIRD MAY BREED IN YOUR
PROJECT AREA SOMETIME WITHIN THE
TIMEFRAME SPECIFIED, WHICH IS A VERY
LIBERAL ESTIMATE OF THE DATES INSIDE
WHICH THE BIRD BREEDS ACROSS ITS
ENTIRE RANGE. "BREEDS ELSEWHERE"
INDICATES THAT THE BIRD DOES NOT
LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus

Breeds Oct 15 to Aug 31

because of the Eagle Act or for potential susceptibilities in offshore areas from certain This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention types of development or activities.

https://ecos.fws.gov/ecp/species/1626

Prairie Warbler Dendroica discolor

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or

Breeds May 1 to Jul 31

Breeds May 10 to Aug 31

attempting to interpret this report.

Probability of Presence (

particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

- 1. The probability of presence for each week is calculated as the number of survey events in the week where the species was events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey
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Survey Effort (I)

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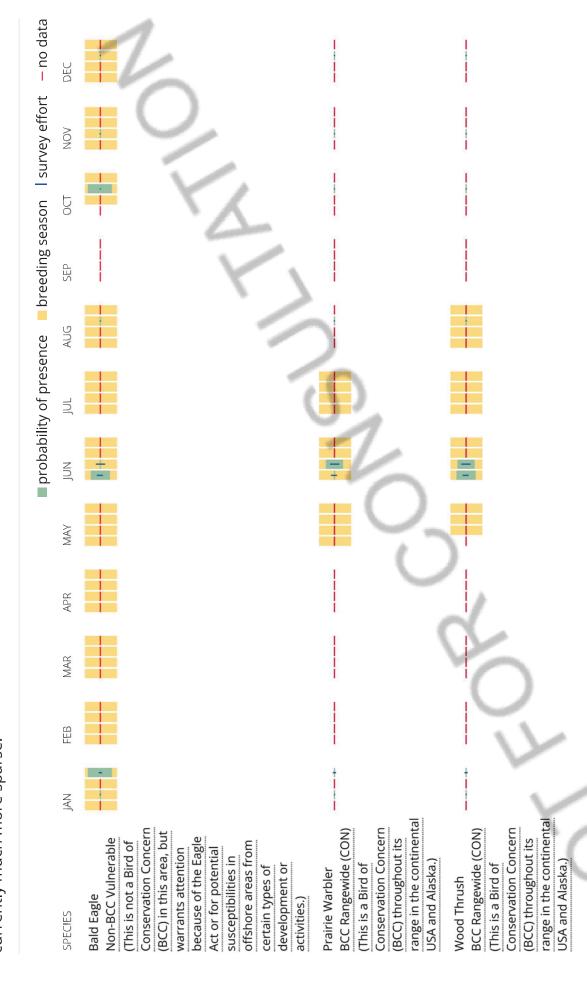
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

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Details about birds that are potentially affected by offshore projects

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source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



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: January 14, 2022

Consultation Code: 05E2VA00-2022-SLI-1736

Event Code: 05E2VA00-2022-E-05626

Project Name: Alternative Urbanna Pump Station Urbanna, Virginia

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-1736

Event Code: Some(05E2VA00-2022-E-05626)

Project Name: Alternative Urbanna Pump Station Urbanna, Virginia

Project Type: WASTEWATER PIPELINE

Project Description: Alternative Pump Station at 215 Linden Avenue, Urbanna, Virginia and

immediate environs

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.6390884,-76.57899196620288,14z



Counties: Middlesex County, 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 Fisheries¹, 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. <u>NOAA Fisheries</u>, 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

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045

Insects

NAME

Monarch Butterfly *Danaus plexippus*

Candidate

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743

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 <u>National Wildlife Refuge</u> 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 30, 2021

Consultation Code: 05E2VA00-2022-SLI-0936

Event Code: 05E2VA00-2022-E-03182

Project Name: HRSD Beaver Dam Pump Station

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-0936

Event Code: Some(05E2VA00-2022-E-03182)
Project Name: HRSD Beaver Dam Pump Station
Project Type: WASTEWATER FACILITY

Project Description: Construction of new pump station and access road.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.45501245,-76.46750235439337,14z



Counties: Gloucester County, Virginia

Candidate

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 Fisheries¹, 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*

Threatened No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045

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

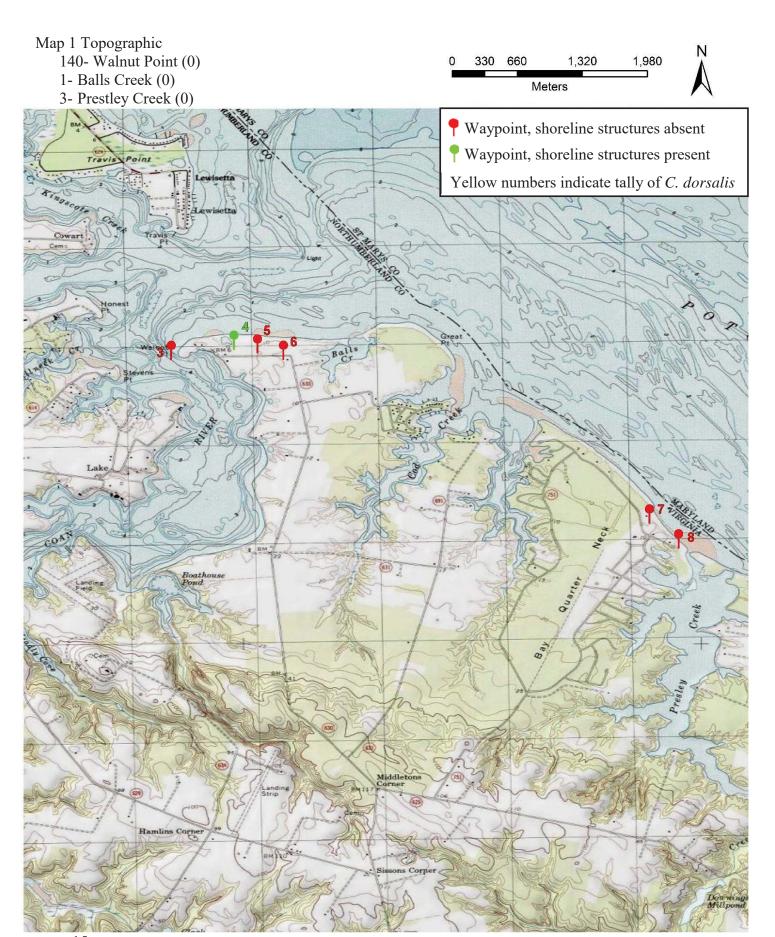
Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

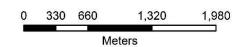
USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> 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.



- 140- Walnut Point (0)
- 1- Balls Creek (0)
- 3- Prestley Creek (0)



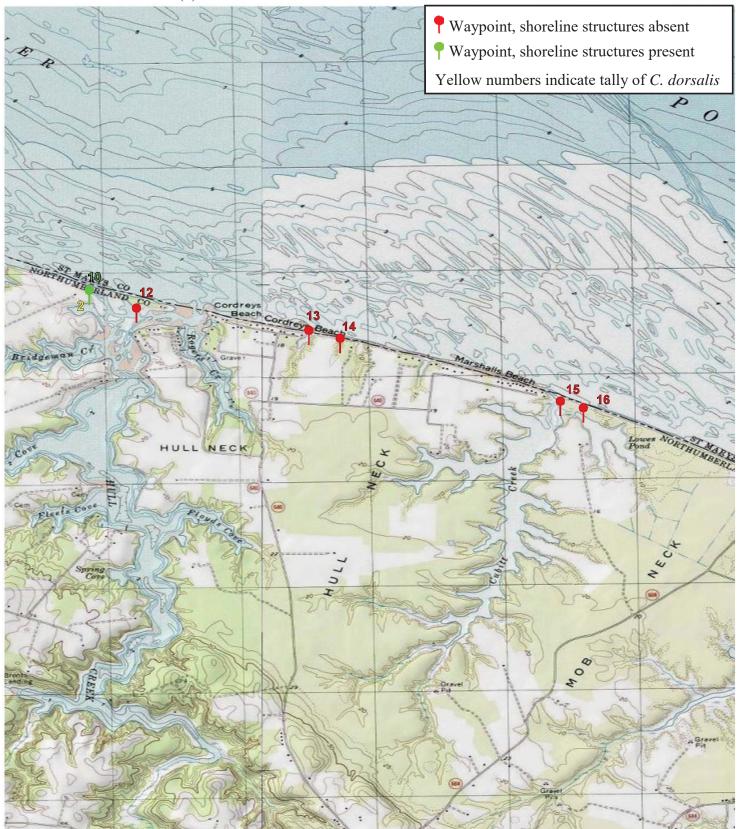




- 4- Neuman Neck South (2)
- 5- Cordrey Beach (0)
- 7- Lowes Pond North (0)



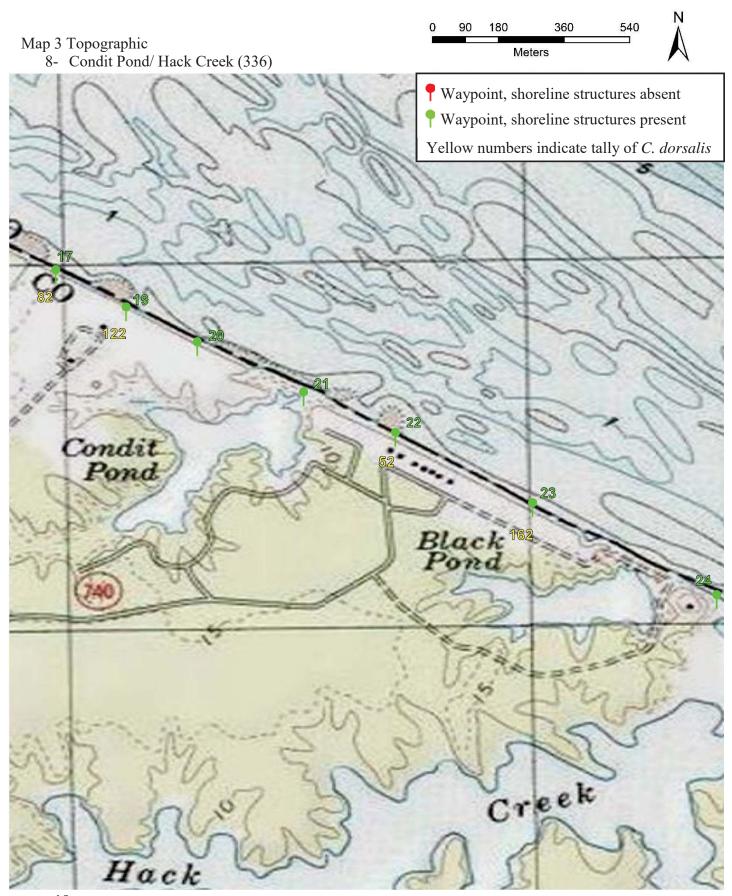




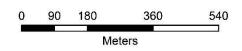
- 4- Neuman Neck South (2)
- 6- Cordrey Beach (0)
- 7- Lowes Pond North (0)



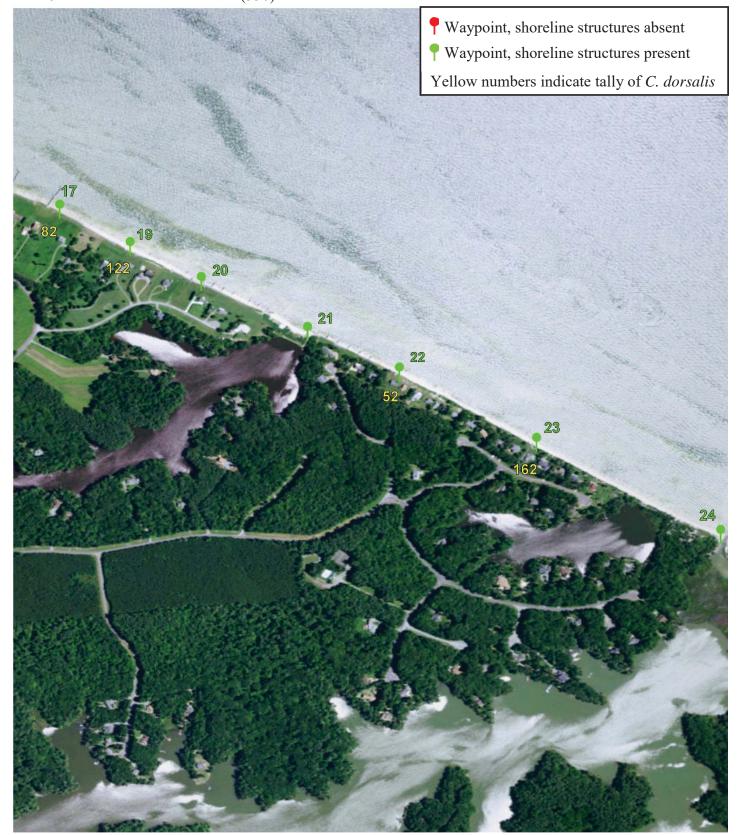




Map 3 Aerial 8- Condit Pond/ Hack Creek (336)







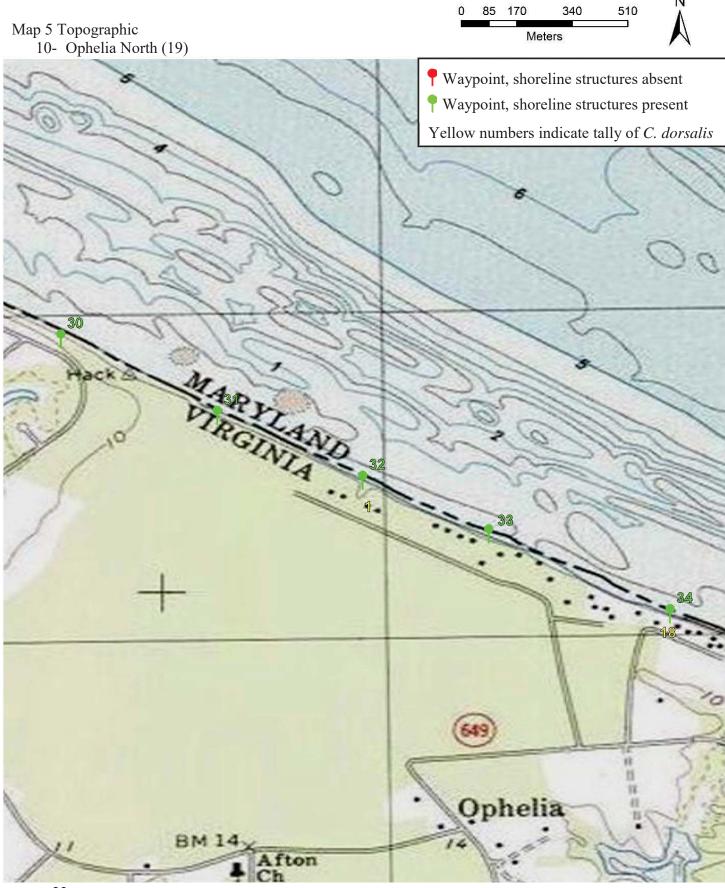
0 85 170 340 510 Map 4 Topographic Meters 9- Vir-Mar (283) Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* /ir-Mar Beach Grave 21

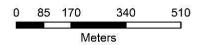
Map 4 Aerial 9- Vir-Mar (283)





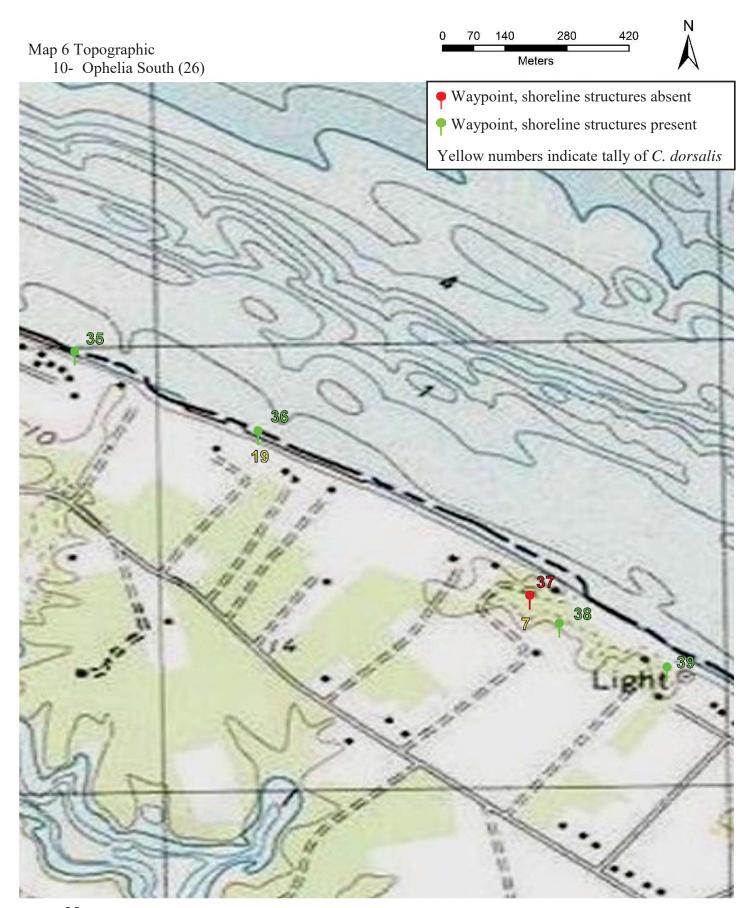




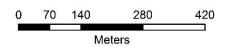






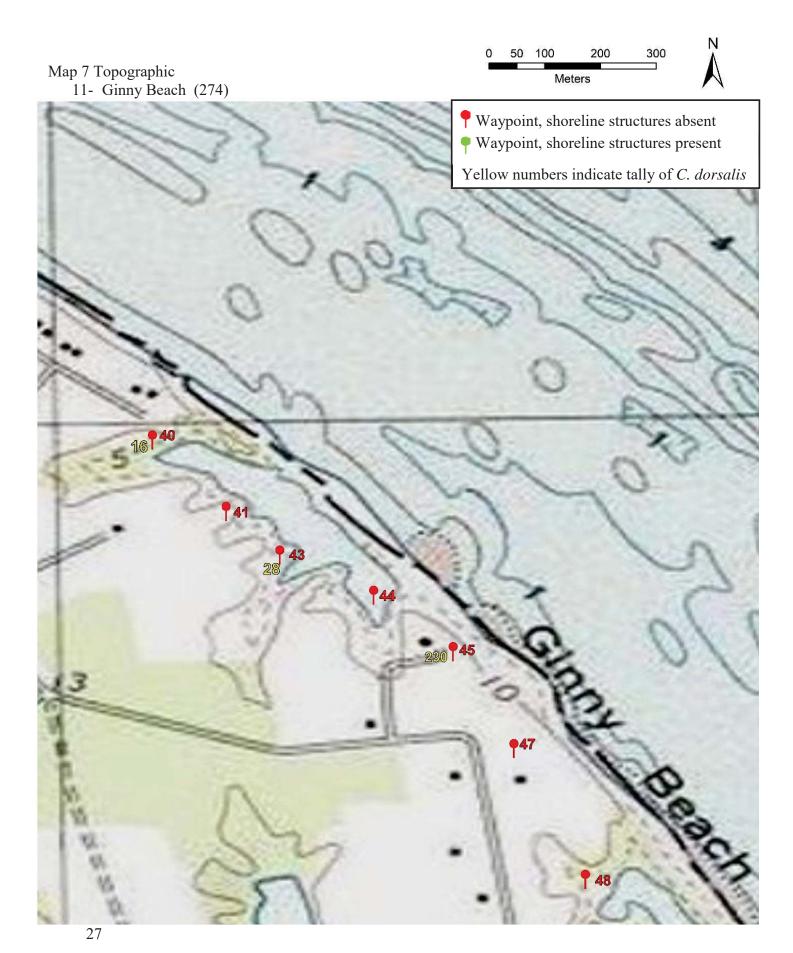


Map 6 Aerial 10- Ophelia South (26)

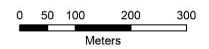






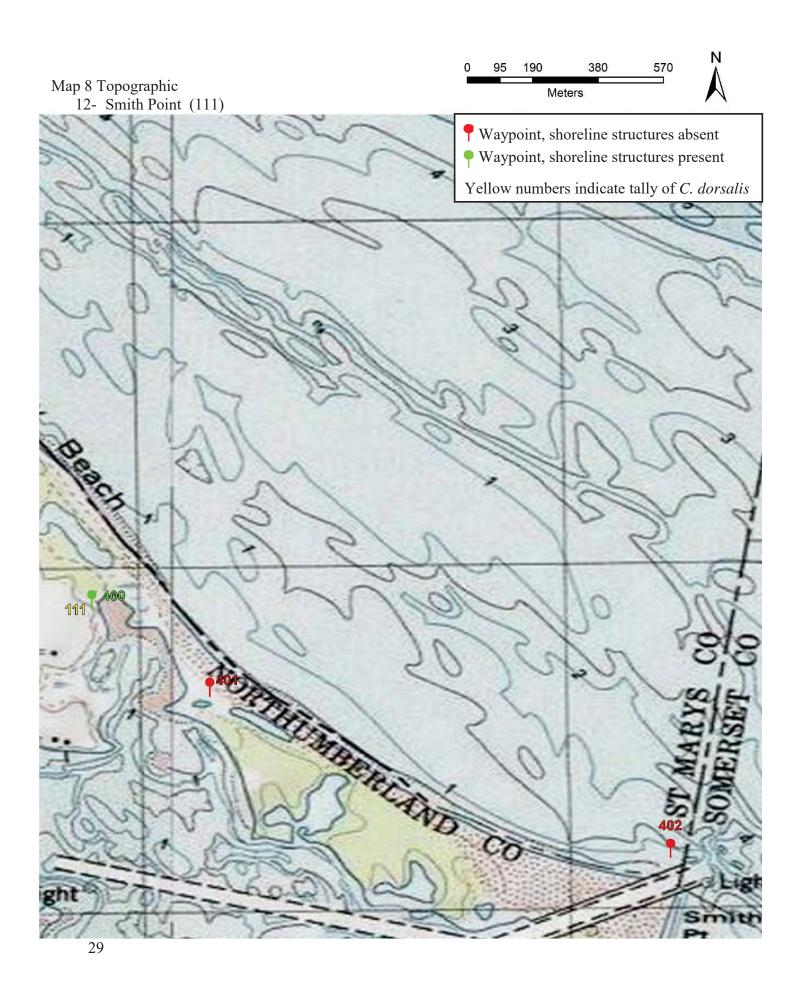


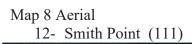
Map 7 Aerial 11- Ginny Beach (274)

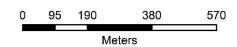






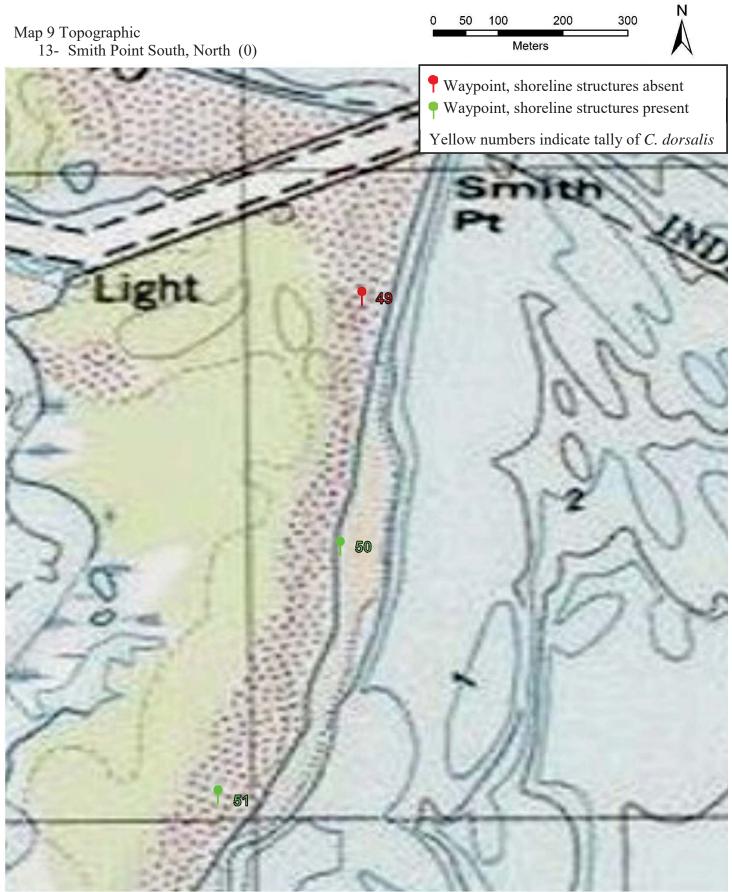




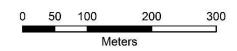




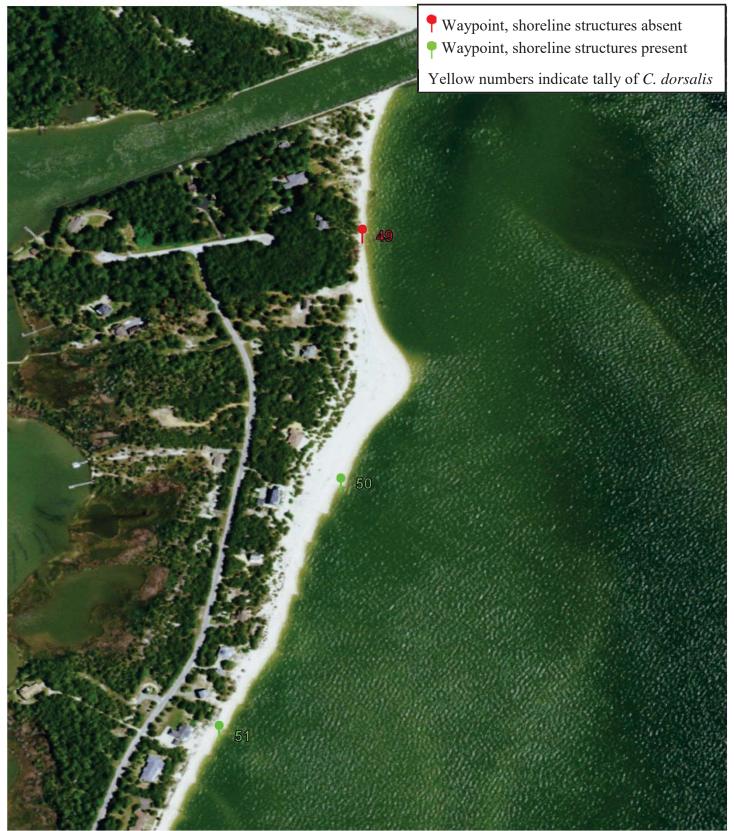


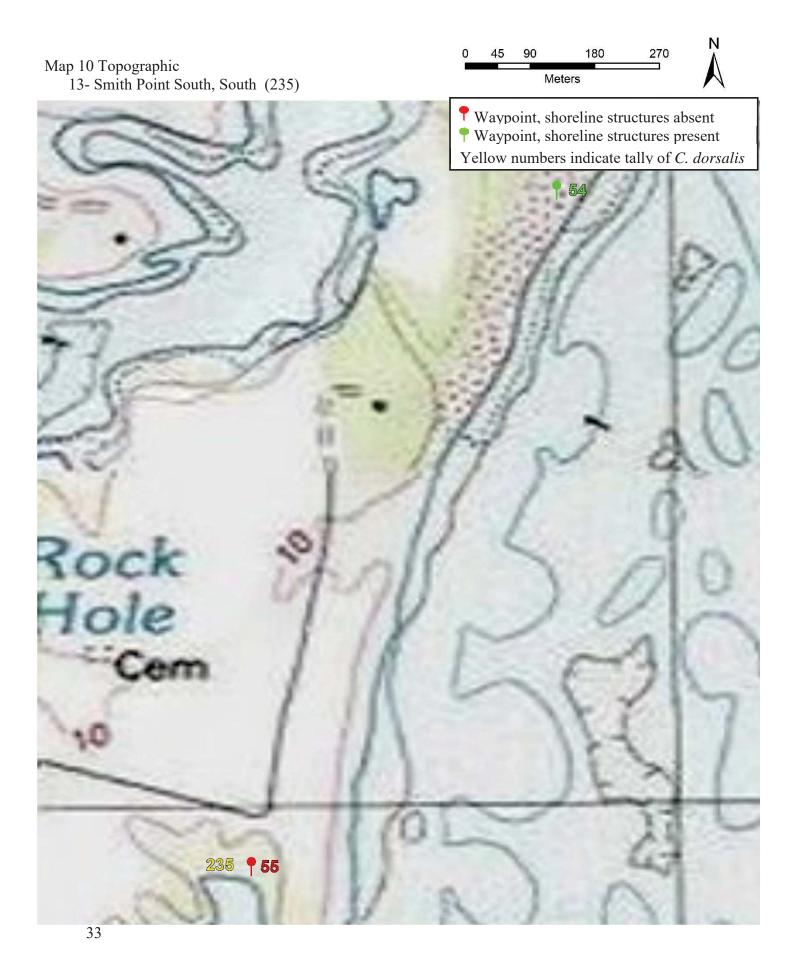


Map 9 Aerial 13- Smith Point South, North (0)

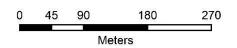




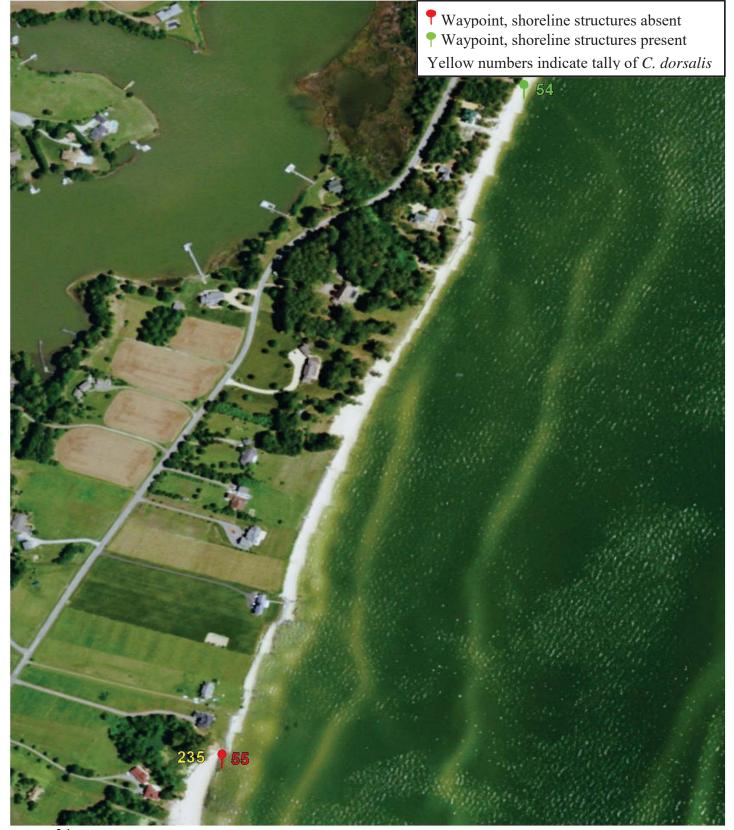


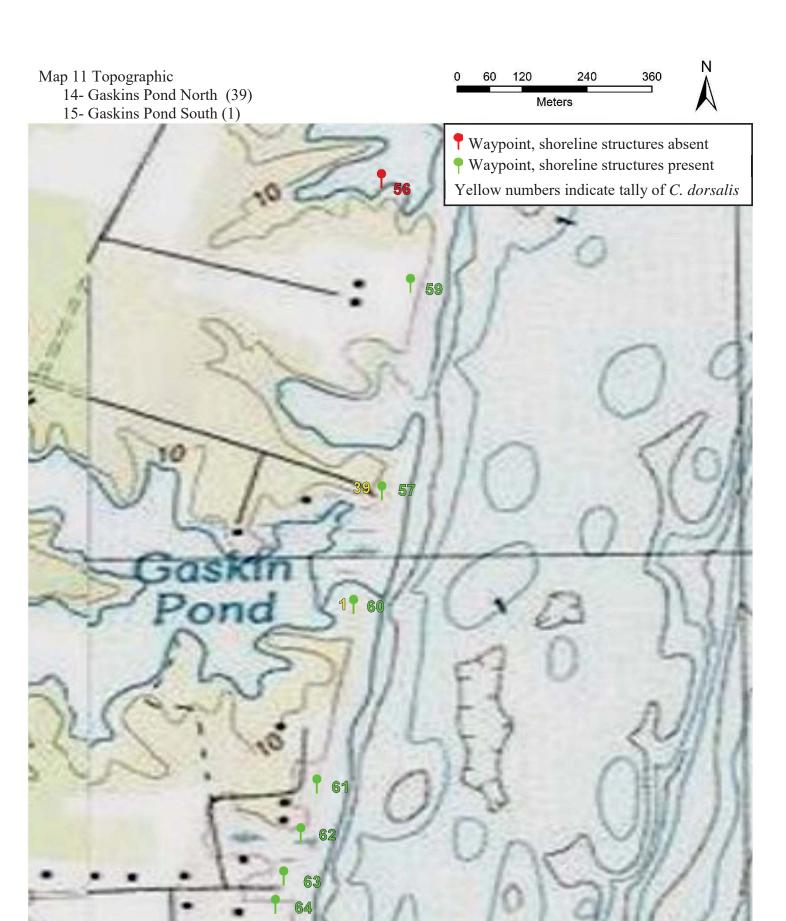


Map 10 Aerial 13- Smith Point South, South (235)







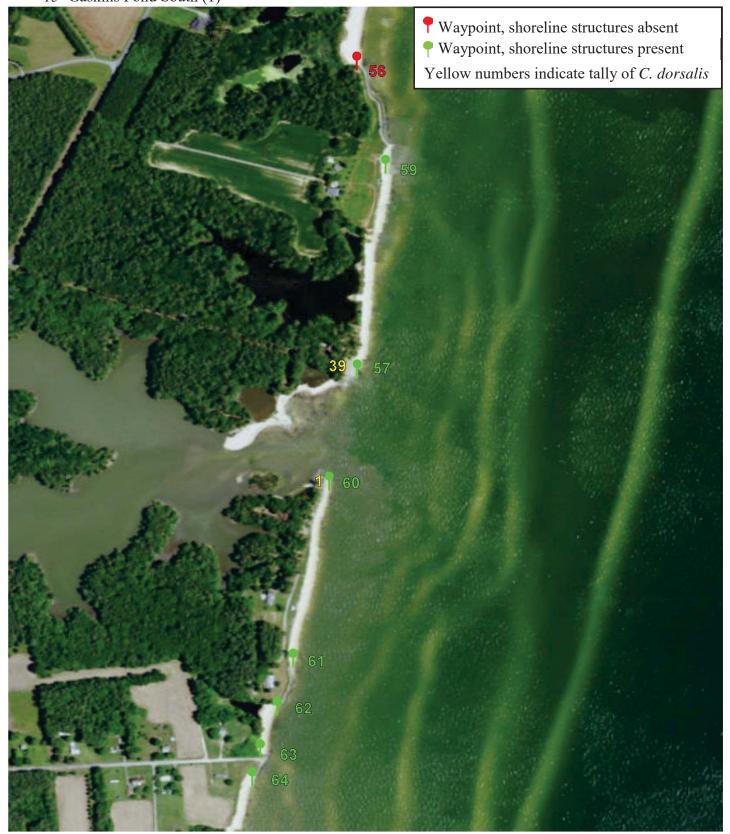


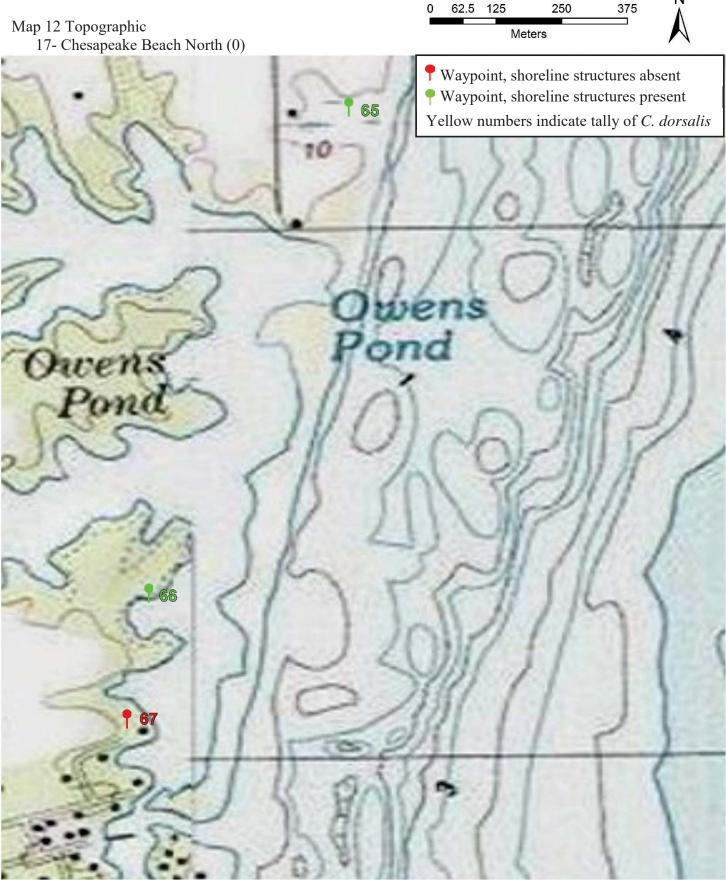
Map 11 Aerial 14- Gaskins Pond North (39)

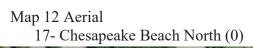
15- Gaskins Pond South (1)







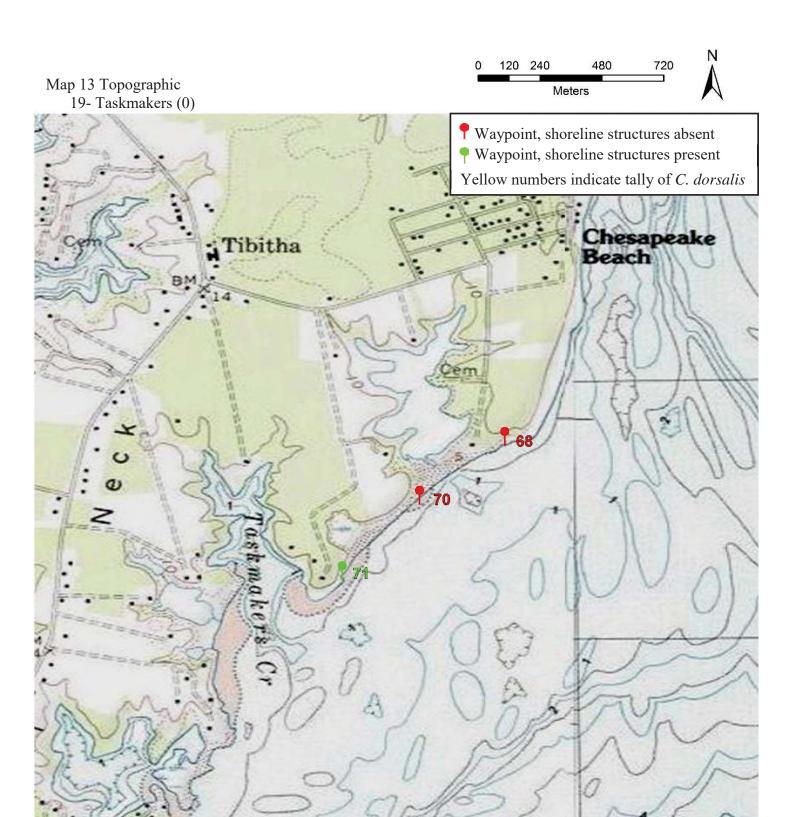










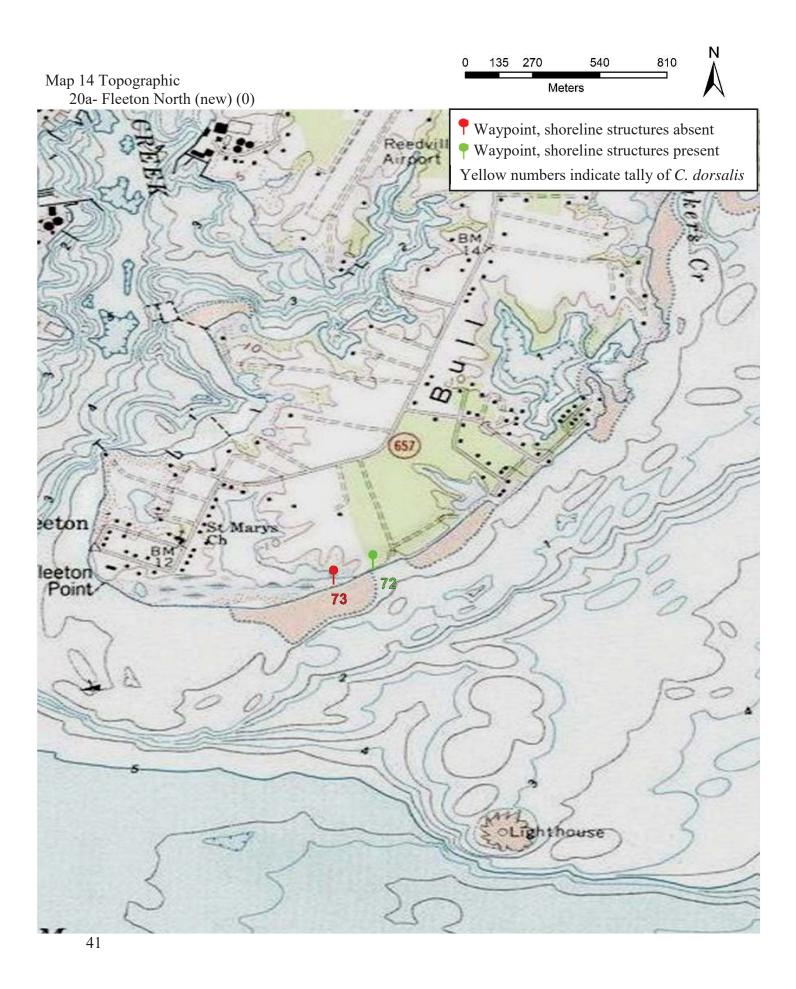


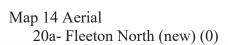


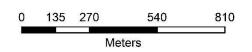






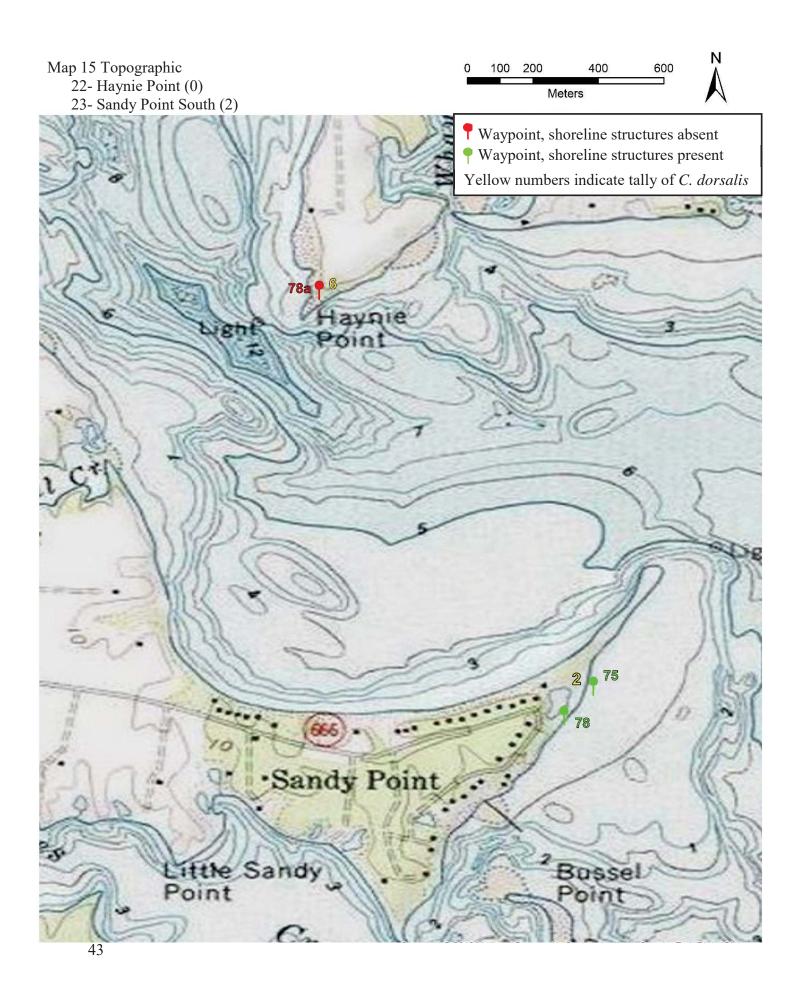




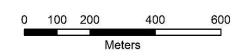




Waypoint, shoreline structures absent P Waypoint, shoreline structures present Yellow numbers indicate tally of C. dorsalis

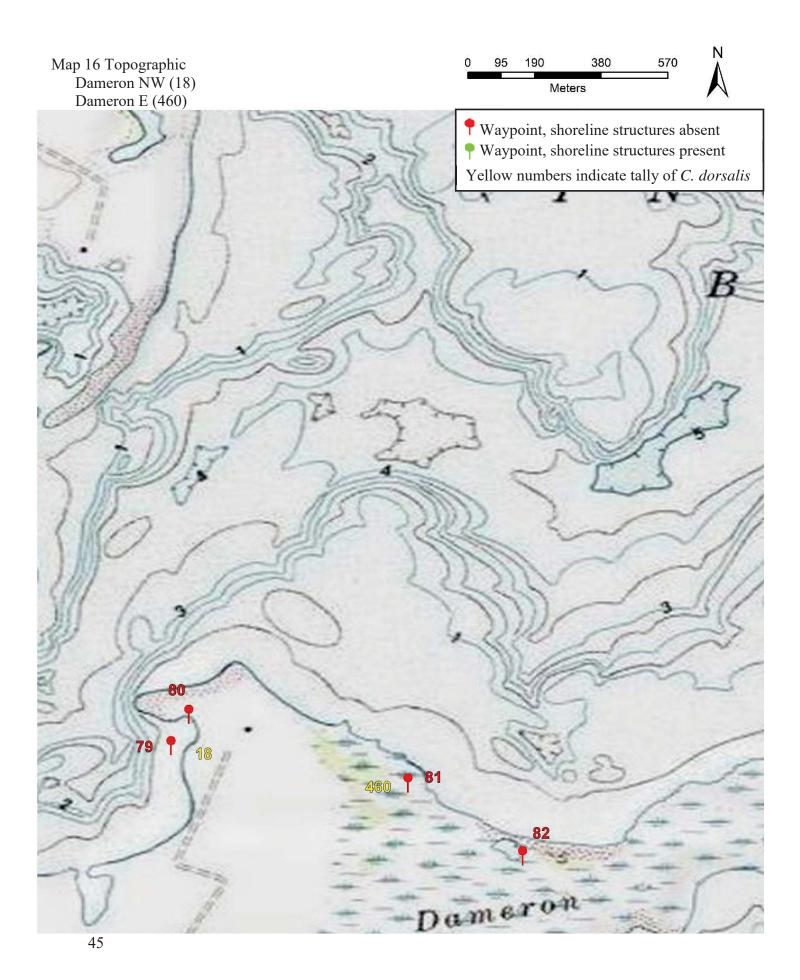


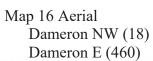
Map 15 Aerial 22- Haynie Point (0) 23- Sandy Point South (2)





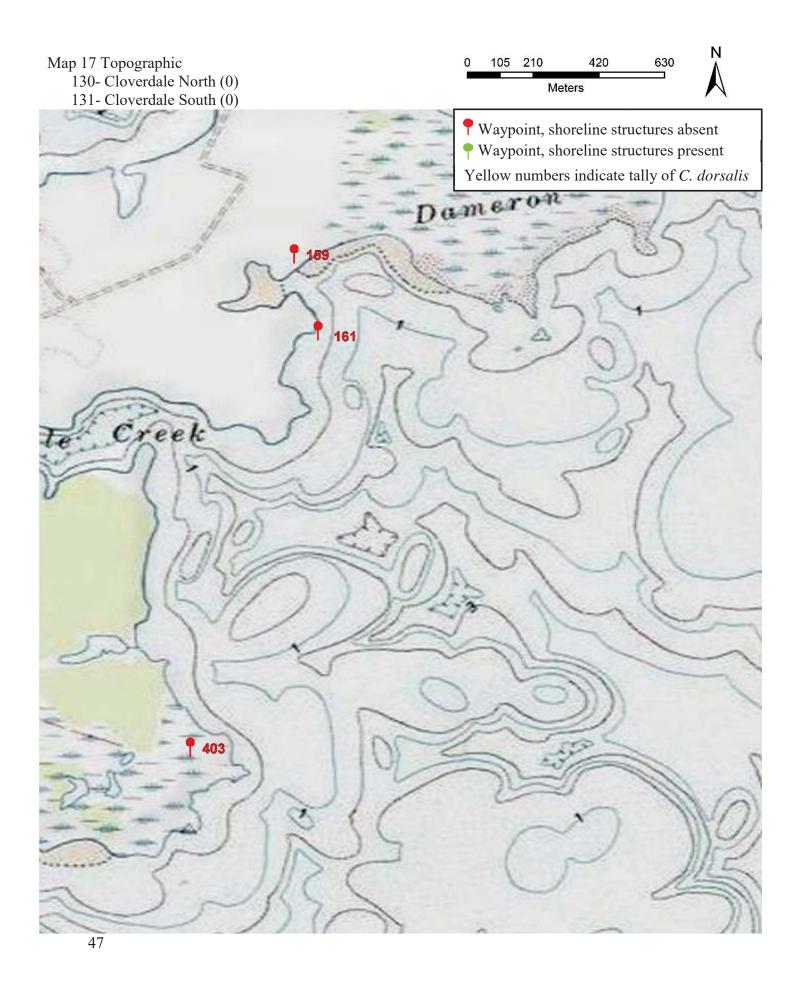
Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis*

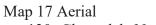






↑ Waypoint, shoreline structures absent • Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis*



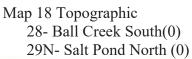


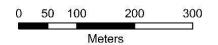
130- Cloverdale North (0) 131- Cloverdale South (0)



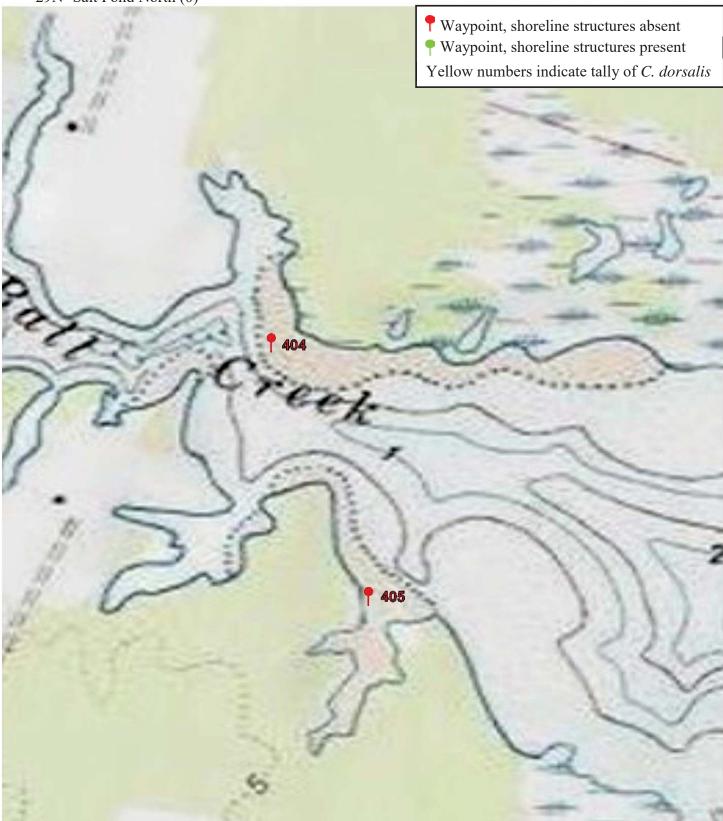


Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis*







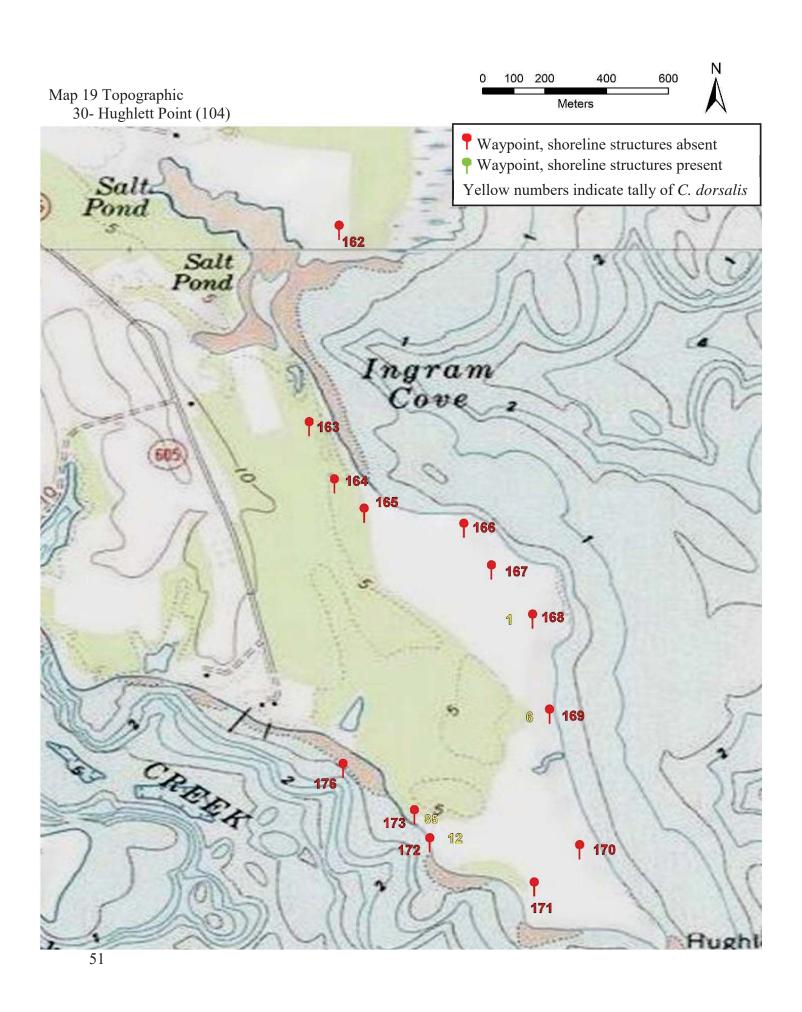


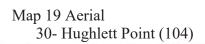
Map 18 Aerial 28- Ball Creek South(0) 29N- Salt Pond North (0)

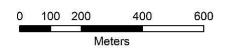




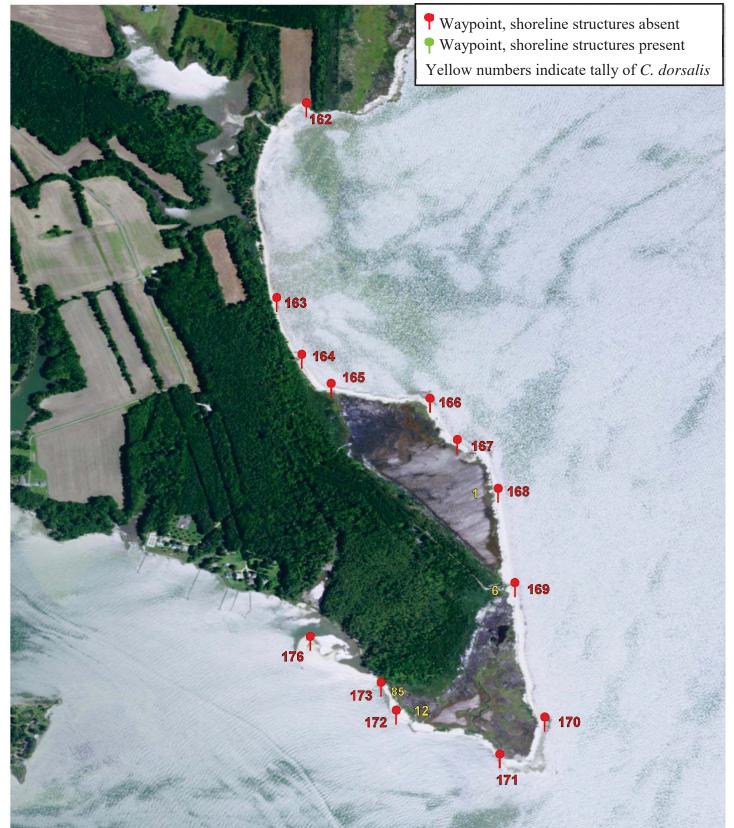


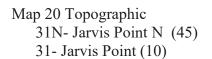


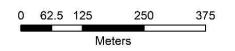




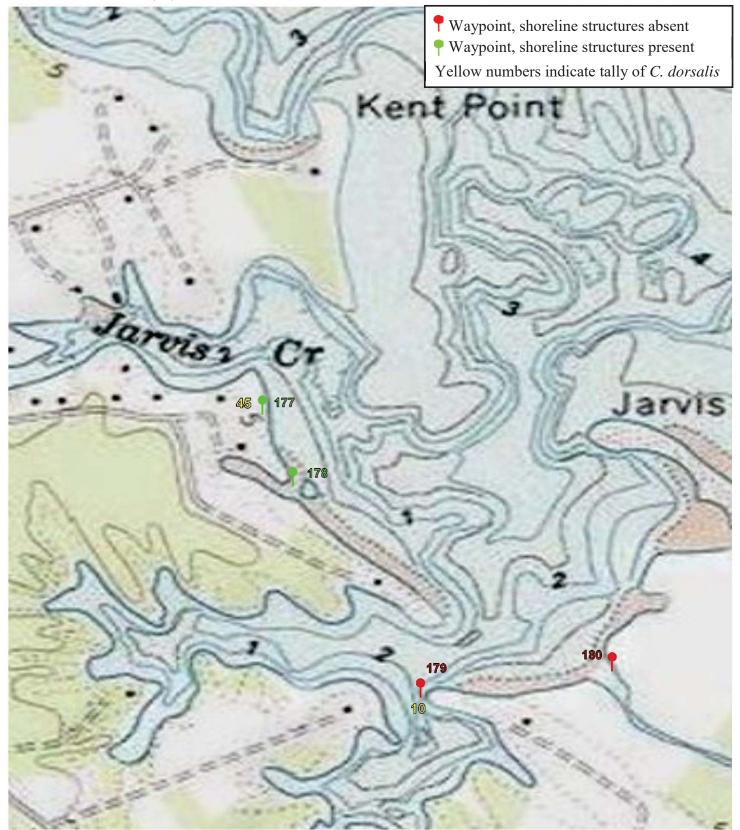




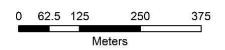




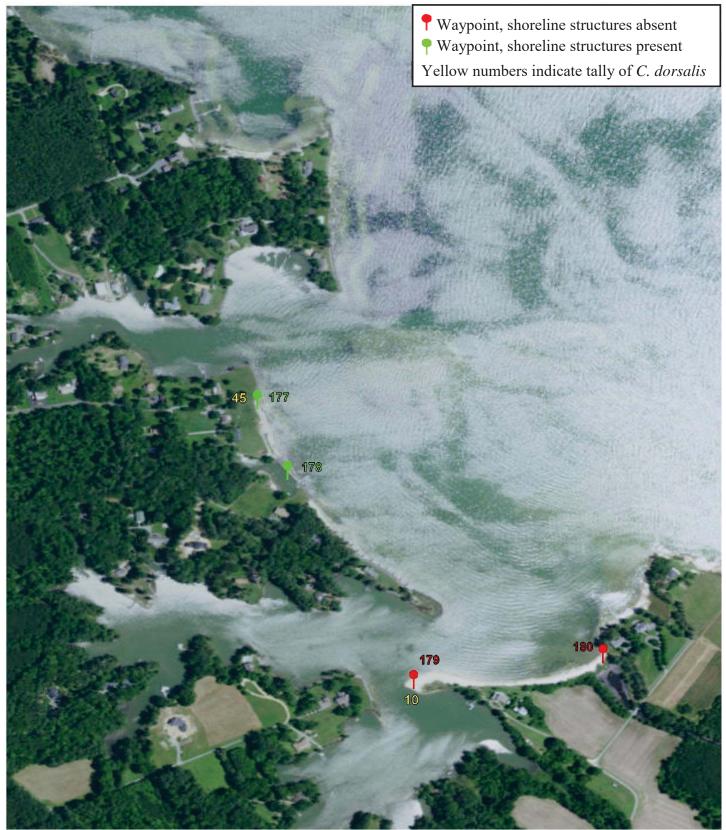


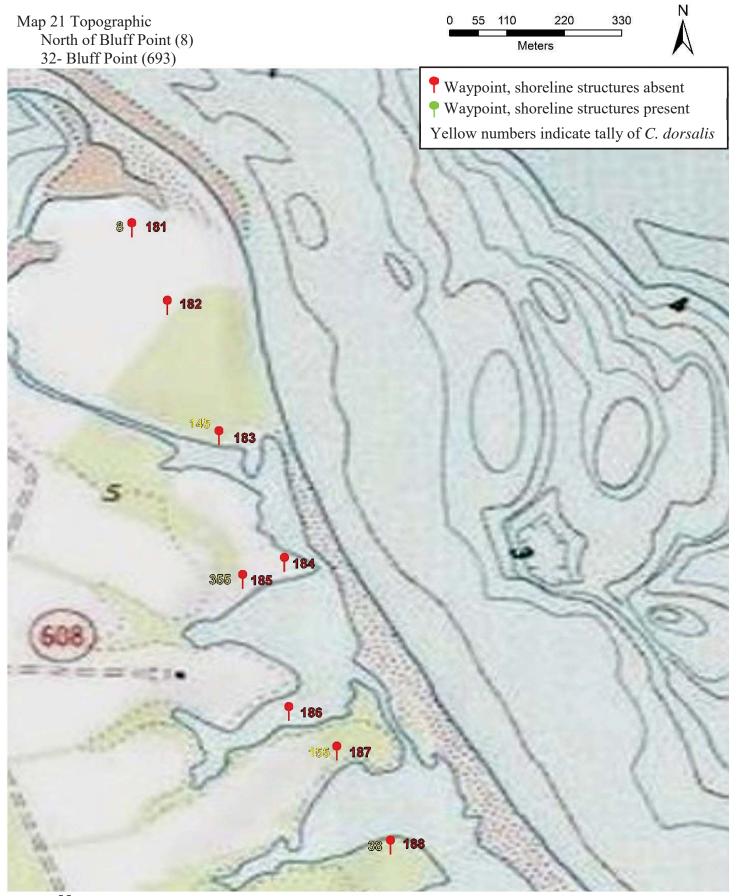


Map 20 Aerial 31N- Jarvis Point N (45) 31- Jarvis Point (10)

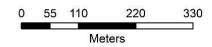




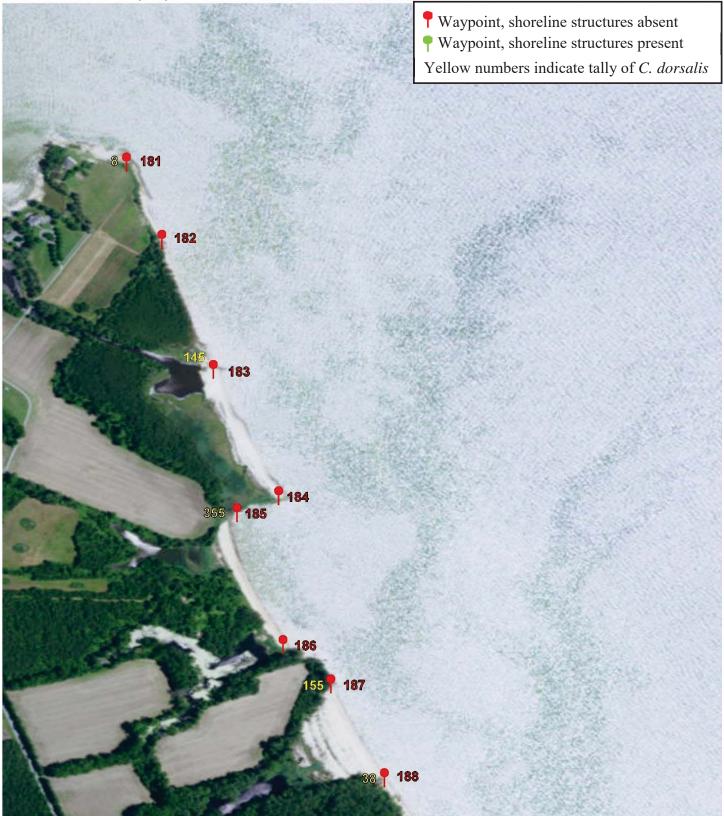




Map 21 Aerial North of Bluff Point (8) 32- Bluff Point (693)

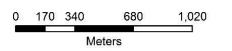




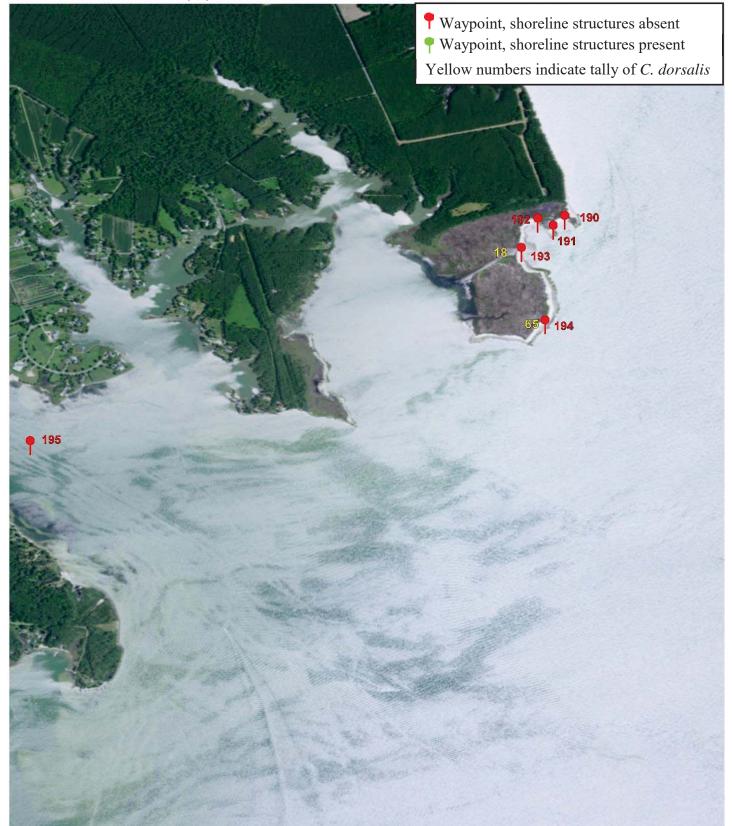


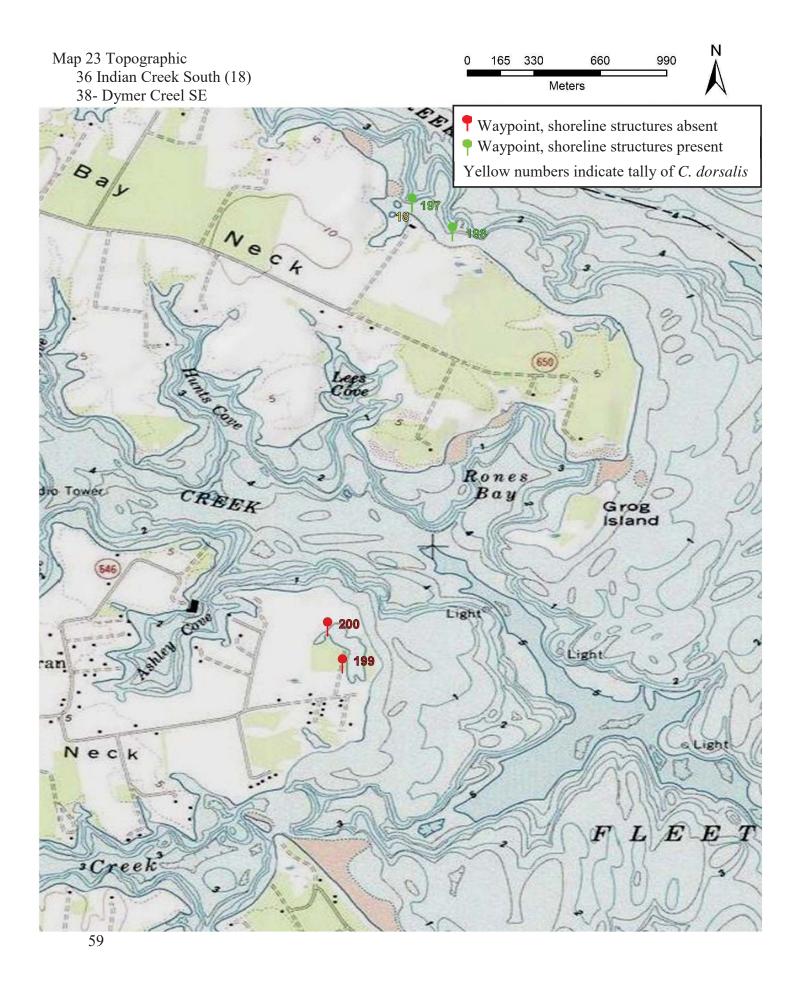
0 170 340 680 1,020 Map 22 Topographic 33- Bluff Point South (73) Meters NECH Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* 193 Creek Bluff Point Light Grog Island



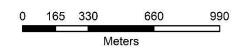








Map 23 Aerial 36 Indian Creek South (18) 38- Dymer Creel SE



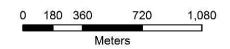




Map 24 Topographic 180 360 720 1,080 40- Little Bay East (92) Meters 41 Oyster Creek (30) Grog Island Waypoint, shoreline structures absent ₱ Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* Light Light B North Point BAY LITTLE Clark Point Asbury Ch Foxwells . ■ Platform Maple Grove Ch

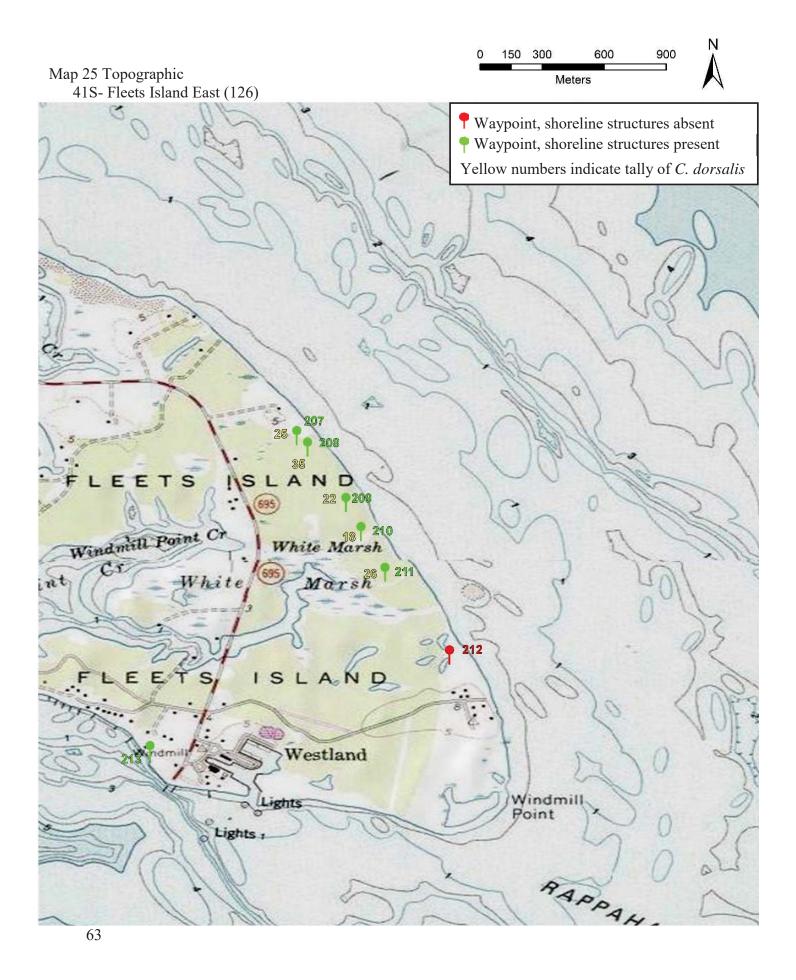
61

Map 24 Aerial 40- Little Bay East (92) 41 Oyster Creek (30)

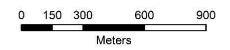




Waypoint, shoreline structures absent P Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis*



Map 25 Aerial 41S- Fleets Island East (126)



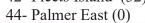


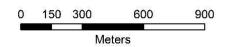


Map 26 Topographic 900 150 300 600 42- Fleets Island (32) Meters 44- Palmer East (0) Waypoint, shoreline structures absent LITTLE BA Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* Foxwells. Platform Cem Windm 218 Deep Hole Point

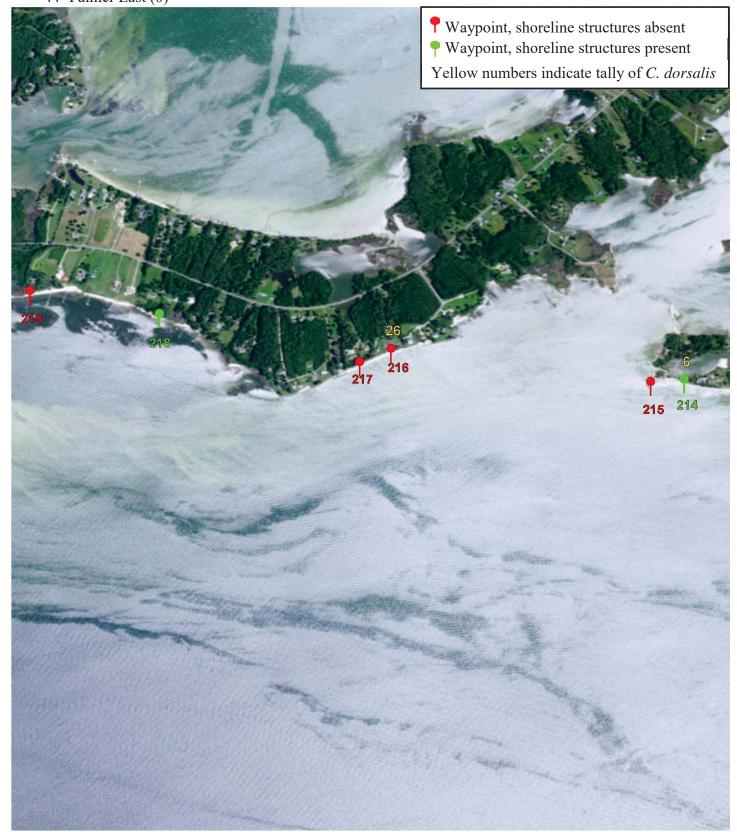
65

Map 26 Aerial 42- Fleets Island (32)

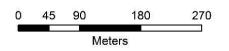




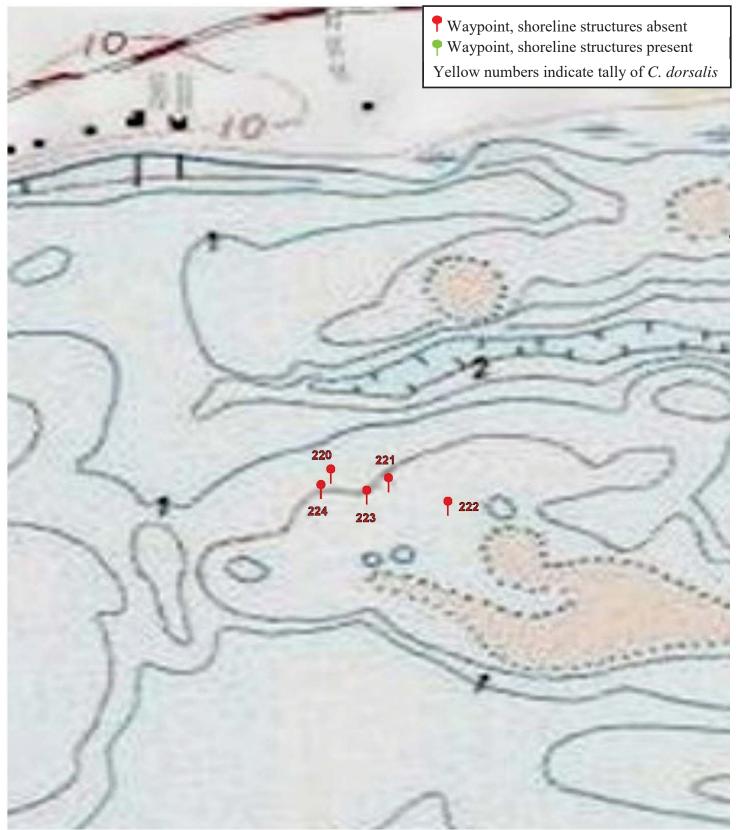




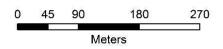
Map 27 Topographic 43- Deep Hole Island (0)





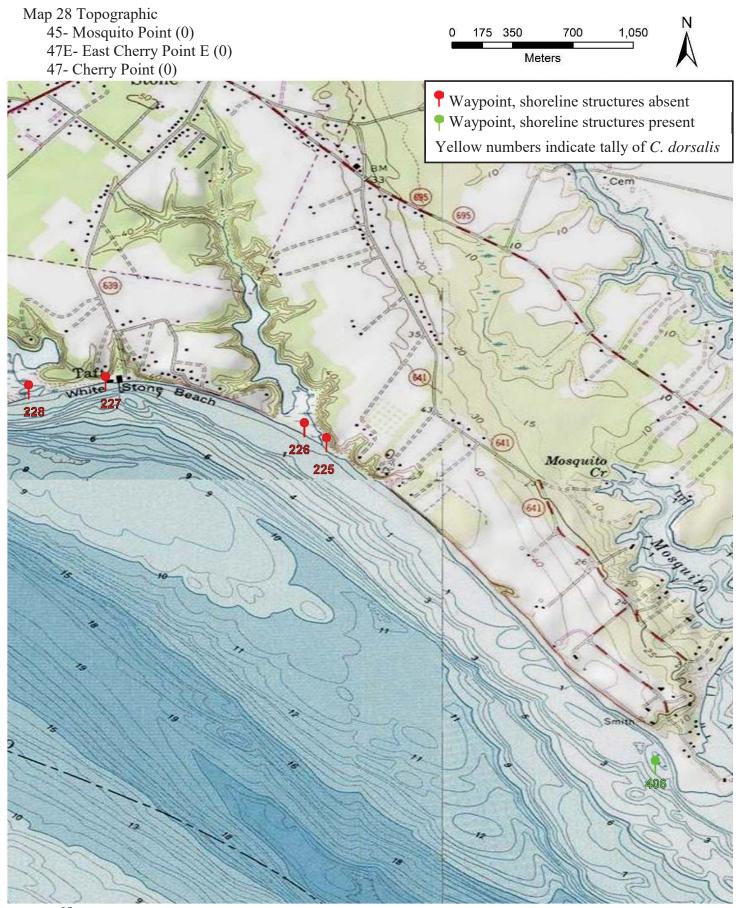


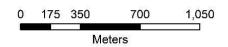
Map 27 Aerial 43- Deep Hole Island (0)





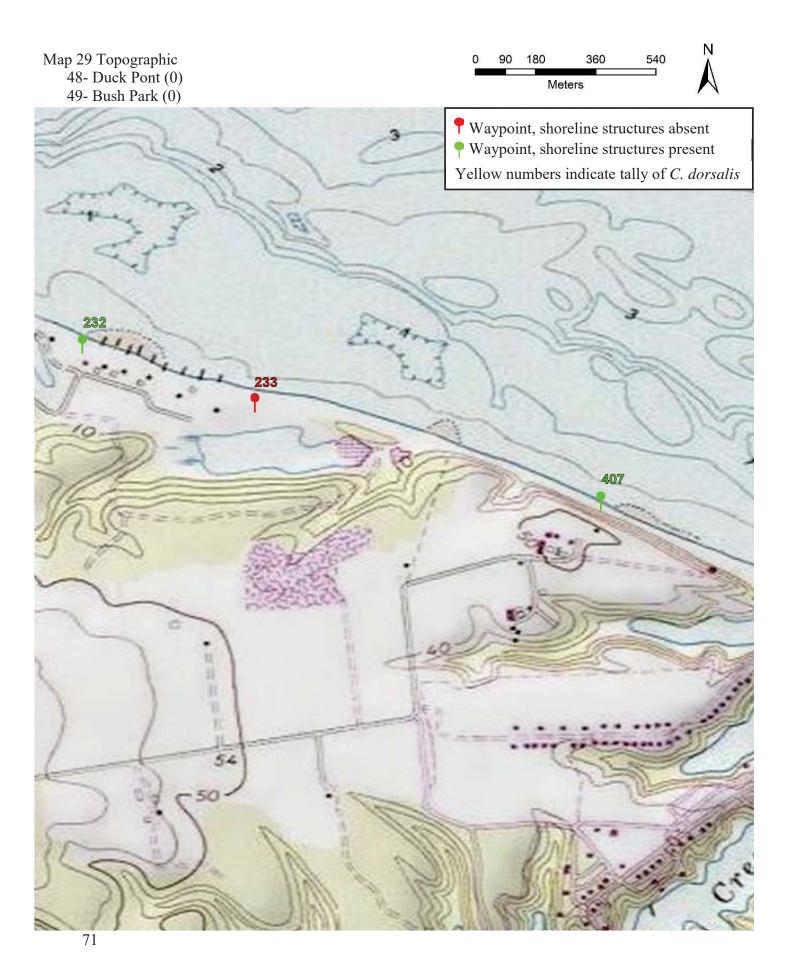






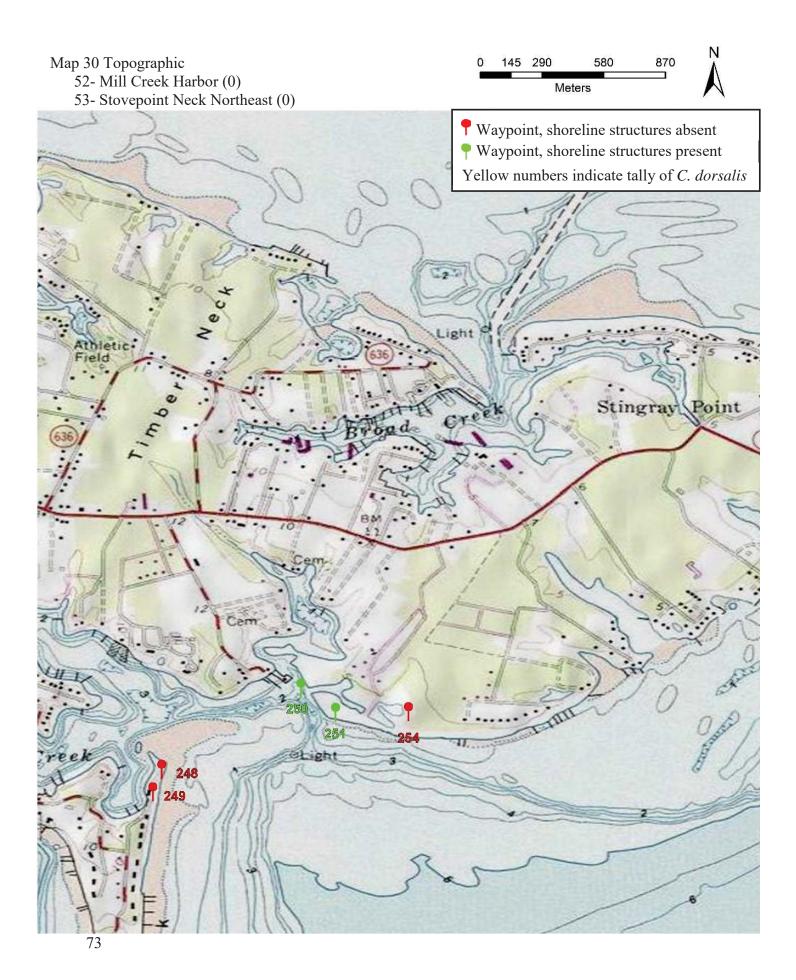




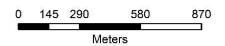




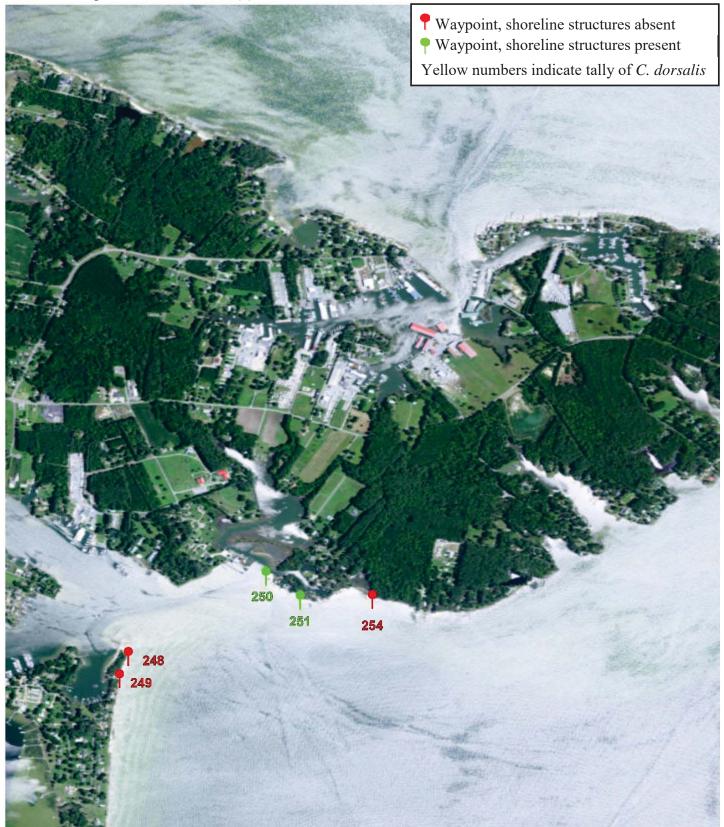




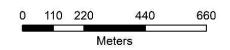
- 52- Mill Creek Harbor (0)
- 53- Stovepoint Neck Northeast (0)



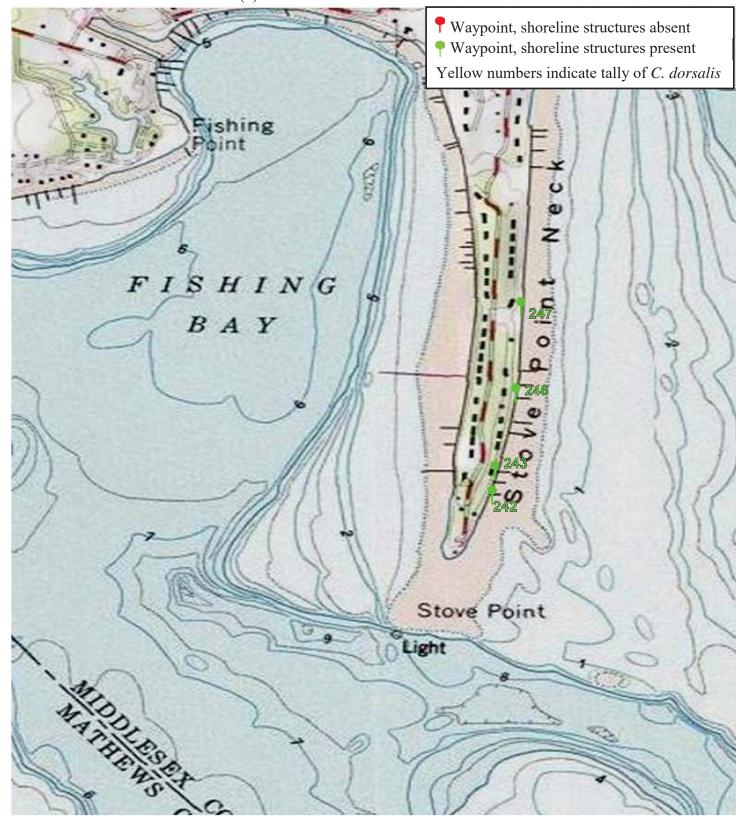




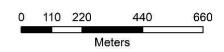
Map 31 Topographic 54- Stove Point Neck Middle (0)



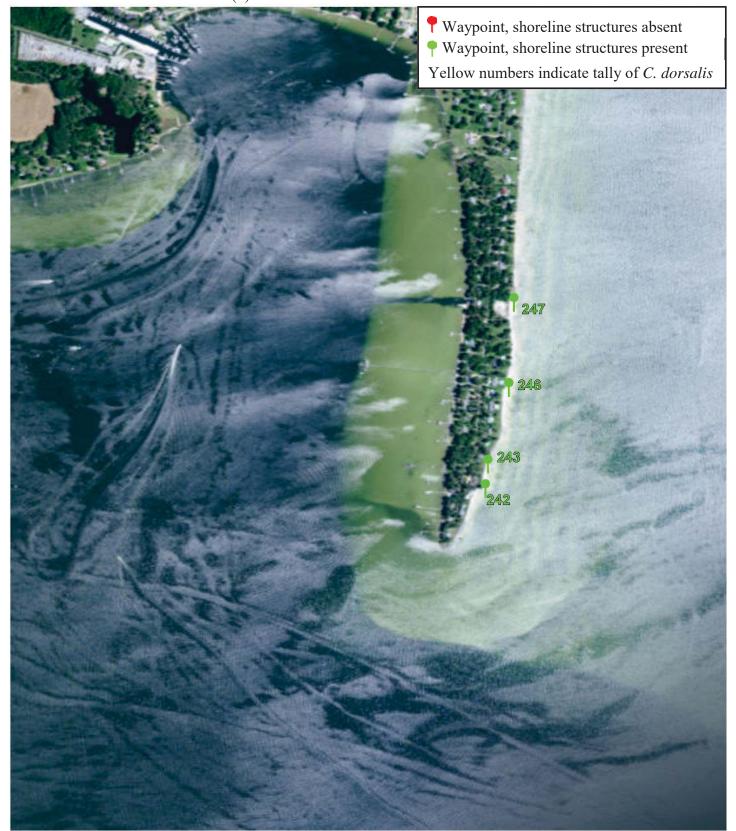


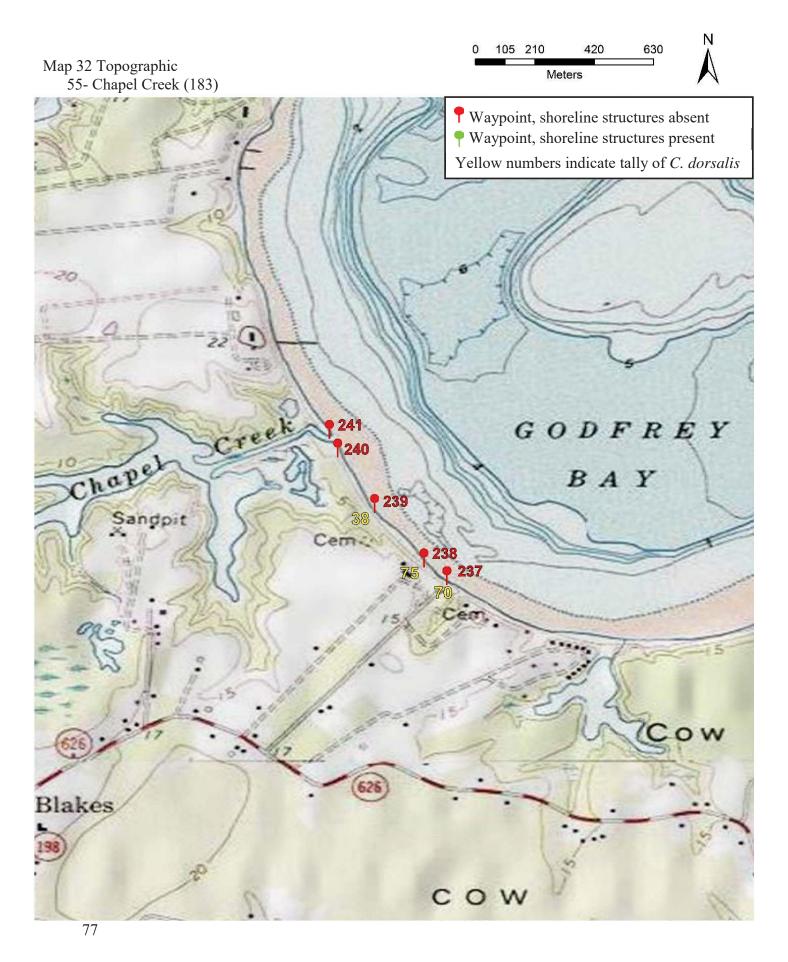


Map 31 Aerial 54- Stove Point Neck Middle (0)

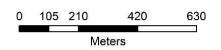








Map 32 Aerial 55- Chapel Creek (183)







Map 33 Topographic 56- Hills Bay West (0) 160 320 640 960 57- Hills Bay South (0) Meters 58- Narrows Point (2) Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* ecton Point HILLS BA HILLS Light e Light Gwynn Landing 309 Middle Groun Light Light a Narrows The Cricket Hill

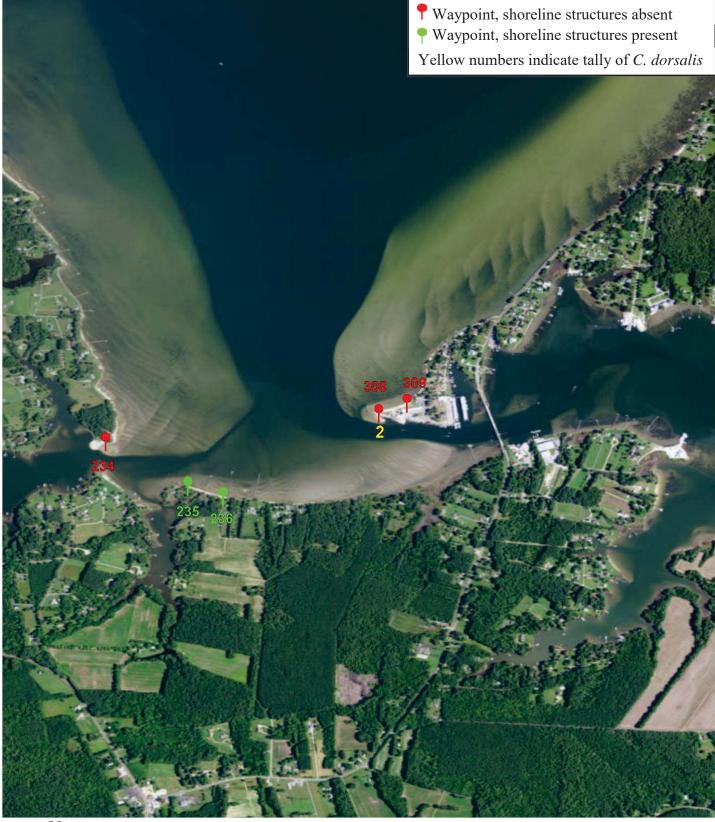
CRAB

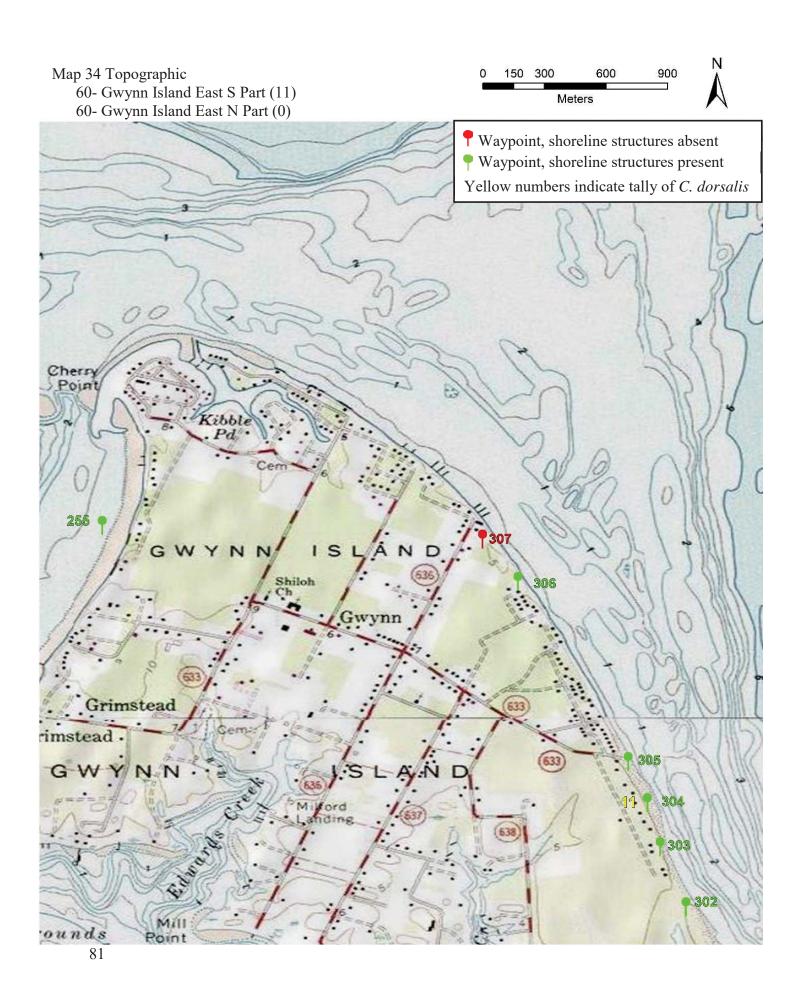
Hudgins

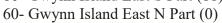
- 56- Hills Bay West (0) 57- Hills Bay South (0)
- 58- Narrows Point (2)

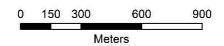










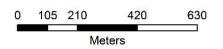






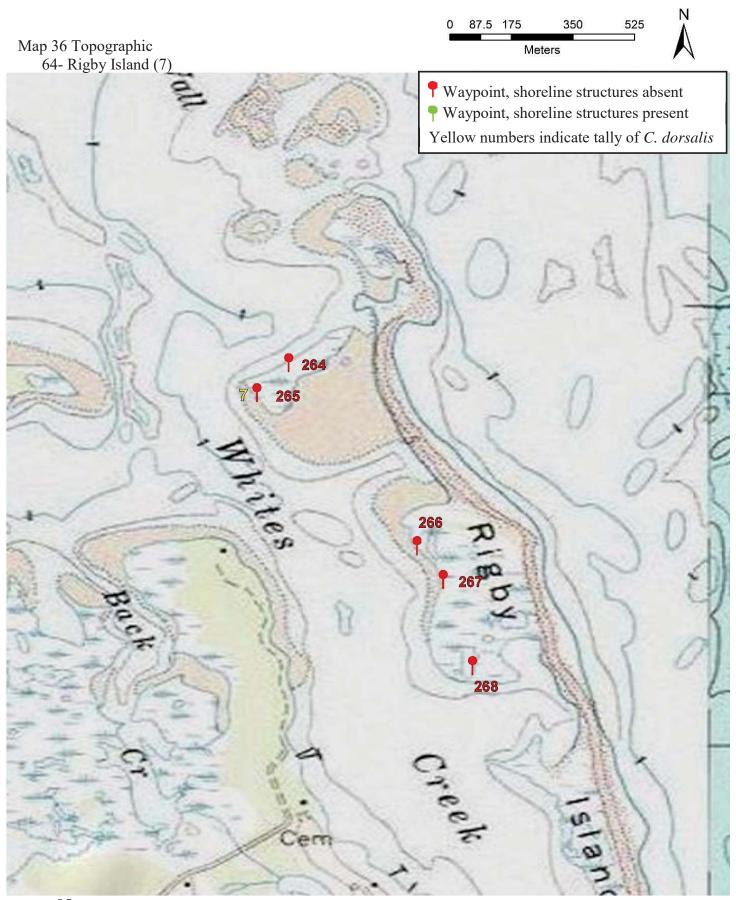
Map 35 Topographic 105 210 420 630 61- Hills Creek (43) Meters 62- Sandy Point (75) Waypoint, shoreline structures absent Waypoint, shoreline structures present Yellow numbers indicate tally of *C. dorsalis* 260 HAFEN 7 262 263 Sage Point Sandy Point Breeze Light C Light 83

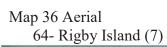
Map 35 Aerial 61- Hills Creek (43) 62- Sandy Point (75)

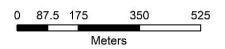






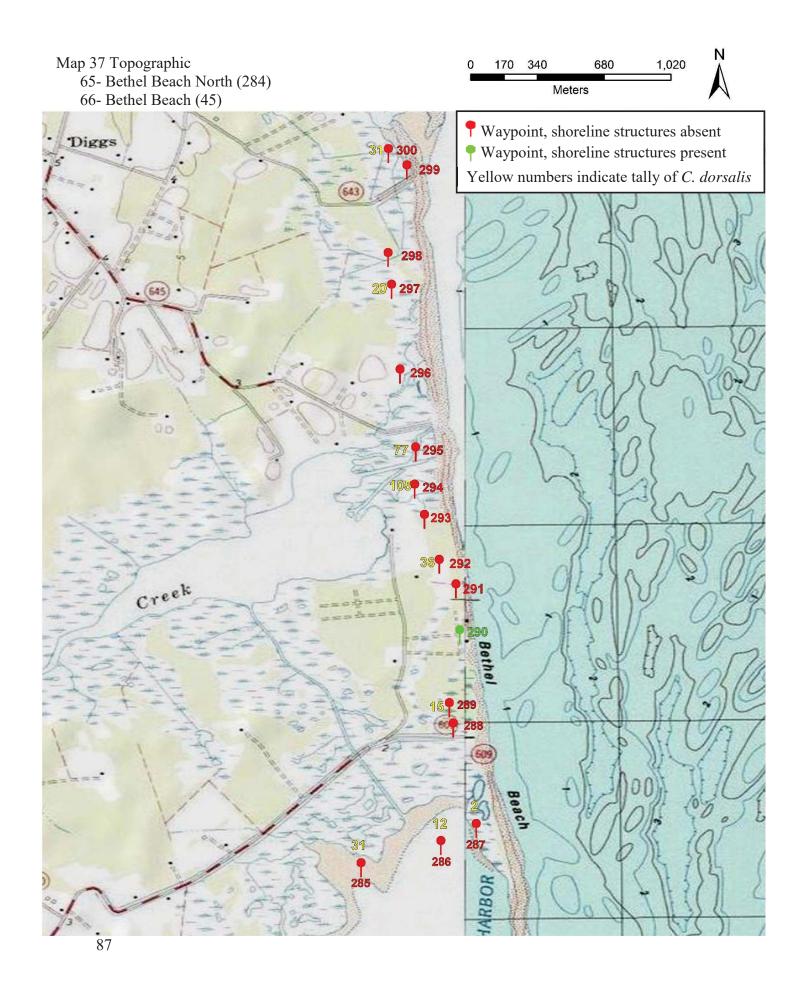




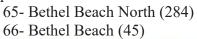


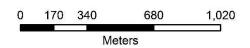






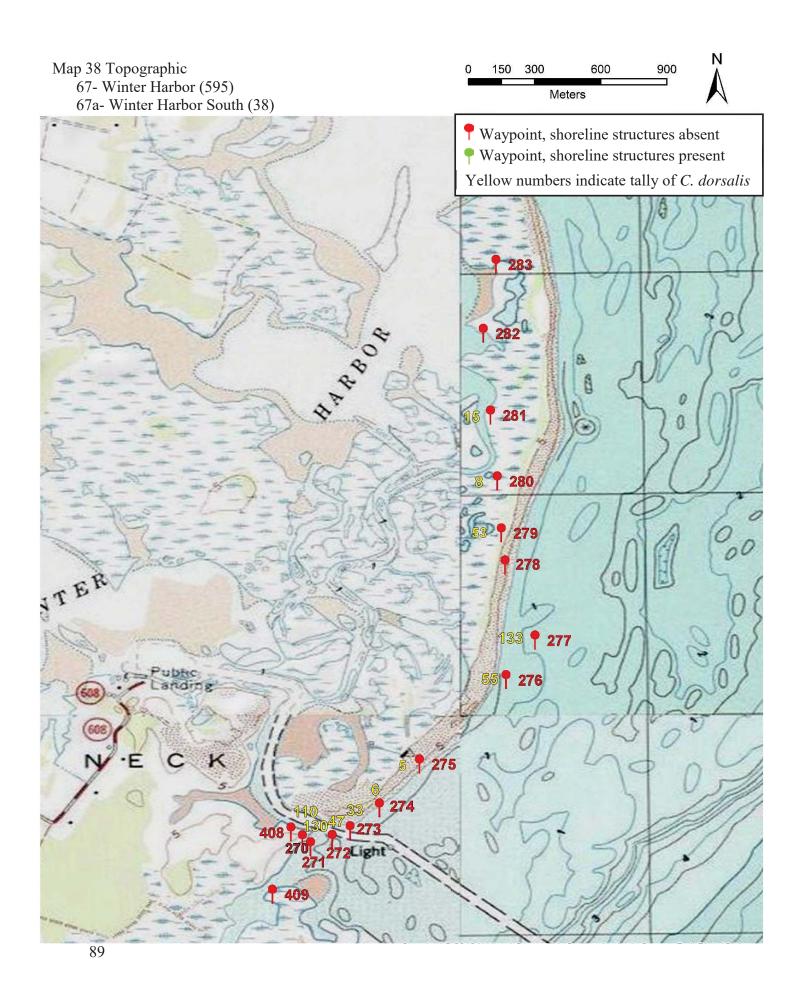
Map 37 Aerial
65 Rethel Reach North (2)



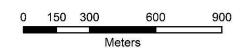






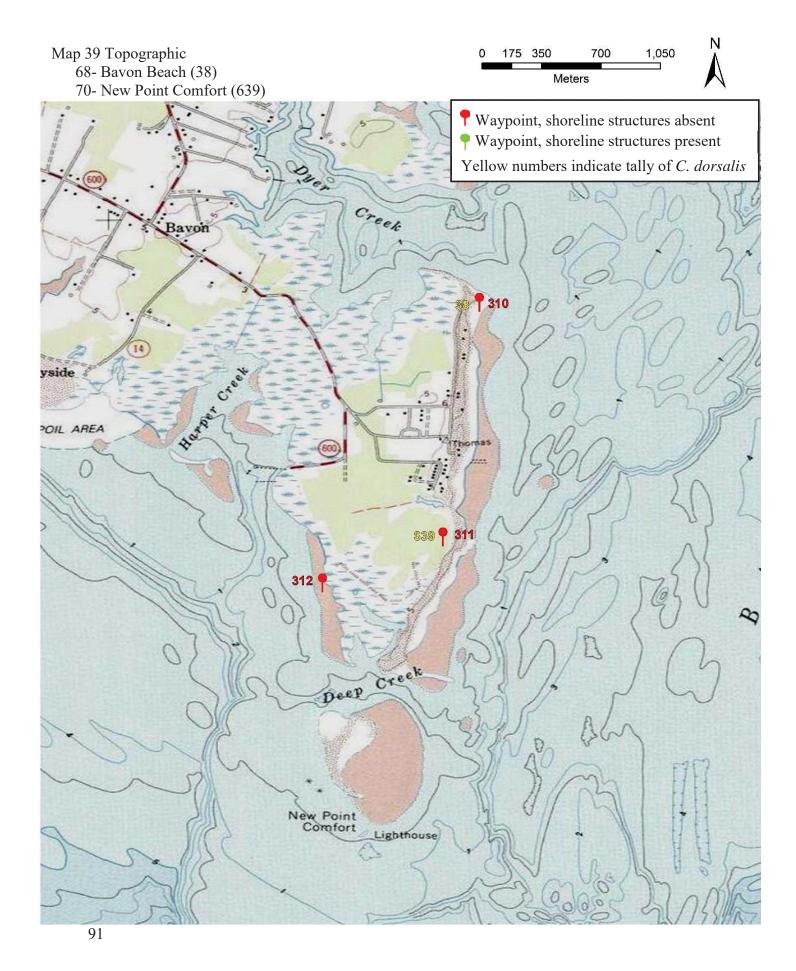


Map 38 Aerial 67- Winter Harbor (595) 67a- Winter Harbor South (38)





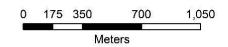




Map 39 Topographic

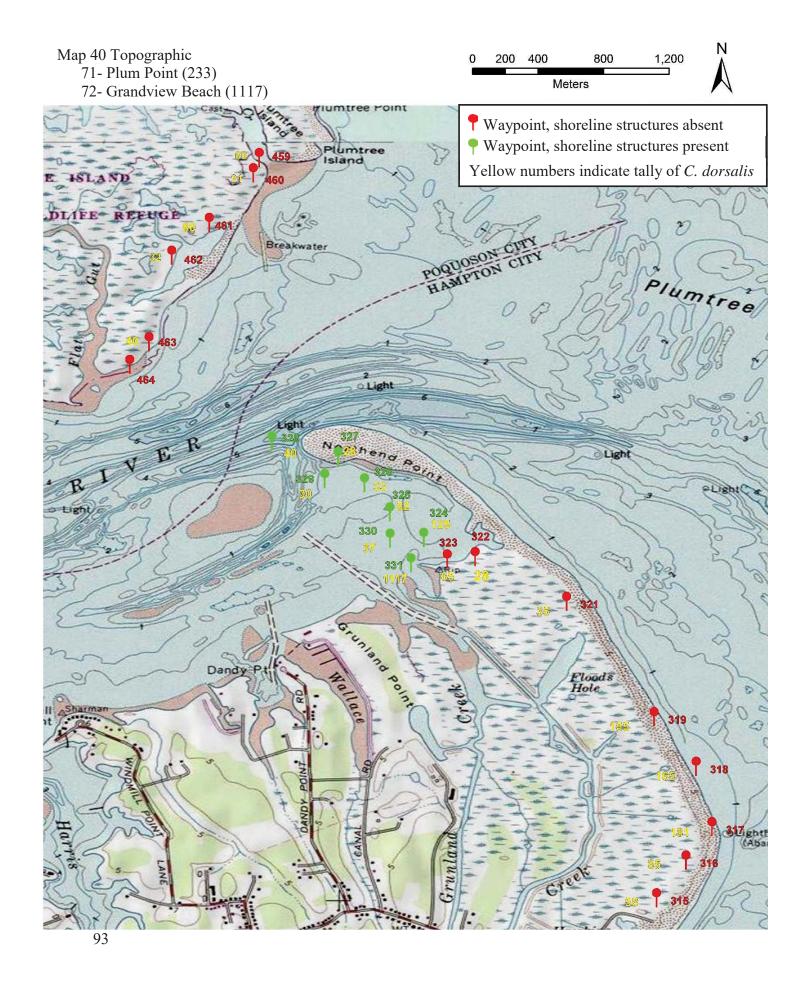
68- Bavon Beach (38)

70- New Point Comfort (639)





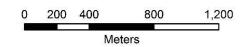




Map 40 Aerial

71- Plum Point (233)

72- Grandview Beach (1117)









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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/



May 10, 2020

In Reply Refer To:

Consultation Code: 05E2VA00-2020-TA-3693

Event Code: 05E2VA00-2020-E-10395

Project Name: HRSD Middlesex Interceptor Phase 2

Subject: Verification letter for the 'HRSD Middlesex Interceptor Phase 2' 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 May 10, 2020 your effects determination for the 'HRSD Middlesex Interceptor Phase 2' (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" 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.

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 2

2. Description

The following description was provided for the project 'HRSD Middlesex Interceptor Phase 2':

Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and 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 HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/ Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to new booster pump stations along the force main alignment.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W



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. 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.

Estimated total acres of forest conversion:
 If known, estimated acres of forest conversion from April 1 to October 31
 If known, estimated acres of forest conversion from June 1 to July 31

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 $\it 0$
- 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 $\it o$
- 9. If known, estimated acres of prescribed fire from June 1 to July 31 σ

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)? θ



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Phone: (804) 693-6694 Fax: (804) 693-9032 http://www.fws.gov/northeast/virginiafield/



In Reply Refer To: May 10, 2020

Consultation Code: 05E2VA00-2020-SLI-3693

Event Code: 05E2VA00-2020-E-10394

Project Name: HRSD Middlesex Interceptor Phase 2

Subject: List of threatened and endangered species that may occur in your proposed project

location, and/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: 05E2VA00-2020-SLI-3693

Event Code: 05E2VA00-2020-E-10394

Project Name: HRSD Middlesex Interceptor Phase 2

Project Type: WASTEWATER PIPELINE

Project Description: Middlesex Interceptor System Program Phase II – Urbanna to Mathews

Transmission Force Main project (MISPPII) includes the design of approximately 3.2 miles of force main from Urbanna to Cook's Corner in addition to approximately 13 miles of force main along Route 33 between Cook's Corner and 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 HRSD Urbanna and Central Middlesex Treatment Plants. The new system will consist of a transmission force main, pump stations, and potential off-line storage tanks. The project will also provide for future connections of the Topping Service Area near the Route 3/Route 33 intersection and the Deltaville Service Area near Hartfield along General Puller Highway. New pump stations are proposed at the two treatment plants that will be decommissioned in addition to

new booster pump stations along the force main alignment.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.564988186246154N76.4732604043296W



Counties: Mathews, VA | Middlesex, VA

Endangered Species Act Species

There is a total of 1 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 Fisheries¹, 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. <u>NOAA Fisheries</u>, 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

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045

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 <u>National Wildlife Refuge</u> 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.



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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: September 22, 2021

Consultation Code: 05E2VA00-2021-SLI-5910 Event Code: 05E2VA00-2021-E-17349

Project Name: HRSD Middlesex Interceptor System Program Phase II - Proposed pump station

in the Town of Urbanna

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: 05E2VA00-2021-SLI-5910 **Event Code:** Some(05E2VA00-2021-E-17349)

Project Name: HRSD Middlesex Interceptor System Program Phase II - Proposed pump

station in the Town of Urbanna

Project Type: WASTEWATER PIPELINE

Project Description: 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 polygon

depicts the location of the Urbanna Wastewater Treatment Plant

component of the project.

The Urbana Wastewater Treatment Plant will be decommissioned and replaced with a gravity sewer system and pump station located adjacent to Tabor Park off of Bonner Street 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 Rangtang Road.

The vertical footprint for the proposed construction is 25 feet in total depth for the wet well, and a total depth of 11 feet for the manhole. Construction is scheduled for early 2023.

Project Location:

Approximate location of the project can be viewed in Google Maps: https:// www.google.com/maps/@37.639502300000004,-76.57805845672965,14z



Counties: Middlesex County, 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 Fisheries¹, 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. <u>NOAA Fisheries</u>, 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

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045

Insects

NAME STATUS

Monarch Butterfly *Danaus plexippus*

Candidate

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743

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 <u>National Wildlife Refuge</u> 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.



Frank N. Stovall Deputy Director for Operations

Darryl Glover
Deputy Director for
Dam Safety,
Floodplain Management and
Soil and Water Conservation

Laura Ellis
Interim Deputy Director for
Administration and Finance

April 8, 2022

Deborah Painter Tetra Tech, Inc. 5700 Lake Wright Drive, Suite 102 Norfolk, VA 23505

Re: HRSD Middlesex Interceptor System Program Phase II

Dear Ms. Painter:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

Alternative 1, Alternative 2, Alternative 3

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

Alternative 4

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

In addition, the proposed project will impact an Ecological Core (C5) as identified in the Virginia Natural Landscape Assessment (https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: http://vanhde.org/content/map.

Ecological Cores are areas of at least 100 acres of continuous interior, natural cover that provides habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that utilize marsh, dune, and beach habitats. Interior core areas begin 100 meters inside the nearest core edges and continue to the deepest parts of cores. Cores also provide natural and economic benefits of open space, recreation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including

carbon sequestration and oxygen production). Cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of natural heritage resources they contain.

Impacts to cores occur when their natural cover is partially or completely converted permanently to developed land uses. Habitat conversion to development results in changes that reduce ecosystem processes, biodiversity, population viability and habitat quality due to limited recolonization, increased predation, and increased introduction and establishment of invasive species.

Therefore, avoiding or minimizing core impacts is a key mitigation measure that will reduce deleterious effects and preserve the area and connectivity of habitats that are key components of biodiversity. DCR recommends efforts to minimize edge in remaining habitat fragments, retain natural corridors that allow movement between fragments and design the intervening landscape to support native wildlife (natural cover versus lawns).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on statelisted threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

A fee of \$270.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov.

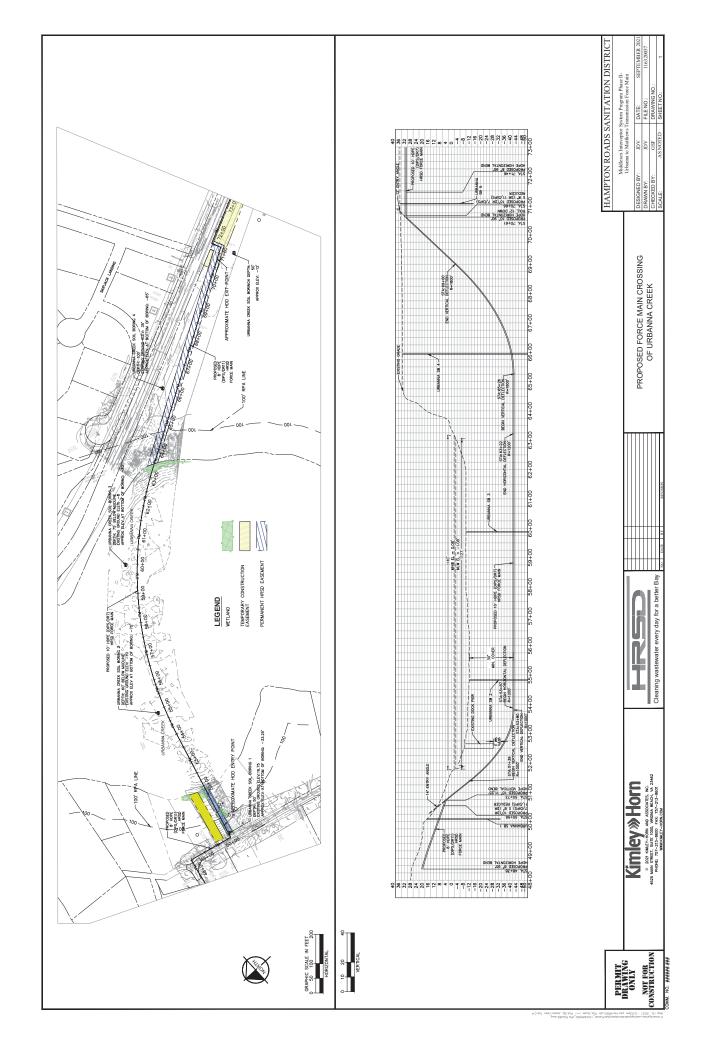
Should you have any questions or concerns, please contact me at 804-225-2429. Thank you for the opportunity to comment on this project.

Sincerely,

Tyler Meader

Tyle Meade

Natural Heritage Locality Liaison



From: Emily A. Hein

Sent: Friday, December 17, 2021 2:47 PM

To: Painter, Debbie

Cc: Sweeney, Brad; Cook, James; scott.funk@kimley-horn.com; Moore, Tim O;

tiffany.birge@mrc.virginia.gov; Advisory

Subject: RE: Tetra Tech MFT: Draft Environmental Assessment Coordination for the HRSD Middlesex

Interceptor System Program Phase II

Good afternoon, Debbie,

We have reviewed the draft EA for the HRSD MISPPII project which includes installing a force main under the Piankatank River and Urbanna Creek and tributaries as well as vegetated and nonvegetated tidal wetlands. As proposed, the force main is proposed to be installed via either horizontal directional drilling (HDD) or mini-HDD methods. In order to minimize impacts, we recommend that all tidal wetlands and streams also be crossed via HDD or mini-HDD rather than open cut methods. Doing so should avoid direct impacts to these areas. With any HDD/mini-HDD project there is the potential for an inadvertent release of drilling fluids (i.e. frac-out), so we recommend development of an inadvertent release/frac-out plan. In wetlands, this should include restoring elevations and plants to preconstruction states. We have mapped submerged aquatic vegetation (SAV) within 2 of the 5 years that currently define an SAV bed (2016–2020) within the LOD for the Piankatank River. SAV is vulnerable to sedimentation, so those beds are areas of particular concern should a frac-out (or other turbidity plume) occur. (SAV mapping data can be accessed here:

https://www.vims.edu/research/units/programs/sav/access/index.php.)

Please let me know if you have questions.

Happy holidays,

-Emily

Upcoming out of office dates: December 20 – January 3

Emily Hein

Pronouns: she/her Assistant Director for Advisory Services VIMS Research and Advisory Services eahein@vims.edu, 804-684-7482



From: Painter, Debbie <donotreply@tetratech.com>

Sent: Friday, December 3, 2021 2:32 PM

To: keith.tignor@vdacs.virginia.gov; robbie.rhur@dcr.virginia.gov; terry.lasher@dof.virginia.gov;

projectreview@dgif.virginia.gov; odwreview-vdh@cov.virginia.gov; roger.kirchen@dhr.virginia.gov; david.spears@dmme.virginia.gov; Emily A. Hein <eahein@vims.edu>; tiffany.birge@mrc.virginia.gov; eir.coordination@vdot.virginia.gov

Cc: brad.sweeney@tetratech.com; james.cook@tetratech.com; scott.funk@kimley-horn.com; tim.moore2@tetratech.com

Subject: Tetra Tech MFT: Draft Environmental Assessment Coordination for the HRSD Middlesex Interceptor System Program Phase II

[EXTERNAL to VIMS received message]

Tetra Tech Managed File Transfer

New Secure File Package is Available to Download until Saturday, 18 December

December 3, 2021

Re: Draft

Environmental Assessment (NEPA) Coordination for the HRSD Middlesex Interceptor System Program Phase II

Dear Reviewer:

On behalf of the Hampton Roads Sanitation District,

Kimley-Horn and Tetra Tech are providing engineering services for the Middlesex Interceptor System Program Phase II – Urbanna to Mathews Transmission Force Main project, which includes the design and construction of a sewage conveyance system to serve Middlesex and Mathews Counties.

In accordance with the provisions of the Virginia Clean Water Revolving Loan Fund, a Draft National Environmental Policy Act (NEPA) Environmental Assessment is submitted for your review and comments.

Please furnish comments within 30 days to Deborah

Painter at <u>Debbie.Painter@tetratech.com</u> or respond by mail to me at Tetra Tech, 5700 Lake Wright Drive Suite 102, Norfolk, Virginia 23502. If you have questions, please contact me using the contact information above or contact the Project Manager at <u>Brad.Sweeney@tetratech.com</u>.

His telephone number is (757) 278-4072.

Yours very truly, Tetra Tech, Inc.

Deborah Painter

Senior Environmental Scientist

c: Brad Sweeney, Scott Funk, Tim Moore, James Cook

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Aquatic Resources Delineation Report for the HRSD Middlesex Interceptor System Program Phase II

Hampton Roads Sanitation District

Mathews and Middlesex Counties, Virginia

January 2022

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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Table 1: Identified Streams

Table 2: Identified Wetlands

APPENDICES

Appendix A: Stream Data Forms

Appendix B: Wetland Data Forms

Appendix C: NRCS Soils Report

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 2021 and January 2022. Surveys were limited to the Project study area illustrated on Figures 1 through 3. The field surveys identified 10 stream reaches and 19 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 18 NWI wetlands are mapped in the Project study area (Figure 3 Index). One wetland, W5, is correlated with an NWI listed wetland as shown in Figure 2-A.

Nineteen 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 3 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 3A to 3J. Open boundary wetlands continue beyond the delineated wetland boundary shown on Figures 3A to 3J; 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 19 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

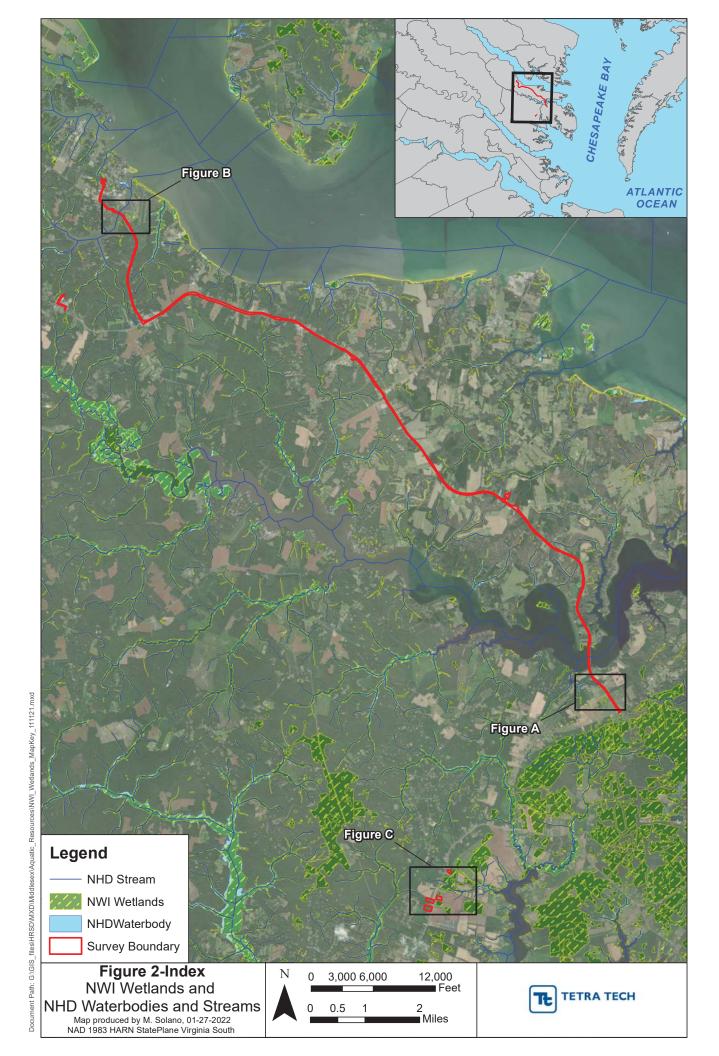
Figure 1: USGS Project Location Map

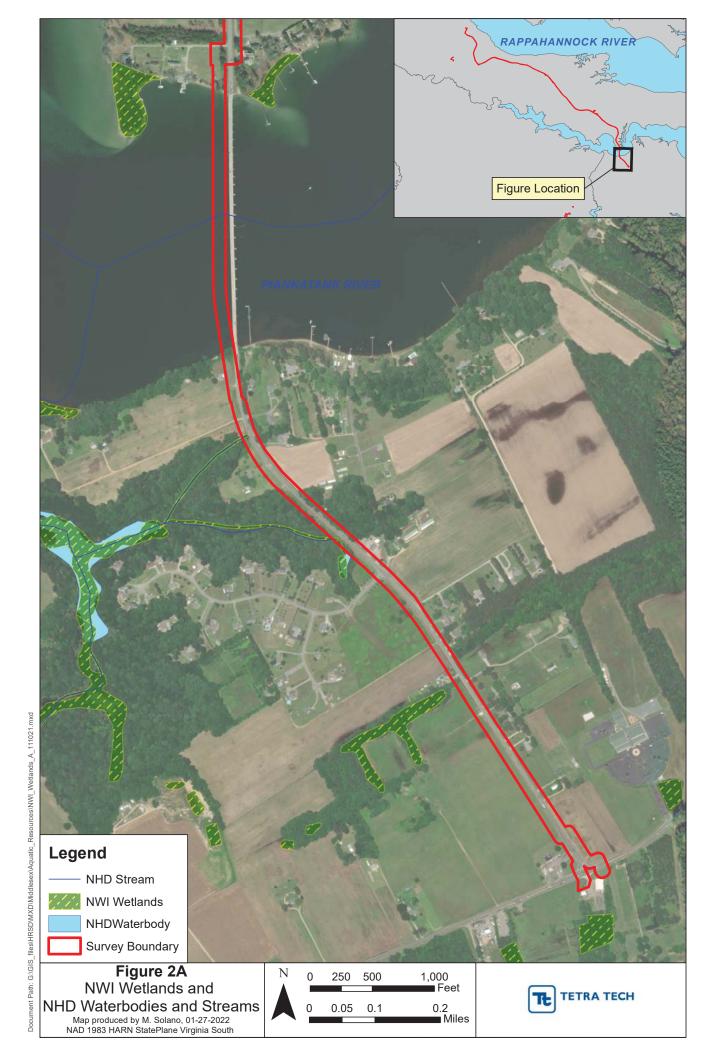
Figure 2-Index: NWI Wetlands and NHD Streams Map Figures 2A-2C: NWI Wetlands and NHD Streams Map

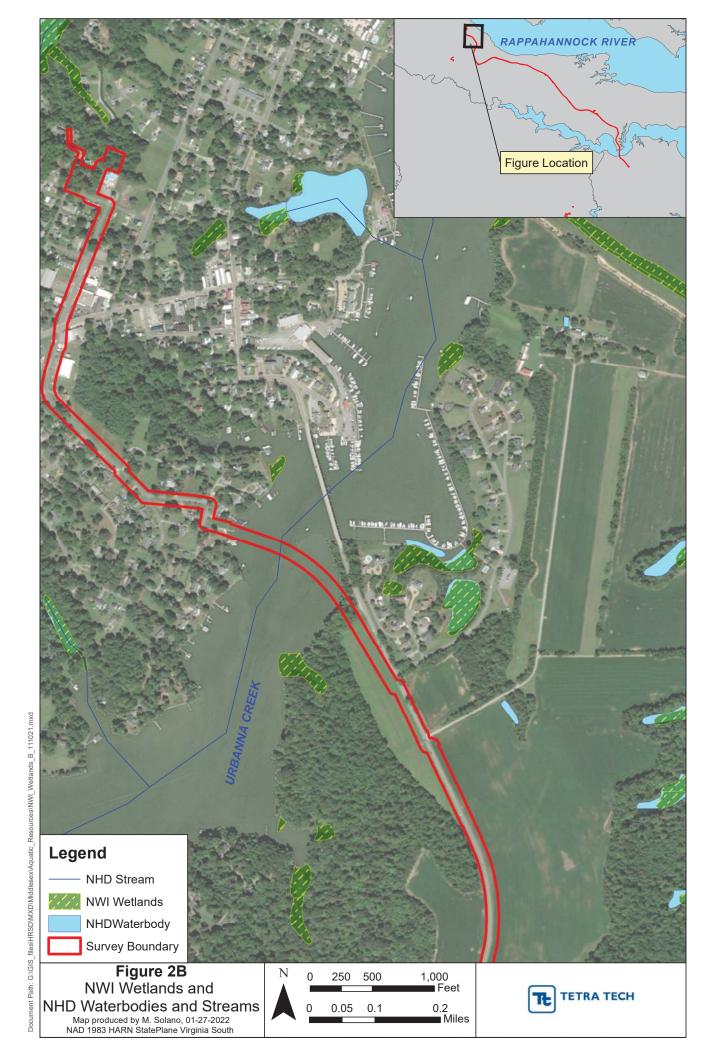
Figure 3-Index: Aquatic Resource Location Index Map

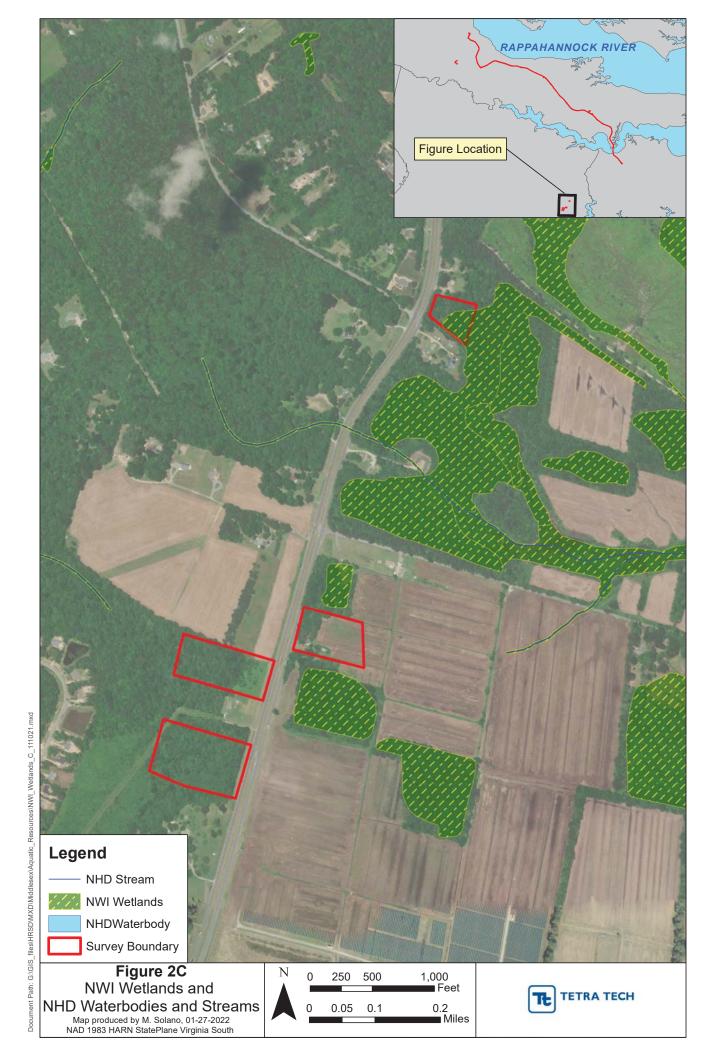
Figures 3A-3J: Aquatic Resource Location Map



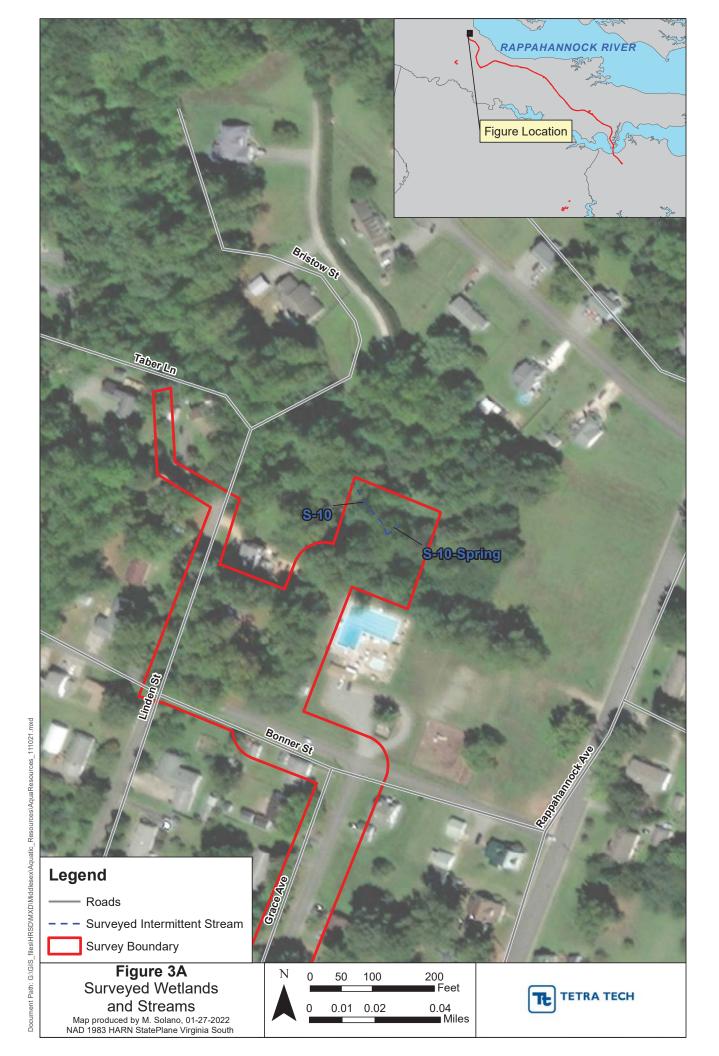


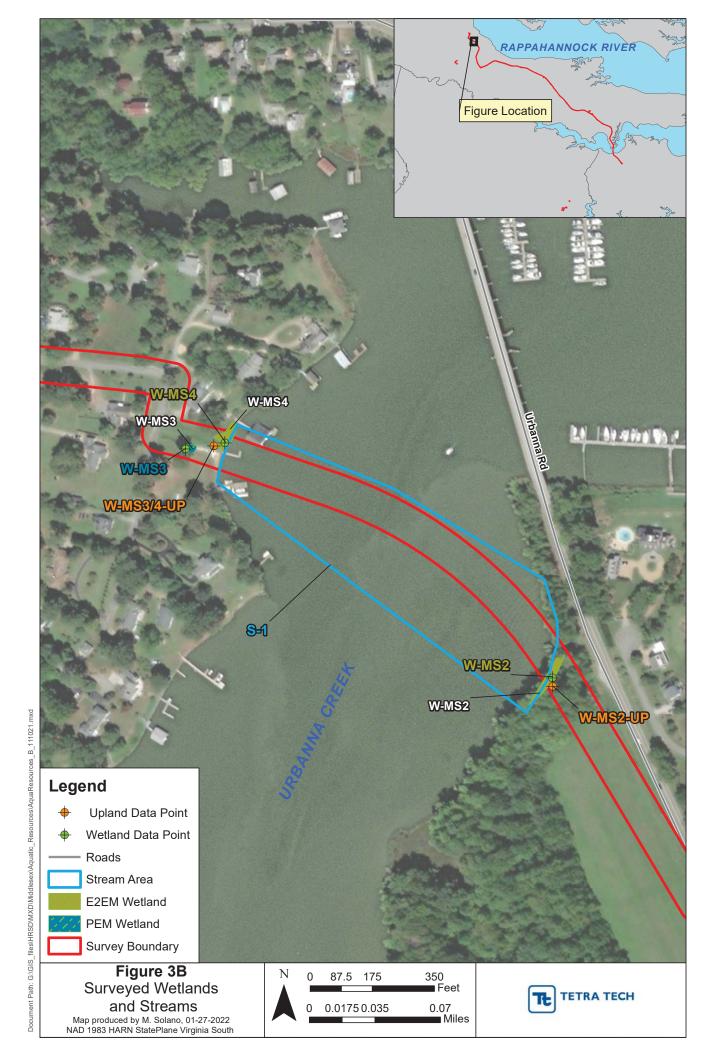


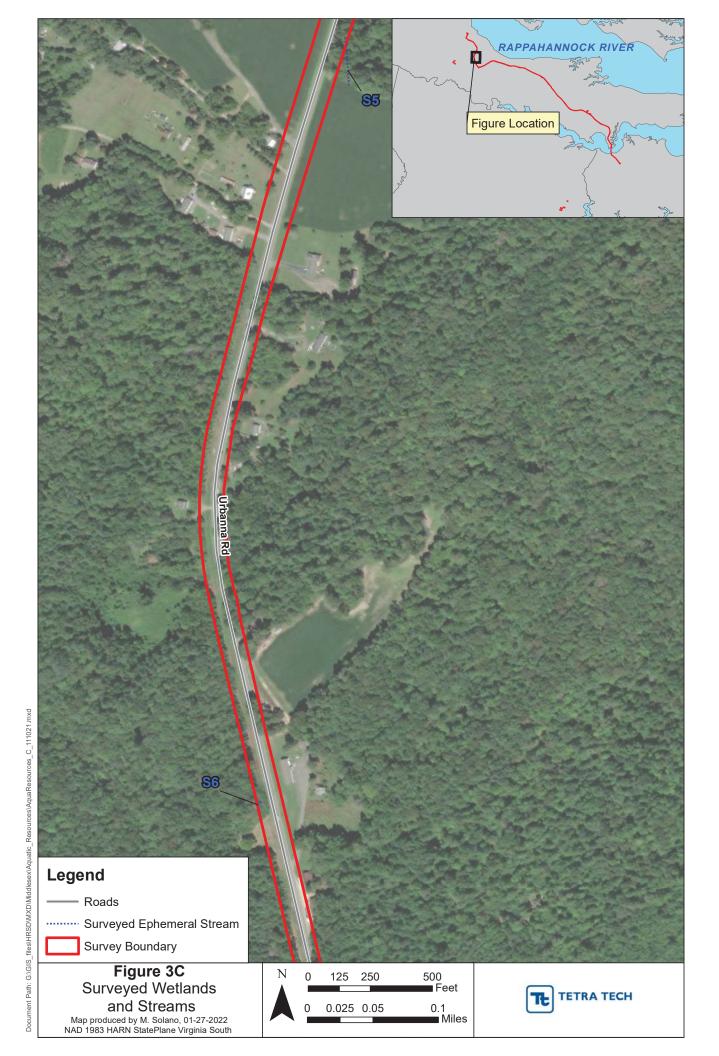


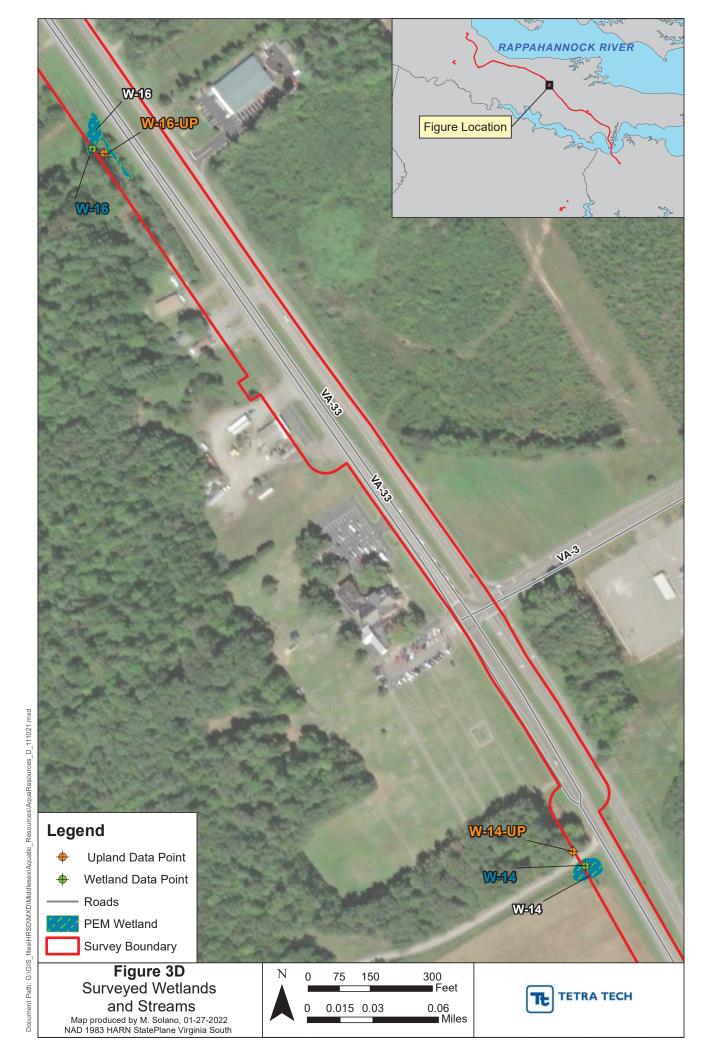


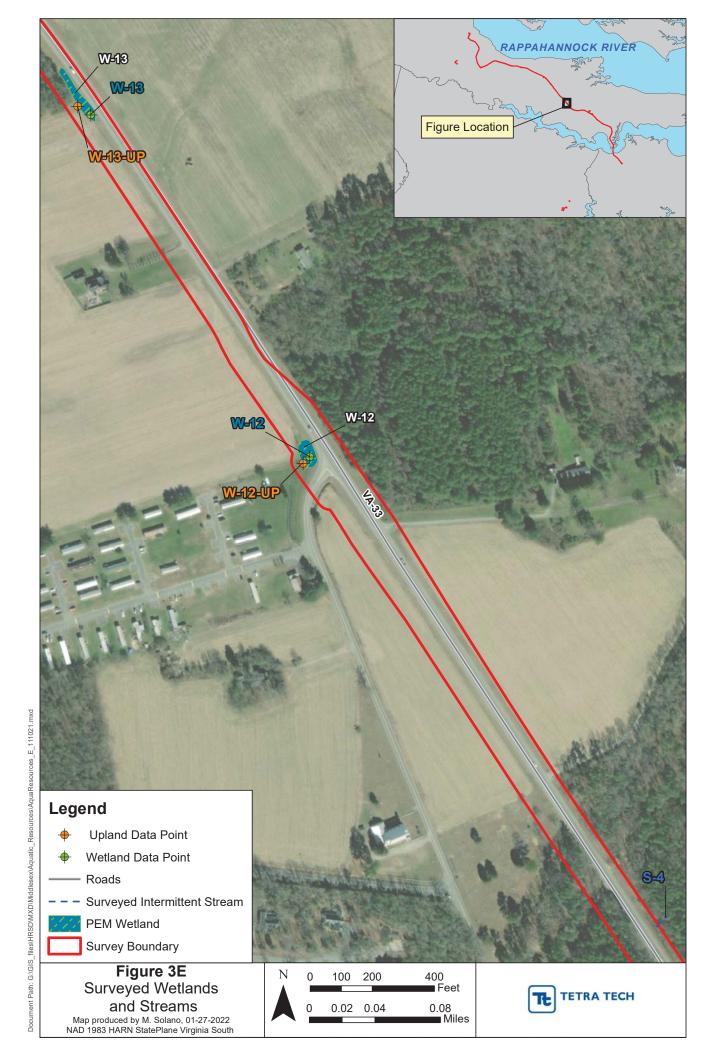


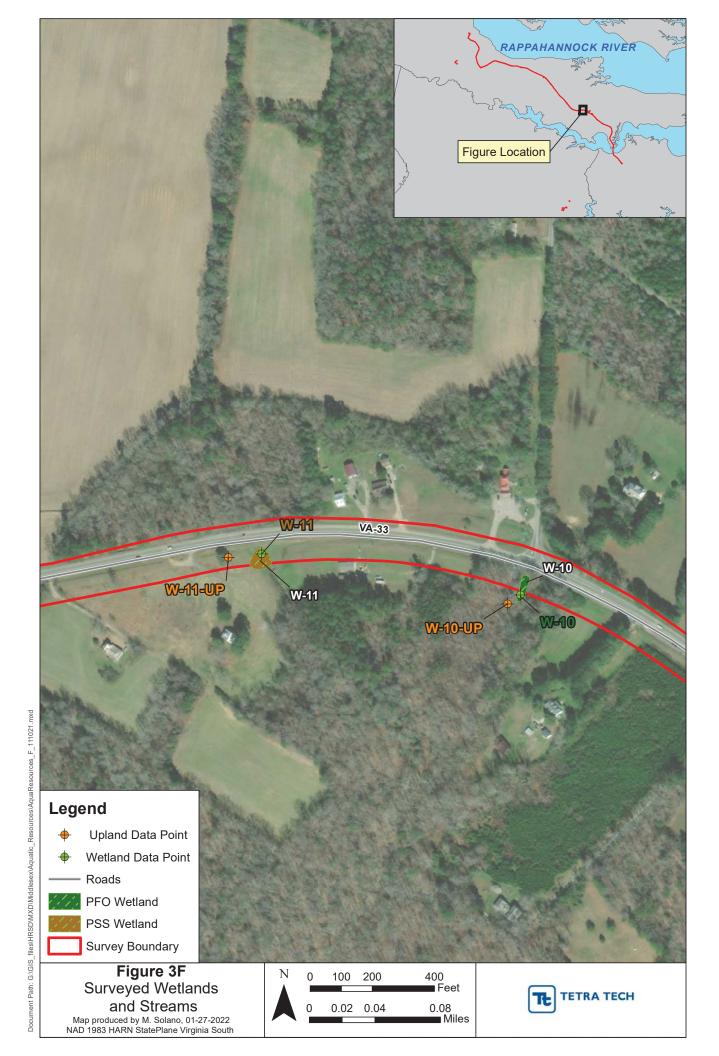


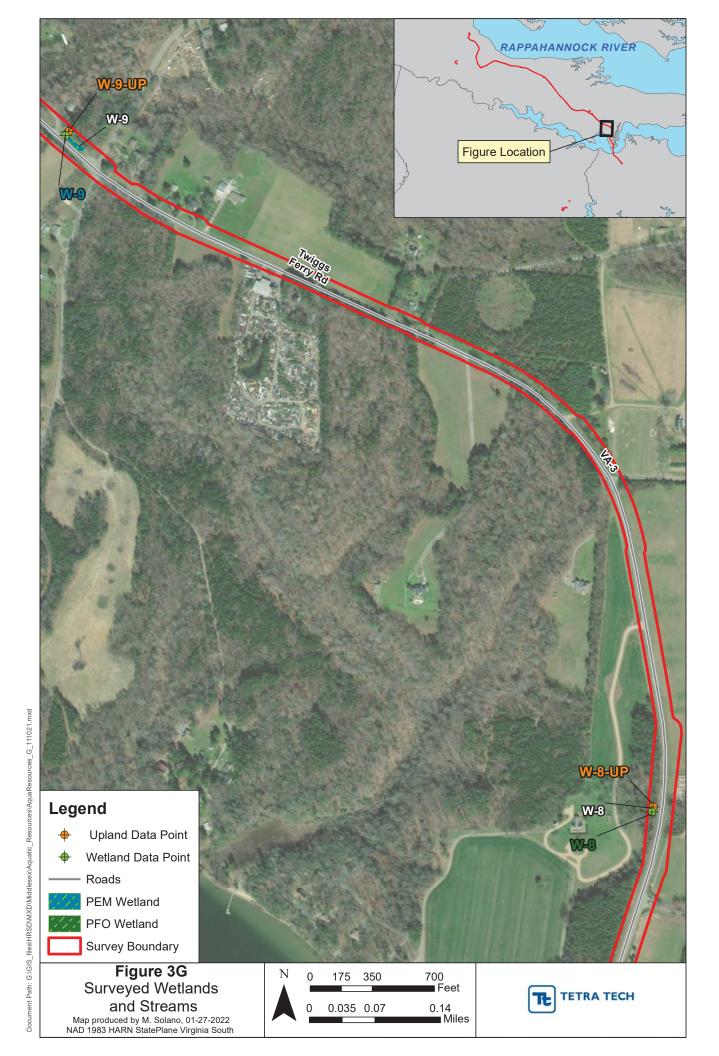




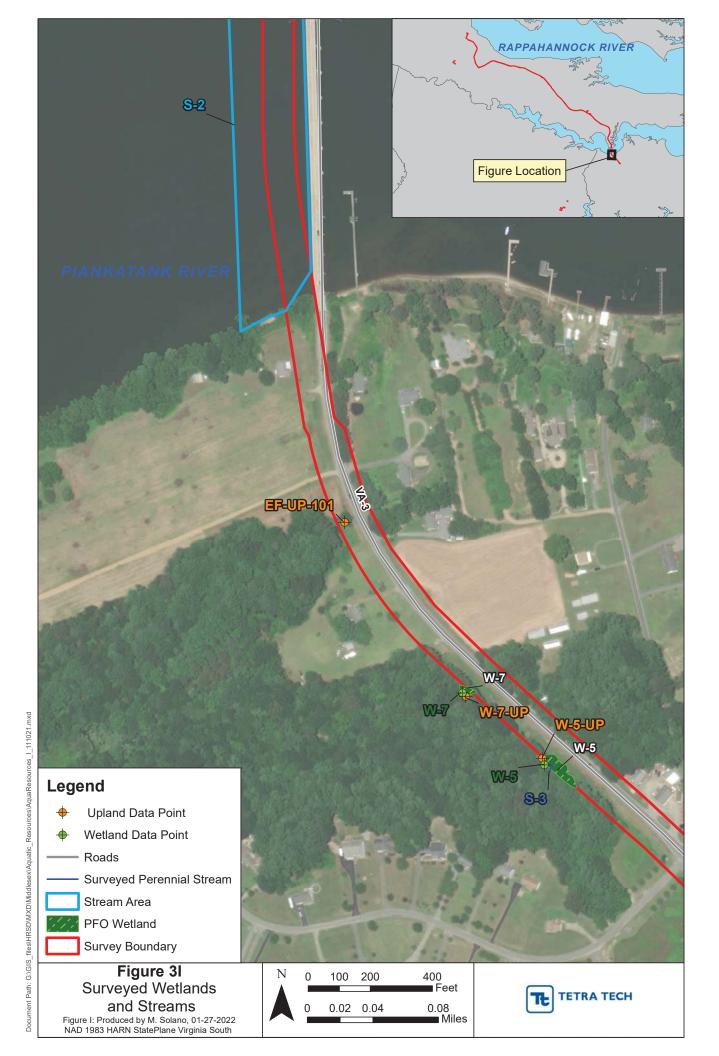


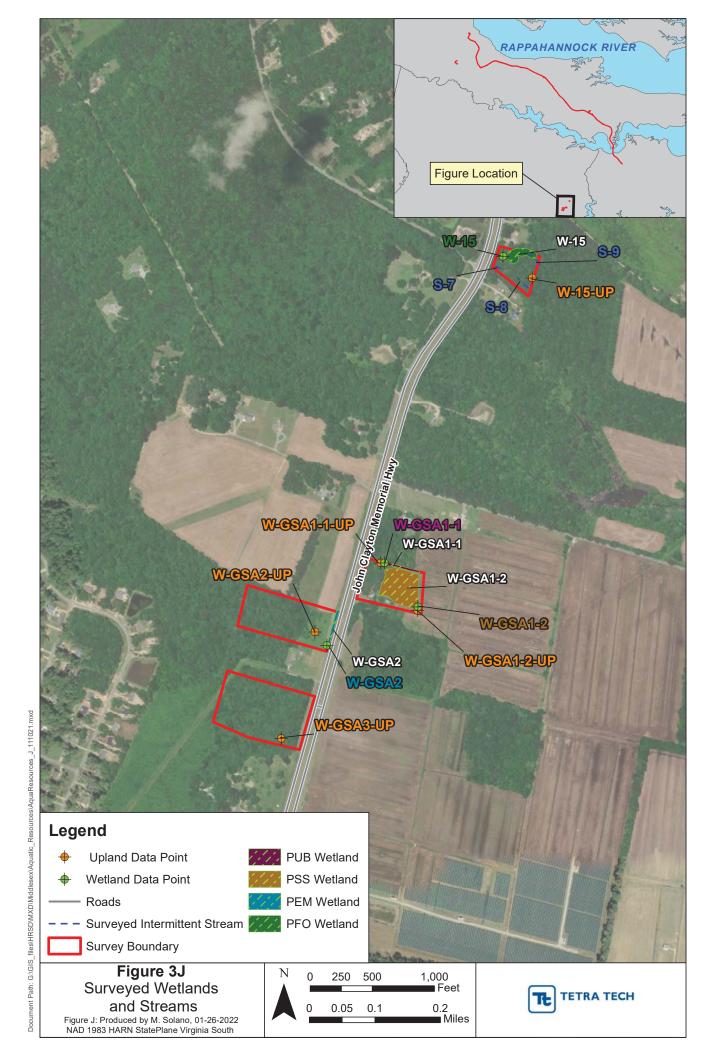












TABLES

Table 1: Identified Streams

Table 2: Identified Wetlands

Table 1.

					_	Identified Streams	reams						
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)	Linear Feet in Survey Area	Geographic Authority	Figure
_	S1	Piankatank River	Middlesex	37.513154	-76.419896	Perennial	MNL	R3	Northeast	2050.00	110.00	Section 10/404	3B
2	S2	Urbanna Creek	Middlesex	37.629513	-76.572037	Perennial	MNL	R3	Northeast	1230.00	138.00	Section 10/404	3H
3	83	UNT to Wadinger Creek	Matthews	37.503280	-76.417500	Perennial	RPW	R3	South	4.00	12.60	Section 404	31
4	84	UNT to Mill Creek	Middlesex	37.558893	-76.468024	Intermittent	RPW	R4	Northeast	2.00	9.00	Section 404	3E
2	S5	UNT to Rosegill Lake	Middlesex	37.618307	-76.569336	Ephemeral	NRPW	R6	East	10.00	24.00	Section 404	3C
9	98	UNT to Urbanna Creek	Middlesex	37.609903	-76.570838	Ephemeral	NRPW	R6	West	12.00	22.00	Section 404	3C
7	22	UNT to North River	Gloucester	37.454353	-76.468993	Intermittent	RPW	R4	Southeast	4.00	54.00	Section 404	31
8	88	UNT to North River	Gloucester	37.453852	-76.468088	Ephemeral	NRPW	R6	Southeast	4.50	147.00	Section 404	31
6	6S	UNT to North River	Gloucester	37.454461	-76.467861	Intermittent	MAN	R4	Southwest	10.00	108.00	Section 404	33
10	S10	UNT to Perkins Creek	Middlesex	37.639412	-76.578079	Intermittent	RPW	R4	West	13.00	126.00	Section 404	3A

Notes:

- 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.

- 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.

- In decimal degrees.

- RPW = Relatively Permanent Waters

- RPW = Traditional Navigable Waters

- TNW = Traditional Navigable Waters

- TNW = From Cowardin et al. 1979; see References. 0 π 4

2

Identified Wetlands Table 2.

	Figure	3H	3B	3B	3B	31	3H	31	3G	36	3F	3F	3E	3E	3D	33	3D	33	33	3J
	Open/Closed Boundary	Closed	Closed	Closed	Closed	Open	Open	Open	uadO	Closed	Open	Open	Closed	Closed	Open	Closed	Open	Open	Open	Open
	Size (square feet) ⁶	2,518	2,859	721	2,508	4,517	1,804	1,090	992	3,895	1,895	3,130	3,892	4,789	3,216	18,259	3,686	4,023	83,805	5,734
	Size (Acres) ⁶	0.05780	0.06564	0.01655	0.05758	0.10369	0.04142	0.02501	0.02277	0.08941	0.04350	0.07185	0.08936	0.10993	0.07384	0.41918	0.08461	0.09000	1.92000	0.13000
	Associated Waterbodies	Piankatank river	Urbanna Creek	Urbanna Creek	Urbanna Creek	UNT to Wadinger Creek	Piankatank River	UNT to Wadinger Creek	Wilton Creek	N/A	UNT to Scoggin Creek	Scoggin Creek	N/A	N/A	UNT to North River					
	Water Type ⁵	RPWWD	RPWWD	RPWWD	RPWWD	RPWWD	RPWWN	RPWWD	RPWWD	ISOLATE	RPWWD	RPWWN	ISOLATE	ISOLATE	RPWWD	RPWWD	RPWWD	RPWWN	RPWWN	RPWWN
Wetlands	HGM⁴	Riverine	Riverine	Slope	Slope	Slope	Slope	Slope	Slope	Depressional	Slope	Slope	Depressional	Depressional	Slope	Slope	Slope	Slope	Slope	Slope
Identified Wetlands	Cowardin Class ³	PEM	PEM	PEM	PEM	PFO	PEM	PFO	PEM	PEM	PFO	PSS	PEM	PEM	PEM	PFO	PEM	PUB	PSS	PEM
	Longitude ²	-76.420069	-76.571996	-76.575514	-76.419963	-76.417549	-76.423043	-76.418445	-76.421768	-76.432867	-76.451741	-76.454609	-76.471869	-76.474214	-76.486446	-76.468726	-76.490421	-76.472188	-76.471293	-76.473862
	Latitude ²	37.513581	37.629363	37.631185	37.507359	37.503319	37.521623	37.503972	37.529907	37.540568	37.554191	37.554596	37.560321	37.566080	37.579991	37.454564	37.584816	37.447841	37.446857	37.446056
	County	Middlesex	Middlesex	Middlesex	Middlesex	Mathews	Middlesex	Middlesex	Middlesex	Middlesex	Middlesex	Middlesex	Middlesex	Middlesex	Middlesex	Gloucester	Middlesex	Gloucester	Gloucester	Gloucester
	Wetland ID	W-MS1	W-MS2	W-MS3	W-MS4	W5-PFO	W6-PEM	W7-PFO	W8-PEM	W9-PEM	W10-PFO	W11-PSS	W12-PEM	W13-PEM	W14-PEM	W15-PFO	W16-PEM	GSA1-1	GSA1-2	GSA2-1
	Wetland Number ¹	1	2	3	4	2	9	7	80	6	10	11	12	13	14	15	16	17	18	19

Notes:

- Wetlands with multiple contiguous Cowardin types (e.g. PEM and PSS) are considered a single wetland system and are counted as one wetland.
- In decimal degrees. Coordinates show wetland test pit locations.
- PEM = Palustrine Emergent

- 2 8

- PFO = Palustrine Forested

- PSS = Palustrine Scrub-Shrub

- PUB = Palustrine Unconsolidated Bottom

- HGM = Hydrogeomorphic

- RPWWD = We'lands directly abutting Relatively Permanent Waters (RPWs) that flow directly or indirectly into Traditional Navigable Waterways (TNWs) - RPWWNN = 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 4 5

- Isolate = Isolated (interstate or intrastate) waters, including isolated wetlands

9

- 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.



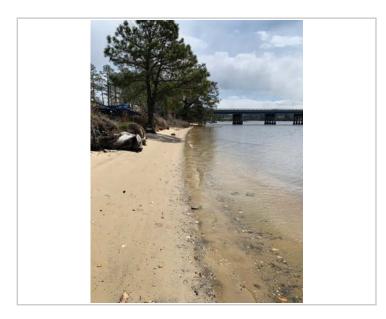
STREAM ID	S1		STREAM NA				
CLIENT HR	SD		PROJECT N				
LAT 37.5131	54 L o	ONG -76.419896				COUNTY Middlesex	
INVESTIGATO	ORS Emily	/ Foster, James C	Cook			DATE 07/09/2021	
WATER TYPE TNW 🗸	RPW	NRPW	FLOW REG Perennial	IME Intermi	ittent	Ephemeral	
					0.	*	4 8 18 1
		Top of Bank He	/idth:2,050 ft	ft	Gradi	ent <u>√</u> Flat Mo (0.5/100 ft) (2 ft/ m Erosion	_
		Water Depth: _			_	None <u>✓</u> Moderate	Heavy
		Water Width:			Artific	cial, Modified or Chanr	nelized
CHANNEL FE	ATURES		Water Mark (Width):	2 050 ft	✓	Yes No	
			Water Mark (Height)		Withi	n Roadside Ditch	
			East	"'		Yes <u>✓</u> No	
		I low birection.	Luot	-	Culve	ert Present Yes _	_ No
					Culve	rt Material:	
						rt Size:in	
FLOW		Water Present No water, str Stream bed Standing wa	ream bed dry moist ater		Propo Morpl Riffle	ortion of Reach Repres	er if water present)
FLOW CHARACTER	ISTICS	✓ Flowing wate	er		Turbi	ditv	
		Velocity			C	Clear <u>∠</u> Slightly tu	ırbid Turbid
			Moderate			Other	
		Slow					
INOR		UBSTRATE COM ld add up to 100				NIC SUBSTRATE COM not necessarily add u	
Substrate Type	Dia	meter	% Composition in Sampling Reach	Substrat Type	te	Characteristic	% Composition in Sampling Area
Bedrock				Detritus		sticks, wood, coarse	
Boulder		56 mm (10")			р	lant materials (CPOM)	
Cobble		6 mm (2.5"-10")	5	Muck-Muc	d b	plack, very fine organic	10
Gravel		mm (0.1"-2.5")				(FPOM)	10
Sand		-2mm (gritty)	90				
Silt		04-0.06 mm	5	Marl		grey, shell fragments	
Clay	< 0.00	04 mm (slick)			Flood	nlain Width	
WATERSHED FEATURES		✓ Forest	Other:	ıl	<u>√</u> W	plain Width ide > 30ft Modera arrow <15ft	te 15-30ft
MAC	ROINVER	TEBRATES/OTH	IER WILDLIFE OBS	ERVED OR	OTHE	R NOTES AND OBSER	RVATIONS
Estimated usin							
	9						

Stream ID <u>S1</u> Date <u>07/09/202</u>1



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	32			STREAM NAME Urbanna Creek					
CLIENT HR	SD		PROJECT N	AME Middl	lesex HRD TFM				
		ONG -76.57203			COUNTY Middlesex				
INVESTIGATO	ORS Emily	/ Foster, James (Cook		DATE 07/09/2021				
WATER TYPE TNW 🗸	RPW	NRPW	FLOW REG Perennial ✓		nittent Ephemeral				
				-					
		Top of Bank H	/idth:1,230 ft	ft	Sinuosity ✓ Low Moreover Market of the				
		Water Depth:			None✓ Moderate	Heavy			
CHANNEL FE	ATURES	Water Width:			Artificial, Modified or Char	nelized			
CHANNEL FE	ATURES	_	Water Mark (Width):	1200 ft	<u>√</u> Yes N	0			
		, ,	Water Mark (Height)		Within Roadside Ditch				
		Flow Direction			Yes✓ N	0			
				-	Culvert Present Yes .	No			
					Culvert Material:				
					Culvert Size:in				
FLOW		Water Presen No water, si Stream bed Standing w	tream bed dry moist rater		Proportion of Reach Repre Morphology Types (Only ent Riffle % Run 10 Pool %	er if water present)			
CHARACTER	ISTICS	✓ Flowing wat	er		Turbidity				
		Velocity			Clear _ <u>✓</u> Slightly	turbid Turbid			
		— Fast ✓	Moderate		Other				
INOR	GANIC SI	Slow UBSTRATE CO	MPONENTS		ORGANIC SUBSTRATE COI	MPONENTS			
iiioii		ld add up to 100			(does not necessarily add u				
Substrate Type	Dia	meter	% Composition in Sampling Reach	Substra Type	I (Tharacteristic	% Composition in Sampling Area			
Bedrock		(4011)		Detritus	sticks, wood, coarse plant materials (CPOM)				
Boulder		56 mm (10")			,				
Cobble		mm (2.5"-10")		Muck-Mu	black, very fine organic (FPOM)	10			
Gravel Sand		nm (0.1"-2.5")	90		(11 0111)	1 1			
		-2mm (gritty)		Marl	grey, shell fragments				
Silt Clay		04-0.06 mm 04 mm (slick)	10	IVIAII	grey, shell fragments				
WATERSHED FEATURES		Predominant ✓ Forest	Other:	ıl	Floodplain Width ✓ Wide > 30ft Moder Narrow <15ft	ate 15-30ft			
		•							
MAC	ROINVER	TEBRATES/OTI	HER WILDLIFE OBS	SERVED OF	R OTHER NOTES AND OBSE	RVATIONS			
Estimated usin	g photos/d	online data							

Stream ID S2 Date <u>07/09/202</u>1



Photograph Number __1

Photograph Direction NE

Comments: Southeast bank



Photograph Number __2

Photograph Direction SW

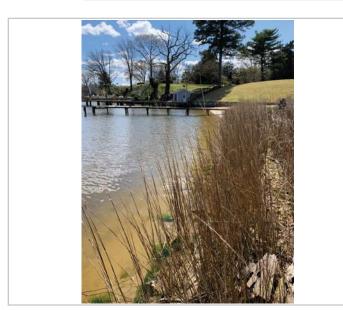
Comments: Southeast bank



Photograph Number 3

Photograph Direction North

Comments: Northwest bank



Photograph Number ___4

Photograph Direction South

Comments: Northwest bank

STREAM ID			STREAM NA			
CLIENT HR	SD		PROJECT N	NAME Middle	esex HRD TFM	
LAT	L	ONG	STATE Virg	inia	COUNTY Mathews	
INVESTIGAT	ORS Emily	/ Foster, James (Cook		DATE 7/9/21	
TNW	RPW v	/ NRPW	FLOW REG Perennial		ittent Ephemeral	
CHANNEL FE	ATURES	Top of Bank H LB _ 1 _ ft Water Depth: Water Width:_ Ordinary High Ordinary High	Vidth: <u>4.5</u> ft leight: RB <u>1</u> 2 in	: <u>4</u> ft): <u>4</u> in	Sinuosity Low Mo Gradient Flat	derate Severe /100 ft)
FLOW CHARACTER	ISTICS	Water Presen No water, si Stream bed Standing water Flowing water Velocity Fast Slow	tream bed dry I moist vater ter		Proportion of Reach Repres Morphology Types (Only ente Riffle 45 % Run 50 Pool 5 % Turbidity Clear Slightly to Other	er if water present) %
INOR		UBSTRATE COM			ORGANIC SUBSTRATE COM (does not necessarily add u	
Substrate Type	Dia	meter	% Composition in Sampling Reach	Substrat Type	Characteristic	% Composition in Sampling Area
Bedrock	_			Detritus	sticks, wood, coarse	
Boulder	!	56 mm (10")			plant materials (CPOM)	
Cobble	 	6 mm (2.5"-10")		Muck-Muck	black, very fine organic (FPOM)	
Gravel Sand	 	mm (0.1"-2.5") -2mm (gritty)	100		(11 01/1)	
Silt		94-0.06 mm	100	Marl	grey, shell fragments	
Clay		04 mm (slick)			groy, choir nagmonts	
Predominant Surrey ✓ Forest — Field/Pasture — Agricultural — ROW Canopy Cover			Residentia Other:	al I	Floodplain Width Wide > 30ft Modera Narrow <15ft	ate 15-30ft
		<u> </u>				
MAC	ROINVER	TEBRATES/OTI	HER WILDLIFE OR	SERVED OR	OTHER NOTES AND OBSER	RVATIONS
			nnows and macroinv		OHEN NOTES AND OBSER	WAIIONO

Stream ID _	S3	Date <u>7/9/21</u>	
Photograph I	Number _	1	Photograph Number 2
Photograph I	Direction <u>I</u>	NE	Photograph Direction
Comments:	Photograp	oh facing into culvert.	Comments:
'			
Photograph	Number _	3	Photograph Number4
Photograph			Photograph Direction
Comments:			Comments:

STREAM ID				STREAM NA		to Mill C		
CLIENT HR	SD			PROJECT N	AME HRS	D Middle	sex TFM	
LAT 37.55889	93 <u>L</u>	ONG - 76.468024	4	STATE Virgin			COUNTY Middlesex	
INVESTIGATO	ORS Emily	y Foster, Katelyr	n Hoisir	ngton			DATE 7/15/21	
WATER TYPE TNW	RPW v	/ NRPW		FLOW REGI Perennial	IME Interm	nittent 🗸	Ephemeral	
CHANNEL FE	ATURES	Water Depth: Water Width:_ Ordinary High	Width: _ Height: t2 n Water n Water	BB 3 ft RB 3 ft in ft Mark (Width):	ft	Stream Stream Artification Within Culve	ent / Flat _ Mo (0.5/100 ft) (2 ft/ m Erosion None _ Moderate sial, Modified or Changyes _ None Roadside Ditch Yes _ / Nort Present / Yes _ t Material: Concrete	derate Severe 100 ft) (10 ft/100 ft) Heavy nelized
FLOW CHARACTER	ISTICS	Water Preser No water, s Stream bec Standing wa Flowing wa Velocity Fast Slow	stream I d moist vater ater	•		Propo Morph Riffle Pool Turbid	dity	
INOR		UBSTRATE CO					NIC SUBSTRATE COM	
Substrate Type	Dia	meter		Composition in mpling Reach	Substra Type		Characteristic	% Composition in Sampling Area
Bedrock					Detritus	sticks, wood, coarse		
Boulder		56 mm (10")				─	lant materials (CPOM)	
Cobble		6 mm (2.5"-10")			Muck-Mu	ıd b	lack, very fine organic (FPOM)	
Gravel Sand		mm (0.1"-2.5") -2mm (gritty)	90	1)			(i i Oivi)	
Sand		-2mm (gritty) 04-0.06 mm	10		Marl		grey, shell fragments	
Clay		04 mm (slick)	10	U	IVICIT		groy, snon nagments	
WATERSHED FEATURES	I	` ,	ture _ al _	unding Landu Commercia Industrial Residential Other: Partly shade	I	Wi	olain Width de > 30ft Modera errow <15ft	ate 15-30ft
BA A C	POINVED	TERDATESIOT	HED IV	VII DI IEE OBS	EDVED OF	э Отигі	R NOTES AND OBSER	PVATIONS
								CHICITAL
Recent umber	ııaıvest ac	ljacent to roadsid	ue, sire	anı bed distuft	oeu nom ne	zavy mac	линегу.	

Stream ID <u>S4</u> Date <u>7/15/21</u>



Photograph Number __1__

Photograph Direction North

Comments:



Photograph Number 2

Photograph Direction South

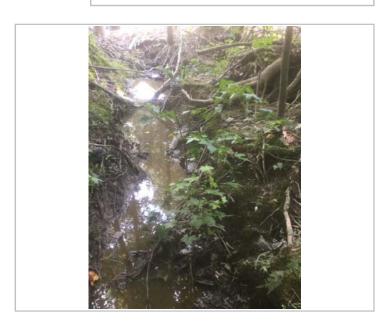
Comments:



Photograph Number 3

Photograph Direction East

Comments:



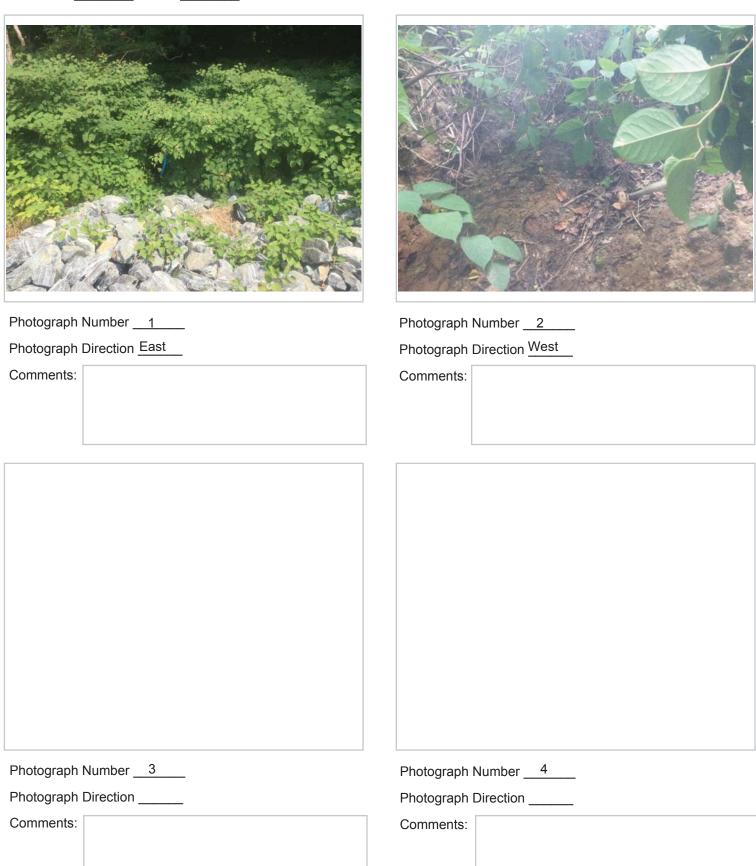
Photograph Number <u>4</u>

Photograph Direction West

Comments:

STREAM ID	S5				Rosegill Lake	
CLIENT HR	SD		PROJECT N	AME MISPII		
LAT 37.6183	07 L	ONG -76.569336			COUNTY Middlesex	
INVESTIGATO	ORS Emily	/ Foster			DATE 07/29/2021	
WATER TYPE TNW	RPW	NRPW ✓	FLOW REG Perennial	IME Intermit	tent Ephemeral 🗸	
CHANNEL FE	ATURES	Top of Bank House LB 5.0 ft Water Depth: Water Width: Ordinary High	/idth:10.0ft eight: RB5.0 0.00in0.0ft Water Mark (Width): Water Mark (Height) : East	ft :in 	Sinuosity Low Gradient Flat Moderate	oderate
FLOW CHARACTER	ISTICS	✓ No water, st Stream bed Standing water Flowing water Velocity Fast Slow	ream bed dry moist ater er		Morphology Types (Only ent Riffle % Run Pool % Turbidity Clear Slightly to ther	er if water present) %
INOR		JBSTRATE CON d add up to 100			DRGANIC SUBSTRATE COM (does not necessarily add u	
	(snou	u auu up to 100	70) °		does not necessarily add t	ip to 100%)
Substrate Type		meter To Too	% Composition in Sampling Reach	Substrate Type		1
Type Bedrock	Dia	meter	% Composition in	Substrate	Characteristic sticks, wood, coarse	% Composition in Sampling Area
Type Bedrock Boulder	Dia	meter 56 mm (10")	% Composition in	Substrate Type	Characteristic sticks, wood, coarse plant materials (CPOM)	% Composition in Sampling Area
Type Bedrock Boulder Cobble	> 25 64-256	meter 56 mm (10") 5 mm (2.5"-10")	% Composition in	Substrate Type	Characteristic sticks, wood, coarse plant materials (CPOM) black, very fine organic	% Composition in Sampling Area
Type Bedrock Boulder Cobble Gravel	Dia > 25 64-256 2-64 r	meter 56 mm (10") mm (2.5"-10") nm (0.1"-2.5")	% Composition in	Substrate Type Detritus	Characteristic sticks, wood, coarse plant materials (CPOM)	% Composition in Sampling Area
Type Bedrock Boulder Cobble Gravel Sand	> 25 64-256 2-64 r	meter 56 mm (10") 5 mm (2.5"-10") nm (0.1"-2.5") -2mm (gritty)	% Composition in	Substrate Type Detritus Muck-Mud	Characteristic sticks, wood, coarse plant materials (CPOM) black, very fine organic (FPOM)	% Composition in Sampling Area
Type Bedrock Boulder Cobble Gravel Sand Silt	> 25 64-256 2-64 r 0.06	meter 56 mm (10") 56 mm (2.5"-10") 75 mm (2.5"-2.5") 75 mm (gritty) 76 mm	% Composition in	Substrate Type Detritus	Characteristic sticks, wood, coarse plant materials (CPOM) black, very fine organic	% Composition in Sampling Area
Type Bedrock Boulder Cobble Gravel Sand	> 29 64-256 2-64 r 0.06 0.00 < 0.00	meter 56 mm (10") 5 mm (2.5"-10") nm (0.1"-2.5") -2mm (gritty) 4-0.06 mm 14 mm (slick) Predominant Forest	% Composition in Sampling Reach Surrounding Landu Commercia I Residential Other:	Substrate Type Detritus Muck-Mud Marl	Characteristic sticks, wood, coarse plant materials (CPOM) black, very fine organic (FPOM)	% Composition in Sampling Area
Type Bedrock Boulder Cobble Gravel Sand Silt Clay WATERSHED FEATURES	Dia > 29 64-256 2-64 r 0.06 0.00 < 0.00	meter 56 mm (10") 5 mm (2.5"-10") nm (0.1"-2.5") -2mm (gritty) 4-0.06 mm 14 mm (slick) Predominant Forest Field/Pastu Agricultura ROW Canopy Covel Open Shaded	% Composition in Sampling Reach Surrounding Landu — Commerciaure — Industrial I — Residential — Other: r — Partly shad	Substrate Type Detritus Muck-Mud Marl see ed	Characteristic sticks, wood, coarse plant materials (CPOM) black, very fine organic (FPOM) grey, shell fragments Floodplain Width Wide > 30ft Moder	% Composition in Sampling Area

Stream ID <u>S5</u> Date <u>07/29/202</u>1



STREAM ID	36		STREAM NA	STREAM NAME UNT to Urbanna Creek					
CLIENT HR	SD		PROJECT N						
		ONG -76.57083			C	COUNTY Middledex			
INVESTIGATO	ORS Emily	/ Foster, Kristen	Walls			DATE 7/29/21			
WATER TYPE TNW	RPW	NRPW _	FLOW REG Perennial	IME Intermi	ittent	Ephemeral 🗸			
		Estimato Mos	euromonte	ı	Sinuos	sity / Low	Modium High		
CHANNEL FE	ATURES	Top of Bank H LB7ft Water Depth: Water Width:_ Ordinary High	Vidth:ft leight:	1ft	Stream Artifici Within	n Erosion None Moderate al, Modified or Chan /es No Roadside Ditch Yes No	oderate Severe (10 ft/100 ft) — Heavy nelized		
						t Present Yes _			
						Material:			
FLOW	107100	Water Presen ✓ No water, s _ Stream bed _ Standing w _ Flowing wa	tream bed dry I moist vater		Propor				
CHARACTER	STICS	Velocity — Fast — Slow				ity ear Slightly t her	urbid Turbid		
INOR		UBSTRATE COI				IC SUBSTRATE COM ot necessarily add u			
Substrate Type	Dia	meter	% Composition in Sampling Reach	Substrat Type	te	Characteristic	% Composition in Sampling Area		
Bedrock				Detritus		sticks, wood, coarse			
Boulder		56 mm (10")			plant materials (CPOM)				
Cobble		6 mm (2.5"-10")	_	Muck-Muc	d bla	ack, very fine organic			
Gravel		mm (0.1"-2.5")	5			(FPOM)			
Sand		-2mm (gritty)	75			anne y als all fine area area.			
Silt		04-0.06 mm	22	Marl	g	rey, shell fragments			
Clay WATERSHED FEATURES		✓ Forest	Other:	ıl	Wic	lain Width le > 30ft Moder: rrow <15ft	Late 15-30ft		
MAC	ROINVER	TEBRATES/OT	HER WILDLIFE OBS	ERVED OR	OTHER	NOTES AND OBSE	RVATIONS		

Stream ID <u>S6</u> Date <u>7/29/21</u>

<u></u>	
Photograph Number1	Photograph Number2
Photograph Direction East	Photograph Direction West
Comments:	Comments:
Photograph Number3	Photograph Number <u>4</u>
Photograph Direction	Photograph Direction
Comments:	Comments:

T	>=				N # D:	1	
STREAM ID					o North River		
CLIENT HR:					esex Interconnector Phase II		
LAT 37.4543	53 <u>L</u>	ONG -76.46899	3 STATE Virgi	inia	COUNTY Gloucester		
INVESTIGATO	ORS K. Ho	oisington, D. Pair	nter		DATE 09/03/2021		
TNW	WATER TYPE TNW RPW NRPW Perennial Intermittent Flow REGIME Perennial Intermittent Flow Regime Perennial Intermittent Flow Regime						
		Estimate Mea			Sinuosity ✓ Low N	Medium High	
		Top of Bank V	Vidth: <u>3.0</u> ft leight:		Gradient Flat Mo (0.5/100 ft) (2 ft/	derate Severe /100 ft) (10 ft/100 ft)	
		LB <u>2.0</u> ft	RB <u>2.0</u>	ft	Stream Erosion	, , ,	
		Water Depth:	in		None✓ Moderate	Heavy	
CHANNEL FE	ATURES	Water Width:_	2.0 ft		Artificial, Modified or Chann		
OHARRE I E	ATORLO	Ordinary High	Water Mark (Width)	: <u>4.0</u> ft	<u>✓</u> Yes No		
		Ordinary High	Water Mark (Height	:): <u>4.0</u> in	Within Roadside Ditch		
		Flow Direction	n: Southeast		Yes <u>✓</u> No		
				_	Culvert Present Yes _		
					Culvert Material:Concrete		
					Culvert Size: 24in		
		Water Presen	tream bed dry		Proportion of Reach Repres Morphology Types (Only ente	er if water present)	
		Stream bed Standing w			Riffle % Run Pool 10(▼ %	%	
FLOW	OTIOO	Standing w			7001 104 70		
CHARACTERISTICS -					Turbidity	· · · · · · · · · · · · · · · · · · ·	
		Velocity			Clear Slightly to Other	pidru bidru	
		Fast Slow	Moderate		Other		
		_					
		UBSTRATE COI)%) 100		ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Dia	meter	% Composition in Sampling Reach		te Characteristic	% Composition in Sampling Area	
Bedrock				Detritus	sticks, wood, coarse		
Boulder		56 mm (10")			plant materials (CPOM)	10 💌	
Cobble		6 mm (2.5"-10")	—	Muck-Mu	d black, very fine organic		
Gravel		mm (0.1"-2.5")	10		(FPOM)		
Sand		-2mm (gritty)	70 🔲	NAI			
Silt)4-0.06 mm	20 💌	Marl	grey, shell fragments		
Clay	< 0.00	04 mm (slick)	Common dim and a med		Floodplain Width		
		Predominant ✓ Forest	Surrounding Land Commercia		Wide > 30ft Modera	ate 15-30ft	
			ure Industrial	a.	✓ Narrow <15ft		
WATEROUER		Agricultura	al 🗸 Residentia	ıl			
WATERSHED FEATURES		ROW	Other:				
		Canopy Cove					
		— Open	Partly shac	ded			
		<u>✓</u> Shaded	_ ′				
MAC	POIN/EP	TERPATES/OT	HER WILDLIEE OR	SEBVED OF	ROTHER NOTES AND OBSER	PVATIONS	
Weak evidence			wei bed willi balik. S	шеат арреа	ars to go under the surface betw	reen 37 and 36.	
	,						
Flare complete	ly separat	ed from pipe.					

Stream ID <u>S7</u> Date <u>09/03/202</u>1



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 _____

STREAM ID			STREAM NA				
CLIENT HR			PROJECT N	AME Middle	esex Interconnector Phase II		
LAT 37.4538	52 <u>L</u>	ONG -76.46808	8 STATE Virgin	nia	COUNTY Gloucester		
INVESTIGATO	ORS K. Ho	isington, D. Pair	nter		DATE 09/03/2021		
TNW	RPW	NRPW _	FLOW REG Perennial		ittent 🗸 Ephemeral 🗸		
		Estimate Mea			Sinuosity Low	Medium High	
		Top of Bank ⊦	Vidth: <u>3.0</u> ft leight: RB <u>2.0</u> 1	ft	Stream Erosion	/100 ft) (10 ft/100 ft)	
		Water Depth:	6.00 in		None _✓ Moderate	Heavy	
CHANNEL FE	ATUDES	Water Width:_	2.5 ft		Artificial, Modified or Chan	nelized	
CHANNEL FE	ATURES	Ordinary High	Water Mark (Width):	1.0 ft	Yes _ <u>✓</u> No)	
		, ,	Water Mark (Height)		Within Roadside Ditch		
			: Southeast	0_ III	Yes <u>✓</u> No	1	
		Flow Direction	Southeast	-	Culvert Present Yes	/ No	
					Culvert Material:	_	
					Culvert Size:in		
Water Present No water, stream Stream bed mois Standing water			tream bed dry I moist vater		Proportion of Reach Representation Morphology Types (Only enter Riffle 0	er if water present)	
CHARACTER	ISTICS	✓ Flowing war	lei		Turbidity		
		Velocity — Fast ✓ Slow	Moderate		✓ Clear Slightly turbid Turbid Turbid Other		
				ORGANIC SUBSTRATE COM (does not necessarily add u			
Substrate Type	Dia	meter	% Composition in Sampling Reach	Substrat Type	te Characteristic	% Composition in Sampling Area	
Bedrock				Detritus	sticks, wood, coarse		
Boulder	> 2	56 mm (10")		Dountab	plant materials (CPOM)	5	
Cobble	64-256	5 mm (2.5"-10")		Muck-Muc	black, very fine organic		
Gravel	2-64 r	nm (0.1"-2.5")		WIGOK WIG	(FPOM)		
Sand	0.06	-2mm (gritty)	90 🗔				
Silt	0.00	4-0.06 mm	10	Marl	grey, shell fragments		
Clay	< 0.00	04 mm (slick)					
Predominant Surrounding Landuse ✓ Forest — Commercial — Field/Pasture — Industrial — Agricultural ✓ Residential — ROW — Other: Canopy Cover — Open — Partly shaded ✓ Shaded Ploodplain Width — Wide > 30ft — Moderate 15-30ft ✓ Narrow <15ft Narrow <15ft Partly shaded							
MAC	ROINVER	TEBRATES/OT	HER WILDLIFE OBS	ERVED OR	OTHER NOTES AND OBSER	RVATIONS	
			s (dragonfly nymph).				
			n) between S7 and S8	3.			

Stream ID <u>S8</u> Date <u>09/03/202</u>1



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:

		T	UNIT 4	a Namb Diver		
STREAM ID S9	T	STREAM NA				
CLIENT HRSD				esex Interconnector Phase II COUNTY Gloucester		
	LONG -76.467861	STATE Virgin	lla			
	K. Hoisington, D. Painter	T 51 OW DEC		DATE 09/03/2021		
TNW RP	W / NRPW	Perennial		ittent 🖊 Ephemeral 🗌		
	Estimate Measure	ments		Sinuosity Low N	Medium ✓ High	
	Top of Bank Width: Top of Bank Height LB <u>2.0</u> ft Water Depth: <u>7.00</u>	t: RB <u>2.0</u> f	ft	Gradient ✓ Flat (0.5/100 ft) Moderate (2 ft/100 ft) Severe (10 ft/100 ft) Stream Erosion Moderate Heavy		
CHANNEL FEATUR	Water Width: 2.0	ft		Artificial, Modified or Chann		
CHANNEL FEATOR	Ordinary High Wate	er Mark (Width):	1.0 ft	Yes _ <u>✓</u> No		
	Ordinary High Wate			Within Roadside Ditch		
	Flow Direction: Sou	utheast	-	Yes✓ No		
				Culvert Meterials		
				Culvert Material:		
	Markey Branch			Culvert Size:in	1.11	
Water Present No water, stream Stream bed moist Standing water FLOW CHARACTERISTICS Flowing water		st		Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle 10 % Run 80 % Pool 10 %		
CHARACTERISTICS Velocity Fast ✓ Moder Slow		derate		Turbidity ✓ Clear Slightly turbid Turbid Other		
				ORGANIC SUBSTRATE COM (does not necessarily add up		
Substrate Type		Composition in ampling Reach	Substra Type	Characteristic	% Composition in Sampling Area	
Bedrock			Detritus	sticks, wood, coarse		
Boulder	> 256 mm (10")		Dounted	plant materials (CPOM)	10 🗷	
	1-256 mm (2.5"-10")		Muck-Mu	d black, very fine organic		
	2-64 mm (0.1"-2.5")			(FPOM)		
		90 🔲	NA-wi			
Silt Clay <	0.004-0.06 mm 1 0.004 mm (slick)	0	Marl	grey, shell fragments		
Predominant Surrounding Landuse ✓ Forest — Commercial — Field/Pasture — Industrial — Agricultural ✓ Residential — ROW — Other: Canopy Cover — Open — Partly shaded ✓ Shaded Predominant Surrounding Landuse — Wide > 30ft — Moderate 15-30ft — Wide > 30ft — Moderate 15-30ft — Wide > 30ft — Moderate 15-30ft — Vide > 30ft — Moderate 15-30ft — Narrow <15ft						
,	· ·					
MACROIN	VERTEBRATES/OTHER	WILDLIFE OBS	ERVED OF	R OTHER NOTES AND OBSER	VATIONS	
A square concrete st		m is on a concre	ete platform	in the stream. Possibly a "soak		
Many macroinverteb	rates.					
Iron oxidized bacteria	а.					

Stream ID <u>S9</u> Date <u>09/03/202</u>1



Photograph Number ___1___

Photograph Direction East

Comments:



Photograph Number 2

Photograph Direction West

Comments:

Photograph Number 3

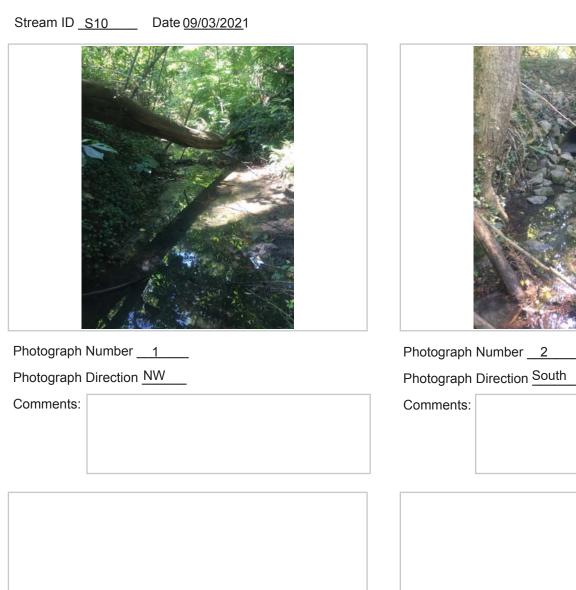
Photograph Direction _____

Comments:

Photograph Number _	4
Photograph Direction	
Comments:	

Johnnerus.		

1							
STREAM ID S10				to Perkins Creek			
CLIENT HRSD		PROJECT N	AME Midd	dlesex Interconnector Phase II			
LAT 37.639412	LONG -76.578079	STATE Virgin	nia	COUNTY Middlesex			
INVESTIGATORS K.	Hoisington, D. Painter			DATE 09/03/2021			
WATER TYPE TNW RPW	✓ NRPW	FLOW REG Perennial		nittent Fphemeral			
CHANNEL FEATURES Estimate Measurements Top of Bank Width:13.0 ft Top of Bank Height: LB18.0 ft				Mildelin Decelete Direct			
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 (does not necessarily add up to 100%)							
Substrate Type		Composition in ampling Reach	Substra Type	Characteristic % Composi Sampling			
Bedrock			Detritus	sticks, wood, coarse			
	256 mm (10")		Dountas	plant materials (CPOM)	10 🔽		
Cobble 64-2	56 mm (2.5"-10")		Muck-Mu	black, very fine organic			
<u> </u>	4 mm (0.1"-2.5")			(FPOM)			
		00 🔲	Marit				
	004-0.06 mm		Marl	grey, shell fragments			
Clay < 0.004 mm (slick) Predominant Surrounding Landuse ✓ Forest — Commercial — Field/Pasture — Industrial — Agricultural ✓ Residential — ROW ✓ Other: Recreational Canopy Cover — Open — Partly shaded ✓ Shaded							
MACROINVI	ERTEBRATES/OTHER	WILDLIFE OBS	ERVED OI	R OTHER NOTES AND OBSER	RVATIONS		
Oxidizing bacteria.							
	Jrbanna Pump Station.						
Riprap placed atop cor	•						



Photograph Number 3

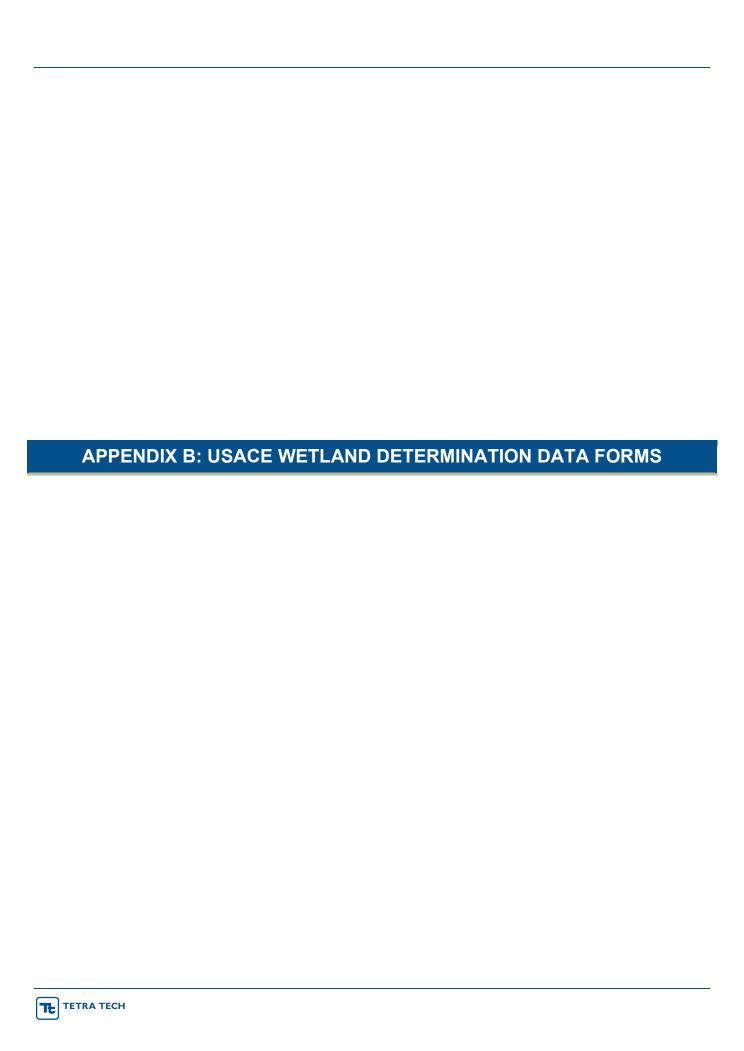
Photograph Direction _____

Comments:

Photograph Number ___4___

Photograph Number __4 ___
Photograph Direction _____

Comments:



Project/Site: HRSD Middlesex TFM	City/County: Middl	esex	Sampling Date: 04/02/2021
Applicant/Owner: HRSD	- , , <u></u>	State: V	Sampling Date: 04/02/2021 A Sampling Point: W1 PEM
Investigator(s): Emily Foster, James Cook	Section, Township.	Range:	
			Concave Slope (%): 5
Subregion (LRR or MLRA): MLRA 153B of LRR Lat: 37.5	13581	Long: -76.4200	69 Datum: WGS84
Soil Map Unit Name: Eunola Ioam		NW	I classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of y			
Are Vegetation, Soil, or Hydrology significantl			
Are Vegetation, Soil, or Hydrology naturally p			ny answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showin			
Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present? Remarks:	within a We	tland?	/es X No
Linear emergent drainage/PEM at north side of side of Piankatank due to steep cliff. Will have			
HYDROLOGY			
Wetland Hydrology Indicators:			ary Indicators (minimum of two required)
Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	13) 5) (LRR U) Odor (C1) heres along Living Rocced Iron (C4) ction in Tilled Soils (Ce (C7)	Spa Dra Dra Mos Dry Cra Cf6 Sat Geo Sha FAC	face Soil Cracks (B6) ursely Vegetated Concave Surface (B8) inage Patterns (B10) ss Trim Lines (B16) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Imagery (C9) omorphic Position (D2) ullow Aquitard (D3) C-Neutral Test (D5) nagnum moss (D8) (LRR T, U)
Field Observations:	. 1		
Surface Water Present? Yes X No Depth (inche Water Table Present? Yes No Depth (inche Saturation Present? Yes No Depth (inche (includes capillary fringe)	s):	Wetland Hydrolog	y Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial pho	tos, previous inspecti	ons), if available:	
Remarks:			

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

EGETATION (Four Strat	a) – Use scientific r	names of pl	ants.		Sampling Point: W 1 PEM
			Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:	,		Species?		Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
1					That Are OBL, FACW, or FAC: 1 (A)
2					Total Number of Dominant
3					Species Across All Strata: 2 (B)
4					Percent of Dominant Species
5					That Are OBL, FACW, or FAC: 50 (A/B)
6					Prevalence Index worksheet:
7					Total % Cover of: Multiply by:
8					OBL species 80 $x 1 = 80$
			= Total Cov		FACW species x 2 =
	50% of total cover:	20% of	total cover	·	FAC species x 3 =
Sapling/Shrub Stratum (Plot siz	e:)				FACU species 20 x 4 = 80
1					UPL species x 5 =
2					Column Totals: 100 (A) 160 (B)
3					Column Totals: 100 (A) 100 (B)
4					Prevalence Index = B/A = 1.6
5					Hydrophytic Vegetation Indicators:
6					1 - Rapid Test for Hydrophytic Vegetation
7					2 - Dominance Test is >50%
8				-	3 - Prevalence Index is ≤3.0 ¹
		:	= Total Cov	er	Problematic Hydrophytic Vegetation ¹ (Explain)
	50% of total cover:	20% of	total cover		
Herb Stratum (Plot size:)				¹ Indicators of hydric soil and wetland hydrology must
1. Juncus effusus Soft rush		80	Yes	OBL	be present, unless disturbed or problematic.
2. Poa pratensis Kentucky blueg	rass	20	Yes	FACU	Definitions of Four Vegetation Strata:
3					Tree Meady plants evaluding vines 2 in (7.6 cm) or
4					Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
5.					height.
6.					Sapling/Shrub – Woody plants, excluding vines, less
7.					than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.					Hank All hank account (ran woods) plants no condition
9.					Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10.				-	
11				-	Woody vine – All woody vines greater than 3.28 ft in height.
12.				-	noight.
12.			= Total Cov	or	
	50% of total cover:				
Woody Vine Stratum (Plot size:			total oover		
1				-	
2				-	
3					
4				-	
5					Hydrophytic Vegetation
	500/ / / /		= Total Cov		Present? Yes X No No
	50% of total cover:		total cover		
Remarks: (If observed, list morp	ohological adaptations be	elow).			

SOIL Sampling Point: W 1 PEM

		e to the dep	th needed to docu			or confirn	n the absence	of indicate	ors.)	
Depth (inches)	Matrix Color (moist)	%	Color (moist)	ox Feature %	SType ¹	Loc ²	Texture		Remarks	
0-3	10YR 2/1	100			. ,,,,,		sepsis	high orga		
3-18	10YR 4/2	98	10YR 5/6	2			sandy loam			
0.10	1011(4/2		10111 0/0				- Janay Ioani	-		
				_						
1Typo: C-C	oncontration D_Da	nlotion PM		S-Maska	d Sand Gr	aine	² Location:	DI -Poro I	ining, M=Matr	
			LRRs, unless othe			all is.			matic Hydric	
☐ Histosol			Polyvalue Be		•	RR S. T. U		Muck (A9) (I	-	
	oipedon (A2)		Thin Dark S		. , .		. —	Muck (A10)	•	
	stic (A3)		Loamy Muck			R O)				MLRA 150A,B)
	en Sulfide (A4)		Loamy Gley		(F2)) (LRR P, S, T)
	d Layers (A5)	D T II)	Depleted Ma		-0)			_	Loamy Soils	(F20)
	Bodies (A6) (LRR lucky Mineral (A7) (L		Redox Dark Depleted Da		,		1 1 '	RA 153B) arent Mater	ial (TE2)	
	esence (A8) (LRR		Redox Depr						k Surface (TF	12)
	uck (A9) (LRR P, T)		Marl (F10) (I		0)			(Explain in I	•	/
	d Below Dark Surfa		Depleted Oc	hric (F11)	(MLRA 1	51)	_	` '	,	
l '=	ark Surface (A12)		Iron-Mangar						drophytic vege	
	rairie Redox (A16)	•	· =			', U)			ogy must be p	
_	Mucky Mineral (S1) Bleyed Matrix (S4)	(LRR O, S)	Delta Ochric			OA 150B)		ess disturbe	ed or problema	atic.
_	Redox (S5)		Reduced Ve							
	Matrix (S6)						RA 149A, 153C	i, 153D)		
_	rface (S7) (LRR P,	S, T, U)	_	Ü	`	, ,	•	. ,		
Restrictive I	Layer (if observed):								
Type:										
Depth (in	ches):						Hydric Soil	Present?	Yes X	No
Remarks:										

Photograph Log

Date: ____ Feature Name: W1 PEM Photograph Direction North Photograph Direction South Comments: Comments: Photograph Direction _____ Photograph Direction _____ Comments: Comments:

Project/Site: HRSD Middlese	ex TFM	City/Co	ounty: Middlesex		Sampling Date: 04/02/2021
Applicant/Owner: HRSD				State: VA	Sampling Date: 04/02/2021 Sampling Point: W1UP
Investigator(s): Emily Foster,			n, Township, Range: _		
Landform (hillslope, terrace, etc					Slope (%): 5
Subregion (LRP or MLPA): MI	LRA 153B of LRR	1 at: 37.507361	Long:	-76.419958	Datum: WGS84
Soil Map Unit Name: Steep sa	andy land	_ Lat	Long	NWI classific	cation: N/A
Are climatic / hydrologic conditi	ons on the site typical for	this time of year? Ye			
Are Vegetation, Soil	, or Hydrology	significantly disturb	ed? Are "Norma	al Circumstances"	present? Yes X No
Are Vegetation, Soil				explain any answe	
					s, important features, etc.
Hydrophytic Vegetation Prese	ont? Voc	No X			
Hydric Soil Present?		No X	Is the Sampled Area		V
Wetland Hydrology Present?			within a Wetland?	Yes	No X
HYDROLOGY					
Wetland Hydrology Indicate	ore:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum		all that annly)		Surface Soil	
Surface Water (A1)		atic Fauna (B13)			getated Concave Surface (B8)
High Water Table (A2)		Deposits (B15) (LRR	U)	Drainage Pa	
Saturation (A3)		rogen Sulfide Odor (C		Moss Trim L	
Water Marks (B1)	Oxid	lized Rhizospheres ald	ong Living Roots (C3)	Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Pres	ence of Reduced Iron	(C4)	Crayfish Bur	rows (C8)
Drift Deposits (B3)		ent Iron Reduction in	Tilled Soils (C6)		isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)		Muck Surface (C7)		= '	Position (D2)
Iron Deposits (B5)		er (Explain in Remarks	5)	Shallow Aqu	` '
Inundation Visible on Aer Water-Stained Leaves (B	o , , ,			FAC-Neutral	moss (D8) (LRR T, U)
Field Observations:	9)			Opinagrium i	11033 (D0) (ERR 1, 0)
Surface Water Present?	Yes No _X	Depth (inches):			
Water Table Present?	Yes No X				
Saturation Present?	Yes No			Hydrology Presei	nt? Yes No_X
(includes capillary fringe) Describe Recorded Data (stre				ailabla:	
Describe Recorded Data (stre	am gauge, monitoring we	eii, aeriai pnotos, prev	rious inspections), if av	allable:	
Remarks:					
Nomano.					
1					

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

Cover cover: FACU FACU FACU FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/ Prevalence Index worksheet:
Cover Cover FACU FACU FACU FACU	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/ 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) (E) Prevalence Index = B/A = Hydrophytic Vegetation 1 - Rapid Test for Hydrophytic Vegetation 1 - Problematic Hydrophytic Vegetation 1 (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover Inver: FACU FACU FACU FACU	Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: O 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 Column Totals: An improve April (A) Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover Cover FACU FACU FACU FACU	Species Across All Strata: 3 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/ Prevalence Index worksheet:
Cover Cover FACU FACU FACU FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/ Prevalence Index worksheet:
Cover Cover Cover FACU FACU FACU FACU	That Are OBL, FACW, or FAC: 0 (A/ Prevalence Index worksheet:
Cover Cover PACU FACU FACU FACU	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) (E Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover Cover FACU FACU FACU FACU	Total % Cover of: Multiply by:
Cover Cover FACU FACU FACU FACU	OBL species
Cover Cover PACU FACU FACU FACU	FACW species
Cover ver: FACU FACU FACU	FAC species
Cover iver: FACU FACU FACU	FACU species x 4 =
Cover iver: FACU FACU FACU	UPL species x 5 =
Cover iver: FACU FACU FACU	Column Totals:
Cover over: FACU FACU FACU	Prevalence Index = B/A =
Cover over: FACU FACU FACU	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover over: FACU FACU FACU	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover over: FACU FACU FACU FACU	1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover over: FACU FACU FACU	2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
Cover over: FACU FACU FACU	3 - Prevalence Index is ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
FACU FACU FACU	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:
FACU FACU FACU	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
FACU FACU	be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
FACU FACU	be present, unless disturbed or problematic. Definitions of Four Vegetation Strata:
FACU FACU	Definitions of Four Vegetation Strata:
FACU	
_	- \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	Tree – Woody plants, excluding vines, 3 in. (7.6 cm)
	 more in diameter at breast height (DBH), regardless height.
	•
	than 3 in. DBH and greater than 3.28 ft (1 m) tall.
	Herb – All herbaceous (non-woody) plants, regardles
	of size, and woody plants less than 3.28 ft tall.
	Woody vine - All woody vines greater than 3.28 ft in
	height.
Cover	
ver:	
	Hydrophytic
Cover	Vegetation
ver:	Present?
(Cover ver:

SOIL Sampling Point: W1 - UP

Profile Desc	cription: (Describe	to the depth	needed to docu	ment the in	dicator	or confirm	the absence o	f indicato	rs.)	
Depth	Matrix			x Features			_			
(inches)	Color (moist)		Color (moist)		Type ¹	Loc ²	<u>Texture</u>		Remarks	
0-18	10YR 3/3						sandy loam			
-										
<u> </u>	-									
¹Type: C=C	oncentration, D=De	nletion RM-R	educed Matrix M	S-Masked S	Sand Gr	ains	² Location: F	PI =Pore Li	ning, M=Matri	Υ
	Indicators: (Appli					unio.			natic Hydric	
☐ Histosol			Polyvalue Be		•	RRSTI			-	
	pipedon (A2)		Thin Dark Su					ick (A10) (•	
	istic (A3)		Loamy Muck							MLRA 150A,B)
	en Sulfide (A4)		Loamy Gley	ed Matrix (F	2)	•				(LRR P, S, T)
Stratifie	d Layers (A5)		Depleted Ma	trix (F3)			Anomalo	ous Bright	Loamy Soils (F20)
	Bodies (A6) (LRR I		Redox Dark				1 1 '	A 153B)		
	ucky Mineral (A7) (L		Depleted Da					ent Materi	, ,	
	resence (A8) (LRR		Redox Depre)				Surface (TF1	2)
	uck (A9) (LRR P, T)		Marl (F10) (I	,	MI DA 4	F4\	U Other (E	xplain in F	Remarks)	
	d Below Dark Surfa ark Surface (A12)	ce (ATT)	Depleted Oc				T) ³ Indicat	tore of hyd	rophytic vege	tation and
	rairie Redox (A16) (MI RA 150A)	=		. , .		•	-	ngy must be p	
	/lucky Mineral (S1)		Delta Ochric			, 0,		-	d or problema	
	Gleyed Matrix (S4)	,,	Reduced Ve			0A, 150B)				
	Redox (S5)		Piedmont Flo							
Stripped	Matrix (S6)		Anomalous I	Bright Loam	y Soils (l	F20) (MLR	A 149A, 153C, 1	153D)		
	rface (S7) (LRR P,									
Restrictive	Layer (if observed)):								
Type:										
Depth (in	ches):						Hydric Soil P	resent?	Yes	No X
Remarks:										

Photograph Log

Date: ___ Feature Name: W1 - UP Photograph Direction North Photograph Direction NW Comments: Comments: Photograph Direction _____ Photograph Direction _____ Comments: Comments:

Project/Site: HRSD Middlese	ex TFM	City/Co	ounty: Middlesex		Sampling Date: 04/02/2021
Applicant/Owner: HRSD			,	State: VA	Sampling Date: 04/02/2021 Sampling Point: W2 UP
Investigator(s): Emily Foster,			n, Township, Range: _		
Landform (hillslope, terrace, etc					Slope (%): 10
		Lat: 37.629293	Long:	-76.571993	Datum: WGS84
Soil Map Unit Name: Emporia	a-Nevarc complex, 15	to 45 percent slope	es	NWI classific	Datum: WGS84
Are climatic / hydrologic condition	ons on the site typical for	this time of year? Ye	es X No	(If no, explain in R	Remarks.)
Are Vegetation, Soil	, or Hydrology	significantly disturb	ed? Are "Norma	al Circumstances"	present? Yes X No
Are Vegetation, Soil	, or Hydrology	naturally problemate	tic? (If needed,	explain any answe	ers in Remarks.)
					s, important features, etc
Hydrophytic Vegetation Prese	ant? Yes	No X			
Hydric Soil Present?		No X	Is the Sampled Area		Y
Wetland Hydrology Present?	Yes		within a Wetland?	Yes	No <u>X</u>
LIVEROLOGY.					
HYDROLOGY				0	-1
Wetland Hydrology Indicato		all that apply)		_	ators (minimum of two required)
Primary Indicators (minimum of Surface Water (A1)					Cracks (B6) getated Concave Surface (B8)
High Water Table (A2)		atic Fauna (B13) Deposits (B15) (LRR	U)	Drainage Pa	
Saturation (A3)		rogen Sulfide Odor (C		Moss Trim L	
Water Marks (B1)		•	ong Living Roots (C3)	_	Water Table (C2)
Sediment Deposits (B2)	Pres	ence of Reduced Iron	(C4)	Crayfish Bur	rrows (C8)
Drift Deposits (B3)	Rece	ent Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)		Muck Surface (C7)		= '	Position (D2)
Iron Deposits (B5)		er (Explain in Remarks	s)	Shallow Aqu	, ,
Inundation Visible on Aer Water-Stained Leaves (B	0, ()			FAC-Neutral	moss (D8) (LRR T, U)
Field Observations:	9)		<u> </u>	<u> </u>	11033 (D0) (ERR 1, 0)
Surface Water Present?	Yes No _X	Depth (inches):			
Water Table Present?	Yes No x				
Saturation Present?	Yes No X			Hydrology Presei	nt? Yes No_X
(includes capillary fringe) Describe Recorded Data (stre	aam gauge monitoring we	all aerial photos prev	ious inspections) if av	ailable:	
Describe Recorded Data (Sile	am gauge, monitoring we	eli, aeriai priotos, prev	ious irispections), ii av	allable.	
Remarks:					

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

EGETATION (Four Strata) – Use scientific n	ames of pl	ants.		Sampling Point: W 2 UP
Tree Stratum (Plot size: 30)		Dominant Species?	Status	Dominance Test worksheet: Number of Dominant Species
1. Liriodendron tulipifera Tulip Poplar	60	Yes	FACU	That Are OBL, FACW, or FAC: 1 (A)
2. Acer rubrum Red maple	30	Yes	FAC	Total Number of Dominant
3. Platanus occidentalis Sycamore	4	No	FACW	Species Across All Strata: 2 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 50 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8				OBL species x 1 =
		= Total Cov		FACW species 4
50% of total cover:	20% of	total cover:	·	FAC species $\frac{30}{30}$ $\times 3 = \frac{90}{30}$
Sapling/Shrub Stratum (Plot size:)				FACU species 66 x 4 = 264
1				UPL species x 5 =
2				Column Totals: 100 (A) 362 (B)
3				Column Totals (A) (B)
4				Prevalence Index = $B/A = \frac{3.6}{}$
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 ¹
		= Total Cov	er er	Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size:)				¹ Indicators of hydric soil and wetland hydrology must
1				be present, unless disturbed or problematic.
2				Definitions of Four Vegetation Strata:
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
		= Total Cov	er er	
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				Hydrophytic
	6	= Total Cov	er er	Vegetation
50% of total cover:		total cover:	:	Present? Yes No X
Remarks: (If observed, list morphological adaptations be	elow).			1
, , , , , , , , , , , , , , , , , , , ,	,			

SOIL Sampling Point: W 2 UP

Profile Description: (Describe to the depth	needed to docu	ment the indicato	r or confirm	n the absence of inc	dicators.)
Depth Matrix		ox Features	. 2		
(inches) Color (moist) %	Color (moist)	% 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				3	
¹ Type: C=Concentration, D=Depletion, RM=F Hydric Soil Indicators: (Applicable to all L			Grains.		Pore Lining, M=Matrix. roblematic Hydric Soils ³ :
Histosol (A1)		elow Surface (S8)	(IDD S T I		•
Histic Epipedon (A2)		urface (S9) (LRR \$		· —	(A10) (LRR S)
Black Histic (A3)		ky Mineral (F1) (LF			ertic (F18) (outside MLRA 150A,B)
Hydrogen Sulfide (A4)		ed Matrix (F2)	,		oodplain Soils (F19) (LRR P, S, T)
Stratified Layers (A5)	Depleted Ma			Anomalous I	Bright Loamy Soils (F20)
Organic Bodies (A6) (LRR P, T, U)		Surface (F6)		(MLRA 15	•
5 cm Mucky Mineral (A7) (LRR P, T, U) Muck Presence (A8) (LRR U)	Depleted Da	rk Surface (F7)			Material (TF2) v Dark Surface (TF12)
1 cm Muck (A9) (LRR P, T)	Marl (F10) (I	, ,			ain in Remarks)
Depleted Below Dark Surface (A11)	_ ` '`	chric (F11) (MLRA	151)	Outlot (Explo	an in Romano,
Thick Dark Surface (A12)	Iron-Mangar	nese Masses (F12)	(LRR O, P,	T) ³ Indicators	of hydrophytic vegetation and
Coast Prairie Redox (A16) (MLRA 150A)	_	ace (F13) (LRR P,			nydrology must be present,
Sandy Mucky Mineral (S1) (LRR O, S)		(F17) (MLRA 151			sturbed or problematic.
Sandy Gleyed Matrix (S4) Sandy Redox (S5)		rtic (F18) (MLRA 1 oodplain Soils (F19			
Stripped Matrix (S6)				RA 149A, 153C, 153[D)
Dark Surface (S7) (LRR P, S, T, U)		- · · g · · · - · · · · · · · · · · ·	()	,,	-,
Restrictive Layer (if observed):					
Type:					
Depth (inches):				Hydric Soil Pres	ent? Yes No X
Remarks:				•	

Photograph Log

Date: ____ Feature Name: W2 UP Photograph Direction SE Photograph Direction SW Comments: Comments: Photograph Direction _____ Photograph Direction _____ Comments: Comments:

Project/Site: HRSD Middlesex TFM		City/C	ounty: Middlesex		Sampling Date: (04/02/2021
Applicant/Owner: HRSD			ounty: Middlesex	State: VA	Sampling Point:	W2 PEM
Investigator(s): Emily Foster, James (Cook		on, Township, Range:			
Landform (hillslone, terrace, etc.): Tidal	shoreline	Local	relief (concave, convey	none). Convex	Slope	e (%): 10
Subregion (LRR or MLRA): MLRA 153E	3 of LRR	Lat: 37.629363	Long: -	76.571996	Datu	_{Im} . WGS84
Soil Map Unit Name: Emporia-Nevarc co			2511g			
Are climatic / hydrologic conditions on the						
						No
Are Vegetation, Soil, or H						140
Are Vegetation, Soil, or H						oturos oto
SUMMARY OF FINDINGS – Att	ach site r	nap snowing sam	ipling point location	ons, transects	s, important re	atures, etc.
		No	Is the Sampled Area			
Hydric Soil Present?	Yes x	No	within a Wetland?	Yes X	No	
Wetland Hydrology Present?	Yes x	No				
Remarks:						
HYDROLOGY						
Wetland Hydrology Indicators:				Secondary Indica	ators (minimum of t	wo required)
Primary Indicators (minimum of one is re	equired; chea	ck all that apply)		Surface Soil		<u></u>
Surface Water (A1)		quatic Fauna (B13)		_	getated Concave S	surface (B8)
High Water Table (A2)	<u>П</u> ма	arl Deposits (B15) (LRF	R U)	☐ Drainage Pa	-	,
Saturation (A3)	<u>x</u> Hy	drogen Sulfide Odor (C	C1)	Moss Trim L	ines (B16)	
Water Marks (B1)		kidized Rhizospheres a	long Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	∐ Pr	esence of Reduced Iro	n (C4)	Crayfish Bur	rows (C8)	
Drift Deposits (B3)		ecent Iron Reduction in	Tilled Soils (C6)		isible on Aerial Ima	igery (C9)
	<u></u> ⊢ Th	nin Muck Surface (C7)		Geomorphic	Position (D2)	
Algal Mat or Crust (B4)			A CONTRACTOR OF THE CONTRACTOR			
Iron Deposits (B5)		her (Explain in Remark	as)	Shallow Aqu	itard (D3)	
Iron Deposits (B5) Inundation Visible on Aerial Imagen		her (Explain in Remark	rs)	FAC-Neutral	itard (D3) Test (D5)	11)
☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imager ☐ Water-Stained Leaves (B9)		her (Explain in Remark	(s)	FAC-Neutral	itard (D3)	U)
Iron Deposits (B5) Inundation Visible on Aerial Imagen Water-Stained Leaves (B9) Field Observations:	y (B7)		es)	FAC-Neutral	itard (D3) Test (D5)	U)
Iron Deposits (B5) Inundation Visible on Aerial Imagen Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X	y (B7)	_ Depth (inches): 1		FAC-Neutral	itard (D3) Test (D5)	U)
☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imager ☐ Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes ☐ Y	y (B7) No No	_ Depth (inches): 1 _ Depth (inches):		FAC-Neutral Sphagnum r	itard (D3) Test (D5)	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes X (includes capillary fringe)	y (B7) No No No	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	·
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? Yes X	y (B7) No No No	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	
Iron Deposits (B5) Inundation Visible on Aerial Imagenty Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? (includes capillary fringe) Describe Recorded Data (stream gauge	y (B7) No No No	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagenty Water-Stained Leaves (B9) Field Observations: Surface Water Present? Water Table Present? Yes Saturation Present? (includes capillary fringe) Describe Recorded Data (stream gauge	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	•
Iron Deposits (B5) Inundation Visible on Aerial Imagery Water-Stained Leaves (B9) Field Observations: Surface Water Present? Yes X Water Table Present? Yes Saturation Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge) Remarks:	y (B7) No No No s, monitoring	Depth (inches): 1 Depth (inches): 0 Depth (inches): 0	Wetland I	FAC-Neutral Sphagnum r	itard (D3) Test (D5) noss (D8) (LRR T,	·

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

		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:)	% Cover			Number of Dominant Species
1				That Are OBL, FACW, or FAC: 4 (A)
2				Total Number of Dominant
3				Species Across All Strata: 4 (B)
4.				
5.				Percent of Dominant Species That Are OBL FACW or FAC: 100 (A/B)
				That Are OBL, FACW, or FAC: 100 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8				OBL species 20 x 1 = 20
		= Total Co	ver	FACW species $\frac{55}{}$ x 2 = $\frac{110}{}$
50% of total cover:	20% of	total cover	:	
Sapling/Shrub Stratum (Plot size: 30)				1 AC species X 3 =
1. Baccharis halimifolia Eastern baccharis	25	Yes	FAC	FACU species x 4 =
2.	_			UPL species x 5 =
				Column Totals: 100 (A) 205 (B)
3				
4				Prevalence Index = B/A = 2.5
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 ¹
	0.5	= Total Co	ver	Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover:				Problematic Hydrophytic vegetation (Explain)
Herb Stratum (Plot size: 30)	20 70 01	10101 00101	•	
DI '' I I' O I	40	Yes	FACW	Indicators of hydric soil and wetland hydrology must
				be present, unless disturbed or problematic.
2. Peltandra virginica Green arrow arum	_ 20	Yes	OBL	Definitions of Four Vegetation Strata:
3. Impatiens capensis	15	Yes	FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6.				Conline/Church Mandy plants avaluating vince less
				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
7				and to the BBT and groater than 6.20 to (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12.				
	75	= Total Co	ver	
50% of total cover:				
	20 /0 01	total cover	•	
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4				
5				Hydrophytic
		= Total Co		Vegetation
50% of total cover:				Present? Yes X No No No
50% of total cover:		total cover	•	
Remarks: (If observed, list morphological adaptations be	low).			

Sampling Point: W 2 PEM

SOIL Sampling Point: W 2 PEM

Depth	cription: (Describe Matrix	to the depth		ment the ii ox Features		or contirm	i the absence of II	nuicators.)	
_(inches)	Color (moist)	%	Color (moist)	% reatures	Type ¹	Loc ²	Texture	Remarks	3
0-18	10YR 5/2	100			.,,,,,		very fine sand		
	10111072								
1							2		
	oncentration, D=De					ains.		Problems 4: New York	
	Indicators: (Applie	cable to all Li						Problematic Hydri	c Solls :
Histoso	. ,		Polyvalue B		. , .		· —	(A9) (LRR O)	
	pipedon (A2)		Thin Dark S					(A10) (LRR S)	
	istic (A3)		Loamy Mucl	-		R O)		/ertic (F18) (outside	
	en Sulfide (A4)		Loamy Gley		F2)			Floodplain Soils (F1	
	d Layers (A5)		Depleted Ma	, ,	•			s Bright Loamy Soils	s (F20)
	Bodies (A6) (LRR F		Redox Dark				(MLRA 1	•	
	ucky Mineral (A7) (L		Depleted Da					t Material (TF2)	-10\
	resence (A8) (LRR I	J)	Redox Depr		3)			ow Dark Surface (TI	-12)
	uck (A9) (LRR P, T)	(8.4.4)	Marl (F10) (I	,		= 4\	U Other (Exp	olain in Remarks)	
	d Below Dark Surfac	ce (A11)	Depleted Oc						
=	ark Surface (A12)		Iron-Mangar					s of hydrophytic veg	
	rairie Redox (A16) (, U)		I hydrology must be	•
_	Mucky Mineral (S1) (LRR O, S)	Delta Ochric			OA 450D)		disturbed or problen	natic.
_	Gleyed Matrix (S4)		Reduced Ve						
	Redox (S5)		Piedmont FI					2D)	
	d Matrix (S6)	O T II)	Anomalous	Bright Loan	ny Soils (F20) (MLR	A 149A, 153C, 15	3D)	
	irface (S7) (LRR P,						_		
	Layer (if observed)	i.							
Type:			_					V	
Depth (ir	ches):		<u> </u>				Hydric Soil Pre	sent? Yes X	No
Remarks:									

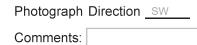
Date: 4/2/21	Feature Name: W2 P	'EM
Date.		



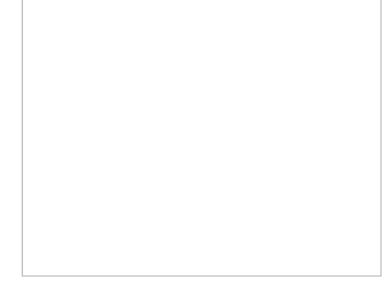


Photograph Direction East	rection East	Direction	Photograph
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Comments:







Photograph Direction NE

Comments:

etion NE	Photograph Direction			
	Comments:			

Project/Site: HRSD Middlese	ex TFM	City/Co	ounty: Middlesex		Sampling Date: 04/02	2/2021
Applicant/Owner: HRSD			,	State: VA	Sampling Date: 04/02 Sampling Point: W3 I	JP
Investigator(s): Emily Foster,			n, Township, Range: _			
Landform (hillslope, terrace, etc		Local r	relief (concave, convex	, none): Convex	Slope (%)	. 10
Subregion (LRR or MLRA): ML					Datum:	
Soil Map Unit Name: Suffolk-I	Remlik complex, 15 to	45 percent slopes		NWI classific	cation: N/A	
Are climatic / hydrologic condition	ons on the site typical for	this time of year? Ye	es X No	(If no, explain in F	Remarks.)	
Are Vegetation, Soil	, or Hydrology	significantly disturb	ed? Are "Norma	al Circumstances"	present? Yes X	No
Are Vegetation, Soil				explain any answe		
SUMMARY OF FINDING						es, etc.
Lludraphytic Vegetation Prese	unt? Von	No X				
Hydrophytic Vegetation Prese Hydric Soil Present?		No ×	Is the Sampled Area		V	
Wetland Hydrology Present?	Yes		within a Wetland?	Yes	No X	
Remarks:						
Upland point associa						
HYDROLOGY				Canadam India		ind)
Wetland Hydrology Indicato		all that apply		_	ators (minimum of two re	<u>equirea)</u>
Primary Indicators (minimum o				Surface Soil		oo (DO)
Surface Water (A1) High Water Table (A2)		atic Fauna (B13) Deposits (B15) (LRR	· IIV	☐ Sparsely Vegetated Concave Surface (B8)☐ Drainage Patterns (B10)		
Saturation (A3)		ogen Sulfide Odor (C		Moss Trim L		
Water Marks (B1)		•	ong Living Roots (C3)		Water Table (C2)	
Sediment Deposits (B2)		ence of Reduced Iron		Crayfish Bur		
Drift Deposits (B3)		ent Iron Reduction in	, ,	= '	isible on Aerial Imagery	(C9)
Algal Mat or Crust (B4)	Thin	Muck Surface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	Othe	r (Explain in Remarks	s)	Shallow Aqu	itard (D3)	
Inundation Visible on Aer	ial Imagery (B7)			FAC-Neutra	Test (D5)	
Water-Stained Leaves (B	9)			Sphagnum r	noss (D8) (LRR T, U)	
Field Observations:						
Surface Water Present?	Yes No X					
Water Table Present?	Yes No _x					.,
Saturation Present? (includes capillary fringe)	Yes No _X	Depth (inches):	Wetland	Hydrology Presei	nt? Yes No	<u>x</u>
Describe Recorded Data (stre	am gauge, monitoring we	ell, aerial photos, prev	vious inspections), if av	ailable:		
Remarks:						

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

/EGETATION (Four Strata) -	- Use scientific na	ames of pl	ants.		Sampling Point: W 3 UP)
			Dominant		Dominance Test worksheet:	
Tree Stratum (Plot size:	·	% Cover			Number of Dominant Species That Are OBL, FACW, or FAC: (/	Δ)
1					That Ale OBL, I ACW, OI I AC.	^)
2					Total Number of Dominant Species Across All Strata: 1 (6)	D)
3 4					Species Across All Strata: 1 (I	B)
					Percent of Dominant Species	
5					That Are OBL, FACW, or FAC: 0 (/	A/B)
6					Prevalence Index worksheet:	
7					Total % Cover of: Multiply by:	
8					OBL species x 1 =	
500	/	2007 -1			FACW species x 2 =	
	% of total cover:	20% 01	total cover	·	FAC species x 3 =	
Sapling/Shrub Stratum (Plot size:					FACU species 100 $x 4 = 400$	
1				-	UPL species x 5 =	
2					Column Totals: 100 (A) 400	(B)
3					()	()
4					Prevalence Index = $B/A = 4.0$	
5					Hydrophytic Vegetation Indicators:	
6					1 - Rapid Test for Hydrophytic Vegetation	
7					2 - Dominance Test is >50%	
8					3 - Prevalence Index is ≤3.0 ¹	
			= Total Co		Problematic Hydrophytic Vegetation ¹ (Explain)	
	% of total cover:	20% of	total cover	:		
Herb Stratum (Plot size: 30)				¹ Indicators of hydric soil and wetland hydrology mu	st
1. Poa pratensis Kentucky bluegrass		75	Yes	FACU	be present, unless disturbed or problematic.	
2. Taraxacum officinale dandelion		15	No	FACU	Definitions of Four Vegetation Strata:	
3. Plantago lanceolata Narrow leaf p	lantain	10	No	FACU	Tree – Woody plants, excluding vines, 3 in. (7.6 cm	n) or
4					more in diameter at breast height (DBH), regardles	s of
5					height.	
6					Sapling/Shrub - Woody plants, excluding vines, le	ess
7					than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8					Herb – All herbaceous (non-woody) plants, regardle	ess
9					of size, and woody plants less than 3.28 ft tall.	
10					Woody vine – All woody vines greater than 3.28 ft	in
11					height.	
12						
		100	= Total Co	ver		
50%	% of total cover: 50	20% of	total cover	: 20		
Woody Vine Stratum (Plot size:)					
1						
2						
3						
4						
5					Hydrophytic	
		:		ver	Vegetation	
50%	% of total cover:	20% of	total cover	r:	Present? Yes No _X	
Remarks: (If observed, list morphole	ogical adaptations be	low).				

SOIL Sampling Point: W 3 UP

Profile Desc	cription: (Describe	to the depth	needed to docu	ment the in	dicator	or confirm	the absence of in	ndicators.)	
Depth	Matrix			x Features		. 2	_		
(inches)	Color (moist)		Color (moist)		Type ¹	Loc ²	Texture	Remarks	
0-18	10YR 4/3								
-									
<u> </u>									
1Type: C-C	oncentration, D=De	nletion PM-P	Peduced Matrix M	S-Macked	Sand Gr	nine	² Location: PL -	Pore Lining, M=Mat	riv
	Indicators: (Appli					ali 13.		Problematic Hydric	
Histosol			Polyvalue Be		•	RRSTII		-	
	oipedon (A2)		Thin Dark Su					(A10) (LRR S)	
	istic (A3)		Loamy Muck					ertic (F18) (outside	MLRA 150A.B)
	en Sulfide (A4)		Loamy Gleye			. •,		Floodplain Soils (F19	
	d Layers (A5)		Depleted Ma		,			Bright Loamy Soils	
	Bodies (A6) (LRR I	P, T, U)	Redox Dark		S)		(MLRA 1		,
5 cm Mu	ucky Mineral (A7) (L	RR P, T, U)	Depleted Da	rk Surface ((F7)		Red Paren	t Material (TF2)	
	esence (A8) (LRR		Redox Depre	essions (F8)			ow Dark Surface (TF	12)
	ıck (A9) (LRR P, T)		Marl (F10) (L				U Other (Exp	lain in Remarks)	
	d Below Dark Surfa	ce (A11)	Depleted Oc	. , .		•	3		
	ark Surface (A12)		Iron-Mangan				•	s of hydrophytic vege	
	rairie Redox (A16) (_			, U)		hydrology must be p	
	Mucky Mineral (S1) (LRR 0, 5)	Delta Ochric			0A 4E0D\	uniess	disturbed or problema	atic.
_	Gleyed Matrix (S4) Redox (S5)		Reduced Ve				0.4.)		
	I Matrix (S6)						эд) A 149A, 153C, 153	RD)	
	rface (S7) (LRR P,	S. T. U)	Anomalous I	ongrit Loam	ly Colla (I	20) (MEIO	~ 140A, 1000, 100	,,,	
	Layer (if observed)								
Type:									
, , , <u> </u>	ches):						Hydric Soil Pre	sent? Yes	No X
Remarks:							,		
rtomanto.									

Date: 4/2/21







Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Comments:

Project/Site: HRSD Middlesex TFM	City/County: Mic	Idlesex	Sampling Date: 04/02/2021
Applicant/Owner: HRSD		State: VA	Sampling Date: 04/02/2021 Sampling Point: W3 PEM
F " F ' I O I	Section, Townsh		
		ave, convex, none): Convex	Slope (%): 10
Subregion (LRR or MLRA): MLRA 153B of LRR	27.631185	Long: -76.575514	Datum: WGS84
Subregion (LRR or MLRA): MLRA 153B of LRR Soil Map Unit Name: Suffolk-Remlik complex, 15 to 4	5 percent slopes	Long	cation: N/A
Are climatic / hydrologic conditions on the site typical for th			
Are Vegetation, Soil, or Hydrology			
			present? Yes X No
Are Vegetation, Soil, or Hydrology		(If needed, explain any answe	
SUMMARY OF FINDINGS – Attach site map	showing sampling po	oint locations, transects	s, important features, etc.
Hydrophytic Vegetation Present? Yes X	No Is the Sau	mpled Area	
Hydric Soil Present? Yes X	No within a l	Vetland? Yes X	No
Wetland Hydrology Present? Yes X	10		
Remarks:		. 5:	
Emergent slope wetland abutting shore	eline of the Piankata	ank River.	
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indic	ators (minimum of two required)
Primary Indicators (minimum of one is required; check all	that apply)	Surface Soil	Cracks (B6)
Surface Water (A1)	Fauna (B13)	Sparsely Ve	egetated Concave Surface (B8)
High Water Table (A2) Marl De	eposits (B15) (LRR U)	Drainage Pa	atterns (B10)
Saturation (A3)	en Sulfide Odor (C1)	Moss Trim L	ines (B16)
☐ Water Marks (B1) ☐ Oxidize	ed Rhizospheres along Living		Water Table (C2)
	ce of Reduced Iron (C4)	☐ Crayfish Bu	
	Iron Reduction in Tilled Soils	_	/isible on Aerial Imagery (C9)
	uck Surface (C7) Explain in Remarks)	☐ Geomorphic	Position (D2)
Inundation Visible on Aerial Imagery (B7)	Explain in Nemarks)	FAC-Neutra	` '
Water-Stained Leaves (B9)			moss (D8) (LRR T, U)
Field Observations:			
Surface Water Present? Yes No X De	epth (inches):		
Water Table Present? Yes X No De	epth (inches): 4		
Saturation Present? Yes X No De	epth (inches): 1	Wetland Hydrology Prese	nt? Yes X No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well,	aerial photos, previous inspe	L ctions), if available:	
Remarks:			
Small areas of ponded water.			

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

Tree Stratum (Plot size:)		ants.		Sampling Point: W 3 PEM
		Dominant		Dominance Test worksheet:
1		Species?		Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
2				Total Number of Dominant
3				Species Across All Strata: 2 (B)
4				Descent of Deminant Charles
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)
6				
7				Prevalence Index worksheet:
8				Total % Cover of: Multiply by:
		= Total Cov		OBL species 65 x 1 = 65
50% of total cover:	20% of	total cover	·	FACW species 35 $x = 70$
Sapling/Shrub Stratum (Plot size:)				FAC species x 3 =
1				FACU species x 4 =
2				UPL species x 5 =
3				Column Totals: 100 (A) 135 (B)
4				Prevalence Index = B/A = 1.35
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 ¹
		= Total Cov	er er	Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover:	20% of	total cover	:	
Herb Stratum (Plot size: 30)				¹ Indicators of hydric soil and wetland hydrology must
1. Juncus effusus Soft rush	25	Yes	OBL	be present, unless disturbed or problematic.
2. Rumex verticillatus Swamp dock	15	Yes	FACW	Definitions of Four Vegetation Strata:
3. Phragmites australis Common reed	20	Yes	FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4. Carex lurida Shallow sedge	20	Yes	OBL	more in diameter at breast height (DBH), regardless of
5. Ludwigia alterniflora Seedbox	20	No	OBL	height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
0				of size, and woody plants less than 3.28 ft tall.
9				or olzo, and woody planto loop than olzo it tall.
9				Woody vine – All woody vines greater than 3.28 ft in
10 11				
10 11				Woody vine – All woody vines greater than 3.28 ft in
10 11				Woody vine – All woody vines greater than 3.28 ft in
10	100	= Total Cov	/er	Woody vine – All woody vines greater than 3.28 ft in
10	100	= Total Cov	/er	Woody vine – All woody vines greater than 3.28 ft in
10	100 20% of	= Total Cov total cover	/er :	Woody vine – All woody vines greater than 3.28 ft in
10	100 20% of	= Total Cov total cover	ver	Woody vine – All woody vines greater than 3.28 ft in
10	100 20% of	= Total Cov total cover	ver	Woody vine – All woody vines greater than 3.28 ft in
10	100 20% of	= Total Cov total cover	ver	Woody vine – All woody vines greater than 3.28 ft in
10	100 20% of	= Total Cov total cover	//er :	Woody vine – All woody vines greater than 3.28 ft in height. Hydrophytic
10	100 20% of	= Total Cover total cover	/er	Woody vine – All woody vines greater than 3.28 ft in height.

SOIL Sampling Point: W 3 PEM

Depth	cription: (Describe Matrix	e to the depth		ment the i		or confirn	n the absence	of indicate	ors.)	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-2	10YR 2/1	100					mucky mineral	High org	anics	
2-18	10YR 4/2	100					coarse sand			
								-		
								-		
¹ Type: C=C	oncentration, D=De	epletion, RM=F	Reduced Matrix. M	S=Masked	Sand Gr	ains.	² Location:	PL=Pore L	ining, M=Mat	rix.
	Indicators: (Appli								matic Hydric	
Histosol	(A1)		Polyvalue B	elow Surfa	ce (S8) (L	.RR S, T, L	J) 🔲 1 cm N	Muck (A9) (I	LRR O)	
Histic E	oipedon (A2)		Thin Dark S					Muck (A10)	, ,	
	stic (A3)		Loamy Mucl			R O)				MLRA 150A,B)
	en Sulfide (A4)		Loamy Gley		F2)				,) (LRR P, S, T)
_	d Layers (A5) Bodies (A6) (LRR	D T II\	Depleted Ma		·6)			aious Brigni RA 153B)	t Loamy Soils	(F20)
	ucky Mineral (A7) (I		Depleted Da	,	,		,	arent Mater	rial (TF2)	
=	esence (A8) (LRR		Redox Depr				$\overline{}$		k Surface (TF	12)
1 cm Mu	uck (A9) (LRR P, T))	Marl (F10) (I	LRR U)	,			(Explain in	•	•
=	d Below Dark Surfa	ice (A11)	Depleted Oc				•			
=	ark Surface (A12)	(III DA 450A)	Iron-Mangar						drophytic veg	
_	rairie Redox (A16) lucky Mineral (S1)		=			, U)		-	logy must be ped or problem	
	Bleyed Matrix (S4)	(LKK U, S)	Delta Ochric			0Δ 150R)		ess disturbe	ed of problem	alic.
	Redox (S5)		Piedmont FI							
	Matrix (S6)						RA 149A, 153C	, 153D)		
	rface (S7) (LRR P,									
Restrictive	Layer (if observed):								
Type:			<u></u>						.,	
Depth (in	ches):						Hydric Soil	Present?	Yes X	No
Remarks:										
1										
ı										
ı										
1										
1										

Photograph Log

Date: 4/2/21 Feature Name: W3 PEM Photograph Direction South Photograph Direction North Comments: Comments: Photograph Direction _____ Photograph Direction _____ Comments: Comments:

Project/Site: HRSD Middlese	x TFM	City/C	ounty: Middlesex		Sampling Date: 04/02/2021
Applicant/Owner: HRSD			,	State: VA	Sampling Date: 04/02/2021 Sampling Point: W4
Investigator(s): Emily Foster,			on, Township, Range: _		
Landform (hillslope, terrace, etc		Local	relief (concave, convex	. none): Concave	Slope (%): 10
Subregion (LRR or MLRA): ML			00 Long:	-76.41996283	Datum: WGS84
Soil Map Unit Name: Suffolk-F			2311g	NWI classific	cation: N/A
Are climatic / hydrologic condition	ons on the site typical for	this time of year? Y	es X No	(If no, explain in R	Remarks.)
Are Vegetation, Soil	, or Hydrology	significantly disturb	bed? Are "Norma	al Circumstances" ¡	present? Yes X No
Are Vegetation, Soil	, or Hydrology	naturally problema	atic? (If needed,	explain any answe	ers in Remarks.)
SUMMARY OF FINDING	S – Attach site ma	np showing sam	pling point locati	ons, transects	s, important features, etc.
Hydrophytic Vegetation Prese	nt? Yes X	No			
Hydric Soil Present?	Yes <u>x</u>	No	Is the Sampled Area		
Wetland Hydrology Present?			within a Wetland?	Yes <u>^</u>	No
HYDROLOGY					
Wetland Hydrology Indicato	rs:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum o		all that apply)		Surface Soil	Cracks (B6)
Surface Water (A1)	Aqua	atic Fauna (B13)	_		getated Concave Surface (B8)
High Water Table (A2)	Marl	Deposits (B15) (LRF	R U)	Drainage Pa	itterns (B10)
Saturation (A3)		ogen Sulfide Odor (C	•	Moss Trim L	` ,
Water Marks (B1)			long Living Roots (C3)		Water Table (C2)
Sediment Deposits (B2)		ence of Reduced Iron	, ,	Crayfish Bur	* *
Drift Deposits (B3)		ent Iron Reduction in	Tilled Soils (C6)		isible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Iron Deposits (B5)		Muck Surface (C7) r (Explain in Remark	·e)	Shallow Aqu	Position (D2)
Inundation Visible on Aeri		(Explain in Roman		FAC-Neutral	` '
Water-Stained Leaves (B9	o , (,			=	moss (D8) (LRR T, U)
Field Observations:					
Surface Water Present?	Yes No X	Depth (inches):			
Water Table Present?	Yes No _x				V
Saturation Present? (includes capillary fringe)	Yes <u>x</u> No	Depth (inches): 1	Wetland	Hydrology Preser	nt? Yes X No
Describe Recorded Data (stre	am gauge, monitoring we	ell, aerial photos, pre	vious inspections), if av	ailable:	
Remarks:					
Thick dark surface.					
THICK GAIN SUITAGE.					

Sampling	Point:	W	4
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T (D) (D) ()		Dominant		Dominance Test worksheet:	
Tree Stratum (Plot size:) 1		Species?		Number of Dominant Species That Are OBL, FACW, or FAC: 2 ((A)
2				Total Number of Dominant	(D)
3				Species Across All Strata: 2 ((B)
4				Percent of Dominant Species	
5				That Are OBL, FACW, or FAC: 100 ((A/B)
6				Prevalence Index worksheet:	
7				Total % Cover of: Multiply by:	
8		= Total Cov		OBL species x 1 =	
FOOV of total across				FACW species x 2 =	
50% of total cover: Sapling/Shrub Stratum (Plot size: 30)	20% 01	total cover		FAC species x 3 =	
Sapling/Shrub Stratum (Plot size: 30) 1. Baccharis halimifolia Eastern baccharis	20	Yes	FAC	FACU species x 4 =	
1				UPL species x 5 =	
2				Column Totals: (A)	
3					
4				Prevalence Index = B/A =	
5					
6				1 - Rapid Test for Hydrophytic Vegetation	
7				x 2 - Dominance Test is >50%	
8	00	Total Cov		3 - Prevalence Index is ≤3.0 ¹	
50% of total cover: 10	20% of	= Total Cov		Problematic Hydrophytic Vegetation ¹ (Explain))
20	20% 01	total cover.	· <u>·</u>		
Herb Stratum (Plot size: 30) 1. Phragmites australis Common reed	70	Yes	FACW	¹ Indicators of hydric soil and wetland hydrology mube present, unless disturbed or problematic.	ıst
2. Solidago sempervirens Seaside goldenrod	5	No	FACW	Definitions of Four Vegetation Strata:	
3. Hibiscus grandifolia Swamp rosemallow	5	No	OBL	Tree Woody plants evaluding since 2 in /7.6 or	m) o=
4				Tree – Woody plants, excluding vines, 3 in. (7.6 cm more in diameter at breast height (DBH), regardles	
5				height.	
6				Sapling/Shrub – Woody plants, excluding vines, le	ess
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.	
8				Herb – All herbaceous (non-woody) plants, regard	less
9				of size, and woody plants less than 3.28 ft tall.	1000
10				Woody vine – All woody vines greater than 3.28 ft	tin
11				height.	
12					
	80	= Total Cov	er		
50% of total cover: 40	20% of	total cover:	16		
Woody Vine Stratum (Plot size:)					
1					
2					
3					
4					
5				Hydrophytic	
	:	= Total Cov	er	Vegetation	
50% of total cover:	20% of	total cover:		Present? Yes X No No	
Remarks: (If observed, list morphological adaptations bel					
	•				

SOIL Sampling Point: W 4

Depth	cription: (Describe Matrix			ox Features					,	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-18	10YR 2/1	100					muck	High organic	with coarse sand o	or thick dark surface
	-									
								_		
1=		- Indian DM D	and an all Markets MA	O Maraland	0 1 0 -		21 13	DI Daniel	tatan M. Mari	
	Concentration, D=De Indicators: (Appli					ains.			ining, M=Mate	
		cable to all Li			•	DD 0 T 1			-	30115 .
Histoso	pipedon (A2)		Polyvalue Be		. , .			Muck (A9) (I Muck (A10)	•	
	listic (A3)		Loamy Muck							MLRA 150A,B)
_	en Sulfide (A4)		Loamy Gley	•	, .	. 0,) (LRR P, S, T)
	d Layers (A5)		Depleted Ma		-/				Loamy Soils	
	Bodies (A6) (LRR I	P, T, U)	Redox Dark		5)			RA 153B)	,	,
	ucky Mineral (A7) (L		Depleted Da	•	•			arent Mater		
	resence (A8) (LRR		Redox Depr	essions (F8)		Very S	Shallow Darl	k Surface (TF	12)
	uck (A9) (LRR P, T)		☐ Marl (F10) (I	,			U Other	(Explain in l	Remarks)	
	ed Below Dark Surfa	ce (A11)	Depleted Oc				3			
=	ark Surface (A12)	(MI DA 450A)	Iron-Mangar		. , .		•		drophytic vege	
	Prairie Redox (A16) (=			, U)			ogy must be p	
	Mucky Mineral (S1) (Gleyed Matrix (S4)	(LRR U, S)	Delta Ochric			0A 150B)		ess disturbe	ed or problema	atic.
	Redox (S5)		Piedmont Fl							
	d Matrix (S6)						RA 149A, 1530	. 153D)		
	urface (S7) (LRR P,	S, T, U)	/oa.ouo .	g	., (0) (, 1002)		
	Layer (if observed)									
Type:		-								
	nches):						Hydric Soi	Present?	Yes X	No
Remarks:							, , , , , ,			
rtomanto.										

Photograph Log

	Pnotogra	on Log
Date: 4/2/	21	Feature Name: W4
	Direction North	Photograph Direction South
Comments:		Comments:
Photograph	Direction East	Photograph Direction West_

Comments:

Project/Site: HRSD Middlese	x TFM			ity/County. Matl	news		Sampling Date:	7/9/2021	
Applicant/Owner: HRSD				324.5		State: VA	Sampling Point: W5	5	
Investigator(s): Emily Foster,	James Cook		5	Section, Township	o, Range:				
Landform (hillslope, terrace, e								₩. 5-10	
	0000								
Subregion (LRR or MLRA): M		<u> </u>						WG364	
Soil Map Unit Name: Steep sa		Jan District				NWI classifi			
Are climatic / hydrologic condi		Marine Com				A Charles Property			
Are Vegetation, Soil _	, or Hydro	ology	significantly d	listurbed?	Are "Norma	I Circumstances"	present? Yesx	_ No	
Are Vegetation, Soil _	, or Hydro	ology	naturally prob	olematic?	(If needed,	explain any answ	ers in Remarks.)		
SUMMARY OF FINDING	GS - Attac	h site m	ap showing	sampling po	int location	ons, transect	s, important feat	ures, etc.	
Hydrophytic Vegetation Pres	sent? Y	as X	No						
Hydric Soil Present?			No		pled Area	1000			
Wetland Hydrology Present?			No	within a W	fetland?	Yes	No		
Remarks:				160			Observed Classifica	ations:	
on the other side of Twigg	s Ferry Road.								
HYDROLOGY									
Wetland Hydrology Indicat	ors:		7 ALWAY T			Secondary Indic	ators (minimum of two	required)	
Primary Indicators (minimum	of one is requi	red; check	(all that apply)			_ Surface Soi	Cracks (B6)		
Surface Water (A1)		Aqu	uatic Fauna (B13))		Sparsely Vegetated Concave Surface (B8)			
X High Water Table (A2)		Mar	Deposits (B15)	(LRR U)		Drainage Patterns (B10)			
X Saturation (A3)			drogen Sulfide Od			_ Moss Trim I			
Water Marks (B1)			dized Rhizosphe		Roots (C3)		Water Table (C2)		
— Sediment Deposits (B2)	Ē	1.2720	sence of Reduce		1227	Crayfish Bu	The state of the s	Cvener)	
Drift Deposits (B3)			cent Iron Reduction		(C6)		/isible on Aerial Image	ry (C9)	
Algal Mat or Crust (B4)		to the second	n Muck Surface (Position (D2)		
Iron Deposits (B5)	edal lacareau (D	Execution Section 1	er (Explain in Re	marks)		Shallow Aqu			
Inundation Visible on As Water-Stained Leaves (()				× FAC-Neutra			
Field Observations:	89)					spragnum	moss (D8) (LRR T, U)		
Surface Water Present?	Vac	No. X	Depth (inches):						
Water Table Present?			Depth (inches):						
Saturation Present?	V0 (2) (2) (2)	100000	Depth (inches):		Wotland	Hudrolony Proces	nt? Yes_x_ N	No	
(includes capillary fringe)	105	140	Depth (inches).	<u> </u>	vveuanu	nyurology rrese	itt res		
Describe Recorded Data (str	eam gauge, me	onitoring w	vell, aerial photos	, previous inspec	tions), if av	ailable:			
2302 60									
Remarks:									
Tromano.									

VEGETATION (Five Strata)	- Use s	cientific	names o	of p	lants
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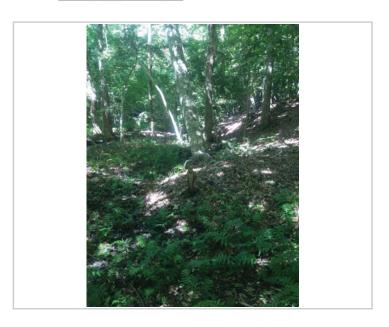
EGETATION (Five Strata) – Use scientific nar	Control of the second			7.45 (C.) * OC.	ng Point: W5	
Tree Stratum (Plot size: 30 ft)		Dominant		Dominance Test worksheet:		
	40	Species?		Number of Dominant Species That Are OBL, FACW, or FAC:	3	(4)
				mai Ale OBL, FACIV, O FAC.		. (^)
Carpinus caroliniana, American Hornbeam		7		Total Number of Dominant	2	
				Species Across All Strata:	3	(B)
				Percent of Dominant Species		
				That Are OBL. FACW, or FAC:	100.0%	(A/E
				Barrelana Indonesia da barrela		1000
	65	= Total Cov	er	Prevalence Index worksheet:	partition and the same	
50% of total cover: 32.5	20% of	total cover	13	Total % Cover of:	0.0000000000000000000000000000000000000	
apling Stratum (Plot size: 30 ft)				OBL species 30 x 1		
ran meter regard and property of				FACW species0 x 2	= 0	-
				FAC species65 x 3	195	- (3)
				FACU species 0 x 4	= 0	_
				UPL species 0 x 5	= 0	
			_	Column Totals: 95 (A)		
				- VV		_ (
				Prevalence Index = B/A =	2.37	_
	0	= Total Cov	er	Hydrophytic Vegetation Indicate	ors:	
50% of total cover:0	20% of	total cover	0	1 - Rapid Test for Hydrophytic		
Shrub Stratum (Plot size: 30 ft)				X 2 - Dominance Test is >50%		
				x 3 - Prevalence Index is ≤3.01		
			_			
				Problematic Hydrophytic Veg	etation (Expla	ain)
			_	Indicators of hydric soil and wetla		must
s				be present, unless disturbed or pre	oblematic.	
i,				Definitions of Five Vegetation S	trata:	
50% of total cover: 0 Herb Stratum (Plot size: 30 ft) Woodwardia areolata, Netted Chain Fern 2 3. 4.	30	Yes	OBL	(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)	Annual Company	
3. ?. 3.			\equiv	Herb – All herbaceous (non-wood herbaceous vines, regardless of s plants, except woody vines, less to 3 ft (1 m) in height.	ize, and wood	ty
				ear and the second	1. 30.0	
0			2 31	Woody vine - All woody vines, re	gardless of he	eight.
1.						
50% of total cover: 15 Woody Vine Stratum (Plot size: 30 ft)	304	= Total Cov total cover				
l						
5.	0		v 14	Hydrophytic		
		= Total Cov	er	Vegetation		
				Present? Yesx	No	
50% of total cover: 0	2024	total amount			140	

SOIL Sampling Point: W5

Comparison Contentration	(inches)	Matrix			x Feature			F2008-074		20000000	
4-12 7.5yr 6/2 100% Sand Sand Sa		Color (moist)		Color (maist)	%	Type'	_Loc*_	Texture		Remarks	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Cocation: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils ³ : Histosol (A1)	0-4					_		Sand	mucky n	nodified	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Very Capilla	4-12	7.5yr 6/2	100%					Loamy sand			
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)	12-20	7.5yr 6/2	100%	-				Sand			
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)											
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)		0.00							9641 		
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)					_						
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)						_					
ydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Histosol (A1)	Time: C-0	Concentration D-Day	eletion DM-D	advaged Matrix M	C-Mackad	Cand Ca		3 contion	DI -Dere I	ining MaMatris	2
Histosol (A1)							an15.				
Histic Epipedon (A2) Black Histic (A3) Loamy Mucky Mineral (F1) (LRR O) Hydrogen Sulfide (A4) Loamy Gleyed Matrix (F2) Stratified Layers (A5) Depleted Matrix (F3) Depleted Matrix (F3) Mucky Mineral (A7) (LRR P, T, U) Depleted Dark Surface (F6) Depleted Dark Surface (F7) Muck Presence (A8) (LRR P, T) Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Coast Prairie Redox (A12) Coast Prairie Redox (A16) (MLRA 150A) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Delta Mucky Mineral (A7) (LRR P, S, Anomalous Bright Loamy Soils (F20) Mari (F10) (LRR U) Depleted Dark Surface (F8) Mari (F10) (LRR U) Depleted Dark Surface (A12) Coast Prairie Redox (A16) (MLRA 150A) Umbric Surface (F13) (LRR P, T, U) Sandy Gleyed Matrix (S4) Sandy Redox (S5) Sandy Redox (S5) Dark Surface (S7) (LRR P, S, T, U) Destrictive Layer (if observed): Type: Depth (inches): Type: Depth (inches): Depth (i							RR S. T. U				
Hydrogen Sulfide (A4) Stratified Layers (A5) Depleted Matrix (F2) Depleted Matrix (F3) Anomalous Bright Loamy Soils (F20) Muck Presence (A8) (LRR P, T, U) Depleted Dark Surface (F7) Muck Presence (A8) (LRR U) Loamy Gleyed Matrix (F3) Muck Presence (A8) (LRR U) Depleted Dark Surface (F7) 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) Sandy Redox (S5) Dark Surface (S7) (LRR P, S, T, U) Depth (inches): Depth (inches): Loamy Gleyed Matrix (F2) Piedmont Floodplain Soils (F19) (LRR P, S, Anomalous Bright Loamy Soils (F20) (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TF12) Other (Explain in Remarks) Other (Explain in Remarks) Depleted Delow Dark Surface (A12) Liron-Manganese Masses (F12) (LRR O, P, T) Jindicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Matrix (S4) Reduced Vertic (F18) (MLRA 150A, 150B) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Stripped Matrix (S6) Dark Surface (S7) (LRR P, S, T, U) Destrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes X No											
Stratified Layers (A5)	Black H	listic (A3)		Loamy Muck	y Mineral	(F1) (LRR	0)	Reduc	ed Vertic (F	18) (outside M	LRA 150A, E
Organic Bodies (A6) (LRR P, T, U) Redox Dark Surface (F6) (MLRA 153B) 5 cm Mucky Mineral (A7) (LRR P, T, U) Depleted Dark Surface (F7) Red Parent Material (TF2) Muck Presence (A8) (LRR U) Redox Depressions (F8) Very Shallow Dark Surface (TF12) 1 cm Muck (A9) (LRR P, T) Marl (F10) (LRR U) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Ochric (F11) (MLRA 151) Thick Dark Surface (A12) Iron-Manganese Masses (F12) (LRR O, P, T) Indicators of hydrophytic vegetation and Vertice (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F13) (LRR P, T, U) Wetland hydrology must be present, Very Shallow Dark Surface (F1						F2)					
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) Dark Surface (S7) (LRR P, T, U) Depleted Dark Surface (F1) Mart (F10) (LRR U) Depleted Ochric (F11) (MLRA 151) Iron-Manganese Masses (F12) (LRR O, P, T) Jedicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Reduced Vertic (F18) (MLRA 150A, 150B) Sandy Redox (S5) Delta Ochric (F19) (MLRA 150A, 150B) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Destrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes X No										Loamy Soils (F	20)
Muck Presence (A8) (LRR U) Redox Depressions (F8) Very Shallow Dark Surface (TF12) 1 cm Muck (A9) (LRR P, T) Marl (F10) (LRR U) Other (Explain in Remarks) Depleted Below Dark Surface (A11) Depleted Ochric (F11) (MLRA 151) Thick Dark Surface (A12) Iron-Manganese Masses (F12) (LRR O, P, T) Indicators of hydrophytic vegetation and Vertice (F13) (LRR P, T, U) Wetland hydrology must be present, Vertically Sandy Mucky Mineral (S1) (LRR O, S) Delta Ochric (F17) (MLRA 151) Unless disturbed or problematic. Sandy Redox (S5) Reduced Vertic (F18) (MLRA 150A, 150B) Stripped Matrix (S6) Piedmont Floodplain Soils (F19) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Destrictive Layer (If observed): Type: Depth (inches): Hydric Soil Present? Yes X No	-							4.3.5	0. 109/2015	al (TE2)	
								_			2)
Thick Dark Surface (A12)	37 Co. 24 Co.	이 없는데 맛 없었다면 뭐 하면 것을 하면 없었습니?									-)
Coast Prairie Redox (A16) (MLRA 150A) Umbric Surface (F13) (LRR P, T, U) wetland hydrology must be present, unless disturbed or problematic. Sandy Mucky Mineral (S1) (LRR O, S) Delta Ochric (F17) (MLRA 151) unless disturbed or problematic. Sandy Gleyed Matrix (S4) Reduced Vertic (F18) (MLRA 150A, 150B) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Stripped Matrix (S6) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Dark Surface (S7) (LRR P, S, T, U) Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes X No	Deplete	d Below Dark Surface	ce (A11)	Depleted Oc	hric (F11)	(MLRA 1	51)	SECTION SECTION	dioestrantic com	5002.0340.226.N	
Sandy Mucky Mineral (S1) (LRR O, S) Delta Ochric (F17) (MLRA 151) unless disturbed or problematic. Sandy Gleyed Matrix (S4) Reduced Vertic (F18) (MLRA 150A, 150B) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Type: Depth (inches): Hydric Soil Present? Yes X No											
Sandy Gleyed Matrix (S4) Reduced Vertic (F18) (MLRA 150A, 150B) Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Pestrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes X No							, U)		The second of the second		
Sandy Redox (S5) Piedmont Floodplain Soils (F19) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Dark Surface (S7) (LRR P, S, T, U) Piedmont Floodplain Soils (F20) (MLRA 149A, 153C, 153D) Piedmont Floodplain Soils (F20) (MLRA 149A) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Piedmont Floodplain Soils (F20) (MLRA 149A) Piedmont Floodplain Piedmo	The second of the second		LRR O, S)				0A 150R)	uni	ess disturbe	ed or problemat	IC.
Stripped Matrix (S6) Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) Dark Surface (S7) (LRR P, S, T, U) testrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yes x No	THE TANK OF THE PARTY OF							9A)			
Dark Surface (S7) (LRR P, S, T, U) lestrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? Yesx No				- (V) D/ 2	10.00				, 153D)		
Type:	Dark S	urface (S7) (LRR P,	S, T, U)								
Depth (inches): No	Restrictive	Layer (if observed)	:								
(2) CAR A (2) CA	Type:			_				TOTOLIA (IIIIAA)			
emarks:	Depth (in	nches):		_				Hydric Soil	Present?	Yesx	No

Date: ____







Photograph Direction West

Comments:

Photograph Direction North

Comments:





Photograph Direction East

Comments:

Photograph Direction South

Project/Site: HRSD Middlese:	x TFM	City/C	County: Mathews		Sampling Date:	7/9/2021	
Applicant/Owner: HRSD		- 38 %	20.3	State: VA	Sampling Point: WS		
Investigator(s): Emily Foster,	James Cook	Section	on, Township, Range:	A-COTOMINE.	EGCondender-renamen-		
Landform (hillslope, terrace, e						%): 50	
Subregion (LRR or MLRA): M	Schile:				Datum		
Soil Map Unit Name: Steep sa		57.555572			cation: N/A	040	
Are climatic / hydrologic condi	itions on the site typ	pical for this time of year? Y	resx No	(If no, explain in F	Remarks.)		
Are Vegetation, Soil _	, or Hydrolog	y significantly distur	rbed? Are *Norma	al Circumstances"	present? Yes x	No	
Are Vegetation, Soil _				explain any answe			
SUMMARY OF FINDING		# T				ures, etc.	
Hydrophytic Vegetation Pres	sent? Yes_	Nox	to the Complet Area				
Hydric Soil Present?		No x	Is the Sampled Area within a Wetland?	Vac	No_x		
Wetland Hydrology Present?		Nox	Within a Weband r	105	NO		
					Cowardin: <u>uplanc</u>	1	
HYDROLOGY							
Wetland Hydrology Indicat	tors:			Secondary Indic	ators (minimum of two	o required)	
Primary Indicators (minimum		check all that apply)		Surface Soil Cracks (B6)			
Surface Water (A1)		_ Aquatic Fauna (B13)			getated Concave Sur	face (B8)	
High Water Table (A2)	2	Marl Deposits (B15) (LR	R U)	Drainage Patterns (B10)			
Saturation (A3)	<u> </u>	_ Hydrogen Sulfide Odor (NO CAN PA	Moss Trim L			
Water Marks (B1)		Oxidized Rhizospheres a	along Living Roots (C3)	Dry-Season	Water Table (C2)		
Sediment Deposits (B2)	_	Presence of Reduced Iro	on (C4)	Crayfish Bur	rrows (C8)		
Drift Deposits (B3)	-	Recent Iron Reduction in	Tilled Soils (C6)	Saturation V	/isible on Aerial Image	ery (C9)	
Algal Mat or Crust (B4)	_	_ Thin Muck Surface (C7)		Geomorphic	Position (D2)		
Iron Deposits (B5)	_	Other (Explain in Remark	ks)	Shallow Aqu	uitard (D3)		
Inundation Visible on Ae	erial Imagery (B7)			FAC-Neutra	l Test (D5)		
Water-Stained Leaves (B9)			Sphagnum r	moss (D8) (LRR T, U))	
Field Observations:							
Surface Water Present?		x Depth (inches):					
Water Table Present?	Yes No .	x Depth (inches):					
Saturation Present? (includes capillary fringe)	100.000	x Depth (inches):	10.11.50.50.50.50		frology Present? Yes Nox		
Describe Recorded Data (str	ream gauge, monito	oring well, aerial photos, pre	evious inspections), if av-	ailable:			
Remarks:							

VEGETATION	(Five Strata)	- Use s	scientific	names o	f plants
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Tree Stratum (Plot size: 30 ft

1 Quercus alba, Northern White Oak

Sapling Stratum (Plot size: 30 ft)

Shrub Stratum (Plot size: 30 ft)

Herb Stratum (Plot size: 30 ft)

Woody Vine Stratum (Plot size: 30 ft)

1.____

Sampling Point: W5-UP Absolute Dominant Indicator Dominance Test worksheet: % Cover Species? Status Number of Dominant Species 0 (A) That Are OBL, FACW, or FAC: 2 Fagus grandifolia, American Beech 30 x FACU Total Number of Dominant 2 (B) Species Across All Strata: Percent of Dominant Species 0.0% (A/B) That Are OBL, FACW, or FAC: 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 ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) 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.

	0 = Total Cover	Hydrophytic Vegetation			
50% of total cover: 0 Remarks: (If observed, list morphological adaptations below	20% of total cover:0 wv).	Present?	Yes	_ Nox	_
Managa aran salemata inga una ang ang ang ang		V. W. 1984 M. 1974 M. 1974 M. 1974	9960 ST Steel at 1000		edesso o
Army Corps of Engineers		Atlantic and Gu	ulf Coastal Plai	n Region – Versio	on 2

0 = Total Cover

______60___x____FACU

90 = Total Cover

____ 0 __ = Total Cover

0 = Total Cover

50% of total cover: 45 20% of total cover; 18

50% of total cover: ___0__ 20% of total cover: ___0

50% of total cover: 0 20% of total cover: 0

50% of total cover: 0 20% of total cover: 0

1.

SOIL Sampling Point: W5-UP

Date: ___

Feature Name: W 5 - UP





Photograph Direction North

Comments:



Comments:





Photograph Direction South

Comments:

Photograph Direction West

Project/Site: HRSD Middlese	ex TFM	City	County Middlesex/Mid	dlesex	Sampling Date:7	7/14/2021
Applicant/Owner: HRSD		38 %	(3992	State: VA	Sampling Point: W6	
Investigator(s): Emily Foster,	. Katelyn Hoisingto	n Sec	tion, Township, Range:	Carto, T.C. d'Salva	20000000000000000000000000000000000000	
Landform (hillslope, terrace, e						5-25
Subregion (LRR or MLRA): N	950-100 Zo				Datum: \	16.5
Soil Map Unit Name: Kemps				NWI classifi	24	
Are climatic / hydrologic cond	itions on the site typ	ical for this time of year?	Yesx _ No	(If no, explain in F	Remarks.)	
Are Vegetation, Soil _	, or Hydrology	y significantly dist.	urbed? Are "Norma	al Circumstances"	present? Yesx	No
Are Vegetation, Soil _	, or Hydrology	y naturally problem	natic? (If needed,	explain any answ	ers in Remarks.)	
SUMMARY OF FINDIN	GS – Attach si	ite map showing sa	mpling point locati	ons, transects	s, important featur	es, etc.
Hydrophytic Vegetation Pres	sent? Yes _	x No	Is the Sampled Area			
Hydric Soil Present?	Yes _	No	within a Wetland?	Yes	X No	
Wetland Hydrology Present	? Yes_	x No	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2.074		
PEM adjacent to Twiggs Fe	erry Road.				Cowardin:	
HYDROLOGY						
Wetland Hydrology Indica	tors:	09 09 KSHST KSSS		Secondary Indic	ators (minimum of two re	equired)
Primary Indicators (minimun	n of one is required;	check all that apply)		Surface Soil	Cracks (B6)	
Surface Water (A1)	_	_ Aquatic Fauna (B13)		Sparsely Ve	egetated Concave Surface	e (B8)
High Water Table (A2)	<u> </u>	Marl Deposits (B15) (LF	RR U)	Drainage Pa	atterns (B10)	
Saturation (A3)		_ Hydrogen Sulfide Odor	(C1)	Moss Trim L	Lines (B16)	
Water Marks (B1)			along Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	_	Presence of Reduced In	ron (C4)	Crayfish Bu	rrows (C8)	
Drift Deposits (B3)	-	Recent Iron Reduction	in Tilled Soils (C6)		isible on Aerial Imagery	(C9)
— Algal Mat or Crust (B4)		_ Thin Muck Surface (C7)		Geomorphic		
Iron Deposits (B5)	The transport of the second se	Other (Explain in Rema	rks)	Shallow Aqu		
Inundation Visible on A				× FAC-Neutra		
Water-Stained Leaves ((B9)			Sphagnum	moss (D8) (LRR T, U)	
Field Observations:	W N-	V . D				
Surface Water Present?	ALTERNATION TO CARREST	X Depth (inches):				
Water Table Present?	\$10 DE	x Depth (inches): 18	1930000 00000		002 12200 L 02200	
Saturation Present? (includes capillary fringe)	Yes No	x Depth (inches): 15	Wetland	Hydrology Prese	nt? Yesx No	
Describe Recorded Data (st	ream gauge, monito	oring well, aerial photos, p	revious inspections), if av	ailable:		,
Remarks:						
Saturation at 15, water tal	hle at 18					
Saturation at 15, water tal	ble at 18.					

VEGETATION (Five Strata) -	Use scientific	names of pla	ants.	
	50	Absolute	Dominant	Indicato

0 = Total Cover

Vegetation

Present?

50% of total cover: 0 20% of total cover: 0

1. Rubus pensilvanicus, Pennsylvania Blackberry 5 Yes FAC 2 Acer rubrum, Red Maple 2 Yes FAC 3 Morella cerifera, Southern Bayberry 2 Yes FAC

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

Tree Stratum (Plot size: 30 ft)

Sapling Stratum (Plot size: 30 ft)

Shrub Stratum (Plot size: 30 ft)

Herb Stratum (Plot size: 30 ft)

50		Dominant		Dominance Test worksheet:
)	% Cover	Species?	Status	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
	0	= Total Cov	er	Prevalence Index worksheet:
50% of total cover:0	20% of	total cover:	0	Total % Cover of;Multiply by:
) ft)			7 - 2	OBL species x 1 = 72
sylvania Blackberry	5	Yes	<u>FAC</u>	FACW species 3 x 2 = 6
	2	Yes	FAC	FAC species 19 x 3 = 57
n Bayberry	2	Yes	FAC	FACU species 0 x 4 = 0
				UPL species0 x 5 =0
				Column Totals: 94 (A) 135 (B)
				Prevalence Index = B/A =1.44
	9	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover: 4.5	20% of	total cover:	1.8	1 - Rapid Test for Hydrophytic Vegetation
t)				X 2 - Dominance Test is >50%
				X 3 - Prevalence Index is ≤3.01
				Problematic Hydrophytic Vegetation [†] (Explain)
				¹ Indicators of hydric soil and wetland hydrology must be present; unless disturbed or problematic.
				Definitions of Five Vegetation Strata:
	0	= Total Cov	ег	Tree - Woody plants, excluding woody vines,
50% of total cover: 0	20% of	total cover:	0	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
tted Chain Fern	60	Yes	OBL	Sapling - Woody plants, excluding woody vines,
ı	12	No	OBL	approximately 20 ft (6 m) or more in height and less
censis, New York Fern	10	No	FAC	than 3 in. (7.6 cm) DBH.
neum, Cinnamon Fern	3	<u>No</u>	FACW	Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
	\equiv		\equiv	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.
	_	= Total Cov		
50% of total cover:42.5	20% of	total cover:	17	
30 ft)				
				1

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

Woody Vine Stratum (Plot size: 30 ft)

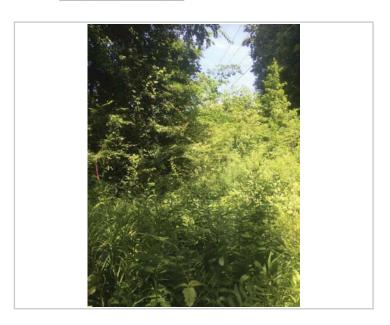
Yes X No __

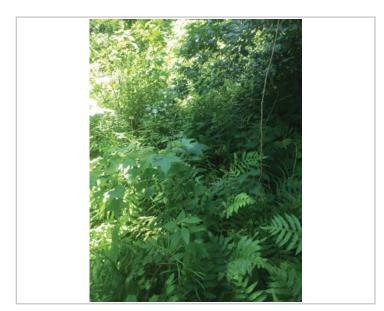
SOIL Sampling Point: W6

Depth	Matrix			x Feature			1-22/18/Vine	all files
(inches)	Color (moist)	%	Color (moist)	%	Type	_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	
		-						
	10 1		-					
	-				=		-	-
nerversum d		Stant Lab		S. S. Sarana			(All Carries and Carries and	
	oncentration, D=Dep Indicators: (Applic					ains.		PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
2		anie to an	Polyvalue B			DD C T I		Muck (A9) (LRR O)
Histosol	pipedon (A2)		Polyvalue B			William Control		Muck (A10) (LRR S)
	istic (A3)		Loamy Much					ed Vertic (F18) (outside MLRA 150A,
	en Sulfide (A4)		Loamy Gley				- TOTAL CO.	ont Floodplain Soils (F19) (LRR P, S, T
	d Layers (A5)		Depleted Ma	atrix (F3)				alous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P		Redox Dark		(75 0 465).		3,100,000	RA 153B)
	ucky Mineral (A7) (LI	300						arent Material (TF2) Shallow Dark Surface (TF12)
	resence (A8) (LRR L uck (A9) (LRR P, T)	"	Redox Depr Mart (F10) (I		0)			(Explain in Remarks)
	d Below Dark Surfac	e (A11)	Depleted Oc		(MLRA 1	51)	_ 0000	(Explain in Nemarks)
	ark Surface (A12)		Iron-Mangar				T) ³ India	ators of hydrophytic vegetation and
_ Coast P	rairie Redox (A16) (I	MLRA 150	A) Umbric Surf	ace (F13)	LRR P, T	U)	wel	land hydrology must be present,
	Mucky Mineral (S1) (I	LRR O, S)	Delta Ochric		Service Services			ess disturbed or problematic.
	Gleyed Matrix (S4)		Reduced Ve					
	Redox (S5) d Matrix (S6)		Piedmont FI				A 149A, 153C	153D)
	matrix (OO)	50025 0000		Dirigini E Con	ny cons (i	20) (1812)	in 140n, 1000	, 1000)
	rface (S7) (LRR P. 5	S. T. U)						
Dark Su	rface (S7) (LRR P, \$ Layer (if observed):	121-112-11-12						
Dark Su	A PART OF THE PART	121-112-11-12						
Dark Su Restrictive	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes × No
Dark Su Restrictive Type:	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes × No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes × No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yesx No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
Dark Su Restrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No <u>——</u>
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>x</u> No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>x</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>x</u> No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes No
Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>x</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes x No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes <u>×</u> No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes x No
Dark Su testrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes x No
Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes X No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yes X No
_ Dark Su estrictive Type: Depth (in	Layer (if observed):	121-112-11-12					Hydric Soil	Present? Yesx No

Date: _____

Feature Name: W6





Photograph Direction North

Comments:



Comments:





Photograph Direction West

Comments:

Photograph Direction East

Project/Site: HRSD Middlesex T	FM	City/C	ounty: Middlesex/Mid	ldlesex	Sampling Date: _	7/14/2021
Applicant/Owner: HRSD			0.00	State: VA	Sampling Point: V	V6-UP
Investigator(s): Emily Foster, Ka	itelyn Hoisington	Section	on, Township, Range: _	Securit Selforer		
Landform (hillslope, terrace, etc.)): Hillslope	Local	relief (concave, convex	, none): None	Slope	(%): 20-40
Subregion (LRR or MLRA): MLR			Long:			
Soil Map Unit Name: Kempsvill			F. 30474.870	5000000000 EX	32	77.0m.
Are climatic / hydrologic condition			MARKETT SATISFACE	and Washington and		
Are Vegetation, Soil						No
Are Vegetation, Soil						
SUMMARY OF FINDINGS				explain any answe		atures, etc.
Hydrophytic Vegetation Presen	t? Yes	No x				
Hydric Soil Present?	Yes	10000	Is the Sampled Area		10000	
Wetland Hydrology Present?	Yes	Nox	within a Wetland?	105	Nox_	
Remarks: Upland adjacent to Twiggs Fe	erry Rd., upslope frpm \	N6 (PEM)			Observed Classifi Cowardin: <u>uplar</u>	
HYDROLOGY						
Wetland Hydrology Indicator	5:			Secondary Indica	ators (minimum of ty	wa required)
Primary Indicators (minimum of	one is required; check a	Il that apply)		Surface Soil	Cracks (B6)	
Surface Water (A1)		tic Fauna (B13)			getated Concave S	urface (B8)
High Water Table (A2)		Deposits (B15) (LRF	R U)		atterns (B10)	11/18/
Saturation (A3)	Hydro	gen Sulfide Odor (0	C1)	Moss Trim L	ines (B16)	
Water Marks (B1)	Oxidiz	red Rhizospheres a	long Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	Prese	nce of Reduced Iro	n (C4)	Crayfish Bur	rrows (C8)	
Drift Deposits (B3)	Recer	nt Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Ima	gery (C9)
Algal Mat or Crust (B4)	Thin N	Muck Surface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	Other	(Explain in Remark	(s)	Shallow Aqu	uitard (D3)	
Inundation Visible on Aeria	I Imagery (B7)			FAC-Neutra	l Test (D5)	
Water-Stained Leaves (B9)			Sphagnum r	moss (D8) (LRR T,	U)
Field Observations:						
Surface Water Present?	Yes No _x D	epth (inches):				
Water Table Present?	Yes No _x D	epth (inches):				
Saturation Present? (includes capillary fringe)	Yes No _x D				nt? Yes	No _x_
Describe Recorded Data (strea	m gauge, monitoring wel	l, aerial photos, pre	vious inspections), if av	ailable:		
Remarks:						

VEGETATION (Five Strata) – Use scientific names of plants.								
Self-transportation (VSR) (VSR	50		Dominant					
Tran Stratum (Diet cize: 20 ft	N.	Ol Course	Consise?	Chahren				

2 Ilex opaca, American Holly 35 Yes FAC

1. Quercus alba, Northern White Oak 5 Yes FACU

Tree Stratum (Plot size: 30 ft)

Sapling Stratum (Plot size: 30 ft)

Shrub Stratum (Plot size: 30 ft)

Herb Stratum (Plot size: 30 ft)

Liriodendron tulipifera, Tuliptree

Sampling Point: W6-UP Dominance Test worksheet: Number of Dominant Species 2____ (A) That Are OBL, FACW, or FAC: Total Number of Dominant 4 ____ (B) Species Across All Strata: Percent of Dominant Species 50.0% (A/B) That Are OBL, FACW, or FAC: Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species _____ 0 ___ x 1 = ____ 0 FACW species _____0 x 2 = ____0 FAC species _______ 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 ≤3.0¹ Problematic Hydrophytic Vegetation¹ (Explain) 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.

0 = Total Cover					
_ 20% o	f total cover	r: <u>0</u>			
30	Yes	FAC_			
5	No	FAC			
5	No	FACU			
	0				
			Hydrophytic		
40	= Total Co	ver	Vegetation		
20% of total cover: 8			Present?	Yes	No
/)_					
	30 5 5 40	20% of total cover 30 Yes 5 No 5 No 40 = Total Co 20% of total cover 20% of total cover	20% of total cover: 0 0		

% Cover Species? Status

50 Yes FACU

85 = Total Cover

5 = Total Cover

0 = Total Cover

50% of total cover: 42.5 20% of total cover: 17

50% of total cover: 2.5 20% of total cover: 1

50% of total cover: 0 20% of total cover: 0

SOIL Sampling Point: W6-UP

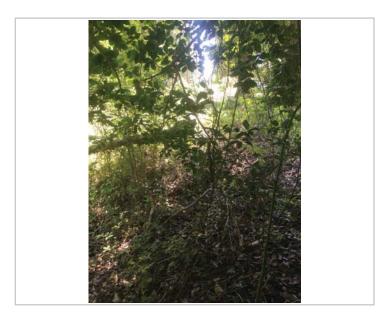
Depth	Matrix			x Feature			1-24-180 Vine	425000000000000000000000000000000000000	
(inches)	Color (moist)		Color (moist)	%	Type'	_Loc ²	Texture	Remarks	
0-12	10yr 4/3	100%					Sandy loam		
12-18	2.5y 7/6	100%					Sand		
		0			ii -				
	60 60			-					
					$\overline{}$	_			
									922
	oncentration, D=Dep					ains.		L=Pore Lining, M=Matro or Problematic Hydric	
2	Indicators: (Applic	able to all L				DD 6 T 1			aons :
Histosol	pipedon (A2)		Polyvalue B					ck (A9) (LRR O) ck (A10) (LRR S)	
	listic (A3)		Loamy Much					Vertic (F18) (outside	MLRA 150A.
	en Sulfide (A4)		Loamy Gley				- TOO TO THE PARTY OF THE PARTY	t Floodplain Soils (F19	
Stratifie	d Layers (A5)		Depleted Ma	atrix (F3)			Anomalo	ous Bright Loamy Soils	(F20)
	Bodies (A6) (LRR F		Redox Dark		(75 0 465).		3, 12, 30, 30, 31, 32, 33	(153B)	
	ucky Mineral (A7) (L	3.00	Depleted Da					ent Material (TF2)	
	resence (A8) (LRR L uck (A9) (LRR P, T)	1)	Redox Depr Mart (F10) (I		8)			allow Dark Surface (TF	12)
	d Below Dark Surface	e (A11)	Man (F10) (i		(MLRA 1	51)	— Other (E	xplain in Remarks)	
	ark Surface (A12)	~ ,	Iron-Mangar				T) ³ Indicat	ors of hydrophytic vege	etation and
	rairie Redox (A16) (MLRA 150A				The state of the s	1000 Hills (1000)	nd hydrology must be p	
	Mucky Mineral (S1) (LRR O, S)	Delta Ochric		Service Services			s disturbed or problems	atic.
	Gleyed Matrix (S4)		Reduced Ve						
	Redox (S5)		Piedmont FI					£2D)	
	d Matrix (S6) urface (S7) (LRR P, :	S T III	Anomalous	Bright Loai	ny sons (i	-20) (MLR	A 149A, 153C, 1	330)	
	Layer (if observed)	241-1-2-1-141							
A STITICTIVE									
Туре:	iches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	iches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No ×
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No ×
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	iches):						Hydric Soil P	resent? Yes	No X
Type:	iches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	nches):						Hydric Soil P	resent? Yes	No X
Type: Depth (in	iches):						Hydric Soil P	resent? Yes	No ×

Photograph Log

Date:		
Date.		

Feature Name:



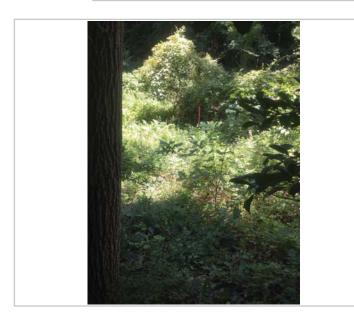


Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:

Photograph Direction West

Comments:

Tetra Tech Photo Log Form

Project/Site: HRSD Middlese	x TFM			City	/County: Mid	dlesex/Mid	dlesex	Sampling Date: _	7/14/2021
Applicant/Owner: HRSD								Sampling Point: V	N7
Investigator(s): Emily Foster,	Katelyn	Hoisingtor	1	Sec	ction, Townshi	p, Range:			
Landform (hillslope, terrace, e									(%): 10-45
Subregion (LRR or MLRA): M	00000mg							Datu	
Soil Map Unit Name: Steep s				_37.30397	<u> </u>		NWI classifi	17.000	MIL VVG304
Are climatic / hydrologic condi		anner to a market	and for this		V V	1010		77	
Are Vegetation, Soil _		The second of gales		and the state of the state of			A CONTRACTOR OF THE PARTY OF TH		No
Are Vegetation, Soil _	, or	Hydrology	na	turally proble	matic?	(If needed,	explain any answ	ers in Remarks.)	
SUMMARY OF FINDING	GS - A	ttach sit	e map s	howing sa	mpling po	int location	ons, transect	s, important fea	atures, etc.
Hydrophytic Vegetation Pres Hydric Soil Present? Wetland Hydrology Present?		Yes	x No x No x No		Is the San within a V	npled Area Vetland?	Yes	No	
Remarks:								Observed Classif	ications:
								Cowardin: <u>PFO</u>	
HYDROLOGY									
Wetland Hydrology Indicat	ors:			-			Secondary Indic	ators (minimum of t	wo required)
Primary Indicators (minimum	of one in	required;	check all th	at apply)			Surface Soi	Cracks (B6)	
Surface Water (A1)		_	Aquatic F	auna (B13)			Sparsely Ve	getated Concave S	urface (B8)
_X High Water Table (A2)			Marl Dep	osits (B15) (L	RR U)		Drainage Pa	atterns (B10)	
X Saturation (A3)		_	Hydrogen	Sulfide Odor	(C1)		Moss Trim I	Lines (B16)	
Water Marks (B1)					s along Living	Roots (C3)	_ Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	l.	_	Presence	of Reduced	Iron (C4)		Crayfish Bu	rrows (C8)	
Drift Deposits (B3)			Recent In	on Reduction	in Tilled Soils	(C6)	Saturation \	risible on Aerial Ima	gery (C9)
— Algal Mat or Crust (B4)		_	Thin Muc	k Surface (C7	7)		Geomorphic	Position (D2)	
Iron Deposits (B5)		_	Other (Ex	plain in Rema	arks)		Shallow Aq		
Inundation Visible on Ae	rial Imag	ery (B7)					X FAC-Neutra		
Water-Stained Leaves (B9)						Sphagnum	moss (D8) (LRR T,	U)
Field Observations:									
Surface Water Present?	14.5	1.000	7.1						
Water Table Present?	Yes _	X No_	Dept	h (inches): 1	2				
Saturation Present? (includes capillary fringe)				h (inches): 0				nt? Yes_x_	No
Describe Recorded Data (str	eam gau	ge, monitor	ing well, a	erial photos, p	previous inspe	ctions), if ava	ailable:		
Remarks:									
TOTAL STATE OF THE									

VEGETATION	(Five Strata)	- Use	scientific	names	of p	plants
-------------------	---------------	-------	------------	-------	------	--------

	nes of pla				ng Point: W7	
5 Starten (States 20 ft		Dominant		Dominance Test worksheet:		
		Species?		Number of Dominant Species	7	
Nyssa sylvatica, Black Tupelo				That Are OBL, FACW, or FAC:	7	(A)
Ilex opaca, American Holly	30	Yes	<u>FAC</u>	Total Number of Dominant		
				Species Across All Strata:	7	(B)
				Percent of Dominant Species		
				That Are OBL, FACW, or FAC:	100.0%	(A/E
						1 Paris
	65	= Total Cov	er	Prevalence Index worksheet:		
50% of total cover: 32.5	20% of	total cover:	13	Total % Cover of:		-
Sapting Stratum (Plot size: 30 ft)	- 1000000			OBL species x 1		_
Carpinus caroliniana, American Hornbeam	15	Yes	FAC	FACW species5 x 2	= 10	-
Acer rubrum, Red Maple				FAC species 85 x 3	= 255	
(1)				FACU species 0 x 4	= 0	
Magnolia virginiana, Sweet-Bay		res	FACW	UPL species 0 x 5		-
			_	Column Totals: 135 (A)	-	(B)
k				County Foldis	010	_ (0)
				Prevalence Index = B/A = _	2.30	
	25	= Total Cov	er	Hydrophytic Vegetation Indicate		
50% of total cover:12.5	20% of	total cover:	5	1 - Rapid Test for Hydrophylic		
Shrub Stratum (Plot size: 30 ft)			- 1	X 2 - Dominance Test is >50%	regulation	
				X 3 - Prevalence Index is ≤3.01		
					1187 - 112 - 121	
				Problematic Hydrophytic Vege	etation' (Expla	in)
			_	5 m 3 m 3		
·	_		_	Indicators of hydric soil and wetla		must
j				be present, unless disturbed or pro		
3				Definitions of Five Vegetation S	trata:	
	0 1	= Total Cov	er	Tree - Woody plants, excluding w	nody vines	
50% of total cover: 0	20% of	total cover:	0	approximately 20 ft (6 m) or more		3 in.
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at br	reast height (D	BH)
Woodwardia areolata, Netted Chain Fern	30	Yes	OBL	Sapling - Woody plants, excluding	a woody vines	
Saururus cernuus, Lizard's-Tail	50.	Yes	_	approximately 20 ft (6 m) or more		
				than 3 in. (7.6 cm) DBH.		
\ <u></u>				Chrish Wands about auchidian	usendo de e	
\ <u></u>				Shrub – Woody plants, excluding approximately 3 to 20 ft (1 to 6 m)		
ì				Herb - All herbaceous (non-wood		
!				herbaceous vines, regardless of s plants, except woody vines, less to	The second secon	A COLUMN TO SERVICE AND ADDRESS OF THE PARTY
L <u> </u>				3 ft (1 m) in height.	ion approxima	iciy
)					11.00	
0				Woody vine - All woody vines, re	gardless of he	ight.
1						
		= Total Cov				
50% of total cover: 22.5	_ 20% of	total cover				
Noody Vine Stratum (Plot size: 30 ft)						
c 						
			<u> </u>			
		_		District to		
·		= Total Cov		Hydrophytic Vegetation		
		- I oral Cov	e.			
50% of total cover:0	0000		_	Present? Yes X	No	

SOIL Sampling Point: W7

A Second	Matrix		needed to docu Red	x Feature						
(inches)	Color (moist)	%	Color (moist)	%		_Loc2	Texture		Remarks	
0-6	10yr 2/2	100%					Sand	< 70% so	oil particles m	asked
6-18	7.5yr 4/2	100%					Sand			
		-00 -00 -00 -00 -00 -00 -00 -00 -00 -00								
					_					
					_					
					-					
	oncentration, D=De					ains.			ining, M=Matri	
	Indicators: (Appli	cable to all L							matic Hydric	Solls":
_ Histosol	pipedon (A2)		Polyvalue B					Muck (A9) (I Muck (A10)		
	istic (A3)		Loamy Much				-		18) (outside N	ILRA 150A.B
	en Sulfide (A4)		Loamy Gley			-,	4000000		ain Soils (F19)	
_ Stratifie	d Layers (A5)		Depleted Ma	atrix (F3)			Anom	alous Bright	Loamy Soils (F20)
_	Bodies (A6) (LRR I	The state of the s	Redox Dark	Frank State All	(C) 5000 (I)		A	RA 153B)		
	ucky Mineral (A7) (L	ALL CONTRACTOR OF THE PARTY OF	Depleted Da					arent Mater		2)
	resence (A8) (LRR I uck (A9) (LRR P, T)		Redox Depr Mart (F10) (I		8)			(Explain in	(Surface (TF1	2)
	d Below Dark Surfa		Depleted Oc		(MLRA 15	51)	_ Other	(Explain iii	(Ciliaiks)	
Thick D	ark Surface (A12)		Iron-Mangar	ese Mass	es (F12) (I	LRR O, P, 1	T) ³ India	cators of hyd	trophytic veget	ation and
	rairie Redox (A16) (U)			ogy must be pr	
THE RESERVE OF THE PARTY	Mucky Mineral (S1)	(LRR O, S)	Delta Ochric				unl	ess disturbe	ed or problema	tic.
THE RESERVE OF THE PARTY OF THE	Gleyed Matrix (S4) Redox (S5)		Reduced Ve Piedmont FI)A)			
	Matrix (S6)					Control of the same of the same	149A, 153C	. 153D)		
	urface (S7) (LRR P,	S, T, U)								
Restrictive	Layer (if observed):								
Times										
Type:							Hudela Call	Dragant?	Yesx	No
Depth (in	iches):						nyane son	Liezein i		
	ches):						nyanc son	riesein r		
Depth (in Remarks:	nd top 2-3 inches.						nydric Soil	Pleselit		
Depth (in Remarks:	200 F 200 F 200						nydric son	riesettr		
Depth (in Remarks:	200 F 200 F 200						nyane son	Present		
Depth (in Remarks:	200 F 200 F 200						nydiic Soil	Plesent		
Depth (in Remarks:	200 F 200 F 200						nydiic Soil	Plesent		
Depth (in Remarks:	200 F 200 F 200						nydic soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Priesell		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fiesding		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fiesding		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Present		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fiesell		
Depth (in Remarks:	200 F 200 F 200						nydric Son	Fiesding		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fiesding		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fiesding		
Depth (in Remarks:	200 F 200 F 200						nydric Soil	Fieselit		
Depth (in remarks:	200 F 200 F 200						nydric Son	Fieselit		

Date: 7/14/21

Feature Name: W 7





Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex	TFM	City/C	County: Mathews		Sampling Date:	7/14/2021
Applicant/Owner: HRSD			3775	State: VA	Sampling Point: V	/7-UP
Investigator(s): Emily Foster, I	Katelyn Hoisington	Section Sectio	on, Township, Range: _	S-CATE VEHIC	55000000000000000000000000000000000000	
Landform (hillslope, terrace, etc	c): Hillslope	Local	relief (concave, convex	none): None	Slope	(%): 25-50
Subregion (LRR or MLRA): ML	200 To				Datu	
Soil Map Unit Name: Steep sa						V.V.
Are climatic / hydrologic conditi		al for this time of year?				
Are Vegetation, Soil						No
Are Vegetation, Soil SUMMARY OF FINDING				explain any answe ons, transects		itures, etc.
Hydrophytic Vegetation Prese	ent? Yes	No x				
Hydric Soil Present?	The state of the s	No_x	Is the Sampled Area	V	1 MAZ	
Wetland Hydrology Present?		No x	within a Wetland?	Tes	Nox	
					Cowardin: <u>Upla</u>	nd
HYDROLOGY						
Wetland Hydrology Indicato	ors:			Secondary Indic	ators (minimum of ty	vo required)
Primary Indicators (minimum		neck all that apply)		NEW 23 220/	Cracks (B6)	
Surface Water (A1)		Aquatic Fauna (B13)			getated Concave Si	urface (B8)
High Water Table (A2)		Marl Deposits (B15) (LR	R U)		atterns (B10)	
Saturation (A3)		Hydrogen Sulfide Odor (10(0)(N	Moss Trim I		
Water Marks (B1)		Oxidized Rhizospheres a	along Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)		Presence of Reduced Iro	on (C4)	Crayfish Bu	rrows (C8)	
Drift Deposits (B3)	_	Recent Iron Reduction in	Tilled Soils (C6)	Saturation \	isible on Aerial Ima	gery (C9)
Algal Mat or Crust (B4)	_	Thin Muck Surface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	_	Other (Explain in Remark	ks)	Shallow Aqu	uitard (D3)	
Inundation Visible on Aer	ial Imagery (B7)			FAC-Neutra	l Test (D5)	
Water-Stained Leaves (B	9)			Sphagnum	moss (D8) (LRR T, I	J)
Field Observations:						
Surface Water Present?	Yes No	Depth (inches):				
Water Table Present?	Yes No	Depth (inches):				
Saturation Present? (includes capillary fringe)	140.7.40	Depth (inches):			nt? Yes	No_x
Describe Recorded Data (stre	am gauge, monitorin	ng well, aerial photos, pre	evious inspections), if av	ailable:		
255						
Remarks:						

VEGETATION (Five Strata) – Use scientific names of plants.						
<u>Iree Stratum</u> (Plot size: <u>30 ft</u>)	Absolute Dominant Indicator % Cover Species? Status					

0 = Total Cover

Vegetation

Present?

50% of total cover: ___0___20% of total cover: ___0__

'EGETATION (Five Strata) – Use scientific n	2010/00 0 A 2020/00 1 0 0	22.3522			Point: W7-U	JP
Tree Stratum (Plot size: 30 ft)		Dominant Species?		Dominance Test worksheet:		
Carya glabra, Pignut Hickory				Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
2 Ilex opaca, American Holly				Service Control of the Control of Control of the Co		
3.				Total Number of Dominant Species Across All Strata:	3	(B)
4.	E(U =					
5				Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7%	(A/B)
S						000000
	70	= Total Cov	rer	Prevalence Index worksheet:	a-nervaninen maa-	
50% of total cover:3	5 20% of	total cover	14		Multiply by:	
Sapling Stratum (Plot size: 30 ft)				OBL species 0 x 1 =		
l. <u>Ilex opaca, American Holly</u>	10	Yes	FAC_	FACW species0 x 2 =		
2				FAC species40 x 3 =		
3				FACU species 40 x 4 =		
4				UPL species0 x 5 =		
5				Column Totals: 80 (A)	280	_ (B)
š				Prevalence Index = B/A =	3.50	
	10	= Total Cov	rer	Hydrophytic Vegetation Indicator		
50% of total cover:	20% of	total cover	2	1 - Rapid Test for Hydrophytic		
Shrub Stratum (Plot size: 30 ft)				X 2 - Dominance Test is >50%		
l				3 - Prevalence Index is ≤3.01		
2				Problematic Hydrophytic Veget	ation [†] (Expla	in)
3					and and Campbella	
4.				Indicators of hydric soil and wetlan	d hydrology r	must
5.				be present, unless disturbed or prof		nu se
5.				Definitions of Five Vegetation Str	ata:	
		= Total Cov	er	To Moral state and discussion		
50% of total cover:	20% of	total cover	0	Tree – Woody plants, excluding wo approximately 20 ft (6 m) or more in		3 in.
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at bre		
1				Sapling - Woody plants, excluding	woody vines	S
2		70. E	17 - 29	approximately 20 ft (6 m) or more in		
3.		371 23		than 3 in, (7.6 cm) DBH.		
4.	-0.00			Shrub - Woody plants, excluding w	roody vines,	
5.	7600			approximately 3 to 20 ft (1 to 6 m) in		
3.				Herb - All herbaceous (non-woody) plants, inclu	idina
7.				herbaceous vines, regardless of siz	e, and wood	У
B.				plants, except woody vines, less that 3 ft (1 m) in height.	an approxima	itely
9.				3 to (1 m) in neight.		
10				Woody vine - All woody vines, reg	ardless of he	ight.
11						
		= Total Cov	er			
50% of total cover:	_					
Woody Vine Stratum (Plot size: 30 ft)	2070		· -			
71. P. S.						
1						
2						
3						
4 5						

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

Yes ____ No __x

SOIL Sampling Point: W7-UP

Depth	Matrix		Redo	x Feature					
(inches)	Color (moist)		Color (moist)	%	Type	Loc2	Texture	Rema	arks
0-18	7.5yr 3/2	100%			<u> </u>		Sand		
	H-8-2 H-13-2				-				
		3 3			i			1	
	502	<u> </u>							
		77					- 30		
Type: C=C	Concentration, D=Dep	letion RM=R	duced Matrix M	S=Masker	Sand Gr	——	3 ocation: E	L=Pore Lining, M=	Matriy
	Indicators: (Applic					JII 1 3.		or Problematic Hy	
Histoso			Polyvalue B			RR S. T. U		ck (A9) (LRR O)	
	pipedon (A2)		Thin Dark S					ck (A10) (LRR S)	
	listic (A3)		Loamy Muck					Vertic (F18) (outs	side MLRA 150A,
Hydrog	en Sulfide (A4)		Loamy Gley				Piedmon	t Floodplain Soils	(F19) (LRR P, S,
	d Layers (A5)		Depleted Ma	itrix (F3)				ous Bright Loamy S	Soils (F20)
	Bodies (A6) (LRR P		Redox Dark		(75 5 935)		3,000,000,000	(153B)	
	ucky Mineral (A7) (LF	000	Depleted Da					ent Material (TF2)	50000000
	resence (A8) (LRR U)	Redox Depr		8)			allow Dark Surface	200 C - 1 - 100 C
	uck (A9) (LRR P, T)	. (444)	Mart (F10) (I		(14) DA 4)		_ Other (E	xplain in Remarks)	8
	ed Below Dark Surfact Park Surface (A12)	e (A11)	Depleted Od Iron-Mangar	TO COMPANY DISCORDING			T) ³ Indical	ors of hydrophytic	vedetation and
	Prairie Redox (A16) (N	ALRA 150A)	Umbric Surf					nd hydrology must	A STATE OF THE PARTY OF THE PAR
	Mucky Mineral (S1) (L		Delta Ochric			,		s disturbed or prob	
	Gleyed Matrix (S4)	7011074.74	Reduced Ve			0A, 150B)			
	Redox (S5)		Piedmont FI				9A)		
_ Stripper	d Matrix (S6)		Anomalous	Bright Loar	ny Soils (i	F20) (MLR	A 149A, 153C, 1	(53D)	
Dark C	urface (S7) (LRR P, S	S, T, U)							
	PER PROPERTY OF THE PROPERTY O								
	Layer (if observed):								
	PER PROPERTY OF THE PROPERTY O		_						
Restrictive Type:	PER PROPERTY OF THE PROPERTY O		_				Hydric Soil P	resent? Yes	Nox
Restrictive Type:	Layer (if observed):		<u> </u>				Hydric Soil P	resent? Yes	No×
Restrictive Type: Depth (in	Layer (if observed):		<u></u>				Hydric Soil P	resent? Yes	No×
Restrictive Type: Depth (in	Layer (if observed):		_				Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):		<u>-</u>				Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):		-				Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	No x
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes _	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Restrictive Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	Nox
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes _	No _x
Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes _	No _x
estrictive Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	No_x
estrictive Type: Depth (in	Layer (if observed):						Hydric Soil P	resent? Yes	No x

Date: _____

Feature Name: W7-UP





Photograph Direction West

Comments:

Photograph Direction East

Comments:





Photograph Direction North

Comments:

Photograph Direction South

Project/Site: HRSD Middlesex TFM		City/0	County Middlesex/Mid	dlesex	_ Sampling Date: _	7/14/2021
Applicant/Owner: HRSD			23/42	State: VA	Sampling Point: V	V8
Investigator(s): Emily Foster, Kately	n Hoisington	Secti	on, Township, Range:			
Landform (hillslope, terrace, etc.): D		10.000.000				(%) 0-10
Subregion (LRR or MLRA): MLRA 15					Datu	100000
						M W0304
Soil Map Unit Name Suffolk-Remli	A someone so and most re-			NWI classif		
Are climatic / hydrologic conditions of	n the site typical f	or this time of year?	/es_x_No	(If no, explain in	Remarks.)	
Are Vegetationx, Soilx,	or Hydrology	significantly distu	rbed? Are "Norma	al Circumstances'	present? Yesx	No
Are Vegetation, Soil,	or Hydrology	naturally problem	atic? (If needed,	explain any answ	rers in Remarks.)	
SUMMARY OF FINDINGS -	Attach site n	nap showing san	npling point locati	ons, transect	s, important fea	atures, etc.
Hydrophytic Vegetation Present?	Yes x	_ No	to the Country of Account			
Hydric Soil Present?		No	Is the Sampled Area	W	v	
Wetland Hydrology Present?		No	within a Wetland?	Yes	X No	1
Remarks:					Observed Classif	ications:
roadside area.						
HYDROLOGY				988 us 10000 to	- 201400 0000	
Wetland Hydrology Indicators:				Secondary India	cators (minimum of t	wo required)
Primary Indicators (minimum of one	e is required; chec	k all that apply)		Surface So	il Cracks (B6)	
Surface Water (A1)	Aq	uatic Fauna (B13)		Sparsely V	egetated Concave S	urface (B8)
High Water Table (A2)	Ma	arl Deposits (B15) (LR	R U)	X Drainage P	atterns (B10)	
Saturation (A3)	Hy	drogen Sulfide Odor (C1)	Moss Trim	Lines (B16)	
Water Marks (B1)	_ 0	idized Rhizospheres	along Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	Pr	esence of Reduced Iro	on (C4)	Crayfish Bu	irrows (C8)	
Drift Deposits (B3)	Re	cent Iron Reduction in	Tilled Soils (C6)		Visible on Aerial Ima	gery (C9)
Algal Mat or Crust (B4)		in Muck Surface (C7)			c Position (D2)	
Iron Deposits (B5)	ACCUPATION OF THE PARK VIEW	her (Explain in Remar	ks)	Shallow Aq		
Inundation Visible on Aerial Im	agery (B7)				al Test (D5)	• • •
Water-Stained Leaves (B9)				Sphagnum	moss (D8) (LRR T,	U)
Field Observations:	v					
	1000	Depth (inches):				
		_ Depth (inches):				
(includes capillary fringe)		_ Depth (inches):			ent? Yesx	No
Describe Recorded Data (stream g	auge, monitoring	well, aerial photos, pre	evious inspections), if av	ailable:		
Remarks:						
Normana.						

VEGETATION (Five Strata)	- Use	scientific	names	of plan	nts
---------------------	--------------	-------	------------	-------	---------	-----

				Sampli	Committee of the commit	
To Status (Diet in 20 ft		Dominant		Dominance Test worksheet:		
		Species?		Number of Dominant Species	3	141
Celtis occidentalis, Common Hackberry				That Are OBL, FACW, or FAC:		(A)
Ligustrum sinense, Chinese Privet			FAC	Total Number of Dominant	4	
				Species Across All Strata:	4	(B)
				Percent of Dominant Species		
				That Are OBL, FACW, or FAC:	75.0%	(A/E
				Prevalence Index worksheet:		1111111
	13	= Total Cov	rer			
50% of total cover: 6.5	20% of	total cover	2.6	Total % Cover of:		_
Sapling Stratum (Plot size: 30 ft)				OBL species 0 x 1		
5				FACW species 2 x 2		
				FAC species 8 x 3		
				FACU species 8 x 4		_
			_	UPL species 0 x 5) = 0	_
		_	-	Column Totals: 18 (A)	60	(B)
					2.22	
				Prevalence Index = B/A = _		_
	Table 1	= Total Cov		Hydrophytic Vegetation Indicate	ors:	
50% of total cover: 0	20% of	total cover		1 - Rapid Test for Hydrophytic	c Vegetation	
Shrub Stratum (Plot size: 30 ft)				X 2 - Dominance Test is >50%		
1				3 - Prevalence Index is ≤3.01		
2				Problematic Hydrophytic Veg	etation [†] (Expla	ain)
3						
L				Indicators of hydric soil and wetla	and hydrology	must
i				be present, unless disturbed or pr		
i		(1)		Definitions of Five Vegetation S	strata:	
		= Total Cov	er		**************************************	
50% of total cover:0				Tree - Woody plants, excluding wa approximately 20 ft (6 m) or more		3 in
Herb Stratum (Plot size: 30 ft)		total cover		(7.6 cm) or larger in diameter at b		
Microstegium vimineum, Japanese Stilt Grass	2	Voc	EAC			
		71		Sapling – Woody plants, excluding approximately 20 ft (6 m) or more		
Pilea pumila, Canadian Clearweed			FACW	than 3 in. (7.6 cm) DBH.	in neight and	1033
3						
4				Shrub – Woody plants, excluding approximately 3 to 20 ft (1 to 6 m)		
5				approximately 5 to 20 ft (1 to 6 ff)	in neight.	
3				Herb - All herbaceous (non-wood		
7				herbaceous vines, regardless of s plants, except woody vines, less t	The second secon	
1				3 ft (1 m) in height.	пан арргодин	atory
)				ran Indiana		
10			n 80	Woody vine - All woody vines, re	egardless of he	eight.
11.						
		= Total Cov	or.			
50% of total cover; 2.5						
	_ 20% Of	total cover				
Woody Vine Stratum (Plot size: 30 ft)						
l-———						
3						
l						
5				Hydrophytic		
	0 :	= Total Cov	er	Vegetation		
				Present? Yesx		

SOIL Sampling Point: W8

O-18 7.5yr 4/2 Type: C=Concentratio Hydric Soil Indicators Histosol (A1) Histic Epipedon (A	n, D=Depletion, RM=	Color (moist) 7.5yr 3/4 Reduced Matrix, MS	5%	De Loc²	loamy clay	Remarks
Type: C=Concentration ydric Soll Indicators Histosol (A1)	n, D=Depletion, RM=			C PL	loamy clay	
ydric Soil Indicators Histosol (A1)		Reduced Matrix, M				
Muck Presence (Al 1 cm Muck (A9) (L Depleted Below Da Thick Dark Surface Coast Prairie Redo	A4) (5) (5) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	Polyvalue Be Thin Dark Su Loamy Muck Loamy Gleye X Depleted Ma Redox Dark Depleted Dai Redox Depre Marl (F10) (L Depleted Oc Iron-Mangan Umbric Surfa Delta Ochric Reduced Ver Piedmont Flo	wise noted.) low Surface (S9) (LR y Mineral (F1) d Matrix (F2) trix (F3) Surface (F6) d Surface (F7) essions (F8) RR U) nnic (F11) (MLI ese Masses (F ce (F13) (LRR (F17) (MLRA bodplain Soils (RA 151) 12) (LRR O, F P, T, U) 151) A 150A, 150B	Indicators for U) 1 cm Muck 2 cm Muck Reduced \ Piedmont i Anomalous (MLRA 1 Red Paren Very Shalk Other (Exp	at Material (TF2) ow Dark Surface (TF12) olain in Remarks) as of hydrophytic vegetation and if hydrology must be present, disturbed or problematic.

Date: 7/14/21

Feature Name: W 8





Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM		City/County: Middlesex/N	1iddlesex	Sampling Date: 7/14/2
Applicant/Owner: HRSD		-58 W W-2	State: VA	Sampling Point: W8-UP
Investigator(s): Emily Foster, Kately	n Hoisington	Section, Township, Range:	e de la constante de la consta	ENVIOLETE HERETALISM = 1
Landform (hillslope, terrace, etc.): Hil	llslope	Local relief (concave, conv	ex. none): None	Slope (%): 10-30
Subregion (LRR or MLRA): MLRA 15:			-76.4217398	Datum: WGS84
Soil Map Unit Name: Suffolk-Remlik				cation:N/A
Are climatic / hydrologic conditions or				
		스탠보다 나타네스 하다		
Are Vegetation, Soil,				
Are Vegetation, Soil, SUMMARY OF FINDINGS -			d, explain any answ tions, transect	
Hydrophytic Vegetation Present?	Yes Nox	Is the Sampled Are		
Hydric Soil Present?	Yes Nox	within a Wetland?		Nox
Wetland Hydrology Present?	Yes Nox	- Within a Wedand?	105	
Hillsde upslope from sparsely veg	getated concave W8.			Observed Classifications: Cowardin: upland
HYDROLOGY				
Wetland Hydrology Indicators:	45 2550H 00 00 20HU V		Secondary Indic	ators (minimum of two required
Primary Indicators (minimum of one	is required; check all that app	ily)	Surface Soi	Cracks (B6)
Surface Water (A1)	Aquatic Fauna ((B13)	Sparsely Ve	getated Concave Surface (B8)
High Water Table (A2)	Marl Deposits (I	B15) (LRR U)	Drainage Pa	atterns (B10)
Saturation (A3)	— Hydrogen Sulfic	de Odor (C1)	Moss Trim I	ines (B16)
Water Marks (B1)	Oxidized Rhizor	spheres along Living Roots (C	B) Dry-Season	Water Table (C2)
Sediment Deposits (B2)	Presence of Re	duced Iron (C4)	Crayfish Bu	
Drift Deposits (B3)		duction in Tilled Soils (C6)		fisible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Thin Muck Surfa	1010 BB 1070 BB		: Position (D2)
Iron Deposits (B5)	Other (Explain i	n Remarks)	Shallow Aqu	
Inundation Visible on Aerial Ima	igery (B7)		FAC-Neutra	
Water-Stained Leaves (B9)			Spriagrium	moss (D8) (LRR T, U)
Field Observations:	No _x _ Depth (incl			
	장 그 아이는 아이는 그들은 아이는 아이를 하는데 없다.	1,000,000		
	No _x Depth (inch	\$00.00V = 1 100.0000 cm	d Hodesland Orean	-12 V N- Y
(includes capillary fringe)	No _x Depth (inch	nes): wetian	a Hydrology Prese	nt? Yes No _x
Describe Recorded Data (stream ga	auge, monitoring well, aerial ph	notos, previous inspections), if	available:	
Remarks:				

	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)	% Cover Species? Status	Number of Dominant Species
1. Ligustrum sinense, Chinese Privet	30 Yes FAC	That Are OBL, FACW, or FAC: 2 (A)
2 Celtis occidentalis, Common Hackberry		SERVICE SHAPE A SERVE AND A SERVICE AND A SE
		I Total Number of Dominant
3		Species Across All Strata: 4 (B)
4.		Percent of Dominant Species
5		That Are OBL, FACW, or FAC:50.0%(A/B)
6		110011000001110110110110110110110110110
	55 = Total Cover	Prevalence Index worksheet:
		Total % Cover of:Multiply by:
50% of total cover: 27.	.5 20% of total cover: 11	OBL species 0 x 1 = 0
Sapling Stratum (Plot size: 30 ft)		
		FACW species 0 x 2 = 0
		FAC species 45 x 3 = 135
2		FACU species60 x 4 =240
3	 	UPL species 0 x 5 = 0
4.	2026 2015 2016	ACCOUNT TO THE PROPERTY OF THE
5		Column Totals:105 (A)375 (B)
6		Prevalence Index = B/A =3.57
	0 = Total Cover	Hydrophytic Vegetation Indicators:
50% of total cover: 0	20% of total cover: 0	
Shrub Stratum (Plot size: 30 ft)		
		2 - Dominance Test is >50%
1		3 - Prevalence Index is ≤3.01
2		Problematic Hydrophytic Vegetation [†] (Explain)
3.		
4.		N. S
		Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5		
6		Definitions of Five Vegetation Strata:
	0 = Total Cover	
50% of total cover:	20% of total cover: 0	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
	20 % or local cover 0	(7.6 cm) or larger in diameter at breast height (DBH).
Herb Stratum (Plot size: 30 ft)		
1 Ligustrum sinense, Chinese Privet	15 Yes FAC	Sapling - Woody plants, excluding woody vines,
2		approximately 20 ft (6 m) or more in height and less
		than 3 in. (7.6 cm) DBH.
3		
4		Shrub - Woody plants, excluding woody vines,
5		approximately 3 to 20 ft (1 to 6 m) in height.
6		Herb - All herbaceous (non-woody) plants, including
		herbaceous vines, regardless of size, and woody
7		plants, except woody vines, less than approximately
8		3 ft (1 m) in height.
9.	<u> </u>	A Section Section 20 S
10		Woody vine - All woody vines, regardless of height.
11		
	15 = Total Cover	
50% of total cover: 7.1	5 20% of total cover: 3	
Woody Vine Stratum (Plot size: 30 ft)	3775 31 507 000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
	25 Voc 5461	
1. Vitis aestivalis, Summer Grape		
2		
3.	V 41	
4.		
5		Hydrophytic
	35 = Total Cover	Vegetation
50% of total cover: 17.	.5 20% of total cover: 7	Present? Yes NoX
Remarks: (If observed, list morphological adaptations be	IOW).	

SOIL Sampling Point: W8-UP

0-18	Matrix		Redo	x Features					
0-18	Color (moist)		olor (moist)	%	Type'	_Loc ²	Texture	Remarks	
	10yr 3/3	100%					Sandy loam		
			-						
	3								
Type: C=Cor	ncentration, D=Depl	etion RM=Redu	ced Matrix M:	S=Masked	Sand Gra	ins	å ocation: PL:	=Pore Lining, M=Matrix	
The second second second	dicators: (Applica							Problematic Hydric S	
Histosol (Polyvalue Be			RR S. T. U) 1 cm Muck	(A9) (LRR O)	
	pedon (A2)	\$ 	Thin Dark Su					(A10) (LRR S)	
Black Hist	tic (A3)		Loamy Muck	y Mineral (F1) (LRR	0)	Reduced \	/ertic (F18) (outside M	LRA 150A,
Hydrogen	Sulfide (A4)	- S	Loamy Gleye	ed Matrix (I	F2)		Piedmont	Floodplain Soils (F19) (LRR P, S, 1
	Layers (A5)		Depleted Ma					s Bright Loamy Soils (F	20)
- 1 M 1 M 2 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M	Bodies (A6) (LRR P,		Redox Dark		7.59001		(MLRA1	25 HATEL - NO. 10 HATELEY	
	ky Mineral (A7) (LR		Depleted Da					t Material (TF2)	£0.
	sence (A8) (LRR U)	_	Redox Depre		3)			ow Dark Surface (TF12)
	k (A9) (LRR P, T)	- (411)	Mart (F10) (L		MIDA 14	41	Other (Exp	olain in Remarks)	
	Below Dark Surface k Surface (A12)	(A(1)	Depleted Oc Iron-Mangan	CONTRACTOR OF THE PROPERTY OF			T) ³ Indicator	s of hydrophytic vegeta	tion and
5-100mm - 12 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	irie Redox (A16) (M	ILRA 150A)	Umbric Surfa					f hydrology must be pre	
	ucky Mineral (S1) (L		Delta Ochric					disturbed or problemati	Mark Contract
	eyed Matrix (S4)	reresentente: 0==	Reduced Ver		- De la Carlo de l	OA, 150B)			
Sandy Re	dox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	9A)		
Stripped I	Matrix (S6)		Anomalous E	Bright Loan	ny Soils (F	20) (MLR	A 149A, 153C, 15	3D)	
	ace (S7) (LRR P, S	11-11-1-1-1-1-1							
testrictive La	ayer (if observed):								
Type:	Marin (Na) Vo						. 1 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Depth (inch	nes):						Hydric Soil Pre	sent? Yes	Nox
Remarks:									

Date: 7/14/21

Feature Name: W 8 UP





Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM		City/C	County. Middlesex/Mid	dlesex	Sampling Date: 7/14/20	
Applicant/Owner: HRSD		38 90			Sampling Point: W9	
Investigator(s): Emily Foster, Kately	n Hoisington	Section	on, Township, Range:	Security State	546660000000000000000000000000000000000	
Landform (hillslope, terrace, etc.): De						
Subregion (LRR or MLRA): MLRA 15		7000000		10.10.000 10.000 10.000	Datum: WGS84	
Soil Map Unit Name Slagle silt loam, (NWI classific	T	
Are climatic / hydrologic conditions or	n the site typical for	this time of year? Y	/esx No	(If no, explain in F	Remarks.)	
Are Vegetationx, Soilx,	or Hydrology X	significantly distur	rbed? Are *Norma	al Circumstances"	present? Yes x No	
Are Vegetation, Soil,				explain any answe		
SUMMARY OF FINDINGS -						
Hydrophytic Vegetation Present?	Yes X	No				
Hydric Soil Present?		No	Is the Sampled Area		,	
Wetland Hydrology Present?		No	within a Wetland?	Yes/	No	
Disturbed roadside PEM in mowe	ed powerline ease	ment.			Cowardin: <u>PEM</u>	
HYDROLOGY						
Wetland Hydrology Indicators:	et constitution on	2000 T 2020		Secondary Indica	ators (minimum of two required	
Primary Indicators (minimum of one	is required; check	all that apply)		Surface Soil	Cracks (B6)	
X Surface Water (A1)	Aqua	atic Fauna (B13)		Sparsely Ve	getated Concave Surface (B8)	
High Water Table (A2)		Deposits (B15) (LR	R U)	Drainage Patterns (B10)		
X Saturation (A3)	Hydr	rogen Sulfide Odor (C1)	Moss Trim L	ines (B16)	
Water Marks (B1)	Oxid	lized Rhizospheres a	along Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	Pres	ence of Reduced Iro	on (C4)	Crayfish Bur	rows (C8)	
Drift Deposits (B3)	Reco	ent Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Thin	Muck Surface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	Othe	er (Explain in Remark	ks)	Shallow Aqu	itard (D3)	
Inundation Visible on Aerial Ima	agery (B7)			FAC-Neutra	Test (D5)	
Water-Stained Leaves (B9)				Sphagnum r	moss (D8) (LRR T, U)	
Field Observations:						
Surface Water Present? Yes	No	Depth (inches): 1				
Water Table Present? Yes	No _x	Depth (inches):				
Saturation Present? Yes (includes capillary fringe)	_x_ No	Depth (inches): 0	100113000000000000000000000000000000000		nt? Yesx No	
Describe Recorded Data (stream ga	auge, monitoring we	ell, aerial photos, pre	evious inspections), if av	ailable:		
Remarks:						

VE	GETATION (Five Strata) -	Use scientifi	c names of pla	ants.	
ter ti terre	chande trade to the contract these fields the trade	50		Dominant	

Tree Stratum (Plot size: 30 ft)

Sapling Stratum (Plot size: 30 ft)

Shrub Stratum (Plot size: 30 ft)

Herb Stratum (Plot size: 30 ft)

1. Murdanna keisak, Wart-Removing Herb 45 Yes

2 Phalaris arundinacea, Reed Canary Grass 15 Yes OBL 3. Juncus effusus, Lamp rush 15 Yes OBL

)		Dominant Species?		Dominance Test worksh Number of Dominant Spe	cies	3	1440
			_	That Are OBL, FACW, or Total Number of Dominan Species Across All Strata	t -	3	
						3	(B)
			_	Percent of Dominant Sper That Are OBL, FACW, or		100.0%	(A/B)
	=	= Total Cove	er	Prevalence Index works	Mariana .	Analiki anih u baran	
50% of total cover:	20% of	total cover:		Total % Cover of: OBL species75			
				FACW species 0			
	-			FAC species0		-277	
				FACU species 0			
				UPL species 0			_
				Column Totals: 75			(B)
						6)	_ (0)
	0	= Total Cove	er.	Prevalence Index =	ONLY OF THE		-
50% of total cover: 0	20% of total cover: 0		Hydrophytic Vegetation Indicators:				
t)				1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50%			
				X 3 - Prevalence Index	is ≤3.0¹		
				Problematic Hydroph		ation [†] (Expla	in)
	700 V	24 - 40 24 - 40			,	ent ent. Amorbone	
	_			Indicators of hydric soil a be present, unless disturb			nust
				Definitions of Five Vege			
	0	= Total Cove	er				
50% of total cover: 0				Tree – Woody plants, exc approximately 20 ft (6 m)	or more in	height and	
				(7.6 cm) or larger in diam	eter at bre	ast height (D	BH).
		Yes	OBL				
Removing Herb	45		- 000	Sapling – Woody plants,	excluding	woody vines	9
ed Canary Grass	100	Yes	OBL	approximately 20 ft (6 m)	excluding or more in	woody vines height and l	ess
ed Canary Grass	177	7.1		Sapling – Woody plants, approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH.	excluding or more in	woody vines height and l	ess
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, e.	or more in	height and l	ess
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH.	or more in	height and l	ess
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, er approximately 3 to 20 ft (1 Herb – All herbaceous (no	or more in coluding w to 6 m) in on-woody	roody vines, n height.	ess
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard	or more in coluding w to 6 m) in on-woody less of siz	roody vines, height. plants, inclue, e, and wood	ess ding
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, er approximately 3 to 20 ft (1 Herb – All herbaceous (no	or more in coluding w to 6 m) in on-woody less of siz	roody vines, height. plants, inclue, e, and wood	ess ding
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in- herbaceous vines, regard plants, except woody vine	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely
ed Canary Grass	15	Yes	OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely
ed Canary Grass	15 15	Yes Yes	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely
ed Canary Grass	15 15 	Yes Yes Total Cove	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ding / tely
ed Canary Grass sh 50% of total cover: 37.5	15 15 	Yes Yes Total Cove	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ding / tely
-Removing Herb eed Canary Grass sh 50% of total cover:37.5	15 15 	Yes Yes Total Cove	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely
50% of total cover: _37.5	15 15 	Yes Yes Total Cove	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely
ed Canary Grass sh 50% of total cover: 37.5	15 15 	Yes Yes Total Cove	OBL OBL	approximately 20 ft (6 m) than 3 in, (7.6 cm) DBH. Shrub – Woody plants, et approximately 3 to 20 ft (1 Herb – All herbaceous (in herbaceous vines, regard plants, except woody vine 3 ft (1 m) in height.	or more in coluding w to 6 m) in on-woody less of siz s, less tha	roody vines, n height. plants, inclue, and wood an approxima	ess ding / tely

____ = Total Cover 50% of total cover: ___0 ___ 20% of total cover: ___0 Remarks: (If observed, list morphological adaptations below). Mowed veg. some species unidentifiable

Woody Vine Stratum (Plot size: 30 ft)

Yes X No

Hydrophytic

Vegetation

Present?

SOIL Sampling Point: W9

Color (moist)	100%	Color (moist)	0.6	Tomas	1	Tours	Manager 1
			%	Type'	_Loc ²	Texture	Remarks
1-18 10yr 5/2		/0				Muck	< 70% soil particles masked
	80% 1	Jyr 5/8			PL	Sandy clay	
Type: C=Concentration, D=E ydric Soil Indicators: (App Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stratified Layers (A5) Organic Bodies (A6) (LRI 5 cm Mucky Mineral (A7) Muck Presence (A8) (LRR P, Depleted Below Dark Sur Thick Dark Surface (A12) Coast Prairie Redox (A16 Sandy Mucky Mineral (S1 Sandy Gleyed Matrix (S4 Sandy Redox (S5) Stripped Matrix (S6) Dark Surface (S7) (LRR I estrictive Layer (if observe Type: Depth (inches):	Cepletion, RM=R Dilicable to all Li R P, T, U) (LRR P, T, U) T) face (A11) (MLRA 150A) () (LRR O, S)	And the second section is a second section of the second section is	wise note ow Surface (S9) r Mineral (d Matrix (F rix (F3) Surface (F6 x Surface ssions (F8 RR U) ric (F11) (rise Masse pe (F13) (I F17) (MLI ric (F18) (I ric (d.) de (S8) (L (LRR S, F1) (LRR F2) (F7) MLRA 15 ss (F12) (L LRR P, T, RA 151) MLRA 15 ixis (F19)	RR S, T, U) T, U) O) A 150B) (MLRA 145	Indicators 1 cm M 2 cm M Reduc Piedm Anoms (MLI Red P Very S Other T) 3Indic wet unle	PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ : fluck (A9) (LRR O) fluck (A10) (LRR S) ed Vertic (F18) (outside MLRA 150A, 16) ont Floodplain Soils (F19) (LRR P, S, 16) alous Bright Loamy Soils (F20) RA 153B) arent Material (TF2) shallow Dark Surface (TF12) (Explain in Remarks) eators of hydrophytic vegetation and land hydrology must be present, ess disturbed or problematic. 153D) Present? Yes X No

Date: _____

Feature Name: W9





Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex T	FM	City/C	ounty. Middlesex/Mid	dlesex	Sampling Date: _	7/14/2021			
Applicant/Owner: HRSD		78 30		Sampling Point: W9-UP					
Investigator(s): Emily Foster, Ka	telyn Hoisington	Section	on, Township, Range:						
Landform (hillslope, terrace, etc.)		10.000,000,000	relief (concave, convex			(%): 0-5			
Subregion (LRR or MLRA): MLRA		E-9/1/1			Datu				
		2000	Long:		1 10	JM VVG364			
Soil Map Unit Name: Slagle silt loa			POO - SAME		cation: N/A				
Are climatic / hydrologic condition	s on the site typical	for this time of year? Y	'es _ x _ No	(If no, explain in I	Remarks.)				
Are Vegetation, Soil	, or Hydrology	significantly distur	bed? Are *Norma	al Circumstances"	present? Yesx	No			
Are Vegetation, Soil	, or Hydrology	naturally problems	atic? (If needed,	explain any answ	ers in Remarks.)				
SUMMARY OF FINDINGS	- Attach site	map showing san	pling point locati	ons, transect	s, important fe	atures, etc.			
Hydrophytic Vegetation Present	? Yes_x	No	Is the Sampled Area						
Hydric Soil Present?	Yes	Nox	within a Wetland?	Vac	No x				
Wetland Hydrology Present?	Yes	Nox	Within a Wotand	100		i			
					Cowardin: <u>Upla</u>	<u>IIu</u>			
HYDROLOGY									
Wetland Hydrology Indicators	i .	er esec		Secondary Indic	ators (minimum of the	wo required)			
Primary Indicators (minimum of	one is required; che	eck all that apply)		Surface Soi	Cracks (B6)				
Surface Water (A1)		quatic Fauna (B13)			egetated Concave S	urface (B8)			
High Water Table (A2)	High Water Table (A2) Marl Deposits (B15) (LRR U)					Drainage Patterns (B10)			
Saturation (A3)		lydrogen Sulfide Odor (I	A STATE OF THE PARTY OF THE PAR	Moss Trim I					
Water Marks (B1)		xidized Rhizospheres a			Water Table (C2)				
Sediment Deposits (B2)	0.00	resence of Reduced Iro		Crayfish Bu		(00)			
Drift Deposits (B3)		ecent Iron Reduction in	Tilled Soils (C6)		/isible on Aerial Ima	gery (C9)			
Algal Mat or Crust (B4)		hin Muck Surface (C7)	(e)		Position (D2)				
Iron Deposits (B5) Inundation Visible on Aerial	CONTRACTOR OF THE PARTY OF THE	ther (Explain in Remark	(8)	Shallow Aqu FAC-Neutra					
Water-Stained Leaves (B9)					moss (D8) (LRR T,	U)			
Field Observations:	<u> </u>			opinginani	moss (Bo) (Entre 1)	-1			
	Yes No X	Depth (inches):							
		Depth (inches):							
		Depth (inches):	Wetland	Hydrology Prese	nt? Yes	No _x			
Describe Recorded Data (stream	n gauge, monitoring	well, aerial photos, pre	vious inspections), if av	ailable:					
Remarks:									

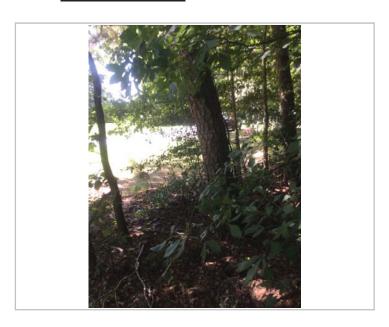
EGETATION (Five Strata) – Use scientific nan	nee or bre			AND THE PROPERTY OF THE PROPER	<u>UP</u>
- Andrews and Selection of the Control of the Contr		Dominant		Dominance Test worksheet:	
		Species?		Number of Dominant Species	7000
Pinus taeda, Loblolly Pine				That Are OBL, FACW, or FAC: 4	(A)
Acer rubrum, Red Maple				Total Number of Dominant	
Quercus rubra, Northern Red Oak	15	<u>Yes</u>	FACU	Species Across All Strata: 6	(B)
				Percent of Dominant Species	
				That Are OBL, FACW, or FAC: 66.7%	(A/B
3					111111
	70	= Total Cov	er	Prevalence Index worksheet:	
50% of total cover: 35	20% of	total cover	14	Total % Cover of;Multiply by:	
Sapling Stratum (Plot size: 30 ft)				OBL species 0 x 1 = 0	_
Juniperus virginiana, Eastern Red-Cedar	14	Yes	FACU	FACW species0 x 2 =0	_
				FAC species x 3 =231	
				FACU species 29 x 4 = 116	
				UPL species 0 x 5 = 0	-01
				Column Totals: 106 (A) 347	
i				Oddini Totals	_ (0)
				Prevalence Index = B/A = 3.27	
	14	= Total Cov	er	Hydrophytic Vegetation Indicators:	
50% of total cover:7	20% of	total cover	2.8	1 - Rapid Test for Hydrophytic Vegetation	
Shrub Stratum (Plot size: 30 ft)				x 2 - Dominance Test is >50%	
5				3 - Prevalence Index is ≤3.01	
					7.4
				Problematic Hydrophytic Vegetation [†] (Explication)	ain)
<u> </u>			_		
	70			Indicators of hydric soil and wetland hydrology	must
5			_	be present, unless disturbed or problematic.	
S				Definitions of Five Vegetation Strata:	
50% of total cover: 0 Herb Stratum (Plot size: 30 ft)		= Total Cov total cover:		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and (7.6 cm) or larger in diameter at breast height (0.6 cm).	
				Sapling - Woody plants, excluding woody vine	S.
2				approximately 20 ft (6 m) or more in height and	less
3				than 3 in. (7.6 cm) DBH.	
k				Shrub - Woody plants, excluding woody vines,	
				approximately 3 to 20 ft (1 to 6 m) in height.	
				Herb - All herbaceous (non-woody) plants, incli	udina
<u> </u>				herbaceous vines, regardless of size, and wood	
'	$\overline{}$			plants, except woody vines, less than approxim	
3	$\overline{}$			3 ft (1 m) in height.	
0				Woody vine - All woody vines, regardless of he	eight.
0				The say this is a say this is a say the say th	ang.in.
1					
	0	= Total Cov	er		
50% of total cover; 0	20% of	total cover	0		
Noody Vine Stratum (Plot size: 30 ft)	7.7				
Campsis radicans, Trumpet-Creeper	12	Yes	FAC		
Rubus pensilvanicus, Pennsylvania Blackberry		-			
			-1710		
<u> </u>					
	_				
)				Hydrophytic	
	-	= Total Cov		Vegetation Present? Yes X No	
50% of total cover:11_	4444			FIRSHII TAS NO	

SOIL Sampling Point: W9-UP

Depth	Matrix			ox Feature				
inches)	Color (maist)		Color (moist)	%	Type'	_Loc*		Remarks
0-8	10yr 5/4	100%					Sandy loam	
				-				
					_			
	<u> </u>							
Type: C=Co	oncentration, D=Dep	oletion RM=R	leduced Matrix M	S=Masked	Sand Gr	ains.	Location: PL=	Pore Lining, M=Matrix.
-	ndicators: (Applic					7.00		Problematic Hydric Soils ³ :
Histosol			Polyvalue B			RR S, T, U) 1 cm Muck	(A9) (LRR O)
	pipedon (A2)		Thin Dark S					(A10) (LRR S)
Black Hi	stic (A3)		Loamy Muci	ky Mineral	(F1) (LRR	(0)	Reduced V	ertic (F18) (outside MLRA 150A,
	n Sulfide (A4)		Loamy Gley	ed Matrix (F2)		Piedmont F	Toodplain Soils (F19) (LRR P, S, 1
	Layers (A5)		Depleted Ma	Carried Control of the sale of the				Bright Loamy Soils (F20)
_	Bodies (A6) (LRR F	Contract to the second	Redox Dark	Maria Carant	102.500.H		(MLRA 1	
	icky Mineral (A7) (L	Control of the Contro	Depleted Da					Material (TF2)
97000000000000	esence (A8) (LRR L	J)	Redox Depr Mart (F10) (8)			ow Dark Surface (TF12)
	ick (A9) (LRR P, T) d Below Dark Surfac	- (Δ11)	Depleted Oc		MIDA 1	541	_ Other (Expi	lain in Remarks)
	rk Surface (A12)	(A) 1)	Iron-Mangar				T) ³ Indicators	s of hydrophytic vegetation and
5 m/d 1/4 m/m CH	rairie Redox (A16) (I	MLRA 150A)	Umbric Surf					hydrology must be present.
	lucky Mineral (S1) (Delta Ochric					disturbed or problematic.
_ Sandy G	lleyed Matrix (S4)		Reduced Ve	ertic (F18) (MLRA 15	0A, 150B)		
	edox (S5)		Piedmont FI					
	Matrix (S6)		Anomalous	Bright Loar	ny Soils (F20) (MLR	A 149A, 153C, 153	(D)
	rface (S7) (LRR P,							
	Layer (if observed)	:						
Type:	Obcode:		_				and the largest baseling	DOMESTIC SOLUTION
Depth (inc	ches):						Hydric Soil Pres	sent? Yes Nox
Remarks:								

Date: 7/14/21

Feature Name: W 9 UP





Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex	TFM	City/Co	ounty: Middlesex/Mid	dlesex	Sampling Date:	7/15/2021
Applicant/Owner: HRSD					Sampling Point: W	
Investigator(s): Emily Foster, k	Katelyn Hoisington	Sectio	n, Township, Range: _			
Landform (hillslope, terrace, etc						(%): 5-15
Subregion (LRR or MLRA): ML					Datu	
Soil Map Unit Name: Slagle si			Long			m. <u>woso-</u>
Are climatic / hydrologic conditi	ions on the site typical for					
Are Vegetation, Soil		-				No
Are Vegetation, Soil				explain any answe		
SUMMARY OF FINDING					,	itures, etc.
Hydrophytic Vegetation Prese	ont? Vec	Nox				
Hydric Soil Present?		No x	Is the Sampled Area			
Wetland Hydrology Present?	Yes		within a Wetland?	Yes	Nox	
Remarks:					Observed Classifi	cations:
Upslope from W10					Cowardin: uplar	
HYDROLOGY						
Wetland Hydrology Indicato	ors:			Secondary Indica	ators (minimum of tw	vo required)
Primary Indicators (minimum	of one is required; check	all that apply)		Surface Soil	Cracks (B6)	
Surface Water (A1)	Aqu	atic Fauna (B13)		Sparsely Ve	getated Concave Su	urface (B8)
High Water Table (A2)	Mari	Deposits (B15) (LRR	t U)	Drainage Pa	tterns (B10)	
Saturation (A3)	Hyd	rogen Sulfide Odor (C	(1)	Moss Trim L	ines (B16)	
Water Marks (B1)	Oxid	dized Rhizospheres al	long Living Roots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	Pres	sence of Reduced Iron	n (C4)	Crayfish Bur	rows (C8)	
Drift Deposits (B3)	Rec	ent Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Imag	gery (C9)
Algal Mat or Crust (B4)	Thin	Muck Surface (C7)		Geomorphic	Position (D2)	
Iron Deposits (B5)	Othe	er (Explain in Remarks	s)	Shallow Aqu	itard (D3)	
Inundation Visible on Aer	ial Imagery (B7)			FAC-Neutral	Test (D5)	
Water-Stained Leaves (B	(9)			Sphagnum n	moss (D8) (LRR T, l	J)
Field Observations:						
Surface Water Present?	Yes No _x	Depth (inches):				
Water Table Present?	Yes Nox	Depth (inches):				
Saturation Present?	Yes No _x		Wetland	Hydrology Preser	nt? Yes	Nox
(includes capillary fringe) Describe Recorded Data (stre	eam gauge monitoring w	ell aerial photos prev	vious inspections) if av	ailable:		
Describe Necorada Data (Sire	dill gauge, monitoring m	ell, actial priotos, pro-	rioda iriapocuoria,, ii uri	dilabie.		
Remarks:						
Remarks:						

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)	% Cover	Species?	Status	Number of Dominant Species
1. Acer rubrum, Red Maple	<u>65</u>	<u>Yes</u>	<u>FAC</u>	That Are OBL, FACW, or FAC:2 (A)
Magnolia virginiana, Sweet-Bay	5	<u>No</u>	<u>FACW</u>	Total Number of Dominant
3				Species Across All Strata:5 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 40.0% (A/B)
6				
	70	= Total Co	/er	Prevalence Index worksheet:
50% of total cover: 35	20% of	total cover	:14	Total % Cover of: Multiply by:
Sapling Stratum (Plot size: 30 ft)				OBL species 0 x 1 = 0
1. Juniperus virginiana, Eastern Red-Cedar	10	Yes	<u>FACU</u>	FACW species 5 x 2 = 10
2				FAC species75 x 3 =225
3				FACU species 20 x 4 = 80
4.				UPL species0 x 5 =0
5.				Column Totals:100 (A)315 (B)
6.				Prevalence Index = B/A =3.15
		= Total Co	/er	Hydrophytic Vegetation Indicators:
50% of total cover:5	20% of	total cover	:2	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)				2 - Dominance Test is >50%
1				3 - Prevalence Index is ≤3.0¹
2.				I
3.				Problematic Hydrophytic Vegetation ¹ (Explain)
4				1
				'Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5				Definitions of Five Vegetation Strata:
6		= Total Co		Definitions of Five Vegetation Strata.
EQUI of total across				Tree – Woody plants, excluding woody vines,
50% of total cover: 0	20% of	total cover	:	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Herb Stratum (Plot size: 30 ft)	_	Voc	FACII	
1. Quercus alba, Northern White Oak				Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
2. Vitis aestivalis, Summer Grape				than 3 in. (7.6 cm) DBH.
3				
4				Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
5				approximatory of to 20 it (1 to 5 iii) iii iii iigiit.
6				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
7				plants, except woody vines, less than approximately
8				3 ft (1 m) in height.
9				Woody vine – All woody vines, regardless of height.
10				, , , , , , , , , , , , , , , , , , ,
11				
	10	= Total Co	/er	
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.				Hydrophytic
	10	= Total Co	/er	Vegetation
50% of total cover:5	20% of	total cover	:2	Present? Yes Nox
Remarks: (If observed, list morphological adaptations belo				
, , , , , , , , , , , , , , , , , , , ,				

Sampling Point: W10-UP

SOIL Sampling Point: W10-UP

Profile Des	cription: (Describe	to the depth				or confirm	the absence of in	ndicators.)
Depth (inches)	Matrix Color (moist)	 _	Color (moist)	ox Features %	Type ¹	Loc ²	Texture	Remarks
0-10	10yr 4/3	100%	Color (Illoist)		Туре	LOC	Sandy loam	Remarks
		100%						
12-18	10yr 6/6						Loamy sand	
¹Type: C=C	concentration, D=Dep	letion, RM=F	Reduced Matrix, M	S=Masked	Sand Gra	ains.	² Location: PL=	Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applic	able to all L	RRs, unless othe	rwise note	ed.)			Problematic Hydric Soils ³ :
Histoso	I (A1)		Polyvalue Be) 1 cm Muck	(A9) (LRR O)
_	pipedon (A2)		Thin Dark S				2 cm Muck	. , ,
ı —	listic (A3) en Sulfide (A4)		Loamy Muck	-		(0)	_	ertic (F18) (outside MLRA 150A,B) Toodplain Soils (F19) (LRR P, S, T)
	d Layers (A5)		Depleted Ma		12)		_	Bright Loamy Soils (F20)
	Bodies (A6) (LRR P		Redox Dark		6)		(MLRA 1	
	ucky Mineral (A7) (LI		Depleted Da		. ,		_	Material (TF2)
ı —	resence (A8) (LRR U	1)	Redox Depr	-	8)			w Dark Surface (TF12)
ı —	uck (A9) (LRR P, T) d Below Dark Surfac	e (A11)	Marl (F10) (I Depleted Oc		(MIRA 1	51)	Other (Expl	ain in Remarks)
1 — .	ark Surface (A12)	((())	Iron-Mangar	, ,	•	,	T) ³ Indicators	s of hydrophytic vegetation and
Coast F	rairie Redox (A16) (F	VILRA 150A)	Umbric Surfa	ace (F13) (LRR P, T	, U)	wetland	hydrology must be present,
	Mucky Mineral (S1) (I	LRR O, S)	Delta Ochric	. , .				listurbed or problematic.
1	Gleyed Matrix (S4) Redox (S5)		Reduced Ve					
1 —	d Matrix (S6)						A 149A, 153C, 153	D)
	ırface (S7) (LRR P, \$	S, T, U)	_		•	, ,		•
Restrictive	Layer (if observed):							
Туре:			_					
Depth (in	ches):		_				Hydric Soil Pres	sent? Yes Nox
Remarks:								
1								

Date: ____

Feature Name: W 10 UP





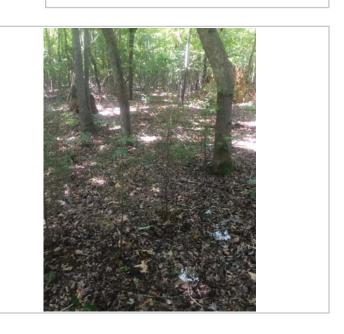
Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Middle	esex/Middlesex	Sampling Date:	7/15/202	
Applicant/Owner: HRSD		State: _VA	Sampling Point: _V	W10	
Investigator(s): _Emily Foster, Katelyn Hoisington	Section, Township, R	lange:			
Landform (hillslope, terrace, etc.): Depression				(%): 0-5	
Subregion (LRR or MLRA): _MLRA 153B of LRR T Lat: _37.55		Long:76.451741			
		NWI classific			
Are climatic / hydrologic conditions on the site typical for this time of ye					
Are Vegetationx_, Soilx_, or Hydrologyx_ significantly				No	
Are Vegetation, Soil, or Hydrology naturally pr	oblematic? (If r	needed, explain any answer	rs in Remarks.)		
SUMMARY OF FINDINGS - Attach site map showing	g sampling point	locations, transects	, important fea	tures, etc.	
Hydrophytic Vegetation Present? Yesx No					
Hydric Soil Present? Yes x No	is the Sample				
Wetland Hydrology Present? Yesx No	within a Wetla	and? Yes^	No		
Remarks:			Observed Classif	fications:	
Small disturbed depression adjacent to General Puller Ave. Fill with ponding water, but poorly defined bed and bank. Water e south. Marginal wetland indicators visible to the south, feature Creeks.	ends directly outside	of survey area to the	Cowardin: <u>PFO</u>		
HYDROLOGY					
Wetland Hydrology Indicators:		Secondary Indica	tors (minimum of tw	vo required)	
Primary Indicators (minimum of one is required; check all that apply)		Surface Soil	Cracks (B6)		
_x Surface Water (A1) Aquatic Fauna (B1	13)	Sparsely Veg	etated Concave Su	urface (B8)	
High Water Table (A2) Marl Deposits (B1:		Drainage Patterns (B10)			
Saturation (A3) Hydrogen Sulfide		Moss Trim Li	nes (B16)		
Water Marks (B1) Oxidized Rhizosph					
Sediment Deposits (B2) Presence of Redu	ced Iron (C4)	Crayfish Burr	ows (C8)		
Drift Deposits (B3) Recent Iron Reduc	ction in Tilled Soils (C6	Saturation Vi	sible on Aerial Imag	gery (C9)	
Algal Mat or Crust (B4) Thin Muck Surface		Geomorphic			
Iron Deposits (B5) Other (Explain in F	Remarks)	Shallow Aqui			
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral			
Water-Stained Leaves (B9)		Sphagnum m	oss (D8) (LRR T, U	J)	
Field Observations:					
Surface Water Present? Yesx No Depth (inches					
Water Table Present? Yes Nox Depth (inches					
Saturation Present? Yes Nox_ Depth (inches includes capillary fringe)		Vetland Hydrology Presen	t? Yes X	No	
Describe Recorded Data (stream gauge, monitoring well, aerial phot	os, previous inspection	ns), if available:			
Remarks:					

VEGETATION	(Five Strata)	- Use	scientific	names	of plants
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	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)		Species?		Number of Dominant Species
1. Acer rubrum, Red Maple				That Are OBL, FACW, or FAC: 8 (A)
2. <u>Ligustrum sinense, Chinese Privet</u>				Total Number of Dominant
3. <u>Liriodendron tulipifera, Tuliptree</u>				Species Across All Strata: 8 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100.0% (A/B)
6				Prevalence Index worksheet:
		= Total Cov		Total % Cover of: Multiply by:
50% of total cover: 30	20% of	total cover:	12	OBL species x 1 =
Sapling Stratum (Plot size: 30 ft)				FACW species x 2 =
Ligustrum sinense, Chinese Privet	25	<u>Yes</u>		FAC species x 3 =
Liquidambar styraciflua, Sweet-Gum	15	<u>Yes</u>	<u>FAC</u>	FACU species x 4 =
3				
4				UPL species x 5 =
5				Column Totals: (A) (B)
6				Prevalence Index = B/A =
	40	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover: 20	20% of	total cover:	8	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)				x 2 - Dominance Test is >50%
1				3 - Prevalence Index is ≤3.01
2				Problematic Hydrophytic Vegetation¹ (Explain)
3				
4				¹ Indicators of hydric soil and wetland hydrology must
5				be present, unless disturbed or problematic.
6.				Definitions of Five Vegetation Strata:
		= Total Cov	er	Too 186-advantanta avaluation was division a
50% of total cover:0				Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in.
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at breast height (DBH).
1. Saururus cernuus, Lizard's-Tail	5	Yes	OBL	Sapling – Woody plants, excluding woody vines,
2. Woodwardia areolata, Netted Chain Fern		Yes	OBL	approximately 20 ft (6 m) or more in height and less
Campsis radicans, Trumpet-Creeper		Yes	FAC	than 3 in. (7.6 cm) DBH.
Toxicodendron radicans, Eastern Poison Ivy		Yes	FAC	Shrub – Woody plants, excluding woody vines,
5				approximately 3 to 20 ft (1 to 6 m) in height.
6				Herb – All herbaceous (non-woody) plants, including
				herbaceous vines, regardless of size, and woody
7				plants, except woody vines, less than approximately
8				3 ft (1 m) in height.
9				Woody vine - All woody vines, regardless of height.
10				
11				
10		= Total Cov		
50% of total cover: 10	20% of	total cover:	4	
Woody Vine Stratum (Plot size: 30 ft)				
1				
2				
3				
4				
5				Hydrophytic
	0	= Total Cov	er	Vegetation
50% of total cover:0	20% of	total cover:	0	Present? Yes X No No No
Remarks: (If observed, list morphological adaptations belo	w).			

Sampling Point: W10

SOIL Sampling Point: W10

epth (Matrix	0/ 0-1/	Redox Features	ma1 12	. Tay.t	Demonto
nches)	Color (moist)	Color (mo		pe ¹ Loc ²	Texture	Remarks
0-18	2.5yr 4/2	80% 10yr 5/6		C PL	Sandy clay loam	
		letion, RM=Reduced Ma		d Grains.		Pore Lining, M=Matrix.
		able to all LRRs, unles				roblematic Hydric Soils ³ :
_ Histoso	, ,		alue Below Surface (S		-	, ,
-	pipedon (A2) listic (A3)		Dark Surface (S9) (LR y Mucky Mineral (F1)		2 cm Muck (ertic (F18) (outside MLRA 150A
_	en Sulfide (A4)		y Gleyed Matrix (F2)	(Little O)	_	oodplain Soils (F19) (LRR P, S,
Stratifie	d Layers (A5)		ted Matrix (F3)		Anomalous	Bright Loamy Soils (F20)
	Bodies (A6) (LRR P	_	x Dark Surface (F6)		(MLRA 15	,
	ucky Mineral (A7) (LF		ted Dark Surface (F7))	_	Material (TF2) w Dark Surface (TF12)
	resence (A8) (LRR U uck (A9) (LRR P, T)	_	x Depressions (F8) F10) (LRR U)			w Dark Surface (TFT2)
•	ed Below Dark Surface		ted Ochric (F11) (MLI	RA 151)	Other (Exple	an in Normano)
	ark Surface (A12)		Manganese Masses (F	12) (LRR O, F	P, T) ³ Indicators	of hydrophytic vegetation and
	Prairie Redox (A16) (N		ic Surface (F13) (LRR			nydrology must be present,
	Mucky Mineral (S1) (L		Ochric (F17) (MLRA			sturbed or problematic.
	Gleyed Matrix (S4) Redox (S5)		ced Vertic (F18) (MLF nont Floodplain Soils (
-	d Matrix (S6)		alous Bright Loamy S			D)
	urface (S7) (LRR P, S			. , ,	, ,	,
strictive	Layer (if observed):					
Туре:						
Depth (ir	nches):				Hydric Soil Pres	ent? Yes <u> </u>
marks:						

Date: ____

Feature Name: W 10





Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex	TFM	City/C	ounty: Middlesex/Mid	ldlesex	Sampling Date:	7/15/2021
Applicant/Owner: HRSD					Sampling Point: W	/11
Investigator(s): Emily Foster, k	Katelyn Hoisington	Section	on, Township, Range:			
Landform (hillslope, terrace, etc						(%): 0-25
Subregion (LRR or MLRA): ML					Datu	
Soil Map Unit Name: _Emporia-						III. <u>WG30-</u>
Are climatic / hydrologic conditi						
Are Vegetationx, Soil	x , or Hydrology	x significantly distur	bed? Are *Norma	al Circumstances" p	present? Yes	C No
Are Vegetation, Soil				explain any answe		
SUMMARY OF FINDING				, , , , , , , , , , , , , , , , , , , ,	,	itures, etc.
Hydrophytic Vegetation Prese	ent? Yes x	No	le the Sempled Area			
Hydric Soil Present?		No	Is the Sampled Area within a Wetland?	Vac X	No	
Wetland Hydrology Present?		No	within a wetland?	res^	No	
Remarks:					Observed Classifi	cations:
Emergent and scrubby vege suvey area. Cannot access of	_			oe outside of	Cowardin: <u>PSS</u>	
HYDROLOGY						
Wetland Hydrology Indicato	ors:			Secondary Indica	ntors (minimum of tw	vo required)
Primary Indicators (minimum	of one is required; che	ck all that apply)		Surface Soil	Cracks (B6)	
Surface Water (A1)	A	quatic Fauna (B13)		Sparsely Ve	getated Concave Si	urface (B8)
High Water Table (A2)	M	larl Deposits (B15) (LRF	R U)	_x Drainage Pa	tterns (B10)	
X Saturation (A3)		ydrogen Sulfide Odor (0	-	Moss Trim L	. ,	
Water Marks (B1)		xidized Rhizospheres a			Water Table (C2)	
Sediment Deposits (B2)		resence of Reduced Iro		X Crayfish Bur		
Drift Deposits (B3)		ecent Iron Reduction in	Tilled Soils (C6)		isible on Aerial Imag	gery (C9)
Algal Mat or Crust (B4)	_	hin Muck Surface (C7)			Position (D2)	
Iron Deposits (B5)		ther (Explain in Remark	(8)	Shallow Aqu FAC-Neutral		
Inundation Visible on Aer Water-Stained Leaves (B				_	noss (D8) (LRR T, I	n
Field Observations:	9)			Opriagrium	iloss (Do) (ERR 1, 1	<i>'</i>
Surface Water Present?	Ves No X	Depth (inches):				
Water Table Present?						
Saturation Present?	Ves X No	Depth (inches): _ Depth (inches): 12	Wotland	Hudrology Proces	nt? Yesx	No
(includes capillary fringe)	res No	Depth (inches)	vvetand	nyarology Fresei	itr res	NO
Describe Recorded Data (stre	am gauge, monitoring	well, aerial photos, pre	vious inspections), if av	ailable:		
Remarks:						
Drainage/stream headwate	rs visible downslope	, cant penetrate vege	tation and very steep	slope prohibits ac	ccess	

VEGETATION (!	Five Strata) -	- Use scientific names	of plants
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_	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC:6 (A)
2				Total Number of Dominant
3				Species Across All Strata: 8 (B)
4.				(2)
				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 75.0% (A/B)
6				Prevalence Index worksheet:
		= Total Cov		Total % Cover of: Multiply by:
50% of total cover:0	20% of	f total cover	:0	OBL species30 x 1 =30
Sapling Stratum (Plot size: 30 ft)				
1. Ligustrum sinense, Chinese Privet	30	Yes	FAC	FACW species0 x 2 =0
2. Rubus pensilvanicus, Pennsylvania Blackberry	20	Yes	FAC	FAC species95 x 3 =285
3. Salix nigra, Black Willow				FACU species15 x 4 =60
4				UPL species0 x 5 =0
				Column Totals:140 (A)375 (B)
5				
6				Prevalence Index = B/A =2.68
	70	= Total Cov	er	Hydrophytic Vegetation Indicators:
50% of total cover: 35	20% of	f total cover	14	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)				x 2 - Dominance Test is >50%
1				X 3 - Prevalence Index is ≤3.0¹
2.				
				Problematic Hydrophytic Vegetation¹ (Explain)
3				
4				Indicators of hydric soil and wetland hydrology must
5				be present, unless disturbed or problematic.
6				Definitions of Five Vegetation Strata:
	0	= Total Cov	er	Tree – Woody plants, excluding woody vines,
50% of total cover:0	20% of	f total cover	:0	approximately 20 ft (6 m) or more in height and 3 in.
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at breast height (DBH).
1. Verbesina alternifolia, Wingstem	25	Yes	FAC	Santing Moderate plants avaluation was deviced
		Yes		Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
				than 3 in. (7.6 cm) DBH.
3. Sorghum halepense, Johnson Grass		<u>Yes</u>		
4				Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
5				approximately 5 to 20 ft (1 to 5 ff) in fleight.
6				Herb - All herbaceous (non-woody) plants, including
7				herbaceous vines, regardless of size, and woody
8.				plants, except woody vines, less than approximately 3 ft (1 m) in height.
9.				o k (1 m) m noight.
				Woody vine - All woody vines, regardless of height.
10				
11				
	<u>45</u>	= Total Cov	er	
50% of total cover: <u>22.5</u>	20% of	f total cover	:9	
Woody Vine Stratum (Plot size: 30 ft)				
Campsis radicans, Trumpet-Creeper	20	Yes	FAC	
2. Vitis aestivalis, Summer Grape		Yes	FACU	
3				
4				
5				Hydrophytic
		= Total Cov		Vegetation
50% of total cover:12.5	20% of	f total cover	5	Present? Yes X No No No
Remarks: (If observed, list morphological adaptations below	w).			

Sampling Point: W11

SOIL Sampling Point: W11

Profile Des	cription: (Describe t	o the depth	needed to docur	ment the i	ndicator	or confirm	the absence	of indicate	ors.)	
Depth (in shock)	Matrix	<u></u> %		x Features			Toyturo		Domorko	
(inches)	Color (moist)		Color (moist)	100/	_Type'	_Loc²	Texture		Remarks	
0-18	10yr 4/2	90% 7	.591 5/6	10%			Sandy clay			
¹Type: C=C	concentration, D=Depl	etion, RM=R	Reduced Matrix, MS	S=Masked	Sand Gra	ains.	² Location:	PL=Pore L	ining, M=Matri	x.
	Indicators: (Applica								matic Hydric \$	
Histoso	I (A1)		Polyvalue Be				1 cm M	luck (A9) (l	_RR O)	
_	pipedon (A2)		Thin Dark Su					luck (A10)		
_	listic (A3) en Sulfide (A4)		Loamy Muck	-		(O)	_		⁻ 18) (outside N ain Soils (F19)	ILRA 150A,B)
1 – , ,	d Layers (A5)		× Depleted Ma		r2)		_		Loamy Soils (F	
ı —	Bodies (A6) (LRR P,	T, U)	Redox Dark		6)		_	(A 153B)	,	
5 cm M	ucky Mineral (A7) (LR	R P, T, U)	Depleted Dai	rk Surface	(F7)		_	rent Mater	, ,	
ı —	resence (A8) (LRR U)		Redox Depre		8)		_ ′		k Surface (TF1:	2)
ı —	uck (A9) (LRR P, T) d Below Dark Surface	(Δ11)	Marl (F10) (L Depleted Ocl		(MIRA 1	51)	Other (Explain in I	Remarks)	
I — ·	ark Surface (A12)	(<11)	Iron-Mangan		•	-	T) ³ Indica	ators of hyd	drophytic veget	ation and
1 —	rairie Redox (A16) (M	ILRA 150A)						and hydrol	ogy must be pr	esent,
1 -	Mucky Mineral (S1) (L	RR O, S)	Delta Ochric				unle	ss disturbe	ed or problemat	tic.
	Gleyed Matrix (S4) Redox (S5)		Reduced Ver Piedmont Flo				24)			
1 —	d Matrix (S6)		Anomalous E			-		153D)		
	ırface (S7) (LRR P, S	, T, U)	_		, (.	, (<u>-</u>	, ,	,		
	Layer (if observed):									
Туре:										
Depth (in	ches):		_				Hydric Soil	Present?	Yesx	No
Remarks:										

Date: ____

Feature Name: W 11





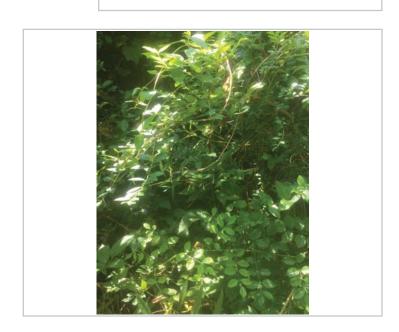
Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

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		
Subregion (LRR or MLRA): MLRA 153B of LRRT Lat: 37.554		
Soil Map Unit Name: Emporia loam, 2 to 6 percent slopes		
Are climatic / hydrologic conditions on the site typical for this time of year		
Are Vegetationx, Soilx, or Hydrologyx significantly		
Are Vegetation, Soil, or Hydrology naturally pro	oblematic? (If needed, explain any answer	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing	sampling point locations, transects,	, important features, etc.
Hydrophytic Vegetation Present? YesNox		
Hydric Soil Present? Yes No ×	Is the Sampled Area	**
Wetland Hydrology Present? Yes No x	within a Wetland? Yes	Nox
Remarks:		Observed Classifications:
Slope adjacent to W11. abuts General Puller Blvd.		Cowardin: <u>upland</u>
HYDROLOGY		
Wetland Hydrology Indicators:	Secondary Indicat	tors (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	Surface Soil 0	Cracks (B6)
Surface Water (A1) Aquatic Fauna (B13		getated Concave Surface (B8)
High Water Table (A2) Marl Deposits (B15		, , ,
Saturation (A3) Hydrogen Sulfide O		
		Water Table (C2)
Sediment Deposits (B2) Presence of Reduce		
		sible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Thin Muck Surface		
Iron Deposits (B5) Other (Explain in Re		
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral	
Water-Stained Leaves (B9)		noss (D8) (LRR T, U)
Field Observations:		,
Surface Water Present? Yes Nox Depth (inches)	:	
Water Table Present? Yes Nox _ Depth (inches)	r	
Saturation Present? Yes No _x _ Depth (inches)	: Wetland Hydrology Presen	t? Yes Nox
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photo	e previous inspections) if available:	
Describe Neuroland Data (stream gauge, monitoring from action provi	s, ртечнова таресиона _ј , п ачалово.	
Remarks:		
Nemarks.		

		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)		Species?		Number of Dominant Species
1. Pinus resinosa, Red Pine	15	<u>Yes</u>	<u>FACU</u>	That Are OBL, FACW, or FAC:1 (A)
2				Total Number of Dominant
3				Species Across All Strata:5 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 20.0% (A/B)
6				Prevalence Index worksheet:
	15			Total % Cover of: Multiply by:
50% of total cover:7.5	20% of	total cover	:3	OBL species
Sapling Stratum (Plot size: 30 ft)				FACW species0 x 2 =0
1. Juniperus virginiana, Eastern Red-Cedar	_5	Yes	<u>FACU</u>	
2				FAC species 20 x 3 = 60
3				FACU species x 4 =
4				UPL species 0 x 5 = 0
5				Column Totals: (A) (B)
6				Prevalence Index = B/A =0.00
		= Total Co	/er	Hydrophytic Vegetation Indicators:
50% of total cover: 2.5				1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)				2 - Dominance Test is >50%
1				3 - Prevalence Index is ≤3.0¹
2.				<u> — </u>
3				Problematic Hydrophytic Vegetation ¹ (Explain)
				1
4				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5				
6				Definitions of Five Vegetation Strata:
		= Total Co		Tree - Woody plants, excluding woody vines,
50% of total cover: 0	20% of	total cover	:	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Herb Stratum (Plot size: 30 ft)				(7.0 cm) of larger in diameter at breast height (DBH).
1. Poa pratensis, Kentucky Blue Grass			<u>FACU</u>	Sapling – Woody plants, excluding woody vines,
2. Plantago lanceolata, English Plantain			_FACU_	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
3. <u>Liquidambar styraciflua, Sweet-Gum</u>				
4. Trifolium pratense, Red Clover	5	No	_FACU_	Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
5				approximately 3 to 20 ft (1 to 6 ff) in height.
6				Herb - All herbaceous (non-woody) plants, including
7				herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately
8				3 ft (1 m) in height.
9				Manda dina Allumada dina assarina attach
10				Woody vine – All woody vines, regardless of height.
11				
	80	= Total Co	/er	
50% of total cover: 40				
Woody Vine Stratum (Plot size: 30 ft)	20 /0 01	.0.01 00701		
Toxicodendron radicans, Eastern Poison Ivy	10	Yes	FAC	
2. Lonicera japonica, Japanese Honeysuckle	10	Yes	<u>FACU</u>	
3				
4				
5				Hydrophytic
		= Total Cov		Vegetation
50% of total cover:10	20% of	total cover	:4	Present? Yes Nox
Remarks: (If observed, list morphological adaptations belo	w).			

Sampling Point: W11-UP

Soll Sampling Point: W11-UP

	cription: (Describe	to the depth				or confirm	the absence of i	ndicators.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	ox Feature: %	SType ¹	Loc ²	Texture	Remarks
0-18	2.5y 5/4	100%					Sandy loam	
							- Sanay Isani	
1= 0.0								
	Concentration, D=Dep					ains.		=Pore Lining, M=Matrix. Problematic Hydric Soils ³ :
	Indicators: (Applic	able to all Lr				DD 0 T 11		-
Histoso	. ,		Polyvalue Be				_	
	pipedon (A2) listic (A3)		Loamy Muck					((A10) (LRR S) /ertic (F18) (outside MLRA 150A,B)
_	en Sulfide (A4)		Loamy Gley	-		. 0)	_	Floodplain Soils (F19) (LRR P, S, T)
	d Layers (A5)		Depleted Ma		,		_	s Bright Loamy Soils (F20)
_	Bodies (A6) (LRR P	, T, U)	Redox Dark	, ,	6)		(MLRA 1	
5 cm M	ucky Mineral (A7) (LI	RR P, T, U)	Depleted Da	rk Surface	(F7)		Red Paren	t Material (TF2)
Muck P	resence (A8) (LRR L	J)	Redox Depr	essions (F	8)		Very Shallo	ow Dark Surface (TF12)
ı —	uck (A9) (LRR P, T)		Marl (F10) (I	-			Other (Exp	olain in Remarks)
ı —	d Below Dark Surfac	e (A11)	Depleted Oc		-	-	_ 3	
ı —	ark Surface (A12)	MI DA 450A)	Iron-Mangar				,	rs of hydrophytic vegetation and
_	rairie Redox (A16) (I Mucky Mineral (S1) (Umbric Surfa Delta Ochric			, 0)		I hydrology must be present, disturbed or problematic.
	Sleyed Matrix (S4)	LKK 0, 3)	Reduced Ve	. , .		ΛΔ 150R)		disturbed of problematic.
I	Redox (S5)		Piedmont Flo					
	d Matrix (S6)						A 149A, 153C, 153	3D)
	ırface (S7) (LRR P, S	S, T, U)	_		•	, ,	, ,	•
Restrictive	Layer (if observed)	:						
Туре:			_					
Depth (in	iches):		_				Hydric Soil Pre	sent? Yes Nox
Remarks:								

Date: ___

Feature Name: W 11 UP





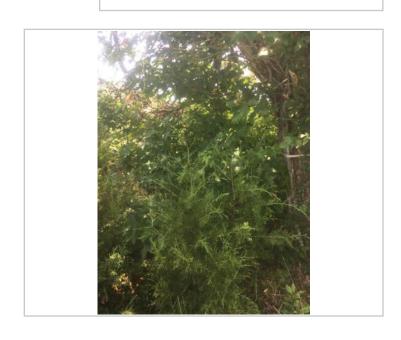
Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Middle	esex/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			
Subregion (LRR or MLRA): MLRA 153B of LRR T Lat: 37.			Datum: WGS84
Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slopes			
Are climatic / hydrologic conditions on the site typical for this time of			
Are Vegetationx, Soilx, or Hydrologyx significan	tly disturbed? Ar	re "Normal Circumstances" p	present? Yes _x _ No
Are Vegetation, Soil, or Hydrology naturally	problematic? (If	f needed, explain any answe	rs in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing	ng sampling poin	t locations, transects	, important features, etc.
Hydrophytic Vegetation Present? Yesx No			
Hydric Soil Present? Yes x No	is the Sampi		
Wetland Hydrology Present? Yes X No	within a Wet	tland? Yes^	No
Remarks:			Observed Classifications:
Likely hydrologically isolated PEM adjacent to soybean field a	nd General Puller Blvd	d. Appears regularly	Cowardin: PEM
mowed, some ponding.			
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indica	ntors (minimum of two required)
Primary Indicators (minimum of one is required; check all that appl	y)	Surface Soil	Cracks (B6)
Surface Water (A1) X Aquatic Fauna (II)	B13)	Sparsely Veg	getated Concave Surface (B8)
High Water Table (A2) Marl Deposits (B	15) (LRR U)	Drainage Pat	tterns (B10)
Saturation (A3) Hydrogen Sulfide	e Odor (C1)	Moss Trim Li	ines (B16)
	pheres along Living Ro	oots (C3) Dry-Season	Water Table (C2)
Sediment Deposits (B2) Presence of Red	luced Iron (C4)	Crayfish Burr	rows (C8)
Drift Deposits (B3) Recent Iron Red	luction in Tilled Soils (C	(6) Saturation Vi	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Thin Muck Surfa	ce (C7)	X Geomorphic	Position (D2)
Iron Deposits (B5) Other (Explain in	Remarks)	Shallow Aqui	itard (D3)
Inundation Visible on Aerial Imagery (B7)		x FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)			noss (D8) (LRR T, U)
Field Observations:			
Surface Water Present? Yesx No Depth (inch	es): 1-2		
Water Table Present? Yes Nox Depth (inch	es):		
Saturation Present? Yes No _x Depth (inch	es):	Wetland Hydrology Presen	nt? Yesx No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial ph	otos, previous inspection	ons), if available:	
pagaina mananaa anii faraani Gandal	otoo, promotep.	ono,, a security	
Remarks:			
Tadpoles observed.			
Tadpores sassification			

VEGETATION	(Five Strata)	- Use	scientific	names	of plants
-------------------	---------------	-------	------------	-------	-----------

			Dominant		Dominance Test worksheet:
Species Across All Strata: 3 (B)	Tree Stratum (Plot size: 30 ft) 1.	% Cover	Species?	Status	
## Percent of Domnant Species 100.0% (A/B)					Total Number of Dominant Species Across All Strata: 3 (B)
The face of Control Species Control Cover					
Companies Comp	5				That Are OBL, FACW, or FAC: 100.0% (A/B)
Soliding Stratum (Plot size: 30 ft Soliding	0		= Total Cov	/er	Prevalence Index worksheet:
Saciling Stratum (Plot size: 30 ft 1	50% of total cover:				Total % Cover of: Multiply by:
FACW species 40		20 70 01	total cover		OBL species60 x 1 =60
FAC species					FACW species40 x 2 =80
## ACU species					FAC species0 x 3 =0
Column Totals: 100 (A) 140 (B)					
5.					UPL species0 x 5 =0
Prevalence Index = B/A = 1.40					Column Totals:100 (A)140 (B)
Shrub Stratum (Plot size: 30 ft Shru					Prevalence Index = B/A = 1.40
Solve of total cover: O 20% of total cover: O X 2 - Dominance Test is >50%		0	= Total Cov	er er	
X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 t The problematic Hydrophytic Vegetation (Explain)	50% of total cover:0	20% of	f total cover	:0	
1	Shrub Stratum (Plot size: 30 ft)				I —
Problematic Hydrophytic Vegetation (Explain) Problematic Hydrophytic Vegetation (Explain) Problematic Hydrophytic Vegetation (Explain) Problematic Hydrophytic Vegetation (Explain) 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 (in m) or more in height and 3 in. (7.6 m) or larger in diameter at breast height (DBH). Sapling — Woody plants, excluding woody vines, approximately 20 ft (in m) or more in height and 3 in. (7.6 m) DBH. Sapling — Woody plants, excluding woody vines, approximately 20 ft (in m) or more in height and less than 3 in. (7.6 m) DBH. Sapling — Woody plants, excluding woody vines, approximately 20 ft (in m) or more in height and less than 3 in. (7.6 m) DBH. Shrub — Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 8 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. Woody Vine — All woody vines, regardless of height. Hydrophytic Vegetation — Vegetatio	1				I —
3. 4. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.	2				
be present, unless disturbed or problematic. 6	3				
be present, unless disturbed or problematic. 6.	4				¹ Indicators of hydric soil and wetland hydrology must
Company Comp	5				be present, unless disturbed or problematic.
50% of total cover: 0 20% of total cover: 0 20% of total cover: 0 30 total cover: 0 4 paper with the page of total cover: 0 4 page of total cover: 0 50% of total cover: 50 20% of total cover: 20 4 page of t	6				Definitions of Five Vegetation Strata:
50% of total cover: 0 20% of total cover: 0 approximately 20 ft (6 m) or more in height and 3 in (7.6 cm) or larger in diameter at breast height (DBH). 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. Shrub – 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 3 in (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 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. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation Van X No.		0	= Total Cov	er	Tree – Woody plants, excluding woody vines.
1. Eleocharis obtusa, Blunt Spike-Rush 2. Murdannia keisak, Wart-Removing-Herb 3.0 Yes OBL 2. Murdannia keisak, Wart-Removing-Herb 3.0 Yes OBL 3. Echinochloa crus-galli, Large Barnyard Grass 4. Carex vulpinoidea, Common Fox Sedge 5. No FACW 5.		20% of	f total cover	:0	approximately 20 ft (6 m) or more in height and 3 in.
2. Murdannia keisak, Wart-Removing-Herb 3. Echinochloa crus-galli, Large Barnyard Grass 2. Echinochloa crus-galli, Large Barnyard Grass 4. Carex vulpinoidea, Common Fox Sedge 5.		30	Yes	OBL	Sanling – Woody plants, excluding woody vines
3. Echinochloa crus-galli, Large Barnyard Grass 4. Carex vulpinoidea, Common Fox Sedge 5.			Yes	OBL	approximately 20 ft (6 m) or more in height and less
5					than 3 in. (7.6 cm) DBH.
6		15	No	FACW	
7					Herb – All herbaceous (non-woody) plants, including
8.					herbaceous vines, regardless of size, and woody
9	8				
10					3 it (1 m) in neight.
11					Woody vine - All woody vines, regardless of height.
100					
50% of total cover:		100	= Total Cov	/er	
Woody Vine Stratum (Plot size: 30 ft	50% of total cover: 50				
1					
2					
3					
4					
5 Hydrophytic Vegetation Proceed: A Veg X No.					
0 = Total Cover Vegetation Proceed: A No. X No. X No.					
Brocont2 Voc X No	v		- Total Ca		1
20% of total cover	E004 of total anyon:				
Remarks: (If observed, list morphological adaptations below).			total cover		

Sampling Point: W12

SolL Sampling Point: W12

Profile Des	cription: (Describe t	o the depth	needed to docur	ment the i	ndicator	or confirm	the absence	of indicate	ors.)	
Depth (inches)	Matrix Color (moist)	 _	Color (moist)	x Features %		Loc ²	Texture		Remarks	
(inches) 0-18	10yr 4/2	85% 7		15%	Type' C	PL	Sandy clay		Remarks	
	10y1 4/2		.5 yr 5/0							
	oncentration, D=Depl					ains.			ining, M=Matrix	
	Indicators: (Applica	ible to all L	Polyvalue Be			DD C T 11			matic Hydric \$	Solls :
Histoso	pipedon (A2)		Thin Dark Su				_	luck (A3) (1		
_	istic (A3)		Loamy Muck						18) (outside N	ILRA 150A,B)
ı —	en Sulfide (A4)		Loamy Gleye		F2)		_		ain Soils (F19)	
_	d Layers (A5) : Bodies (A6) (LRR P,	T 11)	× Depleted Ma		6)		_	_	Loamy Soils (F	F20)
ı —	ucky Mineral (A7) (LR		Redox Dark Depleted Da					RA 153B) arent Mater	ial (TF2)	
ı —	resence (A8) (LRR U)		Redox Depre				_		k Surface (TF1:	2)
_	uck (A9) (LRR P, T)		Marl (F10) (L	-			Other (Explain in I	Remarks)	
ı —	d Below Dark Surface	(A11)	Depleted Oc	1	•	-	-) 31		du a a la . 43 a a a a 4	-4: d
ı —	ark Surface (A12) 'rairie Redox (A16) (M	ILRA 150A)	Iron-Mangan Umbric Surfa		. , ,		*	-	drophytic veget ogy must be pr	
	Mucky Mineral (S1) (L		Delta Ochric			, -,			ed or problemat	
	Gleyed Matrix (S4)		Reduced Ver							
	Redox (S5) d Matrix (S6)		Piedmont Flo			-		153D\		
	irface (S7) (LRR P, S ,	. T. U)	Anomalous E	origini Loan	ily Solis (i	-20) (WILK	M 149M, 155C,	1550)		
	Layer (if observed):	, , -,								
Туре:			_							
Depth (ir	ches):		_				Hydric Soil	Present?	Yesx	No
Remarks:										

Date: 7/15/21







Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Midd	dlesex/Middlesex	Sampling Date:7/15/20)21	
Applicant/Owner: HRSD	State: VA				
Investigator(s): Emily Foster, Katelyn Hoisington	o. Range:				
Landform (hillslope, terrace, etc.): Hillslope					
Subregion (LRR or MLRA): MLRA 153B of LRR T			Datum: WGS84	_	
				_	
Soil Map Unit Name: Slagle silt loam, 2 to 6 percent slope			cation:	_	
Are climatic / hydrologic conditions on the site typical for t					
Are Vegetationx, Soilx, or Hydrologyx_	significantly disturbed?	Are "Normal Circumstances"	present? Yesx No	_	
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any answ	ers in Remarks.)		
SUMMARY OF FINDINGS - Attach site may	showing sampling po	int locations, transects	s, important features, et	c.	
		,	,,		
Hydrophytic Vegetation Present? Yes	is the Jan	pled Area			
Hydric Soil Present? Yes		/etland? Yes	Nox		
Wetland Hydrology Present? Yes	Nox			_	
Remarks:			Observed Classifications:		
Mowed uplands			Cowardin: <u>upland</u>	-	
				_	
HYDROLOGY				_	
Wetland Hydrology Indicators:		Secondary Indic	ators (minimum of two required)	1	
Primary Indicators (minimum of one is required; check a	****		Cracks (B6)		
	ic Fauna (B13)		egetated Concave Surface (B8)		
	Deposits (B15) (LRR U)		atterns (B10)		
	gen Sulfide Odor (C1)	Moss Trim I			
	red Rhizospheres along Living F nce of Reduced Iron (C4)		Water Table (C2)		
	nt Iron Reduction in Tilled Soils	Crayfish Bu			
	Auck Surface (C7)	(C6) Saturation Visible on Aerial Imagery (C9) Geomorphic Position (D2)			
	(Explain in Remarks)	Shallow Aqu			
Inundation Visible on Aerial Imagery (B7)	(==-	FAC-Neutra			
Water-Stained Leaves (B9)		_	moss (D8) (LRR T, U)		
Field Observations:			, , , , , , , , , , , , , , , , , , , ,	\neg	
Surface Water Present? Yes No _x _	Pepth (inches):				
Water Table Present? Yes Nox	epth (inches):				
Saturation Present? Yes No _x D	Pepth (inches):	Wetland Hydrology Prese	nt? Yes Nox		
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well	Laerial photos, previous insper	tions) if available:		\dashv	
Describe Necorded Data (stream gauge, monitoring wei	, acital priotos, previous irispec	diono, il avallable.			
Remarks:				\dashv	
remarks.					
				\neg	

	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ft)	% Cover Species? Status	Number of Dominant Species
1		That Are OBL, FACW, or FAC:0 (A)
2		Total Number of Dominant
3		Species Across All Strata: 3 (B)
4		
5		Percent of Dominant Species
		That Are OBL, FACW, or FAC: 0.0% (A/B)
6		Prevalence Index worksheet:
	= Total Cover	Total % Cover of: Multiply by:
50% of total cover:0	20% of total cover:0	OBL species 0 x 1 = 0
Sapling Stratum (Plot size: 30 ft)		
1		FACW species0 x 2 =0
2		FAC species0 x 3 =0
3.		FACU species100 x 4 =400
		UPL species0 x 5 =0
4		Column Totals:100 (A)400 (B)
5		
6		Prevalence Index = B/A =4.00
	0 = Total Cover	Hydrophytic Vegetation Indicators:
50% of total cover:0	20% of total cover:0	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)		2 - Dominance Test is >50%
1		3 - Prevalence Index is ≤3.0¹
2.		I —
		Problematic Hydrophytic Vegetation¹ (Explain)
3		
4		Indicators of hydric soil and wetland hydrology must
5		be present, unless disturbed or problematic.
6		Definitions of Five Vegetation Strata:
	0 = Total Cover	Tree – Woody plants, excluding woody vines,
50% of total cover:0	20% of total cover:0	approximately 20 ft (6 m) or more in height and 3 in.
Herb Stratum (Plot size: 30 ft)		(7.6 cm) or larger in diameter at breast height (DBH).
	35YesFACU	
	35 Yes FACU	Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
		than 3 in. (7.6 cm) DBH.
3. Plantago lanceolata, English Plantain		
4		Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
5		approximatery 5 to 20 it (1 to 6 in) in height.
6		Herb - All herbaceous (non-woody) plants, including
7		herbaceous vines, regardless of size, and woody
8.		plants, except woody vines, less than approximately 3 ft (1 m) in height.
9.		o k (1 m) in noight.
		Woody vine - All woody vines, regardless of height.
10		
11	100	
	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		Hydrophytic
	0 = Total Cover	Vegetation
50% of total cover: 0	20% of total cover:0	Present? Yes Nox
Remarks: (If observed, list morphological adaptations belo	DW).	
,		

Sampling Point: W12-UP

SOIL Sampling Point: W12-UP

Profile Des	cription: (Describe t	to the depth	needed to docu	ment the i	ndicator	or confirm	the absence of	f indicator	rs.)	
Depth (inches)	Matrix Color (moist)	——————————————————————————————————————	Color (moist)	ox Feature: %		Loc ²	Texture		Remarks	
		100%	Color (moist)	70	_ type				Remarks	
0-18	10yr 4/4	100%					Loam			
										_
¹Tvpe: C=C	concentration, D=Depl	etion. RM=Re	educed Matrix. M	S=Masked	Sand Gr	ains.	² Location: P	L=Pore Lir	ning, M=Matrix	ζ.
	Indicators: (Applica								natic Hydric S	
Histoso	I (A1)		Polyvalue Be	elow Surfa	ce (S8) (L	RR S, T, U) 1 cm Mu	ck (A9) (L l	RR O)	
_	pipedon (A2)		Thin Dark S					ck (A10) (I	*	
_	listic (A3)		Loamy Muck	-		O)	_			ILRA 150A,B)
1 —	en Sulfide (A4) d Layers (A5)		Loamy Gley Depleted Ma		F2)		_		in Soiis (F19) Loamy Soils (F	(LRR P, S, T)
_	Bodies (A6) (LRR P.	T, U)	Redox Dark		6)		_	153B)	Louiny Cons (i	20)
5 cm M	ucky Mineral (A7) (LR	R P, T, U)	Depleted Da					ent Materia	al (TF2)	
ı —	resence (A8) (LRR U)	Redox Depr		8)				Surface (TF12	2)
ı —	uck (A9) (LRR P, T)	(4.11)	Marl (F10) (I			-4)	Other (E	xplain in R	lemarks)	
1 —	d Below Dark Surface ark Surface (A12)	e (A11)	Depleted Oc Iron-Mangar		•	-	T) ³ Indicat	ors of hydr	rophytic veget	ation and
1 —	Prairie Redox (A16) (N	ILRA 150A)			. , ,		,		gy must be pr	
	Mucky Mineral (S1) (L		Delta Ochric	(F17) (ML	.RA 151)				d or problemat	
1 —	Gleyed Matrix (S4)		Reduced Ve							
	Redox (S5)		Piedmont FI			-		50 D)		
	d Matrix (S6) urface (S7) (LRR P, S	T 11)	Anomalous	Bright Loar	ny Solis (I	-20) (IVILKA	A 149A, 153C, 1	530)		
	Layer (if observed):									
Type:			_							
Depth (ir	nches):		_				Hydric Soil P	resent?	Yes	Nox
Remarks:										

Date: ____

Feature Name: W 12 UP





Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West

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, Rang	ge:	
Landform (hillslope, terrace, etc.): Depression	Local relief (concave, con	nvex, none); Concave	Slope (%): 0-5
Subregion (LRR or MLRA): MLRA 153B of LRRT Lat:			
		8 9	
Are climatic / hydrologic conditions on the site typical for this time			
Are Vegetationx, Soilx, or Hydrologyx signifi			
Are Vegetation, Soil, or Hydrology natura	ally problematic? (If nee	ded, explain any answer	rs in Remarks.)
SUMMARY OF FINDINGS – Attach site map sho			*
Hydrophytic Vegetation Present? Yes _ x _ No _	In the Committed A		
Hydric Soil Present? Yesx No	is the Sampled A		Na
Wetland Hydrology Present? Yesx No	within a Wetland	ir tes	No
Remarks:			Observed Classifications:
Roadside depression adjacent to ag. Field.			Cowardin: PEM
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary Indica	tors (minimum of two required)
Primary Indicators (minimum of one is required; check all that a	(ylqq	Surface Soil (ALC: US - CENTRAL CONTRACTOR CONT
Surface Water (A1) Aquatic Faur	1914 (C.T.)		getated Concave Surface (B8)
High Water Table (A2) Marl Deposit		Drainage Pat	
Saturation (A3) Hydrogen Su		Moss Trim Li	
	zospheres along Living Roots (Water Table (C2)
	Reduced Iron (C4)	Crayfish Burr	
	Reduction in Tilled Soils (C6)		sible on Aerial Imagery (C9)
X Algal Mat or Crust (B4) Thin Muck Si		X Geomorphic	
Iron Deposits (B5) Other (Expla	n in Remarks)	Shallow Aqui	
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral	Test (D5)
Water-Stained Leaves (B9)		Sphagnum m	noss (D8) (LRR T, U)
Field Observations:			
Surface Water Present? Yes Nox Depth (i	nches):		
Water Table Present? Yes No _x Depth (ii	100		
Saturation Present? Yes No _x Depth (i		and Hydrology Presen	t? Yes x No
(includes capillary fringe)			
Describe Recorded Data (stream gauge, monitoring well, aeria	photos, previous inspections),	if available:	
9			
Remarks:			

VEGETATION	(Five Strata)	- Use	scientific	names	of plants
VEGETATION	ir ive Strata	_ OSC	SOICHILIIC	Harries	OI DIGITES

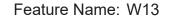
	Absolute Dominant Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: <u>30 ft</u>) 1	% Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC:0 (A)
2 3		Total Number of Dominant Species Across All Strata: 0 (B)
4.		Percent of Dominant Species
5		That Are OBL, FACW, or FAC: (A/B)
6	= Total Cover	Prevalence Index worksheet:
50% of total cover:	20% of total cover: 0	Total % Cover of: Multiply by:
Sapling Stratum (Plot size: 30 ft)	20 % of total cover	OBL species30 x 1 =30
		FACW species0 x 2 =0
1		FAC species0 x 3 =0
2		FACU species 0 x 4 = 0
3		UPL species0 x 5 =0
4		Column Totals: <u>30</u> (A) <u>30</u> (B)
5		Prevalence Index = B/A =1.00
	0 = Total Cover	Hydrophytic Vegetation Indicators:
50% of total cover:0	20% of total cover:0	1 - Rapid Test for Hydrophytic Vegetation
Shrub Stratum (Plot size: 30 ft)		2 - Dominance Test is >50%
1		X 3 - Prevalence Index is ≤3.01
2		Problematic Hydrophytic Vegetation ¹ (Explain)
3		
4.		¹ Indicators of hydric soil and wetland hydrology must
5		be present, unless disturbed or problematic.
6		Definitions of Five Vegetation Strata:
·	0 = Total Cover	John Marie Co. 1100 Togotalion Citata
	20% of total cover: 0	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).
Herb Stratum (Plot size: 30 ft) 1. Murdannia keisak, Wart-Removing-Herb	30 J OBL	
		Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
2		than 3 in. (7.6 cm) DBH.
3		Short Meadanlants such discussed with a
		Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
5		
6		Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody
7		plants, except woody vines, less than approximately
8		3 ft (1 m) in height.
9		Woody vine - All woody vines, regardless of height.
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.		Hydrophytic
	0 = Total Cover	Vegetation
50% of total cover: 0	20% of total cover: 0	Present? Yesx No
Remarks: (If observed, list morphological adaptations belo		
vegetation frequently mowed and unidentifiable		

Sampling Point: W13

SolL Sampling Point: W13

(inches)	Matrix			ox Feature				
	Color (moist)		Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	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%	<u>C</u>	PL	Sandy clay	
6-18	2.5y 5/2	50%	10yr 5/6	50%	C	M	Clay	
Tumo: C=(Concentration, D=Dep	lotion DM		- Maaka			² l eastion:	PL=Pore Lining, M=Matrix.
	Indicators: (Applic					uiis.		for Problematic Hydric Soils ³ :
Histoso			Polyvalue B		,	RR S. T. U		Muck (A9) (LRR O)
_	Epipedon (A2)		Thin Dark S					Muck (A10) (LRR S)
Black H	Histic (A3)		Loamy Much					ced Vertic (F18) (outside MLRA 150A,
	jen Sulfide (A4)		Loamy Gley		F2)			nont Floodplain Soils (F19) (LRR P, S, 7
	ed Layers (A5)		Depleted Ma				_	alous Bright Loamy Soils (F20)
_ ~	c Bodies (A6) (LRR F lucky Mineral (A7) (L l		Redox Dark Depleted Da	,	-		,	RA 153B) arent Material (TF2)
_	Presence (A8) (LRR L		Redox Depr		. ,		_	Shallow Dark Surface (TF12)
	luck (A9) (LRR P, T)	,	Marl (F10) (I	,	0,			(Explain in Remarks)
	ed Below Dark Surfac	e (A11)	Depleted Oc	hric (F11)	(MLRA 15	i1)	_	
_	Dark Surface (A12)		Iron-Mangar		. , .			cators of hydrophytic vegetation and
	Prairie Redox (A16) (I					U)		tland hydrology must be present,
_	Mucky Mineral (S1) (LRR O, S)	Delta Ochric		-	0.0.450.00\	uni	ess disturbed or problematic.
	Gleyed Matrix (S4) Redox (S5)		Reduced Ve Piedmont FI	, ,			9Δ)	
	d Matrix (S6)						эд, A 149A, 153C	c. 153D)
_	urface (S7) (LRR P,	S, T, U)	_		, (.		,	,,
	Layer (if observed)							
Туре:								
							1	
Depth (i	nches):						Hydric Soil	Present? Yes No
							Hydric Soil	Present? Yes No
Depth (in							Hydric Soi	Present? Yes No
							Hydric Soil	Present? Yes X No No No
							Hydric Soil	Present? Yes X No No
							Hydric Soil	Present? Yes <u>×</u> No
							Hydric Soil	Present? Yes <u>x</u> No
							Hydric Soil	Present? Yes <u>x</u> No
							Hydric Soil	Present? Yes <u>x</u> No
							Hydric Soil	Present? Yes X No No
							Hydric Soil	Present? Yes No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yes x No No
							Hydric Soil	Present? Yes x No No
							Hydric Soil	Present? Yes x No No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No
							Hydric Soil	Present? Yesx No

Date: ____







Photograph Direction West

Comments:

Photograph Direction East

Comments:





Photograph Direction South

Comments:

Photograph Direction North

Project/Site: HRSD Middlesex	TFM	City/C	ounty: Middl	lesex/Midd	llesex	Sampling Date:	7/29/2021
Applicant/Owner: HRSD					State: VA	Sampling Point: W	/13-up
Investigator(s): Emily Foster, K	Kristen Walls	Section					
Landform (hillslope, terrace, etc		Local		New Comments of the Comments			(%): 0-5
Subregion (LRR or MLRA): ML			100		200		187. T/4.7
Soil Map Unit Name: Slagle silt							
Are climatic / hydrologic condition Are Vegetationx, Soil						resent? Yes <u>x</u>	No
Are Vegetation, Soil				If needed, e	explain any answe	rs in Remarks.)	
SUMMARY OF FINDING				nt locatio	ns, transects	, important fea	itures, etc.
Hydrophytic Vegetation Prese	ent? Yes_X	No	to visto escr	US 105 HE			
Hydric Soil Present?	Yes		Is the Samp				
Wetland Hydrology Present?	Yes		within a We	etland?	Yes	Nox	
Remarks:	N. Co.					Observed Classifi	cations:
soybean field adacent to roa	ad					Cowardin: uplar	
							 -
HYDROLOGY							
Wetland Hydrology Indicato	rs:				Secondary Indica	ators (minimum of ty	vo required)
Primary Indicators (minimum		all that apply)			Surface Soil	Cracks (B6)	
Surface Water (A1)		tic Fauna (B13)				getated Concave Si	urface (B8)
High Water Table (A2)		Deposits (B15) (LRF	R U)		Drainage Pa		
Saturation (A3)		ogen Sulfide Odor (C			Moss Trim L	2000 000 000	
Water Marks (B1)		zed Rhizospheres a		oots (C3)	Dry-Season	Water Table (C2)	
Sediment Deposits (B2)	Prese	ence of Reduced Iro	n (C4)		Crayfish Bur	rows (C8)	
Drift Deposits (B3)		nt Iron Reduction in		C6)	Saturation V	isible on Aerial Imag	gery (C9)
Algal Mat or Crust (B4)	Thin !	Muck Surface (C7)			Geomorphic	Position (D2)	
Iron Deposits (B5)	Other	r (Explain in Remark	(s)		Shallow Aqu	itard (D3)	
Inundation Visible on Aer	ial Imagery (B7)				FAC-Neutral	Test (D5)	
Water-Stained Leaves (B	9)				Sphagnum n	noss (D8) (LRR T, I	J)
Field Observations:							
Surface Water Present?	Yes No _x [Depth (inches):					
Water Table Present?	Yes Nox [Depth (inches):					
Saturation Present?	Yes No _x [Depth (inches):		Wetland H	lydrology Preser	nt? Yes	Nox
(includes capillary fringe) Describe Recorded Data (stre	eam gauge monitoring we	Il aerial photos pre	vious inspect	tions) if avai	ilable.		
Describe Necorded Data (sire	am gauge, monitoring we	ii, aeriai priotos, pre	vious irispect	ions), ii avai	nable.		
Remarks:							
Nemarks.							

VEGETATION	(Five Strata	- Use	scientific	names	of	plants
------------	--------------	-------	------------	-------	----	--------

/EGETATION (Five Strata) – Use scientific nar	nes of pla	ants.		Sampling Point: W13	-up
		Dominant		Dominance Test worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30 ft</u>) 1. <u>Liquidambar styraciflua, Sweet-Gum</u>	% Cover			Number of Dominant Species That Are OBL, FACW, or FAC: 2	(4)
Pinus taeda, Loblolly Pine			FAC	That Ale OBL, FACW, of FAC.	. (^)
3				Total Number of Dominant Species Across All Strata: 3	(D)
4				Species Across All Strata:3	(D)
5				Percent of Dominant Species	(A (D)
6				That Are OBL, FACW, or FAC: 67.0%	(A/B)
0		Total Cov	/er	Prevalence Index worksheet:	
50% of total cover:22.5				Total % Cover of: Multiply by:	_
Sapling Stratum (Plot size: 30 ft)	20 % OI	total cover		OBL species0 x 1 =0	_
1. Juniperus virginiana, Eastern Red-Cedar	10	J	FΔCII	FACW species0 x 2 =0	_
				FAC species45 x 3 =135	_
2				FACU species10 x 4 =40	_
3				UPL species0 x 5 =0	
4				Column Totals:55(A)175	
5					
6				Prevalence Index = B/A =3.18	_
		= Total Cov		Hydrophytic Vegetation Indicators:	
50% of total cover:5	20% of	total cover	:2	1 - Rapid Test for Hydrophytic Vegetation	
Shrub Stratum (Plot size: 30 ft)				2 - Dominance Test is >50%	
1				3 - Prevalence Index is ≤3.01	
2				Problematic Hydrophytic Vegetation¹ (Expla	ain)
3					
4				¹ Indicators of hydric soil and wetland hydrology	must
5				be present, unless disturbed or problematic.	
6				Definitions of Five Vegetation Strata:	
50% of total cover:0		= Total Cover		Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and	3 in
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at breast height (E	
1. soybean				Sapling – Woody plants, excluding woody vines	
2				approximately 20 ft (6 m) or more in height and	
3.				than 3 in. (7.6 cm) DBH.	
				Shrub – Woody plants, excluding woody vines,	
4				approximately 3 to 20 ft (1 to 6 m) in height.	
5				Harb. All barbassass (non-susado) alanta inclui	
6				Herb – All herbaceous (non-woody) plants, inclunderbaceous vines, regardless of size, and wood	
7				plants, except woody vines, less than approxima	
8				3 ft (1 m) in height.	
9				Woody vine - All woody vines, regardless of he	eight.
10					
11					
		= Total Cov			
50% of total cover: 0	20% of	total cover	:0		
Woody Vine Stratum (Plot size: 30 ft)					
1					
2					
3					
4					
5				Hydrophytic	
	0:	= Total Cov	er er	Vegetation	
50% of total cover: 0	20% of	total cover	:0	Present? Yes X No No	
Remarks: (If observed, list morphological adaptations belo	w).			1	
	-				

SOIL Sampling Point: W13-up

Depth	cription: (Describe Matrix			ox Feature				,	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks	<u> </u>
0-5	10yr 4/4	100%					Sandy loam		
5-10	7.5yr 4/4	100%					Sandy loam		
1 			Dadward Matrix M	0-14			21	Dana Linin - M.M.	A-t-
	Concentration, D=De Indicators: (Appli					ains.		Pore Lining, M=Ma	
Histoso		cable to all i	Polyvalue Be		,	RRSTII		_	c cons .
_	pipedon (A2)		Thin Dark S				_	(A10) (LRR S)	
	listic (A3)		Loamy Muck					ertic (F18) (outside	e MLRA 150A,B)
	en Sulfide (A4)		Loamy Gley		(F2)		_	oodplain Soils (F1	
	d Layers (A5)	D T 11)	Depleted Ma		-0)		_	Bright Loamy Soils	s (F20)
_	: Bodies (A6) (LRR ucky Mineral (A7) (L		Redox Dark Depleted Da				(MLRA 15	ง ธ) Material (TF2)	
_	resence (A8) (LRR		Redox Depr		' '		_	w Dark Surface (TF	F12)
_	uck (A9) (LRR P, T)	,	Marl (F10) (I	*	-,			ain in Remarks)	,
Deplete	d Below Dark Surfa	ce (A11)	Depleted Oc	chric (F11)	(MLRA 1	51)			
_	ark Surface (A12)		Iron-Mangar					of hydrophytic veg	
	Prairie Redox (A16) (Mucky Mineral (S1)		- B # 6 ! :			, U)		hydrology must be sturbed or problen	
_	Gleyed Matrix (S4)	(LKK 0, 3)	Delta Ochric		-	0A. 150B)		sturbed of problem	natic.
_	Redox (S5)		Piedmont Fl	, , ,					
	d Matrix (S6)						A 149A, 153C, 153	D)	
	urface (S7) (LRR P,								
	Layer (if observed								
							l _		v
	iches):		_				Hydric Soil Pres	ent? Yes	No×
Remarks:									

Date: ____







Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction West

Comments:

Photograph Direction East

Project/Site: HRSD Middlesex TFM	City/C	ounty: Middlesex/Midd	esex	Sampling Date:	7/29/2021	
Applicant/Owner: HRSD		s	State: VA	Sampling Point: W14		
Investigator(s): Emily Foster, Kristen Walls	Section	on, Township, Range:				
Landform (hillslope, terrace, etc.): Drainageway					(%)· 0-15	
Subregion (LRR or MLRA): MLRA 153B of LRR T		4 E W	500		S. t. 5/4.5	
a sectional first						
Soil Map Unit Name: Slagle silt loam, 2 to 6 percent		. mg				
Are climatic / hydrologic conditions on the site typical						
Are Vegetationx, Soilx, or Hydrology _			Circumstances" p	present? Yesx	No	
Are Vegetation, Soil, or Hydrology _	naturally problema	atic? (If needed, e.	xplain any answe	rs in Remarks.)		
SUMMARY OF FINDINGS - Attach site	map showing sam	pling point locatio	ns, transects	, important fea	tures, etc.	
	1000					
	No	Is the Sampled Area				
[-] 전화가 하게 하는 경향 전체 전환 전환 기계	No	within a Wetland?	Yesx	No		
Remarks:	NO			Observed Classifis	ations.	
Excavated drainage ditch with dense hydric ver	getation draining south	est.		Observed Classific Cowardin: PEM	ations:	
	500000000000000000000000000000000000000			COWARDIN: PEIVI		
HYDROLOGY						
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of tw	o required)	
Primary Indicators (minimum of one is required; ch	neck all that apply)		Surface Soil		o required/	
	Aquatic Fauna (B13)			getated Concave Su	rface (B8)	
	Marl Deposits (B15) (LRF	R U)	Drainage Pa		ridoc (Do)	
	Hydrogen Sulfide Odor (0		Moss Trim Li	2000 000 000		
	Oxidized Rhizospheres a			Water Table (C2)		
	Presence of Reduced Iro	n (C4)	Crayfish Buri	rows (C8)		
	Recent Iron Reduction in		Saturation Vi	isible on Aerial Imag	ery (C9)	
	Thin Muck Surface (C7)		Geomorphic	Position (D2)		
Iron Deposits (B5)	Other (Explain in Remark	(S)	Shallow Aqui	itard (D3)		
Inundation Visible on Aerial Imagery (B7)			FAC-Neutral	Test (D5)		
Water-Stained Leaves (B9)			Sphagnum n	noss (D8) (LRR T, U)	
Field Observations:						
A STATE OF THE STA	Depth (inches): 2					
Water Table Present? Yesx No						
Saturation Present? Yesx_ No (includes capillary fringe)	Depth (inches): 0	Wetland H	ydrology Presen	nt? Yesx	No	
Describe Recorded Data (stream gauge, monitoring	ng well, aerial photos, pre	vious inspections), if avai	lable:			
The State of the S						
Remarks:						

VEGETATION (Five Strata) —	Use	scientific	names	of	plants
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/EGETATION (Five Strata) – Use scientific nam	nes of pla	ants.		Sampling	Point: W14	
	Absolute	Dominant	Indicator	Dominance Test worksheet:		
<u>Tree Stratum</u> (Plot size: <u>30 ft</u>) 1	% Cover	Species?		Number of Dominant Species That Are OBL, FACW, or FAC:	3	(Δ)
2.				Total Number of Dominant		(^)
3				Species Across All Strata:	3	(B)
4						, ,
5.				Percent of Dominant Species	100.0%	(A (D)
6				That Are OBL, FACW, or FAC:	100.070	(AVD)
		Total Cov		Prevalence Index worksheet:		
				Total % Cover of: M	ultiply by:	_
50% of total cover:0_	20% 01	total cover		OBL species50 x 1 =	50	
Sapling Stratum (Plot size: 30 ft)				FACW species15 x 2 =		_
1				FAC species x 3 =		
2				FACU species 0 x 4 =		
3				I .		-
4				UPL species 0 x 5 =		- (D)
5				Column Totals: 85 (A)	140	_ (B)
6				Prevalence Index = B/A =	1.65	
		= Total Cov		Hydrophytic Vegetation Indicators		
50% of total cover:0						
Shrub Stratum (Plot size: 30 ft)				1 - Rapid Test for Hydrophytic V	egetation	
				2 - Dominance Test is >50%		
1				X 3 - Prevalence Index is ≤3.01		
2				Problematic Hydrophytic Vegeta	ition¹ (Explaii	n)
3						
4				¹ Indicators of hydric soil and wetland		nust
5				be present, unless disturbed or probl	lematic.	
6				Definitions of Five Vegetation Stra	ıta:	
	0 :	= Total Cov	er	Tree – Woody plants, excluding woo	dy vines	
50% of total cover:0	20% of	total cover:	0	approximately 20 ft (6 m) or more in		in.
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at brea	st height (Di	BH).
1. Typha latifolia, Broad-Leaf Cat-Tail	50	yes	OBL	Sapling – Woody plants, excluding v	woody vines	
2. Dichanthelium clandestinum, Deer-Tongue Rosette			FACW	approximately 20 ft (6 m) or more in		
Microstegium vimineum, Japanese Stilt Grass				than 3 in. (7.6 cm) DBH.		
				Shrub - Woody plants, excluding wo	oody vines	
4				approximately 3 to 20 ft (1 to 6 m) in		
5						_
6				Herb – All herbaceous (non-woody) herbaceous vines, regardless of size		
7				plants, except woody vines, less than		
8				3 ft (1 m) in height.		
9				Woody vine - All woody vines rese	rdless of hai	ah t
10				Woody vine – All woody vines, rega	i uless of nei	giit.
11						
	85 :	= Total Cov	er			
50% of total cover: 42.5						
Woody Vine Stratum (Plot size: 30 ft)						
1						
2						
3						
4						
5				Hydrophytic		
	:	= Total Cov	er	Vegetation	1-	
50% of total cover: 0	20% of	total cover:	0	Present? Yes x N		
Remarks: (If observed, list morphological adaptations below	w).			1		
(/-					

SOIL Sampling Point: W14

Depth	Matrix			ox Features		1 - 2	T4	Barrant
inches)	Color (moist)	%	Color (moist)		Type ¹	_Loc ² _	Texture	Remarks
0-12	2.5y 4/2	70%	5yr 5/6	30%	<u> </u>	PL	Clay	
12-18	2.5y 6/1	70%_	5yr 5/6	30%	C		Clay	
							2	
	Concentration, D=Dep Indicators: (Applic					ains.		Problematic Hydric Soils ³ :
Histoso		able to all	Polyvalue B		,	PPSTI		-
_	pipedon (A2)		Thin Dark S					(A10) (LRR S)
_	listic (A3)		Loamy Muc					ertic (F18) (outside MLRA 150A
	en Sulfide (A4)		Loamy Gley	ed Matrix (F2)		Piedmont F	loodplain Soils (F19) (LRR P, S,
	ed Layers (A5)		Depleted Ma				_	Bright Loamy Soils (F20)
	Bodies (A6) (LRR P		Redox Dark	,	,		(MLRA 15	•
_	lucky Mineral (A7) (LI Presence (A8) (LRR U		Depleted Da Redox Depr		, ,		_	Material (TF2) w Dark Surface (TF12)
	luck (A9) (LRR P, T)	''	Marl (F10) (*	0)			ain in Remarks)
	ed Below Dark Surfac	e (A11)	Depleted O		(MLRA 1	51)		,
Thick E	ark Surface (A12)		Iron-Manga	nese Mass	es (F12) (LRR O, P,	T) ³ Indicators	of hydrophytic vegetation and
	Prairie Redox (A16) (I					, U)		hydrology must be present,
_	Mucky Mineral (S1) (I	LRR O, S)	_			0.5 4505)		isturbed or problematic.
	Gleyed Matrix (S4) Redox (S5)		Reduced Ve	, , ,				
	d Matrix (S6)						A 149A, 153C, 153	D)
_	urface (S7) (LRR P, \$	S, T, U)	_ :	g c	, (, (,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-,
Restrictive	Layer (if observed):							
Туре:								
Depth (ii	nches):						Hydric Soil Pres	ent? Yes <u> </u>
Remarks:								

Date: ____







Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction East

Comments:

Photograph Direction West__

Project/Site: HRSD Middlesex	TFM	City/Co	ounty: Middlesex/M	iddlesex	Sampling Date:	7/29/2021		
Applicant/Owner: HRSD				_ State: VA	Sampling Point: W	14-UP		
Investigator(s): Emily Foster, K	(risten Walls	Section						
Landform (hillslope, terrace, etc	c.): Flat	Local r	elief (concave, conve	ex. none); None	Slope	(%): 5-10		
Subregion (LRR or MLRA): ML			15 E	W		S-1 1/4.5		
Soil Map Unit Name: _Slagle sil				Distriction Victoria				
Are climatic / hydrologic conditi								
Are Vegetation, Soil				mal Circumstances" p		No		
Are Vegetation, Soil	, or Hydrology	_ naturally problemat	tic? (If needed	d, explain any answe	ers in Remarks.)			
SUMMARY OF FINDING	S – Attach site ma	p showing sam	pling point loca	tions, transects	, important fea	tures, etc.		
Hydrophytic Vegetation Prese	ent? Yesx	No						
Hydric Soil Present?	Yes	No x	Is the Sampled Are					
Wetland Hydrology Present?	Yes		within a Wetland?	Yes	Nox			
Remarks:					Observed Classific Cowardin: <u>uplan</u>			
HYDROLOGY						-		
Wetland Hydrology Indicato	ors:			Secondary Indica	ators (minimum of tw	o required)		
Primary Indicators (minimum	of one is required; check a	Il that apply)		Surface Soil	Cracks (B6)			
Surface Water (A1)	Aquat	tic Fauna (B13)		Sparsely Ve	getated Concave Su	rface (B8)		
High Water Table (A2)		Deposits (B15) (LRR	U)	Drainage Pa	tterns (B10)			
Saturation (A3)	Hydro	gen Sulfide Odor (C	1)	Moss Trim L	ines (B16)			
Water Marks (B1)	Oxidiz	ed Rhizospheres ald	ong Living Roots (C3	Dry-Season	Water Table (C2)			
Sediment Deposits (B2)	Prese	nce of Reduced Iron	(C4)	Crayfish Bur	rows (C8)			
Drift Deposits (B3)	Recer	nt Iron Reduction in T	Tilled Soils (C6)	(C6) Saturation Visible on Aerial Imagery (C9)				
Algal Mat or Crust (B4)	Thin N	Muck Surface (C7)		Geomorphic Position (D2)				
Iron Deposits (B5)	Other	(Explain in Remarks	3)	Shallow Aquitard (D3)				
Inundation Visible on Aer	ial Imagery (B7)			FAC-Neutral	Test (D5)			
Water-Stained Leaves (B	9)			Sphagnum n	moss (D8) (LRR T, U	I)		
Field Observations:								
Surface Water Present?	Yes No _x _ D	epth (inches):						
Water Table Present?	Yes No X D	epth (inches):						
Saturation Present? (includes capillary fringe)	Yes No _x D	Depth (inches):	Wetland	d Hydrology Preser	nt? Yes	Nox		
Describe Recorded Data (stre	am gauge, monitoring wel	l, aerial photos, prev	vious inspections), if a	available:				
Remarks:								

____15 = Total Cover

Present?

EGETATION (Five Strata) – Use scientific na		Dominant	Indicator	Dominance Test worksheet:	oling Point: W14	
Tree Stratum (Plot size: 30 ft)		Species?		Number of Dominant Species		
1. Acer rubrum, Red Maple	40	<u>Yes</u>	<u>FAC</u>	That Are OBL, FACW, or FAC:	4	(A)
2. <u>Pinus taeda, Loblolly Pine</u>	25	<u>Yes</u>	<u>FAC</u>	Total Number of Dominant		
3. Quercus alba, Northern White Oak	20	Yes	<u>FACU</u>	Species Across All Strata:	5	(B)
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	80.0%	(A/B)
6		= Total Cov		Prevalence Index worksheet:		
50% of total cover: 42				Total % Cover of:	Multiply by:	_
Sapling Stratum (Plot size: 30 ft)	20% 01	total cover		OBL species 0 x	1 =0	_
1. Vaccinium formosum, Southern Blueberry	10	Vec	FAC	FACW species0 x	2 =0	_
2				FAC species 90 x	3 = 270	_
3				FACU species 20 x	4 = 80	_
4				UPL species0 x	5 =0	_
5				Column Totals:110 (A	A) <u>350</u>	(B)
6.				Prevalence Index = B/A =	. 318	
		= Total Cov	/er	Hydrophytic Vegetation Indica		
50% of total cover:				1 - Rapid Test for Hydrophy		
Shrub Stratum (Plot size: 30 ft)				× 2 - Dominance Test is >50%	_	
1				3 - Prevalence Index is ≤3.0		
2.				Problematic Hydrophytic Ve		ain)
3					gotation (Explo	AII1)
4				¹ Indicators of hydric soil and wel	tland hydrology	must
5				be present, unless disturbed or		
6				Definitions of Five Vegetation	Strata:	
	0	= Total Cov	/er	Tree - Woody plants, excluding	woody vines.	
50% of total cover:0	20% of	total cover	:0	approximately 20 ft (6 m) or mor	re in height and	
Herb Stratum (Plot size: 30 ft)				(7.6 cm) or larger in diameter at	breast height (D	OBH).
1				Sapling - Woody plants, exclude		
2				approximately 20 ft (6 m) or more than 3 in. (7.6 cm) DBH.	re in height and	less
3				(7.0 cm) DB11.		
4				Shrub – Woody plants, excluding approximately 3 to 20 ft (1 to 6 r		
5				approximately 3 to 20 ft (1 to 61	ii) iii neigiit.	
6				Herb – All herbaceous (non-wood herbaceous vines, regardless of		
7				plants, except woody vines, less		
8				3 ft (1 m) in height.		•
9				Woody vine – All woody vines,	regardless of he	eiaht.
10						
11						
		= Total Cov				
50% of total cover:	20% of	total cover	:			
Woody Vine Stratum (Plot size: 30 ft)	4 -	Vc -	E ^ ^	1		
Woody Vine Stratum (Plot size: 30 ft) 1. Smilax rotundifolia, Horsebrier						
Woody Vine Stratum (Plot size: 30 ft) 1. Smilax rotundifolia, Horsebrier 2.						
Woody Vine Stratum (Plot size: 30 ft) 1. Smilax rotundifolia, Horsebrier 2						
Woody Vine Stratum (Plot size: 30 ft) 1. Smilax rotundifolia, Horsebrier 2.				Hydrophytic		

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

Yes ___ No ___

SOIL Sampling Point: W14-UP

Profile Des	cription: (Describe	to the depth	needed to docui	ment the i	ndicator	or confirm	the absence of	findicators.)	
Depth _(inches)	Matrix Color (moist)		Redo Color (moist)	x Feature: %		Loc ²	Texture	Remarks	
0-15	10yr 3/2	100%	Color (Illoist)		_ Type		Loam	Remarks	
		10070							
15-18	10yr 4/4						Sandy loam		—
¹ Type: C=C	oncentration, D=Dep	letion, RM=Re	educed Matrix, M	S=Masked	Sand Gra	ains.	² Location: P	L=Pore Lining, M=Matrix.	
Hydric Soil	Indicators: (Applic	able to all LR	Rs, unless othe	rwise note	ed.)			r Problematic Hydric Soils ³ :	
Histosol	, ,		Polyvalue Be) 1 cm Mu	ck (A9) (LRR O)	
I	pipedon (A2)		Thin Dark Su					ck (A10) (LRR S)	
ı —	istic (A3) en Sulfide (A4)		Loamy Muck Loamy Gleye	-		(0)		l Vertic (F18) (outside MLRA 150 t Floodplain Soils (F19) (LRR P, 5	
	d Layers (A5)	,	Depleted Ma		r2)			us Bright Loamy Soils (F20)	3, 1)
ı —	Bodies (A6) (LRR P	, T, U)	Redox Dark	, ,	6)		_	(153B)	
5 cm Mi	ucky Mineral (A7) (LF	RR P, T, U)	Depleted Da	rk Surface	(F7)		Red Pare	ent Material (TF2)	
I —	resence (A8) (LRR U)	Redox Depre	*	8)		_ ′	allow Dark Surface (TF12)	
ı —	uck (A9) (LRR P, T)	o (A11)	Marl (F10) (L		/MI BA 4/	541	Other (E	xplain in Remarks)	
I — ·	d Below Dark Surface ark Surface (A12)	e (ATT)	Depleted Oc Iron-Mangan		-	-	T) ³ Indicat	ors of hydrophytic vegetation and	i
ı —	rairie Redox (A16) (N	/ILRA 150A)	Umbric Surfa					nd hydrology must be present,	
Sandy N	Mucky Mineral (S1) (L	.RR O, S)	Delta Ochric	(F17) (ML	.RA 151)		unles	s disturbed or problematic.	
	Gleyed Matrix (S4)		Reduced Ve						
ı —	Redox (S5) d Matrix (S6)		Piedmont Flo	•	, ,	•	9A) A 149A, 153C, 1	53D)	
ı —	rface (S7) (LRR P, S	s. T. U)	Allollialous I	Silgili Loai	rry cons (i	-20) (WILK)	A 143A, 133C, 1	330)	
	Layer (if observed):								
Туре:			_						
Depth (in	ches):		_				Hydric Soil P	resent? Yes No	
Remarks:									

Date: ____







Photograph Direction North

Comments:

Photograph Direction South

Comments:





Photograph Direction West

Comments:

Photograph Direction East

Project/Site: HRSD Beaverdam Pump Station	City/County: Gloud	ester	Sampling Date: 09/03/2021				
Applicant/Owner: HRSD			Sampling Point: W15-UP				
K III is a B B is to	Section, Township	A LANGUE DE CO					
• , ,	Local relief (concav		Slone (%): 20				
Subregion (LRR or MLRA): LRRT L	27 454388	76, convex, none)	Slope (70)				
Subregion (LRR or MLRA): Limbon conductors							
Soil Map Unit Name: Lumbee sandy loam	20	NWI classifi					
Are climatic / hydrologic conditions on the site typical for this	Company of the Compan		NO 100 CONTRACTOR OF THE PARTY				
Are Vegetation, Soil, or Hydrology s	significantly disturbed?	Are "Normal Circumstances"	present? Yes No				
Are Vegetation, Soil, or Hydrology n	naturally problematic? (If needed, explain any answ	ers in Remarks.)				
SUMMARY OF FINDINGS - Attach site map	showing sampling poi	nt locations, transect	s, important features, etc.				
Hydrophytic Vegetation Present? Yes ✓ N							
Hydric Soil Present? Yes N Wetland Hydrology Present? Yes N	within a We	etland? Yes	No				
Remarks:	Cowardin Code: U	pland HGM:	Water Type:				
Terrains.	Cowardin Code. O	ріапо поілі.	water Type.				
HADBOLOGA							
HYDROLOGY Westernd Mudrale and Indicators		Cocondon India	satara (minimum of tuo nominad)				
Wetland Hydrology Indicators:	that apply)	Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)					
Primary Indicators (minimum of one is required; check all 1							
	Fauna (B13)		egetated Concave Surface (B8)				
	posits (B15) (LRR U)		atterns (B10)				
	en Sulfide Odor (C1) d Rhizospheres along Living R	Moss Trim I					
	ce of Reduced Iron (C4)	Roots (C3) Dry-Season Water Table (C2) Crayfish Burrows (C8)					
	Iron Reduction in Tilled Soils (
	ick Surface (C7)	Geomorphic Position (D2)					
	Explain in Remarks)	Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)	,	FAC-Neutral Test (D5)					
Water-Stained Leaves (B9)		Sphagnum moss (D8) (LRR T, U)					
Field Observations:							
Surface Water Present? Yes No _✓ De	pth (inches):						
Water Table Present? Yes No _✓ De	pth (inches):						
	pth (inches):	Wetland Hydrology Present? Yes No					
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, a	aerial nhotos, previous inspect	ions) if available:					
Describe Nesoraea Data (stream gauge, monitoring well, t	actial priotos, previous irispect	ions), ii avaliabic.					
Remarks:							
Troniano.							

VEGETATION (Four Strata) – Use scientific names of plants:	VEGETATION (Four Strata) - Use scientific names of plants
--	-------------------------	------------------------------------

/EGETATION (Four Strata) – Use scientific n	ames of pl	ants.		Sampling Point: W15-UP
		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:30) 1. Acer rubrum	<u>% Cover</u> 70	Species? ✓	Status FAC	Number of Dominant Species That Are OBL, FACW, or FAC:4 (A)
Liquidambar styraciflua	5			
3.				Total Number of Dominant Species Across All Strata: 5 (B)
I				
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)
j.				,
·				Prevalence Index worksheet:
				Total % Cover of: Multiply by:
	75	= Total Cov	er	OBL species x 1 =
50% of total cover:37	7.5 20% of	total cover:	15.0	FACW species x 2 =
Sapling/Shrub Stratum (Plot size:)				FAC species x 3 =
Asimina triloba	5	✓	FAC	FACU species x 4 =
				UPL species x 5 =
s.				Column Totals: (A) (B)
•				Prevalence Index = B/A =
5.				Hydrophytic Vegetation Indicators:
5.				
·				1 - Rapid Test for Hydrophytic Vegetation ✓ 2 - Dominance Test is >50%
3.				3 - Prevalence Index is ≤3.01
	_	= Total Cov	er	Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover: 2	.5 20% of	total cover:	1.0	Problematic Hydrophytic Vegetation (Explain)
Herb Stratum (Plot size:5)				¹ Indicators of hydric soil and wetland hydrology must
Ligustrum sinense	5	✓	FACU	be present, unless disturbed or problematic.
Vaccinium corymbosum	5	- ✓	FACW	Definitions of Four Vegetation Strata:
3				
·				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
5.				height.
5.				Sapling/Shrub – Woody plants, excluding vines, less
· ·				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8.				Hart All harbassus (non-usada) alanta sasandlasa
)				Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
0				
1.				Woody vine – All woody vines greater than 3.28 ft in height.
2.				neight.
	10	= Total Cov	er	
50% of total cover:5		total cover:		
Voody Vine Stratum (Plot size:15)	2070 01	total oover.		
Smilax rotundifolia	5	1	FAC	
·				
3.				
·				
5.				
·	5	= Total Cov		Hydrophytic Vegetation
50% of total cover: 2		total cover:		Present? Yes No
Processor and the state of the	e distributed and the control of the	total cover.		
Remarks: (If observed, list morphological adaptations be	elow).			

SOIL Sampling Point: W15-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)										
Depth	Matrix		Redo	x Feature	es					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹ _	Loc ²	<u>Texture</u>		Remarks	
0-6	10YR 4/3	100						sandy lo	am	
6-12	7.5YR 3/3	80	10YR 3/3	20				sandy lo	am	
12-18	7.5YR 3/3	80	10YR 3/3	20				sandy lo	am	
	7.011(0/0		10111 0/0					Suridy 10	uiii	
l										
17			B. d d Matrix M				21			
	oncentration, D=Deplicators: (Applications)					ains.	Location:	for Proble	ining, M=Matr matic Hydric	IX.
		able to all				DD 6 T 11				Julis .
Histosol	. ,		Polyvalue Be					Muck (A9) (I		
ı —	pipedon (A2)		Thin Dark St	-		-		Muck (A10)		MI DA 450A D\
No. of the second	istic (A3)		Loamy Muck		7	(0)				MLRA 150A,B)
	en Sulfide (A4) d Layers (A5)		Loamy Gleyer Depleted Ma		(۲2)			-	Loamy Soils	(LRR P, S, T)
	Bodies (A6) (LRR F	T 11\	Redox Dark		E6)			RA 153B)	Loanly Sons	(1-20)
	ucky Mineral (A7) (L						•	arent Mater	ial (TF2)	
_	resence (A8) (LRR l		Redox Depre						k Surface (TF	12)
	uck (A9) (LRR P, T)	-,	Marl (F10) (I		٥)			(Explain in	,	
1	d Below Dark Surfac	ce (A11)	Depleted Oc		(MLRA 1	51)		(Expidii) iii	(Comanie)	
	ark Surface (A12)	,	Iron-Mangar			-	T) ³ Indio	cators of hy	drophytic vege	tation and
ı —	rairie Redox (A16) (MLRA 150	_				•	-	ogy must be p	
1	Mucky Mineral (S1) (Delta Ochric			•	unl	ess disturbe	ed or problema	atic.
Sandy C	Sleyed Matrix (S4)		Reduced Ve	rtic (F18)	(MLRA 15	0A, 150B)				
Sandy F	Redox (S5)		Piedmont Fl	oodplain S	Soils (F19)	(MLRA 14	9A)			
Stripped	l Matrix (S6)		Anomalous I	Bright Loa	my Soils (F20) (MLR	A 149A, 153C	, 153D)		
Dark Su	rface (S7) (LRR P,	S, T, U)								
Restrictive	Layer (if observed)	:								
Type:										,
Depth (in	ches):						Hydric Soil	Present?	Yes	No_ √
Remarks:										

Date: 9/3/21



Photograph Number _____

Photograph Direction North





Photograph Number __

Photograph Direction East

Comments:



Photograph Number ____

Photograph Direction South

Comments:



Photograph Number ___

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/Co	unty: Middlesex		Sampling Date: 9/14/2021
Applicant/Owner: HRSD				Sampling Point: W15
Investigator(s): Emily Foster, Katelyn Hoisington	Section	n, Township, Range:		-
Landform (hillslope, terrace, etc.): Plain				Slope (%): 2
Subregion (LRR or MLRA): MLRA 1538 of LRR T	lat: 37.454564	Long: -	76.468726	Datum: WGS84
Soil Map Unit Name: Lumbee sandy loam	Lut	Long	NIWI classific	eation: PFO1Ed
Are climatic / hydrologic conditions on the site typical for	r this time of year? Ve	,		
				present? Yes 🗸 No
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology			xplain any answe	
SUMMARY OF FINDINGS – Attach site ma	ap showing samp	pling point locatio	ns, transects	, important features, etc.
Hydrophytic Vegetation Present? Yes	No	In the Committed Area		
	No	Is the Sampled Area within a Wetland?	Yes V	
Wetland Hydrology Present? Yes	. No	within a wettand:	163	NO
Remarks:				
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum of one is required; check	all that apply)		Surface Soil	
	atic Fauna (B13)		$\overline{}$	getated Concave Surface (B8)
	Deposits (B15) (LRR	U)	Drainage Par	, ,
	rogen Sulfide Odor (C1		Moss Trim Li	
Water Marks (B1)	lized Rhizospheres alo	ong Living Roots (C3)		Water Table (C2)
	sence of Reduced Iron		Crayfish Buri	, ,
	ent Iron Reduction in T	Tilled Soils (C6)	_	sible on Aerial Imagery (C9)
	Muck Surface (C7)		_	Position (D2)
☐ Iron Deposits (B5) ☐ Othe Inundation Visible on Aerial Imagery (B7)	er (Explain in Remarks))	☐ Shallow Aqui	` '
Water-Stained Leaves (B9)			_	noss (D8) (LRR T, U)
Field Observations:				(- :) (- : : : :)
Surface Water Present? Yes No	Depth (inches):			
Water Table Present? Yes No				,
	Depth (inches): 15	Wetland H	ydrology Presen	nt? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring w	ell, aerial photos, previ	l ious inspections), if avai	lable:	
		•		
Remarks:				

EGETATION (Four Strata) – Use scientific na		Dominant	Indicator	Sampling Point: Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
Acer rubrum	60	Y	FAC	That Are OBL, FACW, or FAC: 6 (A)
Liquidambar styraciflua	20	Υ	FAC	Tatal Number of Descinant
3. <u> </u>		2		Total Number of Dominant Species Across All Strata: 6 (B)
l				
5.				Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B
5.				That Are OBL, FACW, or FAC.
-				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
··-		= Total Cov	/or	OBL species <u>60</u> x 1 = <u>60</u>
50% of total cover: 40				FACW species 40 x 2 = 80
Sapling/Shrub Stratum (Plot size:)	20 /0 01	total cover		FAC species $90 x 3 = 270$
llex opaca	10	Υ	FAC	FACU species 2 x 4 = 8
Lindera benzoin	10	Y	FACW	UPL species x 5 =
Liriodendron tulipifera	2	<u> </u>	FACU	Column Totals: 192 (A) 418 (B)
·			-7100	0.40
·				Prevalence Index = B/A = 2.18
5				Hydrophytic Vegetation Indicators:
S				1 - Rapid Test for Hydrophytic Vegetation
<u></u>				2 - Dominance Test is >50%
3				3 - Prevalence Index is ≤3.0¹
44		= Total Co		Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover: 11	20% of	total cover	: 4	
Herb Stratum (Plot size:) Osmundastrum cinnamomeum	30	Υ	FACW	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woodwardia virginica	60	Y	OBL	Definitions of Four Vegetation Strata:
3.				_
				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) o more in diameter at breast height (DBH), regardless of
l,				

4				Barrant of Daminant Species
5		200		Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
6				
7.				Prevalence Index worksheet:
Language Control of the Control of t				Total % Cover of: Multiply by:
8		= Total C		OBL species 60 x 1 = 60
500 5111 40				FACW species 40 x 2 = 80
	20%	of total cov	/er:	FAC species 90 $\times 3 = 270$
Sapling/Shrub Stratum (Plot size:)	40	.,	5.10	FACU species $\frac{2}{x}$ $\frac{8}{x}$
1. Ilex opaca	_ 10	_ <u>Y</u>	FAC	UPL species x 5 =
2. Lindera benzoin	10	_ <u>Y</u>	FACW	400
3. Liriodendron tulipifera	2		FACU	Column Totals: 192 (A) 418 (B)
4				Prevalence Index = B/A = 2.18
5		1000		Hydrophytic Vegetation Indicators:
6				
7.				1 - Rapid Test for Hydrophytic Vegetation
8				2 - Dominance Test is >50%
o				3 - Prevalence Index is ≤3.0¹
11		_ = Total C		Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover: 11	20%	of total cov	/er: <u>4</u>	
Herb Stratum (Plot size:)				¹ Indicators of hydric soil and wetland hydrology must
1. Osmundastrum cinnamomeum	30	_ <u>Y</u>	FACW	be present, unless disturbed or problematic.
2. Woodwardia virginica	60	_ <u>Y</u>	OBL	Definitions of Four Vegetation Strata:
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6.				Sanling/Shrub Woody plants avaluding vines less
				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
7				and one portain ground and one in (1 m) tail.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10		_		Woody vine – All woody vines greater than 3.28 ft in
11	_ • •	E		height.
12				
		_ = Total C	Cover	
50% of total cover: 45	20%	of total cov	/er: 18	
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4				
5	-			Hydrophytic
		_ = Total C	Cover	Vegetation Present? Yes No
50% of total cover:	20%	of total cov	/er:	Present? Yes No
Remarks: (If observed, list morphological adaptations bel	ow).			

SOIL Sampling Point: _____

Profile Desc	cription: (Describe	to the dept	h needed to docur	nent the	indicator	or confirm	n the absence	of indicators.)
Depth	Matrix			x Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-2	10 YR 3/2	100					Loam	High organics
2-12	10 YR 4/2	100					CILo	
12-18	10 YR 5/1	98	10YR 6/6	2	С	М	SaCl	
l ———								
¹Type: C=C	oncentration D=De	nletion RM=	Reduced Matrix, MS	S=Maske	d Sand G	rains	² I ocation:	PL=Pore Lining, M=Matrix.
			_RRs, unless other			unis.		for Problematic Hydric Soils ³ :
☐ Histosol			Polyvalue Be			RRSTI		Muck (A9) (LRR O)
	pipedon (A2)		Thin Dark Su				_	Muck (A10) (LRR S)
· •	istic (A3)		Loamy Muck	-		-		ced Vertic (F18) (outside MLRA 150A,B)
_	en Sulfide (A4)		Loamy Gleye		,	,		nont Floodplain Soils (F19) (LRR P, S, T)
☐ Stratifie	d Layers (A5)		☑ Depleted Ma	trix (F3)			Anom:	alous Bright Loamy Soils (F20)
_	Bodies (A6) (LRR I		Redox Dark	Surface (F6)		П,	RA 153B)
l =	ucky Mineral (A7) (L		Depleted Dar					Parent Material (TF2)
_	resence (A8) (LRR	•	Redox Depre	-	F8)		_	Shallow Dark Surface (TF12)
_	uck (A9) (LRR P, T)		Marl (F10) (L			E4\	Other	(Explain in Remarks)
	d Below Dark Surfa	ce (A11)	Depleted Ocl			-	T) 31 di	
· =	ark Surface (A12) rairie Redox (A16) (MI DA 150A	☐ Iron-Mangan I) ☐ Umbric Surfa				•	cators of hydrophytic vegetation and tland hydrology must be present,
 =	лаше Redox (A16) (Лиску Mineral (S1) (Delta Ochric					less disturbed or problematic.
· = ·	Gleyed Matrix (S4)	(LIKIT O, O)	Reduced Ver					ioss distarbed of problematio.
_	Redox (S5)		Piedmont Flo					
	Matrix (S6)			-			RA 149A, 1530	c, 153D)
	rface (S7) (LRR P,	S, T, U)						
Restrictive	Layer (if observed):						
Type:								
Depth (in	ches):						Hydric Soil	Present? Yes No
Remarks:								

Date: 9/15/21







Photograph Direction North

Comments:

Photograph Direction East

Comments:





Photograph Direction South

Comments:

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/Cou	nty: Middlesex		Sampling Date: 9/14/2021		
Applicant/Owner: HRSD						
Investigator(s): Emily Foster, Katelyn Hoisington	Section,	Township, Range:				
Landform (hillslope, terrace, etc.): Hillslope	Local reli	ief (concave, convex, r	none): concave	Slope (%): 5		
Subregion (LRR or MLRA): MLRA 1538 of LRR T	Lat: 37.584816	Long: -7	6.490421	Datum: WGS84	4	
Soil Map Unit Name: Slagle silt loam, 2 to 6 percent	slopes		NWI classific	ation: N/A		
Are climatic / hydrologic conditions on the site typical for	this time of year? Yes	✓ No (If no, explain in R	emarks.)		
Are Vegetation, Soil, or Hydrology				oresent? Yes 🗸 No		
Are Vegetation, Soil, or Hydrology	-		xplain any answe			
SUMMARY OF FINDINGS – Attach site ma				,	c.	
			<u> </u>	<u> </u>		
Hydrophytic Vegetation Present? Hydric Soil Present? Yes	No.	the Sampled Area		,		
Wetland Hydrology Present? Yes	No w	vithin a Wetland?	Yes	No		
Remarks:					-	
HYDROLOGY						
Wetland Hydrology Indicators:			_	tors (minimum of two required)	-	
Primary Indicators (minimum of one is required; check a			Surface Soil			
	atic Fauna (B13)			getated Concave Surface (B8)		
	Deposits (B15) (LRR U		Drainage Pat			
	ogen Sulfide Odor (C1) ized Rhizospheres alon		Moss Trim Li	Water Table (C2)		
	ence of Reduced Iron (Crayfish Buri			
	ent Iron Reduction in Till	,	_ ·	sible on Aerial Imagery (C9)		
	Muck Surface (C7)			Position (D2)		
Iron Deposits (B5)	r (Explain in Remarks)		Shallow Aqui	tard (D3)		
Inundation Visible on Aerial Imagery (B7)			FAC-Neutral	* *		
☐ Water-Stained Leaves (B9)			Sphagnum m	noss (D8) (LRR T, U)	_	
Field Observations: Surface Water Present? Yes No _ No _	Donth (inches):					
	Depth (inches): 12					
	Depth (inches): 0	Wetland H	vdrology Presen	it? Yes 🗸 No		
(includes capillary fringe)				. 100 <u> </u>	_	
Describe Recorded Data (stream gauge, monitoring we	II, aerial photos, previo	ous inspections), if avai	lable:			
Remarks:					_	

VEGETATION (Four Strata) – Use scientific na	Sampling Point:			
	Absolute	Dominant Indicator	Dominance Test worksheet:	
Tree Stratum (Plot size:) 1	% Cover	Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC:	<u>3</u> (A)
2			Total Number of Dominant Species Across All Strata:	<u>3</u> (B)

1				That Are OBL, FACW, or FAC:	3	(A)
2				Total Number of Dominant		
3				Species Across All Strata:	3	_ (B)
4				Percent of Dominant Species		
5				That Are OBL, FACW, or FAC:	100	_ (A/B)
6				Prevalence Index worksheet:		
7				Total % Cover of:	Multiply by:	
8.				OBL species x		
500/ / / /		_ = Total Cov		FACW species 95 x		_
50% of total cover:	20%	of total cover		FAC species 10 x		_
Sapling/Shrub Stratum (Plot size:) 1. Liquidambar styraciflua	5	V	EΛC	FACU species x		
**					(5 = <u></u>	
2.				Column Totals: 105 (A	000	(B)
3				-		(-)
4				Prevalence Index = B/A =	2.09	
5				Hydrophytic Vegetation Indica	ators:	
6				1 - Rapid Test for Hydrophy	tic Vegetation	
7				2 - Dominance Test is >50%	6	
8				3 - Prevalence Index is ≤3.0) ¹	
		_ = Total Cov		Problematic Hydrophytic Ve	egetation ¹ (Explain	ain)
50% of total cover: 2.5	20%	of total cover	1	-		
Herb Stratum (Plot size:)	0.5		E4014/	¹ Indicators of hydric soil and we		must
1. Mikania scandens	95	_ <u>Y</u>	FACW	be present, unless disturbed or	·	
2				Definitions of Four Vegetation	ı Strata:	
3				Tree - Woody plants, excluding	vines, 3 in. (7.6	cm) or
4				more in diameter at breast heigh	nt (DBH), regard	dless of
5				height.		
6				Sapling/Shrub – Woody plants,	, excluding vine	s, less
7				than 3 in. DBH and greater than	3.28 ft (1 m) ta	II.
8				Herb – All herbaceous (non-woo	ody) plants, reg	ardless
9				of size, and woody plants less th	nan 3.28 ft tall.	
10				Woody vine – All woody vines g	greater than 3.2	8 ft in
11				height.	g. cato. t. a c	
40				_		
	95	_ = Total Cov	er			
50% of total cover: 47.5	20%	of total cover	19	_		
Woody Vine Stratum (Plot size:)						
1. Smilax rotundifolia	5	Υ	FAC			
2.						
3.						
4.				-		
5.			•	Hydrophytic		
-		= Total Cov	er	- Hydrophytic Vegetation		
50% of total cover: 2.5		of total cover		Present? Yes	No	

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

SOIL Sampling Point: _____

Profile Des Depth	cription: (Describ Matrix	e to the de _l		ment the		or confirn	n the absence of inc	dicators.)
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-15	10 YR 5/2	90	10 YR 5/8	10			CI	
15-18	10 YR 5/2	70	10 YR 5/8	30			SaCl	
-								
- 								
-								
1 _{Turnou} C C	encentration D. De	nletion DM	=Reduced Matrix, M	C Maaka	d Cond Cr		2l costion: DL F	Pore Lining, M=Matrix.
			LRRs, unless othe			all 15.		roblematic Hydric Soils ³ :
☐ Histoso			Polyvalue B		•	.RR S, T, I		(A9) (LRR O)
	pipedon (A2)		Thin Dark S		. , .		· —	(A10) (LRR S)
	istic (A3)		Loamy Mucl			? O)		ertic (F18) (outside MLRA 150A,B)
	en Sulfide (A4) d Layers (A5)		Loamy Gley		(F2)			oodplain Soils (F19) (LRR P, S, T)
_	: Bodies (A6) (LRR	P. T. U)	Depleted Ma		F6)		(MLRA 15	Bright Loamy Soils (F20)
_	ucky Mineral (A7) (I						1 1 '	Material (TF2)
	resence (A8) (LRR		Redox Depr					w Dark Surface (TF12)
	uck (A9) (LRR P, T		Marl (F10) (I			- 43	U Other (Expla	ain in Remarks)
_	d Below Dark Surfa ark Surface (A12)	ace (A11)	☐ Depleted Oc ☐ Iron-Mangar				T) ³ Indicators	of hydrophytic vegetation and
	Prairie Redox (A16)	(MLRA 150						nydrology must be present,
	Mucky Mineral (S1)	•	Delta Ochric			, -,		sturbed or problematic.
	Gleyed Matrix (S4)		Reduced Ve					
	Redox (S5)		Piedmont FI					2)
	d Matrix (S6) urface (S7) (LRR P,	S T III	Anomalous	Bright Loa	imy Solis (F20) (WILF	RA 149A, 153C, 153I	ט)
	Layer (if observed							
Type:								
Depth (in	ches):						Hydric Soil Pres	ent? Yes <u>/</u> No
Remarks:							<u> </u>	



Photograph Number _____

Photograph Direction North

Comments:



Photograph Number ____

Photograph Direction East

Comments:



Photograph Number _____

Photograph Direction South

Comments:



Photograph Number _____

Photograph Direction West

Project/Site: HRSD Middlese	ex TFM	City/C	ounty: Middlesex		Sampling Date: 9/14/2021
Applicant/Owner: HRSD			,	State: VA	Sampling Date: 9/14/2021 Sampling Point: W16-UP
Investigator(s): Emily Foster,	12 () 11 1 1 1 (on, Township, Range: _			
Landform (hillslope, terrace, etc					Slope (%): 5
Subregion (LRR or MLRA). MI	LRA 1538 of LRR T	Lat. 37.584784	Long:	-76.490324	Datum: WGS84
Soil Map Unit Name: Slagle s	ilt loam, 2 to 6 percent	slopes			cation:
Are climatic / hydrologic conditi					
Are Vegetation, Soil					oresent? Yes 🗸 No
Are Vegetation, Soil				explain any answe	
					s, important features, etc.
	X			<u> </u>	· · · · · · · · · · · · · · · · · · ·
Hydrophytic Vegetation Prese	Yes X Yes	No	Is the Sampled Area		
Hydric Soil Present? Wetland Hydrology Present?	Yes	No	within a Wetland?	Yes	No
Remarks:	163	140			
HYDROLOGY					
Wetland Hydrology Indicato	ore:			Secondary Indica	ators (minimum of two required)
Primary Indicators (minimum		all that annly)		Surface Soil	
Surface Water (A1)		itic Fauna (B13)			getated Concave Surface (B8)
High Water Table (A2)		Deposits (B15) (LRI	S II)	Drainage Pa	= : : :
Saturation (A3)		ogen Sulfide Odor (0		Moss Trim L	
Water Marks (B1)		•	long Living Roots (C3)		Water Table (C2)
Sediment Deposits (B2)		ence of Reduced Iro		Crayfish Bur	
Drift Deposits (B3)	Rece	ent Iron Reduction in	Tilled Soils (C6)	☐ Saturation V	isible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Thin	Muck Surface (C7)		Geomorphic	Position (D2)
Iron Deposits (B5)	U Othe	r (Explain in Remark	(s)	Shallow Aqu	itard (D3)
Inundation Visible on Aer	• • • •			FAC-Neutral	` '
Water-Stained Leaves (B	9)				noss (D8) (LRR T, U)
Field Observations:		- (1			
Surface Water Present?	Yes No I				
Water Table Present?	Yes No I				nt? Yes No
Saturation Present? (includes capillary fringe)	Yes No I			Hydrology Preser	it? Yes No_ <u>▼</u> _
Describe Recorded Data (stre	am gauge, monitoring we	ell, aerial photos, pre	vious inspections), if av	ailable:	
Remarks:					

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

bsolute			
Cover	Dominant Species?	Status	Dominance Test worksheet: Number of Dominant Species
	Y N	FAC FAC	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:
<u> </u>	= Total Cov	er	OBL species x 1 =
20% of	total cover:	12	FACW species x 2 =
			FAC species x 3 =
	N	FAC	FACU species x 4 =
	N	FAC	UPL species x 5 =
)	N	FAC	Column Totals: (A) (B)
	N	FACU	Prevalence Index = B/A =
)	Υ	ND	Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation x 2 - Dominance Test is >50%
	- Total Cov	ar.	3 - Prevalence Index is ≤3.0 ¹
			Problematic Hydrophytic Vegetation ¹ (Explain)
20% 01	total cover.		
1	V	EAC	¹ Indicators of hydric soil and wetland hydrology must
			be present, unless disturbed or problematic.
		FAC	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
			Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
			Sapling/Shrub – Woody plants, excluding vines, less
			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.
			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
			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.
			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
5 =	= Total Cov	er	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
5 =		er	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
5 = 20% of	= Total Cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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
5 = 20% of	= Total Cov total cover:	er 5	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.
	20% of	Total Cover:	Total Cover 12

SOIL Sampling Point: W16-UP

Profile Dese		to the de	oth needed to docu			or confirm	n the absenc	e of indicators.)
(inches)	Matrix Color (moist)	%	Color (moist)	ox Feature %	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
Hydric Soil Histosol Histosol Histosol Histic E Black H Hydroge Stratifie Organic 5 cm Mi Muck P 1 cm Mi Deplete Thick D Coast P Sandy N Sandy N Stripped Dark Su Restrictive	Indicators: (Appli	Cable to all P, T, U) LRR P, T, U U) CCE (A11) (MLRA 150 (LRR O, S) S, T, U)):	Redox Depr Marl (F10) (Depleted Oc Iron-Mangar A) Umbric Surf Delta Ochric Reduced Ve	erwise not elow Surface (S9 ky Mineral red Matrix (F3) a Surface (I ark Surface (F11) nese Mass face (F13) a (F17) (Milertic (F18) loodplain S	red.) ace (S8) (L b) (LRR S, (F1) (LRR (F2) F6) e (F7) F8) (MLRA 1: Ses (F12) ((LRR P, T LRA 151) (MLRA 15 Soils (F19)	RR S, T, U T, U) (O) (D) (D) (D) (D) (M) (M)	Indicator I cm 2 cm Redu Piedr Anon (MI Red Very Othe T) 3Ind wr ur 1 49A) RA 149A, 153	Explaining, M=Matrix. In the problematic Hydric Soils in the soil of the soil



Photograph Number ______Photograph Direction North

Comments:



Photograph Number _____ Photograph Direction East

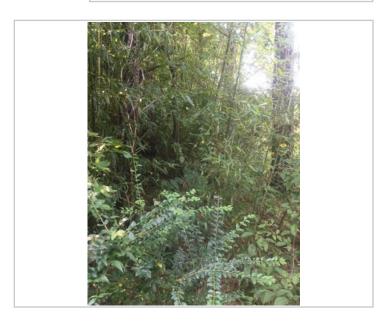
Comments:



Photograph Number _____

Photograph Direction South

Comments:



Photograph Number _____

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Glouce	ester	Sampling Date: 01/12/2022			
Applicant/Owner: HRSD			Sampling Point: GSA1-1-UP			
The second secon	Section, Township, I					
Landform (hillslope, terrace, etc.): Slope			Slone (%): 0-5			
Subregion (LRR or MLRA):						
Soil Map Unit Name: Meggett sandy loam	22	NWI classific				
Are climatic / hydrologic conditions on the site typical for						
Are Vegetation, Soil, or Hydrology	_ significantly disturbed? Ar	re "Normal Circumstances"	present? Yes No			
Are Vegetation, Soil, or Hydrology	_ naturally problematic? (If	needed, explain any answe	ers in Remarks.)			
SUMMARY OF FINDINGS - Attach site ma	p showing sampling poin	t locations, transects	s, important features, etc.			
Hydrophytic Vegetation Present? Yes	No Is the Sample		,			
Hydric Soil Present? Yes Wetland Hydrology Present? Yes	No within a Wet	land? Yes	No			
Remarks:	Cowardin Code: Up	land HGM:	Water Type:			
	Cowardin Code. Op	and nom.	vvater Type.			
Forested uplands adjacent to GSA1-1-WET.						
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Indica	ators (minimum of two required)			
Primary Indicators (minimum of one is required; check a	all that apply)		Cracks (B6)			
	tic Fauna (B13)	Sparsely Vegetated Concave Surface (B8)				
	Deposits (B15) (LRR U)		Drainage Patterns (B10)			
	ogen Sulfide Odor (C1)	Moss Trim L	· · ·			
	zed Rhizospheres along Living Ro		Water Table (C2)			
	ence of Reduced Iron (C4)	Crayfish Burrows (C8)				
Drift Deposits (B3) Recei	nt Iron Reduction in Tilled Soils (C					
Algal Mat or Crust (B4) Thin I	Muck Surface (C7)	Geomorphic	Position (D2)			
Iron Deposits (B5) Other	(Explain in Remarks)	Shallow Aqu	uitard (D3)			
Inundation Visible on Aerial Imagery (B7)		FAC-Neutral				
Water-Stained Leaves (B9)		Sphagnum r	moss (D8) (LRR T, U)			
Field Observations:						
	Depth (inches):					
	Depth (inches):		./			
Saturation Present? Yes No <u>✓</u> [(includes capillary fringe)	Depth (inches):	Wetland Hydrology Presei	nt? Yes No			
Describe Recorded Data (stream gauge, monitoring we	II, aerial photos, previous inspection	ons), if available:				
Remarks:						

50% of total cover: 35.0

30

Sapling/Shrub Stratum (Plot size: ______)

Herb Stratum (Plot size: ______5

2. Glechoma hederacea

Tree Stratum (Plot size:

1. Liquidambar styraciflua 2. Platanus occidentalis

4. Oxydendron arboreum

3. Acer negundo

1. Ligustrum sinense 2 Acer rubrum

1. Lonicera japonica

Absolute Dominant Indicator

% Cover Species? Status

70 = Total Cover

10 = Total Cover

15 = Total Cover

0 ___ = Total Cover

50% of total cover: ____7.5___ 20% of total cover: ___3.0___

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

50% of total cover: ____5.0 ___ 20% of total cover: ____2.0

20% of total cover: 14.0

FAC

FAC

FAC

FACU

FACU

FACU

FACW

40

20

5

5

	Sampling Point: GSA1-1-UP
1	Dominance Test worksheet:
	Number of Dominant Species That Are OBL, FACW, or FAC:4 (A)
	Total Number of Dominant Species Across All Strata: 6 (B)
	Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)
	Prevalence Index worksheet:
	Total % Cover of: Multiply by:
	OBL species x 1 =
	FACW species x 2 =
	FAC species x 3 =
	FACU species x 4 =
	UPL species x 5 =
	Column Totals: (A) (B)
	Prevalence Index = B/A =
	Hydrophytic Vegetation Indicators:
	1 - Rapid Test for Hydrophytic Vegetation
	✓ 2 - Dominance Test is >50%
	3 - Prevalence Index is ≤3.0 ¹
	Problematic Hydrophytic Vegetation ¹ (Explain)
	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	Definitions of Four Vegetation Strata:
	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
	Woody vine – All woody vines greater than 3.28 ft in height.
	Hydrophytic Vegetation Present? Yes _ ✓ _ No

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

Woody Vine Stratum (Plot size: ______15 ____)

SOIL Sampling Point: GSA1-1-UP

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the	indicator	or confir	n the absence of	indicators.)	
Depth	Matrix		Redo	x Feature	es				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks	
0-6	10YR 3/2	_ 100					LoCI		
6-12	10YR 4/1	98	10YR 3/3	2	С	M/PL	CI		
12-18	10YR 4/1	90	10YR 5/6	10	С	M/PL	CI		
							45 		
					-	. —			
l ——									
¹Type: C=Co	oncentration D=De	nletion RM	=Reduced Matrix, M	S=Maske	d Sand G	rains	² Location: Pl	L=Pore Lining, M=Matrix.	
			LRRs, unless othe					or Problematic Hydric Soils ³ :	
Histosol			Polyvalue Be			LRR S. T.		ck (A9) (LRR O)	
_	pipedon (A2)		Thin Dark S				. —	ck (A10) (LRR S)	
I — ·	stic (A3)		Loamy Muck	-		-		Vertic (F18) (outside MLRA 150A,B)	
Hydroge	en Sulfide (A4)		Loamy Gley	ed Matrix	(F2)		Piedmon	t Floodplain Soils (F19) (LRR P, S, T)	
Stratified	d Layers (A5)		Depleted Ma	atrix (F3)			Anomalo	us Bright Loamy Soils (F20)	
	Bodies (A6) (LRR		Redox Dark	,	,		(MLRA	-	
I —	ıcky Mineral (A7) (I							ent Material (TF2)	
	esence (A8) (LRR		Redox Depr		F8)			allow Dark Surface (TF12)	
1	ick (A9) (LRR P, T)		Marl (F10) (I		MIDA 1	E4\	Other (E)	xplain in Remarks)	
	d Below Dark Surfa ark Surface (A12)	ce (ATT)	Depleted Oc Iron-Mangar			-	T) ³ Indicate	ors of hydrophytic vegetation and	
ı —	, ,	(MLRA 150	A) Umbric Surfa			•		nd hydrology must be present,	
	flucky Mineral (S1)							s disturbed or problematic.	
	Bleyed Matrix (S4)	, ,	Reduced Ve		for any later with the same			·	
	Redox (S5)		Piedmont Fl	oodplain	Soils (F19	(MLRA 1	49A)		
	Matrix (S6)		Anomalous I	Bright Loa	amy Soils	(F20) (MLF	RA 149A, 153C, 1	53D)	
	rface (S7) (LRR P,				111		_		
Restrictive I	Layer (if observed):							
Type:								/	
Depth (in	ches):						Hydric Soil Pr	resent? Yes No <u>▼</u>	
Remarks:							•		
Transitional	zone soils, techni	cally meets	F3 here, but no hy	drology	indicators	s present.	Loses F3 indicat	tor immediately upslope.	
	•	•		3,				, , ,	

Date: 1/12/22



Photograph Number ______
Photograph Direction North_____

Comments:



Photograph Number ______
Photograph Direction East____

Comments:



Photograph Number _____

Photograph Direction South

Comments:



Photograph Number _____

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Gloucester	Sampling Date: 01/12/2022					
Applicant/Owner: HRSD	- 116 A - 11 - 11 - 11 - 11 - 11 - 11 -	State: VA Sampling Point: GSA1-1-WET					
	Section, Township, Range:	T. maint-alliant (1997)					
	Local relief (concave, convex						
	Lat: 37.447841 Long:						
Subregion (LRR or MLRA):							
Soil Map Unit Name: Meggett sandy loam	The state of the s	NWI classification: UPL					
	ical for this time of year? Yes No						
Are Vegetation, Soil, or Hydrology	significantly disturbed? Are "Norma	al Circumstances" present? Yes ✓ No					
Are Vegetation, Soil, or Hydrology	naturally problematic? (If needed,	explain any answers in Remarks.)					
SUMMARY OF FINDINGS - Attach si	te map showing sampling point locati	ons, transects, important features, etc.					
	No Is the Sampled Area						
	No within a Wetland?	Yes No					
Wetland Hydrology Present? Yes Remarks:	No Cowardin Code: PUB	HGM: Water Type:					
	, adjacent to GSA1-2-PSS, with very narrow stri						
observable flow, ~6-12" of ponded water, app		p up upiand between the two leatures. No					
observable now, 0-12 or portided water, app	oximately 6 wide.						
HYDROLOGY							
Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)					
Primary Indicators (minimum of one is required;	check all that apply)	Surface Soil Cracks (B6)					
✓ Surface Water (A1)	_ Aquatic Fauna (B13)	✓ Sparsely Vegetated Concave Surface (B8)					
✓ High Water Table (A2)	Marl Deposits (B15) (LRR U)	Drainage Patterns (B10)					
✓ Saturation (A3)	Moss Trim Lines (B16)						
1	Oxidized Rhizospheres along Living Roots (C3)	Dry-Season Water Table (C2)					
Sediment Deposits (B2)							
Drift Deposits (B3)	Recent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imagery (C9)					
Algal Mat or Crust (B4)	Thin Muck Surface (C7)	✓ Geomorphic Position (D2)					
Iron Deposits (B5)	Other (Explain in Remarks)	Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)						
✓ Water-Stained Leaves (B9)		Sphagnum moss (D8) (LRR T, U)					
Field Observations:							
	Depth (inches): 9						
	Depth (inches): 0	,					
	Depth (inches): 0 Wetland	Hydrology Present? Yes No					
(includes capillary fringe) Describe Recorded Data (stream gauge, monito	l ring well, aerial photos, previous inspections), if av	ailable:					
, , , ,							
Remarks:							

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

		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC:1 (A)
2				Total Number of Dominant
3				Species Across All Strata:1 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC:100% (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
8				OBL species x 1 =
50% 51.1.		= Total Cov		FACW species x 2 =
50% of total cover: 0.0	20% of	total cover:		FAC species x 3 =
Sapling/Shrub Stratum (Plot size:) 1. Liquidambar styraciflua	10	1	FAC	FACU species x 4 =
				UPL species x 5 =
2				Column Totals: (A) (B)
3				55 4 75 3 80 85 45 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				✓ 2 - Dominance Test is >50%
8	40			3 - Prevalence Index is ≤3.0¹
50% - 64-4-1 5.0		= Total Cov		Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover: 5.0	20% of	total cover:		
Herb Stratum (Plot size:5				¹Indicators of hydric soil and wetland hydrology must
1				be present, unless disturbed or problematic.
2				Definitions of Four Vegetation Strata:
3				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of height.
5				
6				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
7				
8				Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9				of size, and woody plants less than 5.25 it tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11 12.				height.
12	0	= Total Cov		
50% of total cover: 0.0		total cover:		
	20% 01	total cover.		
Woody Vine Stratum (Plot size:15				
1			· · · · · · · · · · · · · · · · · · ·	
2				
4 5		-		
J		= Total Cov		Hydrophytic Vegetation
50% of total cover: 0.0				Present? Yes _ Vo
Moderatives shall estimate an experience of	- Contract Contract Contract	total cover.		
Remarks: (If observed, list morphological adaptations below		م مائند ادمان		aton and leaves
Very little vegetation rooted in the abandoned agriculture	re aitch. F	illea with S	anding Wa	ater and leaves.

Sampling Point: GSA1-1-WET

SOIL Sampling Point: GSA1-1-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redo	x Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-6	10YR 3/2	100					CILo	
6-12	10YR 2/1	100					CILo	
12-18	10YR 2/1	60					CILo	
12-18	10YR 4/1	40			D	<u>M</u>	Sa	Depleted sand inclusions
1 _{Tyme:} C=C			Paduaad Matrix MS		. ———		² l coation:	DI -Dovo Lining M-Metrix
	oncentration, D=De Indicators: (Appli					ams.		PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :
Histosol		cable to all L	Polyvalue Be			DD S T I		Muck (A9) (LRR O)
_	oipedon (A2)		Thin Dark Su				- —	Muck (A10) (LRR S)
Black Hi			Loamy Muck					ed Vertic (F18) (outside MLRA 150A,B)
I —	n Sulfide (A4)		Loamy Gleye			,		ont Floodplain Soils (F19) (LRR P, S, T)
	Layers (A5)		Depleted Mat		,			alous Bright Loamy Soils (F20)
_	Bodies (A6) (LRR I	P, T, U)	Redox Dark	, ,	- 6)			RA 153B)
	icky Mineral (A7) (L		Depleted Dar	k Surface	(F7)			arent Material (TF2)
_	esence (A8) (LRR		Redox Depre					Shallow Dark Surface (TF12)
1 cm Mu	ick (A9) (LRR P, T)	-	Marl (F10) (L	RR U)			Other	(Explain in Remarks)
	Below Dark Surfa		Depleted Oct	nric (F11)	(MLRA 1	51)		
Thick Da	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12) (LRR O, P,	, T) ³ Indio	cators of hydrophytic vegetation and
Coast Pr	rairie Redox (A16) ((MLRA 150A)	Umbric Surfa	ce (F13)	(LRR P, T	', U)	wet	tland hydrology must be present,
Sandy M	lucky Mineral (S1)	(LRR O, S)	Delta Ochric	(F17) (ML	RA 151)		unl	ess disturbed or problematic.
Sandy G	Bleyed Matrix (S4)		Reduced Ver	tic (F18) (MLRA 15	60A, 150B))	
Sandy R	tedox (S5)		Piedmont Flo	odplain S	oils (F19)	(MLRA 14	49A)	
	Matrix (S6)		Anomalous B	Bright Loai	my Soils (F20) (MLR	RA 149A, 153C	, 153D)
	rface (S7) (LRR P,							
Restrictive I	_ayer (if observed):						
Type:			_					,
Depth (inc	ches):						Hydric Soil	Present? Yes <u>√</u> No
Remarks:							1	
Slight hydro	gen sulfide odor. I	Depleted san	d inclusions start	ing at 12'	". Closes	t additiona	al indicator ma	atches A11, assuming soil contains
	d sand below 18".			9	, 0.0000			
oo /o dopieto	a cana scioni io i							
1								

Date: 1/12/22



Photograph Number ______
Photograph Direction North_____

Comments:



Photograph Number _____ Photograph Direction East

Comments:



Photograph Number _____

Photograph Direction South

Comments:



Photograph Number _____

Photograph Direction West

Project/Site: HRSD Middlesex TFM	City/County: Glouce	ester	Sa	ampling Date:	01/12/2022		
Applicant/Owner: HRSD					GSA1-2-PSS		
F. I. F. A.	_ Section, Township, I						
Landform (hillslope, terrace, etc.): Slope				Slon	ne (%)· 0-5		
Subregion (LRR or MLRA): Lat: 37.4							
Soil Map Unit Name: Meggett sandy loam		NV					
Are climatic / hydrologic conditions on the site typical for this time of					,		
Are Vegetation, Soil, or Hydrology significan	tly disturbed? Ar	re "Normal Circum	stances" pres	sent? Yes	✓ No		
Are Vegetation, Soil, or Hydrology naturally	problematic? (If	needed, explain a	iny answers i	n Remarks.)			
SUMMARY OF FINDINGS - Attach site map showing	ng sampling poin	t locations, tra	ansects, ii	mportant fe	eatures, etc.		
Hydrophytic Vegetation Present? Yes _ ✔ No							
Hydrophytic Vegetation Present? Yes ✓ No Hydric Soil Present? Yes ✓ No			,				
Wetland Hydrology Present? Yes ✓ No	willill a vvel	tland?	Yes	No	-		
Remarks:	Cowardin Code: PS	S HGM:	Slope	Water Ty	/pe: RPWWN		
			-	·			
Abandoned agriculture field, potentially prior-converted-cropla	ands (PCC). Developir	ng scrub shrub co	ommunity do	ominated by s	weetgum, box		
elder, and silky dogwood saplings.							
HYDROLOGY							
Wetland Hydrology Indicators:		Second	lary Indicator	s (minimum of	two required)		
Primary Indicators (minimum of one is required; check all that apply	v)	:1			two required/		
Surface Water (A1) Aquatic Fauna (I			Surface Soil Cracks (B6)				
High Water Table (A2) Marl Deposits (B			Sparsely Vegetated Concave Surface (B8)Drainage Patterns (B10)				
✓ Saturation (A3) — Hydrogen Sulfide			Moss Trim Lines (B16)				
	pheres along Living Ro						
Sediment Deposits (B2) Presence of Red			Crayfish Burrows (C8)				
Drift Deposits (B3) Recent Iron Red		Saturation Visible on Aerial Imagery (C9)					
Algal Mat or Crust (B4) Thin Muck Surfa			Geomorphic Position (D2)				
Iron Deposits (B5) Other (Explain in		_	allow Aquitar				
Inundation Visible on Aerial Imagery (B7)	,		C-Neutral Te				
Water-Stained Leaves (B9)		Sp	hagnum mos	s (D8) (LRR T	, U)		
Field Observations:							
Surface Water Present? Yes No _ ✓ Depth (inch	es):						
Water Table Present? Yes <u>✓</u> No Depth (inch				,			
Saturation Present? Yes <u>✓</u> No Depth (inches	es): \	Wetland Hydrolog	gy Present?	Yes _ 🗸	No		
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial ph	otos previous inspectio	one) if available:					
Describe Necorded Data (stream gauge, monitoring well, acrial pri	otos, previous inspectio	ons), ii avallable.					
Remarks:							

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

		Dominant		Dominance Test worksheet:			
<u>Tree Stratum</u> (Plot size:	% Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC:4 (A)			
2 3				Total Number of Dominant Species Across All Strata: 4 (B)			
4.							
5				Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)			
6				Prevalence Index worksheet:			
7				Total % Cover of: Multiply by:			
8	0			OBL species x 1 =			
50% affectal account 0.0		= Total Cov		FACW species x 2 =			
50% of total cover: 0.0	20% or	total cover:		FAC species x 3 =			
Sapling/Shrub Stratum (Plot size:) 1. Cornus amomum	20	1	FACW	FACU species x 4 =			
1. Comus amomum 2. Liquidambar styraciflua	10		FAC	UPL species x 5 =			
2. Elquidambal styracinua 3. Acer negundo	10		FAC	Column Totals: (A) (B)			
				(1)			
4				Prevalence Index = B/A =			
5				Hydrophytic Vegetation Indicators:			
6				1 - Rapid Test for Hydrophytic Vegetation			
7				✓ 2 - Dominance Test is >50%			
8				3 - Prevalence Index is ≤3.0¹			
	40	= Total Cov	er	Problematic Hydrophytic Vegetation ¹ (Explain)			
50% of total cover: 20.0	20% of	total cover:	8.0				
Herb Stratum (Plot size:5) 1. Carex lurida	50	1	OBL	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
2. Scirpus cyperinus	15		OBL	Definitions of Four Vegetation Strata:			
3. Juncus effuses	10		OBL	Deminions of Four Vegetation Strata.			
4. Andropogon glomeratus	15		FACW	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or			
5				more in diameter at breast height (DBH), regardless of height.			
6				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.			
8				Herb – All herbaceous (non-woody) plants, regardless			
9				of size, and woody plants less than 3.28 ft tall.			
10				Woody vine – All woody vines greater than 3.28 ft in			
11				height.			
12							
		= Total Cov					
50% of total cover:45.0	20% of	total cover:	18.0				
Woody Vine Stratum (Plot size:)							
1							
2							
3							
4							
5				Hydrophytic			
	0	= Total Cov	er	Vegetation			
50% of total cover:0.0	20% of	total cover:	0.0	Present? Yes No			
Remarks: (If observed, list morphological adaptations below	w).						

Sampling Point: GSA1-2-PSS

SOIL Sampling Point: GSA1-2-PSS

l	cription: (Describe	to the dep	oth needed to docu			or confirn	n the absence	of indicators.)
Depth	Matrix			ox Feature	es	1.5.2	Tavton	Domosto
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-6	10YR 4/2	100	S				LoCI	
6-18	10YR 4/2	80	7.5YR 4/6	_ 20	С	M/PL	CILo	
			7. 5.					·
	-							-
l ———								
1Tuno: C=C	oncontration D=Do	nlotion DM	=Reduced Matrix, M	- ———	d Sand C	rains	2l coation:	PL=Pore Lining, M=Matrix.
			LRRs, unless othe			iaiiis.	Indicators	for Problematic Hydric Soils ³ :
Histosol		cubic to un			-	I DD C T I		
_	pipedon (A2)		Polyvalue Be					Muck (A9) (LRR O) Muck (A10) (LRR S)
	istic (A3)		Loamy Muck	-		-		ed Vertic (F18) (outside MLRA 150A,B)
100 miles	en Sulfide (A4)		Loamy Gley	100	,	(0)		ont Floodplain Soils (F19) (LRR P, S, T)
	d Layers (A5)		✓ Depleted Ma		()		_	alous Bright Loamy Soils (F20)
	Bodies (A6) (LRR I	P, T, U)	Redox Dark		F6)			RA 153B)
	ucky Mineral (A7) (L							arent Material (TF2)
_	resence (A8) (LRR I		Redox Depr					hallow Dark Surface (TF12)
1 cm Mu	uck (A9) (LRR P, T)		Marl (F10) (I	LRR U)			Other	(Explain in Remarks)
Deplete	d Below Dark Surfac	ce (A11)	Depleted Oc					
_	ark Surface (A12)		Iron-Mangar		. ,		•	ators of hydrophytic vegetation and
1			A) Umbric Surfa					land hydrology must be present,
	Mucky Mineral (S1) (LRR O, S)						ess disturbed or problematic.
	Gleyed Matrix (S4)		Reduced Ve					
	Redox (S5)		Piedmont Fl	-	Control of the last of the las		The state of the s	153D)
	l Matrix (S6) Irface (S7) (LRR P, I	S T III	Anomalous	Bright Loa	illy Solls	(F20) (WILF	RA 149A, 153C	, 1830)
	Layer (if observed)						1	
Type:		,-						
	ches):						Hydric Soil	Present? Yes No
	cries)						Hydric 30ii	rieseiit: ies_:_ No
Remarks:								

Date: 1/12/22



Photograph Number ______
Photograph Direction North_____

Comments:



Photograph Number ______
Photograph Direction East____

Comments:



Photograph Number _____ Photograph Direction <u>South</u>

Comments:



Photograph Number ______
Photograph Direction West_____

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM	City/County: Glou	cester		Sampling Date:	01/12/2022		
Applicant/Owner: HRSD		State	: VA	Sampling Point:	GSA1-2-UP		
	Section, Township			,			
Landform (hillslope, terrace, etc.): Slope				Slon	e (%)· 0-5		
Subregion (LRR or MLRA): La	[; <u>01.44070</u>	Long:		Dai	tum: <u>147866</u>		
Soil Map Unit Name: Meggett sandy loam		100 T. 100.000					
Are climatic / hydrologic conditions on the site typical for this					,		
Are Vegetation, Soil, or Hydrology sig					No		
Are Vegetation, Soil, or Hydrology na	turally problematic?	(If needed, expla	in any answer	s in Remarks.)			
SUMMARY OF FINDINGS - Attach site map s	howing sampling poi	nt locations,	transects,	important fe	atures, etc.		
Hydrophytic Vegetation Present? Yes No	✓						
Hydric Soil Present? Yes No	J		200				
Wetland Hydrology Present? Yes No	within a W	etland?	Yes	No	-		
Remarks:	Cowardin Code: U	Jpland HC	GM:	Water Ty	pe:		
Mowed, unimproved access road. Evidence that this loc	ation is used for access :	and is closely ma	owed/maintai	ned			
wowed, diffinitioned access road. Evidence that this loc	ation is used for access, a	ind is closely in	oweu/mamtai	neu.			
HYDROLOGY							
Wetland Hydrology Indicators:		Sec	ondary Indicat	ors (minimum of	two required)		
Primary Indicators (minimum of one is required; check all th	at apply)		Surface Soil (Cracks (B6)			
Surface Water (A1) Aquatic F	auna (B13)	_	Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2) Marl Depo	osits (B15) (LRR U)	_	Drainage Patterns (B10)				
Saturation (A3) Hydrogen	Sulfide Odor (C1)	_	Moss Trim Lines (B16)				
Water Marks (B1) Oxidized	Rhizospheres along Living F	Roots (C3)	Dry-Season V	Vater Table (C2)			
	of Reduced Iron (C4)		Crayfish Burro				
	on Reduction in Tilled Soils			sible on Aerial Im	agery (C9)		
	k Surface (C7)	_	Geomorphic F				
	plain in Remarks)		Shallow Aquit				
Inundation Visible on Aerial Imagery (B7)			FAC-Neutral	. ,			
Water-Stained Leaves (B9) Field Observations:			Spriagnum m	oss (D8) (LRR T ,	, 0)		
Surface Water Present? Yes No ✓ Dept	h (inches):						
Water Table Present? Yes No _✓ Dept							
Saturation Present? Yes No _✓ Dept		Wetland Hydro	ology Present	2 Vac	No_✓		
(includes capillary fringe)		_	•	Tes	NO		
Describe Recorded Data (stream gauge, monitoring well, as	rial photos, previous inspec	tions), if available	e:				
Remarks:							
Remarks.							

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

Sampling Point: GSA1-2-UP

	solute Dominant Ir		Dominance Test worksheet:
Tree Stratum (Plot size:30)% C	Cover Species?	Status	Number of Dominant Species
1			That Are OBL, FACW, or FAC:0 (A)
2			Total Number of Dominant
3			Species Across All Strata: 0 (B)
4			(=,
5			Percent of Dominant Species That Are OBL FACW or FAC: 0% (A/B)
			That Are OBL, FACW, or FAC: (A/B)
6			Prevalence Index worksheet:
7			Total % Cover of: Multiply by:
8	0 = Total Cover		OBL species x 1 =
	Total Cover		FACW species x 2 =
50% of total cover:0.0 2	20% of total cover: _	0.0	FAC species x 3 =
Sapling/Shrub Stratum (Plot size:)			
1			FACU species x 4 =
2			UPL species x 5 =
3			Column Totals: (A) (B)
4			Prevalence Index = B/A =
5			Hydrophytic Vegetation Indicators:
6			
7			1 - Rapid Test for Hydrophytic Vegetation
8		—— I	2 - Dominance Test is >50%
	0 = Total Cover		3 - Prevalence Index is ≤3.0¹
50% of total cover:0.02			Problematic Hydrophytic Vegetation¹ (Explain)
	20% of total cover: _		
Herb Stratum (Plot size: 5)	95 N	ND	¹ Indicators of hydric soil and wetland hydrology must
1,		L	be present, unless disturbed or problematic.
2		I	Definitions of Four Vegetation Strata:
3			Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4			more in diameter at breast height (DBH), regardless of
5			height.
6			Sapling/Shrub – Woody plants, excluding vines, less
7			than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8			Herb – All herbaceous (non-woody) plants, regardless
9			of size, and woody plants less than 3.28 ft tall.
10			
			Woody vine – All woody vines greater than 3.28 ft in
11			height.
12	95 - Tatal Carre		
	95 = Total Cover		
50% of total cover: <u>47.5</u> 2	20% of total cover: _	19.0	
Woody Vine Stratum (Plot size:)			
1			
2			
3			
4			
5			Hydrophytic
	0 = Total Cover	r	Vegetation
50% of total cover: 0.0 2	20% of total cover: _	0.0	Present? Yes No _ ✓
Remarks: (If observed, list morphological adaptations below).			
	d	ada Vana	tation commonition is annualizate as most
Vegetation is closely mowed, and consists of turf grasses at vegetation is unidentifiable due to season and mowing.	ind sparsefield we	eas. vege	etation composition is approximate, as most

SOIL Sampling Point: GSA1-2-UP

Profile Desc	ription: (Describe	e to the dep	th needed to docu	ment the	indicator	or confir	m the absence o	f indicators.)
Depth	Matrix		Redo	x Feature				
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	<u>Texture</u> _	Remarks
0-6	10YR 3/2	_ 100					CILo	
6-12	10YR 3/2	90	10YR 3/6	10	<u>C</u>	PL	CILo	
12-20	10YR 4/2	95	10YR 5/6	5	С	PL	CILo	
						. ——	· 	
l ———								
l								
			=Reduced Matrix, M			rains.		L=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Appli	cable to all	LRRs, unless othe	rwise no	ted.)		Indicators fo	or Problematic Hydric Soils ³ :
Histosol	. ,		Polyvalue Be				. —	ick (A9) (LRR O)
ı — ·	pipedon (A2)		Thin Dark So					ck (A10) (LRR S)
07 072	stic (A3)		Loamy Muck			R O)		Vertic (F18) (outside MLRA 150A,B
	n Sulfide (A4)		Loamy Gley		(F2)			nt Floodplain Soils (F19) (LRR P, S, T)
ı —	d Layers (A5) Bodies (A6) (LRR	D T II\	Depleted Ma Redox Dark	, ,	E6)			ous Bright Loamy Soils (F20) A 153B)
	icky Mineral (A7) (L							ent Material (TF2)
ı —	esence (A8) (LRR		Redox Depre					allow Dark Surface (TF12)
ı —	ick (A9) (LRR P, T)	•	Marl (F10) (I		٠,			xplain in Remarks)
	d Below Dark Surfa		Depleted Oc) (MLRA 1	51)	_ `	
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mas	ses (F12)	(LRR O, P	, T) ³ Indicat	tors of hydrophytic vegetation and
1	rairie Redox (A16)							nd hydrology must be present,
	lucky Mineral (S1)	(LRR O, S)		. , .	DOLLAR STATE OF THE STATE OF TH			s disturbed or problematic.
	Sleyed Matrix (S4)		Reduced Ve				The second secon	
	Redox (S5)		Piedmont Flo	-			A CONTRACTOR OF THE PARTY OF TH	1520)
	Matrix (S6)	S T II)	Anomaious i	Bright Loa	amy Soils	(F20) (ML)	RA 149A, 153C, 1	153D)
	rface (S7) (LRR P, Layer (if observed						1	
1	Layer (II observed	,.						
Type:	ah aa \						Hudria Cail D	resent? Yes No ✓
	ches):						Hydric Soil P	resent? Yes No
Remarks:								

Photograph Log

Date: ______

Photograph Number	Photograph Number
Photograph Direction East	Photograph Direction West
Comments:	Comments:
Photograph Number	Photograph Number
Photograph Direction	Photograph Direction
Comments:	Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM		City/C	ounty: Gloucester		Sampling Date: 01/12/2022	2	
Applicant/Owner: HRSD					Sampling Point: GSA2-1-		
Investigator(s): Emily Foster			on, Township, Range: _				
Landform (hillslope, terrace, etc.): Othe							
Subregion (LRR or MLRA):				,		3	
		Lat:					
Soil Map Unit Name: Lumbee sandy loa		MATERIA (2 92) (2)					
Are climatic / hydrologic conditions on the		10	1000 to 1000 t	the principle of the second second	A CONTRACTOR OF THE PARTY OF TH		
Are Vegetation, Soil, or I	Hydrology	_ significantly distur	bed? Are "Norma	al Circumstances" p	oresent? Yes No		
Are Vegetation, Soil, or I	Hydrology	_ naturally problema	atic? (If needed,	explain any answe	ers in Remarks.)		
SUMMARY OF FINDINGS - A	ttach site ma	p showing sam	pling point locati	ons, transects	, important features,	etc.	
Livelyan hadia Magastation Drogont2	V /	Na					
Hydrophytic Vegetation Present? Hydric Soil Present?	Yes <u>√</u> Yes <u>√</u>	No	Is the Sampled Area		,		
Wetland Hydrology Present?	,	No	within a Wetland?	Yes	No		
Remarks:			ardin Code: PEM	HGM: Slope	Water Type: RPWW	N	
	-titt				,,,	.	
Unmaintained roadside drainage dito	ch with prevalen	ce of wetland vege	etation.				
HYDROLOGY							
Wetland Hydrology Indicators:				Secondary Indica	ators (minimum of two require	ed)	
Primary Indicators (minimum of one is	required; check a	ıll that apply)		Surface Soil			
Surface Water (A1)	Aquat	tic Fauna (B13)		Sparsely Vegetated Concave Surface (B8)			
High Water Table (A2)		Deposits (B15) (LRF	R U)	Drainage Patterns (B10)			
✓ Saturation (A3)		ogen Sulfide Odor (0		Moss Trim Lines (B16)			
Water Marks (B1)			long Living Roots (C3)		Water Table (C2)		
Sediment Deposits (B2)		ence of Reduced Iron		Crayfish Bur	rows (C8)		
Drift Deposits (B3)	Recer	nt Iron Reduction in	Tilled Soils (C6)	Saturation V	isible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Thin M	Muck Surface (C7)		Geomorphic	Position (D2)		
Iron Deposits (B5)	Other	(Explain in Remark	ss)	Shallow Aqu	itard (D3)		
Inundation Visible on Aerial Image	ery (B7)			FAC-Neutral			
Water-Stained Leaves (B9)				Sphagnum n	noss (D8) (LRR T, U)		
Field Observations:							
		Depth (inches):					
		Depth (inches):		_	<i>J</i>		
Saturation Present? Yes (includes capillary fringe)	✓ No □	Depth (inches):	0 Wetland	Hydrology Preser	nt? Yes <u></u> No	-	
Describe Recorded Data (stream gaug	e, monitoring wel	ll, aerial photos, pre	vious inspections), if av	ailable:			
	-		•				
Remarks:							

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

/EGETATION (Four Strata) – Use scientific nai	mes of pl	ants.		Sampling Point: GSA2-1-PEM
		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:30) 1		Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC:1 (A)
2				Total Number of Dominant
3 4				Species Across All Strata:1 (B)
5				Percent of Dominant Species That Are OBL, FACW, or FAC:100% (A/B)
6.				matric obe, thow, of tho.
7				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
3350	0	= Total Cov	/er	OBL species x 1 =
50% of total cover:0.0	20% of	total cover	:0.0	FACW species x 2 =
Sapling/Shrub Stratum (Plot size:)				FAC species x 3 =
1				FACU species x 4 =
2				UPL species x 5 =
3				Column Totals: (A) (B)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				✓ 2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 ¹
	^	= Total Cov	/er	Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover:0.0	20% of	total cover	:0.0	
Herb Stratum (Plot size:)				¹ Indicators of hydric soil and wetland hydrology must
1. Persicaria saggittata	75		OBL	be present, unless disturbed or problematic.
2. Vernonia novboraccensis	5		FACW	Definitions of Four Vegetation Strata:
3. Panicum virgatum	10		FAC	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or
4				more in diameter at breast height (DBH), regardless of
5				height.
6				Sapling/Shrub – Woody plants, excluding vines, less
7				than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9		3		of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	90	= Total Cov	/er	
50% of total cover: <u>45.0</u>	20% of	total cover	:18.0	
Woody Vine Stratum (Plot size:)				
1				
2				
3				
4		<u></u>		
5				Hydrophytic
	0	= Total Cov	/er	Vegetation Present? Yes _ V No
50% of total cover:0.0	20% of	total cover	:0.0	Present? Yes _ V No
Remarks: (If observed, list morphological adaptations belo	w).			

SOIL Sampling Point: GSA2-1-PEM

l	cription: (Describe	e to the dep	th needed to docu			or confir	n the absence of i	ndicators.)	
Depth (inches)	Matrix Color (moist)	0/		ox Feature	s Type ¹	_Loc ²	Toytura	Domorko	
(inches) 0-6	Color (moist) 10YR 4/2	<u>%</u> 98	Color (moist) 10YR 4/6	- <u>%</u> 2	C Type	PL	Texture SaCLo	Remarks	
10	20		10114/0						
6-12	10YR 5/4	100					Sa		
33									
100	·		Ti and the second secon						
	-		<u> </u>						
¹Type: C=C	oncentration D=De	nletion RM:	=Reduced Matrix, M	– ——— IS=Maske	d Sand G	ains	² Location: PL:	=Pore Lining, M=Matri	
			LRRs, unless othe			unio.		Problematic Hydric S	
Histosol			Polyvalue B			PR S T		-	
_	pipedon (A2)		Thin Dark S					(A10) (LRR S)	
	istic (A3)		Loamy Muc	-		-		/ertic (F18) (outside N	/ILRA 150A.B)
10 mm	en Sulfide (A4)		Loamy Gley	100	7	,		Floodplain Soils (F19)	
	d Layers (A5)		✓ Depleted Ma		,			s Bright Loamy Soils (
	Bodies (A6) (LRR	P, T, U)	Redox Dark		F6)		(MLRA 1		ŕ
	ucky Mineral (A7) (L		Depleted Da	ark Surface	e (F7)			nt Material (TF2)	
Muck Pi	resence (A8) (LRR	U)	Redox Depr		8)		Very Shall	ow Dark Surface (TF1	2)
	uck (A9) (LRR P, T)		Marl (F10) (LRR U)			Other (Exp	olain in Remarks)	
I — ·	d Below Dark Surfa	ce (A11)	Depleted Or			-	2		
_	ark Surface (A12)		Iron-Manga					rs of hydrophytic veget	
1			A) Umbric Surf			r, U)		hydrology must be pr	
	Mucky Mineral (S1)	(LRR O, S)	Delta Ochrid			TOA 450D		disturbed or problema	tic.
	Gleyed Matrix (S4)		Reduced Ve Piedmont Fl				Secretary and the second secon		
	Redox (S5) I Matrix (S6)			-			RA 149A, 153C, 15	3D)	
	rface (S7) (LRR P,	S T III	Anomalous	bright Loa	illy Solis	(1 20) (WILI	(A 143A, 1330, 13	30)	
	Layer (if observed						1		
Type:		,-							
	ches):						Hydric Soil Pre	esent? Yes_	No
	cries)						Hydric 30ii Fre	sentr res	NO
Remarks:									

Photograph Log

Date: _____

Photograph Number	Photograph Number
Photograph Direction NE	Photograph Direction
Comments: Unmaintained roadside ditch with prevalence of wetland vegetation.	Comments:
Photograph Number	Photograph Number
Photograph Direction	Photograph Direction
Comments:	Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM	City/County: Gloucester Sampling Date: 01/12/2022
Applicant/Owner: HRSD	State: VA Sampling Point: GSA2-UP
44 BORES CONTROL CONTR	Section, Township, Range:
	Local relief (concave, convex, none): concave Slope (%): 3-5
Subregion (LRR or MLRA): Lat: 37.446	
Soil Map Unit Name: Rumford loamy fine sand, 2 to 6 percent slopes	
Are climatic / hydrologic conditions on the site typical for this time of ye	
Are Vegetation ✓, Soil, or Hydrology significantly	
Are Vegetation, Soil, or Hydrology naturally pro	
	g sampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No ✓	
Hydric Soil Present? Yes No	Is the Sampled Area
Wetland Hydrology Present? Yes No	within a Wetland? Yes No
Remarks:	Cowardin Code: Upland HGM: Water Type:
HYDROLOGY	
	Considery Indicators (minimum of the required)
Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
Surface Water (A1) Aquatic Fauna (B1 High Water Table (A2) Marl Deposits (B15	
Saturation (A3) Hydrogen Sulfide (Carlotte Carlotte Carlo	
	neres along Living Roots (C3) Dry-Season Water Table (C2)
Sediment Deposits (B2) Presence of Reduce	
	etion in Tilled Soils (C6) Saturation Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4) Thin Muck Surface	
Iron Deposits (B5) Other (Explain in F	Remarks) Shallow Aquitard (D3)
Inundation Visible on Aerial Imagery (B7)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	Sphagnum moss (D8) (LRR T, U)
Field Observations:	
Surface Water Present? Yes No ✓ Depth (inches	I
Water Table Present? Yes No ✓ Depth (inches	s):
Saturation Present? Yes No _✓_ Depth (inches (includes capillary fringe)	S: Wetland Hydrology Present? Yes No
Describe Recorded Data (stream gauge, monitoring well, aerial photo	os, previous inspections), if available:
Remarks:	
I	I

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

		Dominant		Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?		Number of Dominant Species
1				That Are OBL, FACW, or FAC:0 (A)
2				Total Number of Dominant
3				Species Across All Strata:1 (B)
4				Researt of Deminent Species
5				Percent of Dominant Species That Are OBL, FACW, or FAC:0%(A/B)
6				
7				Prevalence Index worksheet:
8.				Total % Cover of: Multiply by:
-	0	= Total Cov	er	OBL species x 1 =
50% of total cover:0.0				FACW species x 2 =
Sapling/Shrub Stratum (Plot size:15)	_ 20 /0 01	total oover		FAC species x 3 =
				FACU species x 4 =
1			-	UPL species x 5 =
2				Column Totals: (A) (B)
3				
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8				3 - Prevalence Index is ≤3.0 ¹
		= Total Cov	er	Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover:0.0	20% of	total cover	0.0	
Herb Stratum (Plot size:5				¹ Indicators of hydric soil and wetland hydrology must
1. Turf grasses	85	✓	ND	be present, unless disturbed or problematic.
2 Trifolium repens	10		FACU	Definitions of Four Vegetation Strata:
3 Lamium amplexicaule	5		ND	
4				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
				height.
5				
6				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
7				than 5 m. BBT and greater than 5.25 k (1 m) tall.
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	100	= Total Cov	er	
50% of total cover:50.0	20% of	total cover	20.0	
Woody Vine Stratum (Plot size:)				
1				
2.				
3				
4				
5				Undrankutia
		= Total Cov	er	Hydrophytic Vegetation
50% of total cover: 0.0				Present? Yes No _▼
merithra del 1 etc e et 1 etc e et 1 etc e e e e e e e e e e e e e e e e e e	- Anna de Casa	total cover		
Remarks: (If observed, list morphological adaptations below	201			
Closely mowed vegetation. Species composition is app	roximate.			

Sampling Point: GSA2-UP

SOIL Sampling Point: GSA2-UP

Profile Descr	iption: (Describe	to the depti	n needed to docu	ment the i	indicator	or confirn	n the absence	of indicate	ors.)	
Depth .	Matrix		Redo	x Feature						
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-8	7.5YR 3/2	100					SaLo			
8-20	10YR 4/4	100					LoCI			
-										
				- —						
										_
1 _{Type:} C=Ce	acontration D=Da	olotion DM-I	Reduced Matrix, M	S=Mackad	Sand Cr		2l coation:	DI =Doro I	ining M=Matr	iv.
			RRs, unless othe			aii i5.			ining, M=Matr matic Hydric	
Histosol (subjects un E	Polyvalue Be		-	DD S T I		Muck (A9) (•	000
	pedon (A2)		Thin Dark St				. —	Muck (A3) (
Black His			Loamy Muck							MLRA 150A,B)
102 252	Sulfide (A4)		Loamy Gley			-,				(LRR P, S, T)
117 17 17 17 17 17 17 17 17 17 17 17 17	Layers (A5)		Depleted Ma		,				t Loamy Soils	
Organic E	Bodies (A6) (LRR I	P, T, U)	Redox Dark	Surface (F	- 6)		(ML	RA 153B)		
5 cm Mud	ky Mineral (A7) (L	RR P, T, U)	Depleted Da	rk Surface	e(F7)			arent Mate	. ,	
	sence (A8) (LRR I		Redox Depr		8)				k Surface (TF1	2)
	k (A9) (LRR P, T)		Marl (F10) (I				Other	(Explain in	Remarks)	
ı — ·	Below Dark Surface	ce (A11)	Depleted Oc			-	T) 31-4:-		-l	4-4:
ı —	k Surface (A12)	MI DA 150A	Iron-Mangar Umbric Surfa				•		drophytic vege logy must be p	
	ucky Mineral (S1) (Delta Ochric			, 0)			ed or problema	
	eyed Matrix (S4)	Little 0, 0,	Reduced Ve		process to the second second	0A. 150B)		coo diotarbi	ed or probleme	illo.
Sandy Re			Piedmont Flo							
	Matrix (S6)			-			RA 149A, 153C	, 153D)		
Dark Surf	ace (S7) (LRR P,	S, T, U)								
Restrictive La	ayer (if observed)	:								
Type:										,
Depth (incl	nes):						Hydric Soil	Present?	Yes	No_ √
Remarks:										

Date: _____



Photograph Number ______
Photograph Direction North_____

Comments:



Photograph Number _____ Photograph Direction East

Comments:



Photograph Number _____

Photograph Direction NNW

Comments:



Photograph Number _____

Photograph Direction West

Comments:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: HRSD Middlesex TFM	City/County: Gloud	cester		Sampling Date:	01/12/2022
Applicant/Owner: HRSD				Sampling Point:	
F-9-F-4-	Section, Township				
Landform (hillslope, terrace, etc.): Hillslope				Slon	oe (%). 5-10
Subregion (LRR or MLRA): Lat: 3					
					tum: 147.200
Soil Map Unit Name: Johns variant loamy sand	27	7 F. SALES			
Are climatic / hydrologic conditions on the site typical for this time	- Control - Cont				,
Are Vegetation, Soil, or Hydrology significant	cantly disturbed?	Are "Normal Circu	ımstances" p	resent? Yes	✓ No
Are Vegetation, Soil, or Hydrology natura	illy problematic? (If needed, explain	n any answer	s in Remarks.)	
SUMMARY OF FINDINGS - Attach site map sho	wing sampling poi	nt locations,	transects,	important fe	eatures, etc.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No	/		Yes	No_ √ _	
Wetland Hydrology Present? Yes No	within a We	euanur	res	NO_ _	-
Remarks:	Cowardin Code: U	pland HG	M:	Water Ty	/pe:
Upland forest adjacent to John Clayton Memorial Highway					
HYDROLOGY					
Wetland Hydrology Indicators:		:		tors (minimum of	two required)
Primary Indicators (minimum of one is required; check all that a			Surface Soil (
Surface Water (A1) Aquatic Faun				etated Concave	Surface (B8)
High Water Table (A2) Marl Deposits Address of A2			Drainage Pat		
Saturation (A3) Hydrogen Su Water Marks (B1) Oxidized Rhi:	imae Odor (C1) zospheres along Living R		Moss Trim Lir	าes (ชาช) Vater Table (C2)	
	Reduced Iron (C4)		Crayfish Burr		
	Reduction in Tilled Soils (sible on Aerial Im	agery (C9)
Algal Mat or Crust (B4) Thin Muck St			Geomorphic I		(30)
Iron Deposits (B5) Other (Explain	, ,		Shallow Aquit		
Inundation Visible on Aerial Imagery (B7)	,		FAC-Neutral		
Water-Stained Leaves (B9)		:	Sphagnum m	oss (D8) (LRR T	, U)
Field Observations:					
Surface Water Present? Yes No <u>✓</u> Depth (ii					
Water Table Present? Yes No _✓ Depth (ii					,
Saturation Present? Yes No ✓ _ Depth (in	nches):	Wetland Hydro	logy Presen	t? Yes	No_✓
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial	photos, previous inspect	ions), if available	:		
		,			
Remarks:					

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

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size:)		Species?	Status	Number of Dominant Species
1. Liriodendron tulipifera	60		FACU	That Are OBL, FACW, or FAC:2 (A)
2. Acer rubrum	20		FAC	Total Number of Dominant
3				Species Across All Strata: 5 (B)
4		<u> </u>		
5.				Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)
6.				That Ale OBE, I ACW, OF I AC.
7				Prevalence Index worksheet:
				Total % Cover of: Multiply by:
8	80			OBL species x 1 =
70.0		= Total Cov		FACW species x 2 =
50% of total cover: 40.0	20% of	total cover:	10.0	FAC species x 3 =
Sapling/Shrub Stratum (Plot size:)	0.5	,	540	FACU species x 4 =
1. Ligustrum sinense	35		FAC	
2				UPL species x 5 =
3				Column Totals: (A) (B)
4				Prevalence Index = B/A =
5				Hydrophytic Vegetation Indicators:
6.				1
				1 - Rapid Test for Hydrophytic Vegetation
7				2 - Dominance Test is >50%
8	35			3 - Prevalence Index is ≤3.0¹
47.5		= Total Cov		Problematic Hydrophytic Vegetation ¹ (Explain)
50% of total cover:17.5	20% of	total cover:	7.0	
Herb Stratum (Plot size:5				¹ Indicators of hydric soil and wetland hydrology must
1. Polystichum acrostichoides	15		FACU	be present, unless disturbed or problematic.
2. Lonicera japonica	10	_	FACU	Definitions of Four Vegetation Strata:
3. Ilex opaca	5			Tree Meady plants evaluating vines 2 in (7.6 cm) or
4				Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of
5				height.
6.		2		Sanling/Shrub Wasdy plants systeding vines less
				Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
7				, ,
8				Herb – All herbaceous (non-woody) plants, regardless
9				of size, and woody plants less than 3.28 ft tall.
10				Woody vine – All woody vines greater than 3.28 ft in
11				height.
12				
	30	= Total Cov	er	
50% of total cover:15.0	20% of	total cover:	6.0	
Woody Vine Stratum (Plot size:)				
1				
2.				
3				
4				
5				Hydrophytic
		= Total Cov		Vegetation Present? Yes No _✓
50% of total cover:0.0	20% of	total cover:	0.0	resent: res No
Remarks: (If observed, list morphological adaptations belo	w).			

Sampling Point: GSA3-UP

SOIL Sampling Point: GSA3-UP

Profile Desc	cription: (Describe	to the depth	needed to docur	nent the ii	ndicator	or confirm	n the absence of	indicators.)	
Depth	Matrix		Redo	x Features	3				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks	
0-10	10YR 3/2	100					SaLo		
10-16	10YR 3/3	100					SaLo		
18-20	10YR 5/3	100				×	Sa		
-									
l ———									
l									
¹Type: C=C	oncentration, D=De	nletion RM=F	Reduced Matrix MS	S=Masked	Sand Gr	aine	² l ocation: Pl	L=Pore Lining, M=Ma	triv
	Indicators: (Appli					unio.		r Problematic Hydric	
Histosol			Polyvalue Be			RR S. T. I		ck (A9) (LRR O)	
_	pipedon (A2)		Thin Dark Su					ck (A10) (LRR S)	
ı —	istic (A3)		Loamy Muck		-	-		Vertic (F18) (outside	MLRA 150A,B)
No. of the second	en Sulfide (A4)		Loamy Gleye	- ·		•		t Floodplain Soils (F19	
Stratifie	d Layers (A5)		Depleted Ma	trix (F3)			Anomalou	us Bright Loamy Soils	(F20)
Organic	Bodies (A6) (LRR	P, T, U)	Redox Dark	Surface (F	6)		(MLRA		
_	ucky Mineral (A7) (L		Depleted Da				_	ent Material (TF2)	
	resence (A8) (LRR		Redox Depre		3)			llow Dark Surface (TF	F12)
1	uck (A9) (LRR P, T)		Marl (F10) (L		(MI DA 4	E4\	Other (Ex	(plain in Remarks)	
	d Below Dark Surfa ark Surface (A12)	ce (A11)	Depleted Oc Iron-Mangan		•	•	T) ³ Indicate	ors of hydrophytic veg	etation and
ı —	rairie Redox (A16)	(MI RA 150A)	_				•	nd hydrology must be	
1	Mucky Mineral (S1)		Delta Ochric			, 0,		s disturbed or problem	
	Gleyed Matrix (S4)	(=::::0,0)	Reduced Ve			0A, 150B)		and an problem	
	Redox (S5)		Piedmont Flo						
Stripped	Matrix (S6)						A 149A, 153C, 1	53D)	
Dark Su	rface (S7) (LRR P,	S, T, U)							
Restrictive	Layer (if observed):					1		
Type:			_						,
Depth (in	ches):						Hydric Soil Pr	resent? Yes	_ No_ √
Remarks:									

Date: _____



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/Mid	ldlesex	Sampling Date: _	7/9/2021		
Applicant/Owner: HRSD			1 102=	State: VA	Sampling Point: E	F-UP-101		
Investigator(s): Emily Foster, James C	ook	Sec	ction, Township, Range:					
Landform (hillslope, terrace, etc.): Hills			The state of the s			(%): 5-25		
Subregion (LRR or MLRA): MLRA 1538	- 2	0.00m2						
				colina d		V		
Soil Map Unit Name:					cation:			
Are climatic / hydrologic conditions on t								
Are Vegetation, Soil, or	Hydrology	significantly dist	urbed? Are *Norma	al Circumstances"	present? Yes	No		
Are Vegetation, Soil, or	Hydrology	naturally problem	matic? (If needed,	explain any answ	ers in Remarks.)			
SUMMARY OF FINDINGS - A	ttach site	map showing sa	impling point locati	ons, transect	s, important fea	atures, etc.		
Hydrophytic Vegetation Present?	Voc. X	No	PRODUCTION STATES					
Hydric Soil Present?		Nox	Is the Sampled Area					
Wetland Hydrology Present?		No ×	within a Wetland?	Yes	No×			
Remarks:			l.		Observed Classif	ications		
Lacks wetland hydrology and soils. Soils are moist, but presumably on foested wetlan downslope, outside	ly from tropic	cal storm Elsa from t	the previous day. Likely	, , ,	Cowardin: <u>upl</u>			
HYDROLOGY						-		
Wetland Hydrology Indicators:				Secondary Indic	ators (minimum of the	wo required)		
Primary Indicators (minimum of one is	required; che	ck all that apply)		Surface Soi	Cracks (B6)			
Surface Water (A1)		quatic Fauna (B13)		Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2)		lari Deposits (B15) (L	RR U)	Drainage Patterns (B10)				
Saturation (A3)	_ н	ydrogen Sulfide Odor	(C1)	Moss Trim Lines (B16)				
Water Marks (B1)			along Living Roots (C3)					
Sediment Deposits (B2)	P	resence of Reduced I	Iron (C4)	Crayfish Bu	rrows (C8)			
Drift Deposits (B3)	R	ecent Iron Reduction	in Tilled Soils (C6)	Saturation \	risible on Aerial Ima	gery (C9)		
Algal Mat or Crust (B4)	_ 1	hin Muck Surface (C7)	Geomorphic	Position (D2)			
Iron Deposits (B5)	_ 0	ther (Explain in Rema	arks)	Shallow Aq	uitard (D3)			
Inundation Visible on Aerial Imag	ery (B7)			FAC-Neutra				
Water-Stained Leaves (B9)				Sphagnum	moss (D8) (LRR T,	U)		
Field Observations:								
Surface Water Present? Yes _	No _x	Depth (inches):						
		_ Depth (inches); _	CONTRACTOR CONTRACTOR					
(includes capillary fringe)		Depth (inches):	100000000000000000000000000000000000000		nt? Yes	Nox		
Describe Recorded Data (stream gau	ge, monitoring	well, aerial photos, p	revious inspections), if av	ailable:				
Domestic:								
Remarks: Soils moist but not saturated, no w								
Solls moist but not saturated, no w	ater table.							

Tree Stratum (Plot size: 30 ft) 1. Juglans nigra, Black Walnut 2	% Cover 15 		Status UPL	Dominance Test worksheet Number of Dominant Species That Are OBL, FACW, or FAC Total Number of Dominant Species Across All Strata: Percent of Dominant Species	<u> </u>	6	(A) (B)
5				That Are OBL, FACW, or FAC		66.7%	(A/B)
6	15	= Total Cov	er	Prevalence Index workshee	t:		
50% of total cover:7.5				Total % Cover of:	Mu	Itiply by:	-
Sapling Stratum (Plot size: 30 ft)	- 5000			OBL species0	x 1 = _	0	
1. Rubus pensilvanicus, Pennsylvania Blackberry	25	Yes	FAC	FACW species15			_
3 Lieustween singers Chinese Britist	20	Yes	FAC	FAC species95	x 3 = _	285	-
a D. Luidi D. Li D.	20		FACU	FACU species35	x 4 = .	140	_
4. Sambucus nigra, Black Elder	15	No	FACW	UPL species15	x 5 = _	75	_
5.				Column Totals:160	(A)	530	_ (B)
6.				Prevalence Index = B/A	A -	3.31	
***	80	= Total Cov	er	Hydrophytic Vegetation Ind			
50% of total cover:40 <u>Shrub Stratum</u> (Plot size: <u>30 ft</u>) 12 3	_		16	x 2 - Dominance Test is >5 3 - Prevalence Index is ≤ Problematic Hydrophytic	ohytic Ve 50% 3.01	egetation	in)
4				Indicators of hydric soil and to be present, unless disturbed			nust
5				Definitions of Five Vegetation			
0,		= Total Cov		Deminuons of Five Vegetau	on otrai	d,	
50% of total cover: 0 Herb Stratum (Plot size: 30 ft)				Tree – Woody plants, excludi approximately 20 ft (6 m) or n (7.6 cm) or larger in diameter	nore in h	eight and 3	
1. Verbesina alternifolia, Wingstem	25	Yes	FAC	Sapling - Woody plants, exc	luding w	oody vines	,
2 Microstegium vimineum, Japanese Stilt Grass		Yes	FAC	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.			ess
3. Phytolacca americana, American Pokeweed	10	No	FACU	than 3 in, (7.6 cm) DBH.			
4. Campsis radicans, Trumpet-Creeper	5	No	FAC	Shrub - Woody plants, excluding woody vines,			
5. Lonicera japonica, Japanese Honeysuckle	5	No	FACU	approximately 3 to 20 ft (1 to	o m) in i	neight.	
6				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.			
9				Woody vine - All woody vine	s, regar	dless of he	ight.
10	$\overline{}$		_	, , , , , , , , , , , , , , , , , , , ,			
11		= Total Cov total cover					
1							
2.							
3.							
4.							
5.		<u> </u>		Hydrophytic			
	0	= Total Cov		Vegetation Present? Yesx	N.		
50% of total cover: 0	20% of	total cover:	0	103		_	

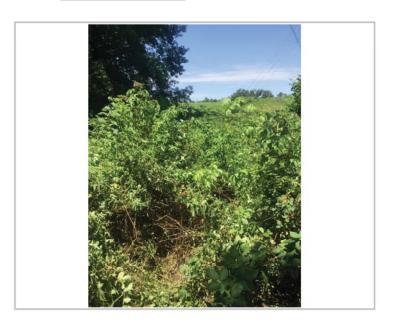
Sampling Point: EF-UP-101

Soil Sampling Point: EF-UP-101

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type Loc ²	Texture Remarks
0-6 10yr 3/2 1009	<u></u>	Loam
6-20 2.5y 4/3 1009	%	Loamy sand
		-
		3 6 8 8 8 10 11
Hydric Soil Indicators: (Applicable to	RM=Reduced Matrix, MS=Masked Sand Grains.	² Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils ³ :
Histosol (A1)	Polyvalue Below Surface (S8) (LRR S, 7	
Histic Epipedon (A2)	Thin Dark Surface (S9) (LRR S, T, U)	2 cm Muck (A10) (LRR S)
Black Histic (A3)	Loamy Mucky Mineral (F1) (LRR O)	Reduced Vertic (F18) (outside MLRA 150A,B
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)	 Piedmont Floodplain Soils (F19) (LRR P, S, T)
Stratified Layers (A5)	Depleted Matrix (F3)	Anomalous Bright Loamy Soils (F20)
Organic Bodies (A6) (LRR P, T, U) 5 cm Mucky Mineral (A7) (LRR P, T,	Redox Dark Surface (F6) Depleted Dark Surface (F7)	(MLRA 153B) Red Parent Material (TF2)
Muck Presence (A8) (LRR U)	Redox Depressions (F8)	Very Shallow Dark Surface (TF12)
1 cm Muck (A9) (LRR P, T)	Mari (F10) (LRR U)	Other (Explain in Remarks)
Depleted Below Dark Surface (A11)	Depleted Ochric (F11) (MLRA 151)	
Thick Dark Surface (A12)	Iron-Manganese Masses (F12) (LRR O,	1
Coast Prairie Redox (A16) (MLRA 1	.[인상] (1 · · · · · · · · · · · · · · · · · ·	wetland hydrology must be present,
Sandy Mucky Mineral (S1) (LRR O, Sandy Gleyed Matrix (S4)	 Delta Ochric (F17) (MLRA 151) Reduced Vertic (F18) (MLRA 150A, 150 	unless disturbed or problematic.
Sandy Redox (S5)	Piedmont Floodplain Soils (F19) (MLRA	
Stripped Matrix (S6)	Anomalous Bright Loamy Soils (F20) (M	(2 to) 4 (3 to 5 to 7 to 1
Dark Surface (S7) (LRR P, S, T, U)	19	Season Se
Restrictive Layer (if observed):		
Resultative Layer (il observed).		
Type:		noon etem seems terminations are not been as
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes No×
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes No×
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes No×
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes No×
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes NoX
Type:		Hydric Soil Present? Yes NoX
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes No×
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox
Type:		Hydric Soil Present? Yes Nox

Date: 7/9/21

Feature Name: EF-UP-101





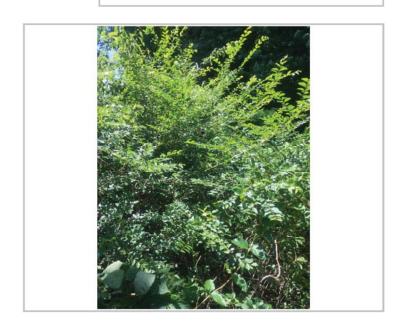
Photograph Direction North

Comments:



Comments:





Photograph Direction East

Comments:



Photograph Direction West

Comments:





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



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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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

Custom Soil Resource Report

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

Custom Soil Resource Report

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.



MAP LEGEND

Special Line Features Streams and Canals Interstate Highways Aerial Photography Very Stony Spot Major Roads Local Roads Stony Spot **US Routes** Spoil Area Wet Spot Other Rails Nater Features **Fransportation 3ackground** W ŧ Soil Map Unit Polygons Severely Eroded Spot Area of Interest (AOI) Soil Map Unit Points Miscellaneous Water Soil Map Unit Lines Closed Depression Marsh or swamp Perennial Water Mine or Quarry Rock Outcrop Special Point Features **Gravelly Spot** Saline Spot Sandy Spot Slide or Slip **Borrow Pit** Lava Flow Sodic Spot Clay Spot **Gravel Pit** Area of Interest (AOI) Sinkhole Blowout Landfill 9 Soils

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 Ar	ea	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 Ar	rea	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

Settina

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.