**A G E N D A**
**JAMES CITY COUNTY WETLANDS BOARD**
**REGULAR MEETING**
**County Government Center, Building F**
**101 Mounts Bay Road, Williamsburg, Virginia, 23185**
**January 13, 2021**
**5:00 PM**

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**A. CALL TO ORDER**

**B. ROLL CALL**

**C. MINUTES**

1. Minutes from November 12, 2020, Regular Meeting

**D. PUBLIC HEARINGS**

1. Case No. WJPA 20-0038 / VMRC 20-1934 : 8797 Pocahontas Trail

**E. BOARD CONSIDERATIONS**

**F. MATTERS OF SPECIAL PRIVILEGE**

1. 2020 Year in Review

**G. ADJOURNMENT**

**AGENDA ITEM NO. C.1.**

**ITEM SUMMARY**

DATE: 1/13/2021

TO: Wetlands Board

FROM: Michael Woolson, Wetlands Board Secretary

SUBJECT: Minutes from November 12, 2020, Regular Meeting

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**ATTACHMENTS:**

| | Description | Type |
|---|---|---|
| 🗋 | Minutes | Minutes |

**REVIEWERS:**

| Department | Reviewer | Action | Date |
|---|---|---|---|
| Wetlands Group | Woolson, Michael | Approved | 1/11/2021 - 11:13 AM |
| Wetlands Group | Small, Toni | Approved | 1/11/2021 - 11:23 AM |
| Publication Management | Daniel, Martha | Approved | 1/11/2021 - 12:15 PM |
| Wetlands Group | Secretary, Wetland | Approved | 1/11/2021 - 12:39 PM |

**M I N U T E S**
**JAMES CITY COUNTY WETLANDS BOARD**
**REGULAR MEETING**
**County Government Center, Building F**
**101 Mounts Bay Road, Williamsburg, Virginia, 23185**
**November 12, 2020**
**5:00 PM**

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## A. CALL TO ORDER

The Wetlands Board meeting for November 12, 2020, was called to order.

The meeting was dedicated to the memory of Mr. John Hughes. Mr. Apperson made a motion to Dedicate the Wetlands Board meeting to the memory of Mr. John Hughes.

A motion to Dedicate the Wetlands Board meeting to the memory of Mr. John Hughes was made by Mr. Apperson, the motion result was:
AYES: 5 NAYS: 0 ABSTAIN: 0 ABSENT: 1
AYES: Apperson, Dunn, Gussman, Roadley, O'Brien
NAYS: None
ABSENT: Waltrip

The responsibility of this Board is to carry out locally the Commonwealth policy to preserve the wetlands and to accommodate economic activity so as to prevent its despoliation.

## B. ROLL CALL

**Board Members Present:**
William Apperson, Chair
Halle Dunn, Vice Chair
David Gussman
Charles Roadley
Michael O'Brien

**Board Members Absent:**
Larry Waltrip

**Other Staff Present:**
Toni Small, Director, Stormwater and Resource Protection
Liz Parman, Assistant County Attorney
Michael Woolson, Senior Watershed Planner, Stormwater and Resource Protection
Trevor Long, Watershed Planner, Stormwater and Resource Protection
Janice Petty, Stormwater Assistant, Stormwater and Resource Protection

## C. MINUTES

1. Minutes from September 9, 2020, Regular Meeting

A motion to Approve the minutes was made by Mr. Gussman. The minutes were approved on a voice vote.

## D. PUBLIC HEARINGS

None

## E. BOARD CONSIDERATIONS

1. 2021 Calendar

2021 Calendar was presented for approval.

Mr. Gussman made a motion to Adopt the 2021 Calendar. The 2021 Calendar was approved: 5-0
AYES: Apperson, Dunn, Gussman, Roadley, O'Brien
NAYS: None
ABSENT: Waltrip

2. Election of Officers for 2021

Mr. Gussman nominated Mr. Apperson to serve as Chair. The nomination was approved: 5-0
AYES: Apperson, Dunn, Gussman, Roadley, O'Brien
NAYS: None
ABSENT: Waltrip

Mr. Gussman nominated Mr. Dunn to serve as Vice Chair. The nomination was approved: 5-0
AYES: Apperson, Dunn, Gussman, Roadley, O'Brien
NAYS: None
ABSENT: Waltrip

Mr. Apperson nominated Mr. Woolson to serve as Secretary. The nomination was approved: 5-0
AYES: Apperson, Dunn, Gussman, Roadley, O'Brien
NAYS: None
ABSENT: Waltrip

## F. MATTERS OF SPECIAL PRIVILEGE

None

## G. ADJOURNMENT

A motion to Adjourn was made by Mr. Apperson and approved on a voice vote. The meeting adjourned at 5:04 p.m.

**AGENDA ITEM NO. D.1.**

**ITEM SUMMARY**

DATE: 1/13/2021

TO: Wetlands Board

FROM: Michael Woolson, Senior Watershed Planner

SUBJECT: Case No. WJPA 20-0038 / VMRC 20-1934 : 8797 Pocahontas Trail

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VHB, on behalf of Carters Grove Associates LLC, has applied for a wetlands permit for the installation of 12 breakwaters, beach nourishment, backshore plantings, a revetment and the refurbishment of an existing revetment at 8797 Pocahontas Trail, JCC Parcel No. 5910100030.

**ATTACHMENTS:**

| | Description | Type |
|---|---|---|
| 🗋 | Staff Report | Staff Report |
| 🗋 | Resolution | Resolution |
| 🗋 | Presentation | Presentation |
| 🗋 | Application, Part 1 | Backup Material |
| 🗋 | Application, Part 2 | Backup Material |
| 🗋 | Public Advertisement | Backup Material |
| 🗋 | APO Letter | Backup Material |
| 🗋 | APO Mailing List | Backup Material |

**REVIEWERS:**

| Department | Reviewer | Action | Date |
|---|---|---|---|
| Wetlands Group | Woolson, Michael | Approved | 1/11/2021 - 11:13 AM |
| Wetlands Group | Small, Toni | Approved | 1/11/2021 - 11:24 AM |
| Publication Management | Daniel, Martha | Approved | 1/11/2021 - 12:01 PM |
| Wetlands Group | Secretary, Wetland | Approved | 1/11/2021 - 12:39 PM |

**WETLANDS BOARD CASE No. WJPA 20-0038/VMRC 20-1934. 8797 Pocahontas Trail**
**Staff Report for the January 13, 2021, Wetlands Board Public Hearing**

*This staff report is prepared by James City County Stormwater and Resource Protection to provide information to the Wetlands Board to assist them in making a recommendation on this assessment. It may be useful to members of the general public interested in this assessment.*

## EXISTING SITE DATA AND INFORMATION

| | |
|---|---|
| Applicant: | Mr. Samuel Mencoff, Carter's Grove Associates LLC |
| Owner/Agent: | Mr. Neville Reynolds, Vanasse Hangen Brustlin, Inc. (VHB), Inc. |
| Location: | 8797 Pocahontas Trail |
| Parcel: | Carter's Grove |
| Parcel Identification No.: | 5910100030 |
| Watershed: | Skiffes Creek (HUC JL35) |
| Floodplain: | Zone AE - Base flood elevation is determined to be 9 feet mean sea level (MSL)<br>Zone VE - Coastal flood zone with velocity hazard (wave action). Flood elevations range from 10 to 15 feet MSL |
| Proposed Activity: | Construction of a living shoreline consisting of 12 breakwaters, beach nourishment, backshore plantings, a revetment refurbishment, and 2 new revetments |
| Wetland Impacts: | No vegetated impacts, 108,500 square feet non-vegetated impacts |
| Staff Contact: | Michael D. Woolson, Senior Watershed Planner Phone: 253-6823 |

## PROJECT DISCUSSION

Mr. Neville Reynolds, VHB Inc., has applied for a wetlands permit on behalf of Mr. Samuel Mencoff, Carter's Grove Associates LLC, to construct a living shoreline consisting of 12 breakwaters, beach nourishment, backshore plantings, a revetment refurbishment, and a new revetment on property located at 8797 Pocahontas Trail within the Skiffes Creek watershed. The property is further identified as James City County Tax Map Parcel No. 5910100030 and is otherwise known as Carter's Grove Plantation.

The shoreline is characterized by heavily eroding banks caused by offshore wave action. The height of several of the bluffs are estimated at over 50 feet. Consistent with Senate Bill 776 enacted on July 1, 2020, the applicant is proposing a living shoreline approach to protect and restore the property. The project consists of 12 free-standing, offshore, armor stone breakwaters, and 78,000 cubic yards of sand fill to create 108,754 square feet of sandy, intertidal shoreline and 285,595 square feet of vegetated shoreline. The plantings are *Spartina patens* (saltmeadow hay) planted on 18-inch centers.

Upstream from the plantation house is a series of eight breakwaters, all 175 feet in length, while the downstream segment has two 206-foot, one 200-foot, and one 175-foot breakwaters. The project also includes the installation of two new segments of riprap revetment (660 feet and 387 feet) and refurbishing an older revetment for approximately 1,380 feet. Total impacts to non-vegetated intertidal wetlands equates to 108,500 square feet and 240,558 square feet of subaqueous impacts. The project also includes the

installation of an open-pile, timber pier 8-foot wide x 832-feet long and covered boat lift. The pier crosses non-vegetated wetlands and open water. Both the pier and boatlift are outside of the Wetlands Board's jurisdiction.

In addition, a failed concrete drainage channel located in the center of an existing revetment will be replaced with a pipe outfall and a failing spillway from a freshwater pond adjacent to the shoreline will be replaced with a spill box and emergency spillway.

**MITIGATION DISCUSSION**

As published in *The Virginia Register* on July 11, 2005, the revised Wetland Mitigation Compensation Policy and Supplemental Guidelines, Regulation 4VAC 20-390-10 et seq., Virginia, as a Chesapeake Bay Program partner, is committed to "achieve a no-net loss of existing wetlands acreage and function in the signatories' regulatory programs." In order for a proposed project to be authorized to impact wetlands and compensate for the wetland loss in some prescribed manner, the following three criteria must be met:

1. All reasonable mitigative efforts, including alternative siting, which would eliminate or minimize wetland loss or disturbance must be incorporated in the proposal; and

2. The proposal must clearly be water dependent in nature; and

3. The proposal must demonstrate clearly its need to be in the wetlands and its overwhelming public and private benefits.

If the proposed project cannot meet one or more of the above criteria, the project must be denied or must occur in areas outside of wetlands. Should it satisfy all three criteria, however, compensation for the wetland loss is required. The sequence of acceptable mitigation options should be as follows: on-site, off-site within the same watershed, mitigation bank(s) in the same watershed or a payment of an in-lieu fee. If compensation is required, it should be a condition of the permit.

Staff has reviewed this application and finds that this project meets the three criteria outlined above.

**STAFF RECOMMENDATIONS**

Staff has reviewed the above application and recommends approval of the application as presented. Should the Board wish to approve the application, staff suggests the following conditions be incorporated into the approval:

1. The applicant must obtain all other necessary local, state, and/or federal permits required for the project; and

2. All development activities located in the special flood hazard area shall comply with Article VI, Division 3, Floodplain Area Regulations of the James City County Zoning Ordinance and receive all required approval and permits prior to commencement of such activities; and

3. The backshore planting area shall be planted with *Spartina patens*, approximately 285,600 square feet in area, with 2-inch plugs on an 18-inch spacing in a triangular pattern; and

4. A surety in the amount of $20,000 be paid and in place prior to the commencement of work, in a form acceptable to the James City County Attorney's Office, to guarantee plant survival; and

5. One half of the surety will be released immediately after planting. The remaining surety will be released once a 90% minimum survival rate is achieved at one-year post planting; and

6. The Wetlands Permit for this project shall expire on January 13, 2022, if construction has not begun; and

7. If an extension of the permit is needed, a written request shall be submitted to the Stormwater and Resource Protection Division no later than December 2, 2021, six weeks prior to the expiration date.

MDW/md
WJPA20-38_VMRC20-1934PTr

# **R E S O L U T I O N**

CASE NO. WJPA 20-0038/VMRC 20-1934. 8797 POCAHONTAS TRAIL

JAMES CITY COUNTY WETLANDS PERMIT

WHEREAS, Mr. Samuel Mencoff (the "Applicant"), has applied to the Wetlands Board of James City County (the "Board") to request a permit to use and develop in areas designated as wetlands on property identified as James City County Real Estate Tax Parcel No. 5910100030 and further identified as 8797 Pocahontas Trail (the "Property") as set forth in the application WJPA 20-0038/VMRC 20-1934; and

WHEREAS, the Board has listened to the arguments presented and has carefully considered all evidence entered into the record.

NOW, THEREFORE, BE IT RESOLVED that the Wetlands Board of James City County, Virginia, following a public hearing, by a majority vote of its members FINDS that:

1. The anticipated public and private benefit of the proposed activity in the wetlands exceeds its anticipated public and private detriment.

2. The proposed development conforms to the standards prescribed in Section 28.2-1308 of the Code of Virginia, and the guidelines promulgated pursuant to Section 28.2-1301 of the Code of Virginia.

3. The proposed activity does not violate the purpose and intent of Chapter 22 of the James City County Code or Sections 28.2-1300 et. seq. of the Code of Virginia.

4. In granting this Wetlands Permit, the following conditions are hereby imposed:

    a. The applicant must obtain all other necessary local, state, and/or federal permits required for the project; and

    b. All development activities located in the special flood hazard area shall comply with Article VI, Division 3, Floodplain Area Regulations of the James City County Zoning Ordinance and receive all required approvals and permits prior to commencement of such activities; and

    c. The backshore planting area shall be planted with *Spartina patens*, approximately 285,600 square feet in area, with 2-inch plugs on an 18-inch spacing in a triangular pattern; and

    d. A surety in the amount of $20,000 be paid and in place prior to the commencement of work, in a form acceptable to the James City County Attorney's Office, to guarantee plant survival; and

e. One half of the surety will be released immediately after planting. The remaining surety will be released once a 90% minimum survival rate is achieved at one-year post planting; and

f. The Wetlands Permit for this project shall expire on January 13, 2022, if construction has not begun; and

g. If an extension of the permit is needed, a written request shall be submitted to the Stormwater and Resource Protection Division no later than December 2, 2021, six weeks prior to the expiration date.

| | |
|---|---|
| _____ | _____ |
| William Apperson | Michael Woolson |
| Chairman, Wetlands Board | Secretary to the Board |

Adopted by the Wetlands Board of James City County, Virginia, this 13th day of January, 2021.

THE FORGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ DAY OF _____, 2021 IN THE COMMONWEALTH OF VIRGINIA, IN THE COUNTY OF JAMES CITY.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES: _____

WJPA20-38_VMRC20-1934PTr-res

# Wetlands Board
# of James City County, Virginia

## January 13, 2020

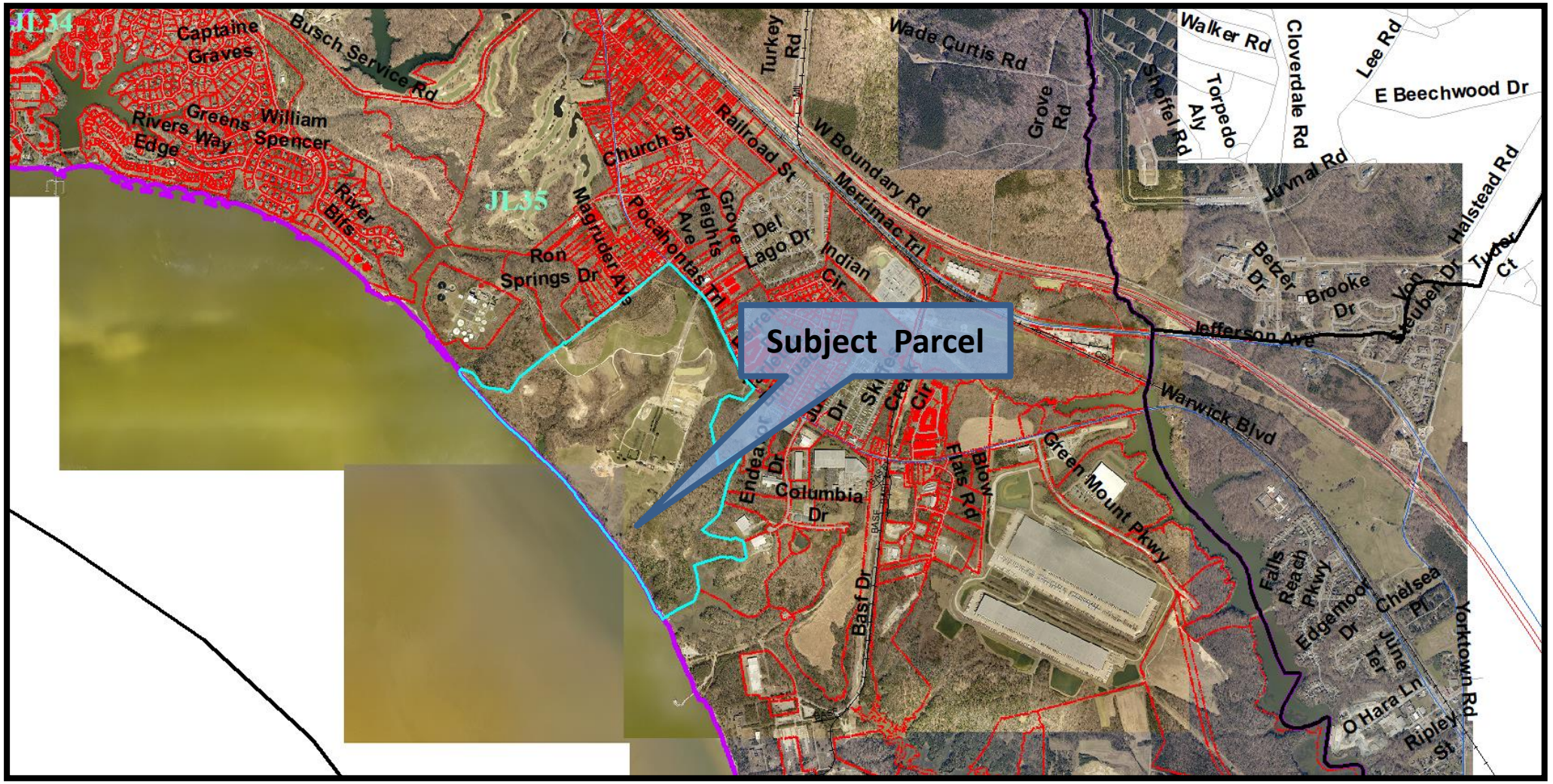
**WJPA 20-0038**

**Carter's Grove**

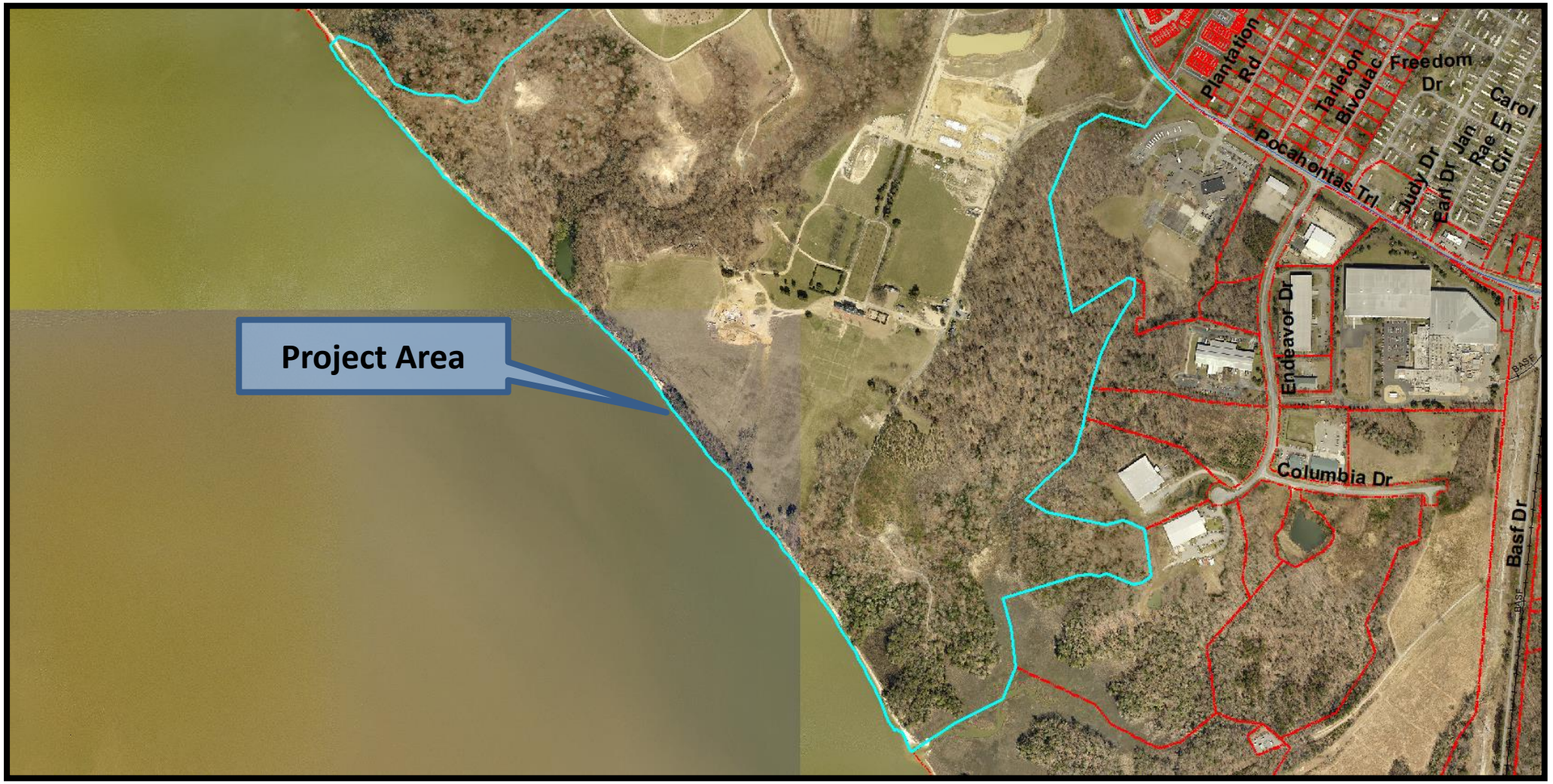
**8797 Pocahontas Trail**

# Applicant Request

- ✓ Construction of a living shoreline, breakwaters, and sand backfill.




**Vicinity Map**
**WJPA 20-0038**
**8797 Pocahontas Trail**




**Aerial Map**
**WJPA 20-0038**
**8797 Pocahontas Trail**

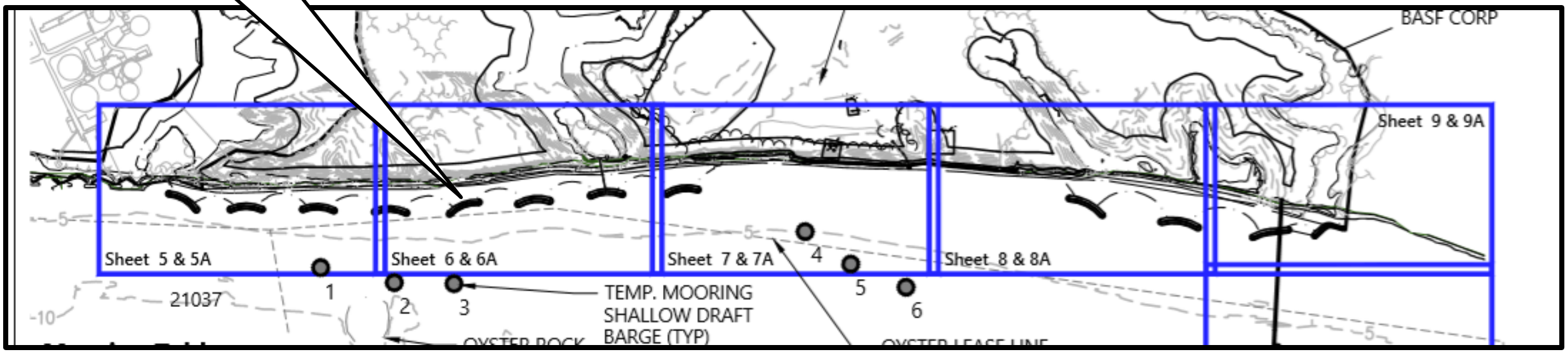

**Topography**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Plan showing proposed improvements, submitted October 29, 2020. For representative use only for presentation of case #WJPA 20-0038.**

**Site Plan**
**WJPA 20-0038**
**8797 Pocahontas Trail**

**Site Plan revision showing proposed improvements, submitted October 29, 2020. For representative use only for presentation of case #WJPA 20-0038.**

**Proposed Breakwaters**




**Breakwaters**
**WJPA 20-0038**
**8797 Pocahontas Trail**

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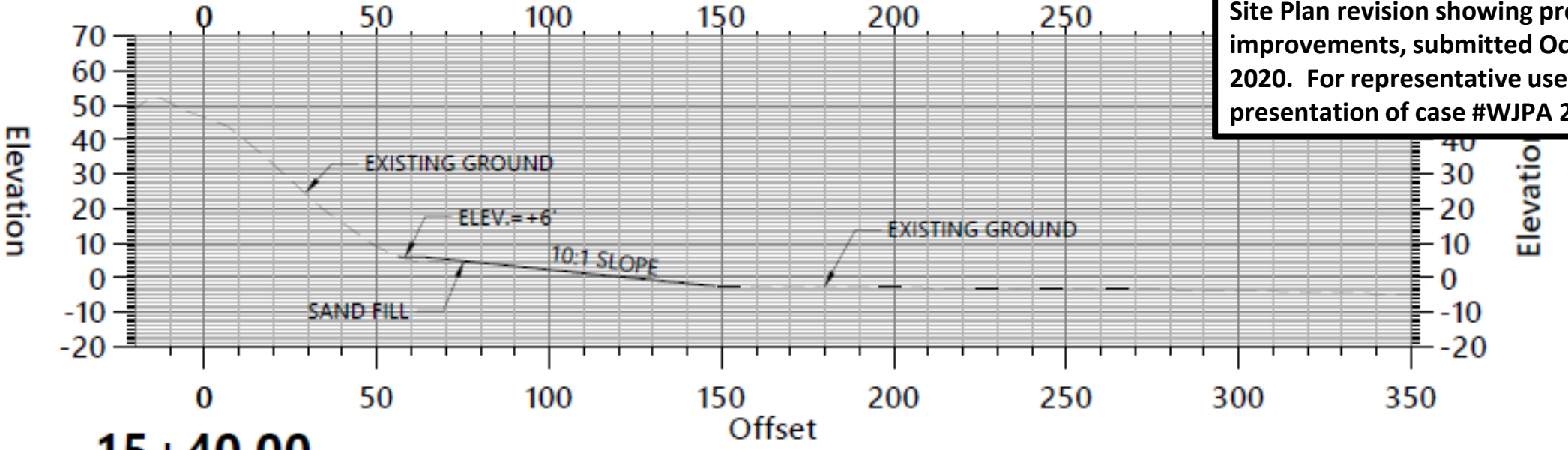
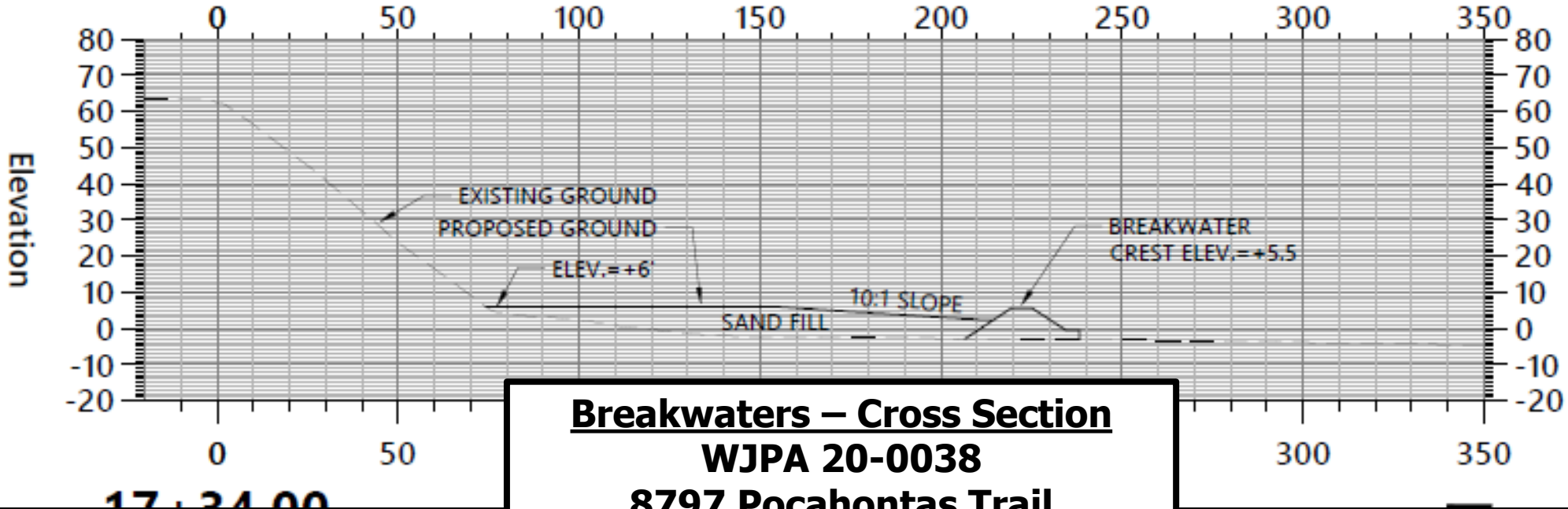



15+40.00

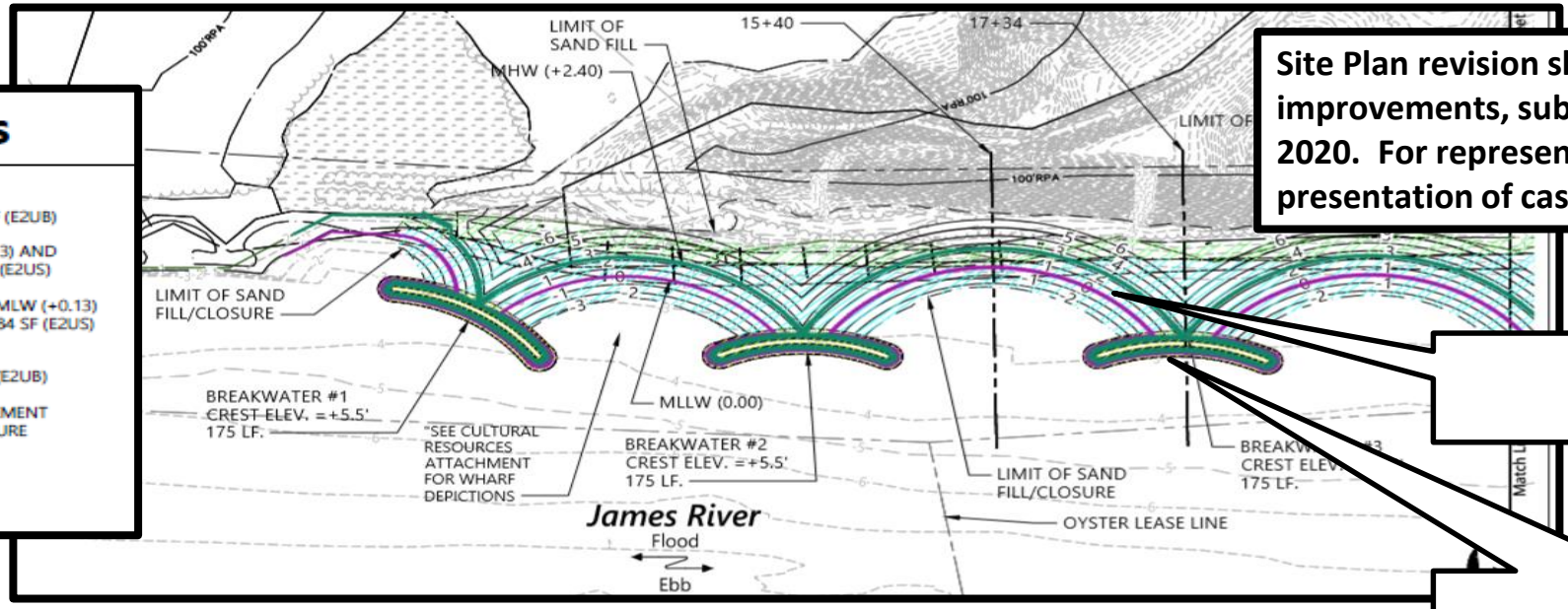


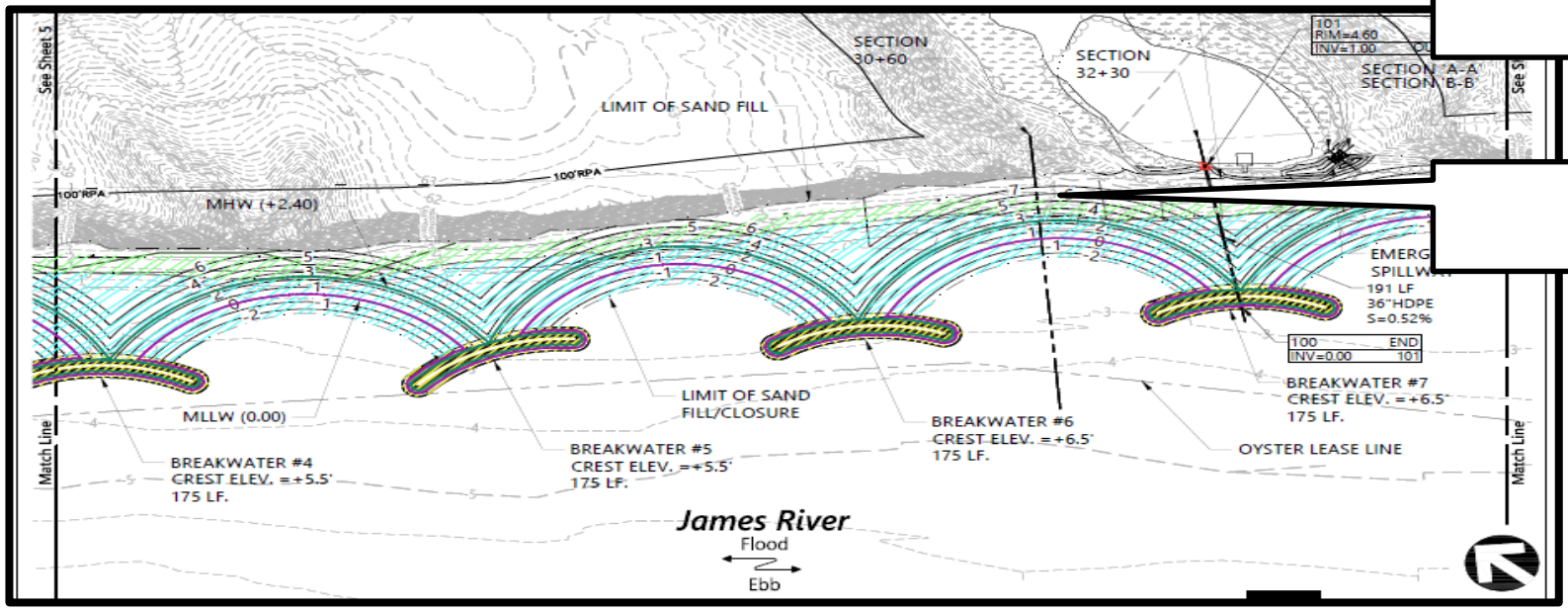

17+34.00

**Breakwaters – Cross Section**
**WJPA 20-0038**
**8797 Pocahontas Trail**

## Total Impact Areas

- SAND FILL BELOW MLW (+0.13) AREA = 158,844 SF (E2UB)
- SAND FILL BETWEEN MLW (+0.13) AND MHW (+2.40) AREA = 96,416 SF (E2US)
- REVETMENT IMPACT BETWEEN MLW (+0.13) AND MHW (+2.40) AREA = 12,084 SF (E2US)
- BREAKWATER IMPACT BELOW MLW (+0.13) AREA = 81,714 SF (E2UB)
- POND SPILL BOX AND REPLACEMENT EMERGENCY SPILLWAY STRUCTURE IMPACT AREA = 130 SF (PEM)




**Site Plan revision showing proposed improvements, submitted October 29, 2020. For representative use only for presentation of case #WJPA 20-0038.**

**Sand fill**

**Breakwaters**

**Revetment**

# Impacted Areas

## Total Impact Areas

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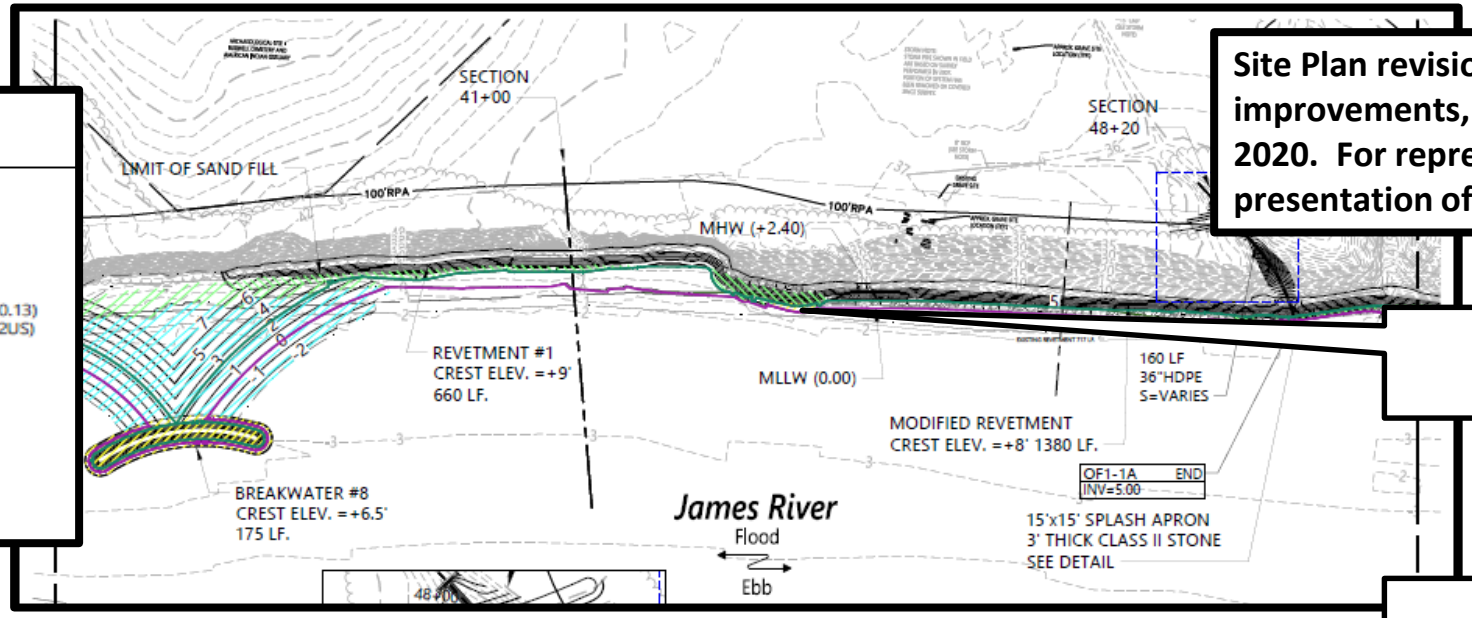


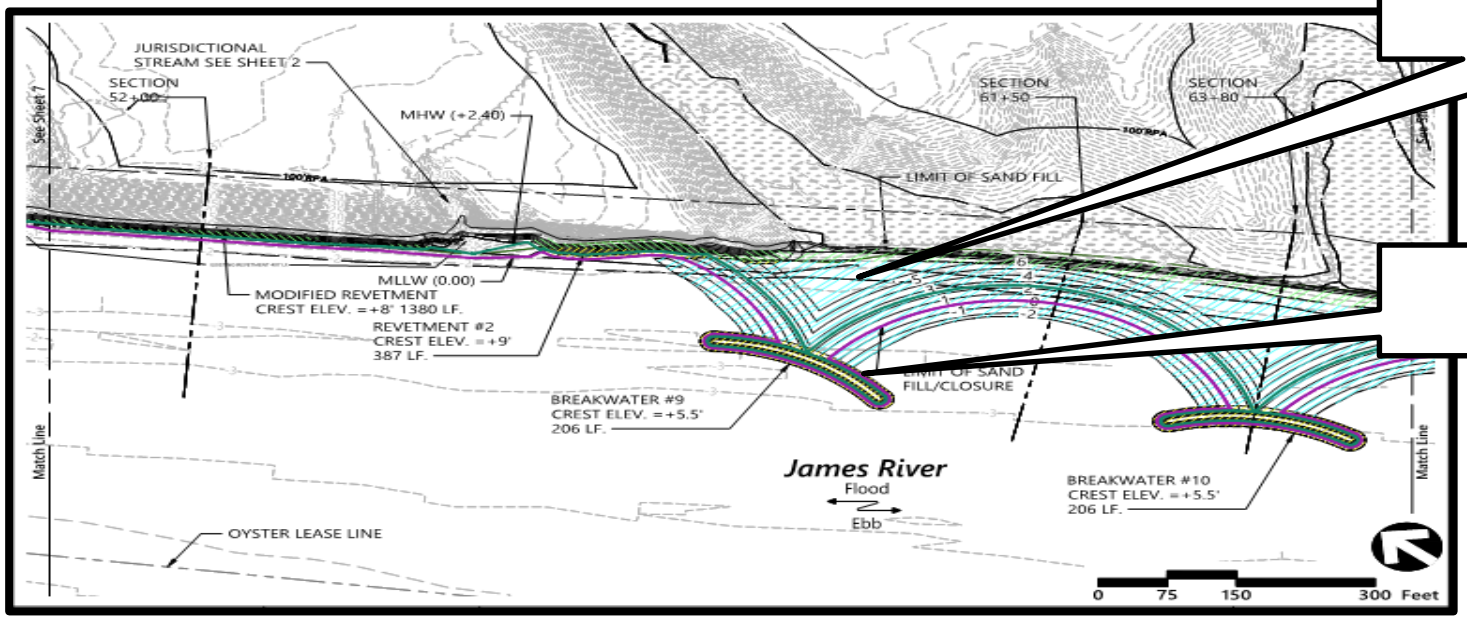


**Site Plan revision showing proposed improvements, submitted October 29, 2020. For representative use only for presentation of case #WJPA 20-0038.**

**Revetment**

**Sand fill**

**Breakwaters**

**Impacted Areas**

**Site Plan revision showing proposed improvements, submitted October 29, 2020. For representative use only for presentation of case #WJPA 20-0038.**

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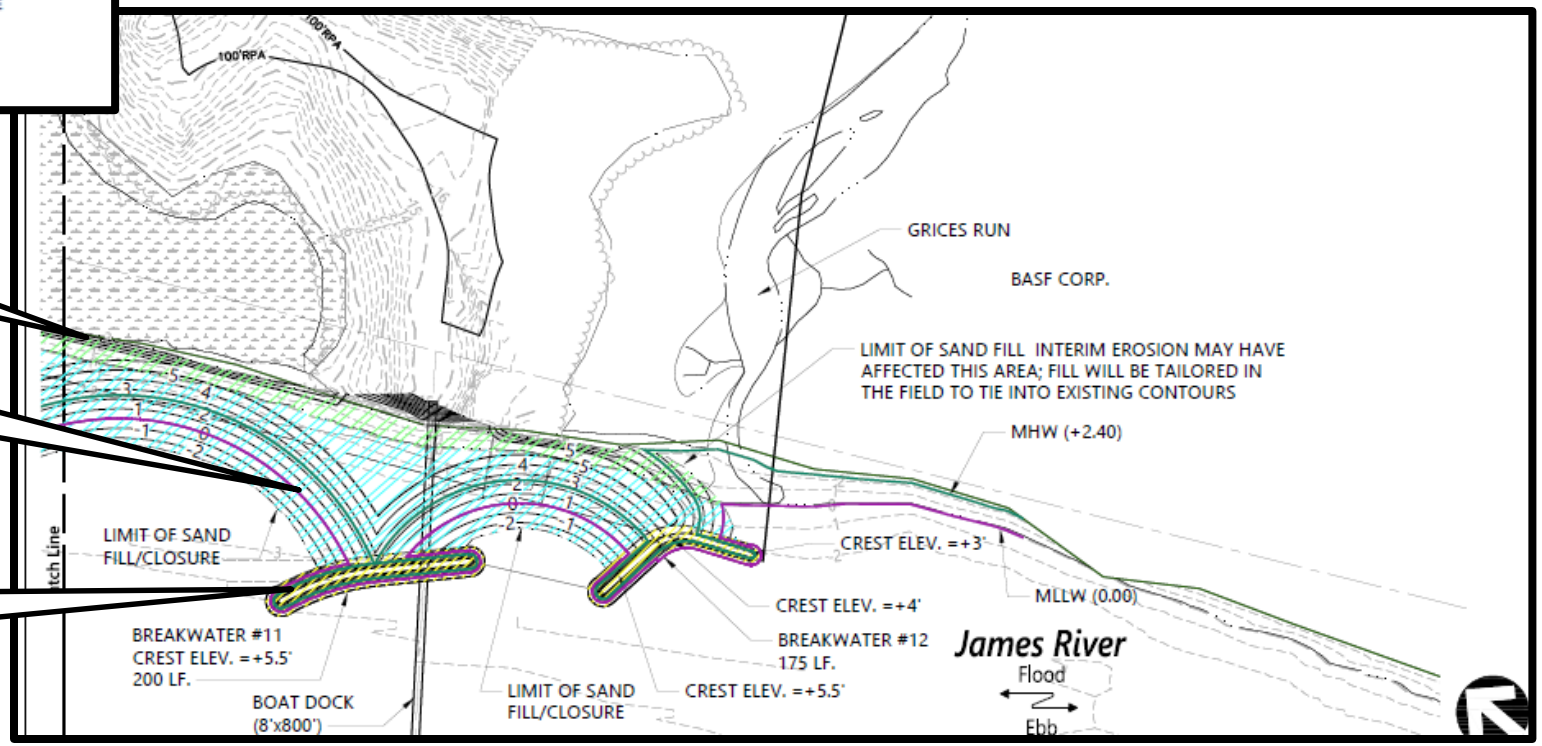
**Revetment**

**Sand fill**

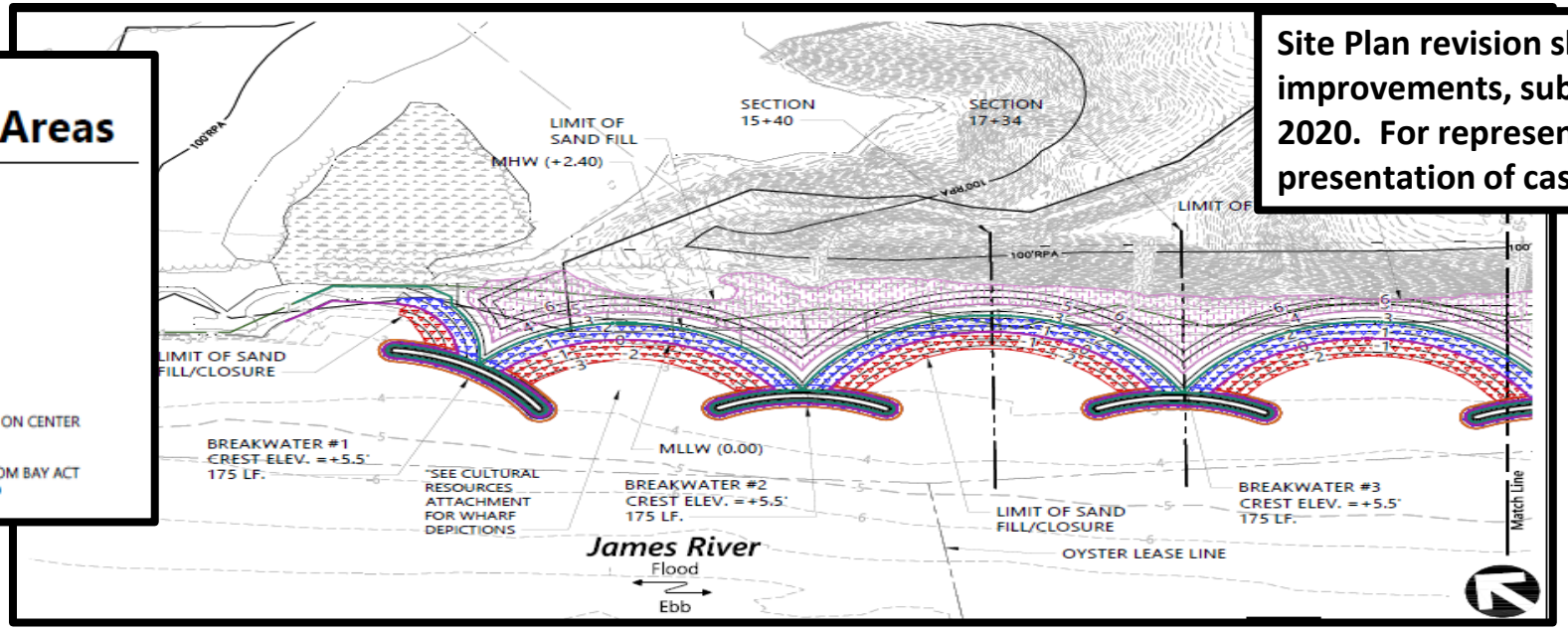
**Breakwater**




**Impacted Areas**

## Total Resulting Habitat Areas

- SUBAQUEOUS SAND HABITAT
  AREA = 104,946 SF
- SUBAQUEOUS ROCK HABITAT
  AREA =12,300 SF
- INTERTIDAL SAND HABITAT
  AREA = 108,754 SF
- INTERTIDAL ROCK HABITAT
  AREA = 41,620 SF
- PLANTING ZONE 1, AREA = 285,595 SF
  BACKSHORE PLANTINGS - SPARTINA PATENS 18" ON CENTER
- PLANTING ZONE 2, AREA = 5,698 SF
  RIPARIAN BUFFER PLANTING TO BE SELECTED FROM BAY ACT
  PLANTING PALLET - SPACING TO BE DETERMINED

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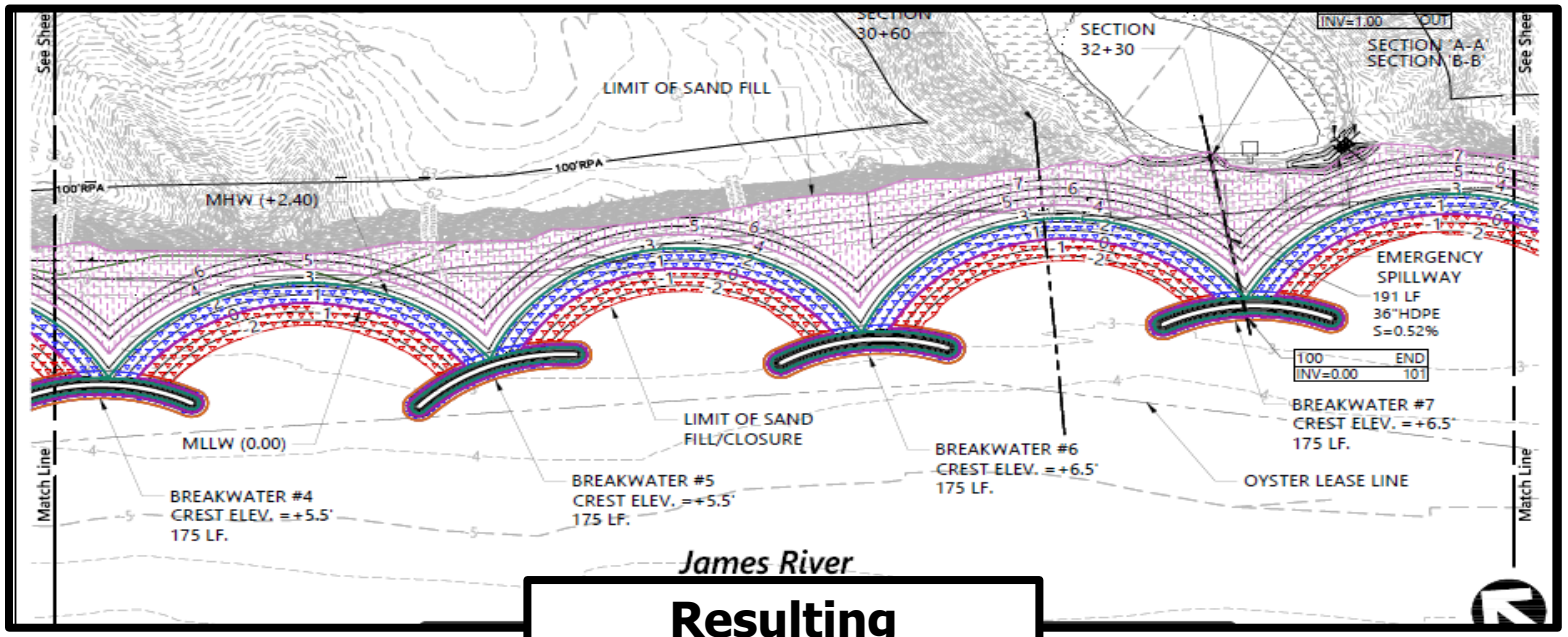


**Resulting Habitat**

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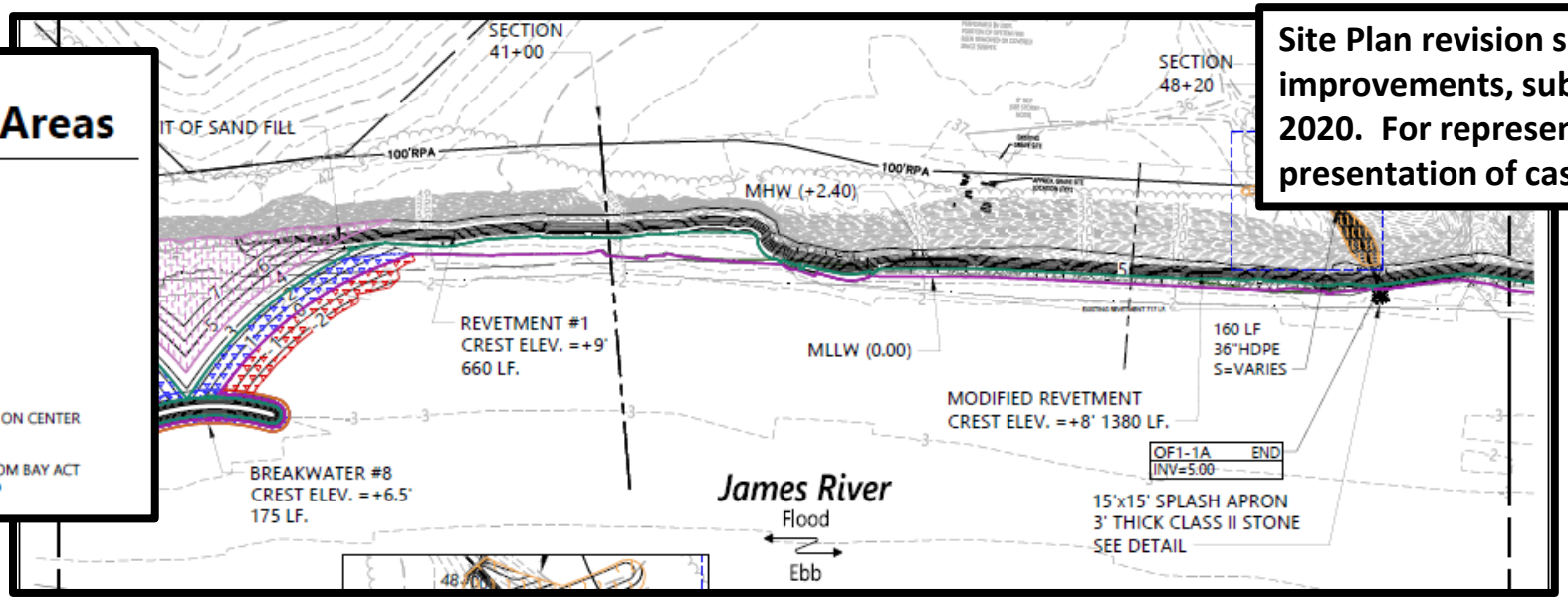


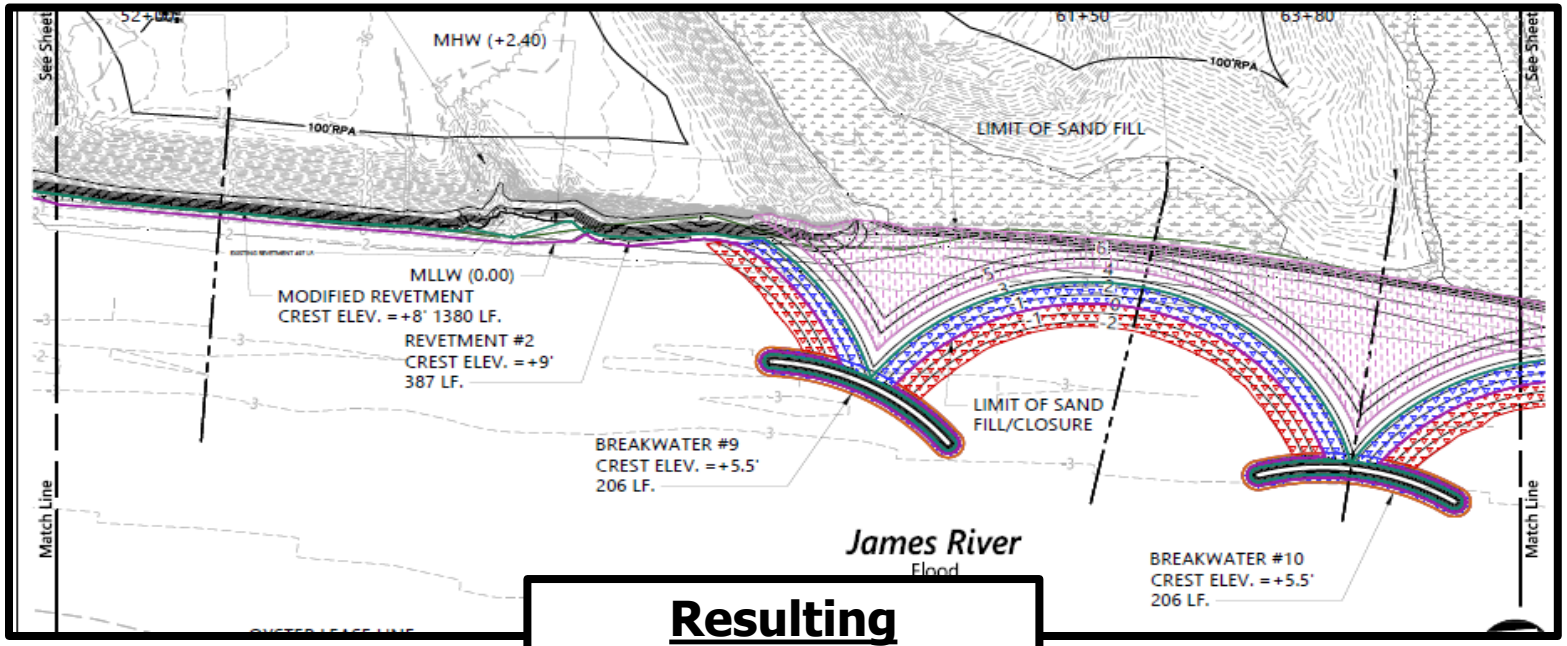


**Resulting Habitat**

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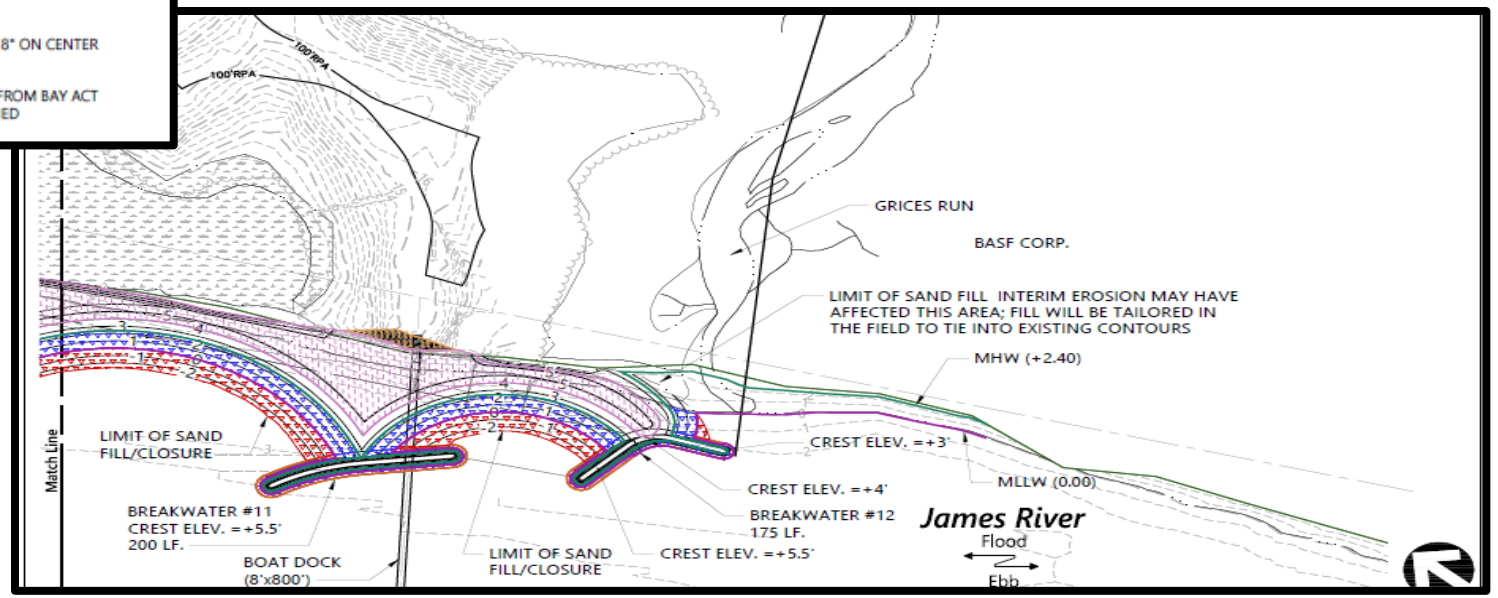


**Resulting Habitat**



**Site Photo #1**
**WJPA 20-0038**
**8797 Pocahontas Trail**



**Site Photo #2**
**WJPA 20-0038**
**8797 Pocahontas Trail**



**Site Photo #3**
**WJPA 20-0038**
**8797 Pocahontas Trail**



**Site Photo #4**
**WJPA 20-0038**
**8797 Pocahontas Trail**



**Site Photo #5**
**WJPA 20-0038**
**8797 Pocahontas Trail**



**Site Photo #6**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Photo #7**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Photo #7**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Photo #8**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Photo #9**
**WJPA 20-0038**
**8797 Pocahontas Trail**


**Site Photo #10**
**WJPA 20-0038**
**8797 Pocahontas Trail**

# Permit Conditions

## Staff Recommended Conditions

- ✓ The applicant must obtain all other necessary local, state, and/or federal permits required for the project.

- ✓ All development activities located in the special flood hazard area shall comply with Article VI, Division 3, Floodplain Area Regulations of the James City County Zoning Ordinance and receive all required approval and permits prior to commencement of such activities.

# Permit Conditions

## Staff Recommended Conditions

- ✓ The backshore planting area shall be planted with *Spartina patens*, approximately 285,600 square feet in area, with 2-inch plugs on an 18-inch spacing in a triangular pattern.

- ✓ A surety in the amount of $20,000 be paid and in place prior to the commencement of work, in a form acceptable to the James City County Attorney's Office, to guarantee plant survival.

- ✓ One half of the surety will be released immediately after planting. The remaining surety will be released once a 90% minimum survival rate is achieved at one-year post planting.

# Permit Conditions

## Staff Recommended Conditions Cont.

- ✓ The Wetlands Permit for this project shall expire on January 13, 2022, if construction has not begun.

- ✓ If an extension of the permit is needed, a written request shall be submitted to the Stormwater and Resource Protection Division no later than December 2, 2021, six weeks prior to the expiration date.

**From:** Frye, Christopher
**To:** jpa.permits@mrc.virginia.gov
**Cc:** Jeffrey Madden; Howell, Beth (MRC); Reynolds, Neville
**Subject:** Carter"s Grove Shoreline Stabilization Project, James City County
**Date:** Thursday, October 22, 2020 8:24:10 PM
**Attachments:** [redacted] Part 1.pdf

---

Please find attached Part 1 of the Carter's Grove Shoreline Stabilization Project. Due to the total size of the permit package we are submitting this application in two separate parts (1 and 2). A second e-mail will be sent containing Part 2.


**Christopher W. Frye**
Senior Project Manager

351 McLaws Circle
Suite 3
Williamsburg, VA 23185-5797
**P** 757.279.2836 | **M** 757.503.3796 | **F** 757.903.2794
cfrye@vhb.com

**Engineers | Scientists | Planners | Designers**
**www.vhb.com**





Received by VMRC October 23, 2020 /blh

October 20, 2020

Ref: 34122.20

Mr. Jeff Madden
Virginia Marine Resources Commission - Habitat Management
380 Fenwick Road
Fort Monroe, VA 23651

Re: Carter's Grove Shoreline Stabilization Project - Joint Permit Application
James City County, VA

Dear Jeff,

This will follow our discussions at the pre-application site visit to Carter's Grove Plantation with Mike Woolson of the James City County Wetlands Board on August 7, 2020. On behalf of the applicant, Carter's Grove Associates LLC, Vanasse Hangen Brustlin, Inc. (VHB) is pleased to submit the enclosed Joint Local State Federal Permit Application for the project which includes the installation of approximately 4,300 linear feet of living shoreline using headland breakwaters along the Carter's Grove waterfront, installation of new revetment and refurbishment of an existing revetment, improvement of existing drainage structures, and construction of new, private pier and covered boat slip along the James River in James City County. This application is consistent with the preliminary plans presented at that meeting, with minor modifications.

Specifically, the project is comprised of 12 free-standing, offshore, armor stone breakwaters and 78,000 cubic yards of sand fill to create 108,754 square feet of stable, sandy, intertidal shoreline and 285,595 square feet of vegetated backshore. Backshore plantings are comprised on planting *Spartina patens* (saltmeadow hay) on 18" centers. Upstream from the mansion is a series of eight (8) breakwaters all 175-feet in length, while the downstream segment has two (2) 206-foot, a 200-foot and a 175-foot breakwater. The project also includes the installation of two new segments of riprap revetment (660 feet and 387 feet) and refurbishing an older revetment for approximately 1,380 feet. Total impacts to non-vegetated inter-tidal wetlands is 96,416 square feet and subaqueous impacts are calculated at 240,558 square feet. The project also includes the installation of an open-pile, timber pier (8-foot wide x 832 feet long) and covered boat lift (1,550 sq. ft.). In addition, a failed concrete drainage channel located in the center of an existing revetment will be replaced with a pipe outfall and a failing spillway from a freshwater pond adjacent to the shoreline will be replaced with a spill box and emergency spillway.

There are several key points that we would like to bring to your attention as you review the application package:

Engineers | Scientists | Planners | Designers

351 McLaws Circle
Suite 3
Williamsburg, Virginia 23185
P 757.220.0500
F 757.903.2794

Cultural Resources. As you are aware, the subject property has a rich history which has been studied extensively since The Colonial Williamsburg Foundation began detailed archeological investigations in the 1970's. We retained The James River Institute of Archeology and Mr. Nick Luccketti to review our project in the context of previous studies and to conduct supplemental field testing in areas not previously covered, but where work was initially contemplated. Similarly, we retained Tidewater Atlantic Research, LLC. to conduct an underwater survey for potential resources. These documents are provided as supporting documentation. As a result of the on-going restoration efforts across the property and the sensitive cultural areas of the site, almost all construction work will be conducted from the water, the exception being replacement of the previously installed concrete swale with a piped outfall. The underwater survey identified potentially significant wharf remains and this area has been avoided as well, except for placement of sand fill over the beach where this structure may have made landfall.

Oyster Leases. There are numerous oyster leases channel-ward of the Carters Grove shoreline and we have included an exhibit depicting these leases. There is no work proposed within any lease boundaries. However, there will be moorings for several barges at various locations along the shoreline. The contractor, Coastal Design & Construction (Jim Gunn), has contacted each lease holder and has obtained their permission to temporarily moor his barges during the construction process. An exhibit depicting his mooring locations has been included in the permit drawings.

Essential Fish Habitat. Due to the potential for anadromous fish within the project vicinity, we have prepared an EFH report which is attached. We have submitted this document directly to Mr. David O'Brien at NOAA, National Marine Fisheries Service.

Coastal Zone Management Consistency. A CZM consistency document has been prepared and submitted to DEQ for its review.

Wetland Impacts. The project will not result in any vegetated tidal impacts and non-vegetated tidal impacts will be offset in-kind by placement of the sand fill and new beaches. Non-tidal wetland impacts are limited to minor square footage at the pond edges, resulting from installation of the new and emergency outfall structures.

Lastly, as you may know, this shoreline stabilization project was a component of the mitigation plan put forth by Dominion Power in its application for permits leading to the installation of the Swift Creek transmission line over the James River, just down-stream of the Carter's Grove shoreline. As such, a portion of the funding is being provided through The Conservation Fund, which is responsible for distribution and oversight of allocation of the mitigation funding. This is a reimbursable program where the owner must submit invoices for the work to receive compensation.

The attached permit application and drawings as well as the noted additional documents provide specific project details for your review and consideration. Upon review, should you have any questions regarding the plan, please feel free to contact me or Chris Frye at (757) 220-0500. We look forward to working with you through the permit process.

Sincerely,

Vanasse Hangen Brustlin, Inc.

R. Neville Reynolds

Senior Principal
rreynolds@VHB.com

Enclosures

cc: James R. Gunn Coastal Design and Construction, Inc.
Samuel Mencoff; Carters Grove Associates LLC.
Jerry Kirby; Kirby Perkins Construction

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Received by VMRC October 23, 2020 /blh

JOINT PERMIT APPLICATION

# Carter's Grove

## Shoreline Stabilization Project

JAMES CITY COUNTY, VIRGINIA

PREPARED ON BEHALF OF

CARTER'S GROVE ASSOCIATES, LLC

October 1, 2020

Received by VMRC October 23, 2020 /blh

- DEQ: Permit application fees required for Virginia Water Protection permits – while detailed in 9VAC25-20 – are conveyed to the applicant by the applicable DEQ office (http://www.deq.virginia.gov/Locations.aspx). Complete the Permit Application Fee Form and submit it per the instructions to the address listed on the form. Instructions for submitting any other fees will be provided to the applicant by DEQ staff.
- VMRC: An application fee of $300 may be required for projects impacting tidal wetlands, beaches and/or dunes when VMRC acts as the LWB. VMRC will notify the applicant in writing if the fee is required. Permit fees involving subaqueous lands are $25.00 for projects costing $10,000 or less and $100 for projects costing more than $10,000. Royalties may also be required for some projects. The proper permit fee and any required royalty is paid at the time of permit issuance by VMRC. VMRC staff will send the permittee a letter notifying him/her of the proper permit fees and submittal requirements.
- LWB: Permit fees vary by locality. Contact the LWB for your project area or their website for fee information and submittal requirements. Contact information for LWBs may be found at http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html.

| **FOR AGENCY USE ONLY** | |
|---|---|
| | Notes: |
| | JPA # **20-1934** |

# APPLICANTS
# Part 1 – General Information

**PLEASE PRINT OR TYPE ALL ANSWERS:** If a question does not apply to your project, please print N/A (not applicable) in the space provided. If additional space is needed, attach 8-1/2 x 11 inch sheets of paper.

| ***Check all that apply*** | | |
|---|---|---|
| Pre-Construction Notification (PCN) ☐<br>NWP # _____<br>(*For Nationwide Permits ONLY - No DEQ-VWP permit writer will be assigned*) | Regional Permit 17 (RP-17) ☐ | |

**County or City in which the project is located:**_____
**Waterway at project site:**_____

***PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK (Include all federal, state, and local pre application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)***

Historical information for past permit submittals can be found online with VMRC - https://webapps.mrc.virginia.gov/public/habitat/ - or VIMS - http://ccrm.vims.edu/perms/newpermits.html

| Agency | Action / Activity | Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13) | Date of Action | If denied, give reason for denial |
|---|---|---|---|---|
| | | | | |
| | | | | |

# Part 1 - General Information (continued)

1. Applicant's legal name* and complete mailing address: Contact Information:
   Home (____)_____
   Work (____)_____
   Fax (____)_____
   Cell (____)_____
   e-mail _____
   State Corporation Commission Name and ID Number (if applicable) _____

2. Property owner(s) legal name* and complete address, if different from applicant: Contact Information:
   Home (____)_____
   Work (____)_____
   Fax (____)_____
   Cell (____)_____
   e-mail _____
   State Corporation Commission Name and ID Number (if applicable) _____

3. Authorized agent name* and complete mailing address (if applicable): Contact Information:
   Home (____)_____
   Work (____)_____
   Fax (____)_____
   Cell (____)_____
   e-mail _____
   State Corporation Commission Name and ID Number (if applicable) _____

*** If multiple applicants, property owners, and/or agents, each must be listed and each must sign the applicant signature page.**

4. Provide a detailed description of the project in the space below, including the type of project, its dimensions, materials, and method of construction. Be sure to include how the construction site will be accessed and whether tree clearing and/or grading will be required, including the total acreage. If the project requires pilings, please be sure to include the total number, type (e.g. wood, steel, etc), diameter, and method of installation (e.g. hammer, vibratory, jetted, etc). If additional space is needed, provide a separate sheet of paper with the project description.

# Part 1 - General Information (continued)

5. Have you obtained a contractor for the project? ___ Yes* ___ No. *If your answer is "Yes" complete the remainder of this question and submit the Applicant's and Contractor's Acknowledgment Form (enclosed)
   Contractor's name* and complete mailing address: Contact Information:
   Home (____)_____
   Work (____)_____
   Fax (____)_____
   Cell (____)_____
   email _____
   State Corporation Commission Name and ID Number (if applicable) _____

*** If multiple contractors, each must be listed and each must sign the applicant signature page.**

6. List the name, address and telephone number of the newspaper having general circulation in the area of the project. Failure to complete this question may delay local and State processing.

   Name and complete mailing address: Telephone number
   (____) _____

7. Give the following project location information:
   Street Address (911 address if available)_____
   Lot/Block/Parcel#_____
   Subdivision_____
   City / County_____ ZIP Code_____
   Latitude and Longitude at Center Point of Project Site (Decimal Degrees):
   _____ / -_____ (Example: 36.41600/-76.30733)

   If the project is located in a rural area, please provide driving directions giving distances from the best and nearest visible landmarks or major intersections. *Note: if the project is in an undeveloped subdivision or property, clearly stake and identify property lines and location of the proposed project. A supplemental map showing how the property is to be subdivided should also be provided.*

8. What are the *primary and secondary purposes of and the need for* the project? For example, the primary purpose may be "to protect property from erosion due to boat wakes" and the secondary purpose may be "to provide safer access to a pier."

# Part 1 - General Information (continued)

9. Proposed use (check one):
   ___ Single user (private, non-commercial, residential)
   ___ Multi-user (community, commercial, industrial, government)

10. Describe alternatives considered and the measures that will be taken to avoid and minimize impacts, to the maximum extent practicable, to wetlands, surface waters, submerged lands, and buffer areas associated with any disturbance (clearing, grading, excavating) during and after project construction. *Please be advised that unavoidable losses of tidal wetlands and/or aquatic resources may require compensatory mitigation.*

11. Is this application being submitted for after-the-fact authorization for work which has already begun or been completed? ___Yes ___No. If yes, be sure to clearly depict the portions of the project which are already complete in the project drawings.

12. Approximate cost of the entire project (materials, labor, etc.): $_____
    Approximate cost of that portion of the project that is channelward of mean low water:
    $_____

13. Completion date of the proposed work:_____-_____

14. Adjacent Property Owner Information: List the name and complete **mailing address**, including zip code, of each adjacent property owner to the project. (NOTE: If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.) Failure to provide this information may result in a delay in the processing of your application by VMRC.


Received by VMRC October 23, 2020 /blh

# Part 2 - Signatures

**1. Applicants and property owners (if different from applicant).**
**NOTE: REQUIRED FOR ALL PROJECTS**

| |
|---|
| **PRIVACY ACT STATEMENT: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.** |
| **CERTIFICATION: I am hereby applying for all permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit.**<br>**In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.** |

Applicant's Legal Name (printed/typed) (Use if more than one applicant)

Applicant's Signature (Use if more than one applicant)

Date

Property Owner's Legal Name (printed/typed) (Use if more than one owner)
(If different from Applicant)

Property Owner's Signature (Use if more than one owner)

Date



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## Part 2 – Signatures (continued)

*2. Applicants having agents (if applicable)*

**CERTIFICATION OF AUTHORIZATION**

I (we), Samuel M. Mencoff, hereby certify that I (we) have authorized Neville Reynolds, VHB
(Applicant's legal name(s)) (Agent's name(s))
to act on my behalf and take all actions necessary to the processing, issuance and acceptance of this permit and any and all standard and special conditions attached.

We hereby certify that the information submitted in this application is true and accurate to the best of our knowledge.

(Agent's Signature) (Use if more than one agent)

October 15, 2020
(Date)

(Applicant's Signature) (Use if more than one applicant)

10/1/20
(Date)

*3. Applicant's having contractors (if applicable)*

**CONTRACTOR ACKNOWLEDGEMENT**

I (we), Samuel M. Mencoff, have contracted James R. Gunn, CD&C
(Applicant's legal name(s)) (Contractor's name(s))
to perform the work described in this Joint Permit Application, signed and dated _____.

We will read and abide by all conditions set forth in all Federal, State and Local permits as required for this project. We understand that failure to follow the conditions of the permits may constitute a violation of applicable Federal, state and local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes. In addition, we agree to make available a copy of any permit to any regulatory representative visiting the project to ensure permit compliance. If we fail to provide the applicable permit upon request, we understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all terms and conditions.

James R. Gunn, COASTAL DESIGN & CONSTR., INC
Contractor's name or name of firm

P.O. Box 650 Gloucester, VA 23061
Contractor's or firms address

Contractor's signature and title

2701-015499A
Contractor's License Number

Applicant's signature

(use if more than one applicant)

10/1/20
Date



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# Part 3 – Appendices

Please complete and submit the appendix questions applicable to your project, and attach the required vicinity map(s) and drawings to your application. If an item does not apply to your project, please write "N/A" in the space provided.

---

**Appendix A: (TWO PAGES) Projects for Access** to the water such as private and community piers, boathouses, marinas, moorings, and boat ramps. Answer all questions that apply.

1. **Briefly describe your proposed project**.

2. **For private, noncommercial piers:**
   Do you have an existing pier on your property? ____Yes____ No
   If yes, will it be removed? ____Yes ____No
   Is your lot platted to the mean low water shoreline? ____Yes ____No
   What is the overall length of the proposed structure? _____feet.
   Channelward of Mean High Water? _____feet.
   Channelward of Mean Low Water? _____feet.
   What is the area of the piers and platforms that will be constructed over
   Tidal non-vegetated wetlands _____ square feet.
   Tidal vegetated wetlands _____ square feet.
   Submerged lands _____square feet.
   What is the total size of any and all L- or T-head platforms?_____sq. ft.
   For boathouses, what is the overall size of the roof structure? _____sq. ft.
   Will your boathouse have sides?_____Yes____ No.

   NOTE: All proposals for piers, boathouses and shelter roofs must be reviewed by the Virginia Marine Resources Commission (Commission or VMRC), however, pursuant to § 28.2-1203 A 5 of the Code of Virginia a VMRC permit may not be required for such structures (except as required by subsection D of § 28.2-1205 for piers greater than 100 feet in length involving commercially productive leased oyster or clam grounds), provided that (i) the piers do not extend beyond the navigation line or private pier lines established by the Commission or the United States Army Corps of Engineers (USACE), (ii) the piers do not exceed six feet in width and finger piers do not exceed five feet in width, (iii) any L or T head platforms and appurtenant floating docking platforms do not exceed, in the aggregate, 400 square feet, (iv) if prohibited by local ordinance open-sided shelter roofs or gazebo-type structures shall not be placed on platforms as described in clause (iii), but may be placed on such platforms if not prohibited by local ordinance, and (v) the piers are determined not to be a navigational hazard by the Commission. Subject to any applicable local ordinances, such piers may include an attached boat lift and an open-sided roof designed to shelter a single boat slip or boat lift. In cases in which open-sided roofs designed to shelter a single boat, boat slip or boat lift will exceed 700 square feet in coverage or the open-sided shelter roofs or gazebo structures exceed 400 square feet, and in cases in which an adjoining property owner objects to a proposed roof structure, permits shall be required as provided in § 28.2-1204.


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## Part 3 – Appendices (continued)

3. **For USACE permits**, in cases where the proposed pier will encroach beyond one fourth the waterway width (as determined by measuring mean high water to mean high water or ordinary high water mark to ordinary high water mark), the following information must be included before the application will be considered complete. For an application to be considered complete:

   a. The USACE MAY require depth soundings across the waterway at increments designated by the USACE project manager. Typically 10-foot increments for waterways less than 200 feet wide and 20-foot increments for waterways greater than 200 feet wide with the date and time the measurements were taken and how they were taken (e.g., tape, range finder, etc.).
   b. The applicant MUST provide a justification as to purpose if the proposed work would extend a pier greater than one-fourth of the distance across the open water measured from mean high water or the channelward edge of the wetlands.
   c. The applicant MUST provide justification if the proposed work would involve the construction of a pier greater than five feet wide or less than four feet above any wetland substrate.

4. Provide the type, size, and registration number of the vessel(s) to be moored at the pier or mooring buoy.

   Type Length Width Draft Registration #
   _____
   _____
   _____

5. For **Marinas, Commercial Piers, Governmental Piers, Community Piers and other non-private piers**, provide the following information:
   A) Have you obtained approval for sanitary facilities from the Virginia Department of Health?_____ (required pursuant to Section 28.2-1205 C of the Code of Virginia).
   B) Will petroleum products or other hazardous materials be stored or handled at your facility?_____.
   C) Will the facility be equipped to off-load sewage from boats?_____.
   D) How many wet slips are proposed?_____. How many are existing?_____.
   E) What is the area of the piers and platforms that will be constructed over
      Tidal non-vegetated wetlands _____ square feet
      Tidal vegetated wetlands _____ square feet
      Submerged lands _____square feet

6. For **boat ramps**, what is the overall length of the structure?_____feet.
   From Mean High Water?_____feet.
   From Mean Low Water?_____feet.

   Note: drawings must include the construction materials, method of installation, and all dimensions. If tending piers are proposed, complete the pier portion.
   **Note: If dredging or excavation is required, you must complete the Standard Joint Point Permit application.**


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# Part 3 – Appendices (continued)

**Appendix B: Projects for Shoreline Stabilization** in tidal wetlands, tidal waters and dunes/beaches including riprap revetments and associated backfill, marsh toe stabilization, bulkheads and associated backfill, breakwaters, beach nourishment, groins, jetties, and living shoreline projects. Answer all questions that apply. Please provide any reports provided from the Shoreline Erosion Advisory Service or VIMS**.**

**NOTE:** It is the policy of the Commonwealth that living shorelines are the preferred alternative for stabilizing tidal shorelines (Va. Code § 28.2-104.1). **Information on non-structural, vegetative alternatives (i.e., Living Shoreline) for shoreline stabilization is available at http://ccrm.vims.edu/coastal_zone/living_shorelines/index.html.**

1. Describe each **revetment, bulkhead, marsh toe, breakwater, groin, jetty, other structure, or living shoreline project** separately in the space below. Include the overall length in linear feet, the amount of impacts in acres, and volume of associated backfill below mean high water and/or ordinary high water in cubic yards, as applicable:

2. What is the maximum encroachment channelward of mean high water?_____feet.
   Channelward of mean low water?_____feet.
   Channelward of the back edge of the dune or beach?_____feet.

3. Please calculate the square footage of encroachment over:
   - Vegetated wetlands _____square feet
   - Non-vegetated wetlands _____square feet
   - Subaqueous bottom _____square feet
   - Dune and/or beach _____square feet

4. For bulkheads, is any part of the project maintenance or replacement of a previously authorized, currently serviceable, existing structure? ____ Yes____ No.

   If yes, will the construction of the new bulkhead be no further than two (2) feet channelward of the existing bulkhead? _____Yes ____No.

   If no, please provide an explanation for the purpose and need for the additional encroachment.


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# Part 3 – Appendices (continued)

5. Describe the type of construction and **all** materials to be used, including source of backfill material, if applicable (e.g., vinyl sheet-pile bulkhead, timber stringers and butt piles, 100% sand backfill from upland source; broken concrete core material with Class II quarry stone armor over filter cloth).
   **NOTE**: **Drawings must include construction details, including dimensions, design and all materials, including fittings if used**.

6. If using stone, broken concrete, etc. for your structure(s), what is the average weight of the:
   Core (inner layer) material_____ pounds per stone Class size _____
   Armor (outer layer) material _____ pounds per stone Class size _____

7. For **beach nourishment**, including that associated with breakwaters, groins or other structures, provide the following:

   - Volume of material
     _____ cubic yards channelward of mean low water
     _____ cubic yards landward of mean low water
     _____ cubic yards channelward of mean high water
     _____ cubic yards landward of mean high water

   - Area to be covered
     _____ square feet channelward of mean low water
     _____ square feet landward of mean low water
     _____ cubic yards channelward of mean high water
     _____ cubic yards landward of mean high water

   - Source of material, composition (e.g. 90% sand, 10% clay):_____
   - Method of transportation and placement:

     _____

   - Describe any proposed vegetative stabilization measures to be used, including planting schedule, spacing, monitoring, etc. Additional guidance is available at http://www.vims.edu/about/search/index.php?q=planting+guidelines:


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# *Project Technical Summary*

| Project Number | | Date |
|---|---|---|
| 34122.20 | Carter's Grove Associates LLC – Shoreline Stabilization and Water Access Project | 10/20/2020 |

## Introduction

Carter's Grove is a privately-owned historic property comprised of 466 acres situated along the James River, located just downstream from Kingsmill Resort in James City County. This historic site is listed on the National Register of Historic Places and is the original plantation home of the Carter family during colonial America. A conservation easement has been granted to the Virginia Department of Historic Resources (VDHR) and the Virginia Outdoors Foundation (VOF) over the property by previous owners to limit uses of the property for the protection of natural resources, as well as to preserve the historic character of the site. The waterfront property has approximately 7,500 linear feet of shoreline that exhibits variable conditions including low eroding escarpments, barrier beaches in front of emergent wetland systems, steep eroding bluffs up to 40 feet high, and several short reaches of stabilized shoreline (JPA Sheets 1 and 2).

In 2017, Dominion Energy received permit authorization to install an overhead powerline crossing of the James River near Carters Grove. As mitigation for project impacts, Dominion Energy agreed to fund a shoreline stabilization project for the purpose of preserving the historic landscape and cultural resources that occur on the site. The project will ensure protection of underground historic artifacts that may occur on top of the shoreline bluff adjacent to the eroding shoreline and ensure preservation of the overall historic landscape, pristine character, and setting of the property as a Colonial Period plantation. The project will also enhance water quality of the James River by reducing sediment loads currently eroding into the river from collapsing exposed banks and bluffs, some of which are over 60 feet high.

This document will outline the site conditions that have been considered in the development of a living shoreline stabilization design for the Carter's Grove shoreline. The plans have been developed to be compatible with the historic property and cultural resources while maintaining a high standard of protection for the shoreline and the natural resources that exist there. The goal is to increase shoreline resiliency from large storm events and to reduce long-term vulnerability of the uplands from sea level rise. The owner also wishes to install a private pier and boathouse that is located at the downstream extents of the property.

## Existing Conditions

### Existing Infrastructure

The upstream segment of the project area is comprised of relatively untouched shoreline that varies from a barrier beach fronting a freshwater pond and emergent wetland to steeply sloping banks that rise up to approximately 60 feet in height. A series of dilapidated timber groins can be seen at the upstream end of the proposed project that were installed in the mid-1970's under permit #76-0521. Near the pond another series of dilapidated groins can be seen that were installed in the early 1970's under permit #73-0538 as erosion protection along the beach area fronting the freshwater pond.

Downstream from the pond the high bluffs and shoreline continue as untouched features for approximately 900 feet at which point the shoreline has been manipulated. In the late-1970's a permit (#79-0461) was obtained to construct approximately 500 linear feet of revetment along the shoreline, fronting the archaeological site known as Wolstenholme Town. This site contained various features,



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including grave sites near the top of the bluff. Portions of the revetment were constructed into the river, the banks were regraded and fill was placed behind the revetment to tie into the top of bluff without disturbing the archaeological site. A concrete swale was also constructed to direct upland runoff downslope and onto the revetment. These features all currently exist although their condition has deteriorated over the 40 years that they have been in place.

Another revetment project was permitted and installed (#89-0512) that was comprised of 450 feet of new riprap revetment and bank grading. This segment of work abuts the 1979 revetment and also included a concrete swale at the downstream end of the work to manage upland runoff. Continuing downstream from this point there are no shore protection measures where the barrier beach fronts a broad palustrine wetland and then an estuarine wetland. At the very downstream end of the property there is a series of three timber groins just upstream of Grices Run.

## Cultural/Archaeological Resources

Carter's Grove Plantation is a National Historic Landmark that encompasses approximately 466 acres that includes a 1755 mansion, farm fields, lawns and woods, though it was far larger in the past (Kelso 1972:74; Boroughs 2008: i, 15-19). A significant number of investigations have occurred on the property over the years that have identified 15 archaeological sites (see Figures 1-3 in Attachment D). In addition, significant Native American occupation of the site dates back into the Middle Woodland period (c. 500 B.C. – A.D. 900), while the first European settlers arrived in 1618. Initially known as "Martin's Hundred," the plantation was renamed "Carter's Grove" upon the death of owner Robert 'King' Carter in 1732.

A conservation easement has been granted to the Virginia Department of Historic Resources (VDHR) and the Virginia Outdoors Foundation (VOF) over the property by previous owners to limit uses of the property for the protection of natural resources, as well as the historic character of the site. Further details on the historical aspects of the property can be found in Attachment D, which summarizes the landside and waterside cultural/archaeological resources identified previously and recently.

## Topographic/Bathymetric Survey

Physical surveys were conducted along much of the shoreline/bluff in July 2018 and September 2020. For the topographic surveys the horizontal and vertical datums were established using a GPS static session and processing using OPUS GPS solution. A hydrographic survey was conducted by Waterway Surveys & Engineering Ltd. in April 2018. Soundings were referenced to mean lower low water datum as established by the National Ocean Survey (NOS) Tidal Epoch 1983-2001.

## Wetland Delineation

VHB wetland scientists identified jurisdictional boundaries on the 466-acre property during field investigations in January and February of 2016. A preliminary jurisdictional determination was received from the U.S. Army Corps of Engineers on May 18, 2016. No vegetated, tidal wetlands were identified along the barrier beaches of the Carter's Grove shoreline. However, several ravines that extend into the uplands and daylight at the beach were delineated as jurisdictional wetlands. The following describes the identified wetlands that can be seen on Sheet 2 of the JPA drawings (Attachment A).

*PFO Wetlands* - Palustrine forested (PFO) wetlands are associated with stream floodplains found within the Johnston complex soil type. Dominant trees include green ash *(Fraxinus pennsylvanica)*, red maple *(Acer rubrum)*, sweet-gum *(Liquidambar styraciflua)*, and American sycamore *(Plantanus occidentalis)*. Ground cover plants include jewelweed *(Impatiens capensis)*, lizard's tail *(Saururus cernuus)*, Japanese stiltgrass *(Microstegium vimineum)*, and manna grass *(Glyceria striata)*. Hydrophytic Vegetation Indicator 2 (Dominance Test) and the F3 (Depleted Matrix) hydric soil indicator are commonly present. The A7 soil indicator (5 cm Mucky Mineral) is common along the toe of the ravines where heavy groundwater discharges are present. Wetland hydrology indicators consist of sediment deposits, water-stained leaves, a high water table, and soil saturation.

*PEM Wetlands* - Palustrine emergent (PEM) wetlands occur at the lower end of the drainageways dominated by river edge sedge *(Carex hyalinolepis)*, soft rush *(Juncus effusus)*, and arrow arum *(Peltandra virginica)* intermixed with common reed *(Phragmites australis)*. Scattered bald cypress *(Taxodium distichum)* trees are commonly found along the edges. PEM wetlands were recorded with

Hydrophytic Vegetation Indicator 2 (Dominance Test) with the A3 (black histic), A7 (5 cm Mucky Mineral), or A9 (1 cm Muck) hydric soil indicator, and primary wetland hydrology indicators of standing water and soil saturation.

*E2EM Wetlands* - The estuarine emergent marshes are tidally influenced system located at the southeastern and northwestern ends of the property associated with Grices Creek and Grove Creek. These areas maintain the Bohicket soil type with salt marsh cordgrass *(Spartina alterniflora)* as the dominant plant species mixed with big cordgrass *(Spartina cynosuroides)* and patches of cattails *(Typha latifolia).*

### Chesapeake Bay Preservation Area Determination

VHB conducted a Chesapeake Bay Preservation Area (CBPA) determination within the 466-acre property in March 2016. The determination provided a site-specific Resource Protection Area (RPA) boundary that was reviewed and approved by James City County on September 14, 2016. Approved RPA boundaries are depicted on the JPA permit drawings (Attachment A).

### Submerged Aquatic Vegetation (SAV)

VHB consulted the Virginia Institute of Marine Science online SAV mapping tool for the area and determined that no SAV has been identified within this reach of the James River. Further, no SAV has been observed during field investigations. This is likely due to the high turbidity levels and low-light conditions observed in this segment of the river.

### Public and Private Oyster Grounds

The Virginia Marine Resources Commission online mapping tool was utilized to determine if any public or private oyster grounds were within the vicinity of the project. The nearest public ground is located approximately 2 miles downstream from the project. However, several private leases can be found immediate offshore from the project with lease #20825 present along the majority of the project (Sheet 2, Attachment A). It is noted that these leases are located within a permanent shellfish condemnation zone #059-067 that is in place due to the Hampton Roads Sanitation District sewage treatment plant outfall located within the James River.

### Hydrodynamic Setting

The mean tidal range in the area of the project is 2.27 feet. Hurricane Isabel is considered the storm of record for this area with a storm surge elevation of approximately +10.2 feet (mllw)(VIMS, 2005). The greatest fetch at this location is the SSW direction at approximately 12 miles, while the W and WNW fetches range between 6 and 8.5 miles, respectively. Storm waves can be significant on this open segment of the James River and so the design must take this into consideration with respect to the type, size, and position of coastal structures.

## Proposed Plan

Project includes the installation approximately 4,300 linear feet of living shoreline along the Carter's Grove waterfront, in two separate segments. In total the project is comprised of 12 free-standing, offshore, armor stone breakwaters and 94,500 cubic yards of sand fill to create 108,754 square feet of stable, sandy, intertidal shoreline and 285,595 square feet of vegetated backshore. The upstream segment contains a series of eight (8) offshore breakwaters all 175-feet in length, while the downstream segment has two (2) 206-foot breakwaters, a 200-foot, and a 175-foot breakwater. The project also includes the installation of two new segments of riprap revetment for a total 1,047 linear feet. In addition, 1,380 linear feet of existing riprap revetment will be refurbished by regrading and re-armoring the structure with larger armor stone. Approximately 78,000 cubic yards of clean, beach-quality sand will be placed behind the breakwaters in the configuration shown to develop stable beaches that will protect the base of the bluffs that remain ungraded.

Several runoff conveyance improvements are proposed as part of the project. At Station 32+30 a 36-inch pipe and control structure will be installed from the freshwater pond, through the created beach, and outfall on the channelward portion of breakwater #7. An emergency overflow structure is also proposed at the pond that will convey higher runoff events across the face of the beach embayment between breakwaters #7 and #8. The other runoff improvement occurs along the segment of existing revetment construction in the 1970's, described

above, that included a concrete swale/ditch. This feature and associated ravine no longer have a defined conveyance as erosion has altered the drainage patterns. The proposed plan includes construction of a low, earthen berm perpendicular to the flow patter to allow for collection and conveyance of runoff through a proposed 36-inch pipe. The buried pipe (Sta 48+20) will carry runoff to the base of the reconstructed revetment and discharge onto a 15' x 15' splash apron (Sheet 15, Attachment A).

The property owner wishes to construct a private, non-commercial, open-pile pier that is located at the downstream end of the property near Grices Run. The pier is proposed to be 8-foot wide by 832 feet long and will have an open-sided, covered slip at the channelward end of the pier. The dimensions on the roofline of the covered structure are 55.3' x 28' for approximately 1,550 square feet. Minor bank grading will occur at the landfall end of the pier.

Finally, as part of the construction process, authorization for temporary barge mooring is being requested. Ten mooring locations are proposed and depicted on Sheet 3 of the JPA drawings (Attachment A). The moorings are located in two oyster leases #20825 and #21975.

## Impacts

Wetlands:
The pond drainage structure at Sta. 32+30 is estimated to have an impact on 80 square feet of Palustrine Emergent Wetland (PEM). The updated structure and pipe will not change the current normal water surface elevation and so no impacts are expected to the wetlands surrounding the pond. There are no vegetated tidal wetland impacts associated with the shoreline stabilization project. Sand fill placement will impact 96,416 square feet of non-vegetated, intertidal wetlands (E2US) and the proposed revetment work will impact 12,084 square feet of non-vegetated, intertidal wetlands (E2US).

Subaqueous Bottom:
Sand fill associated with the living shoreline project will impact 158,844 square feet of subaqueous bottom (E2UB). The breakwater structures will impact 81,714 square feet of subaqueous bottom (E2UB). The placement of breakwaters and sand have avoided any impacts to the adjacent private oyster leases. Temporary moorings located at 10 positions will have only a temporary impact on the bottom. The marine contractor, Coastal Design & Construction, has directly coordinated the moorings with the leaseholders and they voiced no concerns. It is noted that two oyster rock areas were identified by the leaseholder of #20825 and the mooring plan has avoided these areas.

Resource Protection Area:
Two small RPA areas within the project boundaries are proposed for clearing, grading, and revegetation. The ravine located at Sta. 48+20 has approximately 6,000 square feet of disturbance associated with regrading the conveyance and ravine, and construction of an earthen berm. This area will be revegetated with appropriate, native, riparian buffer plantings that will detailed in a separate RPA Reforestation Plan submitted to the County. Another RPA impact area is located at the landward end of the private pier. Minor bank grading is required in this location to make a smooth transition with the dock construction. This area will also be included in the aforementioned RPA Reforestation Plan to be submitted to the County.

Cultural/Archaeological Resources:
The attached report contained in Attachment D that was prepared by the James River Institute for Archaeology, concludes that the project will not affect any of the documented resources. In addition, no coastal structures are proposed to be placed within the recommended wharf avoidance buffer outlined by Tidewater Atlantic Research, Inc., further supporting the no affect determination.

Threatened and Endangered Species:
Identified species include the Northern Long-eared bat (*Myotis septentrionalis*), Atlantic sturgeon (*Acipenser oxyrinchus*), and the bald eagle (*Haliaeetus leucocephalus*). The project includes small areas of tree clearing at the ravine and pier landing. Clearing would be conducted outside the time-of-year restriction for bats and therefore no impact to this species is anticipated. Attachment C includes the NLAA verification form covering Atlantic and Shortnose sturgeon. Impacts to these species and their habitat have been demonstrated as being insignificant given the width of the waterway is 2.75 miles at the project location, there are no impacts to SAV

habitat, and there are no impacts to spawning grounds associated with these species. In addition, soft start procedures will be employed during the pier installation to provide the opportunity for these fishes and others to leave the area prior to full energy pile driving. The bald eagle nest has been documented as being active in 2020 and so we have initiated coordination with the USFWS regional bald eagle coordinator, Mr. Tom Wittig.

## Created Habitats

Wetlands and Subaqueous Areas:
The living shoreline plan will result in the creation of 285,595 square feet of backshore plantings comprised of *Spartina patens* planted on 18" centers. Plantings occur above the proposed +4' contour and extend to the landward tie in point of the backshore terrace. The shoreline plan will create 108,754 square feet of sandy intertidal zone which is a 13% increase over the reported impacts. New rocky intertidal areas are calculated at 41,620 square feet. Sand fill slopes that will reside below mean low water total approximately 104,946 square feet, while rocky subaqueous areas total 12,300 square feet.

## Conclusions:

The shoreline stabilization plan for Carter's Grove has been developed to ensure stable embayments and backshore beaches along the 4,300 linear feet of shoreline being protected, which includes a significant stretch of eroding bluffs. The created backshore areas will provide protection to the base of the bluffs from waves generated during high energy events. The design also transitions the backshore beaches into those areas of unique wetlands perched within several large drainages that intersect the James River shoreline. Impacts from the revetment rehabilitation and new construction are limited to non-vegetated, intertidal wetlands and those footprints are being minimized to the greatest extend possible. Construction is being conducted from the channelward side to avoid impacts to the cultural/archeological resources located on Carter's Grove uplands and the wharf avoidance buffer is being respected at the waterfront.

The majority of the impacts are associated with the living shoreline improvements, which are considered as the preferred methodology for stemming shoreline erosion. This is also in conformance with the SB 776 which requires the Marine Resources Commission to only approve living shoreline approaches to shoreline stabilization. This has been followed to greatest extend practicable, but areas of the revetment rehabilitation and new construction were selected because of efficiency, cost, and limiting impacts. Accordingly, we respectfully request authorization to implement the subject shoreline stabilization plan for Carter's Grove.

# Attachment A

## Permit Drawings

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SOURCE: USGS QUADRANGLE YORKTOWN AND HOG ISLAND


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# CARTERS GROVE SHORELINE STABILIZATION

## LOCATION MAP

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 1**

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WETLAND DELINEATION WAS COMPLETED BY VHB ON FEBRUARY 21, 2016 AND CONFIRMED BY THE U.S. ARMY CORPS OF ENGINEERS ON MAY 18, 2016.

0 500 1000 2000 Feet

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# CARTERS GROVE SHORELINE STABILIZATION

## AERIAL AND WETLANDS MAP

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
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**SHEET 2**

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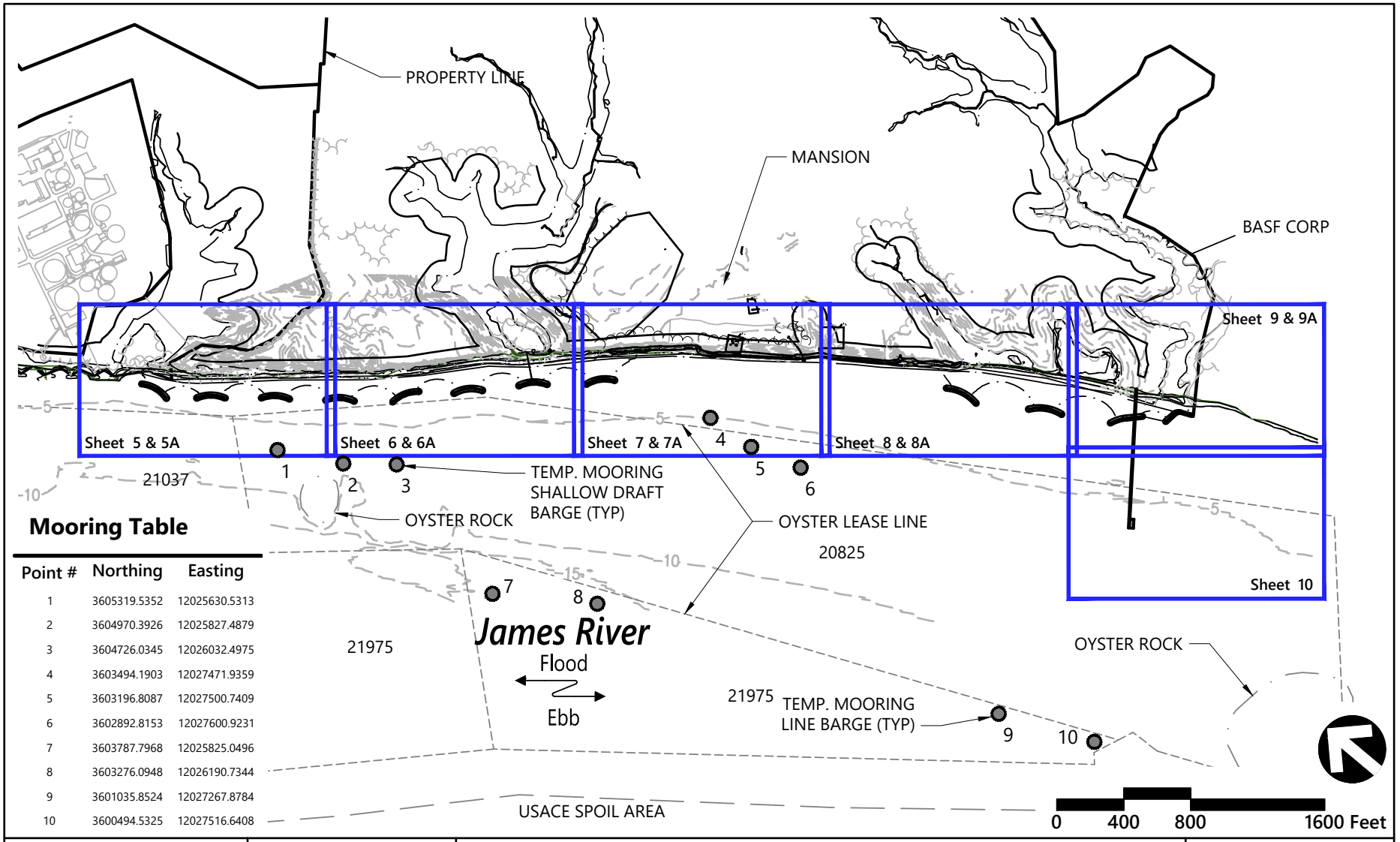


## Mooring Table

| Point # | Northing | Easting |
|---|---|---|
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| 2 | 3604970.3926 | 12025827.4879 |
| 3 | 3604726.0345 | 12026032.4975 |
| 4 | 3603494.1903 | 12027471.9359 |
| 5 | 3603196.8087 | 12027500.7409 |
| 6 | 3602892.8153 | 12027600.9231 |
| 7 | 3603787.7968 | 12025825.0496 |
| 8 | 3603276.0948 | 12026190.7344 |
| 9 | 3601035.8524 | 12027267.8784 |
| 10 | 3600494.5325 | 12027516.6408 |

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# CARTERS GROVE SHORELINE STABILIZATION

## SHEET INDEX, TEMP. MOORING LOCATIONS & PRIVATE OYSTER LEASES

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
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**REVISED:**
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**SHEET 3**

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# Total Impact Areas

SAND FILL BELOW
MLW (+0.13) AREA = 158,844 SF (E2UB)

SAND FILL BETWEEN MLW (+0.13) AND
MHW (+2.40) AREA = 96,416 SF (E2US)

REVETMENT IMPACT BETWEEN MLW (+0.13)
AND MHW (+2.40) AREA = 12,084 SF (E2US)

BREAKWATER IMPACT BELOW
MLW (+0.13) AREA = 81,714 SF (E2UB)

POND SPILL BOX AND REPLACEMENT
EMERGENCY SPILLWAY STRUCTURE
IMPACT AREA = 130 SF (PEM)

# Notes

## General

1. WETLAND DELINEATION WAS COMPLETED BY VHB ON FEBRUARY 21, 2016 AND CONFIRMED BY THE U.S. ARMY CORPS OF ENGINEERS ON MAY 18, 2016.

2. HYDROGRAPHIC SURVEY CONDUCTED BY WATERWAY SURVEYS & ENGINEERING, LTD. ON APRIL 18 & 26, 2018.

3. TOPOGRAPHIC DATA IS A COMPILATION OF PREVIOUSLY CONDUCTED GROUND AND LIDAR SURVEYS. VHB SURVEY CONDUCTED SUPPLEMENTAL GROUND SURVEYS ALONG THE SHORELINE ON JULY 2018 AND SEPTEMBER 2020.

# Total Resulting Habitat Areas

SUBAQUEOUS SAND HABITAT
AREA = 104,946 SF

SUBAQUEOUS ROCK HABITAT
AREA =12,300 SF

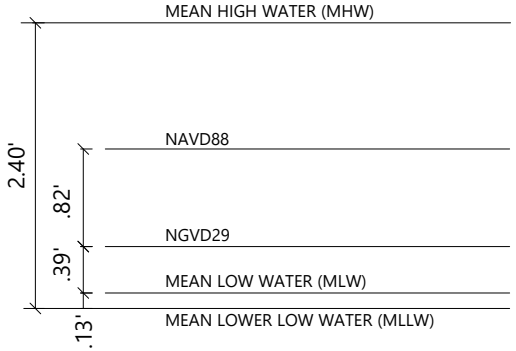
INTERTIDAL SAND HABITAT
AREA = 108,754 SF

INTERTIDAL ROCK HABITAT
AREA = 41,620 SF

PLANTING ZONE 1, AREA = 285,595 SF
BACKSHORE PLANTINGS - SPARTINA PATENS 18" ON CENTER

PLANTING ZONE 2, AREA = 5,698 SF
RIPARIAN BUFFER PLANTING TO BE SELECTED FROM BAY ACT
PLANTING PALLET - SPACING TO BE DETERMINED

# Diagram Of Datum Plane

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**CARTERS GROVE SHORELINE STABILIZATION**
**LEGEND AND GENERAL NOTES**

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

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**SHEET 4**

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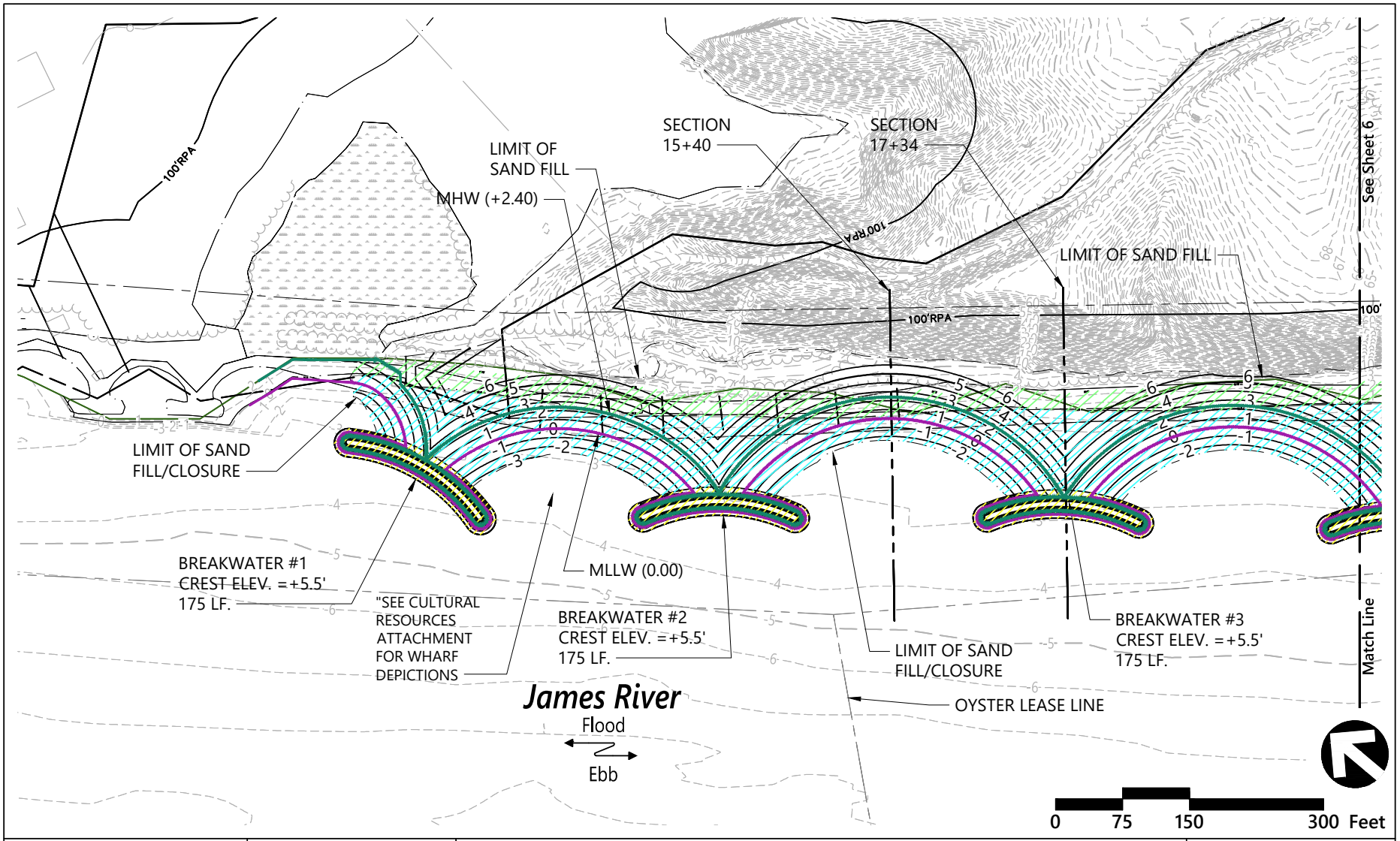


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# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
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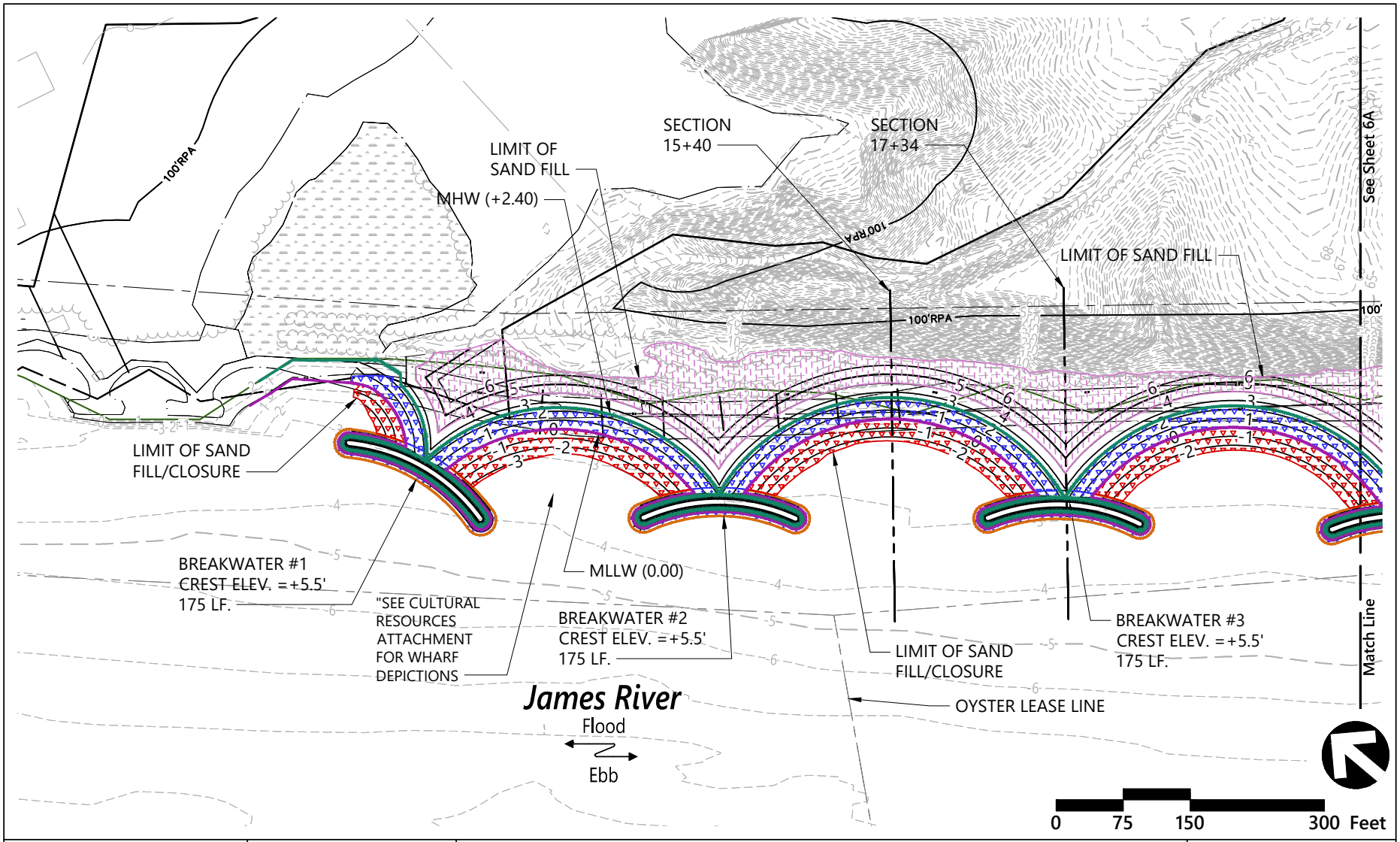


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# CARTERS GROVE SHORELINE STABILIZATION

## RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
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**SHEET 5A**

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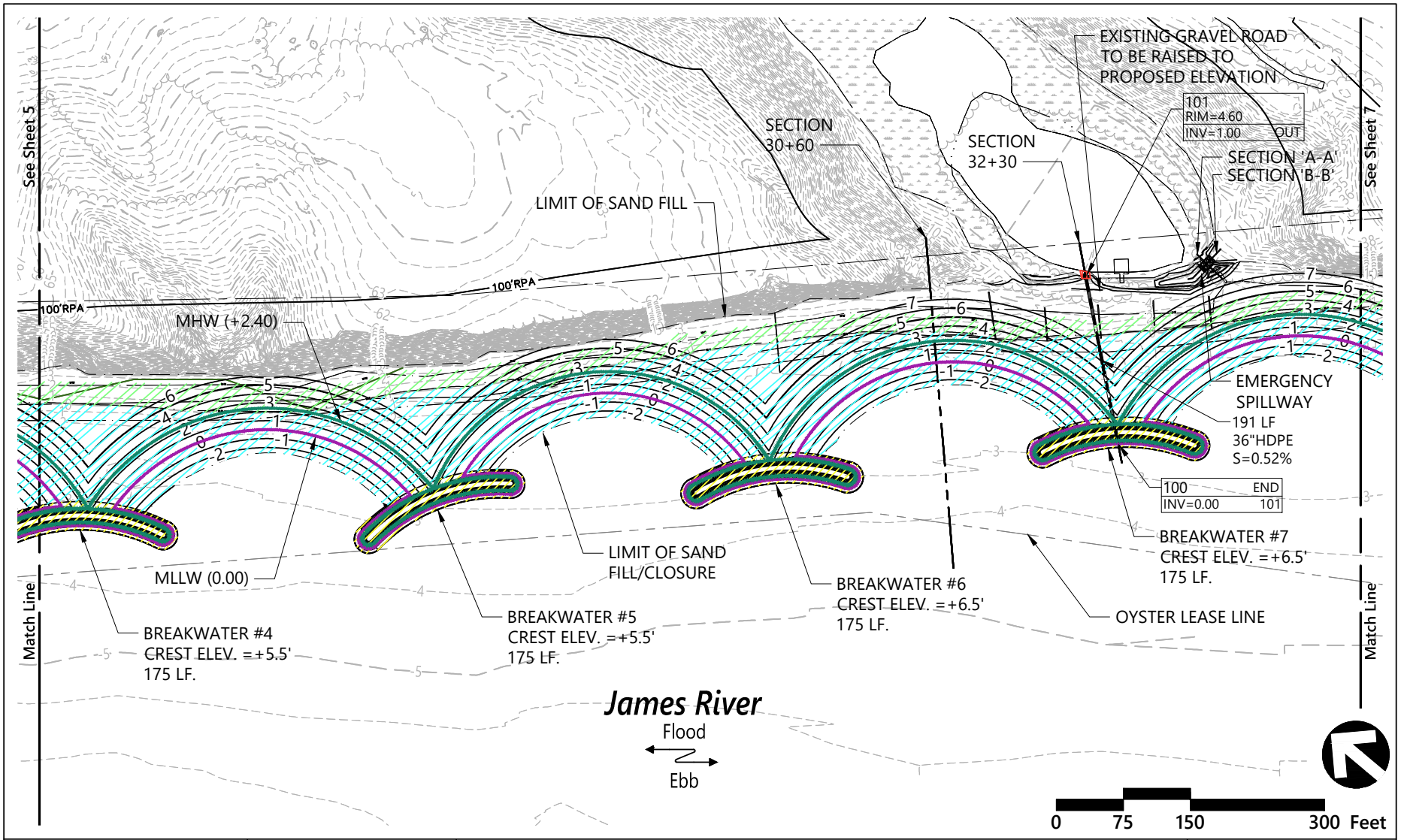


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# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
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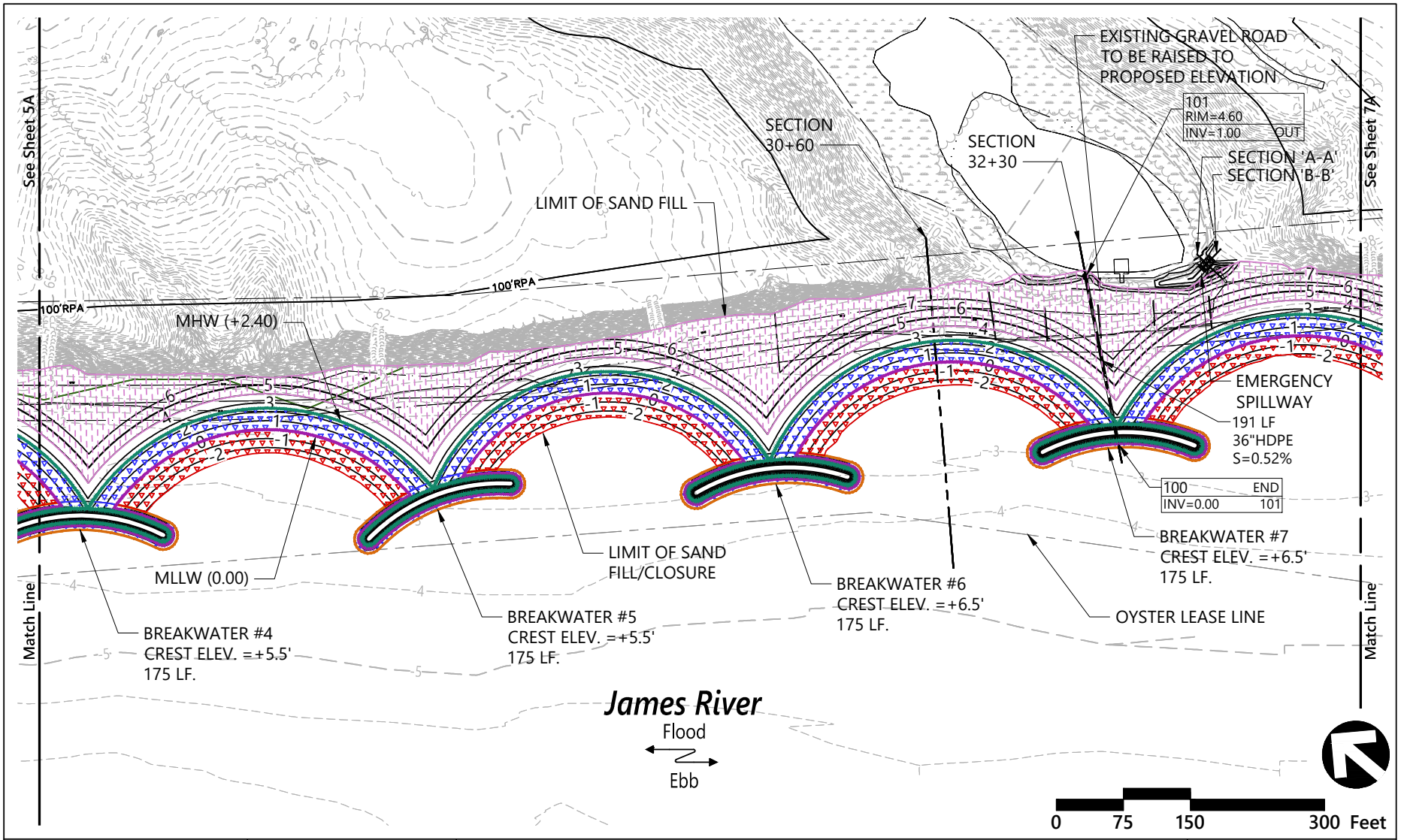


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# CARTERS GROVE SHORELINE STABILIZATION

## RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 6A**

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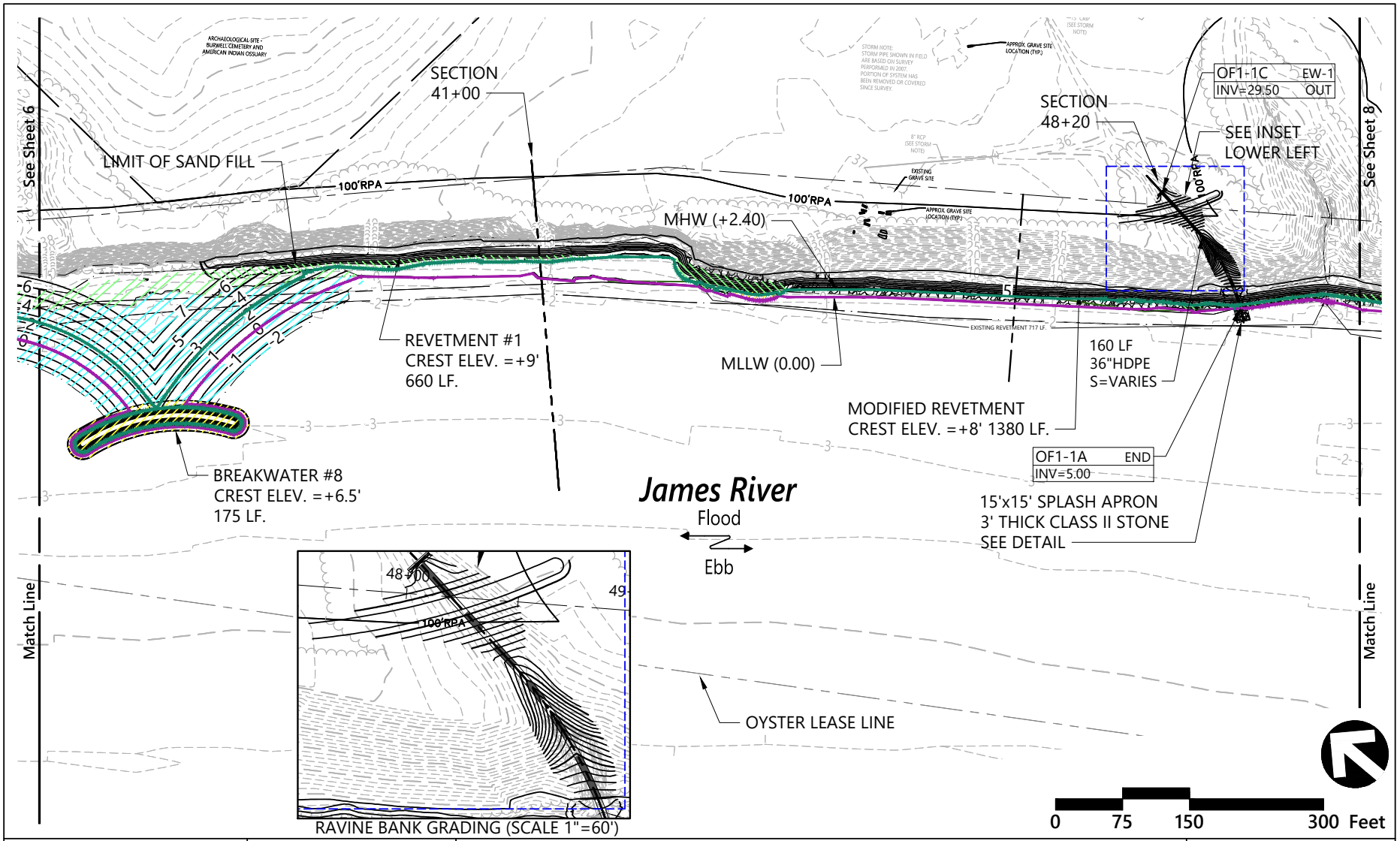


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# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS

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**IN: WILLIAMSBURG, VIRGINIA**

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**APPLICATION BY:**
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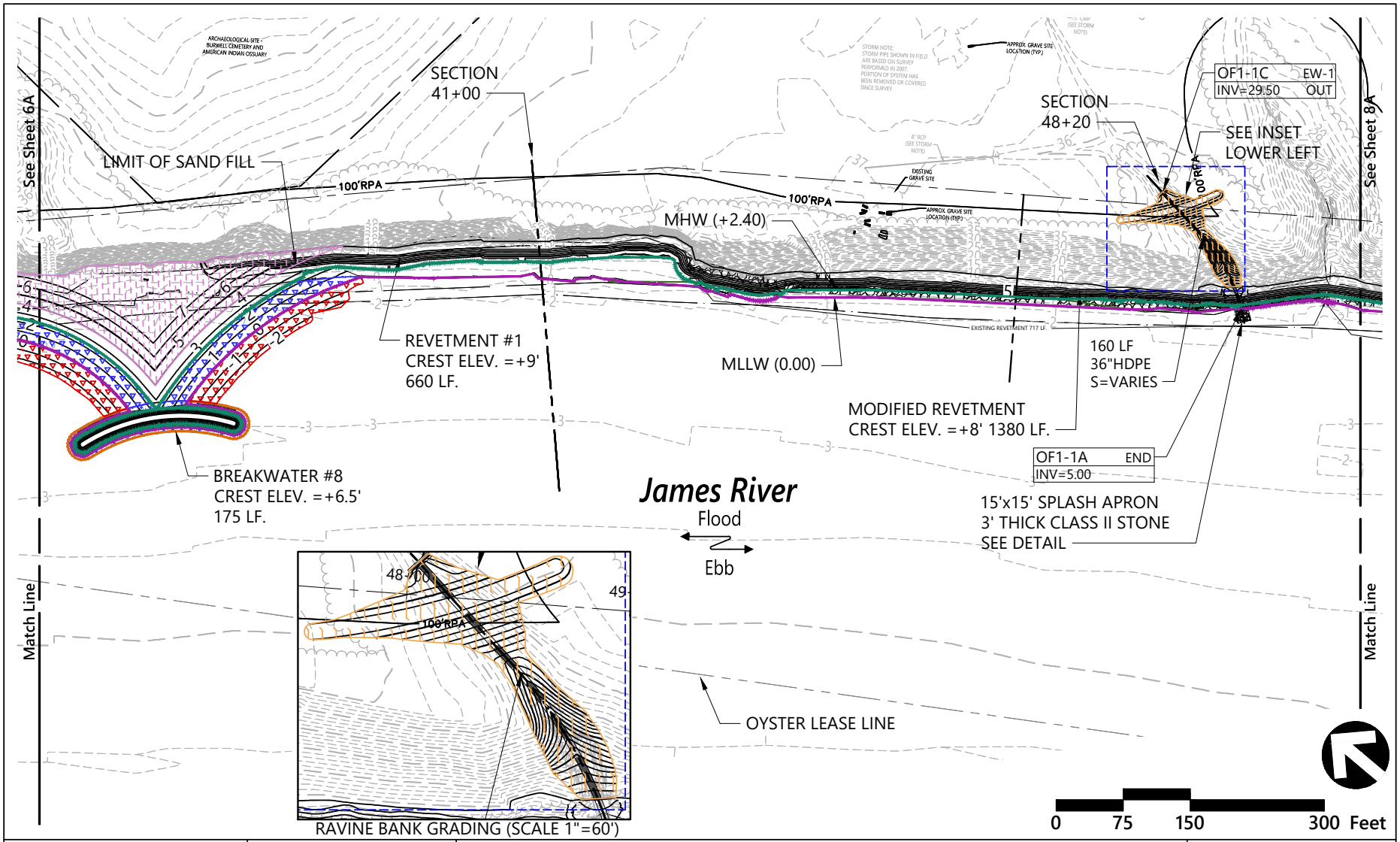


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**ADJACENT PROPERTY OWNERS:**
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# CARTERS GROVE SHORELINE STABILIZATION

## RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

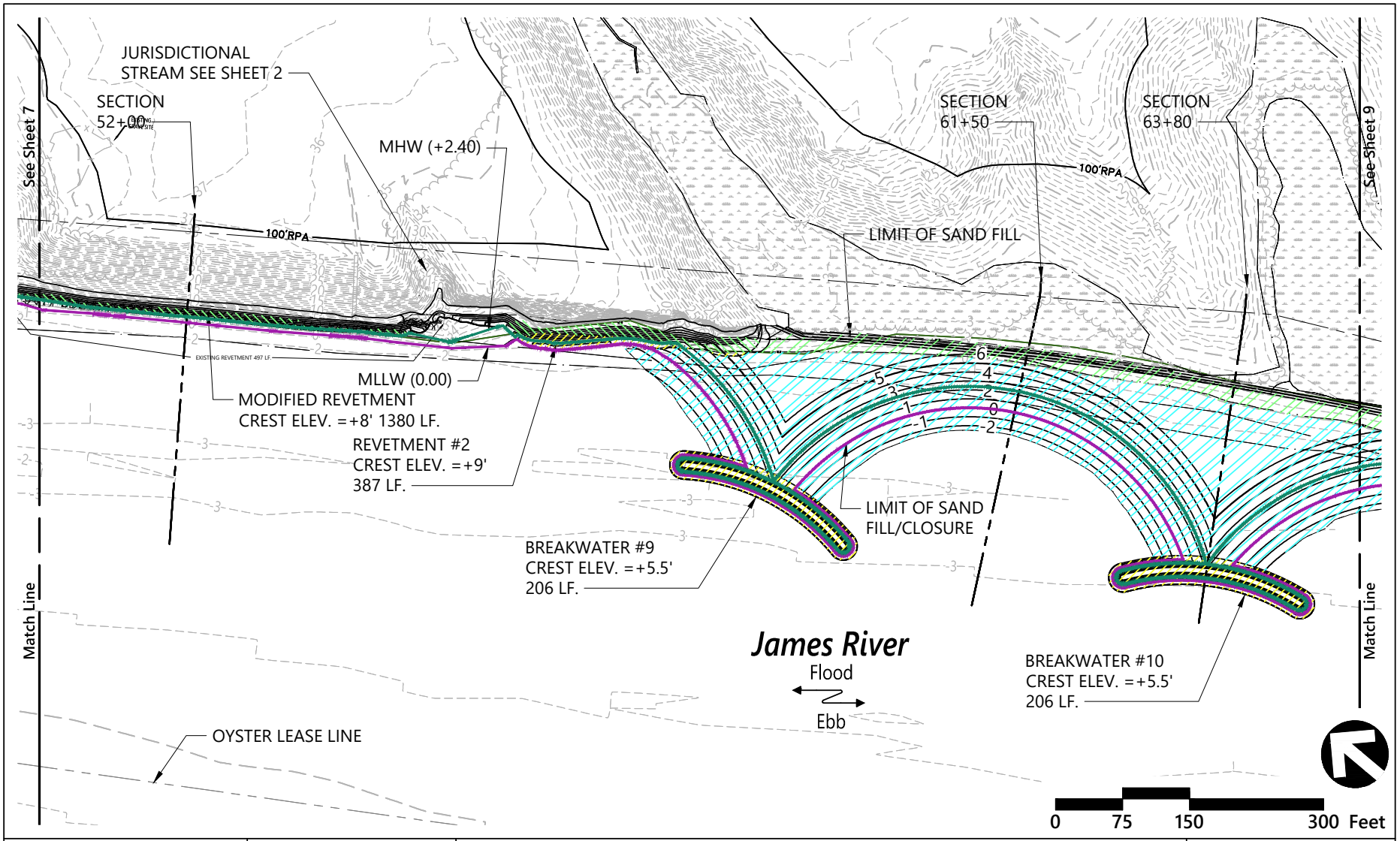
**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 7A**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 22, 2020 10:11:44 AM MBURDICK Plotted Thursday, October 22, 2020 10:25:34 AM Burdick, Mike
\\VHB\GBL\PROJ\WILLIAMSBURG\34122.20 CG-COASTAL_SHORELIN_STAB\CAD\EV\PLANSET\JPA\3412220-JPA-IMP




vhb
351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 8**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 22, 2020 10:11:44 AM MBURDICK Plotted Thursday, October 22, 2020 10:25:49 AM Burdick, Mike
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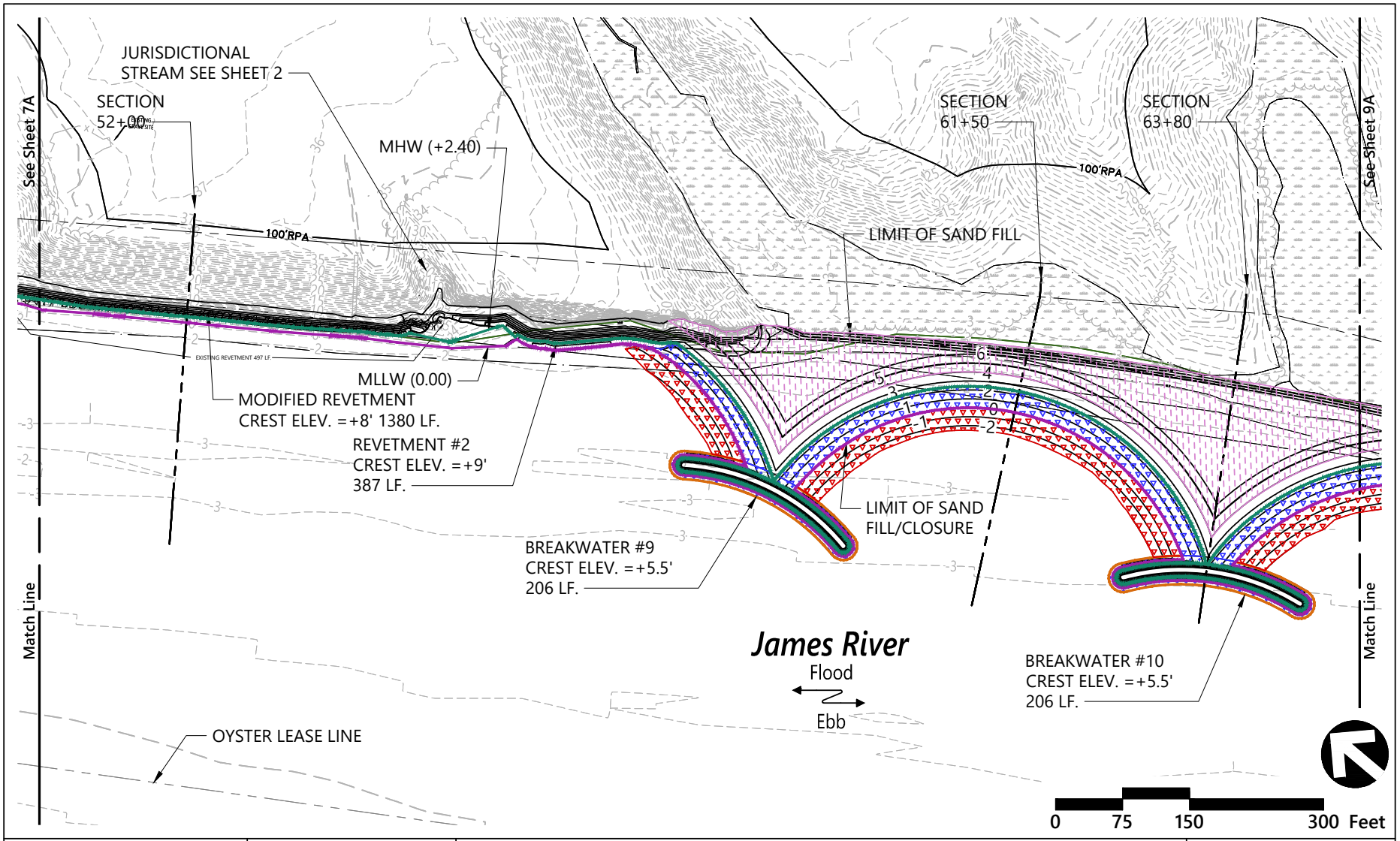


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(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

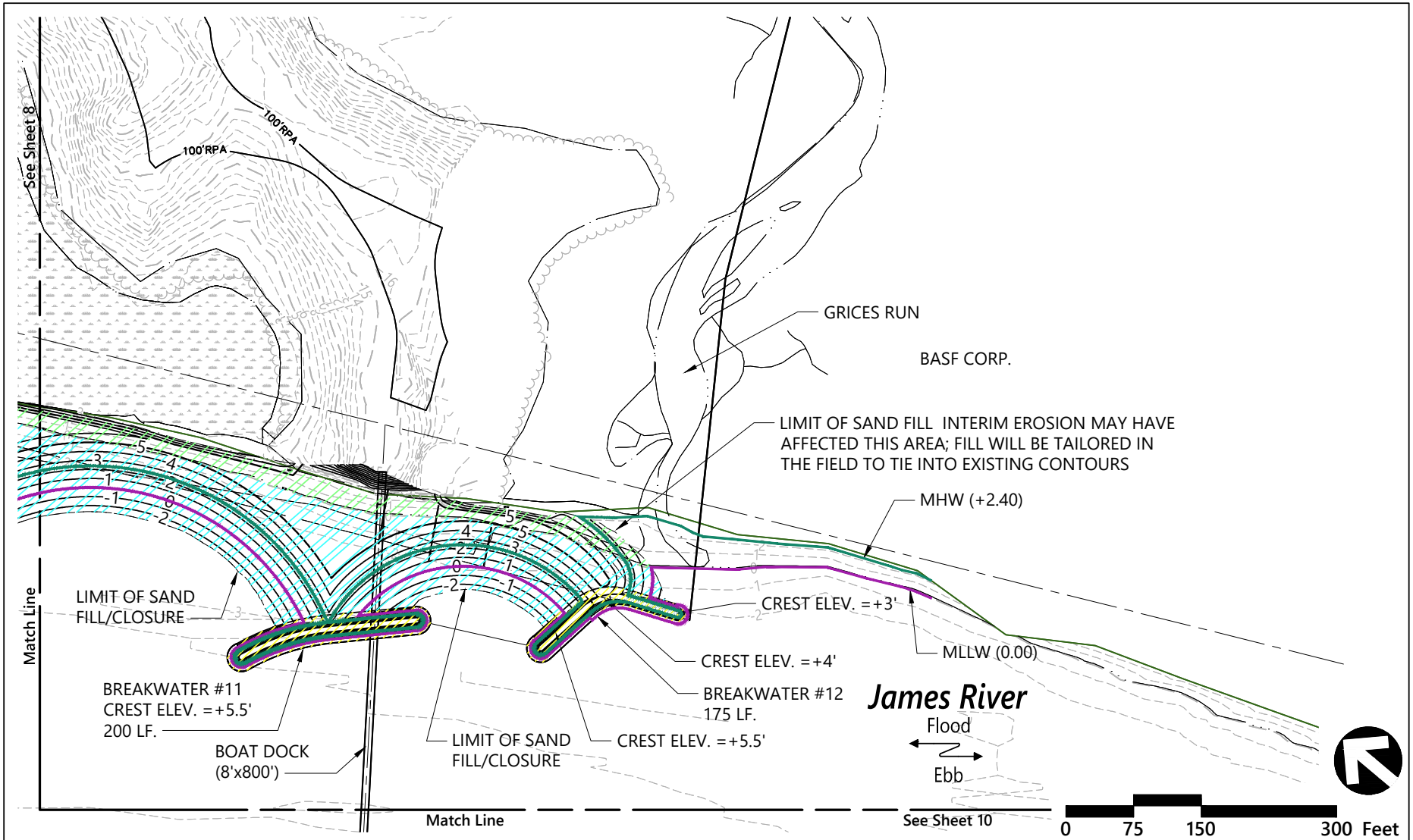
**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 8A**

Received by VMRC October 23, 2020 /blh

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 9**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 22, 2020 10:11:44 AM MBURDICK Plotted Thursday, October 22, 2020 10:26:19 AM Burdick, Mike
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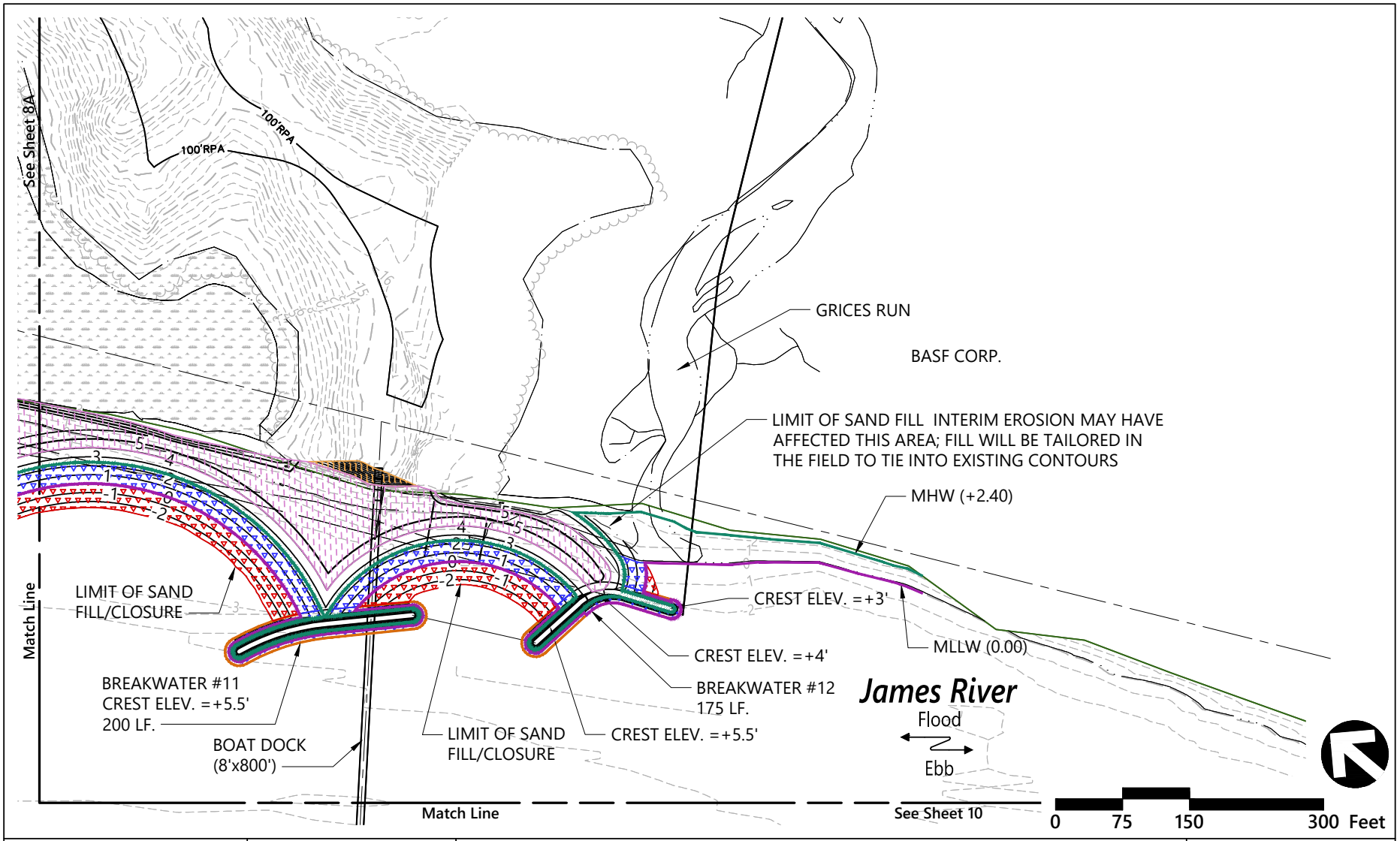


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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 9A**

Received by VMRC October 23, 2020 /blh

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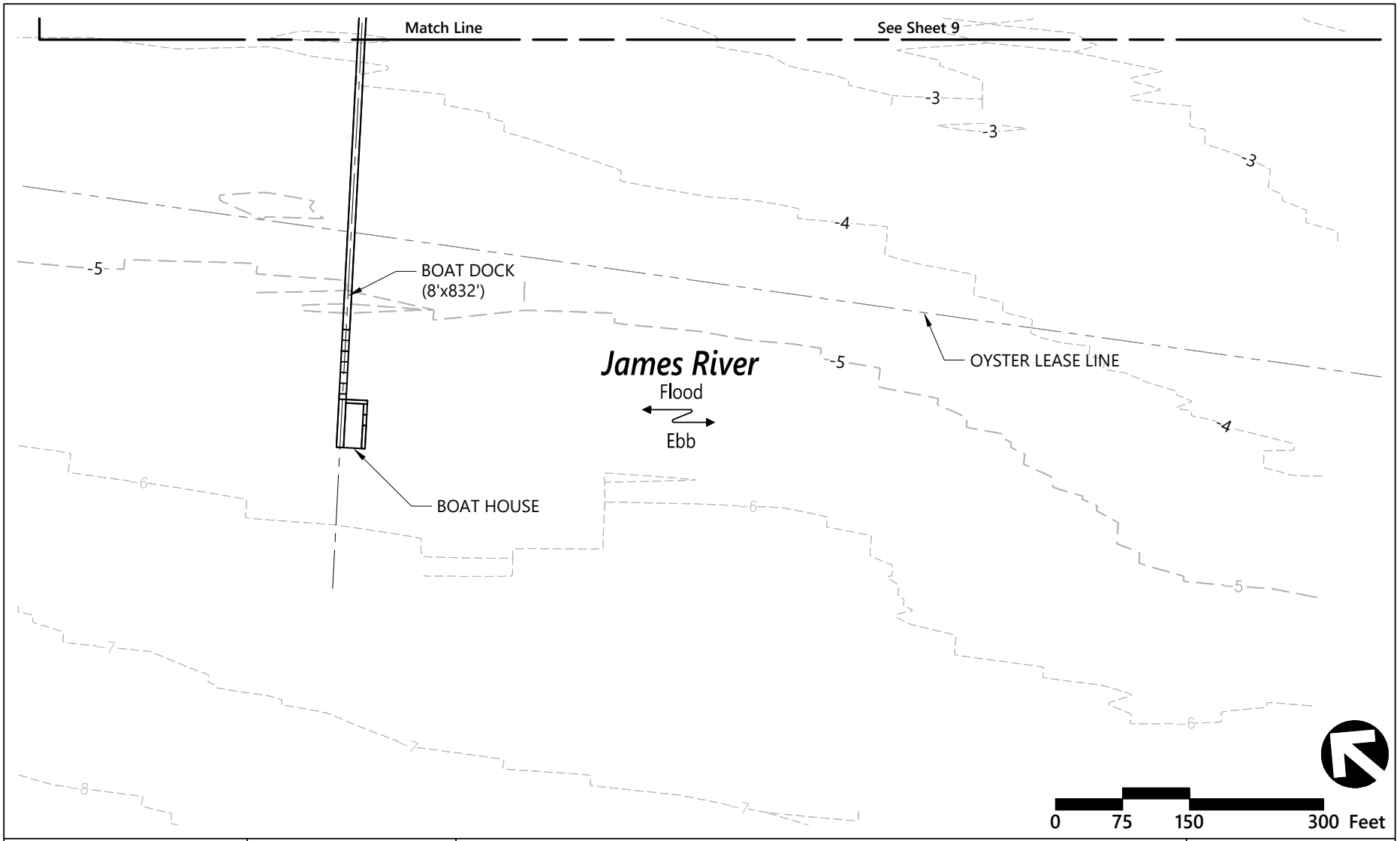


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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## LAYOUT, IMPACT AREAS, AND RESULTING HABITAT

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 10**

Saved Thursday, October 22, 2020 10:09:03 AM MBURDICK Plotted Thursday, October 22, 2020 10:29:55 AM Burdick, Mike
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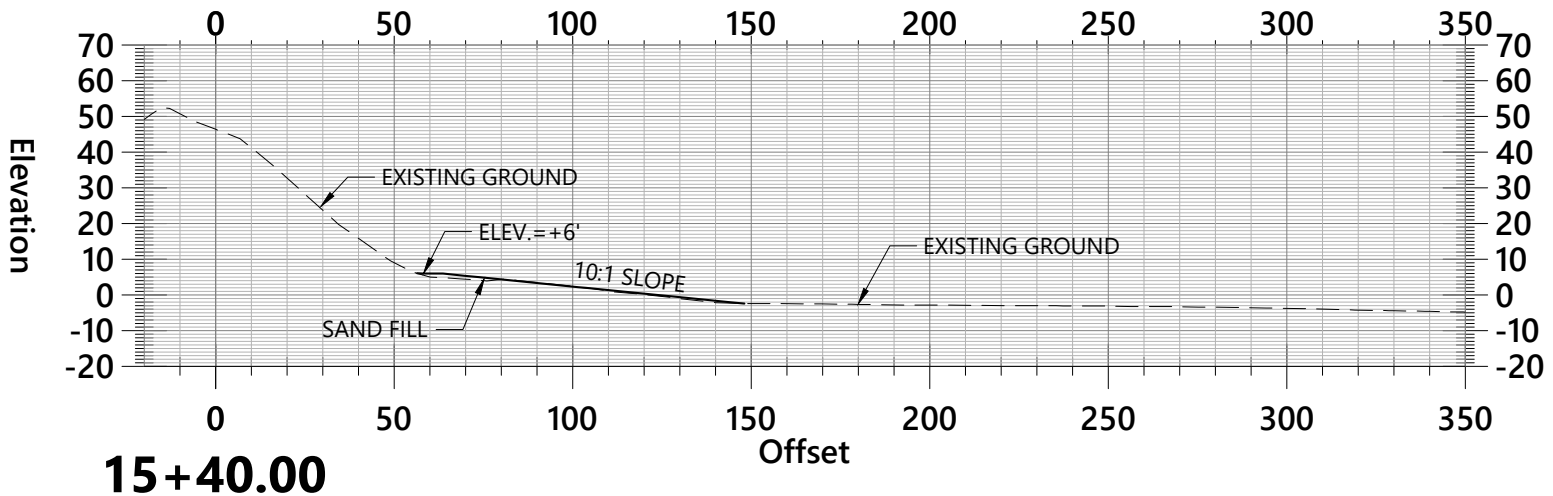
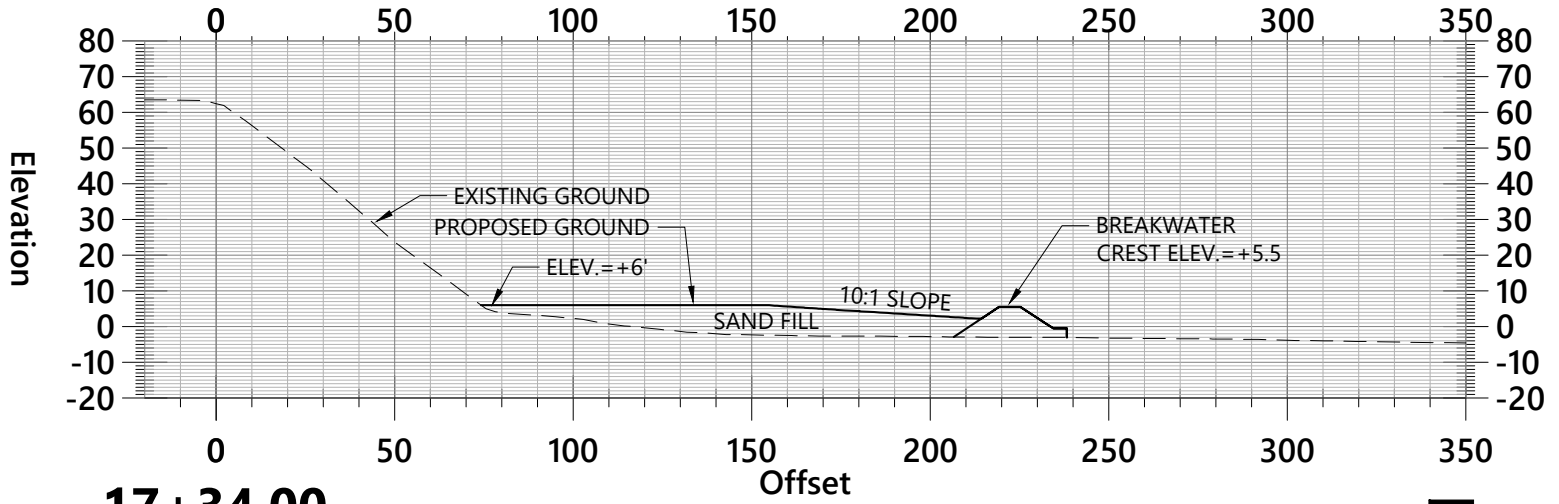



**15+40.00**




**17+34.00**

0 25 50 Feet

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## CROSS SECTIONS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 11**

Received by VMRC October 23, 2020 /blh

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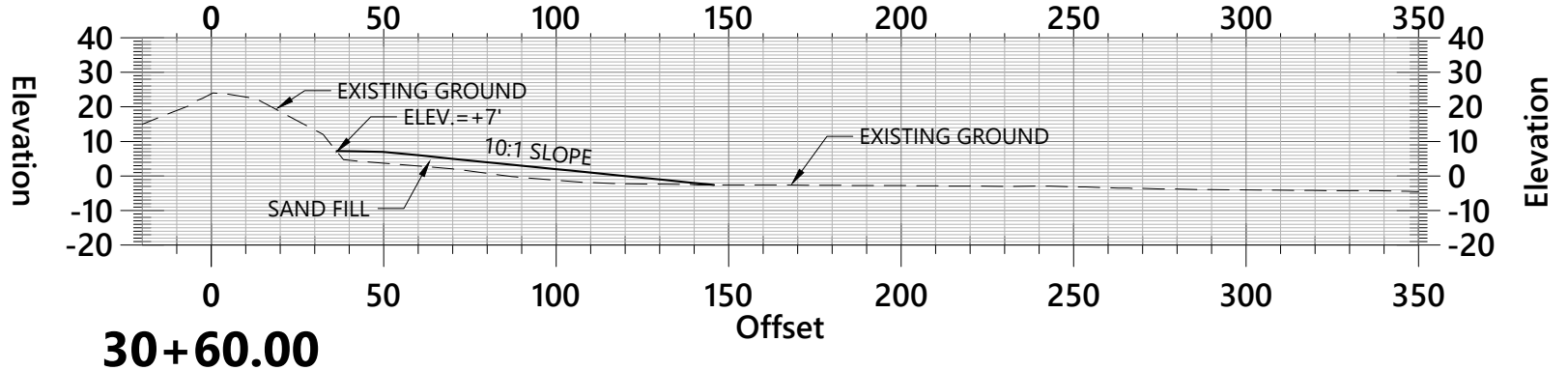
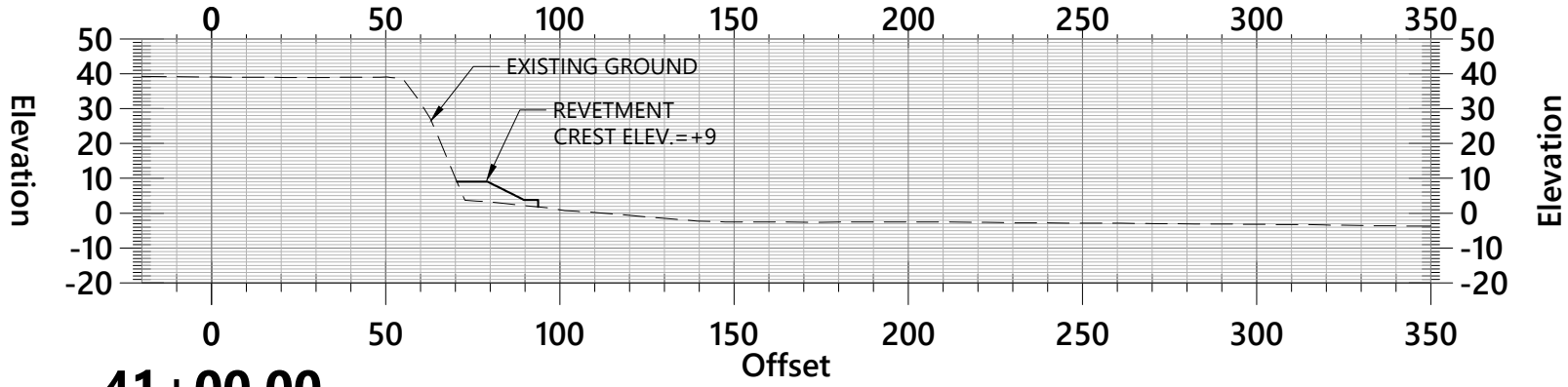



**30+60.00**




**41+00.00**

0 25 50 Feet

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## CROSS SECTIONS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

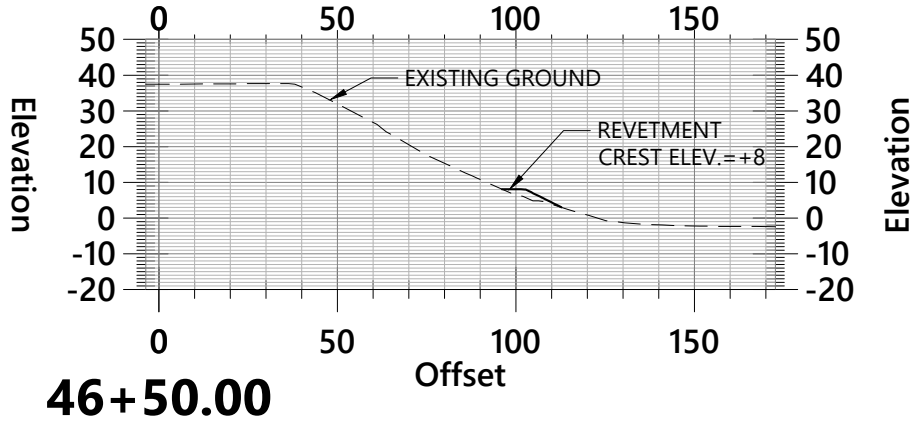
**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

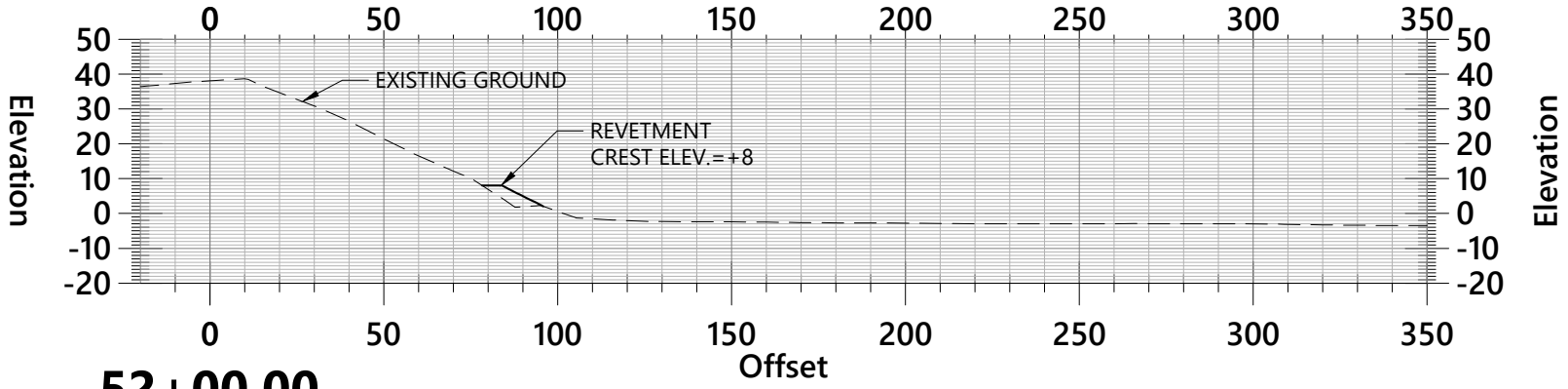
**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 12**

Received by VMRC October 23, 2020 /blh




**46+50.00**




**52+00.00**

0 25 50 Feet

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(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## CROSS SECTIONS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

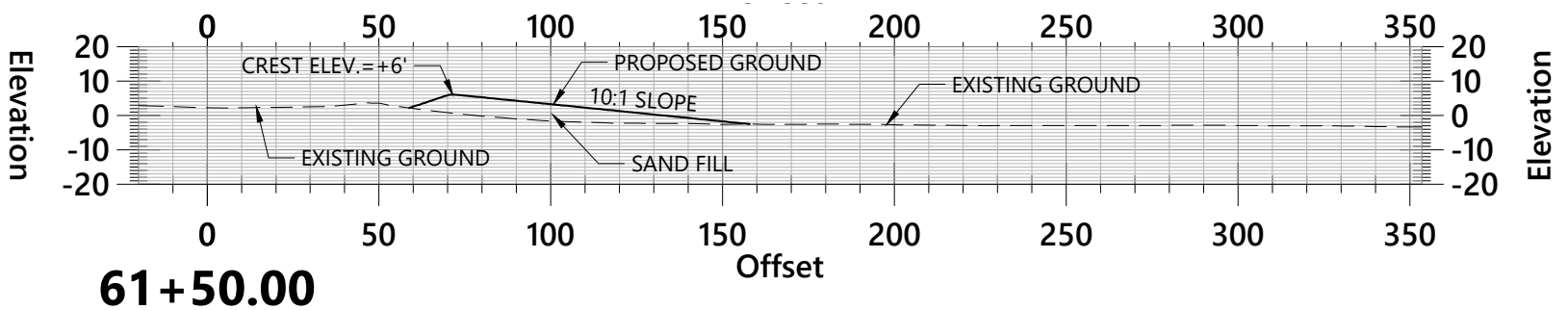
**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

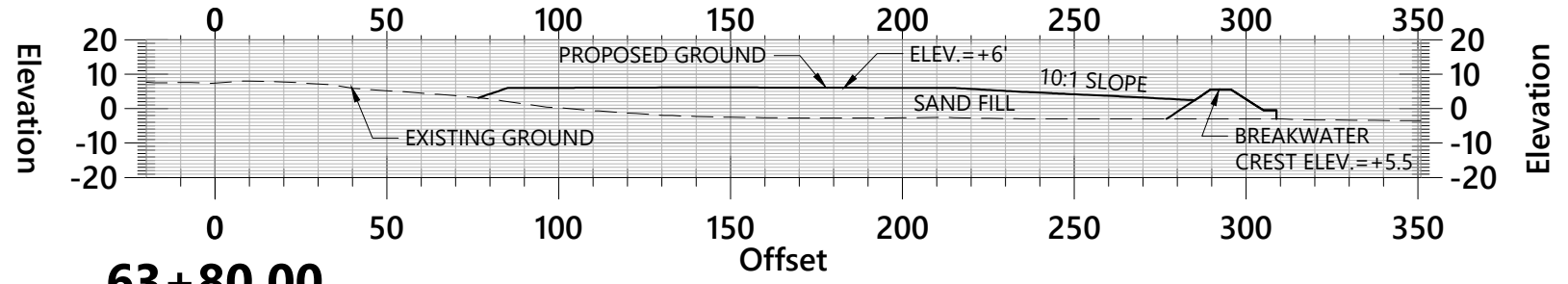
**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 13**

Received by VMRC October 23, 2020 /blh




**61+50.00**




**63+80.00**

0 25 50 Feet

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Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## CROSS SECTIONS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

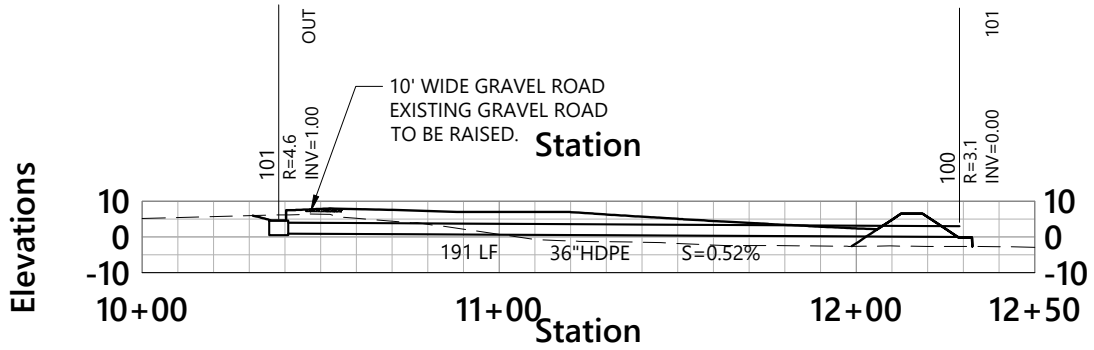
**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

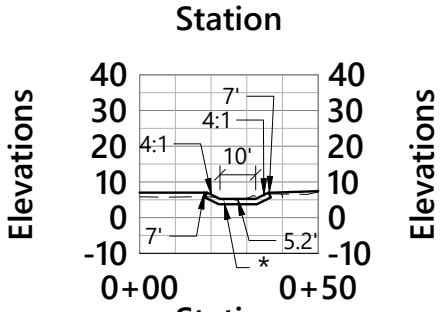
**SHEET 14**

Received by VMRC October 23, 2020 /blh

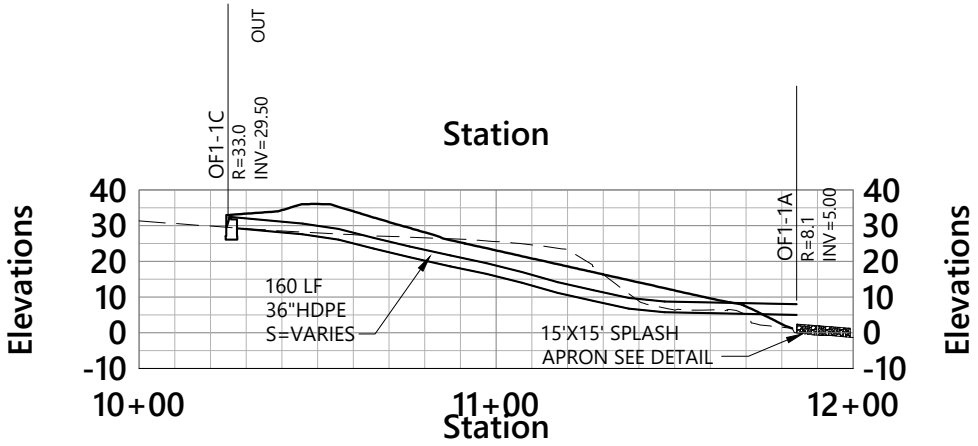
Saved Thursday, October 22, 2020 1:02:26 PM MBURDICK Plotted Thursday, October 22, 2020 1:14:23 PM Burdick, Mike
\\VHB\GBL\PROJ\WILLIAMSBURG\34122.20 CG-COASTAL_SHORELIN_STAB\CAD\EV\PLANSET\JPA\3412220-JPA-XS



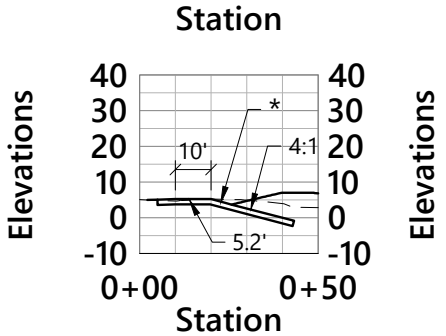

## Storm Pipe at STA 32+30




## Section 'B-B'




## Storm Pipe at STA 48+20




## Section 'A-A'

* CLASS II ROCK CHOKED WITH
R4 AND THEN 21A AGGREGATE

0 25 50 Feet

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## CROSS SECTIONS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

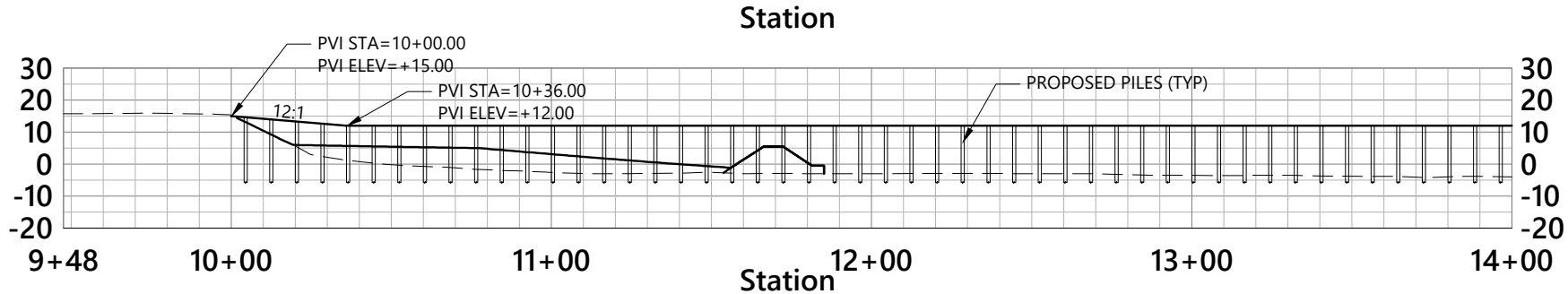
**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

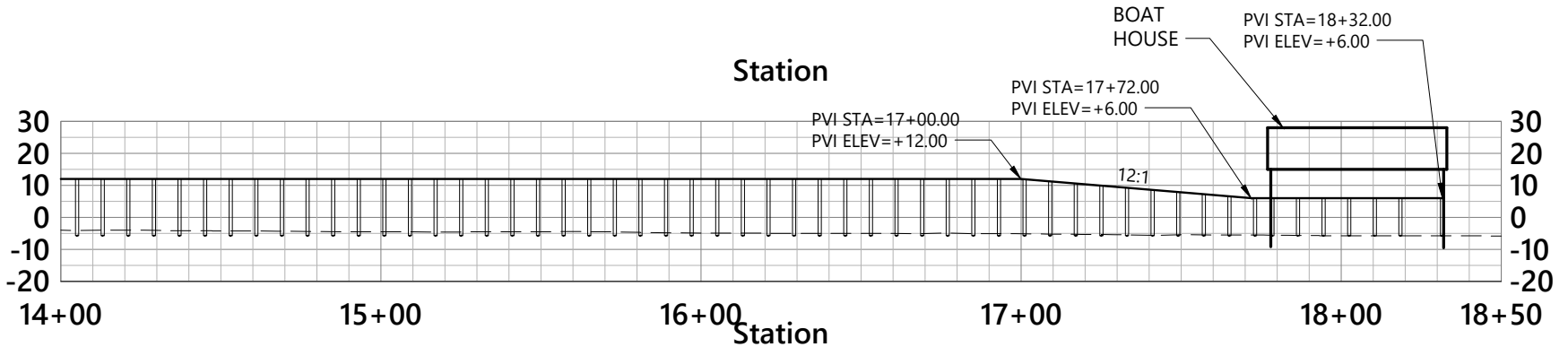
**SHEET 15**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 22, 2020 10:09:03 AM MBURDICK Plotted Thursday, October 22, 2020 10:31:47 AM Burdick, Mike
\\VHB\GBL\PROJ\WILLIAMSBURG\34122.20 CG-COASTAL_SHORELIN_STAB\CAD\EV\PLANSET\JPA\3412220-JPA-XS




**Boat Dock**




**Boat Dock**

0 25 50 Feet

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## BOAT DOCK PROFILE

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**WATER ACCESS**

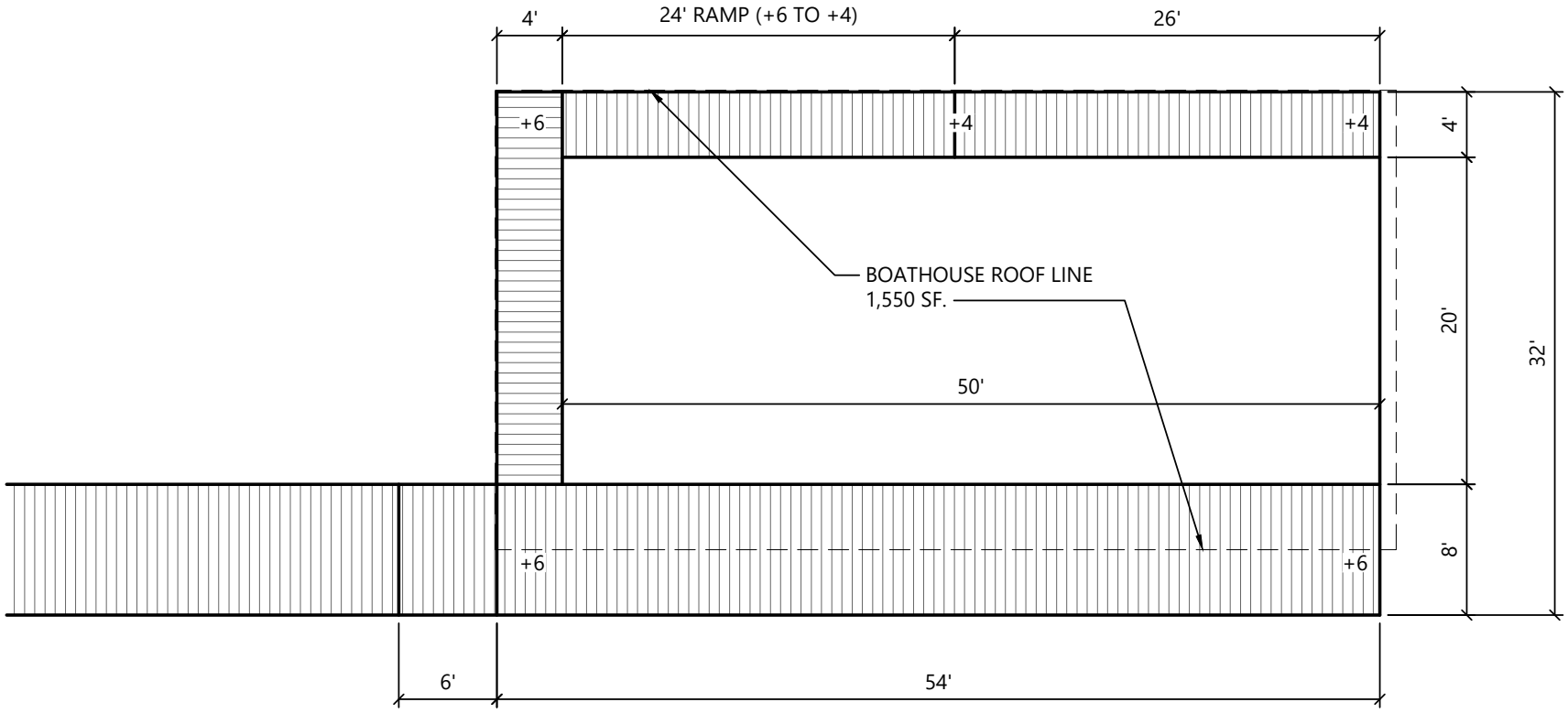
**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 16**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 15, 2020 7:20:08 AM MBURDICK Plotted Thursday, October 22, 2020 10:33:32 AM Burdick, Mike
\\VHB\GBL\PROJ\WILLIAMSBURG\34122.20 CG-COASTAL_SHORELIN_STAB\CAD\EV\PLANSET\JPA\3412220-JPA-DT

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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## BOAT HOUSE PLAN

**AT: JAMES RIVER**

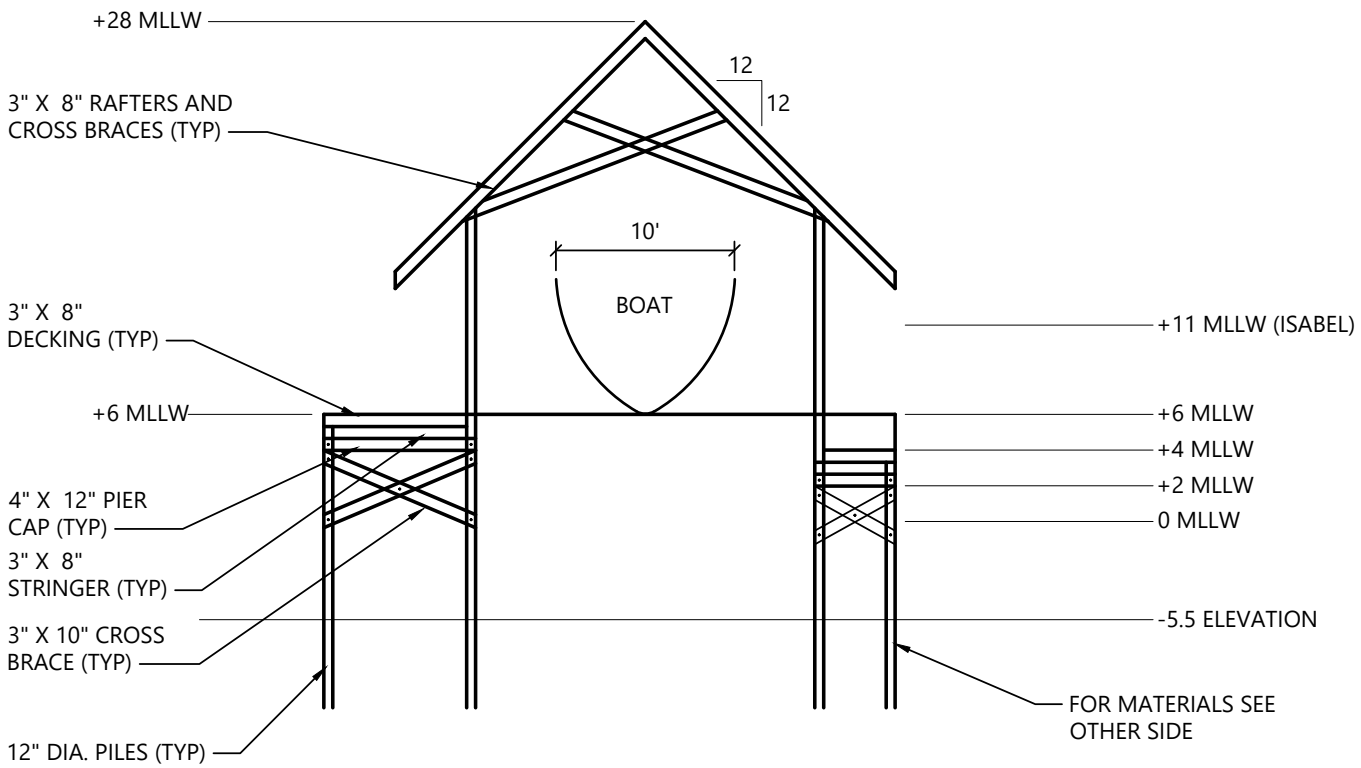
**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**WATER ACCESS**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 17**

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Williamsburg, Virginia 23185
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**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## BOAT HOUSE ELEVATION

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

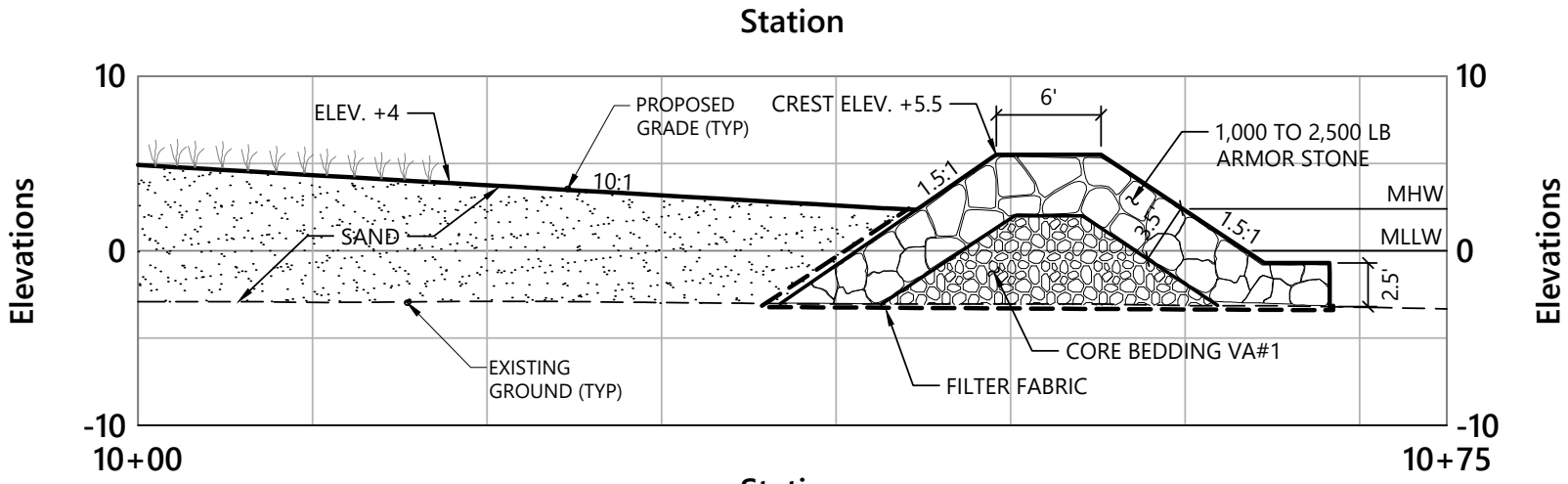
**PURPOSE:**
**WATER ACCESS**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 18**

Received by VMRC October 23, 2020 /blh




# Breakwater

351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

## CARTERS GROVE SHORELINE STABILIZATION

**BREAKWATER DETAIL**

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

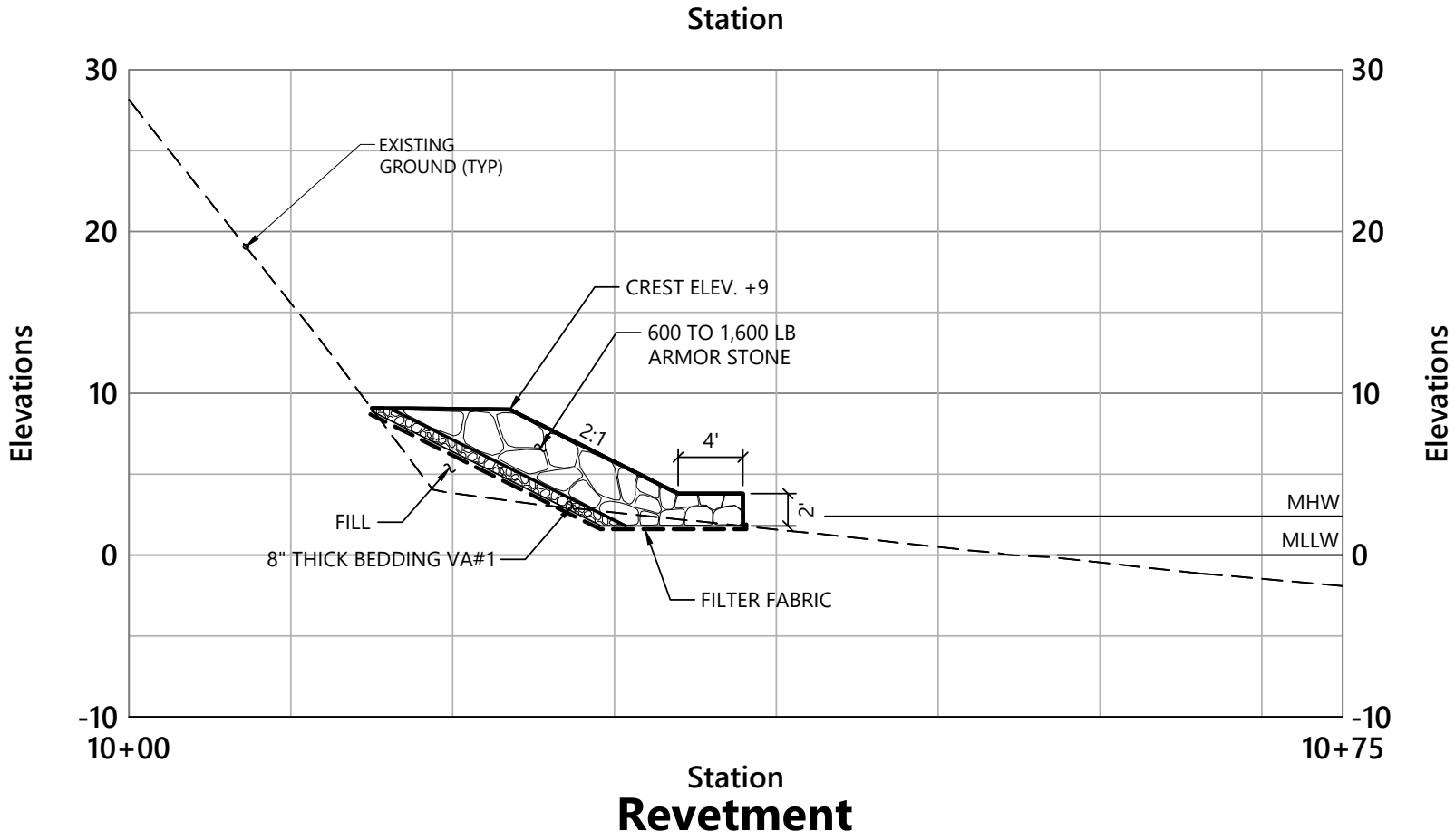
**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 19**

Received by VMRC October 23, 2020 /blh




# Revetment

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Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

## CARTERS GROVE SHORELINE STABILIZATION

**REVETMENT DETAIL**

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

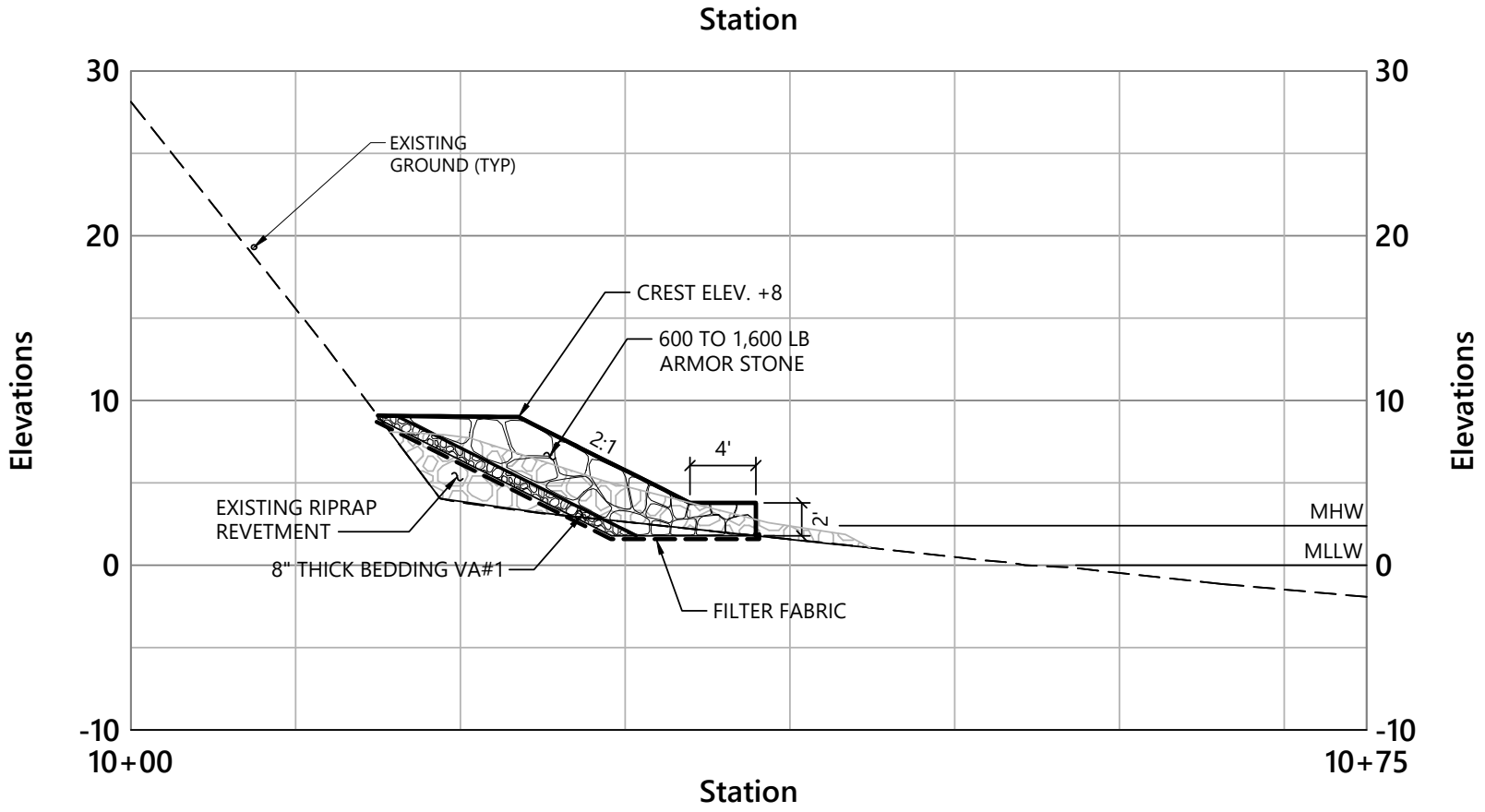
**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 20**

Received by VMRC October 23, 2020 /blh

Saved Thursday, October 15, 2020 7:20:08 AM MBURDICK Plotted Thursday, October 22, 2020 10:34:13 AM Burdick, Mike
\\VHB\GBL\PROJ\WILLIAMSBURG\34122.20 CG-COASTAL_SHORELIN_STAB\CAD\EV\PLANSET\JPA\3412220-JPA-DT




# Revetment Over Existing Revetment

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Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
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2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

## CARTERS GROVE SHORELINE STABILIZATION

**REVETMENT DETAIL**

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

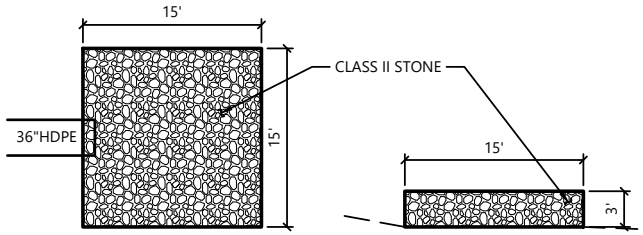
**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

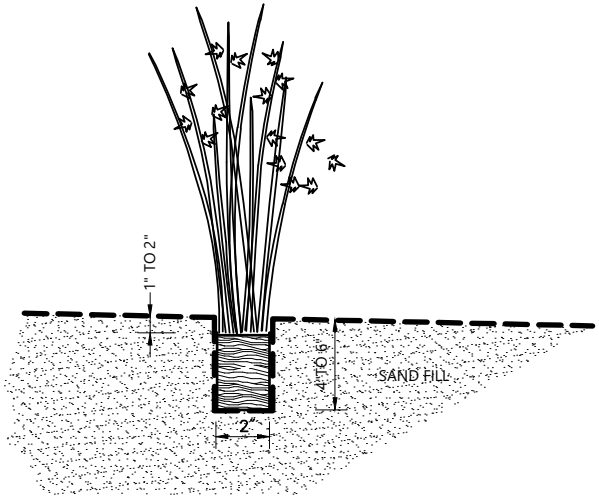
**SHEET 21**

Received by VMRC October 23, 2020 /blh



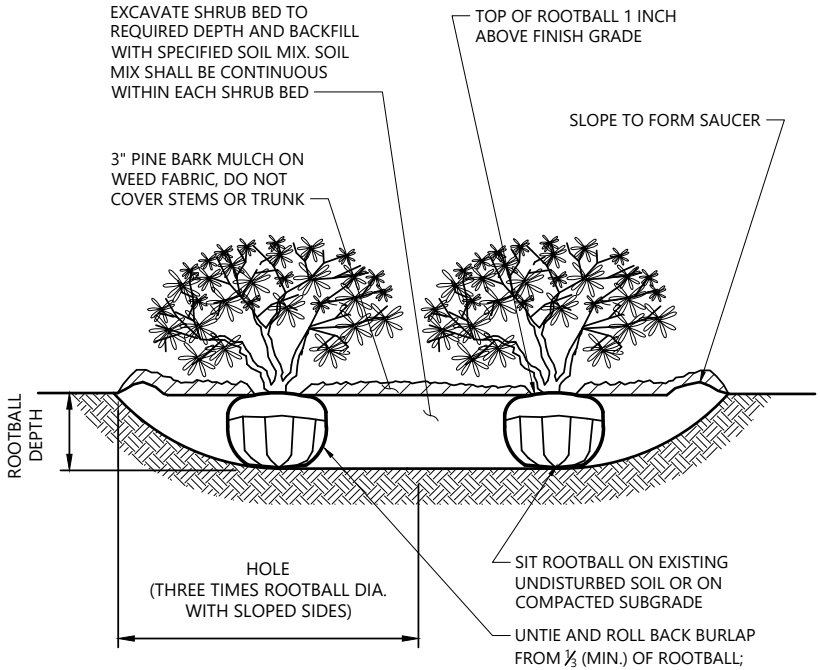

## Splash Apron Detail

N.T.S. Source: VHB




## Herbaceous Planting Detail

N.T.S. Source: VHB




**NOTES**

1. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

## Shrub Bed Planting

1/16

N.T.S. Source: VHB REV LD_601S

vhb
351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185
(757) 220-0500 • Fax: (757) 903-2794

**ADJACENT PROPERTY OWNERS:**
1. KCSA
2. BASF CORP.

DATUM:
MEAN LOW LOW WATER

# CARTERS GROVE SHORELINE STABILIZATION

## PLANTING DETAILS

**AT: JAMES RIVER**

**IN: WILLIAMSBURG, VIRGINIA**

**PURPOSE:**
**SHORELINE STABILIZATION**

**APPLICATION BY:**
**CARTERS GROVE ASSOCIATES LLC**

**REVISED:**
**DATE: OCTOBER , 2020**

**SHEET 22**

Received by VMRC October 23, 2020 /blh

# Attachment B

# Wetland Delineation and USACE Preliminary Jurisdictional Determination

Received by VMRC October 23, 2020 /blh

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

MAY 18, 2016

**PRELIMINARY JURISDICTIONAL DETERMINATION**

Southern Virginia Regulatory Section
NAO-2016-00318 (Grice's Run, James River)

Samuel M. Mencoff
c/o Timothy Davis, Vanasse Hangen Brustlin, Inc
351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185

Dear Mr. Mencoff:

This letter is in reference to the pre-application request (NAO-2016-00318) Timothy Davis of VHB submitted on your behalf for a preliminary jurisdictional determination of the approximately 466 acre site located at Carter's Grove Plantation in James City County, Virginia.

The preliminary jurisdictional determination is based upon the wetland line flagged by Clayton Robertson on February 17, 2016, and depicted on the exhibit date stamped as received February 21, 2016 and entitled "Wetland Delineation Map" which provides the location of approximately 111 acres of wetlands, 1.76 acres of open waters, and 13,100 linear feet of jurisdictional streams for the 465.8 acres of property incorporated in the project area. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual (and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*) and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation, along with the presence of an ordinary high water mark.

Discharges of dredged or fill material, including those associated with mechanized land clearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination. This preliminary jurisdictional

determination and associated wetland delineation map may be submitted with a permit application.

Enclosed are two copies of the "Preliminary Jurisdictional Determination Form". Please review the document, sign both copies, return one copy to the Corps (803 Front Street, Norfolk, VA 23510) within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands is valid for a period of five years from the date of this letter unless new information warrants revision prior to the expiration date.

If you have any questions, please contact me at 757-201-7540 or you may email me at matt.m.wicks@usace.army.mil.

Sincerely,

Matthew Wicks
Environmental Scientist,
Southern Virginia Regulatory Section

Enclosures: *Preliminary Jurisdictional Determination Form*

# PRELIMINARY JURISDICTIONAL DETERMINATION FORM

**BACKGROUND INFORMATION:**

**A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD):** Wednesday, May 18, 2016

**B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:**
Samuel M. Mencoff
c/o Timothy Davis, Vanasse Hangen Brustlin, Inc
351 McLaws Circle, Suite 3
Williamsburg, Virginia 23185

**C. DISTRICT OFFICE: Norfolk District (CENAO-REG)**

**FILE NAME:** Carter's Grove Plantation

**FILE NUMBER:** NAO-2016-00318

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**
**(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)**

State: **VIRGINIA** County/parish/borough: James City City: Williamsburg

Center coordinates of site (lat/long in degree decimal format):

Latitude: 37.20483 ° N Longitude: -76.6249 ° W

Universal Transverse Mercator:

Name of nearest waterbody: Grice's Run, James River

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 13,100 linear feet; width (ft); and/or 1.76 acres.

Cowardin Class: R4UB, R3UB, POW

Stream Flow: Intermittent, Upper Perrenial

Wetlands: 110.99 acres

Cowardin Class: PFO1B, E2US, E2EM, PEM

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal: James River

Non-Tidal:

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): April 28, 2016

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

3. This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA:**

**Data reviewed for preliminary JD (check all that apply)** - checked items should be included in case file and, where checked and requested, appropriately reference sources below.

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: NAO-2016-00318 "Wetland Delineation Map"

☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☒ Office concurs with data sheets/delineation report. Created by C. Robertson

☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps:

☐ Corps navigable waters' study:

☐ U.S. Geological Survey Hydrologic Atlas:

☐ USGS NHD data.

☐ USGS 8 and 12 digit HUC maps.

☐ U.S. Geological Survey map(s). Cite scale & quad name:

☒ USDA Natural Resources Conservation Service Soil Survey.

Citation: ArcGIS Database

☒ National wetlands inventory map(s). Cite name: ArcGIS Database

☐ State/Local wetland inventory map(s):

☐ FEMA/FIRM maps:

☐ 100-year Floodplain Elevation: (National Geodetic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): GIS 2013

or ☐ Other (Name & Date):

☐ Previous determination(s):

File no. and date of response letter:

☒ Other information (please specify): Site visit by Corps representative identifying wetlands

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

Signature
Regulatory Project Manager
(REQUIRED)

5-18-2016
Date

Signature of person requesting
Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

5/18/2016
Date

February 19, 2016

**Study Area** (465.8 Ac)

**Delineated Wetlands**

- Estuarine Intertidal Emergent Wetland (21.1 Ac)
- Estuarine Intertidal Unconsolidated Shore (7.27 Ac)
- Palustrine Emergent Wetland (1.04 Ac)
- Palustrine Forested Wetland (29.72 Ac)
- Palustine Unconsolidated Bottom (1.76 Ac)
- Stream (13,100 LF)

**Data Point**

**Wetland Flags**

Pocahontas Trail

60

James River

North

0 600

SCALE IN FEET

Source: 2015 James City County, Virginia Orthophotography

vhb **Carter's Grove Plantation** | James City County, Virginia

FIGURE 4

**Wetland Delineation Map**

# Attachment C

## Threatened & Endangered Species Searches

## IPaC Results

## NOAA NLAA Verification Form

Received by VMRC October 23, 2020 /blh

# 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: July 08, 2020
Consultation Code: 05E2VA00-2020-SLI-4811
Event Code: 05E2VA00-2020-E-13365
Project Name: Carters Grove Shoreline

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-4811

Event Code: 05E2VA00-2020-E-13365

Project Name: Carters Grove Shoreline

Project Type: SHORELINE / BEACH PROTECTION / RENOURISHMENT

Project Description: Shoreline restoration and stabilization.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.204436519279454N76.62845258904487W


Counties: James City, 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 Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

| NAME | STATUS |
|---|---|
| Northern Long-eared Bat *Myotis septentrionalis*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9045 | Threatened |

## Critical habitats

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

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

**VaFWIS - Department of Game and Inland Fisheries**

37,13,14.7 -76,39,00.2 **is the Search Point**

Submit Cancel

**Search Point**

- **Change** to "clicked" map point
- **Fixed** at 37,13,14.7 -76,39,00.2

**Show Position Rings**

Yes No

1/2 mile and 1/8 mile at the **Search Point**

**Show Search Area**

Yes No

2 Search distance miles radius

**Search Point** is at map center

**Base Map** Choices

Topography

**Map Overlay** Choices

Current List: Position, Search

**Map Overlay Legend**

Position Rings 1/2 mile and 1/8 mile at the Search Point

2 mile radius Search Area

back

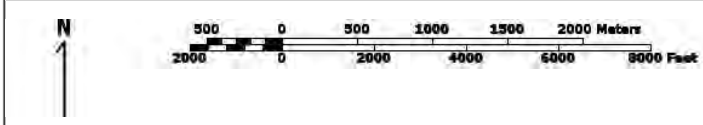
Refresh Browser Page

Map Click Pan To M

Map Scale In Zoom Out

Screen Size Small Size Big

Help


Point of Search 37,13,14.7 -76,39,00.2

Map Location 37,13,14.7 -76,39,00.2

Select **Coordinate System:**

- Degrees,Minutes,Seconds Latitude - Longitude
- Decimal Degrees Latitude - Longitude
- Meters UTM NAD83 East North Zone
- Meters UTM NAD27 East North Zone

Base Map source: Topographic maps from TOPO! copyright 2006 (see National Geographic Maps for details)

Map projection is UTM Zone 18 NAD 1983 with left 349606 and top 4124638. Pixel size is 8 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 1000 columns by 1000 rows for a total of 1000000 pixles. The map display represents 8000 meters east to west by 8000 meters north to south for a total of 64.0 square kilometers. The map display represents 26251 feet east to west by 26251 feet north to south for a total of 24.7 square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2020-09-23 08:31:29 (qa/qc March 21, 2016 12:20 - tn=1054912 dist=3218.688 I )
$poi=36.9001468 -76.4668158

## VaFWIS Initial Project Assessment Report Compiled on 9/23/2020, 8:38:41 AM

Known or likely to occur within a **2 mile radius around point 37,13,14.7 -76,39,00.2** in **095 James City County, 181 Surry County, 199 York County, VA**

View Map of Site Location

597 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 36) (36 species with Status* or Tier I** or Tier II** )

| BOVA Code | Status* | Tier** | Common Name | Scientific Name | Confirmed | Database(s) |
|---|---|---|---|---|---|---|
| 030074 | FESE | Ia | Turtle, Kemp's ridley sea | Lepidochelys kempii | | BOVA |
| 040228 | FESE | Ia | Woodpecker, red-cockaded | Picoides borealis | | BOVA |
| 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | Yes | BOVA,TEWaters,Habitat,SppObs |
| 040183 | FESE | | Tern, roseate | Sterna dougallii dougallii | | BOVA |
| 030071 | FTST | Ia | Turtle, loggerhead sea | Caretta caretta | | BOVA |
| 040144 | FTST | Ia | Knot, red | Calidris canutus rufa | | BOVA |
| 050022 | FTST | Ia | Bat, northern long-eared | Myotis septentrionalis | Yes | BOVA,SppObs |
| 040120 | FTST | IIa | Plover, piping | Charadrius melodus | | BOVA |
| 010347 | SE | Ia | Sunfish, blackbanded | Enneacanthus chaetodon | | BOVA |
| 040110 | FPSE | Ia | Rail, eastern black | Laterallus jamaicensis jamaicensis | | BOVA |
| 050020 | SE | Ia | Bat, little brown | Myotis lucifugus | Yes | BOVA,SppObs |
| 050034 | SE | Ia | Bat, Rafinesque's eastern big-eared | Corynorhinus rafinesquii macrotis | | BOVA |
| 050027 | SE | Ia | Bat, tri-colored | Perimyotis subflavus | | BOVA |
| 020052 | SE | IIa | Salamander, eastern tiger | Ambystoma tigrinum | | BOVA |
| 030013 | SE | IIa | Rattlesnake, canebrake | Crotalus horridus | | BOVA |
| 040096 | ST | Ia | Falcon, peregrine | Falco peregrinus | | BOVA |
| 040293 | ST | Ia | Shrike, loggerhead | Lanius ludovicianus | | BOVA |
| 020044 | ST | IIa | Salamander, Mabee's | Ambystoma mabeei | Yes | BOVA,Habitat,SppObs |
| 020002 | ST | IIa | Treefrog, barking | Hyla gratiosa | | BOVA |
| 040292 | ST | | Shrike, migrant loggerhead | Lanius ludovicianus migrans | | BOVA |
| 030067 | CC | IIa | Terrapin, northern diamond-backed | Malaclemys terrapin terrapin | | BOVA,Habitat |
| 030063 | CC | IIIa | Turtle, spotted | Clemmys guttata | | BOVA |
| 010077 | | Ia | Shiner, bridle | Notropis bifrenatus | | BOVA |
| 040040 | | Ia | Ibis, glossy | Plegadis falcinellus | | BOVA |
| 040306 | | Ia | Warbler, golden-winged | Vermivora chrysoptera | | BOVA |
| 020063 | | IIa | Toad, oak | Anaxyrus quercicus | | BOVA |
| 040052 | | IIa | Duck, American black | Anas rubripes | | BOVA |
| 040033 | | IIa | Egret, snowy | Egretta thula | | BOVA |
| 040029 | | IIa | Heron, little blue | Egretta caerulea caerulea | | BOVA |
| 040036 | | IIa | Night-heron, yellow-crowned | Nyctanassa violacea violacea | | BOVA |
| 040114 | | IIa | Oystercatcher, American | Haematopus palliatus | | BOVA |
| 040181 | | IIa | Tern, common | Sterna hirundo | | BOVA |

| | | | | | | |
|---|---|---|---|---|---|---|
| 040320 | | IIa | Warbler, cerulean | Setophaga cerulea | | BOVA |
| 040140 | | IIa | Woodcock, American | Scolopax minor | | BOVA |
| 040203 | | IIb | Cuckoo, black-billed | Coccyzus erythropthalmus | | BOVA |
| 040105 | | IIb | Rail, king | Rallus elegans | | BOVA |

To view **All 597 species** View 597

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.; b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

**Anadromous Fish Use Streams** ( 2 records ) View Map of All Anadromous Fish Use Streams

| Stream ID | Stream Name | Reach Status | Anadromous Fish Species | | | View Map |
|---|---|---|---|---|---|---|
| | | | Different Species | Highest TE* | Highest Tier** | |
| C32 | Halfway creek | Confirmed | 1 | | | Yes |
| C92 | James River 1 | Confirmed | 6 | | IV | Yes |

**Impediments to Fish Passage** ( 4 records ) View Map of All Fish Impediments

| ID | Name | River | View Map |
|---|---|---|---|
| 411 | BREWERY ROAD DAM | GROVE CREEK | Yes |
| 410 | CONFERENCE CENTER DAM | TR-JAMES RIVER | Yes |
| 409 | KINGSMILL DAM | HALFWAY CREEK | Yes |
| 668 | WILLIAMSBURG COUNTRY CLUB DAM | KING CREEK | Yes |

**Colonial Water Bird Survey**

N/A

**Threatened and Endangered Waters** ( 7 Reaches ) View Map of All Threatened and Endangered Waters

| Stream Name | T&E Waters Species | | | | | | | View Map |
|---|---|---|---|---|---|---|---|---|
| | Highest TE* | BOVA Code, Status*, Tier**, Common & Scientific Name | | | | | | |
| James River (0154595 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0156308 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0159765 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0160440 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0173836 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0175357 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |
| James River (0178744 ) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | | Yes |

**Managed Trout Streams**

N/A

**Bald Eagle Concentration Areas and Roosts**

**are present**. View Map of Bald Eagle Concentration Areas and Roosts

( 5 records )

| BECAR ID | Observation Year | Authority | Type | Comment |
|---|---|---|---|---|
| 10 | | Bryan Watts (Center for Conservation Biology) | Roost | Count 15 |
| 24 | 2009 | Jeannette Parker (VDGIF) | Roost | Count 8 |
| 47 | 2006 - 2007 | Center for Conservation Biology at the College of William and Mary/Virginia Commonwealth University | Summer Concentration Area | Eagle_use |
| 49 | 2006 - 2007 | Center for Conservation Biology at the College of William and Mary/Virginia Commonwealth University | Summer Concentration Area | Eagle_use |

| 52 | 2006 - 2007 | Center for Conservation Biology at the College of William and Mary/Virginia Commonwealth University | Winter Concentration Area | Eagle_use |
|---|---|---|---|---|

**Bald Eagle Nests** ( 6 records )

View Map of All Query Results
Bald Eagle Nests

| Nest | N Obs | Latest Date | DGIF Nest Status | View Map |
|---|---|---|---|---|
| JC0304 | 7 | Apr 26 2007 | HISTORIC | Yes |
| JC0401 | 9 | Apr 28 2008 | Unknown | Yes |
| JC0501 | 8 | Apr 28 2008 | Unknown | Yes |
| JC0703 | 4 | Apr 23 2008 | Unknown | Yes |
| JC8703 | 20 | May 10 1999 | HISTORIC | Yes |
| JC9802 | 9 | Jan 1 2002 | HISTORIC | Yes |

Displayed 6 Bald Eagle Nests

**Habitat Predicted for Aquatic WAP Tier I & II Species** ( 1 Reach )

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

| Stream Name | Tier Species | | | | | | View Map |
|---|---|---|---|---|---|---|---|
| | Highest TE* | BOVA Code, Status*, Tier**, Common & Scientific Name | | | | | |
| James River (20802061) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | Yes |
| James River (20802061) | FESE | 010032 | FESE | Ib | Sturgeon, Atlantic | Acipenser oxyrinchus | Yes |

**Habitat Predicted for Terrestrial WAP Tier I & II Species** ( 2 Species )

View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below

ordered by Status Concern for Conservation

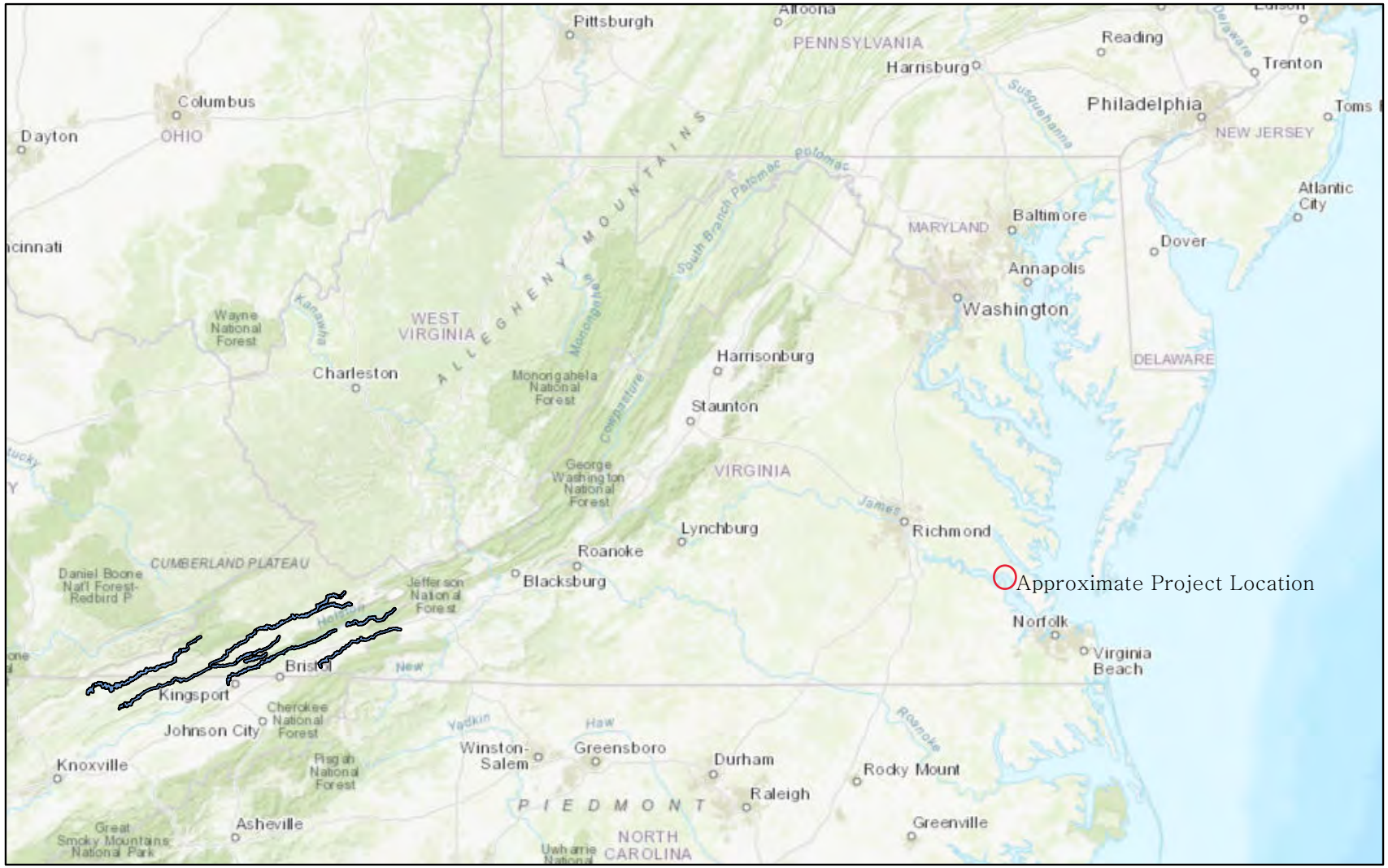
| BOVA Code | Status* | Tier** | Common Name | Scientific Name | View Map |
|---|---|---|---|---|---|
| 020044 | ST | IIa | Salamander, Mabee's | Ambystoma mabeei | Yes |
| 030067 | CC | IIa | Terrapin, northern diamond-backed | Malaclemys terrapin terrapin | Yes |

**Public Holdings:** ( 2 names )

| Name | Agency | Level |
|---|---|---|
| Colonial National Historical Park | National Park Service | Federal |
| Yorktown Naval Weapons Station | U.S. Dept. of Navy | Federal |

Compiled on 9/23/2020, 8:38:41 AM I1054912.0 report=IPA searchType= R dist= 3218.688 poi= 37,13,14.7 -76,39,00.2
PixelSize=64; Anadromous=0.049942; BECAR=0.04585; Bats=0.034037; Buffer=0.111042; County=0.124621; Impediments=0.036862; Init=0.173598; PublicLands=0.037221; SppObs=0.346219; TEWaters=0.057892; TierReaches=0.095422; TierTerrestrial=0.084559; Total=2.250678; Tracking_BOVA=1.110652; Trout=0.026429

# Carters Grove Shoreline




July 8, 2020

Virginia Critical Habitat (published)

1:4,622,324

0 30 60 120 mi

0 50 100 200 km

Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

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Carters Grove Living Shoreline Project

Bald Eagle Map, September 2020


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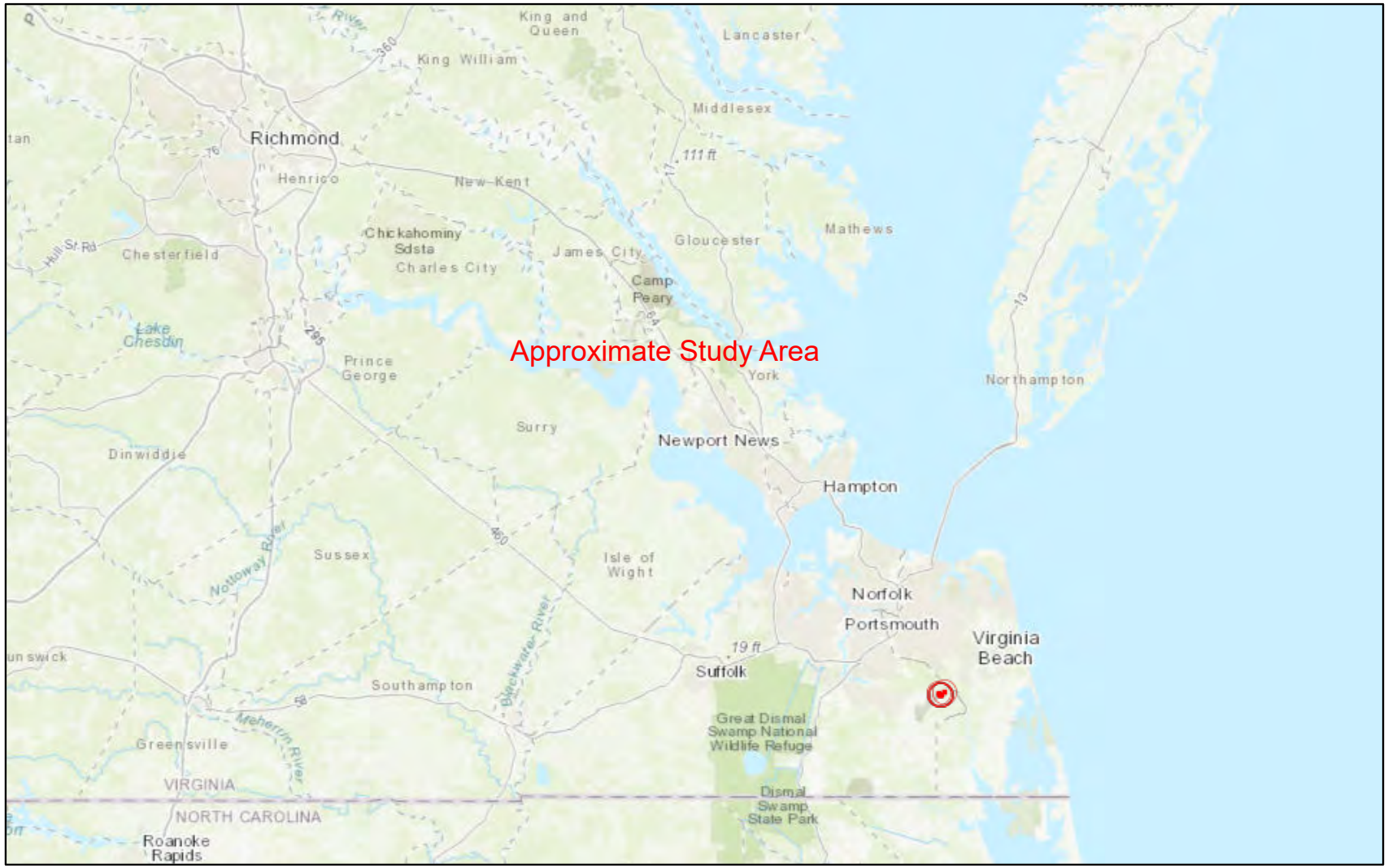
# NLEB Locations and Roost Trees




7/8/2020, 4:06:22 PM

NLEB Known Occupied Maternity Roost (Summer Habitat)

1:1,155,581

0 5 10 20 mi

0 12.5 25 50 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, VA Dept. Game & Inland Fisheries Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS |

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# 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/

IPaC Record Locator: 879-22475004 July 08, 2020

Subject: Consistency letter for the 'Carters Grove Living Shoreline' project indicating that any take of the northern long-eared bat 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).

Dear Caitlin Cyrus:

The U.S. Fish and Wildlife Service (Service) received on July 08, 2020 your effects determination for the 'Carters Grove Living Shoreline' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited 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, any take of the northern long-eared bat 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 Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into 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 your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

---

[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**

Carters Grove Living Shoreline

**2. Description**

The following description was provided for the project 'Carters Grove Living Shoreline':

> Shoreline restoration and stabilization.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.204436519279454N76.62845258904487W


**Determination Key Result**

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

**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 non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

# Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat 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).

## Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   *No*

2. Will your activity purposefully **Take** northern long-eared bats?

   *No*

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   **Automatically answered**
   *No*

4. 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*

5. 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*

6. Will the action involve Tree Removal?

   *No*

## Project Questionnaire

**If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.**

1. Estimated total acres of forest conversion:

*0*

2. If known, estimated acres of forest conversion from April 1 to October 31

*0*

3. If known, estimated acres of forest conversion from June 1 to July 31

*0*

**If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.**

4. Estimated total acres of timber harvest

*0*

5. If known, estimated acres of timber harvest from April 1 to October 31

*0*

6. If known, estimated acres of timber harvest from June 1 to July 31

*0*

**If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.**

7. Estimated total acres of prescribed fire

*0*

8. If known, estimated acres of prescribed fire from April 1 to October 31

*0*

9. If known, estimated acres of prescribed fire from June 1 to July 31

*0*

**If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.**

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

*0*

NOAA FISHERIES
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Greater Atlantic Region

US Army Corps of Engineers

# GARFO ESA Section 7: NLAA Program Verification Form

(Please submit a signed version of this form, together with any project plans, maps, supporting analyses, etc., to nmfs.gar.esa.section7@noaa.gov with "**USACE NLAA Program: [Application Number]**" in the subject line)

## Section 1: General Project Details

| | |
|---|---|
| Application Number: | |
| Reinitiation: | |
| Applicant(s): | |
| Permit Type: | |
| Anticipated project start date (e.g., 10/1/2020) | |
| Anticipated project end date (e.g., 12/31/2022 – if there is no permit expiration date, write "N/A") | |

Project Type/Category (check all that apply to entire action):

| | | | |
|---|---|---|---|
| ☐ | Aquaculture (shellfish) and artificial reef creation | ☐ | Mitigation (fish/wildlife enhancement or restoration) |
| ☐ | Dredging and disposal/beach nourishment | ☐ | Bank stabilization |
| ☐ | Piers, ramps, floats, and other structures | ☐ | If other, describe project type category: |

| | | | |
|---|---|---|---|
| Town/City: | | Zip: | |
| State: | | Water body: | |



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| Project/Action Description **and** Purpose<br>(*include relevant permit conditions that are not captured elsewhere on form*): | | |
|---|---|---|
| | | |
| Type of Bottom Habitat Modified: | Permanent/Temporary: | Area (acres): |
| | | |
| | | |
| | | |
| Project Latitude (e.g., 42.625884) | | |
| Project Longitude (e.g., -70.646114) | | |
| Mean Low Water (MLW)(m) | | |
| Mean High Water (MHW)(m) | | |

| Width (m) of water body in action area: | Stressor Category (stressor that extends furthest distance into water body – e.g., turbidity plume; sound pressure wave): | Max extent (m) of stressor into the water body: |
|---|---|---|
| | | |

**Section 2: ESA-listed species and/or critical habitat in the action area:**

| | | | |
|---|---|---|---|
| ☐ | Atlantic sturgeon (all DPSs) | ☐ | Kemp's ridley sea turtle |
| ☐ | Atlantic sturgeon critical habitat<br>Indicate which DPS : | ☐ | Loggerhead sea turtle<br>(NW Atlantic DPS) |
| ☐ | Shortnose sturgeon | ☐ | Leatherback sea turtle |
| ☐ | Atlantic salmon (GOM DPS) | ☐ | North Atlantic right whale |
| ☐ | Atlantic salmon critical habitat<br>(GOM DPS) | ☐ | North Atlantic right whale<br>critical habitat |
| ☐ | Green sea turtle (N. Atlantic DPS) | ☐ | Fin whale |

* Please consult GARFO PRD's ESA Section 7 Mapper for ESA-listed species and critical habitat information for your action area at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater.



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**Section 3: NLAA Determination (check all applicable fields):**
If the Project Design Criteria (PDC) is met, select Yes. If the PDC is not applicable (N/A) for your project (e.g., the stressor category is not included for your project activity, or for PDC 2, your project does not occur within the range of the GOM DPS of Atlantic salmon), select N/A. If the PDC is applicable, but is not met, leave both boxes blank and provide a justification for that PDC in Section 4.

| a) GENERAL PDC | | | |
|---|---|---|---|
| Yes | N/A | PDC # | PDC Description |
| ☐ | ☐ | 1. | No portion of the proposed action will individually or cumulatively have an adverse effect on ESA-listed species or designated critical habitat. |
| ☐ | ☐ | 2. | No portion of the proposed action will occur in the tidally influenced portion of rivers/streams where Atlantic salmon presence is possible from April 10–November 7.<br><br>**Note**: If the project will occur within the geographic range of the GOM DPS Atlantic salmon but their presence is not expected following the best available commercial scientific data, the work window does not need to be applied (include reference in project description). |
| ☐ | ☐ | 3. | No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as spawning grounds as follows:<br>i. Gulf of Maine: April 1–Aug. 31<br>ii. Southern New England/New York Bight: Mar. 15–Aug. 31<br>iii. Chesapeake Bay: March 15–July 1 and Sept. 15–Nov. 1<br><br>**Note**: If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval (include reference in project description). |
| ☐ | ☐ | 4. | No portion of the proposed action that may affect shortnose or Atlantic sturgeon will occur in areas identified as overwintering grounds, where dense aggregations are known to occur, as follows:<br>i. Gulf of Maine: Oct. 15–April 30<br>ii. Southern New England/ New York Bight: Nov. 1–Mar. 15<br>iii. Chesapeake Bay: Nov. 1–Mar. 15<br><br>**Note**: If river specific information exists that provides better or more refined time of year information, those dates may be substituted with NMFS approval (include reference in project description). |
| ☐ | ☐ | 5. | Within designated Atlantic salmon critical habitat, no portion of the proposed action will affect spawning and rearing areas (PBFs 1-7). |
| ☐ | ☐ | 6. | Within designated Atlantic sturgeon critical habitat, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand) (PBF 1). |



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| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 7. | Work will result in no or only temporary/short-term changes in water temperature, water flow, salinity, or dissolved oxygen levels. |
| ☐ | ☐ | 8. | If ESA-listed species are (a) likely to pass through the action area at the time of year when project activities occur; and/or (b) the project will create an obstruction to passage when in-water work is completed, then a zone of passage (~50% of water body) with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage). |
| ☐ | ☐ | 9. | Any work in designated North Atlantic right whale critical habitat must have no effect on the physical and biological features (PBFs). |
| ☐ | ☐ | 10. | The project will not adversely impact any submerged aquatic vegetation (SAV). |
| ☐ | ☐ | 11. | No blasting or use of explosives will occur. |

| b) The following stressors are applicable to the action (check all that apply – use Stressor Category Table for guidance): | |
|---|---|
| ☐ | Sound Pressure |
| ☐ | Impingement/Entrapment/Capture |
| ☐ | Turbidity/Water Quality |
| ☐ | Entanglement (Aquaculture) |
| ☐ | Habitat Modification |
| ☐ | Vessel Traffic |

| | **Stressor Category** | | | | | |
|---|---|---|---|---|---|---|
| **Activity Category** | Sound Pressure | Impingement/ Entrapment/ Capture | Turbidity/ Water Quality | Entanglement | Habitat Mod. | Vessel Traffic |
| Aquaculture (shellfish) and artificial reef creation | N | N | Y | Y | Y | Y |
| Dredging and disposal/beach nourishment | N | Y | Y | N | Y | Y |



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| | Stressor Category | | | | | |
|---|---|---|---|---|---|---|
| **Activity Category** | Sound Pressure | Impingement/ Entrapment/ Capture | Turbidity/ Water Quality | Entanglement | Habitat Mod. | Vessel Traffic |
| Piers, ramps, floats, and other structures | Y | N | Y | N | Y | Y |
| Transportation and development (e.g., culvert construction, bridge repair) | Y | N | Y | N | Y | Y |
| Mitigation (fish/wildlife enhancement or restoration) | N | N | Y | N | Y | Y |
| Bank stabilization and dam maintenance | Y | N | Y | N | Y | Y |

c) SOUND PRESSURE PDC

**Information for Pile Driving:**
If your project includes non-timber piles*, please attach your calculation to this verification form showing that the noise is below the injury thresholds of ESA-listed species in the action area. The GARFO Acoustic Tool is available as one source, should you not have other information:

https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic

*Sound pressure effects from timber and steel sheet piles were analyzed in the NLAA programmatic consultation, so no additional acoustic information is necessary.

| | Pile material | Pile diameter/width (inches) | Number of piles | Installation method |
|---|---|---|---|---|
| a) | | | | |
| b) | | | | |
| c) | | | | |
| d) | | | | |



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| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 12. | If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a "soft start" is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase. *In addition to using a soft start at the beginning of the work day for pile driving, one must also be used at any time following cessation of pile driving for a period of 30 minutes or longer.*<br><br>For impact pile driving: pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one minute wait period, then two subsequent 3-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.<br><br>For vibratory pile installation: pile driving will be initiated for 15 seconds at reduced energy followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy driving, one-minute waiting period will be repeated two additional times, followed immediately by pile-driving at full rate and energy. |
| ☐ | ☐ | 13. | Any new pile supported structure must involve the installation of ≤ 50 piles (below MHW). |
| ☐ | ☐ | 14. | All underwater noise (pressure) is below (<) the physiological/injury noise threshold for ESA-species in the action area. |

d) IMPINGEMENT/ENTRAINMENT/CAPTURE PDC

| **Information for Dredging/Disposal:** | | | |
|---|---|---|---|
| Type of dredge: | | | |
| Maintenance dredging?: | | If "Yes", how many acres? | |
| If maintenance, when was the last dredge cycle? | | | |
| New dredging: | | If "Yes", how many acres? | |
| Estimated number of dredging events covered by permit: | | | |
| ESA-species exclusion measures required (e.g., cofferdam, turbidity curtain): | | | |
| If no exclusion measures required, explain why: | | | |
| **Information for Intake Structures**: | | | |
| Mesh screen size (mm) for temporary intake: | | | |



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| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 15. | Only mechanical, cutterhead, and low volume hopper (e.g., CURRITUCK, ~300 cubic yard maximum bin capacity) dredges may be used. |
| ☐ | ☐ | 16. | No new dredging in Atlantic sturgeon or Atlantic salmon critical habitat (maintenance dredging still must meet all other PDCs). New dredging outside Atlantic sturgeon or salmon critical habitat is limited to one time dredge events (e.g., burying a utility line) and minor (≤ 2 acres) expansions of areas already subject to maintenance dredging (e.g., marina/harbor expansion). |
| ☐ | ☐ | 17. | Work behind cofferdams, turbidity curtains, or other methods to block access of animals to dredge footprint is required when operationally feasible or beneficial and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, exclusion methods are not necessary). |
| ☐ | ☐ | 18. | Temporary intakes related to construction must be equipped with appropriate sized mesh screening (as determined by GARFO section 7 biologist and/or according to Chapter 11 of the NOAA Fisheries Anadromous Salmonid Passage Facility Design) and must not have greater than 0.5 fps intake velocities, to prevent impingement or entrainment of any ESA-listed species life stage. |
| ☐ | ☐ | 19. | No new permanent intake structures related to cooling water, or any other inflow at facilities (e.g. water treatment plants, power plants, etc.). |

e) TURBIDITY/WATER QUALITY PDC

| **Information for Turbidity Producing Activity (excluding disposal):** | |
|---|---|
| ESA-species turbidity control measures required (e.g., turbidity curtain): | |
| If no turbidity control measures required, explain why: | |
| **Information for Dredged Material Disposal:** | |
| Disposal site: | |
| Estimated number of trips to disposal site: | |
| Relevant disposal site permit/special conditions required (NAE: for offshore disposal, include Group A, B, C, or relevant Long Island Sound consultation): | |

| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 20. | Work behind cofferdams, turbidity curtains, or other methods to control turbidity is required when operationally feasible or beneficial and ESA-listed species are likely to be present (if presence is limited to rare, transient individuals, turbidity control methods are not necessary). |
| ☐ | ☐ | 21. | In-water offshore disposal may only occur at designated disposal sites that have been the subject of ESA section 7 consultation with NMFS, where a valid consultation is in place and appropriate permit/special conditions are included. |



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| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 22. | Any temporary discharges must meet state water quality standards (e.g., no discharges of substances in concentrations that may cause acute or chronic adverse reactions, as defined by EPA water quality standards criteria). |
| ☐ | ☐ | 23. | Only repair, upgrades, relocations and improvements of existing discharge pipes or replacement in-kind are allowed; no new construction of untreated discharges. |
| | f) ENTANGLEMENT PDC | | |

**Information for Aquaculture Projects:**

| | |
|---|---|
| Approximate distance from shore (MHW)(m): | |
| Grow season begins (approximate): | |
| Grow season ends (approximate): | |
| Total number of vertical lines: | |
| Total number of horizontal lines: | |
| Is any gear seasonally removed from the water? If yes, which parts and when? | |

| | Aquaculture Gear | Acreage (total permit footprint) | Type of Shellfish Cultivated |
|---|---|---|---|
| a) | | | |
| b) | | | |
| c) | | | |

| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 24. | Shell on bottom <50 acres with maximum of 4 corner marker buoys; |
| ☐ | ☐ | 25. | Cage on bottom with no loose floating lines <5 acres and minimal vertical lines (1 per string of cages, 4 corner marker buoys); |
| ☐ | ☐ | 26. | Floating cages in <3 acres in waters and shallower than -10 feet MLLW with no loose lines and minimal vertical lines (1 per string of cages, 4 corner marker buoys); |
| ☐ | ☐ | 27. | Floating upweller docks in >10 feet MLLW. |
| ☐ | ☐ | 28. | Any in-water lines, ropes, or chains must be made of materials and installed in a manner to minimize or avoid the risk of entanglement by using thick, heavy, and taut lines that do not loop or entangle. Lines can be enclosed in a rigid sleeve. |
| | g) HABITAT MODIFICATION PDC | | |
| Yes | N/A | PDC # | PDC Description |
| ☐ | ☐ | 29. | No conversion of habitat type (soft bottom to hard, or vice versa) for aquaculture or reef creation. |



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| | h) VESSEL TRAFFIC PDC |
|---|---|

**Information for Vessel Traffic**:

| | Temporary Project Vessel Type | Number of Vessels |
|---|---|---|
| a) | | |
| b) | | |
| c) | | |
| | Type of Non-Commercial or Aquaculture Vessels Added<br>*– only include if there is a net increase directly/indirectly resulting from project*) | Number of Vessels<br>(*if sum > 2, PDC 33 is not met and justification required in Section 4*) |
| a) | | |
| b) | | |
| | Type of Commercial Vessels Added<br>(*only include if there is a net increase directly/indirectly resulting from project*) | Number of Vessels<br>(*if > 0, PDC 33 is not met and justification required in Section 4*) |
| a) | | |
| b) | | |

| | |
|---|---|
| If no temporary/permanent vessel traffic, briefly explain (e.g., all land-based work, no net increase in vessel traffic) | |

| Yes | N/A | PDC # | PDC Description |
|---|---|---|---|
| ☐ | ☐ | 30. | Maintain project vessels operating within the action area to speed limits below 10 knots and dredge vessel speeds of 4 knots maximum, while dredging. |
| ☐ | ☐ | 31. | Maintain a 1,500-foot buffer between project vessels and ESA-listed whales and a 150-foot buffer between project vessels and sea turtles unless the vessel is navigating to an in-water disposal site/activity. If the vessel is navigating to an in-water disposal site/activity, refer to and include the conditions contained in the appropriate GARFO-USACE/EPA consultation for the disposal site. |
| ☐ | ☐ | 32. | The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project. |
| ☐ | ☐ | 33. | The permanent net increase in vessels resulting from a project (e.g., dock/float/pier/boating facility) must not exceed two non-commercial vessels. A project must not result in the permanent net increase of any commercial vessels (e.g., a ferry terminal). |

**Section 4: Justification for Review under the NLAA Program**

If the action is not in compliance with all of the General PDC and appropriate stressor PDC, but you can provide justification and/or special conditions to demonstrate why the project still meets the NLAA determination and is consistent with the aggregate effects considered in the programmatic consultation, you may still certify your project through the NLAA program using



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this verification form. Please identify which PDC your project does not meet (e.g., PDC 9, PDC 15, PDC 22, etc.) and provide your rationale and justification for why the project is still eligible for the verification form.

To demonstrate that the project is still NLAA, you must explain why the effects on ESA-listed species or critical habitat are **insignificant** (i.e., too small to be meaningfully measured or detected) or **discountable** (i.e., extremely unlikely to occur). **Please use this language in your justification.**

| PDC# | Justification |
|---|---|
| | |
| | |
| | |



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| | |
|---|---|
| | |

**Section 5: USACE Verification of Determination**

| | |
|---|---|
| ☐ | In accordance with the NLAA Program, USACE has determined that the action complies with all applicable PDC and is not likely to adversely affect listed species. |
| ☐ | In accordance with the NLAA Program, the USACE has determined that the action is not likely to adversely affect listed species per the justification and/or special conditions provided in Section 4. |
| USACE Signature: | Date: |
| | |

**Section 6: GARFO Concurrence**

| | |
|---|---|
| ☐ | In accordance with the NLAA Program, GARFO PRD concurs with USACE's determination that the action complies with all applicable PDC and is not likely to adversely affect listed species or critical habitat. |
| ☐ | In accordance with the NLAA Program, GARFO PRD concurs with USACE's determination that the action is not likely to adversely affect listed species or critical habitat per the justification and/or special conditions provided in Section 4. |
| ☐ | GARFO PRD does not concur with USACE's determination that the action complies with the applicable PDC (with or without justification), and recommends an individual Section 7 consultation to be completed independent from the NLAA Program. |
| GARFO Signature: | Date: |
| | |



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Endangered Species Act (ESA) Section 7 Determination Table

Project Name: Carters Grove Living Shoreline

Date: September 29, 2020

Consultation Code: 05E2VA00-2020-SLI-4811

| Species / Resource Name | Habitat/Species Presence in Action Area | Sources of Info | ESA Section 7 Determination | Project Elements that Support Determination |
|---|---|---|---|---|
| *Insert name of species or resource as listed on Official Species List.* | *Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).* | *Explain what info suitable habitat/species presence is based on.* | *Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).* | *Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.* |
| Northern Long-eared Bat | Suitable habitat present; species not present in action area. | VGIF online NLEB map indicates no NLEB in action area. Dkey | May effect. Adherence to 4(d) rule. | A NLEB was recorded within 2 miles of the project shoreline on the Naval Weapons Station. The project site will be the immediate shoreline (beach and water) of the James River associated with a living shoreline project. The work will be performed using barges. |
| Bald Eagle | Active eagle nest is located adjacent to James River shoreline. | Virginia Center for Conservation Biology | Bald Eagle take permit may be required. | Living shoreline will be installed within 60 to 70 feet from an active eagle nest, and the proposed boat dock will be approximately 610 feet from the eagle nest. |
| Atlantic sturgeon | Critical habitat is present | NOAA, National Marine Fisheries | Not likely to adversely affect | See NOAA NLAA Determination Form |

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# Attachment D

## Carter's Grove Historical & Archaeological Summary

## Underwater Survey Report

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# HISTORICAL AND ARCHAEOLOGICAL OVERVIEW OF CARTER'S GROVE PLANTATION JAMES CITY COUNTY, VIRGINIA

**October 2020**

**Prepared By:**
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# I. INTRODUCTION

**Background**

Carter's Grove Plantation is a National Historic Landmark located on the James River about 6 miles downriver from Jamestown Island and just south of the Grove community in James City Count. Today, the property encompasses approximately 466 acres that includes a 1755 mansion, farm fields, lawns and woods, though it was far larger in the past (Kelso 1972:74; Boroughs 2008: i, 15-19). Several archeological surveys of the property have identified 15 archaeological sites (Figures 1-3). A conservation easement has been granted to the Virginia Department of Historic Resources (VDHR) and the Virginia Outdoors Foundation (VOF) over the property by previous owners to limit uses of the property for the protection of natural resources, as well as the historic character of the site. The waterfront property has approximately 7,500 linear feet of shoreline that exhibits variable conditions including low eroding escarpments, barrier beaches in front of emergent wetland systems, steep eroding bluffs up to 60 feet high, and several short reaches of stabilized shoreline.

Significant Native American occupation of the site dates back into the Middle Woodland period (c. 500 B.C. – A.D. 900), while the first European settlers arrived in 1618. Initially known as "Martin's Hundred," the plantation was renamed "Carter's Grove" upon the death of owner Robert 'King' Carter in 1732. Robert Carter's grandson, Carter Burwell, began construction on the estate's mansion in the late 1730's which took almost 20 years to complete (Noel Hume 1991: 8). This mansion was remodeled and expanded in the early 20th century by the McCrea family, who owned the plantation from 1928-1969 and also built the Caretaker's Cottage and stables in 1928 (Boroughs 2008:18-19, 21; Chris Price 2015, pers. comm.). After that time, the Colonial Williamsburg Foundation (CWF) acquired Carter's Grove, with the intention of restoring the grounds to a working 18th-century plantation. To that end, CWF sponsored archaeological excavations on the property, opened the estate to the public and established a museum on-site (Kelso 1972: ix; Noël Hume 1991: xxii; Boroughs 2008:18-19). In 2007, the CWF divested itself of the property, only to reacquire it at auction in 2014 and resell it later in the year (Washington 2007; Svrluga 2014). The current owner is Carter's Grove Associates, LLC.

**Proposed Shoreline Stabilization**

Project includes the installation approximately 4,300 linear feet of living shoreline along the Carters Grove waterfront, in two separate segments. In total the project is comprised of 12 free-standing, offshore, armor stone breakwaters and 78,000 cubic yards of sand fill to create 108,754 square feet of stable, sandy, intertidal shoreline and 285,595 square feet of vegetated backshore. The upstream segment contains a series of eight (8) offshore breakwaters all 175-feet in length, while the downstream segment has two (2) 206-foot breakwaters, a 200-foot, and a 175-foot breakwater. The project also includes the installation of two new segments of riprap revetment for a total 1,047 linear feet. In addition, 1,380 linear feet of existing riprap revetment will be refurbished by reworking and adding additional larger armor stone. Approximately 78,000 cubic yards of clean,



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beach-quality sand will be placed behind the breakwaters in the configuration shown to develop stable beaches. The back shore areas will be planted with salt meadow hay.


**Figure 1.** Location of Carter's Grove Plantation in relation to historic Jamestown and Williamsburg. Photograph copyright Google 2016.



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**Figure 2.** Location of Carter's Grove Plantation on combined Hog Island and Yorktown, Virginia USGS Quadrangles.



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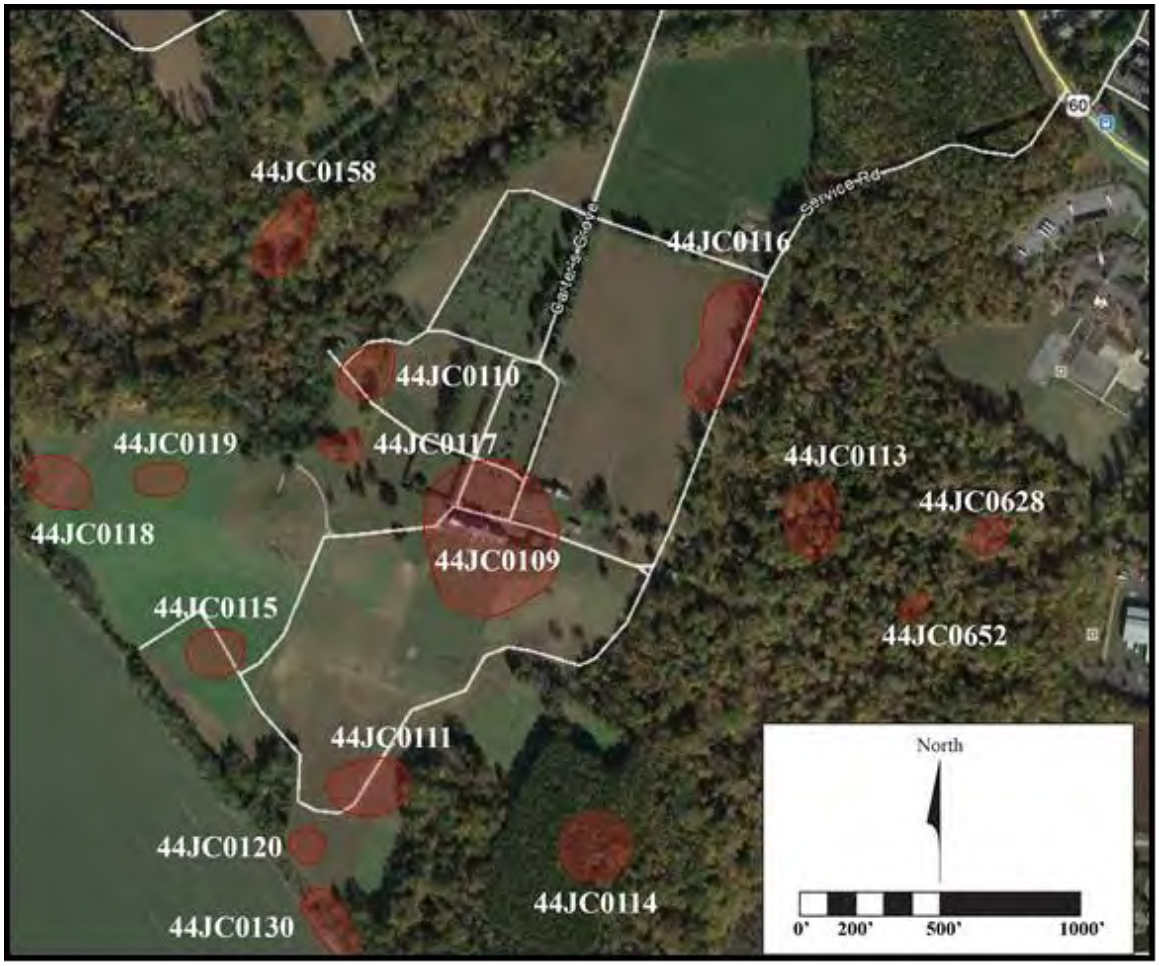


**Figure 3.** Locations of the known archaeological sites surrounding the core of the Carter's Grove Plantation property according to VCRIS. Background photo copyright Google 2016.



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# II. HISTORICAL BACKGROUND

The earliest known occupation of the property dates to the Archaic period (8000 - 1200 BC). LeCroy (6500 – 5800 BC) and Morrow Mountain II (5000 - 4000 BC) projectile points indicate that Native American groups visited the estate beginning in the Early Archaic period. These visits were likely quite short, and no long-term occupations from this period have been found to date to on the property (Justice 1987:91, 105; Muraca 1989:11-14). A temporary camp site from sometime during the Late Archaic (2500 - 1200 BC) has been found at Carter's Grove, but it also appears to have been a short-term occupation (Bradshaw 2010:52-56). The most significant Native American occupation occurred during the Middle (500 BC – 900 AD) and Late (900 – 1600 AD) Woodland periods. Several sites, including multiple, seasonal Middle Woodland encampments focused on harvesting riverine resources, and a long-term Late Woodland settlement represented by a shell midden and ossuary, are present at Carter's Grove at site 44JC0118 and 44JC0119 (Kelso 1972:71-72; Muraca 1989:11-19; Moodey 1992:74-75; McFaden 2009:7-29).

**Woodland (1200 B.C. – ca. A.D. 1600)**

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

*Middle Woodland*

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

*Late Woodland*

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



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

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

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

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

During this period, the southern shore of the York River was the home territory of the Chiskiack Indians. The principal village of this Algonquian group, numbering around 200 men, women, and children, was located east of Indian Field Creek, about six miles downriver from the project area. By the Late Woodland Period, beginning around 900 A.D., the Chiskiacks and their neighbors in Tidewater Virginia had settled in loosely-clustered, permanent villages. They relied primarily on corn-based agriculture for their subsistence, supplemented seasonally by the rich resources of the river and the surrounding lands (Rountree 1989: 11).



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**European Settlement**

European settlement of the plantation began in the 17th century. The Society of Martin's Hundred probably received its patent in 1618 through the Virginia Company of London, which was struggling to expand its shaky financial base by selling land to subsidiary companies (Noël Hume 1979). The Society's ship *Guift of God* left England in 1618 carrying 220 settlers to populate the 20,000 acre tract of land. William Harwood, the leader and possible "governor" of the settlement, arrived more than a year later and likely resided in the community from 1623 through 1625. An Indian uprising in March of 1622 destroyed all but two houses and part of a church at Wolstenhome Town (the primary settlement on the plantation) and reduced the population of the settlement from 140 people to 62 (Noël Hume 1979, 1991:64-66; Edwards 2004:7). Later, 20 individuals returned to the settlement, but despite continuous immigration, by 1625 only 30 residents resided in this area (Noël Hume 1979:66).

After 1622, the primary settlement at Martin's Hundred moved away from Wolstenhome Town near the river, and onto the bluff near the future site of the Carter's Grove Mansion (Edwards 2004:9). This community seems to have disappeared after about 1650, and its decline may have been tied to a steep drop in tobacco prices in the 1640s (Noël Hume 1991:40-41; Edwards 2004:9). In addition to Wolstenhome Town and its successor, at least nine other 17th-century sites have been identified at Carter's Grove. Unfortunately, few historical documents from or about these sites have survived to the present day (Edwards 2004:9). By the early 18th century, Martin's Hundred "seemed to cease to be an entity" (Edwards 2004:10).

Robert "King" Carter of Corotoman, a wealthy planter and politician from Lancaster County, Virginia, purchased what had been Martin's Hundred (by then also referred to as Merchant's Hundred) sometime between 1710 and 1720, though it is not known from whom he procured the land (Stephenson 1990:1-2, 205; Noël Hume 1991:8). In 1726, Robert Carter wrote a will which changed the name of the property to Carter's Grove and deeded it and all of the "lands, slaves, stocks of cattle & hoggs, houses, [and] plantations" to his daughter Elizabeth and grandson Carter Burwell (Noël Hume 1991:8). The implication of this statement is that by 1726, not only was Carter's Grove a functioning plantation, but several structures were present on the property. Based on Robert Carter's letters and account books, he appears to have grown tobacco at Carter's Grove (Stephenson 1990:7-8). He may also have raised crops of wheat, corn, hay and timber (Noël Hume 1974:23).

Carter Burwell took possession of the estate following the demise of his mother in 1734. His property was divided into several quarters, each with an overseer. The quarters listed in Burwell's account books were: "Merchant's Hundred, North Wales, New Quarter, Mill Quarter, Neck of Land, Foace's and Black Swamp" (Stephenson 1990:33). The account books also indicated that in July of 1739, Burwell ordered 94,000 bricks and employed several laborers, including a bricklayer named Thomas Wharton, on an unspecified construction project. A second bricklayer, William Robinson, was hired in 1740, and is known to have done "work on a Dairy." By 1744, Burwell was making bricks at Carter's Grove, and the next year "Carpenters began to get the Boards for a 40 foot house." Burwell also began ordering oyster shells in 1746, presumably to make mortar. In 1751 he attempted to acquire more, taking out an ad in the *Virginia Gazette*



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and offering to pay "three shillings a hogshead" for shells (Noël Hume 1974:13-15; Stephenson 1990:31-33, 37-38, 294).

Carter Burwell had a large mansion constructed on the property, which survives to the present day (Figure 6). The mansion was built from 1751 to 1755, and a 1750 order of 460,000 bricks was presumably part of that construction project (Noël Hume 1974:15-16; Stephenson 1990:36). The mansion is flanked by two buildings, which are believed to have functioned as a kitchen (east dependency) and office (west dependency). All three structures are brick, and display a Flemish bond pattern above the water table. Curiously, the dependencies have glazed, decorative headers, while the mansion does not. Burwell's account books indicate that he was living at Carter's Grove by 1739, and mention both a "kitchen" and a "house" existing by 1740 and 1741, respectively (Stephenson 1990:31, 295; Wenger 1996:5-6).

The west dependency may have been the "house." Rough calculations done by Mark Wenger suggest that Carter Burwell's 1739 order of 94,000 bricks[1] would have been about what was needed to construct the west dependency and its full cellar. Burwell employed several laborers and a bricklayer at that time, indicating that he had undertaken a substantial construction project. A 1740 payment of £22.60 to another bricklayer, William Robinson, may have been for the construction of the east dependency. At the time, 5 shillings would have purchased about 1,000 bricks; thus the payment to Robinson would have purchased about 89,000 bricks. This amount would have been about right for the east dependency, which did not include a full cellar and thus required fewer bricks than the west dependency (Stephenson 1990:294; Wenger 1996:5-8). Either building could have functioned as a home for the Burwells before the mansion was constructed. However, as the west dependency appears to have been constructed first, and the east dependency seems to have been used as a kitchen for much, if not all, of its existence, the west wing is more likely to have been the Burwell residence (Noël Hume 1974:21; Stephenson 1990:134, 149).

Interestingly, later account books mention repairs made to the "old House" in 1770 (Stephenson 1990:51). Kelso suggests this building stood "either where the terraces were constructed or where the mansion now stands." Archaeological testing near the terraces did turn up evidence for an ephemeral structure, though this building may have been demolished as early as 1760. However, the terraces are known to have been built between 1730 and 1745 (Kelso 1972:29-31). This suggests that Carter Burwell had a plan in mind for his mansion complex, since he built the terraces before the main house was even begun. Considering all of the information, it is probable that the "old House" referred to in 1770 is the west dependency, which was built by Carter Burwell to function as a residence prior to the completion of the mansion.

Archaeological research by William M. Kelso identified large fenced garden complex south of the house that was created around the time Burwell's brick mansion was constructed. Artifacts recovered from backfilled post holes suggest that the first period fence surrounding the garden was constructed and in use after 1740, and was

[1] Wenger (1995:8) states that this purchase happened in 1748. However, the excerpts from the Burwell Papers (M 96-1 CWI) reproduced in Stephenson (1990:294) indicate that the purchase actually took place in 1739.



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likely abandoned from 1760 to 1780 (Kelso 1972:11). A second period fence was installed sometime after 1769 and the two fences may have coexisted, at least along the southern and eastern extent of the garden, based on the placement of the fence posts (1972:12). The historical record confirms the construction of the garden complex in the early years of the brick mansion, although the dates do differ. In June 1765, the estate ledger shows that "1500 Garden Pails [pales or pickets]" were purchased and in 1766 Peyton Randolph was paid for "840 fence Rails" and "921 stakes." This suggests a considerable amount of fence construction was undertaken from 1765 to 1766, which Kelso associated with the first period fence line (Kelso 1972:20). Both archaeological and historical evidence agree that the garden was in existence by at least 1781, when the estate ledger mentions that three rows of trees were planted outside the garden (Kelso 1972: 20). Symmetrical gardens, such as the one at Carter's Grove, were common to Tidewater plantations at the time. Historical evidence confirms that another Burwell property, Kingsmill Plantation, also had a large symmetrical garden by 1781 (Kelso 1972: 21).

The mansion, terrace and flanking buildings were all complete and in use by 1755. The next year, Carter Burwell was dead, and his son Nathaniel Burwell inherited the property (Kelso 1972:4-5; Stephenson 1990:45). Nathaniel was only six at that time, and, until he came of age in 1771, Carter's Grove was managed by his guardian, William Nelson (Kelso 1972:4-5). William seems to have diversified the plantation's offerings, and by 1771 Carter's Grove was growing straw, wheat, and corn, and producing turkeys and butter (Stephenson 1990:62). Tobacco and wool were also in production by 1778 (Stephenson 1990:65-66).

In 1772, Nathaniel graduated from the College of William and Mary and married Susannah Grymes, daughter of the Honorable Philip Grymes of Middlesex County. Nathaniel and his wife lived at Carter's Grove, and until at least 1777, so did Nathaniel's sister Sarah and her husband John Bracken (Stephenson 1990:61-64). Nathaniel's account books indicate that he spent time repairing and expanding his estate. In 1784, he hired James Ratcliffe, a brick mason, to work "on the Wine room & Kitchen" and to add a brick underpinning to a stable. Another brick mason, Humphrey Harwood, was employed often from 1778 to 1789. Harwood mentioned working on a "pilloring House," a "Store House," a kitchen, a barn, and an overseer's house. He also built four hearths, and did a variety of repair work and plastering, including on a wooden chimney and a well.

Susannah Grymes Burwell died in 1788, leaving Nathaniel with their six surviving children. He remarried the next year, to widow Lucy Page Baylor. After his remarriage, Nathaniel and Lucy moved to another property, Carter Hall, in Clark County, Virginia. Carter's Grove remained an active plantation, but was no longer Nathaniel's focus, and his son Carter Burwell II took over management of the property in 1804. Nathaniel Burwell died only ten years later (Stephenson 1990:67-76).

Carter Burwell II was born in 1773, but little is known of his life prior to 1804. He attended the College of William and Mary, and was married, but had no children until 1817. Burwell made one notable addition to Carter's Grove: he purchased a wharf known as Trebell's Landing in 1804. The wharf was notable for having been the site where the Comte de Rochambeau landed the French siege artillery prior to the Battle of

Yorktown in in 1781 (Noël Hume 1974:26-28; Stephenson 1990:74-78, 90, 304, 457). British troops under Colonel Tarleton camped at Carter's Grove that same year (Noël Hume 1991:5). Carter died in 1819, and the land passed to his widow Mary Burwell (nee Duncan). Legal wrangling over Carter's will lasted for years afterward, and much of his wealth was dispersed. The Grove, as it then appears to have been called, eventually passed to Carter's son, Philip, in 1837, though he sold it to Thomas Wynne the next year (Noël Hume 1974:21; Stephenson 1990:77-88). Wynne owned the plantation where he maintained a public wharf and steamboat landing station known as "Grove Wharf," located at the older Trebell's Landing site, until his death in 1854 (Stephenson 1990:88-92).

Robert Carter, Carter Burwell I, and Nathaniel Burwell all maintained somewhat detailed records of Carter's Grove, but information about the tenure of Carter Burwell II and Thomas Wynne is more limited. Records of building construction and repairs, perhaps the most important information for archaeologists, are sorely lacking. Still, tax records and other documents do give some idea of what was going on at Carter's Grove in the first half of the 19th century. The number of slaves at Carter's Grove dropped from around 43 in 1796 to only 20 the next year—presumably the rest were moved to Carter Hall with Nathaniel and Lucy Burwell. During Carter Burwell II's ownership, there were only about 14 slaves on the property. These reductions suggest a corresponding shrinkage in the amount of activity taking place at Carter's Grove from 1797 to 1819 (Noël Hume 1974:21; Stephenson 1990:73). Interestingly, the size of the property did not diminish much, even during Thomas Wynne's tenure: Robert Carter had owned 1400 acres, and Wynne owned about 1200 acres (Stephenson 1990:5, 34, 73-74, 91).

Wynne had tried to sell the estate in 1854, just before his death, advertising the land as "my farm on which I reside, known as the 'Grove'" (Stephenson 1990:91). Wynne's use of the term "farm" to describe his property was read by Ivor Noël Hume as a sign that "the glory had departed" from the estate by that point (1974:21). This is perhaps reading too much into Wynne's word choice, but it is clear that Wynne was better known for his operation of Grove Wharf than for his farming. In his obituary, the *Virginia Gazette* described him only as "the gentlemanly proprietor of the 'Grove Wharf,'" and made no mention of his plantation (Stephenson 1990:92).

After Wynne's death, the Grove was traded among several owners, and documentary information about the plantation is relatively scarce. Lewis Ellison was the first of the new owners, purchasing the property in 1856. Ellison seems to have sold off outer sections of the plantation to raise money, but was unable to pay off the debt from his initial purchase. In 1867, he was forced to cede it back to the Wynne family, who sold it to Thomas Stratton in 1869. By 1868, the plantation was reportedly home to a "choice and flourishing" peach orchard, and the Grove Wharf was both popular and profitable (Stephenson 1990:93-106). Excavations in the 1970s indicated that a dairy had been built just northeast of the mansion sometime between 1840 and 1860, meaning it was erected either by Thomas Wynne or Lewis Ellison. The building was clearly in use after 1857, as a sagging wall was underpinned by an iron plowshare with the text "…WATT & CO. RICHD. VA. PAT 1857" molded on it. Fill overtop of the dairy indicated it was abandoned sometime between 1860 and 1900 (Kelso 1972:22-24).



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Thomas Stratton owned the property for less than a year before selling it to Fanny and Young Choles, who in 1874 sold it to Stephen and Mary Roberts. A description of the property from an 1874 advertisement mentions that the buildings on the property "consist of a dwelling elegantly fitted up… two large brick kitchens and the usual out-houses found on such an estate" (Stephenson 1990:106-112).

The dwelling is clearly the 1755 mansion, while the two brick kitchens are likely the flankers: the original kitchen and the old house/office. An 1874 plat of the property shows an additional two buildings near the mansion: one north and one east of the east flanker (Figure 4). These probably represent two of the "usual out-houses," though none of the buildings are labeled on the plat. A subsequent advertisement noted that "the dwelling is probably the best in the county," and, "the outer buildings are in excellent condition" (Stephenson 1990:114).

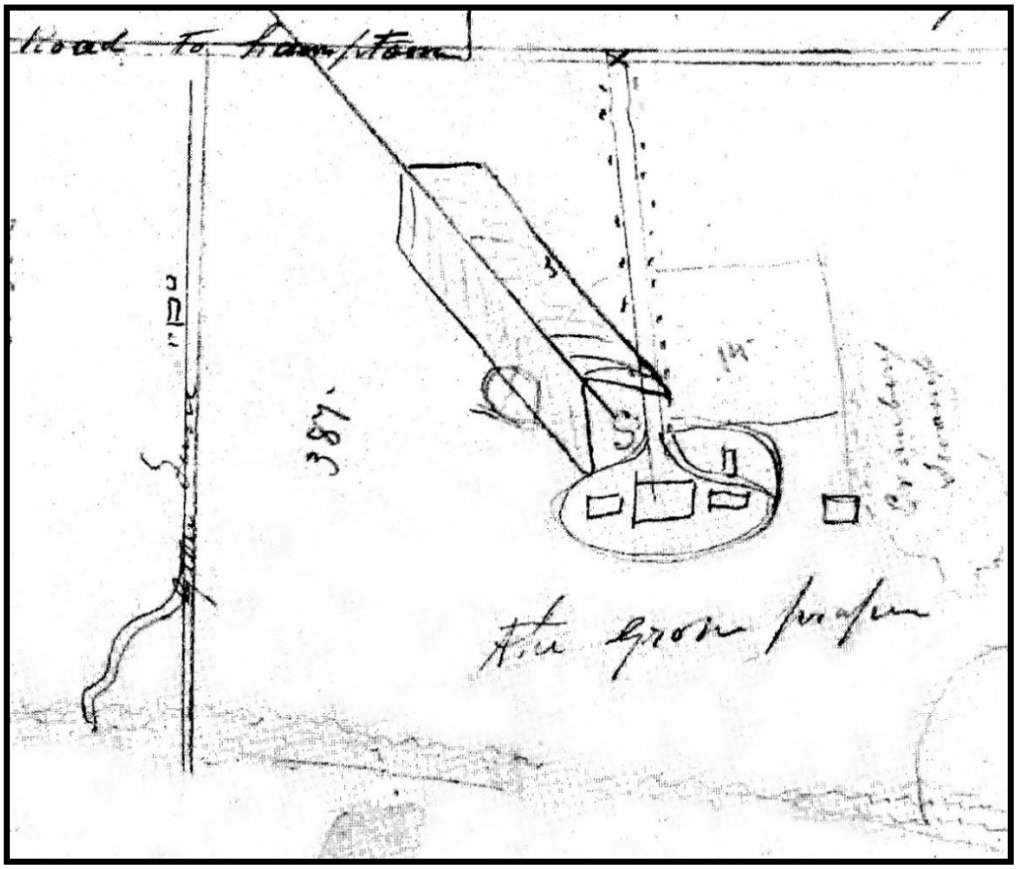


**Figure 4.** 1874 plat map showing the main Carter's Grove building complex and a couple outbuildings, one of which may be the Dairy or Building X (Noël Hume 1974:20).

Neither Stratton, the Choles brothers, nor the Roberts owned Carter's Grove outright. Instead, all made mortgage-like payments to the Wynne family. When Stephen Roberts died and his wife Mary defaulted around 1876, the Wynnes once again took possession of the estate. In 1881, the Wynnes appear to have planted locust trees along the entrance drive, as well as painted paneling in the mansion red, white and blue; both



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actions were in honor of the centennial of the Battle of Yorktown (Noël Hume 1974:21; Yetter 1990:10). The Wynnes sold the property to the Booth family soon after, in 1883. In 1907, the Booths sold it to T. Percival Bisland (Stephenson 1990:119-133). Bisland made some modifications to the property around 1908, building a connecting passage between the east flanker and the mansion, and installing a furnace and bathrooms in the latter structure. Bisland died in 1908, and his wife owned the property until her own passing in 1910. Carter's Grove was subsequently sold at auction to a group of three men who formed the Curtis, Harwood and Bickford Company. The Company produced a pamphlet on Carter's Grove, where it was noted that a "five thousand gallon cylindrical steel tank" had been buried near the mansion to hold water. The Company dissolved in 1913, with two of the three partners selling out to the third: A.G. Harwood. Harwood appears to have rented Carter's Grove to tenants (Stephenson 1990:133-157).

In 1928, Archibald and Mary McCrea purchased Carter's Grove from A.G. Harwood. Mary McCrea was a collateral descendant of the Burwells, and her daughters by a previous marriage were direct descendants of Robert Carter. The McCreas restored the interior of the mansion, which by that time was in bad shape, and made several changes to the property (Stephenson 1990:157-161). In 1928, they built the caretaker's cottage, and the next year they planted several new gardens and boxwoods on the property (Stephenson 1990:162-166; Yetter 1990:1; Boroughs 2008:18-19; Price 2015, personal communication). In 1930, they installed the oval driveway, and presumably resurfaced the adjoining roads. They also rebuilt the connecting passage between the mansion and the kitchen, and added another between the old house/office and mansion. Finally, the McCreas expanded both flankers to the south (Noël Hume 1974:21-22; Stephenson 1990:157-179).

Archibald McCrea died in 1937, and Mary McCrea lived at Carter's Grove an additional 23 years, passing in 1960. The Sealantic Fund, a philanthropic organization, bought the property in 1963, and allowed public access under the supervision of the CWF. The CWF was given the deed to the property in 1969, and Carter's Grove was categorized as a National Historic Landmark in 1971 (Noël Hume 1991:3-8; Boroughs 2008:18-19). Multiple archaeological investigations on the property and a museum was established on the property (Kelso 1972; Noël Hume 1991; Boroughs 2008). In 2007, the CWF divested itself of Carter's Grove, only to reacquire it at auction in 2014 and resell it later that year (Washington 2007; Syrluga 2014). The current owner is Carter's Grove Associates, LLC.

# III. ARCHAEOLOGY AT CARTER'S GROVE

## 1970-71 ARCHAEOLOGICAL SURVEY OF CARTER'S GROVE

The first archaeological work at Carter's Grove took place from June 8, 1970 to September 10, 1971 when Dr. William M. Kelso was contracted by the CWF to conduct a property-wide archaeological survey. The purpose of the survey was to gather data to aid in the reestablishment of Carter's Grove as an 18th century working plantation. Kelso's survey identified several areas of archaeological interest, including Middle and Late Woodland Native American sites, two 17th-century occupations, and multiple 18th- and 19th-century features (Kelso 1972; Noel Hume 1974).

CWF Chief Archaeologist Ivor Noel Hume conducted a more detailed investigation of the wooded areas of the property and the 17th-century sites at Carter's Grove from 1976-1980, and was able to chronicle the evolution of the first European settlement at Carter's Grove known as known as Martin's Hundred (Noel Hume 1991). Many other archaeological studies of the property have been conducted since that time, most carried out by the CWF (Bott 1979; Muraca 1989; Samford 1990; Moodey 1992; Edwards 2004; Boroughs 2008; McFaden 2009; Bradshaw 2010).

The Kelso survey of Field 8 and much of Field 9 consisted of parallel machine cut trenches – the trenches were 7' wide while the spacing between trenches varied from 20'-25', however the spacing was reduced whenever significant archaeological features were encountered (Figures 5 and 6). The northeast section of Field 9 was not mechanically trenched due to the previous discovery of Native American burials there. Consequently, Dr. Norman Barka of the College of William and Mary was called in to test the site. Investigation of the human burial area involved the excavation of a 10' square down to subsoil immediately east of the identified ossuary area. While very subtle soil discolorations were noticeable, a closer inspection of a 6' square area within the original testing limits identified 9 to 10 closely spaced Indian secondary or bundle burials. The sampled area represents only a small portion of a possibly very large Indian ossuary likely dating from 350 to 1600 AD. The area of Field 9 west of the ossuary which was identified as a Native shell midden was determined by Barka to have undisturbed Indian occupation zones between plow zone and subsoil layers and likely represents the main living area of the local Indian population at the time when the ossuary was formed.



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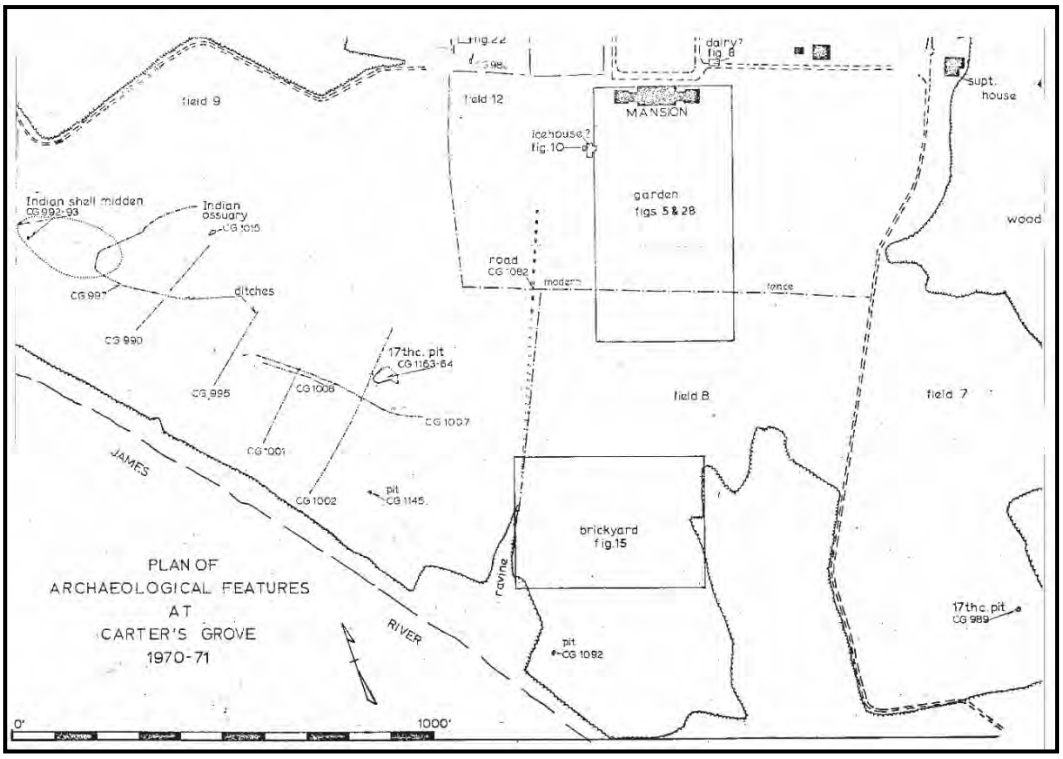


**Figure 5.** Map showing features identified in Fields 8 and 9 during the 1970 to 1971 Kelso survey of Carter's Grove (Kelso 1972).

**Figure 6.** Illustration of systematic mechanical trenching of fields during the 1970-71 archaeological survey of Carter's Grove.



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## PREVIOUS ARCHAEOLOGICAL RESEARCH AT FIELD 8

The north edge of Field 8 was a fence line, no longer extant, located 400' directly south of the mansion. The south boundary of Field 8 was the James River, with the west and east bounds being Field 9 and Field 7 respectively. The field was sampled at the outset by the machine excavation of 7' wide trenches at intervals of 20'-25'. It was estimated that approximately half of the plowzone was eventually removed from Field 8. The mechanical stripping identified two sites, a brickyard complex and a 17th century storage pit (44JC0114) (Kelso 1972:7/8).

The brickyard complex (44JC0111) was found to cover an area of roughly 300' by 400' and spread across the middle of Field 8 from the edge of Field 9 on the west to the wooded area surrounding the natural drainage cut on the east. Identified within this area were five brick clamps, three large shallow pits, several smaller pits, and two wells. The brick clamps, often referred to as kilns -- the two terms were and are used interchangeably (Lounsbury 1994:81, 199) -- were characterized by linear arrangements of burnt clay, post holes, and parallel ditches. The linearity of the brick clamps derives from the stacking of unfired bricks in "benches" arranged to allow the flow of intense heat through and around the bricks. Associated with the brick clamps were several pits of various sizes. None of the larger pits were found to be deeper than 1.25' below the stripped surface, too shallow to have been used as a source of clay for the brickmaking operation. Although the function of these pits was not readily discernible, it is not difficult to imagine that some aspect of the brickmaking process would result in such shallow excavations.

Wells were a necessary part of any brickmaking operation, providing the water to mix with clay to form the bricks. Well A (CG1315) was excavated to a depth of 30' below the stripped surface. Well B (CG1111) was excavated to its base 35' below the stripped surface. Lined with ordinary bricks to its top, the bottom 8' were lined with compass bricks. Compass bricks were roughly wedge-shaped to allow for a tighter, architecturally stable fit. Artifactual evidence recovered from the wells (wooden tools, wine bottle glass, wrought nails, and an iron hoe blade) point to their abandonment at some point in the middle of the 18th century. The meager artifact assemblage recovered from the remaining brickyard features seem to corroborate this as the most likely period of activity (Kelso 1972:43-63).

Field 8 also yielded a sizable rectangular pit (CG1092) located in its southwest corner just outside the wooded area surrounding a springhead draining towards the James River. The pit measured roughly 3' by 4' and was slightly deeper than 3' below the stripped surface. The few artifacts recovered from this feature were musket balls, Bellarmine stoneware, and what appeared to be decayed tree branches. Although its purpose was unclear, it was thought that this may have functioned as a hunting blind during the 17th century (Kelso 1972:68).

Beginning in 1979, Nicholas Luccketti of the CWF Department of Archaeological Research led a survey in the previously unstudied neighboring wooded area. The intensive shovel testing of this area at 10' intervals quickly revealed a rich early-17th century site (Site H) associated with one of the darkest moments in early American history. The portion of Site H that lay in the previously surveyed Field 8 was



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mechanically stripped of plowzone, while the wooded area was excavated by hand in 10' square blocks. These excavations uncovered the footprint of a fortified dwelling with seven sets of human remains found outside its defenses. An impressive array of military items (lead shot, bandolier caps, pan covers for matchlock muskets, a sword pommel, etc.) and an artifact assemblage that strongly suggested an early-17th century occupation led to the obvious and disturbing conclusion that this site, peripheral to nearby Wolstenholme Towne, represented a household that like its neighbor was wiped out in the Powhatan Uprising of 1622 (Luccketti 1981).

Located just south of the surveyed area of Field 8, Site 44JC0130 was identified by Luccketti in 1979. At that time it was identified as a shell midden but was not studied further. The site was revisited by WMCAR in 1997 during which a piece of sand-tempered pottery was collected from the eroding shoreline bluff. The Native American pottery suggested a Woodland Period affiliation, although the VDHR site form broadens the temporal designation to Prehistoric based on the dearth of artifacts and investigation into this site.

## PREVIOUS ARCHAEOLOGICAL RESEARCH AT FIELD 9

Field 9, an arbitrary designation defining the area southwest of the Carter's Grove Mansion which encompasses a ridge, ravine, knoll and surrounding fields overlooking the James River, has been subject to numerous archaeological investigations. Mechanical stripping identified a shell midden, identified at that time as CG 992 and 993, now designated as Site 44JC0118, which was mapped but not further excavated. The northeastern section of the field was not mechanically stripped due to the discovery of Native American burials (44JC0119) close to the surface. This area was left for later hand-testing (Kelso 1972).

Hand testing of the northeastern portion of the field was conducted by Norman Barka of the College of William & Mary in April of 1971. The area of the field east of the 18th century Burwell graves showed no indication of Indian occupation or features. As subsoil was only 0.7' below ground surface it was believed that plowing destroyed any Native American occupation layers in this area. Barka opened a 10' square excavation area down to subsoil immediately east of the Native American burials identified by Kelso (44JC0119). Very subtle features were observed in the subsoil and a further investigation of a 6' square area within the original 10' square excavation showed from nine to ten closely spaced Indian secondary or bundle burials. This suggested that the multiple-burial ossuary feature was possibly very large, encompassing at minimum Barka's excavation and Kelso's identified burials. Barka dated this ossuary from A.D. 350-1600. Barka also investigated the field to the west of 44JC0119 in the area identified by Kelso as a shell midden (44JC0118). Here, he located undisturbed Native American occupation zones between plowzone and subsoil. Barka suggested that this was probably the main living area for the Native American occupation of Carter's Grove (Kelso 1972).

Due to the potential for 17th century features in Field 9, Noel Hume initiated further investigations of this area further from 1977 to 1980. Initial testing was limited to hand excavating an area approximately 100' by 200' chosen to embrace the large patch of dark soil (possibly a backfilled cellar) identified by Kelso in 1971 as well as a few of the



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post-holes and ditch lines identified at the time and later was designated as Site C (44JC0115). As Site C had been subjected to extensive plowing, Noel Hume decided to bring in a machine to continue stripping this area.

The large pit identified by Kelso as a backfilled cellar yielded a wealth of military and domestic artifacts, all apparently discarded at the time of a large fire. The presence of burned architectural remains suggested that a structure in the area had burned. In the south, the post holes which characterized the area ended in an almost square projection forming the corner of a triangular fort. A well was also identified in which the remains of a helmet and breast plate were recovered. Noel Hume believed that the fort either enclosed Wolstenholme Towne or stood adjacent to it and was built in 1619 or 1620. Ultimately a trapezoidal fort measuring 93' by 130' with the one clearly defined watchtower, a "domestic unit" post dwelling, company compound, barn, and 15 graves were uncovered (Figures 7 and 8).



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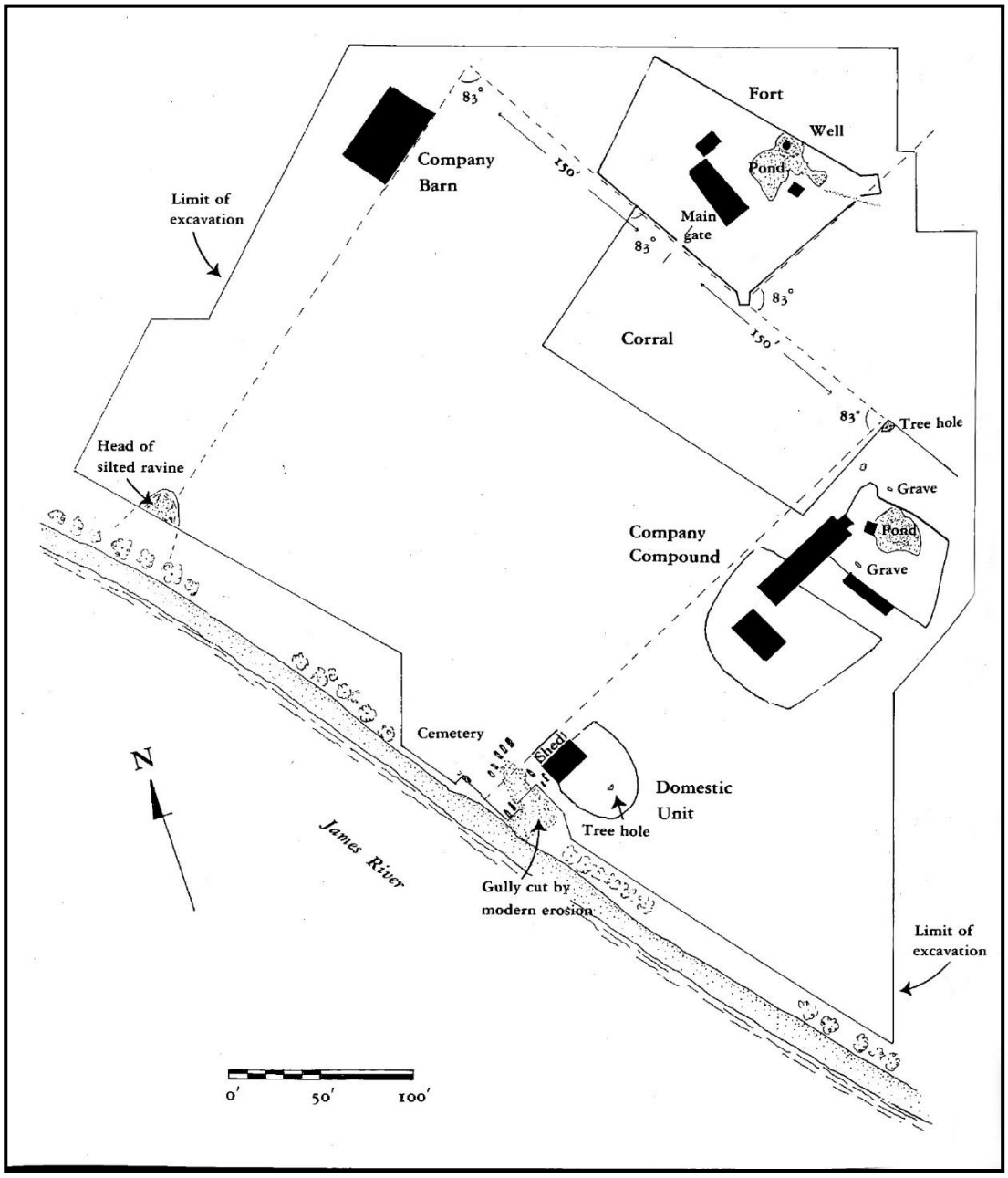


**Figure 7.** Plan of major archaeological features at Site C/Wolstenholme Towne (Noel Hume).



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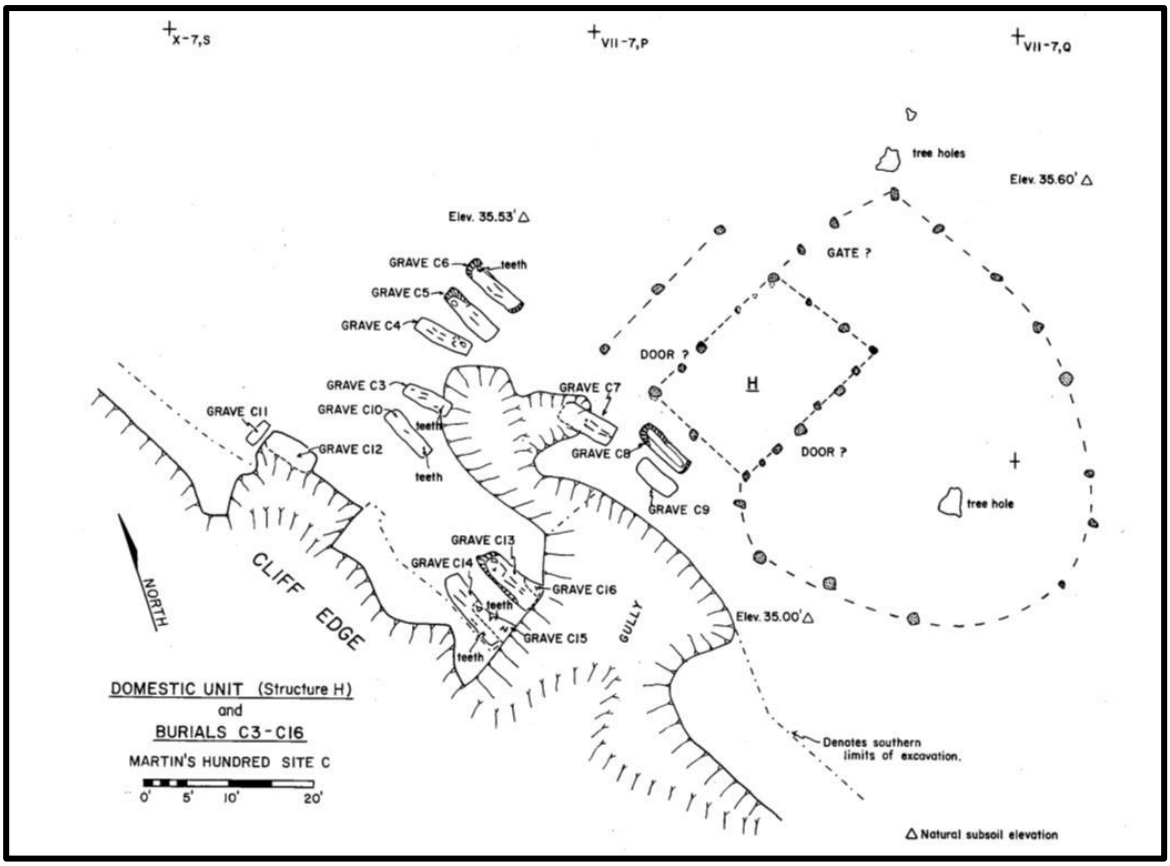


**Figure 8.** Plan of graves uncovered at Site C.

The current location of the museum was investigated by David Muraca in 1987. This investigation covered the approximately 18,500' square area on a knoll about 1000' southwest of the mansion building on which the museum would be constructed. Muraca reestablished the 1971 Kelso grid system and conducted preliminary shovel tests every 20' to confirm that mechanical stripping of the area would not impact features. When the area was cleared for plowzone removal, the entire impact area of the museum building was mechanically stripped. Evidence for three time periods of Native American habitation was present on the terrace, often with more than one occupation per time period. Muraca recovered a LeCroy (Early Archaic) and a Morrow Mountain II (Middle Archaic) projectile point from the excavated plowzone.

Several irregularly-shaped pit features were located throughout the site and contained charred wood, oyster and fossil shell, burned clay, cobbles, animal bone, and Mockley ceramic. The irregularity of the pits suggested that they were naturally formed depressions which were either intentionally filled with trash or naturally filled with surrounding artifacts washed in. Discernable layers within the pits suggested multiple filling episodes over a short time period. These pits could have been used for storage or as small cooking pits. No diagnostic lithics were recovered and the recovery of Mockley from one of the features is the only diagnostic artifact which suggests a Middle Woodland date (Muraca 1989).



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The presence of a Late Woodland multiple-burial ossuary west of the museum site suggests a seasonal or semi-permanent Late Woodland encampment in the area. Muraca recovered Rappahannock Fabric Impressed ceramics (a type of Townsend) and one sherd of Roanoke Simple Stamped Ware which would date to late in the Late Woodland period. In addition to these ceramics, Muraca encountered a large oval-shaped hearth or roasting pit (CGER 6069 A) in the center of the project area on the crest of the ridge. This pit was approximately 6' by 5' with 1.4' of very dark brown sandy loam fill surviving below plowzone. A heavy concentration of charred wood was present within the pit. The pit was also lined with fire-cracked rock all along the slightly sloping sides and flat bottom. Fragments of this fire-cracked rock mended, suggesting that whole cobbles were used to line the pit and shattered *in situ* due to heat. The very center bottom of the large pit contained a smaller, 1.5' by 1' pit approximately 0.3' deep with a flat bottom. This smaller pit was also filled with charred wood and the clay around it showed thermal alteration. Rappahannock Incised ceramics recovered from both the small and large pit cross-mended, suggesting that the two pits were contemporary. Carbon 14 dates for both the large pit [540 (+/-90) BP] and small pit [670(+/-70) BP] confirm this association.

The results of previous archaeological testing suggest that there were at least three distinct occupations of Native Americans at Carter's Grove. Four projectile points suggest a very small, temporary Archaic occupation centered on the area near the museum and Martin's Hundred Overlook. The best represented period of occupation appears to be the Middle Woodland, likely with numerous temporary occupations of the area over a significant period of time. This is suggested by the widespread distribution of Mockley ceramics across the area, particularly along the ridge, as well as the small discrete trash pits which also dot the ridgeline. The Late Woodland occupation of Field 9 suggests a peripheral activity area related to a seasonal or semi-permanent settlement nearby as represented by a large hearth/roasting pit feature and multiple-burial ossuary as well as the recovery of Townsend-type ceramics. Late Woodland occupation of the property appears to be concentrated primarily in the area to the west of the Burwell vaults.

## RECENT ARCHAEOLOGICAL SURVEYS AT CARTER'S GROVE

### JRIA 2019 Archaeological Survey of Two Bluff Stabilization Areas at Carter's Grove Williamsburg, Virginia

In 2019 the James River Institute for Archaeology, Inc. (JRIA) conducted an archaeological survey of two areas along the bluffs overlooking the James River at Carter's Grove in Williamsburg, Virginia. The purpose of the survey was to assess whether shoreline stabilization efforts would impact existing archaeological resources. JRIA archaeologists excavated shovel tests within 2 areas along the bluff. Seven positive shovel tests in Area 1 indicate the presence of a thin shell midden, possibly associated with previously identified site 44JC0130, visible just below the surface in the eroding bluff. Twenty-six positive shovel tests yielded an abundance of prehistoric artifacts at Area 2. This area undoubtedly is part of the previously identified prehistoric site 44JC0118 located along the top of the ridge just north of the survey area. The two test units excavated at Area 2 clearly show a buried cultural horizon between 1.0'-2.0' below the ground surface in the middle of the survey area.



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Based on the results of this investigation and the findings of previous archaeological testing in this area, JRIA recommends that site 44JC0118 is eligible for nomination to the National Register of Historic Places and that any areas of the site that may be impacted by shoreline stabilization should be first documented by data recovery. JRIA also recommends that site 44JC0130 has low research potential and that any ground disturbing activity within 44JC0130 should be monitored by a professional archaeologist (Appendix A).

**Tidewater Atlantic Research 2020 Submerged Cultural Resource Remote-Sensing Survey of the Carter's Grove Shoreline Stabilization Site in the James River, James City County, Virginia**

Tidewater Atlantic Research, Inc. (TAR) of Washington, North Carolina was contracted by VHB to conduct a remote-sensing survey of the James River Area of Potential Effect related to a proposed shoreline stabilization project at Carter's Grove in James City County, Virginia (Figure 9). That investigation was carried out on 26, 27, and 28 August 2020. The remote-sensing investigation was carried out with a cesium-vapor magnetometer, a high resolution side scan sonar, and CHIRP digital sub-bottom profiler. Differential global positioning was used to control navigation and data collection location. Analysis of the magnetic and acoustic data generated by the survey identified 202 magnetic anomalies, 15 sonar targets and 2 sub bottom features within the area surveyed.

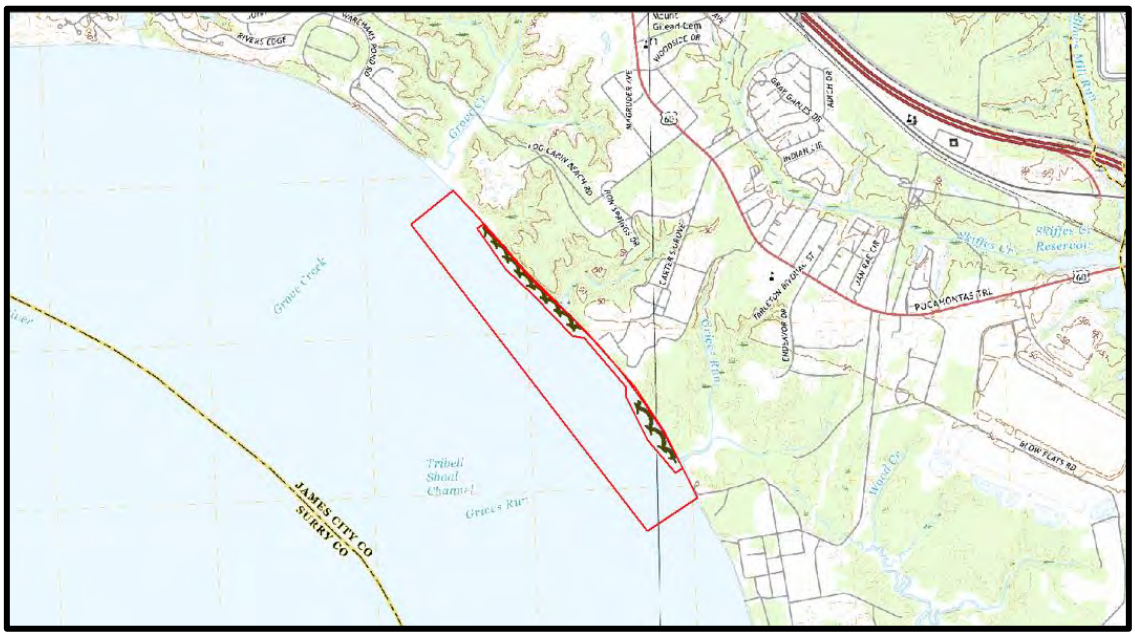


**Figure 9.** Carter's Grove project location and APE (USGS 7.5' Quadrangle: Surry, 2019).



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Thirteen magnetic anomalies identified during the survey are associated with the remains of an historic wharf structure. That structure represents a cultural resource potentially eligible for inclusion on the National Register of Historic Places (NRHP). With the exception of two sonar targets that are associated with the historic wharf structure and pilings near the southern extremity of the survey area, the remaining 13 are associated with linear objects such as logs or pilings. The two sub-bottom features are associated with relict channels and possibly buried pipelines. Based on those findings, construction of the proposed shoreline stabilization structures will have no impact on submerged archaeological resources that are eligible for nomination to the NRHP if the historic wharf structure buffer can be avoided. If the subject buffer can be avoided, no additional investigation is recommended. If not, a Phase II archaeological diver investigation of the subject wharf remains is recommended to assess its NRHP eligibility (Appendix B).

# IV. SUMMARY OF FINDINGS

The current shoreline stabilization plan does not adversely affect site 44JC0118; in fact, the shoreline stabilization plan will prevent further loss of the site to erosion. Further, the current shoreline stabilization plan will not affect any of the documented archaeological resources areas in the vicinity of the project (Figure 10).

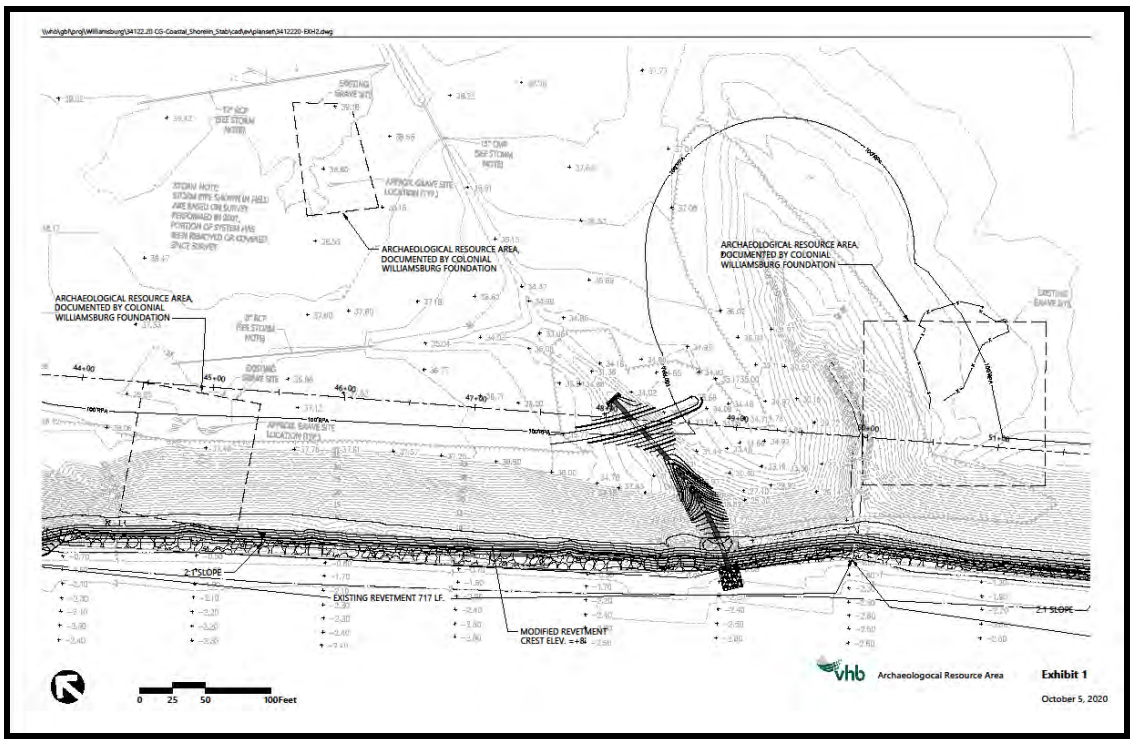


**Figure 10.** Plan showing location of burials at Site C/Wolstenholme Towne.

JRIA recommends that site 44JC0130 has low research potential and that any ground disturbing activity within 44JC0130 should be monitored by a professional archaeologist

The proposed shoreline protection project will be constructed almost entirely from the water and on-land earthwork is limited to installation of drainage pipes in previously disturbed areas. In the vicinity of the historic wharf structure, a minimal layer of sand fill will be placed on the existing beach in the vicinity where the historic wharf may have made landfall. There is no subaerial evidence of the wharf remaining along the shoreline, most likely due to decades of wave action and erosion. Based on review of the proposed shoreline protection plans in the context of past and recent investigations, no additional investigations are suggested and the project will not adversely affect any underwater potentially significant cultural resources.

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# APPENDIX A: JAMES RIVER INSTITUTE FOR ARCHAEOLOGY, INC. ARCHAEOLOGICAL SURVEY



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# ARCHAEOLOGICAL SURVEY OF TWO BLUFF STABILIZATION AREAS AT CARTER'S GROVE WILLIAMSBURG, VIRGINIA

**April 2019**

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# ABSTRACT

On 5-6 March 2019, the James River Institute for Archaeology, Inc. (JRIA) conducted an archaeological survey of two areas along the bluffs overlooking the James River at Carter's Grove in Williamsburg, Virginia. The purpose of the survey was to assess whether shoreline stabilization efforts would impact existing archaeological and architectural resources. The property is currently owned by Carter's Grove Associates, LLC, and is under a historic easement held by the Virginia Department of Historic Resources. The two areas tested were located in the lightly wooded areas along the bluffs to the south and southwest of the manor house. JRIA archaeologists excavated 20 shovel tests within Area 1 and 65 shovel tests and two test units within Area 2. Seven positive shovel tests in Area 1 indicate the presence of a thin shell midden, possibly associated with previously identified site 44JC0130, visible just below the surface in the eroding bluff. Twenty-six positive shovel tests yielded an abundance of prehistoric artifacts at Area 2. This area undoubtedly is part of the previously identified prehistoric site 44JC0118 located along the top of the ridge just north of the survey area. The two test units excavated at Area 2 clearly show a buried cultural horizon between 1.0'-2.0' below the ground surface in the middle of the survey area.

Based on the results of this investigation and the findings of previous archaeological testing in this area, JRIA recommends that site 44JC0118 is eligible for nomination to the National Register of Historic Places and that any areas that may be impacted by shoreline stabilization should be first documented by data recovery. JRIA recommends that site 44JC0130 has low research potential and that any ground disturbing activity within 44JC0130 should be monitored by a professional archaeologist.



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# I. INTRODUCTION

On 5-6 March 2019, the James River Institute for Archaeology, Inc. (JRIA) conducted an archaeological survey of two areas along the bluffs overlooking the James River at Carter's Grove in Williamsburg, Virginia. The purpose of the survey was to assess whether shoreline stabilization efforts would impact existing archaeological and architectural resources. The property is currently owned by Samuel M. Mencoff and is under a historic easement held by the Virginia Department of Historic Resources and James City County. The two areas tested were located in the lightly wooded areas along the bluffs to the south and southwest of the manor house. JRIA archaeologists excavated 20 shovel tests within Area 1 and 65 shovel tests and two test units within Area 2. Seven positive shovel tests in Area 1 indicate the presence of a thin shell midden, possibly associated with previously identified site 44JC0130, visible just below the surface in the eroding bluff. Twenty-six positive shovel tests yielded an abundance of prehistoric artifacts at Area 2. These materials are likely associated with the previously identified prehistoric site (44JC0118) located along the top of the ridge just north of the survey area. The two test units excavated at Area 2 clearly show a buried cultural horizon between 1.0'-2.0' below the ground surface in the middle of the survey area.

Both the documentary research and archaeological testing were conducted at a level in compliance with the Secretary of the Interior's Standards for archaeological surveys, as well as Virginia Department of Historic Resources (VDHR) guidelines for cultural resource surveys.

The archaeological investigation was conducted under the direction of JRIA Principal Archaeologist Nicholas M. Luccketti. The fieldwork was conducted by Project Archaeologist Anthony W. Smith with the assistance of archaeological field technicians John Meyer, Alexandra Bynum-Stuart, and Thomas Kester. Project Archaeologist Sean Romo assisted in establishing the testing grid at both survey areas. Matthew R. Laird conducted the historical research for the project. Assistant Curator Meghan West cataloged all of the artifacts recovered during the project. Mr. Smith authored the final report with assistance from Allison Conner.



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**Figure 1.** Testing areas on aerial photograph (Google Earth 2019).



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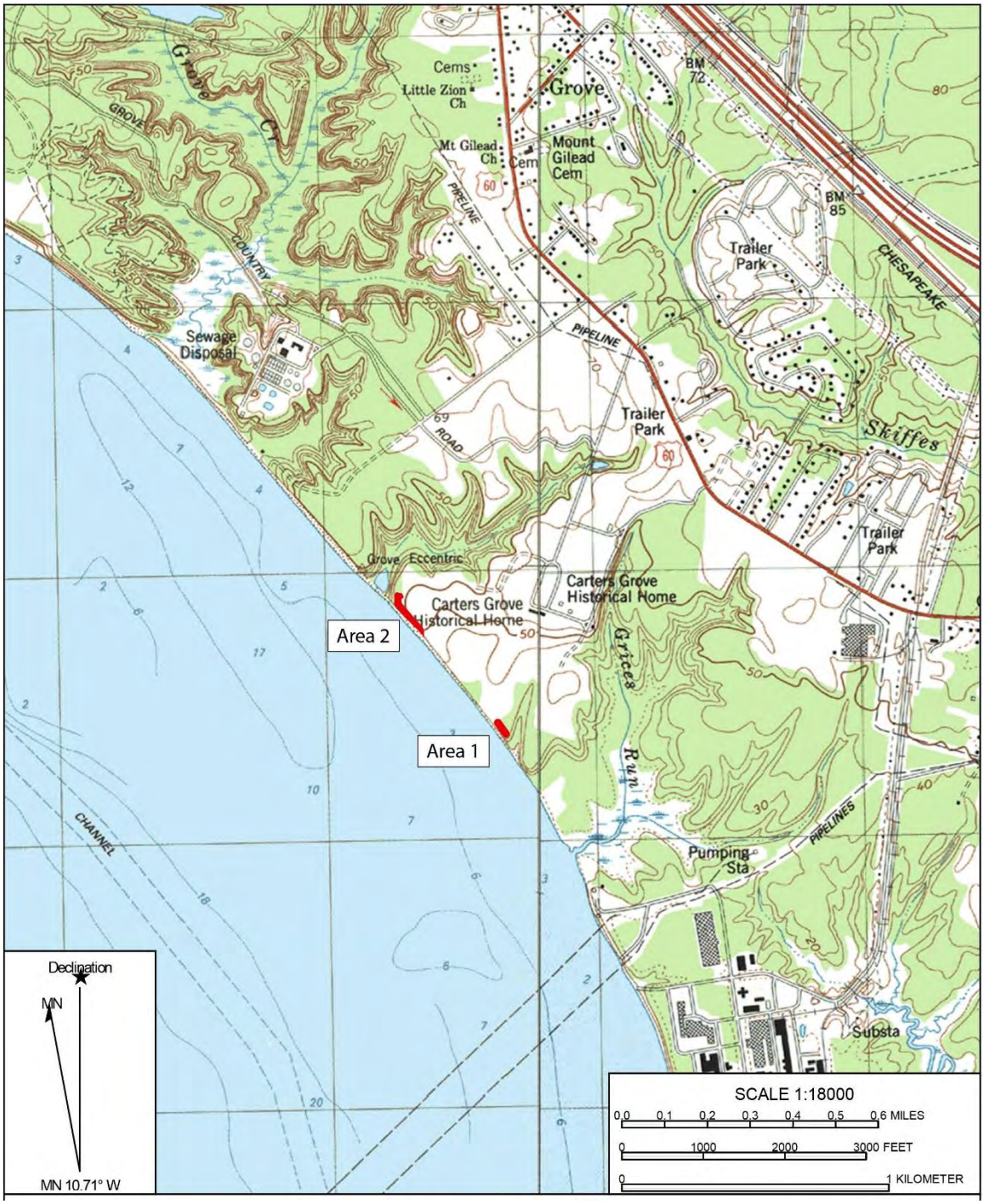


**Figure 2.** Location of testing areas on 1984 USGS topographic maps (Hog Island and Yorktown quadrangles 1:24 000)



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# II. PREVIOUS ARCHAEOLOGICAL RESEARCH

The project areas lie within the 400 acre historic easement (047-0001) held by the Virginia Department of Historic Resources (VDHR) and James City County. The larger Carter's Grove property is listed on the National Register of Historic Places, the National Historic Landmarks register, and the Virginia Landmark Registry. An exhaustive survey in 1970/1 by William Kelso identified several historic and prehistoric sites across the property. Two of the sites identified by Kelso—44JC0118 and 44JC0119—and one identified in 1979—Site 44JC0130—are directly or closely associated with the current project areas (Figures 3 and 4).


**Figure 3.** Location of Previously Identified Archaeological Sites Relative to Current Testing Areas (VCRIS 2019).



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*44JC0118*

Site 44JC0118 was first identified in 1971 following the survey of Field 9 by Kelso. The site was described as a Late Woodland shell midden.

*44JC0119*

Site 44JC0119 was identified during the Field 9 survey by Kelso in 1971. Later investigation by Norman Barka of the College of William and Mary located nine to ten secondary burials in what he described as a prehistoric Native American ossuary.

*44JC0130*

First identified in 1979 by Nick Luccketti, and later studied further by the William and Mary Center for Archaeological Research (WMCAR) in 1997, Site 44JC0130 represents a Late Woodland shell midden of indeterminate size.

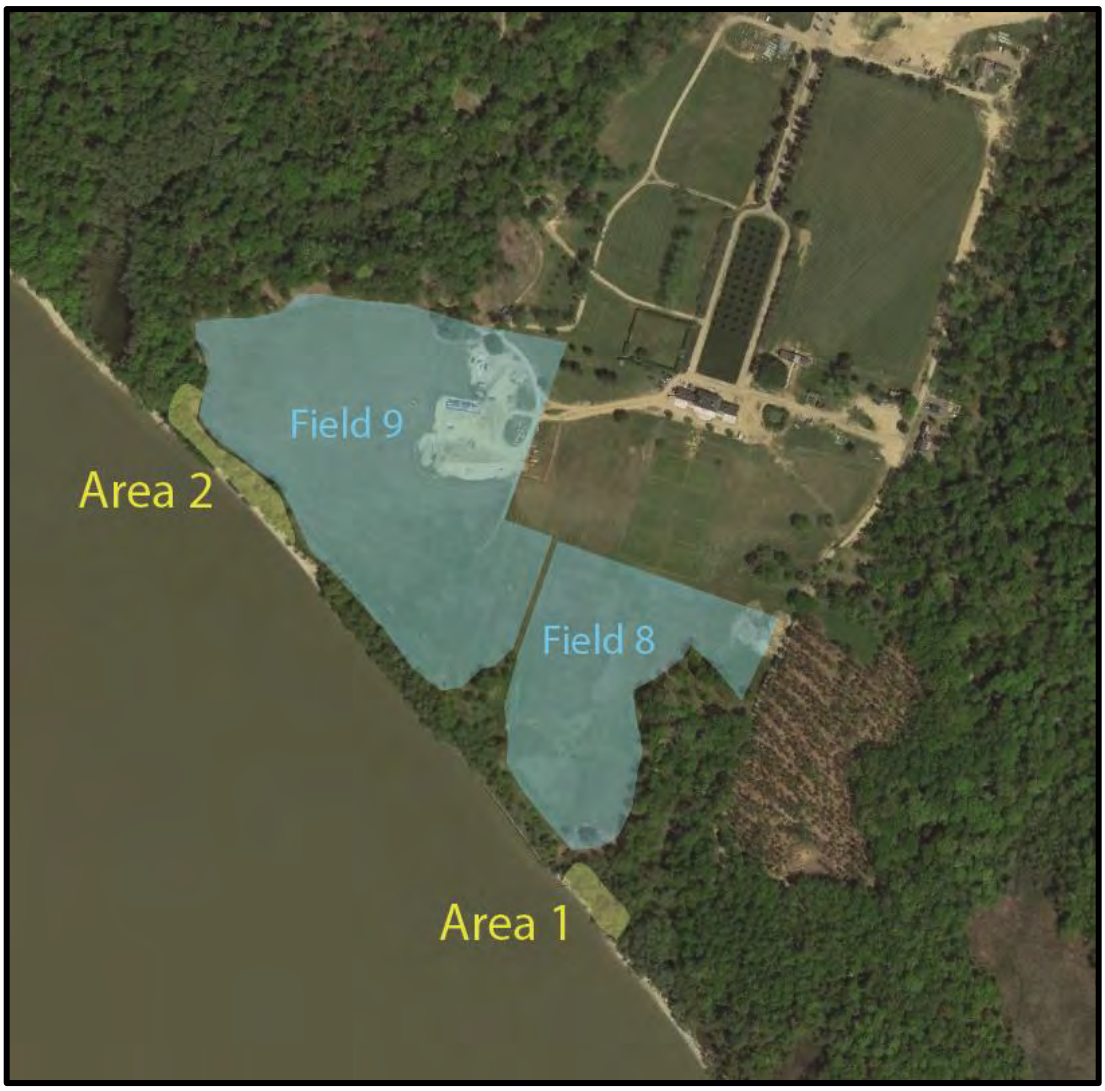


**Figure 4.** Locations of Testing Areas Relative to Kelso's Fields 8 and 9.



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## PREVIOUS ARCHAEOLOGICAL RESEARCH AT FIELD 9

Field 9, an arbitrary designation defining the area southwest of the Carter's Grove Mansion which encompasses a ridge, ravine, knoll and surrounding fields overlooking the James River, has been subject to numerous archaeological investigations. Kelso's original survey in 1971 conducted a systematic removal of the plowzone by heavy machinery along exploratory trenches 7' wide excavated at 20'-25' intervals. Mechanical stripping identified a shell midden, identified at that time as CG 992 and 993, now designated as Site 44JC0118, which was mapped but not further excavated. The northeastern section of the field was not mechanically stripped due to the discovery of Native American burials (CG 1015, now Site 44JC0119) close to the surface. This area was left for later hand-testing (Kelso 1971).

Hand testing of the northeastern portion of the field was conducted by Norman Barka of the College of William & Mary in April of 1971. The area of the field east of the 18th century Burwell graves showed no indication of Indian occupation or features. As subsoil was only 0.7' below ground surface it was believed that plowing destroyed any Native American occupation layers in this area. Barka opened a 10' square excavation area down to subsoil immediately east of the Native American burials identified by Kelso (CG 1015/44JC0119). Very subtle features were observed in the subsoil and a further investigation of a 6' square area within the original 10' square excavation showed from nine to ten closely spaced Indian secondary or bundle burials. This suggested that the multiple-burial ossuary feature was possibly very large, encompassing at minimum Barka's excavation and Kelso's identified burials. Barka dated this ossuary from A.D. 350-1600. Barka also investigated the field to the west of 44JC0119 in the area identified by Kelso as a shell midden (CG 992, 993/44JC0118). Here, he located undisturbed Native American occupation zones between plowzone and subsoil. Barka suggested that this was probably the main living area for the Native American occupation of Carter's Grove (Kelso 1971).

In 1979, the Virginia Research Center for Archaeology (VCRA) more intensively investigated the features previously identified in Field 9 in an attempt to determine the relationship between Native American settlement in this area and Martin's Hundred. Ivor Noël Hume had posited that the Martin's Hundred settlement site was chosen because the area had been previously cleared by Native Americans, and a more precise occupation date for the Native American features present on the ridge could help confirm this hypothesis. As part of this investigation, four 7' square test units were excavated. These test units showed that the site displayed intact vertical stratigraphy dating from the Middle to Late Woodland, based on the recovery of Mockley and Townsend ceramics. Two test units showed the shell midden as having two distinct deposits: an upper layer containing 80% of the Townsend ceramics, which date to the Late Woodland; and a lower layer which contained 80% of the earlier, Middle Woodland Mockley ceramics. Test unit excavation as well as large-scale shovel testing uncovered three areas of shell concentration. The intermittent spacing of these concentrations throughout the site may indicate either sparse or periodic occupation of the area or later site disturbance. The recovery of both Mockley and Townsend ceramics from mixed deposits elsewhere in the site area meant that archaeologists were unable to determine the relationship of the Native American occupation to Martin's Hundred. In addition to ceramics, VCRA



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recovered deer, sturgeon and turtle bones and six non-diagnostic lithic artifacts. The ossuary was reexamined but no excavation within the feature took place (Bott 1979, Muraca 1989).

In 1985, Nate Smith and Mary Zylowski of Colonial Williamsburg's Office of Archaeological Excavation tested the construction site for the Martin's Hundred Overlook. While monitoring, they identified and excavated a prehistoric shell-filled feature which contained no diagnostic artifacts. In addition to monitoring, eight 5' square test units were opened in the area surrounding the Overlook. These units yielded Middle and Late Woodland pottery as well as two Middle Archaic projectile points from the plowzone. However, no intact prehistoric features were identified. In 1986, Smith returned to the area and conducted archaeological testing north of the Overlook site in preparation for the construction of a museum to house the Martin's Hundred collection. This testing identified a shell midden deposit which was uncovered and partially excavated by Smith. The excavated quarter of the midden showed intact cultural layers: an "upper fill" which contained a heavy concentration of oyster shell in dark brown sand, and a "lower fill" of brown sand with less shell. Both layers contained bone, oyster and clam shells, and equal densities of Mockley ceramics. No Late Woodland component of the feature was discovered. After this excavation, the proposed site of the museum was changed to an alternate location (Muraca 1989).

The current location of the museum was investigated by David Muraca in 1987. This investigation covered the approximately 18,500' square area on a knoll about 1000' southwest of the mansion building on which the museum would be constructed. Muraca reestablished the 1971 Kelso grid system and conducted preliminary shovel tests every 20' to confirm that mechanical stripping of the area would not impact features. When the area was cleared for plowzone removal, the entire impact area of the museum building was mechanically stripped. This area was expanded and additional plowzone removed, resulting in 139 10' squares being uncovered[1]. Several areas adjacent to the ridge appeared to have some remnant cultural layers below plowzone. Features within the stripped area were mapped, sectioned, recorded and removed. Soils were screened through 1/4" mesh to recover artifacts and soil samples were taken for later analysis. Evidence for three time periods of Native American habitation was present on the terrace, often with more than one occupation per time period. Muraca recovered a Le Croy (Early Archaic) and a Morrow Mountain II (Middle Archaic) projectile point from the excavated plowzone. These points, as well as the two Archaic projectile points found in the plowzone by Smith and Zylowski in 1985, suggest some Archaic occupation of the area (1989).

Evidence for two Woodland period occupations of the site—one or more Middle Woodland seasonal encampments and a Late Woodland peripheral activity area relating to a small semi-permanent Late Woodland settlement nearby—were located and both appear to extend outside Muraca's project area. Mockley ceramics were widely disturbed across the ridge and were the only Middle Woodland type of ceramic recovered. Several

[1] It is not clear in Muraca's report what this figure indicates, whether these "squares" were an extension of the Kelso mansion grid out into this field area or whether they represent an amalgamation of irregular or non-contiguous roughly 10' square machine-excavated sections.



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Middle Woodland Rossville type projectile points (ca. 500 BC to 400 AD) were recovered along with what appears to be associated debitage. These lithic artifacts may represent a discrete activity area for the production of Rossville points, especially given that the cobbles utilized seem similar to those eroding out of the nearby bank of the James River. Several irregularly-shaped pit features were located throughout the site and contained charred wood, oyster and fossil shell, burned clay, cobbles, animal bone, and Mockley ceramic. The irregularity of the pits suggested that they were naturally formed depressions which were either intentionally filled with trash or naturally filled with surrounding artifacts washed in. Discernable layers within the pits suggested multiple filling episodes over a short time period. These pits could have been used for storage or as small cooking pits. No diagnostic lithics were recovered and the recovery of Mockley from one of the features is the only diagnostic artifact which suggests a Middle Woodland date (Muraca 1989).

Several additional pits were identified which likely date to the Middle Woodland. These manmade, shallow circular pits range from 1' to 3.4' long with sloping sides and flat bottoms. These were encountered across the top of the ridge in no discernable pattern and are very similar to the shell-filled feature encountered during the Overlook construction. These pits were similar to one another, although some contained an upper layer of concentrated shell. All these pits contained a light artifact scatter including oyster and fossil shell, fire-cracked rock, lithic flakes and Mockley ceramics. These pits likely represent discrete trash deposits and were dug intentionally (1989).

The most interesting Middle Woodland feature identified by Muraca was an articulated dog burial (CGER 6032A). This feature was located in the southwestern quadrant of Muraca's project area. It consisted of an irregular oval pit approximately 3' long (east-west) by 2.4' wide (north-south) with vertical sides and a smooth flat bottom. The pit was 1' deep and filled with dark brown sandy loam with charcoal flecking and an almost complete, articulated dog skeleton. Plowing had apparently removed the pelvic area of the dog, although the rest was intact. Soil beneath the animal bore the impression of an open twined textile which may represent the remains of a mat or woven sack placed beneath the dog. Also present within the pit were shell fragments, Mockley ceramics and quartz flakes. Based on the homogeneous composition of the fill, the shape of the pit, and the articulation of the dog skeleton, the burial seems intentional (1989).

The presence of a Late Woodland multiple-burial ossuary west of the museum site suggests a seasonal or semi-permanent Late Woodland encampment in the area. Muraca recovered Rappahannock Fabric Impressed ceramics (a type of Townsend) and one sherd of Roanoke Simple Stamped Ware which would date to late in the Late Woodland period. In addition to these ceramics, Muraca encountered a large oval-shaped hearth or roasting pit (CGER 6069 A) in the center of the project area on the crest of the ridge. This pit was approximately 6' by 5' with 1.4' of very dark brown sandy loam fill surviving below plowzone. A heavy concentration of charred wood was present within the pit. The pit was also lined with fire-cracked rock all along the slightly sloping sides and flat bottom. Fragments of this fire-cracked rock mended, suggesting that whole cobbles were used to line the pit and shattered *in situ* due to heat. The very center bottom of the large pit contained a smaller, 1.5' by 1' pit approximately 0.3' deep with a flat bottom. This smaller pit was also filled with charred wood and the clay around it showed thermal



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alteration. Rappahannock Incised ceramics recovered from both the small and large pit cross-mended, suggesting that the two pits were contemporary. Carbon 14 dates for both the large pit [540 (+/-90) BP] and small pit [670(+/-70) BP] confirm this association. It is likely that the smaller, thermally altered pit contained the fire for the hearth or roasting pit. In addition to the charred wood and ceramics, numerous animal bones including deer, duck, oyster shell, and snapping turtle were recovered. No associated structural features were encountered surrounding the large pit suggesting that it was an outdoor feature (1989).

The results of previous archaeological testing suggest that there were at least three distinct occupations of Native Americans at Carter's Grove. Four projectile points suggest a very small, temporary Archaic occupation centered on the area near the museum and Martin's Hundred Overlook. The best represented period of occupation appears to be the Middle Woodland, likely with numerous temporary occupations of the area over a significant period of time. This is suggested by the widespread distribution of Mockley ceramics across the area, particularly along the ridge, as well as the small discrete trash pits which also dot the ridgeline. A possible Rossville projectile point manufacturing area and an articulated dog burial also represent the Middle Woodland occupation of this area. The Late Woodland occupation of Field 9 suggests a peripheral activity area related to a seasonal or semi-permanent settlement nearby as represented by a large hearth/roasting pit feature and multiple-burial ossuary as well as the recovery of Townsend-type ceramics. Late Woodland occupation of the property appears to be concentrated primarily in the area to the west of the Burwell vaults.

## PREVIOUS ARCHAEOLOGICAL RESEARCH AT FIELD 8

Also examined as part of Kelso's initial survey in 1970/1 was Field 8. The north edge of Field 8 was a fence line, no longer extant, located 400' directly south of the mansion. The south boundary of Field 8 was the James River, with the west and east bounds being Field 9 and Field 7 respectively. The field was sampled at the outset by the machine excavation of 7' wide trenches at intervals of 20'-25'. This interval was occasionally tightened if discoveries warranted. It was estimated that approximately half of the plowzone was eventually removed from Field 8. The mechanical stripping identified two sites, a brickyard complex and a 17th century storage pit (CG1092/44JC0114) (Kelso 1971:7/8).

The brickyard complex (44JC0111) was found to cover an area of roughly 300' by 400' and spread across the middle of Field 8 from the edge of Field 9 on the west to the wooded area surrounding the natural drainage cut on the east. Identified within this area were five brick clamps, three large shallow pits, several smaller pits, and two wells. It was noted that there was a considerable amount of over- or under-fired brick rubble in the excavated plowzone. The brick clamps, often referred to as kilns -- the two terms were and are used interchangeably (Lounsbury 1994:81, 199) -- were characterized by linear arrangements of burnt clay, post holes, and parallel ditches. The linearity of the brick clamps derives from the stacking of unfired bricks in "benches" arranged to allow the flow of intense heat through and around the bricks. Two rows of post holes were located on the outer edges of the clamps with a set of larger, some burnt, post holes



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located down the center. It was thought at the time that these may have been the remains of a crude roof. Associated with the brick clamps were several pits of various sizes. None of the larger pits were found to be deeper than 1.25' below the stripped surface, too shallow to have been used as a source of clay for the brickmaking operation. Although the function of these pits was not readily discernible, it is not difficult to imagine that some aspect of the brickmaking process would result in such shallow excavations.

Wells were a necessary part of any brickmaking operation, providing the water to mix with clay to form the bricks. Well A (CG1315) was excavated to a depth of 30' below the stripped surface. Although the upper portion of the well appeared to be unlined or to have been robbed of its bricks, the bottom 8' was found to be enclosed within a box of wooden slats. Well B (CG1111) was excavated to its base 35' below the stripped surface. Lined with ordinary bricks to its top, the bottom 8' were lined with compass bricks. Compass bricks were roughly wedge-shaped to allow for a tighter, architecturally stable fit. Artifactual evidence recovered from the wells (wooden tools, wine bottle glass, wrought nails, and an iron hoe blade) point to their abandonment at some point in the middle of the 18th century. The meager artifact assemblage recovered from the remaining brickyard features seem to corroborate this as the most likely period of activity (Kelso 1971:43-63).

Field 8 also yielded a sizable rectangular pit (CG1092) located in its southwest corner just outside the wooded area surrounding a springhead draining towards the James River. The pit measured roughly 3' by 4' and was slightly deeper than 3' below the stripped surface. The few artifacts recovered from this feature were musket balls, Bellarmine stoneware, and what appeared to be decayed tree branches. Although its purpose was unclear, it was thought that this may have functioned as a hunting blind during the 17th century (Kelso 1971:68).

Beginning in 1979, Nicholas Luccketti of the Department of Archaeological Research at the Colonial Williamsburg Foundation led survey efforts in the previously unstudied neighboring wooded area. The intensive shovel testing of this area at 10' intervals quickly revealed a rich early-17th century site (Site H) associated with one of the darkest moments in early American history. The portion of Site H that lay in the previously surveyed Field 8 was mechanically stripped of plowzone, while the wooded area was excavated by hand in 10' square blocks. These excavations uncovered the footprint of a fortified dwelling with seven sets of human remains found outside its defenses. An impressive array of military items (lead shot, bandolier caps, pan covers for matchlock muskets, a sword pommel, etc.) and an artifact assemblage that strongly suggested an early-17th century occupation led to the obvious and disturbing conclusion that this site, peripheral to nearby Wolstenholme Towne, represented a household that like its neighbor was wiped out in the Powhatan Uprising of 1622 (Luccketti 1981).

Located just south of the surveyed area of Field 8, Site 44JC0130 was identified by Nicholas Luccketti in 1979. At that time it was identified as a shell midden but was not studied further. The site was revisited by WMCAR in 1997 during which a piece of sand-tempered pottery was collected from the eroding shoreline bluff. The Native American pottery suggested a Woodland Period affiliation, although the VDHR site form broadens the temporal designation to Prehistoric based on the dearth of artifacts and investigation into this site.



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# III. ARCHAEOLOGICAL TESTING METHODS & RESULTS

The current project included the excavation of 75 shovel tests and two test units in two areas along the edge of the bluffs overlooking the James River to the south and southwest of the Carter's Grove mansion (Figure 4). Within the project areas, shovel tests were hand-excavated at a 50' interval in Area 1 and a 20' interval in Area 2. Shovel tests measured at least 1.25' in diameter and were excavated by natural levels to the appearance of sterile subsoil. All soils from undisturbed contexts were screened through ¼-inch wire mesh, and all artifacts were collected. Representative shovel test profiles were recorded on standardized shovel test hole record forms and soil color classified with a Munsell Color Chart. Each shovel test was located on a scale map of the project area.

## AREA 1

Area 1 runs along the top of the bluff, between Grice's Run on the east and another significant cut on the west (Figures 5 and 6). Most of this area apparently rests just outside the 1971 tested Field 8, though the west end of the area rests well within previously identified Site 44JC0130. Site 44JC0130 was initially identified by Nicholas Luccketti in 1979, and further investigated by WMCAR in 1997. The site was described as a Woodland period shell midden of indeterminate size. The tested area for this project measured 75' wide by 250' long and was sampled at an interval of 50'. The ten initial shovel tests resulted in three positive shovel tests (F1, F3, G2). Further radial shovel testing around these positives identified four more positive shovel tests (F1E, F1W, F3E, G2S). The only artifacts recovered from these shovel tests were oyster shell and oyster shell fragments. The overall scatter of oyster shell was light, with the heaviest concentration found in shovel test F1 (Figure 7). No oyster shell was visible at the ground surface. A thin layer of oyster shell was seen eroding out of the bluff just below the ground surface to the south of F1.

The current findings seem to corroborate the presence of a temporally indeterminate shell midden in this area. The discontinuous nature of the artifact scatter suggests that some portion of this site may have already been lost to erosion.



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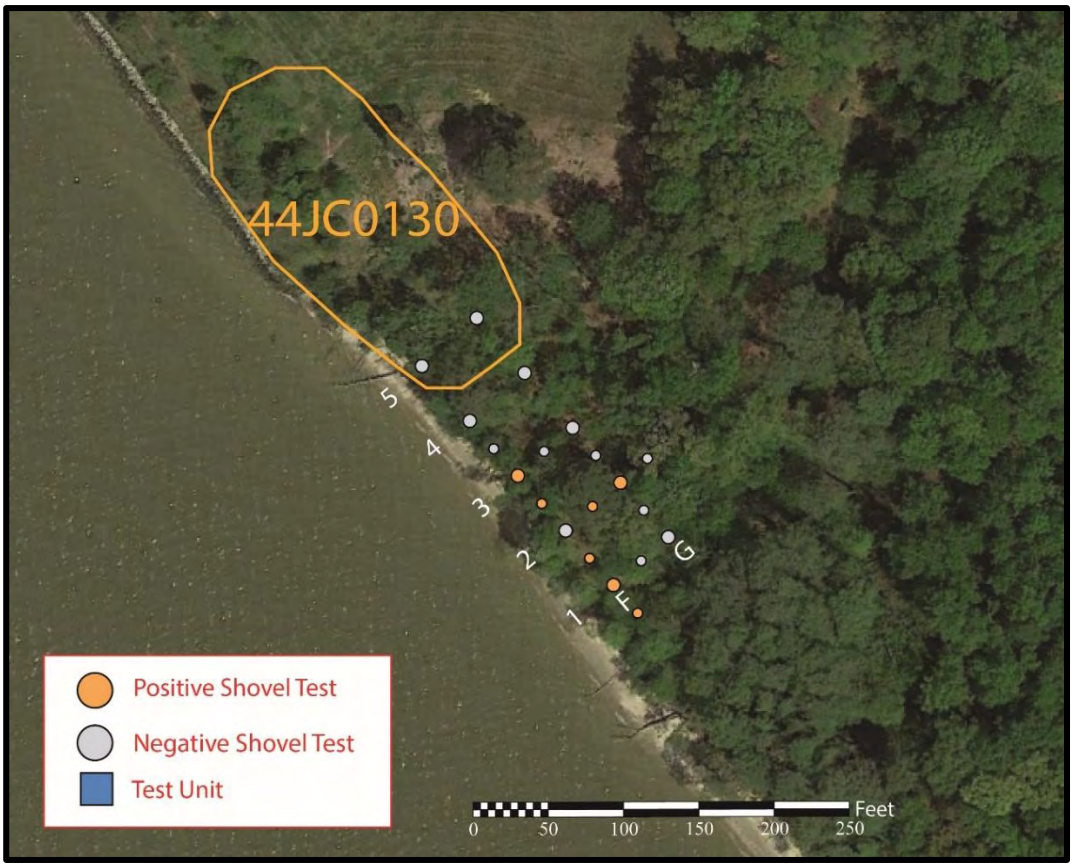


**Figure 5.** Shovel test locations at Area 1.

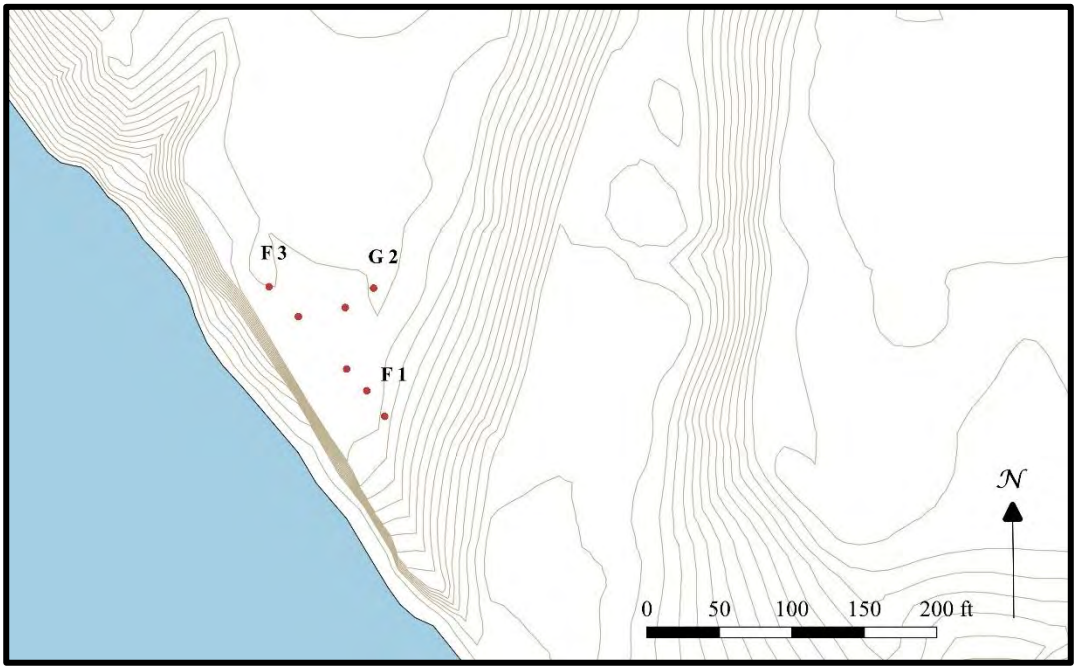


**Figure 6.** Positive shovel tests at Area 1, on a 2’ contour map of the area.



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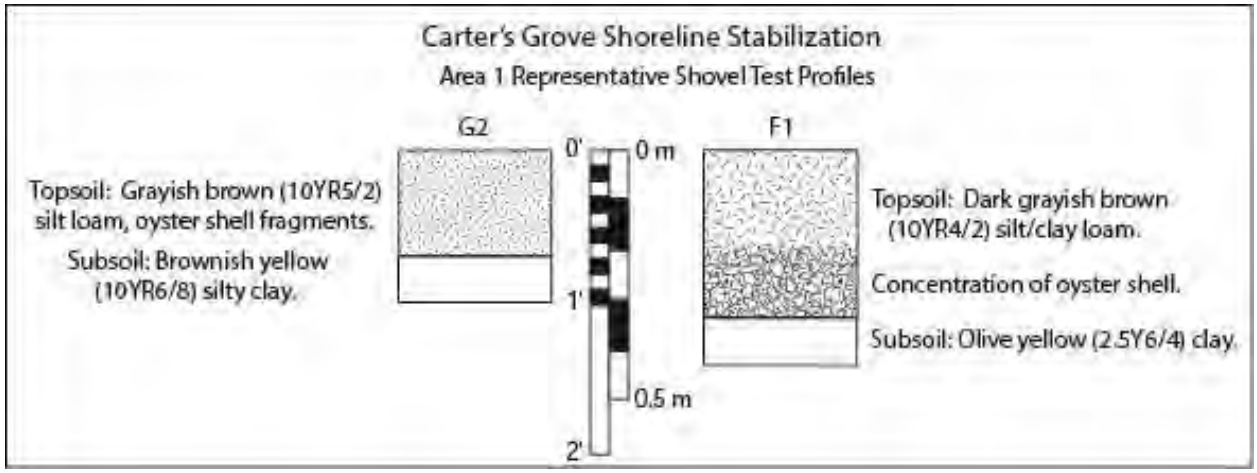


**Figure 7.** Representative shovel test profiles at Area 1.

## AREA 2

Area 2 contained the wooded strip along the top of the bluff just east of a dammed pond, at the southwest corner of the open area surrounding the Carter's Grove mansion (Kelso's Field 9) (Figures 8 and 9). This area never exceeded 75' in width and ran for a distance of roughly 600'. A total of 69 shovel tests were excavated within this area at an interval of 20'. The 20' interval was utilized to maximize the possibility of identifying the uncertain boundaries of previously identified Native American Site 44JC0118 located along the top of the ridge north of the test area. Twenty-six of these shovel tests were found to contain historic and/or prehistoric artifacts. The preponderance of artifacts recovered were prehistoric in nature, oyster shell fragments and Native American pottery. The very light scatter of historic artifacts included brick fragments, unidentified nail fragments, and refined earthenwares (creamware, pearlware). The artifact assemblage was concentrated in the center of the tested area, with no artifacts found in the easternmost 200'. Shovel test profiles indicated the presence of a buried soil horizon located between the 10 and 20 transects (Figure 10). Following shovel testing two 3'by 3' test units were excavated in the center of Area 2 in order to determine the integrity of the soil column and the site's overall research potential.

Test Unit 1 was located midway between shovel tests D12 and D13. Excavation of this test unit revealed a darker, more compacted buried cultural horizon beneath approximately 1' of topsoil/plowzone. The topsoil/plowzone was described as a brown/dark brown (10YR4/3) silt loam. The buried material, a dark grayish brown (10YR4/2) silt loam mottled with very pale brown (10YR7/3) silty sand and with charcoal flecking, measured roughly 1' thick and contained only prehistoric artifacts, almost solely Native American pottery (Figure 11). Excavation of the buried cultural horizon revealed a possible linear cultural feature running roughly north/south across the eastern half of the base of the test unit (Figures 12 and 13). While not excavated at this



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time, the feature was sampled and found to extend approximately 0.4’ into otherwise sterile subsoil.

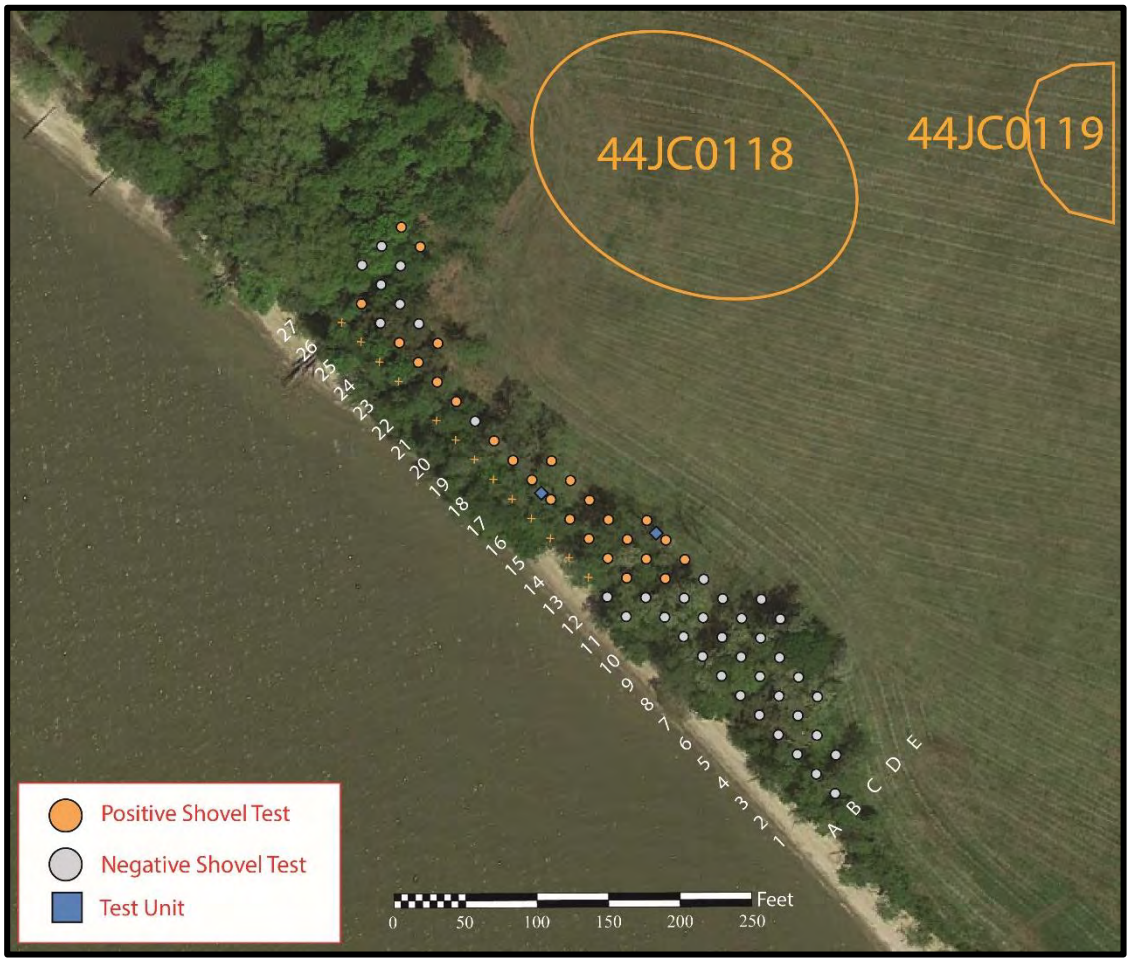


**Figure 8.** Shovel test locations at Area 2.



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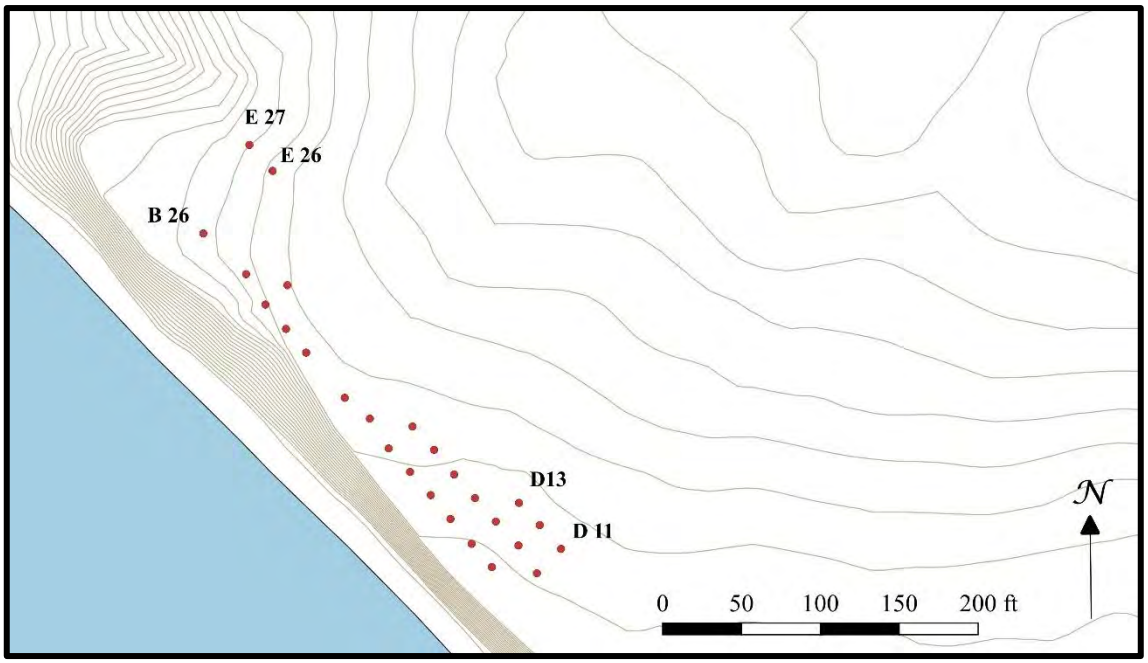


**Figure 9.** Positive shovel tests at Area 2, on a 2' contour map of the area.

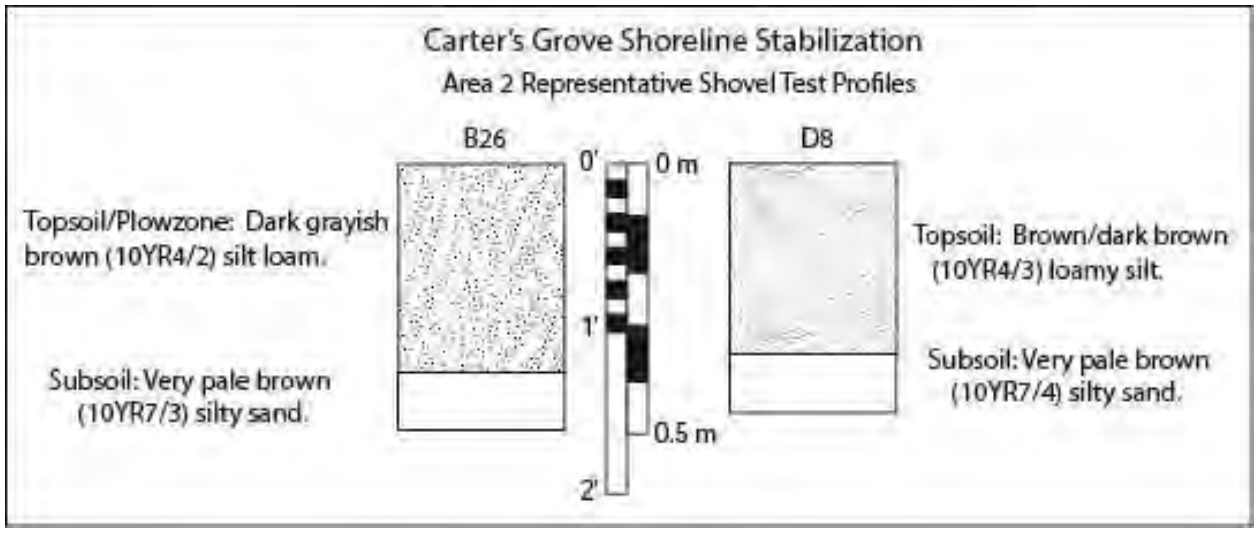


**Figure 10.** Representative shovel test profiles at Area 2.



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**Figure 11.** West profile of Test Unit 1 illustrating distinct break between soil layers.

**Figure 12.** Plan at base of Test Unit 1. Note linear feature running N/S across eastern half of test unit.



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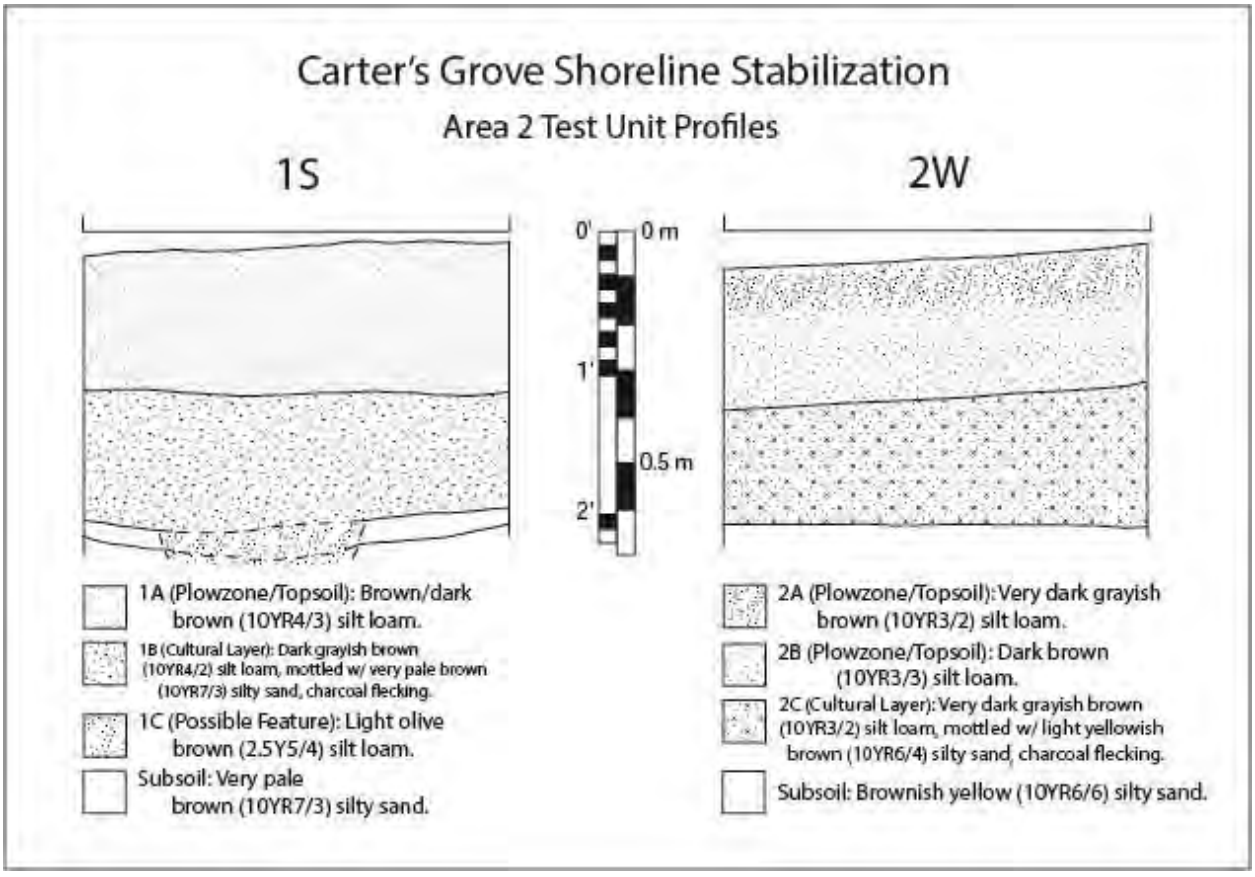


**Figure 13.** Representative test unit profiles from Area 2.

Test Unit 2 was located midway between shovel tests B16 and B17, in an area with oyster shell visible at the ground surface. Test Unit 2 also revealed a buried cultural horizon beneath two topsoil/plowzone layers, although not as distinct as that found in Test Unit 1. Layer 2A, the organically rich topsoil, was identified as a very dark grayish brown (10YR3/2) silt loam measuring 0.3' thick. The remaining topsoil/plowzone, Layer 2B, was described as a dark brown (10YR3/3) silt loam roughly 0.7' thick. The probable buried cultural horizon measured roughly 1' thick and was described as a mix of very dark grayish brown (10YR3/2) and brown/dark brown (10YR4/3) sandy loams, mottled with subsoil at its base (Figure 14). Test Unit 2 contained prehistoric artifacts such as Native American pottery and a Caraway projectile point (Figures 15 and 16). Caraway points, and the very similar Clarksville and Madison types, are associated with Late Woodland period (A.D. 900-1607) cultures of the Virginia and North Carolina Piedmont (Coe 1964:49). Also recovered from this test unit was a significant amount of oyster shell fragments, as well as a biface preform (Figures 17 and 18).

Both test units exhibited a clear distinction in artifact density and size at the interface between topsoil and buried cultural levels. Historic materials (never in



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abundance) were not found below this interface, and a noticeable increase in the size and frequency of Native American pottery sherds was seen in the buried cultural levels.

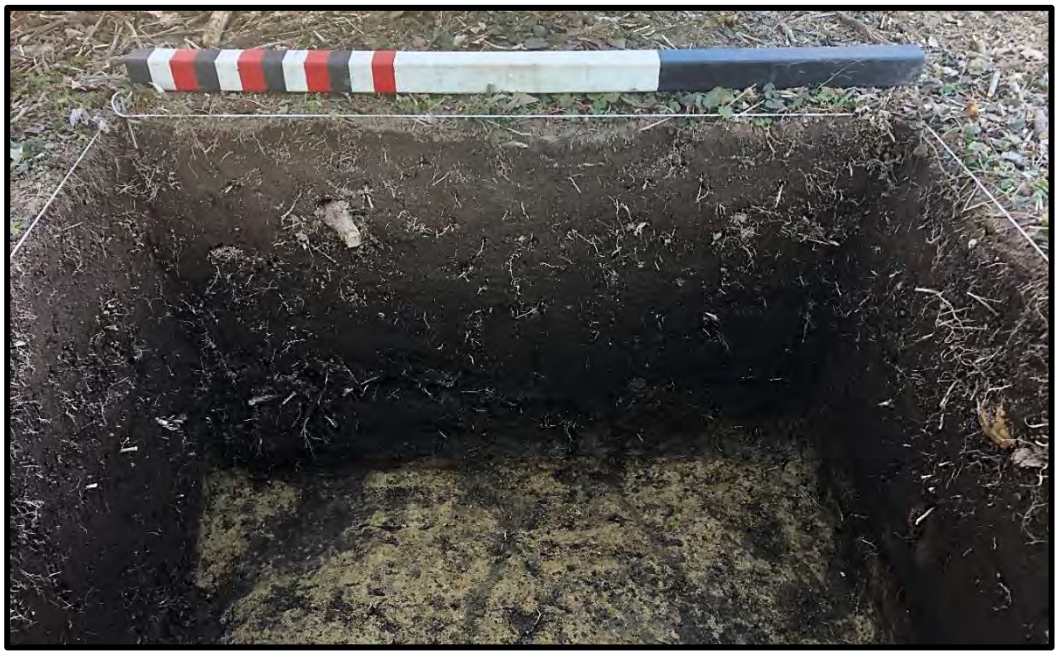

**Figure 14.** North profile of Test Unit 2.


**Figure 15.** Quartzite Caraway projectile point recovered from Test Unit 2.



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**Figure 16.** Sample of shell-tempered pottery sherds from Test Unit 1.



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**Figure 17.** Pottery, coral, and oyster shell samples recovered from Test Unit 2.


**Figure 18.** Partial quartz biface/tool preform found in Test Unit 2.



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# IV. CONCLUSIONS AND RECOMMENDATIONS

**Area 1**

JRIA archaeologists excavated 10 shovel tests and 10 radial shovel tests within Area 1, seven of which contained oyster shell and oyster shell fragments. The positive results were located at the southeastern end of the survey area, along the bluff edge and the top of the natural drainage to the east. A very thin (0.5-0.6') layer of shell was identified in Shovel Test F1, at the extreme southeast corner of the survey area. Soil profiles suggested that the area was relatively undisturbed, but may have been truncated somewhat by erosional processes.

**Area 2**

JRIA archaeologists excavated a total of 69 shovel tests within Area 2. Twenty-six of these shovel tests were found to contain historic and/or prehistoric artifacts. The vast majority of artifacts recovered were prehistoric in nature, oyster shell fragments and Native American pottery attributable to the Late Woodland period. The very light scatter of historic artifacts included brick fragments, unidentified nail fragments, and refined earthenwares (creamware, pearlware). The artifact assemblage was concentrated in the center of the tested area, with no artifacts found in the easternmost 200'. Shovel test and test unit profiles indicated the presence of a buried soil horizon concentrated between the 10 and 20 transects. The test unit excavations clearly indicated a lack of historic materials below the plowzone/cultural horizon interface. Significant amounts of Townsend-type pottery were recovered from the buried cultural material, in addition to oyster shell and a small collection of lithic artifacts including a Caraway projectile point.

## RECOMMENDATIONS

**Area 1**

While the shell midden identified in Area 1 is almost certainly an extension of previously identified Site 44JC0130, the failure of the current survey to recovery any cultural material other than oyster shell is problematic. During a pedestrian survey of the area in 1997, WMCAR collected a single sherd of Native American pottery which seemed to indicate a Woodland period presence, however this categorization was amended by the VDHR from "Late Woodland" to "Prehistoric" based upon the lack of diagnostic examples. The ephemeral nature of the thin shell scatter it is unlikely to afford significant research potential and while no further archaeological investigation is warranted, JRIA recommends that any ground disturbing activity in Area 1 should be monitored by a professional archaeologist.



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**Area 2**

The sampled cultural layer in Test Units 1 and 2 contained significant amounts of shell-tempered fabric-impressed and net-impressed ceramics of the Townsend type. The presence of this type of ceramic in addition to a Caraway projectile point strongly suggest a Native American presence within the project area during the Late Woodland period (A.D. 900-1607) (Coe 1964:49; Rountree and Randolph 2002:23). While the boundaries of Site 44JC0118 have not been formally determined, Area 2 undoubtedly part of the previously identified shell midden Site 44JC0118.

Prior to the Woodland period in the Americas there was a long history of seasonality, movement throughout the landscape at different times of the year in response to the availability of specific food resources (Flannery 1968:74-75). The Late Woodland period (A.D. 900-1607) saw significant changes to the largely forage-based sedentarism of the Early and Middle Woodland. The introduction of corn as a domesticated crop c. A.D. 900-1000 lead to increased settlement, but not the total abandonment of seasonal hunting-and-gathering ventures. As wild and foraged foods became augmented by agricultural products such as beans, corn, and squash, the duration and intensity of settlements, themselves growing in number, increased. The occasional surplus of foodstuffs made possible by extended residence and increased agriculture were typically stored in sub-surface storage pits immediately adjacent to domestic structures. Bearing in mind the presence of an intact cultural layer below the plowzone just south of Site 44JC0118, it may be possible that these features survive in the current project area as has been found at the adjacent site, 44JC0119. The resultant accumulations of food-derived waste (shell, bone, seeds, etc.) were then deposited in localized areas near groups of domestic structures (Rountree and Randolph 2002:12-20, Gallivan 2003:156-9). Shell middens are a prime example of this communal behavior and may contain valuable information regarding diet, foodways, and material culture. Oyster roasting and/or smoking pits have also been identified within midden features, the preserved oysters being instilled with a “trade” or “tribute” value in addition to its primary nutritional role (Barfield and Barber 1992:226).

The study of the oyster shells making up the shell midden can themselves bear substantial information. Individual shells can be thin-sliced and analyzed microscopically to indicate the age of the oyster (much like tree ring dating) and the season of harvest. Chemical analyses can further enhance findings of seasonality by examining the oxygen content, oxygen levels tending to be higher in winter-harvested oysters (Klein 2015).

JRIA recommends that Area 2 is part of Site 44JC0118 and that the finding of intact historic stratigraphy by the current JRIA testing in Area 2and the finding of features by previous archaeological investigations at 44JC0118 and associated site 44JC0119 indicate that Area 2 and 44JC0118 are eligible for nomination to the National Register of Historic Places and that any ground disturbing activity in Area 2 should be preceded by data recovery in the area to be disturbed.

# V. REFERENCES


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VCRIS Virginia Department of Historic Resources, Richmond.
2019

United States Geological Survey
1984a Hog Island quadrangle, 1:24 000 scale

1984b Yorktown quadrangle, 1:24 000 scale.



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# APPENDIX A: ARCHAEOLOGICAL SITE INVENTORY FORM



Received by VMRC October 23, 2020 /blh

## Snapshot

Date Generated: April 12, 2019

**Site Name:** No Data
**Site Classification:** Terrestrial, open air
**Year(s):** No Data
**Site Type(s):** Shell midden
**Other DHR ID:** 047-0001
**Temporary Designation:** No Data

**Site Evaluation Status**

Not Evaluated

## Locational Information

**USGS Quad:** HOG ISLAND
**County/Independent City:** James City (County)
**Physiographic Province:** No Data
**Elevation:** No Data
**Aspect:** No Data
**Drainage:** No Data
**Slope:** No Data
**Acreage:** No Data
**Landform:** Other
**Ownership Status:** No Data
**Government Entity Name:** No Data

## Site Components

### Component 1

**Category:** Domestic
**Site Type:** Shell midden
**Cultural Affiliation:** No Data
**DHR Time Period:** No Data
**Start Year:** No Data
**End Year:** No Data
**Comments:** No Data

## Bibliographic Information

**Bibliography:**

No Data

**Informant Data:**

No Data

## CRM Events

### Event Type: Survey:Phase I/Reconnaissance

**Project Staff/Notes:**
No Data

**Project Review File Number:** No Data
**Sponsoring Organization:** No Data
**Organization/Company:** Unknown (DSS)
**Investigator:** Kelso, William M.
**Survey Date:** 1/1/1971
**Survey Description:**
Plowzone- to subsoil; tested by Norman Barrka, College of William & Mary April 12-16, 1971.

| Current Land Use | Date of Use | Comments |
|---|---|---|
| Agricultural field | *No Data* | *No Data* |

**Threats to Resource:** No Data
**Site Conditions:** Site Condition Unknown
**Survey Strategies:** Subsurface Testing
**Specimens Collected:** Yes
**Specimens Observed, Not Collected:** Yes
**Artifacts Summary and Diagnostics:**
see finds list at CW Dept. of Archaeology
**Summary of Specimens Observed, Not Collected:**
No Data
**Current Curation Repository:** CW Dept of Archaeology
**Permanent Curation Repository:** No Data
**Field Notes:** No
**Field Notes Repository:** No Data
**Photographic Media:** No Data
**Survey Reports:** No Data
**Survey Report Information:**
1) See Keith Bott's report
2) Colonial Williamsburg's research has two C14 dates 440+/-90 B.P. & 670+/-70 B.P. - Townsend ceramics associated.
---
1) Report on exploratory excavations at Carter's Grove Plantation, James City, Co., VA, W.M. Kelso, 1972
2) digging for Carter's Grove - I.N.H. 1974
**Survey Report Repository:** No Data
**DHR Library Reference Number:** No Data
**Significance Statement:** No Data
**Surveyor's Eligibility Recommendations:** No Data
**Surveyor's NR Criteria Recommendations, :** No Data
**Surveyor's NR Criteria Considerations:** No Data

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## Legend

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- Architecture Labels
- Individual Historic District Properties
- Archaeological Resources
- Archaeology Labels
- DHR Easements
- USGS GIS Place names
- County Boundaries


N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

**Title: Archaeological Resources** **Date: 4/12/2019**

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

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

## Snapshot

Date Generated: April 12, 2019

**Site Name:** No Data
**Site Classification:** Terrestrial, open air
**Year(s):** 15000 B.C.E - 1606 C.E
**Site Type(s):** Grave/burial
**Other DHR ID:** 047-0001
**Temporary Designation:** No Data

**Site Evaluation Status**

Not Evaluated

## Locational Information

**USGS Quad:** HOG ISLAND
**County/Independent City:** James City (County)
**Physiographic Province:** No Data
**Elevation:** No Data
**Aspect:** No Data
**Drainage:** No Data
**Slope:** No Data
**Acreage:** No Data
**Landform:** Other
**Ownership Status:** No Data
**Government Entity Name:** No Data

## Site Components

### Component 1

**Category:** Funerary
**Site Type:** Grave/burial
**Cultural Affiliation:** Native American
**DHR Time Period:** Early Archaic Period, Early Woodland, Late Archaic Period, Late Woodland, Middle Archaic Period, Middle Woodland, Paleo-Indian
**Start Year:** -15000
**End Year:** 1606
**Comments:** 9-10 bundle or secondary burials closely spaced

## Bibliographic Information

**Bibliography:**

No Data

**Informant Data:**

No Data

## CRM Events

### Event Type: Other

**Project Staff/Notes:**

Temporal designation changed to Prehistoric/Unknown due to lack of diagnostics

**Project Review File Number:** No Data
**Sponsoring Organization:** No Data
**Organization/Company:** Unknown (DSS)
**Investigator:** WMCAR
**Survey Date:** 4/8/1997
**Survey Description:**

9-10 bundle or secondary burials closely spaced; tested by Norman Barka, College of William & Mary April 12-16, 1971.

| Current Land Use | Date of Use | Comments |
|---|---|---|
| Agricultural field | *No Data* | *No Data* |

**Threats to Resource:** No Data
**Site Conditions:** Site Condition Unknown
**Survey Strategies:** Subsurface Testing
**Specimens Collected:** Yes
**Specimens Observed, Not Collected:** Yes
**Artifacts Summary and Diagnostics:**

see finds list at CW Dept. of Archaeology

**Summary of Specimens Observed, Not Collected:**

No Data

**Current Curation Repository:** CW Dept of Archaeology
**Permanent Curation Repository:** No Data
**Field Notes:** No
**Field Notes Repository:** No Data
**Photographic Media:** No Data
**Survey Reports:** No Data
**Survey Report Information:**

1) Report on exploratory excavations at Carter's Grove Plantation, James City, Co., VA, W.M. Kelso, 1972
2) digging for Carter's Grove - I.N.H. 1974

**Survey Report Repository:** No Data
**DHR Library Reference Number:** No Data
**Significance Statement:** No Data
**Surveyor's Eligibility Recommendations:** No Data
**Surveyor's NR Criteria Recommendations, :** No Data
**Surveyor's NR Criteria Considerations:** No Data

### Event Type: Survey:Phase I/Reconnaissance

**Project Staff/Notes:**

No Data

**Project Review File Number:** No Data
**Sponsoring Organization:** No Data
**Organization/Company:** Unknown (DSS)
**Investigator:** Kelso, William M.
**Survey Date:** 1/1/1971
**Survey Description:**

No Data

**Threats to Resource:** No Data

| | |
|---|---|
| **Site Conditions:** | No Data |
| **Survey Strategies:** | No Data |
| **Specimens Collected:** | No Data |
| **Specimens Observed, Not Collected:** | No Data |
| **Artifacts Summary and Diagnostics:** | |
| No Data | |
| **Summary of Specimens Observed, Not Collected:** | |
| No Data | |
| **Current Curation Repository:** | No Data |
| **Permanent Curation Repository:** | No Data |
| **Field Notes:** | No Data |
| **Field Notes Repository:** | No Data |
| **Photographic Media:** | No Data |
| **Survey Reports:** | No Data |
| **Survey Report Information:** | |
| No Data | |
| **Survey Report Repository:** | No Data |
| **DHR Library Reference Number:** | No Data |
| **Significance Statement:** | No Data |
| **Surveyor's Eligibility Recommendations:** | No Data |
| **Surveyor's NR Criteria Recommendations, :** | No Data |
| **Surveyor's NR Criteria Considerations:** | No Data |

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## Legend

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- Architecture Labels
- Individual Historic District Properties
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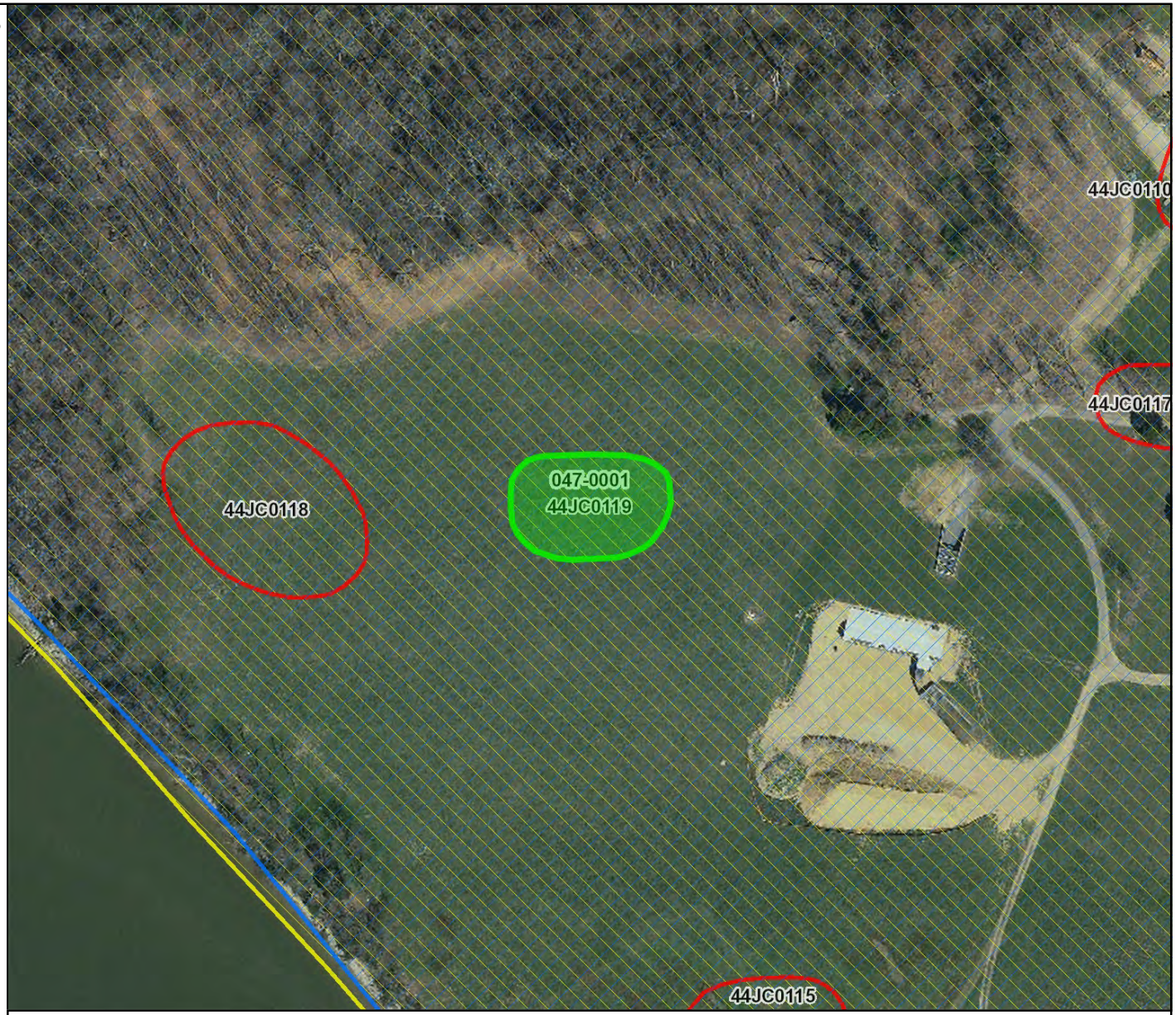


N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

**Title: Archaeological Resources** **Date: 4/12/2019**

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## Snapshot

Date Generated: April 12, 2019

**Site Name:** No Data
**Site Classification:** Terrestrial, open air
**Year(s):** 1200 B.C.E - 1606 C.E
**Site Type(s):** Shell midden
**Other DHR ID:** 047-0001
**Temporary Designation:** No Data

**Site Evaluation Status**

Not Evaluated

## Locational Information

**USGS Quad:** HOG ISLAND
**County/Independent City:** James City (County)
**Physiographic Province:** No Data
**Elevation:** No Data
**Aspect:** No Data
**Drainage:** No Data
**Slope:** No Data
**Acreage:** No Data
**Landform:** Other
**Ownership Status:** No Data
**Government Entity Name:** No Data

## Site Components

### Component 1

**Category:** Domestic
**Site Type:** Shell midden
**Cultural Affiliation:** Native American
**DHR Time Period:** Early Woodland, Late Woodland, Middle Woodland
**Start Year:** -1200
**End Year:** 1606
**Comments:** No Data

## Bibliographic Information

**Bibliography:**

No Data

**Informant Data:**

No Data

## CRM Events

### Event Type: Other

**Project Staff/Notes:**
Temporal designation modified from Late Woodland to Prehistoric/Unknown citing insufficient diagnostic examples in the site survey form.

**Project Review File Number:** No Data
**Sponsoring Organization:** No Data
**Organization/Company:** Unknown (DSS)
**Investigator:** WMCAR
**Survey Date:** 4/8/1997
**Survey Description:**
No Data

**Threats to Resource:** No Data
**Site Conditions:** Unknown Portion of Site Destroyed
**Survey Strategies:** Surface Testing
**Specimens Collected:** Yes
**Specimens Observed, Not Collected:** Yes
**Artifacts Summary and Diagnostics:**
sand tempered cordmarked sherd found eroding out of bank and donated to VDHR.
**Summary of Specimens Observed, Not Collected:**
No Data
**Current Curation Repository:** VDHR
**Permanent Curation Repository:** No Data
**Field Notes:** No
**Field Notes Repository:** No Data
**Photographic Media:** No Data
**Survey Reports:** No Data
**Survey Report Information:**
No Data
**Survey Report Repository:** No Data
**DHR Library Reference Number:** No Data
**Significance Statement:** No Data
**Surveyor's Eligibility Recommendations:** No Data
**Surveyor's NR Criteria Recommendations, :** No Data
**Surveyor's NR Criteria Considerations:** No Data

### Event Type: Survey:Phase I/Reconnaissance

**Project Staff/Notes:**
No Data
**Project Review File Number:** No Data
**Sponsoring Organization:** No Data
**Organization/Company:** Unknown (DSS)
**Investigator:** Lucketti, N.M.
**Survey Date:** 1/1/1979
**Survey Description:**
No Data

**Threats to Resource:** No Data
**Site Conditions:** No Data
**Survey Strategies:** No Data

**Specimens Collected:** No Data
**Specimens Observed, Not Collected:** No Data
**Artifacts Summary and Diagnostics:**
No Data
**Summary of Specimens Observed, Not Collected:**
No Data
**Current Curation Repository:** No Data
**Permanent Curation Repository:** No Data
**Field Notes:** No Data
**Field Notes Repository:** No Data
**Photographic Media:** No Data
**Survey Reports:** No Data
**Survey Report Information:**
No Data
**Survey Report Repository:** No Data
**DHR Library Reference Number:** No Data
**Significance Statement:** No Data
**Surveyor's Eligibility Recommendations:** No Data
**Surveyor's NR Criteria Recommendations, :** No Data
**Surveyor's NR Criteria Considerations:** No Data

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N

Feet

0 50 100 150 200

1:2,500 / 1"=208 Feet

**Title: Archaeological Resources** **Date: 4/12/2019**

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# APPENDIX B: ARTIFACT CATALOG

# Carter's Grove Shoreline Stabilization

State Site # 44JC0118

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-ST | B12 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 254.0 | | 1 |
| 2-ST | B13 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 3.4 | | 2 |
| 2-ST | B14 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 24.6 | | 3 |
| 2-ST | B14 | | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 4 |
| 2-ST | B15 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 11.9 | | 5 |
| 2-ST | B15 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | AB POTTERY VESSEL | FRAGMENT | 1 | <25mm | 0.0 | | 6 |
| 2-ST | B16 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 13.0 | | 7 |
| 2-ST | B17 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 12.1 | | 8 |
| 2-ST | B17 | | Area 2 | CABORIGINAL POTTERY | AB SAND TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 2 | | 0.0 | sherds mend; interior scraped | 9 |
| 2-ST | B18 | | Area 2 | ABONE | ANIMAL UNID | | FRAGMENT | 1 | | 1.5 | | 11 |
| 2-ST | B18 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 3.9 | | 10 |
| 2-ST | B18 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 2 | | 0.0 | | 12 |
| 2-ST | B19 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 0.6 | | 13 |
| 2-ST | B19 | | Area 2 | SGLASS | GLASS AQUA | WINDOW GLASS | FRAGMENT | 1 | | 0.0 | | 14 |
| 2-ST | B21 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 1 | <25mm | 0.0 | | 16 |
| 2-ST | B21 | | Area 2 | CBRICK | | BRICK | FRAGMENT | 1 | | 0.7 | | 15 |
| 2-ST | B21 | | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB DEBITAGE | TERTIARY FLAKE | 1 | <2cm | 0.0 | | 17 |
| 2-ST | B22 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 1.1 | | 18 |
| 2-ST | B23 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 12.7 | | 19 |
| 2-ST | B24 | | Area 2 | ASHELL | ANIMAL CLAM | SHELL | FRAGMENT | 1 | | 4.3 | | 21 |
| 2-ST | B24 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 7.1 | | 20 |

State Site # 44JC0118

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-ST | B24 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 1 | <25mm | 0.0 | | 23 |
| 2-ST | B24 | | Area 2 | CCOARSEWARE | PEARL BLUE/GREEN-EDGED | HOLLOWWARE | RIM FRAGMENT | 1 | | 0.0 | | 22 |
| 2-ST | B26 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/CORD MARKED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | <25mm | 0.0 | | 24 |
| 2-ST | C11 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 1.3 | | 25 |
| 2-ST | C12 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 30.4 | | 26 |
| 2-ST | C13 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 6.5 | | 27 |
| 2-ST | C14 | | Area 2 | ATOOTH | ANIMAL FISH SHARK | TOOTH FOSSILIZED | FRAGMENT | 1 | | 0.0 | probable Mako shark tooth | 30 |
| 2-ST | C14 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 1 | <25mm | 0.0 | | 28 |
| 2-ST | C14 | | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB COBBLE | FRAGMENT | 1 | | 9.5 | | 29 |
| 2-ST | C15 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 2 | <25mm | 0.0 | | 34 |
| 2-ST | C15 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 3 | <25mm | 0.0 | | 33 |
| 2-ST | C15 | | Area 2 | CCERAMIC CTP | LOCAL CLAY | TOBACCO PIPE | PIPEBOWL FRAGMENT | 1 | | 0.0 | possible Native American pipe; décor noted on exterior; burned | 32 |
| 2-ST | C15 | | Area 2 | SGLASS | GLASS COLORLESS | HOLLOWWARE | FRAGMENT CURVED | 1 | | 0.0 | | 31 |
| 2-ST | C16 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 9.4 | | 35 |
| 2-ST | C16 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 1 | <25mm | 0.0 | | 37 |
| 2-ST | C16 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 2 | | 0.0 | | 36 |
| 2-ST | C16 | | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB COBBLE | FRAGMENT | 1 | | 2.5 | probable FCR | 38 |
| 2-ST | C17 | | Area 2 | ABONE | ANIMAL UNID | BONE FOSSILIZED | FRAGMENT | 1 | | 0.0 | | 43 |
| 2-ST | C17 | | Area 2 | ASHELL | ANIMAL CLAM | SHELL | FRAGMENT | 0 | | 2.0 | | 40 |
| 2-ST | C17 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 2.9 | | 39 |

State Site # 44JC0118

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-ST | C17 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 41 |
| 2-ST | C17 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 1 | <25mm | 0.0 | | 42 |
| 2-ST | C23 | | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 3.6 | | 44 |
| 2-ST | D11 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 1 | <25mm | 0.0 | | 46 |
| 2-ST | D11 | | Area 2 | CEARTHENWARE | CREAM | HOLLOWWARE | FRAGMENT CURVED | 1 | | 0.0 | | 45 |
| 2-ST | D11 | | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB SHATTER | FRAGMENT | 1 | | 10.6 | | 47 |
| 2-ST | D12 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 3 | <25mm | 0.0 | | 48 |
| 2-ST | D13 | | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 1 | <25mm | 0.0 | | 50 |
| 2-ST | D13 | | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 2 | <25mm | 0.0 | | 49 |
| 2-ST | E26 | | Area 2 | RBOG IRON | | BOG IRON | FRAGMENT | 1 | | 1.8 | | 51 |
| 2-ST | E27 | | Area 2 | ASHELL | ANIMAL CLAM | SHELL | FRAGMENT | 0 | | 5.1 | | 52 |
| 3-TU | 1 | A | Area 2 | ABONE | ANIMAL UNID | UNIDENTIFIED FORM | FRAGMENT | 2 | | 0.0 | burned | 65 |
| 3-TU | 1 | A | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 0.8 | | 66 |
| 3-TU | 1 | A | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 34 | <25mm | 0.0 | | 71 |
| 3-TU | 1 | A | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 69 |
| 3-TU | 1 | A | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | RIM FRAGMENT | 1 | <25mm | 0.0 | | 68 |
| 3-TU | 1 | A | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 4 | | 0.0 | | 70 |
| 3-TU | 1 | A | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | <25mm | 0.0 | | 67 |
| 3-TU | 1 | A | Area 2 | CBRICK | | BRICK | FRAGMENT | 0 | | 5.8 | | 61 |
| 3-TU | 1 | A | Area 2 | CEARTHENWARE | CREAM | HOLLOWWARE | FRAGMENT CURVED | 1 | | 0.0 | glaze missing on interior | 60 |

State Site # 44JC0118

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-TU | 1 | A | Area 2 | MIRON | | NAIL WROUGHT | SHANK | 1 | | 0.0 | | 64 |
| 3-TU | 1 | A | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB DEBITAGE | TERTIARY FLAKE | 2 | <2cm | 0.0 | | 73 |
| 3-TU | 1 | A | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB DEBITAGE | TERTIARY FLAKE | 1 | <2cm | 0.0 | | 72 |
| 3-TU | 1 | A | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB TOOL CORE | FRAGMENT | 2 | | 167.7 | | 74 |
| 3-TU | 1 | A | Area 2 | SGLASS | GLASS OLIVE GREEN | BOTTLE WINE | FRAGMENT | 1 | | 0.0 | | 63 |
| 3-TU | 1 | A | Area 2 | SMORTAR | | MORTAR | FRAGMENT | 0 | | 1.9 | | 62 |
| 3-TU | 1 | B | Area 2 | ABONE | ANIMAL UNID | BONE FOSSILIZED | FRAGMENT | 3 | | 0.0 | | 76 |
| 3-TU | 1 | B | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 0.5 | | 75 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 21 | <25mm | 0.0 | | 88 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 4 | | 0.0 | | 87 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | RIM FRAGMENT | 1 | | 0.0 | | 86 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 4 | | 0.0 | | 85 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 8 | | 0.0 | 2 sherds mend | 84 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 5 | | 0.0 | | 82 |
| 3-TU | 1 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/SIMPLE STAMPED | AB POTTERY VESSEL | BODY FRAGMENT | 10 | | 0.0 | 4 sherds mend | 83 |
| 3-TU | 1 | B | Area 2 | CCERAMIC CTP | LOCAL CLAY | TOBACCO PIPE | PIPEBOWL FRAGMENT | 1 | | 0.0 | rim fragment; décor on exterior | 81 |
| 3-TU | 1 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB DEBITAGE | SECONDARY FLAKE | 1 | 2-5cm | 0.0 | | 79 |
| 3-TU | 1 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB COBBLE | FRAGMENT | 1 | | 1.2 | possible FCR | 80 |
| 3-TU | 1 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB DEBITAGE | SECONDARY FLAKE | 1 | <2cm | 0.0 | | 77 |
| 3-TU | 1 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB DEBITAGE | TERTIARY FLAKE | 1 | <2cm | 0.0 | | 78 |
| 3-TU | 2 | A | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 7.2 | | 89 |
| 3-TU | 2 | A | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB SHATTER | FRAGMENT | 1 | | 119.4 | possible FCR | 90 |

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| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-TU | 2 | B | Area 2 | ABONE | ANIMAL CORAL | | FRAGMENT | 1 | | 7.6 | | 100 |
| 3-TU | 2 | B | Area 2 | ABONE | ANIMAL UNID | | FRAGMENT | 3 | | 5.5 | burned | 97 |
| 3-TU | 2 | B | Area 2 | ASHELL | ANIMAL CLAM | SHELL | FRAGMENT | 0 | | 8.0 | | 99 |
| 3-TU | 2 | B | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 230.8 | | 98 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB POTTERY INDETERMINATE TEMP/INDETERMINATE | UNIDENTIFIED FORM | FRAGMENT | 26 | <25mm | 0.0 | | 109 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/CORD MARKED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 107 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 7 | | 0.0 | | 108 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SAND & SHELL TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 2 | | 0.0 | | 106 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/CORD MARKED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 102 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/FABRIC IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 103 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/INDETERMINATE | AB POTTERY VESSEL | BODY FRAGMENT | 14 | | 0.0 | | 105 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/NET IMPRESSED | AB POTTERY VESSEL | BODY FRAGMENT | 9 | | 0.0 | | 101 |
| 3-TU | 2 | B | Area 2 | CABORIGINAL POTTERY | AB SHELL TEMP/SIMPLE STAMPED | AB POTTERY VESSEL | BODY FRAGMENT | 1 | | 0.0 | | 104 |
| 3-TU | 2 | B | Area 2 | CBRICK | | BRICK | FRAGMENT | 0 | | 5.9 | | 93 |
| 3-TU | 2 | B | Area 2 | CEARTHENWARE | CREAM | HOLLOWWARE | FRAGMENT CURVED | 1 | | 0.0 | | 91 |
| 3-TU | 2 | B | Area 2 | CPORCELAIN | PORCELAIN CHINESE UNDER BLUE | HOLLOWWARE | BASE/FOOTRING/BODY FRAGMENT | 1 | | 0.0 | unidentifiable blue motif on body exterior | 92 |
| 3-TU | 2 | B | Area 2 | MIRON | | NAIL WROUGHT | COMPLETE | 1 | | 0.0 | heavily oxidized | 95 |
| 3-TU | 2 | B | Area 2 | RBOG IRON | | BOG IRON | FRAGMENT | 2 | | 24.0 | | 96 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC CHERT | AB DEBITAGE | TERTIARY FLAKE | 1 | <2cm | 0.0 | | 113 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB DEBITAGE | TERTIARY FLAKE | 2 | <2cm | 0.0 | | 115 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB DEBITAGE | SECONDARY FLAKE | 1 | <2cm | 0.0 | | 114 |

State Site # 44JC0118

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB SHATTER | FRAGMENT | 1 | | 2.9 | | 116 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB TOOL BIFACE | FRAGMENT | 1 | 38 x 24 x 15mm | 13.4 | missing one side; very early stage | 119 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB TOOL BIFACE | COMPLETE | 1 | 21 x 17 x 8mm | 2.4 | very early stage, mostly worked on one side | 118 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZ | AB TOOL CORE | FRAGMENT | 1 | | 53.5 | | 117 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB COBBLE | FRAGMENT | 1 | | 36.9 | | 112 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB DEBITAGE | TERTIARY FLAKE | 1 | 2-5cm | 0.0 | | 110 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB DEBITAGE | TERTIARY FLAKE | 4 | <2cm | 0.0 | | 111 |
| 3-TU | 2 | B | Area 2 | RLITHIC | AB LITHIC QUARTZITE | AB TOOL BIFACE PROJECTILE POINT | COMPLETE | 1 | 30 x 22 x 6mm | 3.4 | Caraway Projectile Point | 120 |
| 3-TU | 2 | B | Area 2 | SGLASS | GLASS GREEN | WINDOW GLASS | FRAGMENT | 1 | | 0.0 | | 94 |
| 3-TU | 2 | C | Area 2 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 9.0 | | 121 |

State Site # Area 1

| Provenience: Type | Context | Layer | Other | Material 1 | Material 2 | Form | Portion/Element | Qty | Size | Wgt (g) | Notes | Artifact No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-ST | F01 | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 161.1 | | 53 |
| 2-ST | F01E | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 35.3 | | 54 |
| 2-ST | F01W | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 103.5 | | 55 |
| 2-ST | F03 | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 164.5 | | 56 |
| 2-ST | F03E | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 19.7 | | 57 |
| 2-ST | G02 | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 30.6 | | 58 |
| 2-ST | G02S | | Area 1 | ASHELL | ANIMAL OYSTER | SHELL | FRAGMENT | 0 | | 4.1 | | 59 |

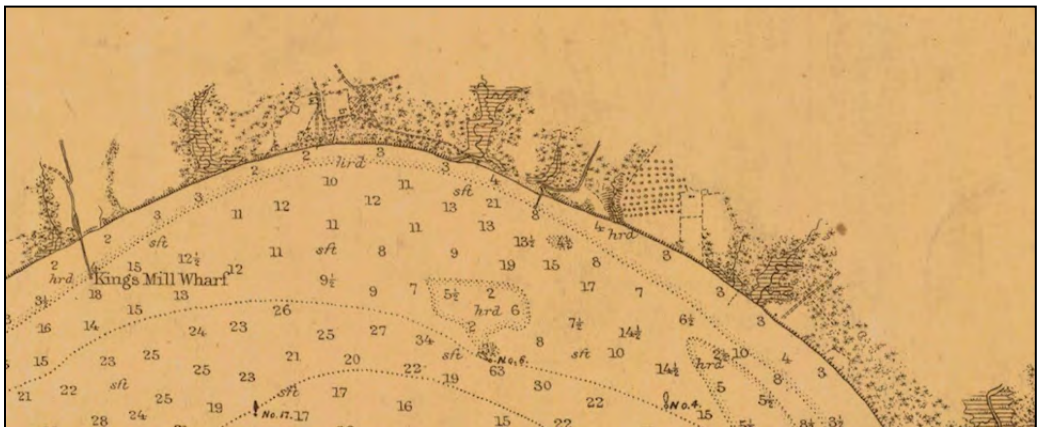
# APPENDIX B: TIDEWATER ATLANTIC RESEARCH, INC. UNDERWATER SURVEY ASSESSMENT



Received by VMRC October 23, 2020 /blh

Technical Assessment Entitled:

# *A Submerged Cultural Resource Remote-Sensing Survey of the Carter's Grove Shoreline Stabilization Site in the James River, James City County, Virginia*




**[Detail of 1877 U.S. Coast Survey map entitled *James River, Chart No. 2, From Point of Shoals Light To Sloop Point*]**

Submitted to:

**Vanasse Hangen Brustlin, Inc.**
**351 McLaws Circle, Suite 3**
**Williamsburg, Virginia 23185-5797**

Submitted by:

**Tidewater Atlantic Research, Inc.**
**P. O. Box 2494**
**Washington, North Carolina 27889**

Submittal Date:

**1 October 2020**

Received by VMRC October 23, 2020 /blh

**Abstract**

Vanasse Hangen Brustlin, Inc. (VHB) of Williamsburg, Virginia is working with Carter's Grove Associates LLC on design and 106 permitting for shoreline stabilization on the James River waterfront, James City County, Virginia. An *Environmental Assessment* of the impacts on submerged cultural resources associated with construction of shoreline stabilization structures is an integral part of permitting. To identify submerged cultural resources and assess any impacts of proposed project activities on those resources, VHB requested that Tidewater Atlantic Research, Inc. (TAR) of Washington, North Carolina conduct a remote-sensing survey of the James River *Area of Potential Effect.* That investigation was carried out on 26, 27, and 28 August 2020. The remote-sensing investigation was carried out with a cesium-vapor magnetometer, a high-resolution sidescan sonar, and CHIRP digital sub-bottom profiler. Differential global positioning was used to control navigation and data collection location. Analysis of the magnetic and acoustic data generated by the survey identified 202 magnetic anomalies, 15 sonar targets and 2 sub-bottom features within the area surveyed. Thirteen magnetic anomalies identified during the survey are associated with the remains of an historic wharf structure. That structure represents a cultural resource potentially eligible for inclusion on the National Register of Historic Places (NRHP). With the exception of two sonar targets that are associated with the historic wharf structure and pilings near the southern extremity of the survey area, the remaining 13 are associated with linear objects such as logs or pilings. The two sub-bottom features are associated with relict channels and possibly buried pipelines. Based on those findings, construction of the proposed shoreline stabilization structures will have no impact on submerged archaeological resources that are eligible for nomination to the NRHP if the historic wharf structure buffer can be avoided. If the subject buffer can be avoided, no additional investigation is recommended. If not, a Phase II archaeological diver investigation of the subject wharf remains is recommended to assess its NRHP eligibility.

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## Introduction

Vanasse Hangen Brustlin, Inc. (VHB) of Williamsburg, Virginia is working with Carter's Grove Associates LLC on design and 106 permitting for shoreline stabilization on the James River waterfront, James City County, Virginia. An *Environmental Assessment* of the impacts on submerged cultural resources associated with construction of shoreline stabilization structures is an integral part of permitting. To identify submerged cultural resources and assess any impacts of proposed project activities on those resources, VHB requested that Tidewater Atlantic Research, Inc. (TAR) of Washington, North Carolina conduct a remote-sensing survey of the James River *Area of Potential Effect*.

The Carter's Grove submerged cultural resource remote-sensing survey was designed to meet the marine survey criteria of the Virginia Department of Historic Resources (VDHR) and to comply with the National Historic Preservation Act of 1966, as amended, through 1992 (36 CFR 800, *Protection of Historic Properties*), the Abandoned Shipwreck Act of 1987 (*Abandoned Shipwreck Act Guidelines*, National Park Service, *Federal Register*, Vol. 55, No. 3, December 4, 1990, pages 50116-50145), the National Environmental Policy Act of 1969 (Public Law 11-190), Executive Order 11593, the Advisory Council on Historic Preservation Procedures for the protection of historic and cultural properties (36 CFR Part 800) and updated guidelines described in 36 CFR 64 and CFR 66. The results of the proposed investigation will provide VHB and Carter's Grove with the archaeological data essential for complying with federal submerged cultural resource legislation and Commonwealth of Virginia regulations. The remote-sensing data will provide the first step in determining the potential NRHP eligibility of the historic wharf structure.

The submerged cultural resource remote-sensing survey was carried out using a Geometrics 881 cesium vapor magnetometer, a Klein 3900 high-resolution digital sidescan sonar, and an EdgeTech 3100P CHIRP sub-bottom profiler. Both vessel positioning and remote-sensing data collection were controlled by HYPACK survey software running on an onboard computer. That computer georeferenced all data collection using a TRIMBLE differential global positioning system (DGPS).

Fieldwork was carried out on 26, 27, and 28 August 2020. Project personnel consisted of Principal Investigator Gordon Watts, Field Director Ralph Wilbanks, and Remote-Sensing Equipment Operator Rufus Purdue. Data analysis and GIS based illustrations were prepared by Dr. Watts. Dr. Watts and Ms. Arnold prepared this report.

## Project Location

The project site is located in the James River offshore of Carter's Grove in James City County, Virginia. The survey area lies adjacent to the east bank of the James River and extends from the mouth of Grices Run in the south to a point offshore of the sewage treatment plant and south of the mouth of Grove Creek (Figure 1). The eastern border of the survey area follows the USGS 7.5' Quadrangle: Surry, 2019 shoreline.

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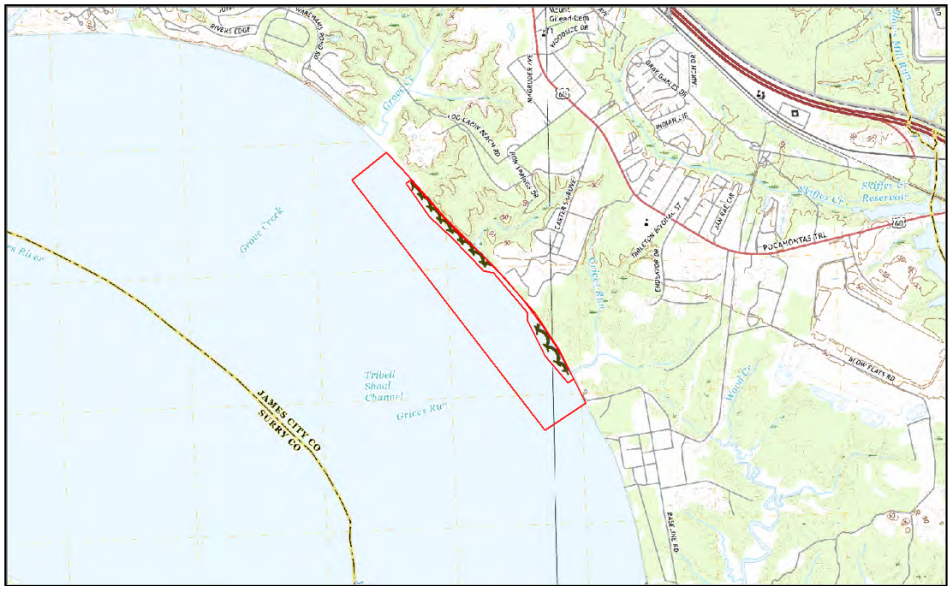


**Figure 1. Carter's Grove project location and APE (USGS 7.5' Quadrangle: Surry, 2019).**

Virginia South state plane coordinates, NAD 83, U.S. Survey Foot, for the James River extremities of the Carter's Grove survey area (Figure 2) are presented in Table 1.

| Point | Northing | Easting |
|---|---|---|
| NW | 12023892.1 | 3606253.5 |
| NE | 12024767.1 | 3606951.4 |
| SE | 12029819.2 | 3600597.2 |
| SW | 12028787.9 | 3599920.1 |

**Table 1. Carter' s Grove survey area coordinates.**

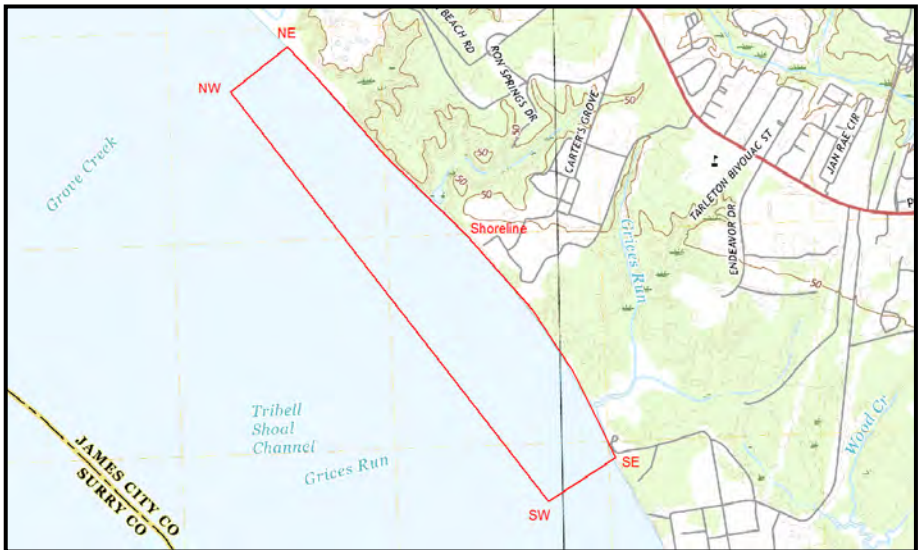


**Figure 2. Survey area border points (Detail of USGS 7.5' Quadrangle: Surry, 2019).**

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**Remote-Sensing Survey Methodology**

In order to reliably identify submerged cultural resources, TAR personnel conducted a systematic remote-sensing survey of the project area. All marine survey activities were conducted from the 25-foot survey vessel *Tidewater Surveyor* (Figure 3). In order to fulfill the requirements for survey activities in Virginia, magnetic and acoustic remote-sensing equipment were employed. This combination of remote sensing represent the "state of the art" in submerged cultural resource location technology and offers the most reliable and cost-effective method of locating and identifying potentially significant targets. Data collection was controlled using a DGPS. DGPS produces the highly accurate coordinates necessary to support a sophisticated navigation program and assures reliable target location.

**Figure 3. TAR project vessel *Tidewater Surveyor*.**

An EG&G GEOMETRICS G-881 marine cesium magnetometer, capable of plus or minus 0.001 gamma resolution, was employed to collect magnetic data in the survey area (Figure 4). To produce the most comprehensive magnetic record, data was collected at 10 samples per second. Due to shoal water within the project area, the magnetometer sensor was towed just below the water surface at a speed of approximately 3 to 4 knots.

Magnetic data were recorded as a data file associated with the computer navigation system. Data from the survey were contour plotted using QUICKSURF computer software to facilitate anomaly location and definition of target signature characteristics. All magnetic data were correlated with the acoustic remote-sensing records.

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**Figure 4. GEOMETRICS G-881 cesium vapor magnetometer.**

A 450/900 kHz KLEIN 3900 digital sidescan sonar (interfaced with SONARPRO data acquisition software) was employed to collect acoustic data in the survey area (Figure 5). Due to shoal water within the project area, the sidescan sonar transducer was deployed and maintained between 10 and 2 feet below the water. Acoustic data were collected using a range scale of 50 meters to provide a combination of 500% coverage and high target signature definition. Acoustic data were recorded as a digital file with SONARPRO and tied to the magnetic and positioning data by the computer navigation system. These data were then imported into CHESAPEAKE TECHNOLOGY SONARWIZ.MAP for additional review and to create a mosaic.

**Figure 5. KLEIN System 3900 digital sidescan sonar.**

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Acoustic sub-bottom data was collected using an EDGETECH 3100P portable sub-bottom profiler with a SB-216S tow vehicle (Figure 6). The SB-216S provides three frequency spectrums between 2 and 15kHz with a pulse length of 20 msec. Penetration in coarse and calcareous sand is factory rated at 6 meters with from 2 to 10cm of vertical resolution. During the survey the sub-bottom transducer was deployed and maintained between 4 to 5 feet below the water surface. To facilitate target identification, sub-bottom sonar records were electronically tied to DGPS coordinates. Sub-bottom data was recorded as a digital file using EDGETECH's Discover software and DGPS provided record positioning.

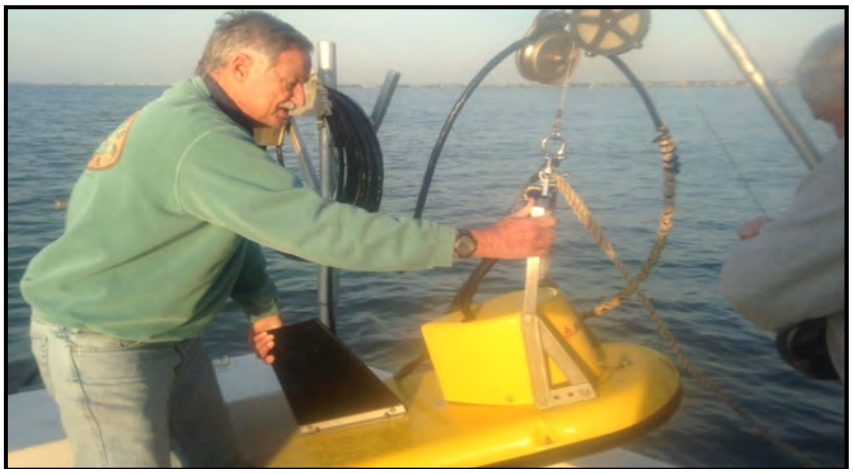

**Figure 6. EDGETECH SB-216S tow vehicle.**

A TRIMBLE AgGPS was used to control navigation and data collection in the survey area. That system has an accuracy of plus or minus three feet, and can be used to generate highly accurate coordinates for the computer navigation system. he DGPS was employed in conjunction with an onboard 2.4 GHz laptop loaded with HYPACK navigation and data collection software (Figure 7). All magnetic and acoustic records were tied to positioning events generated by HYPACK Positioning data generated by the navigation system were tied to magnetometer records by regular annotations to facilitate target location and anomaly analysis. All data is related to the Virginia State Plane Coordinate System, NAD 83.

**Figure 7. Computer navigation system located at the research vessel helm.**

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All remote-sensing survey data was collected on lines established in HYPACK navigation software. Planned survey lines in the area were spaced at 15 meters. Records of the as-run survey lines confirm coverage (Figure 8).

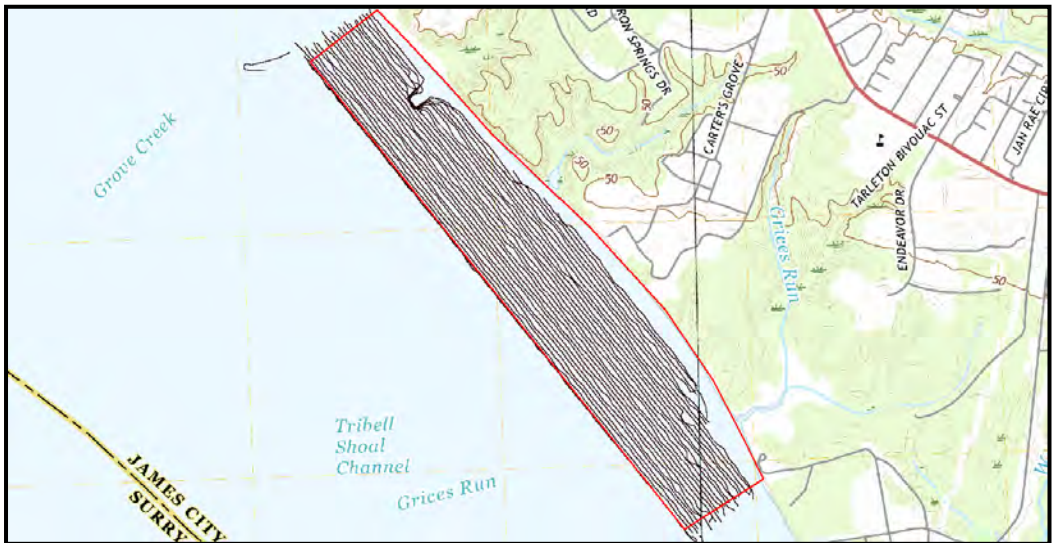


**Figure 8. Survey vessel track lines in the survey area.**

Survey tracklines on the eastern perimeter indicate the limit of access with instruments deployed. Access inshore was limited by shallow water, pilings associated with the historic dock structure (Figure 9), another set of pilings in the south, and fallen trees and tree stumps in the water due to erosion (Figure 10).

**Figure 9. Pilings associated with historic wharf structure.**

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**Figure 10. Trees and stumps in the shallow water exposed at low tide.**

**Remote-Sensing Data Analysis**

To ensure reliable target identification and assessment, analysis of the magnetic and acoustic data was carried out as it was generated. Using QUICKSURF contouring software, magnetic data generated during the survey were contour plotted at 5-gamma intervals for analysis and accurate location of magnetic anomalies. The magnetic data were examined for anomalies that were isolated and analyzed in accordance with intensity, duration, areal extent, and signature characteristics. Sonar records were analyzed to identify targets on the basis of configuration, areal extent, target intensity and contrast with background, elevation and shadow image, and they were also reviewed for possible association with identified magnetic anomalies.

Data generated by the remote-sensing equipment were developed to support an assessment of each magnetic and acoustic signature. Analysis of each target signature included consideration of magnetic and sonar signature characteristics previously demonstrated to be reliable indicators of historically significant submerged cultural resources. Assessment of each target includes avoidance options and possible adjustments to avoid potential cultural resources. Where avoidance is not possible the assessment will include recommendations for additional investigation to determine the exact nature of the cultural material generating the signature and its potential NRHP significance. A magnetic contour map of the survey area was produced to aid in the analysis of each target.

**Magnetometer Data**

Line-by-line analysis of magnetometer data identified 202 anomalies (Figure 11; Appendix A). The majority of those, 150 anomalies, are associated with small and moderate ferrous objects. Those signatures can reliably be identified as debris. Signatures identified as debris can be associated with material such as crab traps, iron pipe, small vessel anchors, chain, pilings with ferrous hardware, cable, and wire rope.

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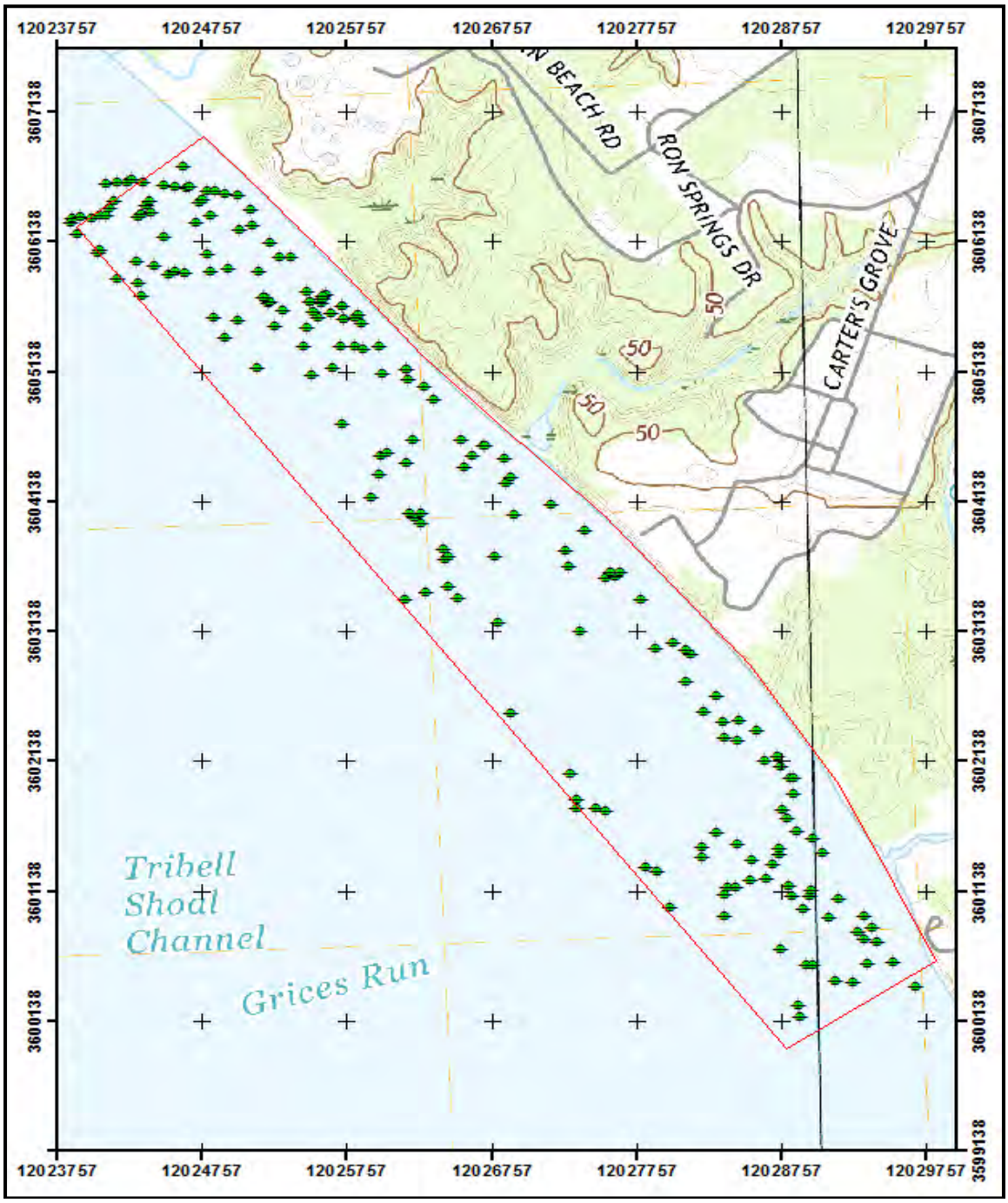


**Figure 11. Distribution of magnetic anomalies in the survey area.**

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For analysis and reporting, the survey area was divided into four sections (Figure 12). Each section illustrates the anomalies and magnetic contours over the background of the James River NOAA Chart #12248-1. Section 1 (Figure 13) illustrates the north end of the survey area. Discharge pipe lines in the north extending into the river from the sewage treatment plant produced 27 of the largest anomalies.

Thirteen additional anomalies are associated with the historic "Grove Whf" structure identified on nineteenth-century navigation charts and maps. Proposed breakwater structures are also illustrated. Remains of the "Grove Whf" are buffered for avoidance (Figure 13). Coordinates for the buffer are presented in Table 2.

| Point | Northing | Easting |
|---|---|---|
| A | 12025047.4 | 3605775.5 |
| B | 12025221.9 | 3605890.1 |
| C | 12025570.1 | 3605905.7 |
| D | 12025570.1 | 3606107.1 |
| E | 12025649.9 | 3606005.6 |
| F | 12025438.1 | 3605811.1 |
| G | 12025428.5 | 3605637.5 |
| H | 12025255.8 | 3605509.9 |

**Table 2. Avoidance buffer coordinates.**

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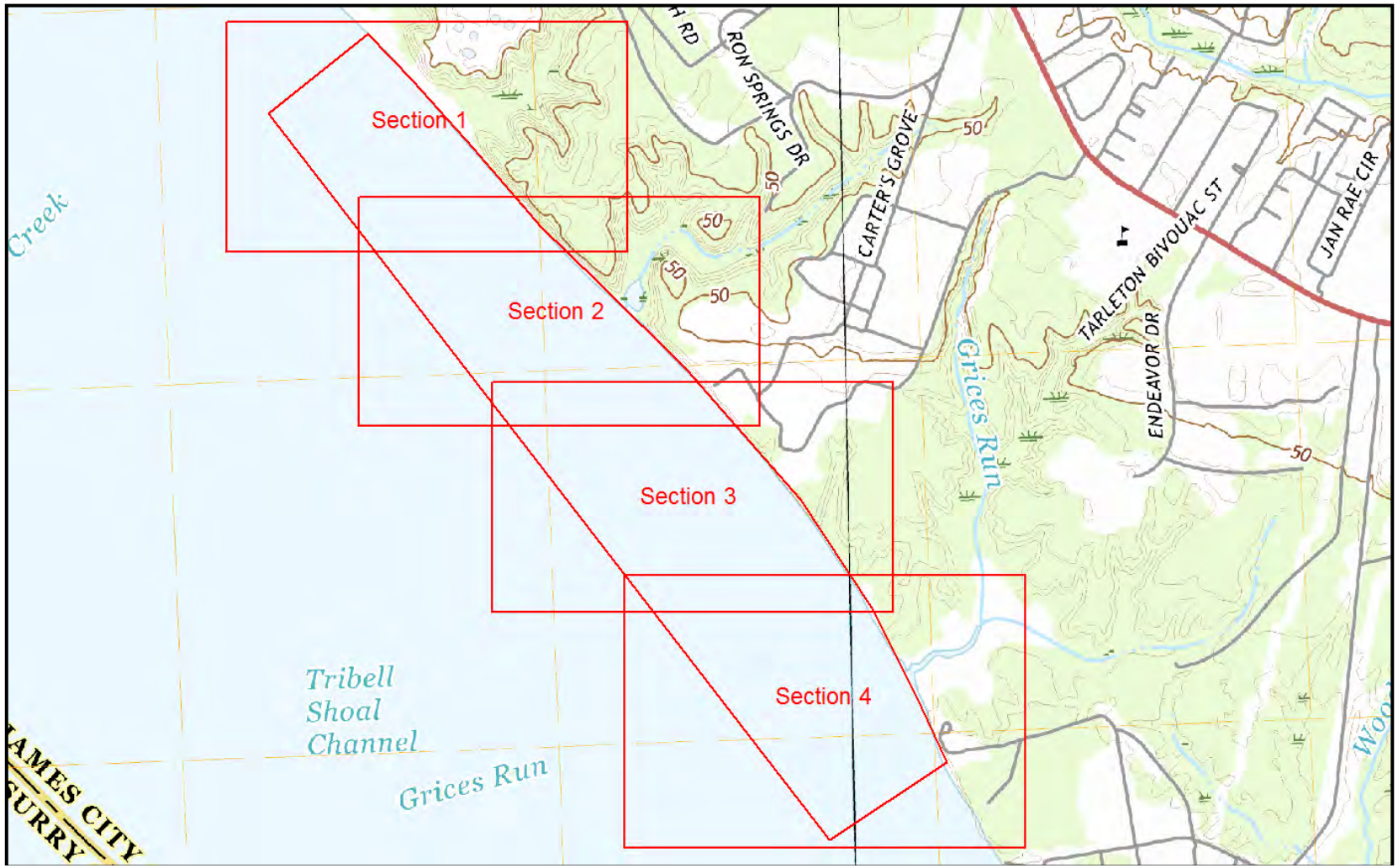


**Figure 12. Detailed map sections.**

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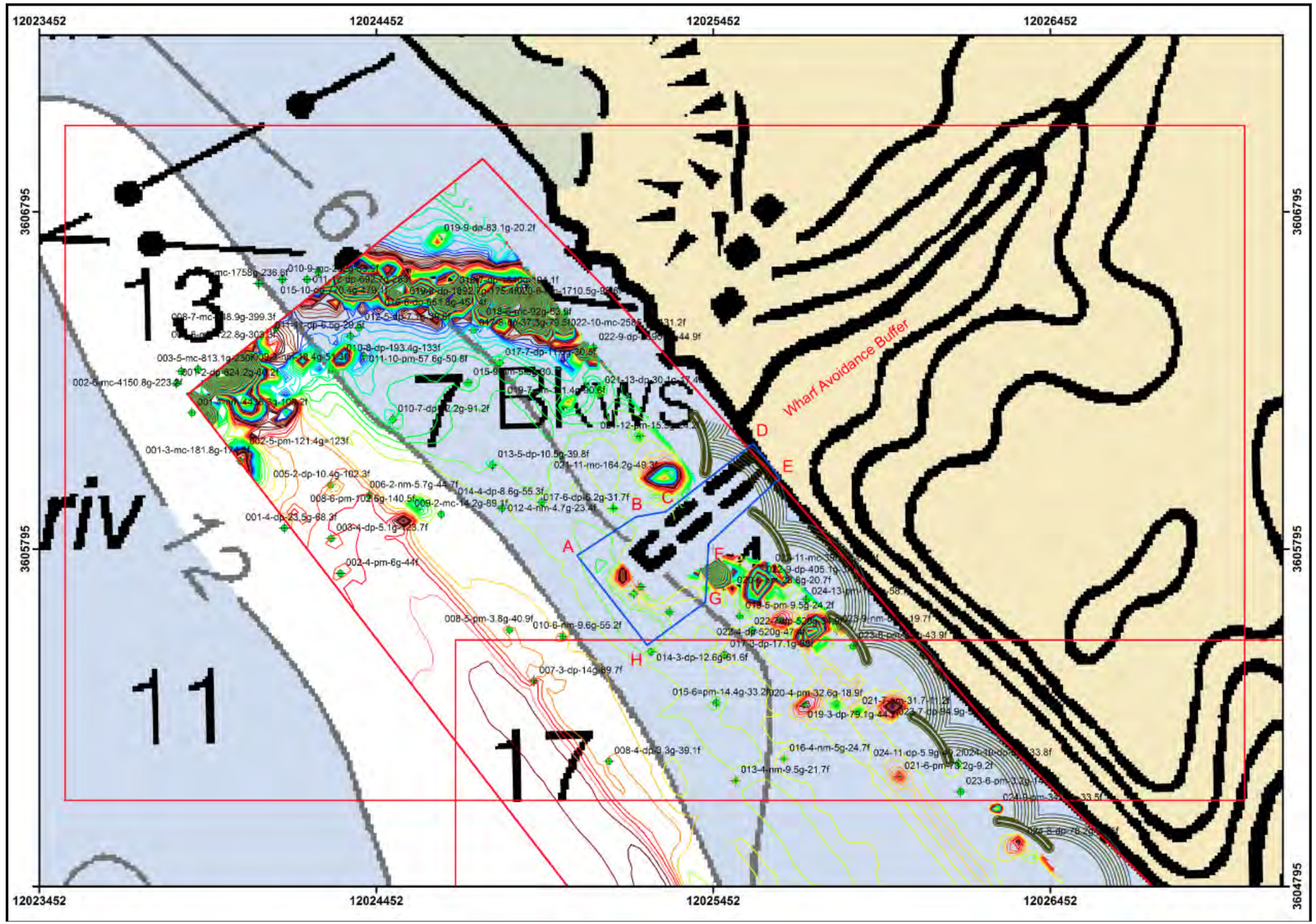


**Figure 13. Section 1 illustrating magnetic anomalies, contours, the "Grove Whf" buffer, and proposed breakwater structures.**

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The "Grove Whf" structure is represented on a map of the Yorktown and Williamsburg area prepared for Major General George Brinton McClellan's Peninsula Campaign of 1862 under the direction of Brigadier General and Chief of Topographic Engineers A. A. Humphreys (Figure 14). The 1877 U.S. Coast Survey chart of the James River shows the wharf at Carter's Grove and also depicts pilings to the south (Figure 15). Remains of "Grove Whf" are buffered for avoidance as the surviving structure and associated debris appear to qualify for NRHP eligibility.

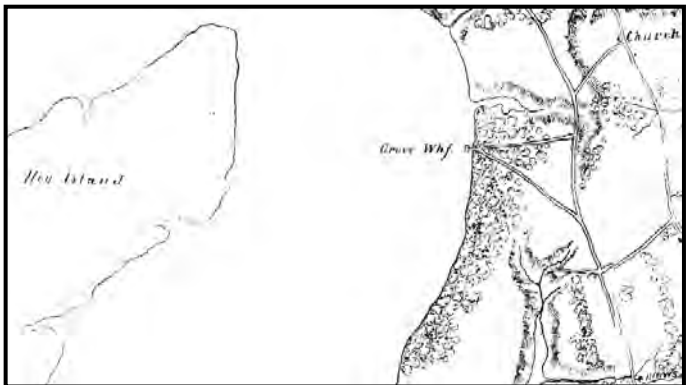


**Figure 14. Detail of 1862 McClellan map showing "Grove Whf.".**

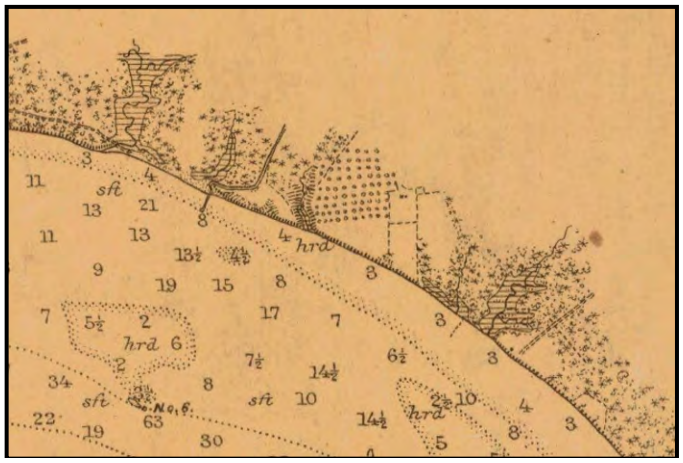


**Figure 15. Detail of 1877 James River U.S. Coast Survey Chart No. 2.**

Section 2 (Figure 16) illustrates additional anomalies and magnetic contours. All of the anomalies represent debris. Section 3 (Figure 17) also illustrates anomalies and the associated magnetic contours. All of those anomalies represent debris. The majority of anomalies in Section 3 and Section 4 are located offshore of the proposed breakwaters and none are recommended for avoidance. Construction for the proposed breakwaters in Sections 2, 3, and 4 will not impact potentially significant submerged cultural resources.

In Section 4 (Figure 18), almost all magnetic anomalies appear to be associated with small ferrous objects that represent debris. The majority are located offshore of proposed breakwaters and none are recommended for avoidance. The exceptions are 12 anomalies in the south that are associated with charted pilings and pipelines.

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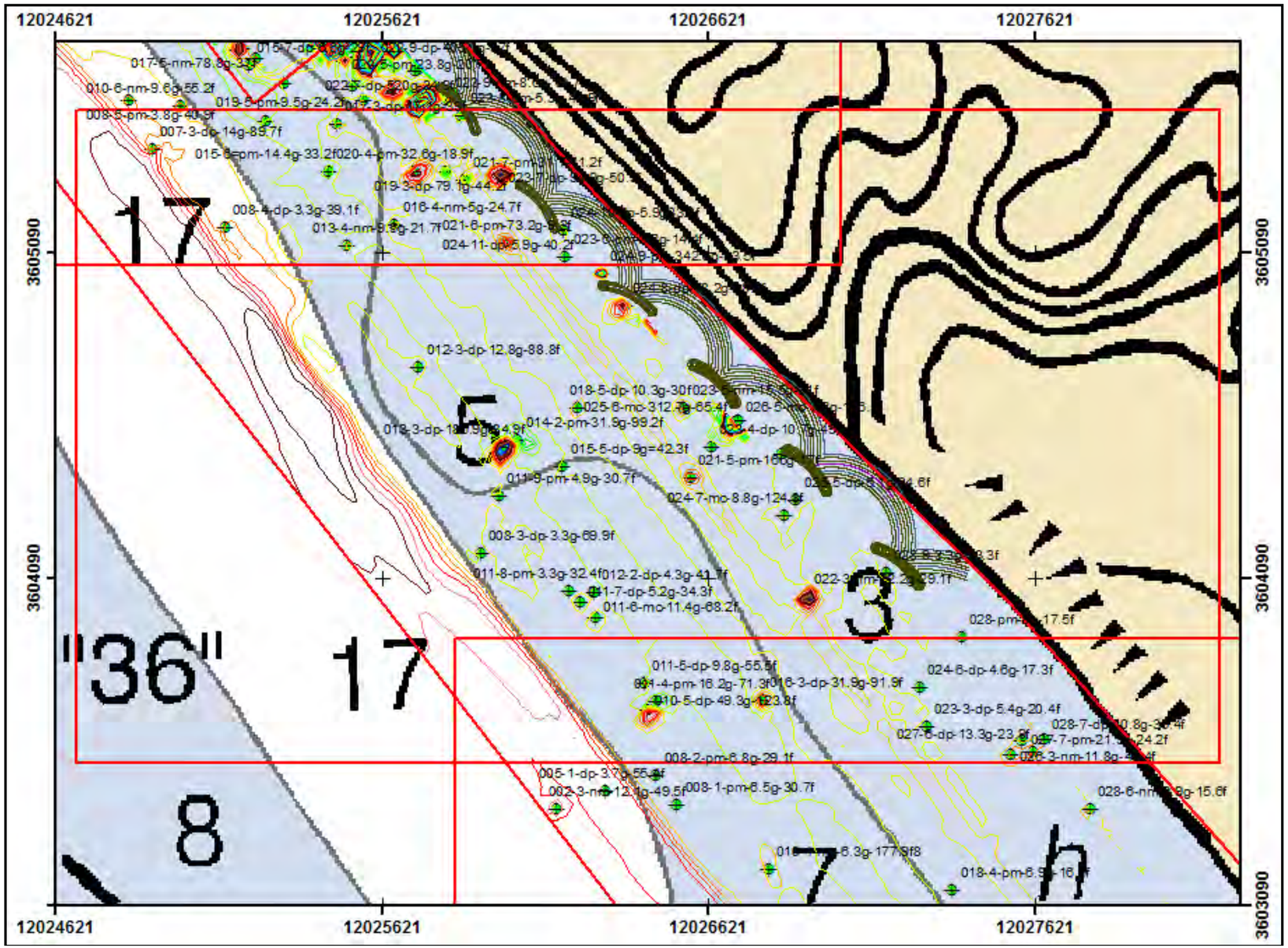


**Figure 16. Section 2 illustrating anomalies, contours, and proposed breakwater structures.**

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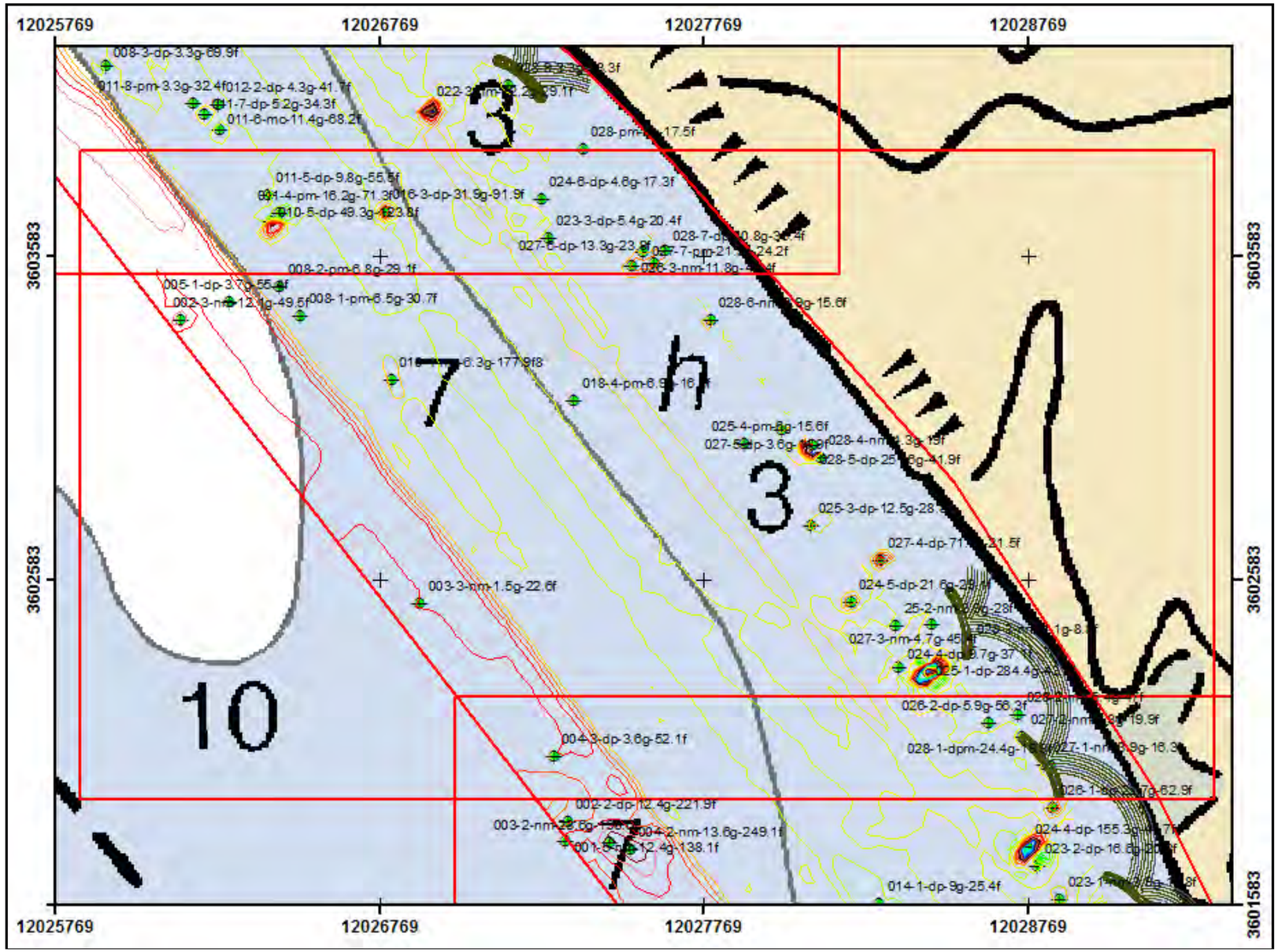


**Figure 17. Section 3 illustrating anomalies, contours, and proposed breakwater structures.**

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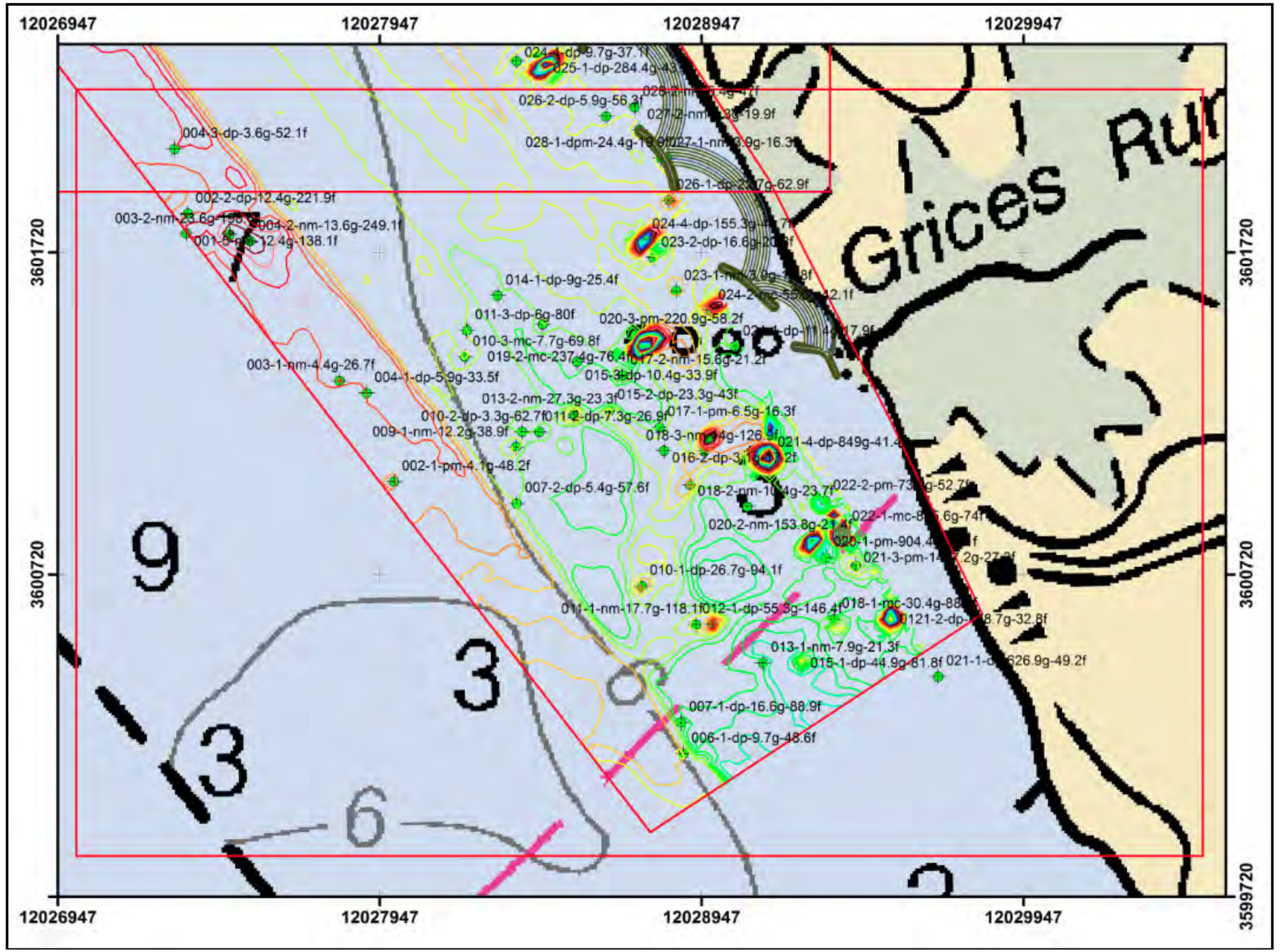


**Figure 18. Section 4 illustrating anomalies, contours, pilings, charted pipeline area and proposed breakwater structures.**

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**Sidescan Sonar Data**

Line-by-line analysis of the sidescan sonar data identified a total of 15 acoustic targets (Figure 19; Appendix B).

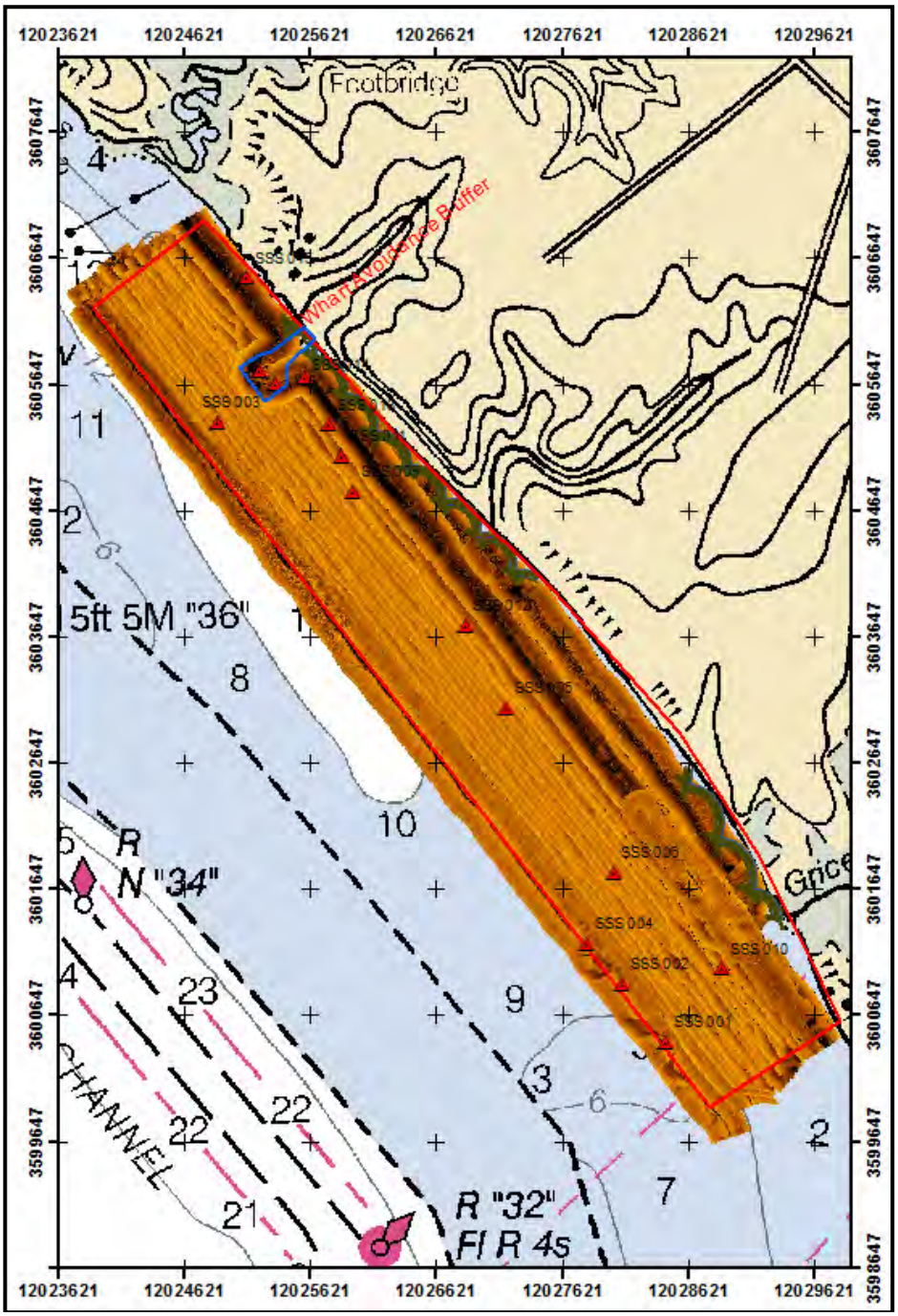


**Figure 19. Carter's Grove survey area sonar coverage mosaic and acoustic targets.**

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The majority of those acoustic targets are associated with small and moderate length linear objects. Those signatures can reliably be identified as debris; such as pilings, poles, logs and/or tree trunks. One of the target images (Figure 20) is associated with the "Grove Whf" structure and a cluster of poles or pilings in the immediate vicinity of that structure.

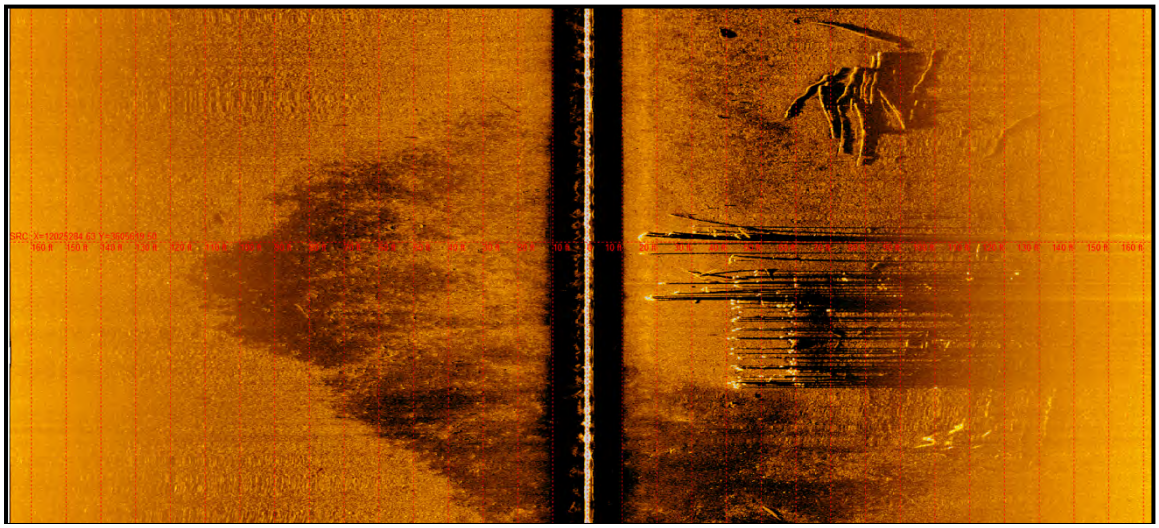

**Figure 20. Sonar image of the "Grove Whf." structure and log or piling cluster on bottom.**

**Sub-bottom Profiler Data Analysis**

Line-by-line analysis of the sub-bottom profiler data confirmed that the majority of the survey area was featureless (Figure 21).

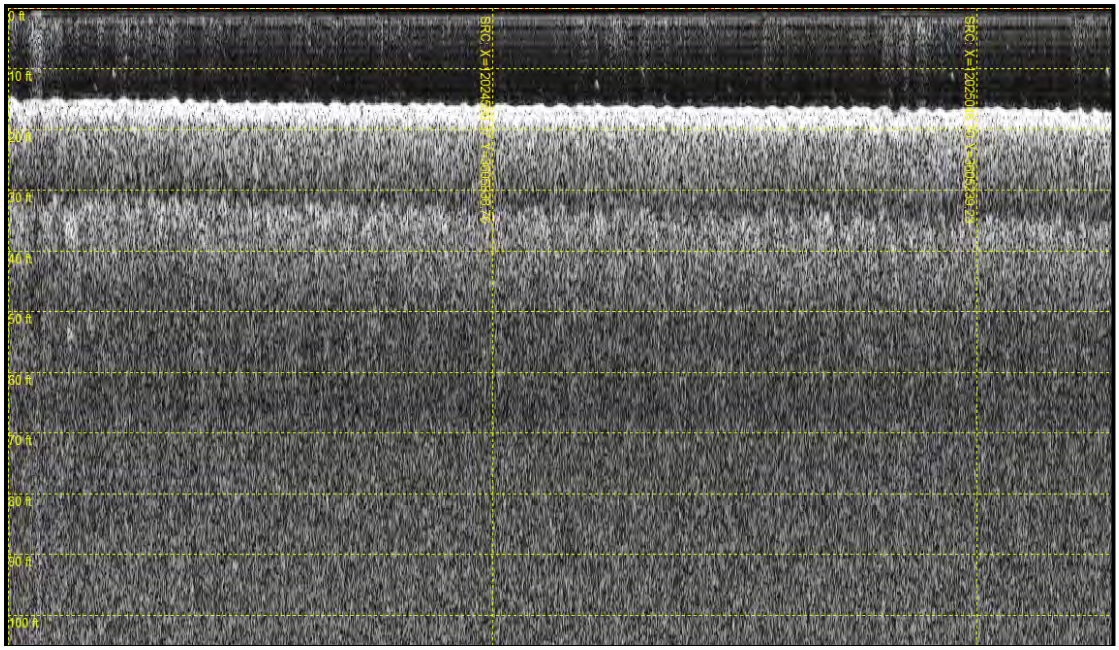

**Figure 21. Sub-bottom profiler data image example of featureless area.**

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The only exceptions were in the southern extremity of the survey area (Figure 22). Feature SBP 20-2 appears to be associated with a relict channel northwest of Grices Run (Figure 23). A second feature possibly resembling infilling with organic debris or dense material forming a cap on infilling (Figure 24). SBP 12-2 lies offshore and west of Grices Run and could be associated with that terrestrial feature.

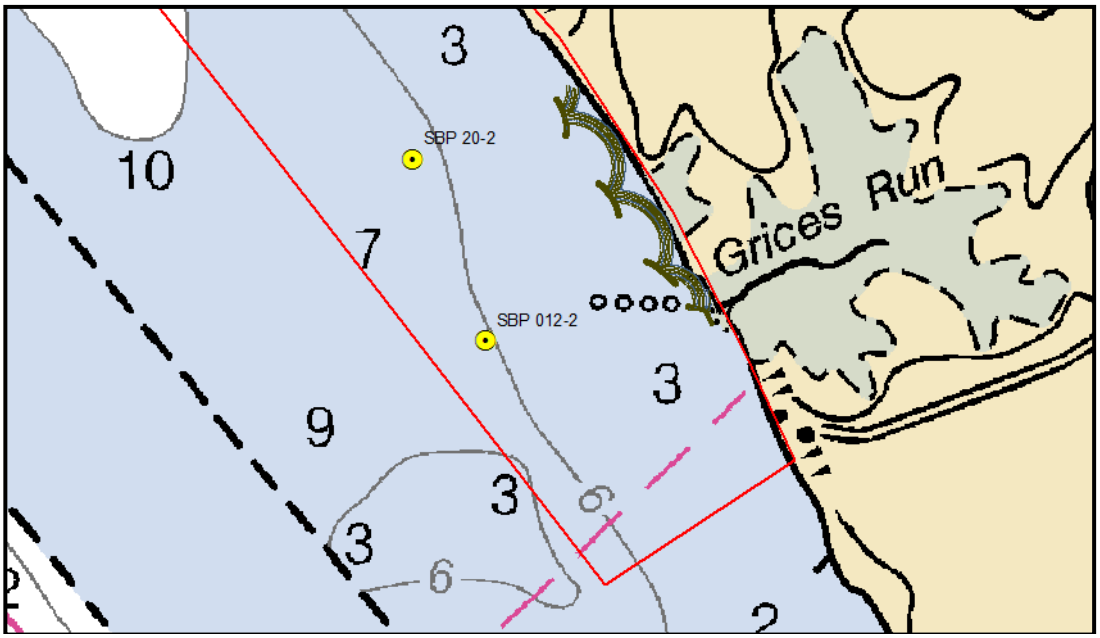


**Figure 22. Sub-bottom feature locations**.

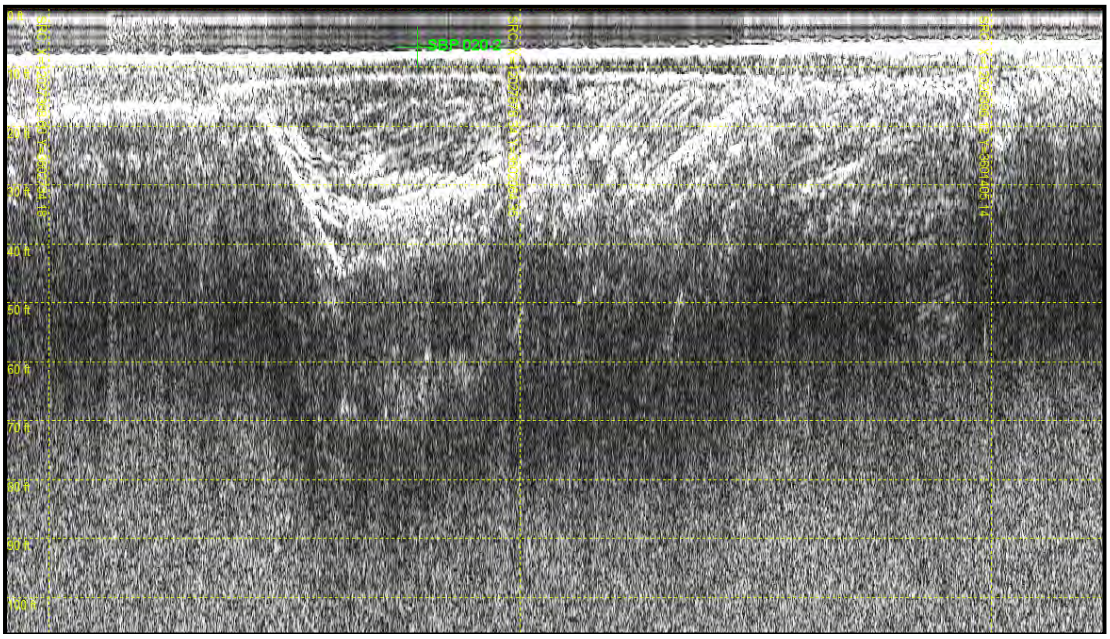

**Figure 23. Sub-bottom profiler data image of SBP 20-2, possible relict channel.**

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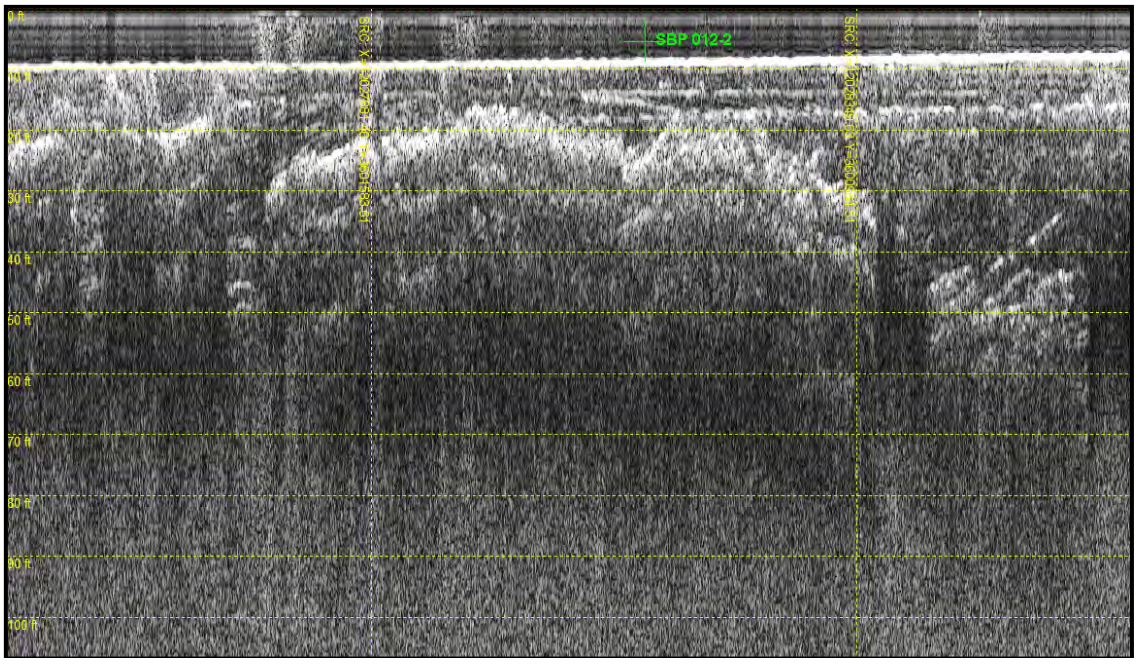


**Figure 24. Sub-bottom profiler data image of feature representing infilling with organic debris or dense material cap.**

**Conclusions and Recommendations**

The James River represents what is likely Virginia's most historic waterway and Carter's Grove embodies one of the Commonwealth's most important plantations. The main dwelling was built in the mid-eighteenth century by Robert "King" Carter. In addition, Carter's Grove is the archaeological site of Wolstenholme Town. Established in 1691, the Colonial village was destroyed during a 1622 Indian attack.

Only one site in the Carter's Grove survey area is recommended for additional consideration. That site is the remains of the wharf structure. Analysis of the remote-sensing data and low-tide visual evidence confirms that elements of the "Grove Whf" structure survive at the site. The "Grove Whf" identified on the aforementioned 1862 Union army map could have been constructed and been in use much earlier in conjunction with an historical association with Carter's Grove.

Structural remains of the "Grove Whf" contains design and construction features of the wharf that existed in the nineteenth and twentieth centuries. In addition, more subtle features of earlier eighteenth-century and possibly seventeenth-century wharves could also survive. Due to the association with Carter's Grove and potential NRHP eligibility, the wharf site is buffered for avoidance. If avoidance is possible, no additional investigation is recommended. If avoidance is not possible, Phase II archaeological diver investigation designed to support NRHP eligibility and mitigation options is recommended.

No additional investigation of the remaining magnetic anomalies, acoustic sonar targets, and sub-bottom features is recommended in conjunction with the shoreline stabilization plan as proposed.

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**Appendix A: Carter's Grove Magnetic Anomaly Table**

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Carter's Grove Magnetic Anomaly Table

| Anomaly | X Coordinate | Y Coordinate | Line# | Anomaly # | Signature | Intensity | Duration | Identification | Assessment |
|---|---|---|---|---|---|---|---|---|---|
| 001-1-nm-4438.3g-109.2f | 12023905.2 | 3606198.8 | 1 | 1 | Negative Monopolar | 4438.3g | 109.2f | Large Ferrous Object | Sewer Pipeline |
| 001-2-dp-824.2g-60.2f | 12023859.2 | 3606286.3 | 1 | 2 | Dipolar | 824.2g | 60.2f | Large Ferrous Object | Sewer Pipeline |
| 001-3-mc-181.8g-174.8f | 12024049.5 | 3606055.8 | 1 | 3 | Multicomponent | 181.8g | 174.8f | Moderate Ferrous Object | Debris |
| 001-4-dp-23.5g-68.3f | 12024179.2 | 3605857.4 | 1 | 4 | Dipolar | 23.5g | 68.3f | Small Ferrous Object | Debris |
| 001-5-nm-12.4g-138.1f | 12027345.6 | 3601779.8 | 1 | 5 | Negative Monopolar | 12.4g | 138.1f | Small Ferrous Object | Debris |
| 002-1-pm-4.1g-48.2f | 12027991.8 | 3601008.9 | 2 | 1 | Positive Monopolar | 4.1g | 48.2f | Small Ferrous Object | Debris |
| 002-2-dp-12.4g-221.9f | 12027351 | 3601840.9 | 2 | 2 | Dipolar | 12.4g | 221.9f | Moderate Ferrous Object | Debris |
| 002-3-nm-12.1g-49.5f | 12026157.5 | 3603386.3 | 2 | 3 | Negative Monopolar | 12.1g | 49.5f | Small Ferrous Object | Debris |
| 002-4-pm-6g-44f | 12024345.7 | 3605723.2 | 2 | 4 | Positive Monopolar | 6g | 44f | Small Ferrous Object | Debris |
| 002-5-pm-121.4g-123f | 12024059.4 | 3606083 | 2 | 5 | Positive Monopolar | 121.4g | 123f | Moderate Ferrous Object | Debris |
| 002-6-mc-4150.8g-223.2f | 12023873.1 | 3606321.4 | 2 | 6 | Multicomponent | 4150.8g | 223.2f | Large Ferrous Object | Sewer Pipeline |
| 003-1-nm-4.4g-26.7f | 12027822.6 | 3601322.2 | 3 | 1 | Negative Monopolar | 4.4g | 26.7f | Small Ferrous Object | Debris |
| 003-2-nm-23.6g-198.6f | 12027480.8 | 3601776.4 | 3 | 2 | Negative Monopolar | 23.6g | 198.6f | Moderate Ferrous Object | Debris |
| 003-3-nm-1.5g-22.6f | 12026895.6 | 3602512.7 | 3 | 3 | Negative Monopolar | 1.5g | 22.6f | Small Ferrous Object | Debris |
| 003-4-dp-5.1g-123.7f | 12024317.9 | 3605826.5 | 3 | 4 | Dipolar | 5.1g | 123.7f | Small Ferrous Object | Debris |
| 003-5-mc-813.1g-230f | 12023922.8 | 3606328.1 | 3 | 5 | Multicomponent | 813.1g | 230f | Large Ferrous Object | Sewer Pipeline |
| 004-1-dp-5.9g-33.5f | 12027906.6 | 3601283.7 | 4 | 1 | Dipolar | 5.9g | 33.5f | Small Ferrous Object | Debris |
| 004-2-nm-13.6g-249.1f | 12027545.1 | 3601755.1 | 4 | 2 | Negative Monopolar | 13.6g | 249.1f | Moderate Ferrous Object | Debris |
| 004-3-dp-3.6g-52.1f | 12027310.1 | 3602041.6 | 4 | 3 | Dipolar | 3.6g | 52.1f | Small Ferrous Object | Debris |
| 004-4-mc-5496.8g-253.7f | 12024005.2 | 3606322.1 | 4 | 4 | Multicomponent | 5496.8g | 253.7f | Large Ferrous Object | Sewer Pipeline |
| 005-1-dp-3.7g-55.4f | 12026308.2 | 3603442.5 | 5 | 1 | Dipolar | 3.7g | 55.4f | Small Ferrous Object | Debris |
| 005-2-dp-10.4g-102.3f | 12024316.4 | 3605985.1 | 5 | 2 | Dipolar | 10.4g | 102.3f | Small Ferrous Object | Debris |
| 005-3-mc-2017.3g-242.1f | 12024059.1 | 3606340.5 | 5 | 3 | Multicomponent | 2017.3g | 242.1f | Large Ferrous Object | Sewer Pipeline |
| 006-1-dp-9.7g-48.6f | 12028890.7 | 3600164.3 | 6 | 1 | Dipolar | 9.7g | 48.6f | Small Ferrous Object | Debris |
| 006-2-nm-5.7g-44.7f | 12024430.9 | 3605954 | 6 | 2 | Negative Monopolar | 5.7g | 44.7f | Small Ferrous Object | Debris |
| 006-3-mc-348.4g-385.3f | 12024104.5 | 3606343.3 | 6 | 3 | Multicomponent | 348.4g | 385.3f | Large Ferrous Object | Sewer Pipeline |
| 007-1-dp-16.6g-88.9f | 12028884 | 3600261.5 | 7 | 1 | Dipolar | 16.6g | 88.9f | Small Ferrous Object | Debris |
| 007-2-dp-5.4g-57.6f | 12028372.9 | 3600941 | 7 | 2 | Dipolar | 5.4g | 57.6f | Small Ferrous Object | Debris |
| 007-3-dp-14g-89.7f | 12024919.6 | 3605404 | 7 | 3 | Dipolar | 14g | 89.7f | Small Ferrous Object | Debris |
| 007-4-nm-59.6g-104.3f | 12024538.4 | 3605887.4 | 7 | 4 | Negative Monopolar | 59.6g | 104.3f | Moderate Ferrous Object | Debris |
| 007-5-mc-122.8g-303.3f | 12024127.1 | 3606398.1 | 7 | 5 | Multicomponent | 122.8g | 303.3f | Large Ferrous Object | Sewer Pipeline |
| 008-1-pm-6.5g-30.7f | 12026527.9 | 3603397.4 | 8 | 1 | Positive Monopolar | 6.5g | 30.7f | Small Ferrous Object | Debris |
| 008-2-pm-6.8g-29.1f | 12026462.9 | 3603486.2 | 8 | 2 | Positive Monopolar | 6.8g | 29.1f | Small Ferrous Object | Debris |
| 008-3-dp-3.3g-69.9f | 12025925.8 | 3604170.4 | 8 | 3 | Dipolar | 3.3g | 69.9f | Small Ferrous Object | Debris |
| 008-4-dp-3.3g-39.1f | 12025142.3 | 3605165.8 | 8 | 4 | Dipolar | 3.3g | 39.1f | Small Ferrous Object | Debris |
| 008-5-pm-3.8g-40.9f | 12024847.3 | 3605556.2 | 8 | 5 | Positive Monopolar | 3.8g | 40.9f | Small Ferrous Object | Debris |
| 008-6-pm-102.6g-140.5f | 12024573.7 | 3605912.4 | 8 | 6 | Positive Monopolar | 102.6g | 140.5f | Moderate Ferrous Object | Debris |
| 008-7-mc-248.9g-399.3f | 12024153.7 | 3606450.3 | 8 | 7 | Multicomponent | 248.9g | 399.3f | Large Ferrous Object | Sewer Pipeline |
| 009-1-nm-12.2g-38.9f | 12028371.4 | 3601116.8 | 9 | 1 | Negative Monopolar | 12.2g | 38.9f | Small Ferrous Object | Debris |
| 009-2-mc-14.2g-89.1f | 12024644.7 | 3605898.5 | 9 | 2 | Multicomponent | 14.2g | 89.1f | Small Ferrous Object | Debris |
| 009-3-nm-18.4g-51.3f | 12024323 | 3606332.7 | 9 | 3 | Negative Monopolar | 18.4g | 51.3f | Small Ferrous Object | Debris |
| 009-4-mc-1758g-236.6f | 12024103.2 | 3606582.4 | 9 | 4 | Multicomponent | 1758g | 236.6f | Large Ferrous Object | Sewer Pipeline |
| 010-1-dp-26.7g-94.1f | 12028762 | 3600685 | 10 | 1 | Dipolar | 26.7g | 94.1f | Small Ferrous Object | Debris |
| 010-2-dp-3.3g-62.7f | 12028389.4 | 3601163.1 | 10 | 2 | Dipolar | 3.3g | 62.7f | Small Ferrous Object | Debris |
| 010-3-mc-7.7g-69.8f | 12028211.9 | 3601396.1 | 10 | 3 | Multicomponent | 7.7g | 69.8f | Small Ferrous Object | Debris |
| 010-4-nm-6.3g-177.9f | 12026807 | 3603201.8 | 10 | 4 | Negative Monopolar | 6.3g | 177.9f | Small Ferrous Object | Debris |
| 010-5-dp-49.3g-123.8f | 12026436.6 | 3603690.2 | 10 | 5 | Dipolar | 49.3g | 123.8f | Moderate Ferrous Object | Debris |
| 010-6-nm-9.6g-55.2f | 12025005.5 | 3605536.7 | 10 | 6 | Negative Monopolar | 9.6g | 55.2f | Small Ferrous Object | Debris |
| 010-7-dp-12.2g-91.2f | 12024500.4 | 3606179.2 | 10 | 7 | Dipolar | 12.2g | 91.2f | Small Ferrous Object | Debris |
| 010-8-dp-193.4g-133f | 12024347.3 | 3606358.8 | 10 | 8 | Dipolar | 193.4g | 133f | Large Ferrous Object | Sewer Pipeline |
| 010-9-mc-232g-63.9f | 12024173.3 | 3606594.5 | 10 | 9 | Multicomponent | 232g | 63.9f | Large Ferrous Object | Sewer Pipeline |
| 011-10-pm-57.6g-50.8f | 12024414 | 3606368.1 | 11 | 10 | Positive Monopolar | 57.6g | 50.8f | Small Ferrous Object | Sewer Pipeline |
| 011-11-dp-6.5g-29.5f | 12024375.1 | 3606426.7 | 11 | 11 | Dipolar | 6.5g | 29.5f | Small Ferrous Object | Sewer Pipeline |
| 011-12-dp-692.7g-283f | 12024246.6 | 3606594.4 | 11 | 12 | Dipolar | 692.7g | 283f | Large Ferrous Object | Sewer Pipeline |
| 011-1-nm-17.7g-118.1f | 12028929.3 | 3600565 | 11 | 1 | Negative Monopolar | 17.7g | 118.1f | Small Ferrous Object | Debris |
| 011-2-dp-7.3g-26.9f | 12028443 | 3601162.7 | 11 | 2 | Dipolar | 7.3g | 26.9f | Small Ferrous Object | Debris |
| 011-3-dp-6g-80f | 12028218.3 | 3601478.2 | 11 | 3 | Dipolar | 6g | 80f | Small Ferrous Object | Debris |
| 011-4-pm-16.2g-71.3f | 12026460.5 | 3603713.4 | 11 | 4 | Positive Monopolar | 16.2g | 71.3f | Small Ferrous Object | Debris |
| 011-5-dp-9.8g-55.5f | 12026426.8 | 3603769.6 | 11 | 5 | Dipolar | 9.8g | 55.5f | Small Ferrous Object | Debris |
| 011-6-mc-11.4g-68.2f | 12026277.6 | 3603972.7 | 11 | 6 | Multicomponent | 11.4g | 68.2f | Small Ferrous Object | Debris |
| 011-7-dp-5.2g-34.3f | 12026229.5 | 3604020.4 | 11 | 7 | Dipolar | 5.2g | 34.3f | Small Ferrous Object | Debris |
| 011-8-pm-3.3g-32.4f | 12026198.2 | 3604051.7 | 11 | 8 | Positive Monopolar | 3.3g | 32.4f | Small Ferrous Object | Debris |
| 011-9-pm-4.9g-30.7f | 12025981.2 | 3604342.9 | 11 | 9 | Positive Monopolar | 4.9g | 30.7f | Small Ferrous Object | Debris |
| 012-1-dp-55.3g-146.4f | 12028981.5 | 3600566 | 12 | 1 | Dipolar | 55.3g | 146.4f | Moderate Ferrous Object | Sewer Pipeline |
| 012-2-dp-4.3g-41.7f | 12026272.9 | 3604047.8 | 12 | 2 | Dipolar | 4.3g | 41.7f | Small Ferrous Object | Debris |
| 012-3-dp-12.8g-88.8f | 12025736 | 3604737.9 | 12 | 3 | Dipolar | 12.8g | 88.8f | Small Ferrous Object | Debris |
| 012-4-nm-4.7g-23.4f | 12024825.3 | 3605916.5 | 12 | 4 | Negative Monopolar | 4.7g | 23.4f | Small Ferrous Object | Debris |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 012-5-dp-7.1g-39.6f | 12024400.8 | 3606451.2 | 12 | 5 | Dipolar | 7.1g | 39.6f | Small Ferrous Object | Debris |
| 012-6-mc-928.5g-213.5f | 12024280.1 | 3606615.6 | 12 | 6 | Multicomponent | 928.5g | 213.5f | Large Ferrous Object | Sewer Pipeline |
| 013-1-nm-7.9g-21.3f | 12029138.6 | 3600446.1 | 13 | 1 | Negative Monopolar | 7.9g | 21.3f | Small Ferrous Object | Debris |
| 013-2-nm-27.3g-23.3f | 12028551.4 | 3601217.1 | 13 | 2 | Negative Monopolar | 27.3g | 23.3f | Small Ferrous Object | Debris |
| 013-3-dp-186.9g-84.9f | 12025991.6 | 3604495.6 | 13 | 3 | Dipolar | 186.9g | 84.9f | Moderate Ferrous Object | Debris |
| 013-4-nm-9.5g-21.7f | 12025517.9 | 3605108.9 | 13 | 4 | Negative Monopolar | 9.5g | 21.7f | Small Ferrous Object | Debris |
| 013-5-dp-10.5g-39.8f | 12024796.7 | 3606043.9 | 13 | 5 | Dipolar | 10.5g | 39.8f | Small Ferrous Object | Debris |
| 013-6-dp-1244.6g-317.2f | 12024355.3 | 3606599.6 | 13 | 6 | Dipolar | 1244.6g | 317.2f | Large Ferrous Object | Sewer Pipeline |
| 014-1-dp-9g-25.4f | 12028313.8 | 3601586.1 | 14 | 1 | Dipolar | 9g | 25.4f | Small Ferrous Object | Debris |
| 014-2-pm-31.9g-99.2f | 12026039.7 | 3604514.1 | 14 | 2 | Positive Monopolar | 31.9g | 99.2f | Small Ferrous Object | Debris |
| 014-3-dp-12.6g-61.6f | 12025267 | 3605491.1 | 14 | 3 | Dipolar | 12.6g | 61.6f | Small Ferrous Object | Debris |
| 014-4-dp-8.6g-55.3f | 12024942.9 | 3605933.6 | 14 | 4 | Dipolar | 8.6g | 55.3f | Small Ferrous Object | Debris |
| 015-10-dp-770.4g-479.1f | 12024502.2 | 3606573.9 | 15 | 10 | Dipolar | 770.4g | 479.1f | Large Ferrous Object | Sewer Pipeline |
| 015-1-dp-44.9g-81.8f | 12029260.4 | 3600439.6 | 15 | 1 | Dipolar | 44.9g | 81.8f | Small Ferrous Object | Debris |
| 015-2-dp-23.3g-43f | 12028661 | 3601230 | 15 | 2 | Dipolar | 23.3g | 43f | Small Ferrous Object | Debris |
| 015-3-dp-10.4g-33.9f | 12028560.8 | 3601381 | 15 | 3 | Dipolar | 10.4g | 33.9f | Small Ferrous Object | Debris |
| 015-4-dp-19.7g-35.8f | 12028453.5 | 3601497 | 15 | 4 | Dipolar | 19.7g | 35.8f | Small Ferrous Object | Debris |
| 015-5-dp-9g-42.3f | 12026176.5 | 3604432.6 | 15 | 5 | Dipolar | 9g | 42.3f | Small Ferrous Object | Debris |
| 015-6-pm-14.4g-33.2f | 12025460.4 | 3605339.4 | 15 | 6 | Positive Monopolar | 14.4g | 33.2f | Small Ferrous Object | Debris |
| 015-7-dp-6.6g-29f | 12025215.4 | 3605662.8 | 15 | 7 | Dipolar | 6.6g | 29f | Small Ferrous Object | Historic Wharf |
| 015-8-nm-12g-34.5f | 12025183.7 | 3605709.7 | 15 | 8 | Negative Monopolar | 12g | 34.5f | Small Ferrous Object | Historic Wharf |
| 015-9-pm-5.3g-30.1f | 12024724.3 | 3606288.2 | 15 | 9 | Positive Monopolar | 5.3g | 30.1f | Small Ferrous Object | Debris |
| 016-1-dp-29.1g-114.4f | 12028911.7 | 3600999.1 | 16 | 1 | Dipolar | 29.1g | 114.4f | Small Ferrous Object | Debris |
| 016-2-dp-3.1g-17.2f | 12028831.1 | 3601104.9 | 16 | 2 | Dipolar | 3.1g | 17.2f | Small Ferrous Object | Debris |
| 016-3-dp-31.9g-91.9f | 12026788.7 | 3603719 | 16 | 3 | Dipolar | 31.9g | 91.9f | Small Ferrous Object | Debris |
| 016-4-nm-5g-24.7f | 12025661.9 | 3605173.6 | 16 | 4 | Negative Monopolar | 5g | 24.7f | Small Ferrous Object | Debris |
| 016-5-mc-77.9g-159.1f | 12025236 | 3605683.3 | 16 | 5 | Multicomponent | 77.9g | 159.1f | Moderate Ferrous Object | Historic Wharf |
| 016-6-dp-651.8g-451.4f | 12024581.6 | 3606559.8 | 16 | 6 | Dipolar | 651.8g | 451.4f | Large Ferrous Object | Sewer Pipeline |
| 017-1-pm-6.5g-16.3f | 12028817.2 | 3601177.1 | 17 | 1 | Positive Monopolar | 6.5g | 16.3f | Small Ferrous Object | Debris |
| 017-2-nm-15.6g-21.2f | 12028701.1 | 3601338.8 | 17 | 2 | Negative Monopolar | 15.6g | 21.2f | Small Ferrous Object | Pilings |
| 017-3-dp-17.1g-39f | 12025485.8 | 3605482.4 | 17 | 3 | Dipolar | 17.1g | 39f | Small Ferrous Object | Debris |
| 017-4-dp-58.3g-24.9f | 12025322.1 | 3605608.4 | 17 | 4 | Dipolar | 58.3g | 24.9f | Small Ferrous Object | Historic Wharf |
| 017-5-nm-78.8g-37f | 12025196.2 | 3605713.5 | 17 | 5 | Negative Monopolar | 78.8g | 37f | Small Ferrous Object | Historic Wharf |
| 017-6-dp-6.2g-31.7f | 12025155.6 | 3605916.2 | 17 | 6 | Dipolar | 6.2g | 31.7f | Small Ferrous Object | Debris |
| 017-7-dp-11.6g-30.5f | 12024818.5 | 3606346.8 | 17 | 7 | Dipolar | 11.6g | 30.5f | Small Ferrous Object | Debris |
| 017-8-dp-37.3g-79.5f | 12024740.4 | 3606443.7 | 17 | 8 | Dipolar | 37.3g | 79.5f | Small Ferrous Object | Debris |
| 017-9-dp-1642.1g-189.1f | 12024651.1 | 3606550.2 | 17 | 9 | Dipolar | 1642.1g | 189.1f | Large Ferrous Object | Sewer Pipeline |
| 018-1-mc-30.4g-88.7f | 12029358.2 | 3600581.8 | 18 | 1 | Multicomponent | 30.4g | 88.7f | Small Ferrous Object | Debris |
| 018-2-pm-10.4g-23.7f | 12029089.4 | 3600930.7 | 18 | 2 | Positive Monopolar | 10.4g | 23.7f | Small Ferrous Object | Debris |
| 018-3-nm-14g-126.9f | 12028955.7 | 3601103.2 | 18 | 3 | Negative Monopolar | 14g | 126.9f | Small Ferrous Object | Debris |
| 018-4-pm-6.9g-16.6f | 12027368.6 | 3603136.5 | 18 | 4 | Positive Monopolar | 6.9g | 16.6f | Small Ferrous Object | Debris |
| 018-5-dp-10.3g-30f | 12026222 | 3604612.7 | 18 | 5 | Dipolar | 10.3g | 30f | Small Ferrous Object | Debris |
| 018-6-mc-92g-53.9f | 12024761.7 | 3606466.3 | 18 | 6 | Multicomponent | 92g | 53.9f | Small Ferrous Object | Debris |
| 018-7-dp-1640g-194.1f | 12024682.1 | 3606559.9 | 18 | 7 | Dipolar | 1640g | 194.1f | Large Ferrous Object | Sewer Pipeline |
| 019-1-nm-51.4g-26.9f | 12028965.8 | 3601142.8 | 19 | 1 | Negative Monopolar | 51.4g | 26.9f | Small Ferrous Object | Debris |
| 019-2-mc-237.4g-76.4f | 12028750.1 | 3601424.3 | 19 | 2 | Multicomponent | 237.4g | 76.4f | Moderate Ferrous Object | Pilings |
| 019-3-dp-79.1g-44.2f | 12025720.5 | 3605337.6 | 19 | 3 | Dipolar | 79.1g | 44.2f | Small Ferrous Object | Debris |
| 019-4-dp-16.5g-53.1f | 12025567.8 | 3605554.6 | 19 | 4 | Dipolar | 16.5g | 53.1f | Small Ferrous Object | Debris |
| 019-5-pm-9.5g-24.2f | 12025531.7 | 3605596.4 | 19 | 5 | Positive Monopolar | 9.5g | 24.2f | Small Ferrous Object | Debris |
| 019-6-nm-27.4g-38.5f | 12025185.1 | 3605708.7 | 19 | 6 | Negative Monopolar | 27.4g | 38.5f | Small Ferrous Object | Historic Wharf |
| 019-7-pm-111.4g-90.6f | 12025017.7 | 3606233.3 | 19 | 7 | Positive Monopolar | 111.4g | 90.6f | Moderate Ferrous Object | Debris |
| 019-8-dp-1892.7g-175.4f | 12024798 | 3606527.6 | 19 | 8 | Dipolar | 1892.7g | 175.4f | Large Ferrous Object | Sewer Pipeline |
| 019-9-dp-83.1g-20.2f | 12024637.4 | 3606715.2 | 19 | 9 | Dipolar | 83.1g | 20.2f | Small Ferrous Object | Debris |
| 020-1-pm-904.4g-34.1f | 12029332.6 | 3600773.2 | 20 | 1 | Positive Monopolar | 904.4g | 34.1f | Large Ferrous Object | Pipeline |
| 020-2-nm-153.8g-21.4f | 12029294.6 | 3600825.9 | 20 | 2 | Negative Monopolar | 153.8g | 21.4f | Moderate Ferrous Object | Pilings |
| 020-3-pm-220.9g-58.2f | 12028746.2 | 3601465 | 20 | 3 | Positive Monopolar | 220.9g | 58.2f | Moderate Ferrous Object | Pilings |
| 020-4-pm-32.6g-18.9f | 12025818.1 | 3605336.4 | 20 | 4 | Positive Monopolar | 32.6g | 18.9f | Small Ferrous Object | Debris |
| 020-5-pm-23.8g-20.7f | 12025506.6 | 3605681.2 | 20 | 5 | Positive Monopolar | 23.8g | 20.7f | Small Ferrous Object | Debris |
| 020-6-nm-1710.5g-98.6f | 12024852.2 | 3606532.5 | 20 | 6 | Negative Monopolar | 1710.5g | 98.6f | Large Ferrous Object | Sewer Pipeline |
| 021-10-dp-94.9g-37.9f | 12025505.2 | 3605683.7 | 21 | 10 | Dipolar | 94.9g | 37.9f | Small Ferrous Object | Historic Wharf |
| 021-11-mc-164.2g-49.3f | 12025302 | 3606024.8 | 21 | 11 | Multicomponent | 164.2g | 49.3f | Moderate Ferrous Object | Historic Wharf |
| 021-12-pm-15.5g-24.2f | 12025234.2 | 3606129.2 | 21 | 12 | Positive Monopolar | 15.5g | 24.2f | Small Ferrous Object | Debris |
| 021-13-dp-30.1g-17.4f | 12025114.4 | 3606264.1 | 21 | 13 | Dipolar | 30.1g | 17.4f | Small Ferrous Object | Debris |
| 021-14-mc-7494.5g-228.8f | 12024918.1 | 3606508.9 | 21 | 14 | Multicomponent | 7494.5g | 228.8f | Large Ferrous Object | Sewer Pipeline |
| 021-1-dp-626.9g-49.2f | 12029683 | 3600403.6 | 21 | 1 | Dipolar | 626.9g | 49.2f | Moderate Ferrous Object | Pipeline |
| 021-2-dp-158.7g-32.8f | 12029537.7 | 3600594.3 | 121 | 2 | Dipolar | 158.7g | 32.8f | Moderate Ferrous Object | Pipeline |
| 021-3-pm-1437.2g-27.3f | 12029425.9 | 3600747.4 | 21 | 3 | Positive Monopolar | 1437.2g | 27.3f | Large Ferrous Object | Pipeline |
| 021-4-dp-849g-41.4f | 12029159 | 3601082.7 | 21 | 4 | Dipolar | 849g | 41.4f | Moderate Ferrous Object | Debris |
| 021-5-pm-166g-17f | 12026569.1 | 3604399.8 | 21 | 5 | Positive Monopolar | 166g | 17f | Small Ferrous Object | Debris |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 021-6-pm-73.2g-9.2f | 12026003.6 | 3605120.5 | 21 | 6 | Positive Monopolar | 73.2g | 9.2f | Small Ferrous Object | Debris |
| 021-7-pm-31.7-11.2f | 12025877.7 | 3605313.3 | 21 | 7 | Positive Monopolar | 31.7 | 11.2f | Small Ferrous Object | Debris |
| 021-8-dp-80.3g-18.3f | 12025649.6 | 3605585.9 | 21 | 8 | Dipolar | 80.3g | 18.3f | Small Ferrous Object | Debris |
| 021-9-nm-261.6g-13.2f | 12025581.7 | 3605671.3 | 21 | 9 | Negative Monopolar | 261.6g | 13.2f | Small Ferrous Object | Debris |
| 022-1-mc-805.6g-74f | 12029390.2 | 3600853 | 22 | 1 | Multicomponent | 805.6g | 74f | Large Ferrous Object | Pipeline |
| 022-2-pm-73.9g-52.7f | 12029331.6 | 3600949.1 | 22 | 2 | Positive Monopolar | 73.9g | 52.7f | Small Ferrous Object | Debris |
| 022-3-nm-72.2g-29.1f | 12026920.1 | 3604034.1 | 22 | 3 | Negative Monopolar | 72.2g | 29.1f | Small Ferrous Object | Debris |
| 022-4-dp-520g-47.4f | 12025741 | 3605549.2 | 22 | 4 | Dipolar | 520g | 47.4f | Moderate Ferrous Object | Debris |
| 022-5-dp-405.1g-42.3f | 12025591.5 | 3605702.9 | 22 | 5 | Dipolar | 405.1g | 42.3f | Moderate Ferrous Object | Historic Wharf |
| 022-6-dp-85.2g-49.2f | 12025378.2 | 3606019.1 | 22 | 6 | Dipolar | 85.2g | 49.2f | Small Ferrous Object | Historic Wharf |
| 022-7-dp-405.1g-37f | 12025594.1 | 3605702.5 | 22 | 9 | Dipolar | 405.1g | 37f | Moderate Ferrous Object | Historic Wharf |
| 022-8-dp-2590.2g-44.9f | 12025096.3 | 3606391.8 | 22 | 9 | Dipolar | 2590.2g | 44.9f | Large Ferrous Object | Sewer Pipeline |
| 022-9-mc-2585.7g-131.2f | 12025012.7 | 3606493.5 | 22 | 10 | Multicomponent | 2585.7g | 131.2f | Large Ferrous Object | Sewer Pipeline |
| 023-10-pm-20.4g-54.5f | 12025734.6 | 3605649.9 | 23 | 10 | Positive Monopolar | 20.4g | 54.5f | Small Ferrous Object | Debris |
| 023-11-mc-396.3g-84.4f | 12025619.9 | 3605736.5 | 23 | 11 | Multicomponent | 396.3g | 84.4f | Moderate Ferrous Object | Historic Wharf |
| 023-12-mc-308.3g-110.1f | 12025490.2 | 3605758.6 | 23 | 12 | Multicomponent | 308.3g | 110.1f | Moderate Ferrous Object | Historic Wharf |
| 023-1-nm-3.9g-15.8f | 12028868.7 | 3601600.6 | 23 | 1 | Negative Monopolar | 3.9g | 15.8f | Small Ferrous Object | Debris |
| 023-2-dp-16.6g-20.8f | 12028797.8 | 3601703.6 | 23 | 2 | Dipolar | 16.6g | 20.8f | Small Ferrous Object | Debris |
| 023-3-dp-5.4g-20.4f | 12027292.6 | 3603639.3 | 23 | 3 | Dipolar | 5.4g | 20.4f | Small Ferrous Object | Debris |
| 023-4-dp-10.7g-45f | 12026632.9 | 3604494.3 | 23 | 4 | Dipolar | 10.7g | 45f | Small Ferrous Object | Debris |
| 023-5-nm-15.5g-31f | 12026549.1 | 3604612.3 | 23 | 5 | Negative Monopolar | 15.5g | 31f | Small Ferrous Object | Debris |
| 023-6-pm-3.2g-14.4f | 12026186 | 3605075.9 | 23 | 6 | Positive Monopolar | 3.2g | 14.4f | Small Ferrous Object | Debris |
| 023-7-dp-94.9g-50.9f | 12025985.3 | 3605329.7 | 23 | 7 | Dipolar | 94.9g | 50.9f | Small Ferrous Object | Debris |
| 023-8-pm-5.3g-43.9f | 12025866.8 | 3605507.5 | 23 | 8 | Positive Monopolar | 5.3g | 43.9f | Small Ferrous Object | Debris |
| 023-9-nm-8.6g-19.7f | 12025818.9 | 3605556.8 | 23 | 9 | Negative Monopolar | 8.6g | 19.7f | Small Ferrous Object | Debris |
| 024-10-dp-5.9g-33.8f | 12026178.7 | 3605159.6 | 24 | 10 | Dipolar | 5.9g | 33.8f | Small Ferrous Object | Debris |
| 024-11-dp-5.9g-40.2f | 12026179.3 | 3605158.9 | 24 | 11 | Dipolar | 5.9g | 40.2f | Small Ferrous Object | Debris |
| 024-12-dp-87.2g-27.6f | 12025845.2 | 3605576.8 | 24 | 12 | Dipolar | 87.2g | 27.6f | Small Ferrous Object | Debris |
| 024-13-pm-16.4g-58.7f | 12025727.7 | 3605645.9 | 24 | 13 | Positive Monopolar | 16.4g | 58.7f | Small Ferrous Object | Debris |
| 024-14-dp-23.6g-60.3f | 12025599.7 | 3605720.2 | 234 | 14 | Dipolar | 23.6g | 60.3f | Small Ferrous Object | Debris |
| 024-1-dp-11.4g-17.9f | 12029050.5 | 3601428.2 | 24 | 1 | Dipolar | 11.4g | 17.9f | Small Ferrous Object | Pilings |
| 024-2-mc-55.9g-42.1f | 12028974.6 | 3601539.9 | 24 | 2 | Multicomponent | 55.9g | 42.1f | Small Ferrous Object | Pilings |
| 024-4-dp-155.3g-44.7f | 12028770.3 | 3601760.6 | 24 | 4 | Dipolar | 155.3g | 44.7f | Moderate Ferrous Object | Pilings |
| 024-4-dp-9.7g-37.1f | 12028372.8 | 3602314.3 | 24 | 4 | Dipolar | 9.7g | 37.1f | Small Ferrous Object | Debris |
| 024-5-dp-21.6g-29.1f | 12028224.9 | 3602517.2 | 24 | 5 | Dipolar | 21.6g | 29.1f | Small Ferrous Object | Debris |
| 024-6-dp-4.6g-17.3f | 12027270.8 | 3603757.6 | 24 | 6 | Dipolar | 4.6g | 17.3f | Small Ferrous Object | Debris |
| 024-7-mc-8.8g-124.8f | 12026856.9 | 3604283.3 | 24 | 7 | Multicomponent | 8.8g | 124.8f | Small Ferrous Object | Debris |
| 024-8-dp-78.2g-38.5f | 12026367.6 | 3604927 | 24 | 8 | Dipolar | 78.2g | 38.5f | Small Ferrous Object | Debris |
| 024-9-pm-342.8g-33.5f | 12026295.9 | 3605026.9 | 24 | 9 | Positive Monopolar | 342.8g | 33.5f | Moderate Ferrous Object | Debris |
| 025-1-dp-284.4g-43.5f | 12028462 | 3602300.8 | 25 | 1 | Dipolar | 284.4g | 43.5f | Moderate Ferrous Object | Debris |
| 025-2-nm-3.9g-28f | 12028362.8 | 3602442.1 | 25 | 2 | Negative Monopolar | 3.9g | 28f | Small Ferrous Object | Debris |
| 025-3-dp-12.5g-28.8f | 12028101.6 | 3602749.4 | 25 | 3 | Dipolar | 12.5g | 28.8f | Small Ferrous Object | Debris |
| 025-4-pm-6g-15.6f | 12027896.1 | 3603004.3 | 25 | 4 | Positive Monopolar | 6g | 15.6f | Small Ferrous Object | Debris |
| 025-5-dp-5.1g-34.6f | 12026891.2 | 3604331.5 | 25 | 5 | Dipolar | 5.1g | 34.6f | Small Ferrous Object | Debris |
| 025-6-mc-312.7g-65.4f | 12026707.2 | 3604570.2 | 25 | 6 | Multicomponent | 312.7g | 65.4f | Moderate Ferrous Object | Debris |
| 026-1-dp-22.7g-62.9f | 12028845 | 3601882.3 | 26 | 1 | Dipolar | 22.7g | 62.9f | Small Ferrous Object | Debris |
| 026-2-dp-5.9g-56.3f | 12028650.4 | 3602142.5 | 26 | 2 | Dipolar | 5.9g | 56.3f | Small Ferrous Object | Debris |
| 026-3-nm-11.8g-43.4f | 12027551.8 | 3603553.3 | 26 | 3 | Negative Monopolar | 11.8g | 43.4f | Small Ferrous Object | Debris |
| 026-4-dp-23.4g-109.5f | 12026846.9 | 3604473.4 | 26 | 4 | Dipolar | 23.4g | 109.5f | Small Ferrous Object | Debris |
| 026-5-mc-7.2g-126.5f | 12026714 | 3604574.4 | 26 | 5 | Multicomponent | 7.2g | 126.5f | Small Ferrous Object | Debris |
| 027-1-nm-3.9g-16.3f | 12028820.8 | 3602013.2 | 27 | 1 | Negative Monopolar | 3.9g | 16.3f | Small Ferrous Object | Debris |
| 027-2-nm-6.3g-19.9f | 12028754.1 | 3602100.7 | 27 | 2 | Negative Monopolar | 6.3g | 19.9f | Small Ferrous Object | Debris |
| 027-3-nm-4.7g-45.4f | 12028474.2 | 3602448.8 | 27 | 3 | Negative Monopolar | 4.7g | 45.4f | Small Ferrous Object | Debris |
| 027-4-dp-71.7g-21.5f | 12028316.3 | 3602645.5 | 27 | 4 | Dipolar | 71.7g | 21.5f | Small Ferrous Object | Debris |
| 027-5-dp-3.6g-11.9f | 12028011.5 | 3603047.9 | 27 | 5 | Dipolar | 3.6g | 11.9f | Small Ferrous Object | Debris |
| 027-6-dp-13.3g-23.9f | 12027618.1 | 3603562.5 | 27 | 6 | Dipolar | 13.3g | 23.9f | Small Ferrous Object | Debris |
| 027-7-pm-21.9g-24.2f | 12027586 | 3603596.9 | 27 | 7 | Positive Monopolar | 21.9g | 24.2f | Small Ferrous Object | Debris |
| 028-1-dp-24.4g-19.9f | 12028841.1 | 3602012.8 | 28 | 1 | Dipolar | 24.4g | 19.9f | Small Ferrous Object | Debris |
| 028-2-nm-5.4g-47f | 12028739.8 | 3602171.3 | 28 | 2 | Negative Monopolar | 5.4g | 47f | Small Ferrous Object | Debris |
| 028-3-nm-4.1g-8.8f | 12028588.3 | 3602377.5 | 28 | 3 | Negative Monopolar | 4.1g | 8.8f | Small Ferrous Object | Debris |
| 028-4-nm-4.3g-19f | 12028130.7 | 3602962.9 | 28 | 4 | Negative Monopolar | 4.3g | 19f | Small Ferrous Object | Debris |
| 028-5-dp-251.6g-41.9f | 12028105 | 3602999 | 28 | 5 | Dipolar | 251.6g | 41.9f | Moderate Ferrous Object | Debris |
| 028-6-nm-9.9g-15.6f | 12027792.2 | 3603383.4 | 28 | 6 | Negative Monopolar | 9.9g | 15.6f | Small Ferrous Object | Debris |
| 028-7-dp-10.8g-36.4f | 12027653.4 | 3603598.8 | 28 | 7 | Dipolar | 10.8g | 36.4f | Small Ferrous Object | Debris |
| 028-8-pm-8g-17.5f | 12027401.4 | 3603911.2 | 28 | 8 | Positive Monopolar | 8g | 17.5f | Small Ferrous Object | Debris |
| 028-pm-9-3.3g-13.3f | 12027167 | 3604110.1 | 28 | 9 | Positive Monopolar | 3.3g | 13.3f | Small Ferrous Object | Debris |

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**Appendix B: Carter's Grove Sonar Target Report**

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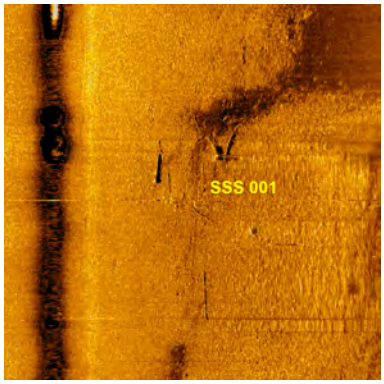
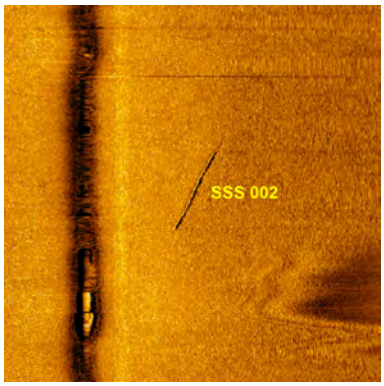
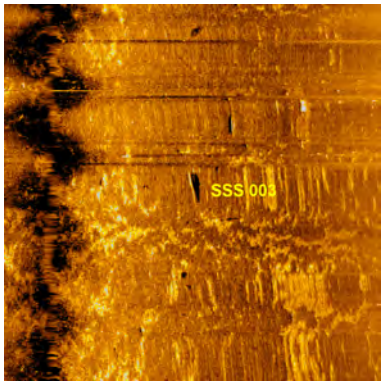
# Carter's Grove Sonar Target Report

Generated on 9/21/2020 2:27:55 PM

| Target Image | Target Info | User Entered Info |
|---|---|---|
|  | SSS 001<br>• Sonar Time at Target: 1/10/2001 8:55:36 PM<br>• Click Position<br>37.1962904983 -76.6269091557 (WGS84)<br>37.1961440873 -76.6272323242 (NAD27LL)<br>37.1962904983 -76.6269091557 (LocalLL)<br>(X) 12028447.51 (Y) 3600438.10 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL03200826165800.xtf<br>• Ping Number: 75181<br>• Range to target: 60.89 US ft<br>• Fish Height: 9.24 US ft<br>• Heading: 155.500 Degrees<br>• Event Number: (-1)<br>• Line Name: carL03200826165800<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 36.43 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 83.36 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Bottom Surface Debris Scatter |
|  | SSS 002<br>• Sonar Time at Target: 1/10/2001 8:54:27 PM<br>• Click Position<br>37.1975737190 -76.6280855213 (WGS84)<br>37.1974273089 -76.6284086559 (NAD27LL)<br>37.1975737190 -76.6280855213 (LocalLL)<br>(X) 12028095.68 (Y) 3600898.43 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL03200826165800.xtf<br>• Ping Number: 74158<br>• Range to target: 47.17 US ft<br>• Fish Height: 8.74 US ft<br>• Heading: 146.300 Degrees<br>• Event Number: (-1)<br>• Line Name: carL03200826165800<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 1.61 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 41.04 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Long Linear Object |

# Carters Grove Sonar Target Report

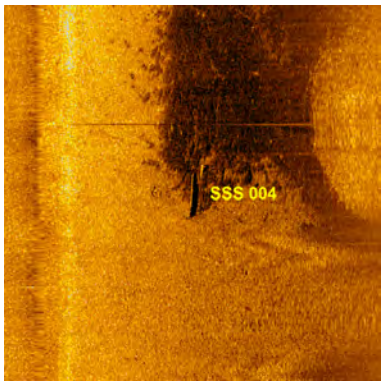



## SSS 003

- Sonar Time at Target: 1/11/2001 12:24:25 PM
- Click Position
  37.2099668343 -76.6388121521 (WGS84)
  37.2098204342 -76.6391349818 (NAD27LL)
  37.2099668343 -76.6388121521 (LocalLL)
  (X) 12024883.09 (Y) 3605348.03 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL07200827084000.xtf
- Ping Number: 11969
- Range to target: 61.89 US ft
- Fish Height: 17.62 US ft
- Heading: 161.100 Degrees
- Event Number: (-1)
- Line Name: carL07200827084000
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 1.38 US ft
- Target Height: 0.00 US ft
- Target Length: 15.01 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object




## SSS 004

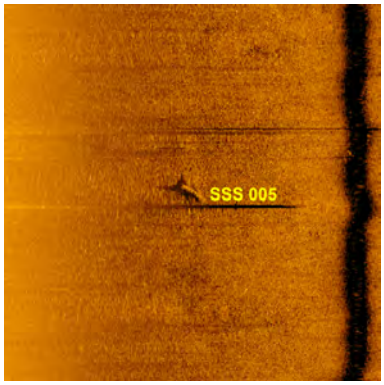
- Sonar Time at Target: 1/10/2001 8:53:36 PM
- Click Position
  37.1984791075 -76.6290301348 (WGS84)
  37.1983326965 -76.6293532421 (NAD27LL)
  37.1984791075 -76.6290301348 (LocalLL)
  (X) 12027814.07 (Y) 3601222.56 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL03200826165800.xtf
- Ping Number: 73399
- Range to target: 67.09 US ft
- Fish Height: 12.80 US ft
- Heading: 144.500 Degrees
- Event Number: (-1)
- Line Name: carL03200826165800
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 0.55 US ft
- Target Height: 0.00 US ft
- Target Length: 24.31 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object`

Received by VMRC October 23, 2020 /blh

# Carters Grove Sonar Target Report

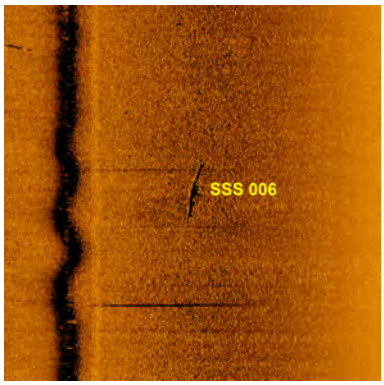



## SSS 005

- Sonar Time at Target: 1/11/2001 2:08:38 PM
- Click Position
  37.2036328862 -76.6310838280 (WGS84)
  37.2034865079 -76.6314068836 (NAD27LL)
  37.2036328862 -76.6310838280 (LocalLL)
  (X) 12027178.89 (Y) 3603086.80 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL13200827101900.xtf
- Ping Number: 104072
- Range to target: 72.28 US ft
- Fish Height: 7.29 US ft
- Heading: 148.100 Degrees
- Event Number: (-1)
- Line Name: carL13200827101900
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 2.37 US ft
- Target Height: 0.00 US ft
- Target Length: 13.47 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object



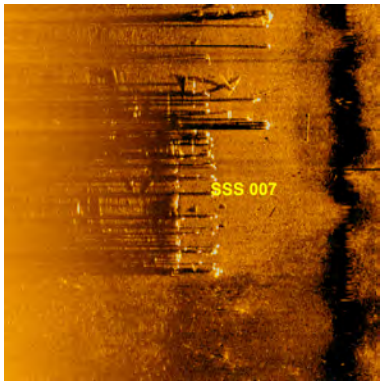

## SSS 006

- Sonar Time at Target: 1/11/2001 2:11:13 PM
- Click Position
  37.1999986431 -76.6282542279 (WGS84)
  37.1998522576 -76.6285773631 (NAD27LL)
  37.1999986431 -76.6282542279 (LocalLL)
  (X) 12028029.05 (Y) 3601780.18 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL13200827101900.xtf
- Ping Number: 106368
- Range to target: 54.18 US ft
- Fish Height: 5.74 US ft
- Heading: 145.700 Degrees
- Event Number: (-1)
- Line Name: carL13200827101900
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 0.87 US ft
- Target Height: 0.00 US ft
- Target Length: 23.82 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object

# Carters Grove Sonar Target Report

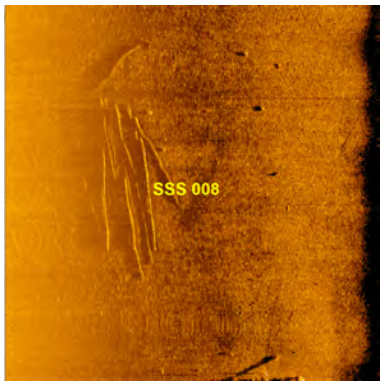



## SSS 007

- Sonar Time at Target: 1/11/2001 2:38:10 PM
- Click Position
  37.2110862197 -76.6376267370 (WGS84)
  37.2109398454 -76.6379496065 (NAD27LL)
  37.2110862197 -76.6376267370 (LocalLL)
  (X) 12025220.19 (Y) 3605762.32 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL15200827105400.xtf
- Ping Number: 130268
- Range to target: 66.33 US ft
- Fish Height: 8.85 US ft
- Heading: 156.200 Degrees
- Event Number: (-1)
- Line Name: carL15200827105400
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 56.52 US ft
- Target Height: 0.00 US ft
- Target Length: 94.69 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Dock Pilings




## SSS 008

- Sonar Time at Target: 1/11/2001 2:38:26 PM
- Click Position
  37.2107885329 -76.6372082758 (WGS84)
  37.2106421604 -76.6375311577 (NAD27LL)
  37.2107885329 -76.6372082758 (LocalLL)
  (X) 12025344.17 (Y) 3605656.36 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL15200827105400.xtf
- Ping Number: 130499
- Range to target: 106.49 US ft
- Fish Height: 8.12 US ft
- Heading: 150.800 Degrees
- Event Number: (-1)
- Line Name: carL15200827105400
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 48.54 US ft
- Target Height: 0.00 US ft
- Target Length: 108.11 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Objects Possible Pilings

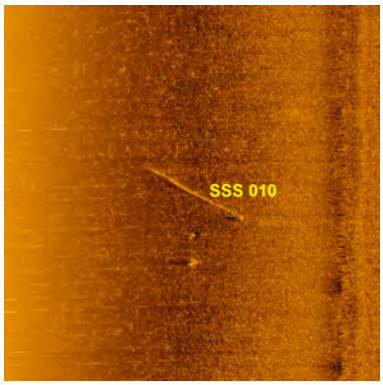
# Carters Grove Sonar Target Report


## SSS 009

- Sonar Time at Target: 1/11/2001 2:40:23 PM
- Click Position
  37.2084087833 -76.6351466909 (WGS84)
  37.2082624095 -76.6354696312 (NAD27LL)
  37.2084087833 -76.6351466909 (LocalLL)
  (X) 12025961.52 (Y) 3604801.93 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL15200827105400.xtf
- Ping Number: 132234
- Range to target: 61.50 US ft
- Fish Height: 7.70 US ft
- Heading: 145.200 Degrees
- Event Number: (-1)
- Line Name: carL15200827105400
- Water Depth: 0.00 US ft

## Dimensions and attributes

- Target Width: 1.61 US ft
- Target Height: 0.00 US ft
- Target Length: 33.15 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object Possible Piling



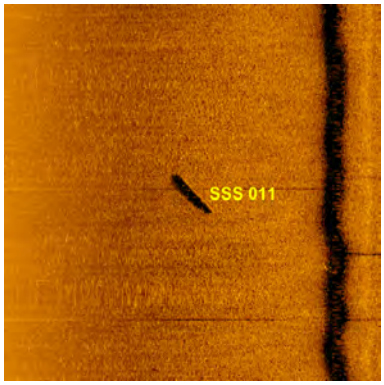
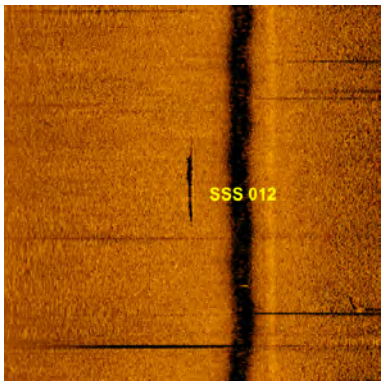

## SSS 010

- Sonar Time at Target: 1/11/2001 2:49:03 PM
- Click Position
  37.1978736321 -76.6253323450 (WGS84)
  37.1977272566 -76.6256555668 (NAD27LL)
  37.1978736321 -76.6253323450 (LocalLL)
  (X) 12028895.24 (Y) 3601023.51 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL15200827105400.xtf
- Ping Number: 139919
- Range to target: 65.27 US ft
- Fish Height: 5.92 US ft
- Heading: 154.200 Degrees
- Event Number: (-1)
- Line Name: carL15200827105400
- Water Depth: 0.00 US ft

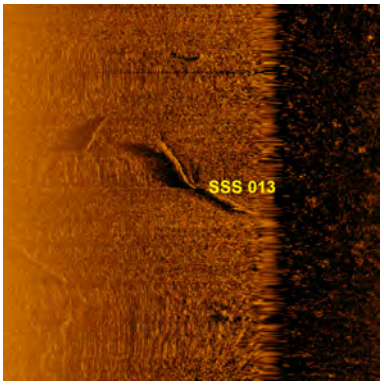
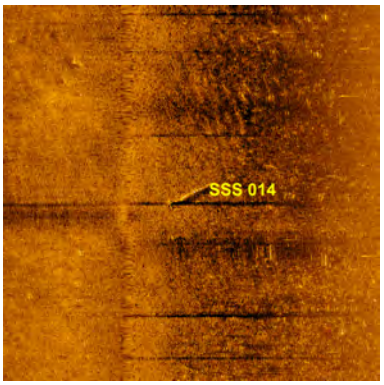
## Dimensions and attributes

- Target Width: 0.28 US ft
- Target Height: 0.00 US ft
- Target Length: 50.84 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Linear Object Possible Chain or Wire Possible Association with Anomaly 16-1

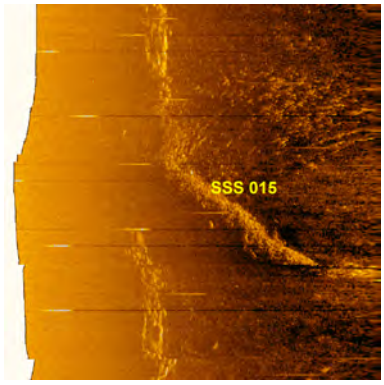
# Carters Grove Sonar Target Report

| | | |
|---|---|---|
|  | SSS 011<br>• Sonar Time at Target: 1/11/2001 3:14:47 PM<br>• Click Position<br>37.2091836528 -76.6354187808 (WGS84)<br>37.2090372841 -76.6357417146 (NAD27LL)<br>37.2091836528 -76.6354187808 (LocalLL)<br>(X) 12025876.72 (Y) 3605082.44 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL17200827112900.xtf<br>• Ping Number: 162725<br>• Range to target: 62.88 US ft<br>• Fish Height: 6.02 US ft<br>• Heading: 149.100 Degrees<br>• Event Number: (-1)<br>• Line Name: carL17200827112900<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 1.38 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 22.47 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Linear Object Possible Piling r Log |
|  | SSS 012<br>• Sonar Time at Target: 1/11/2001 3:17:26 PM<br>• Click Position<br>37.2054435828 -76.6321567627 (WGS84)<br>37.2052972118 -76.6324797891 (NAD27LL)<br>37.2054435828 -76.6321567627 (LocalLL)<br>(X) 12026853.43 (Y) 3603739.75 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL17200827112900.xtf<br>• Ping Number: 165080<br>• Range to target: 21.35 US ft<br>• Fish Height: 6.45 US ft<br>• Heading: 142.200 Degrees<br>• Event Number: (-1)<br>• Line Name: carL17200827112900<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 1.14 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 35.17 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Linear Object Possible Piling or Log |

# Carters Grove Sonar Target Report

| | | |
|---|---|---|
|  | SSS 013<br>• Sonar Time at Target: 1/11/2001 4:09:41 PM<br>• Click Position<br>37.2098800490 -76.6357600813 (WGS84)<br>37.2097336839 -76.6360830061 (NAD27LL)<br>37.2098800490 -76.6357600813 (LocalLL)<br>(X) 12025772.34 (Y) 3605333.98 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL20200827121600.xtf<br>• Ping Number: 211341<br>• Range to target: 35.63 US ft<br>• Fish Height: 47.55 US ft<br>• Heading: 323.800 Degrees<br>• Event Number: (-1)<br>• Line Name: carL20200827121600<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 1.41 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 56.07 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Linear Object Possible Piling with Fitings or cable Anomalies 19-3 and 20-4 |
|  | SSS 014<br>• Sonar Time at Target: 1/11/2001 4:53:48 PM<br>• Click Position<br>37.2108935871 -76.6364164523 (WGS84)<br>37.2107472251 -76.6367393592 (NAD27LL)<br>37.2108935871 -76.6364164523 (LocalLL)<br>(X) 12025573.95 (Y) 3605699.15 (Projected Coordinates)<br>• Map Projection: VA83-SF<br>• Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL24200827131101.xtf<br>• Ping Number: 250424<br>• Range to target: 28.22 US ft<br>• Fish Height: 5.84 US ft<br>• Heading: 134.500 Degrees<br>• Event Number: (-1)<br>• Line Name: carL24200827131101<br>• Water Depth: 0.00 US ft | Dimensions and attributes<br>• Target Width: 1.68 US ft<br>• Target Height: 0.00 US ft<br>• Target Length: 26.27 US ft<br>• Target Shadow: 0.00 US ft<br>• Mag Anomaly:<br>• Avoidance Area:<br>• Classification1:<br>• Classification2:<br>• Area:<br>• Block:<br>• Description: Possible Pipe Anomaly 022-9 |

## Carters Grove Sonar Target Report




### SSS 015

- Sonar Time at Target: 1/11/2001 4:18:18 PM
- Click Position
  37.2131013380 -76.6379167290 (WGS84)
  37.2129549820 -76.6382395946 (NAD27LL)
  37.2131013380 -76.6379167290 (LocalLL)
  (X) 12025121.29 (Y) 3606494.21 (Projected Coordinates)
- Map Projection: VA83-SF
- Acoustic Source File: C:\Users\Owner\Desktop\Carters Grove Sonar Files\carsss\carL21200827123500.xtf
- Ping Number: 218986
- Range to target: 81.93 US ft
- Fish Height: 36.31 US ft
- Heading: 153.200 Degrees
- Event Number: (-1)
- Line Name: carL21200827123500
- Water Depth: 0.00 US ft

### Dimensions and attributes

- Target Width: 7.24 US ft
- Target Height: 0.00 US ft
- Target Length: 107.35 US ft
- Target Shadow: 0.00 US ft
- Mag Anomaly:
- Avoidance Area:
- Classification1:
- Classification2:
- Area:
- Block:
- Description: Sewer Pipe Riprap

# Attachment E

## Site Photographs

Received by VMRC October 23, 2020 /blh

Carters Grove Shoreline Stabilization/Living Shoreline Project
Representative Photographs
James City County, VA
September 24, 2020

Photograph 1: View of shoreline facing upstream at the southern end of the project area.

Photograph 2: View of shoreline adjacent to estuarine emergent wetland located on right side of photo beyond the Phragmites.

Carters Grove Shoreline Stabilization/Living Shoreline Project
Representative Photographs
James City County, VA
September 24, 2020

Photograph 3: Example of collapsing shoreline bluff.

Photograph 4: View of stone revetment to be improved.

Carters Grove Shoreline Stabilization/Living Shoreline Project
Representative Photographs
James City County, VA
September 24, 2020

Photograph 5: Typical view of raw, eroding shoreline bluff.

Photograph 6: View of eroding shoreline bluff.

Received by VMRC October 23, 2020 /blh

Carters Grove Shoreline Stabilization/Living Shoreline Project
Representative Photographs
James City County, VA
September 24, 2020

Photograph 7: Another example of a collapsing section of the shoreline.

Photograph 8: View of the shoreline at the northern, upstream end of the project.

Received by VMRC October 23, 2020 /blh

# Attachment F

# Essential Fish Habitat Assessment

Received by VMRC October 23, 2020 /blh

October 6, 2020

Ref: 34122.20

Mr. Dave O'Brien
NOAA - Virginia Field Office
1375 Greate Road
Gloucester Point, VA 23062

Re: Essential Fish Habitat Assessment
Carter's Grove Shoreline Stabilization Project
James City County, Virginia

Dear Dave,

Carters Grove is a privately-owned historic property with a 38-room manor house constructed in 1755 situated next to 7,800 linear feet of James River shoreline in the southern end of James City County. This 466-acre estate is rich with pre-historic and colonial period cultural and archeological resources. In 2017, Virginia Energy received permit authorization to install an overhead powerline crossing the James River near Carters Grove resulting in cultural viewshed impacts to the Carters Grove historic property. As mitigation for the cultural impacts, Dominion Energy agreed to fund a shoreline stabilization project for the purpose of preserving the historic landscape and cultural resources that occur on the site. The project will ensure protection of underground historic artifacts known to occur on top of the shoreline bluff adjacent to the eroding shoreline, and it will ensure preservation of the overall historic landscape, pristine character, and setting of the property as a Colonial Period plantation. The project will also enhance the water quality of the James River by reducing the erosion of exposed banks and bluffs that increases sediment and nutrient loads in the river.

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), protects fisheries resources within and adjacent to the study area. The Magnuson-Stevens Act provides for the federal management of coastal fisheries and the implementation of fishery management plans (FMPs) for species that have been overfished. It requires National Marine Fisheries Service (NMFS) to coordinate with federal and state agencies, resource users, and others to identify, conserve, and enhance Essential Fish Habitat (EFH). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802(10)). In compliance with the Magnuson-Stevens Act, this EFH assessment is provided to describe the effects of the Carter's Grove Shoreline Stabilization Project on designated EFH within and adjacent to the project area.

Engineers | Scientists | Planners | Designers

351 McLaws Circle
Suite 3
Williamsburg, Virginia 23185
P 757.220.0500
F 757.903.2794

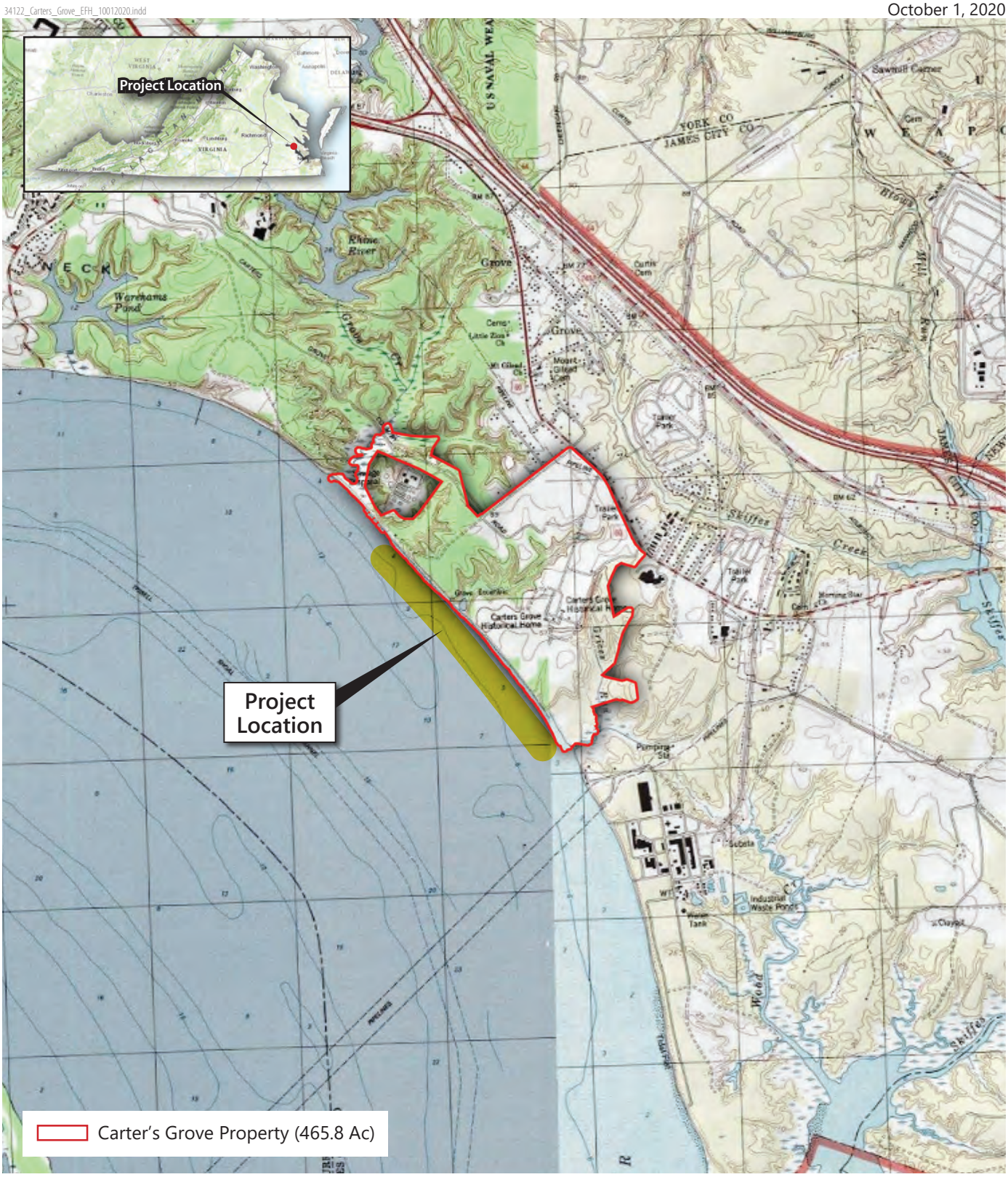
**PROJECT DESCRIPTION**

The Carter's Grove Shoreline Stabilization Project is located on the north bank of the James River, approximately 6.5 miles downstream from Jamestown Island in James City County, Virginia (Figure 1). The project will occur along and immediately adjacent to the existing shoreline, and it is located between a living shoreline associated with the municipal waste treatment plant and the confluence of Grice's Run with the James River. An initial site inspection of the approximately 7,800 linear feet of James River shoreline along

the Carter's Grove Plantation property to assess the extent of erosion and degradation. The site exhibited variable conditions including low eroding escarpments, barrier beaches in front of emergent wetland systems, steep eroding bluffs to 40 feet in height, and a short reach of stabilized shoreline. Approximately 6,000 linear feet of shoreline will be restored/stabilized for this project.

Breakwaters will be strategically placed to blend with or accentuate shoreline features that have developed naturally in response to the wave climate, geological conditions, and anthropogenic influences. These structures alter the impinging wave climate so that sand nourishment can be placed to create inherently stable beach plan-forms, marsh terraces, and dune features where native coastal vegetation will be planted and allowed to mature. The project will include bank grading and re-establishment of riparian vegetation, 4,300 linear feet of living shoreline installation including offshore breakwaters with sand fill and marsh or dune vegetation, installation (1047 linear feet) and modification (1,380 linear feet) of stone revetments, dock construction, and the improvement of upland drainage systems. The overall plan and site layout is provided in Figure 2, and detailed plan drawings are included as Attachment A.

The project will install two separate segments of living shoreline along the Carters Grove waterfront. In total the project consists of 12 free-standing, armor stone breakwaters and sand fill that will create 108,754 square feet of stable, sandy, intertidal shoreline and 285,595 square feet of vegetated backshore. Upstream from the mansion, a series of eight breakwaters, all 175-feet in length, will be installed; while the downstream segment will have four breakwaters, with two at 206 feet long, one 200-foot, and one 175-foot breakwater. Gaps between the structures will vary between 150 and 280 feet. Breakwaters will sit in 2 to 4 feet of water and have crest elevations of +5.5 or +6.5 feet above mean lower low water (MLLW), depending on specific site conditions, see Attachment A. Approximately 2,185 linear feet of breakwaters will be constructed, requiring approximately 13 tons per foot or 28,400 tons of rock total. The beaches/backshore structures associated with the breakwaters will meet the bank at approximately 7 feet above MLLW. The beach berm will be approximately 5 feet above MLLW and 15 to 20 feet wide, sloping to closure at 10:1 slope. Accounting for tombolos (sand attachment to breakwaters) and embayments (between structures), the beaches/backshore would require a total of 78,000 cubic yards of sand. Backshore plantings will include the installation of saltmeadow hay (*Spartina patens*) on 18" centers. The project also includes the installation of a new segments of riprap revetment and refurbishment of an older revetment installed in the 1970's. Total impacts of the living shoreline and revetment structures to non-vegetated intertidal wetlands is 108,500 square feet, and subaqueous impacts are calculated at 240,558 square feet.




**Carter's Grove Plantation** | James City County, Virginia

Essential Fish Habitat Assessment

North

0 3,000

SCALE IN FEET

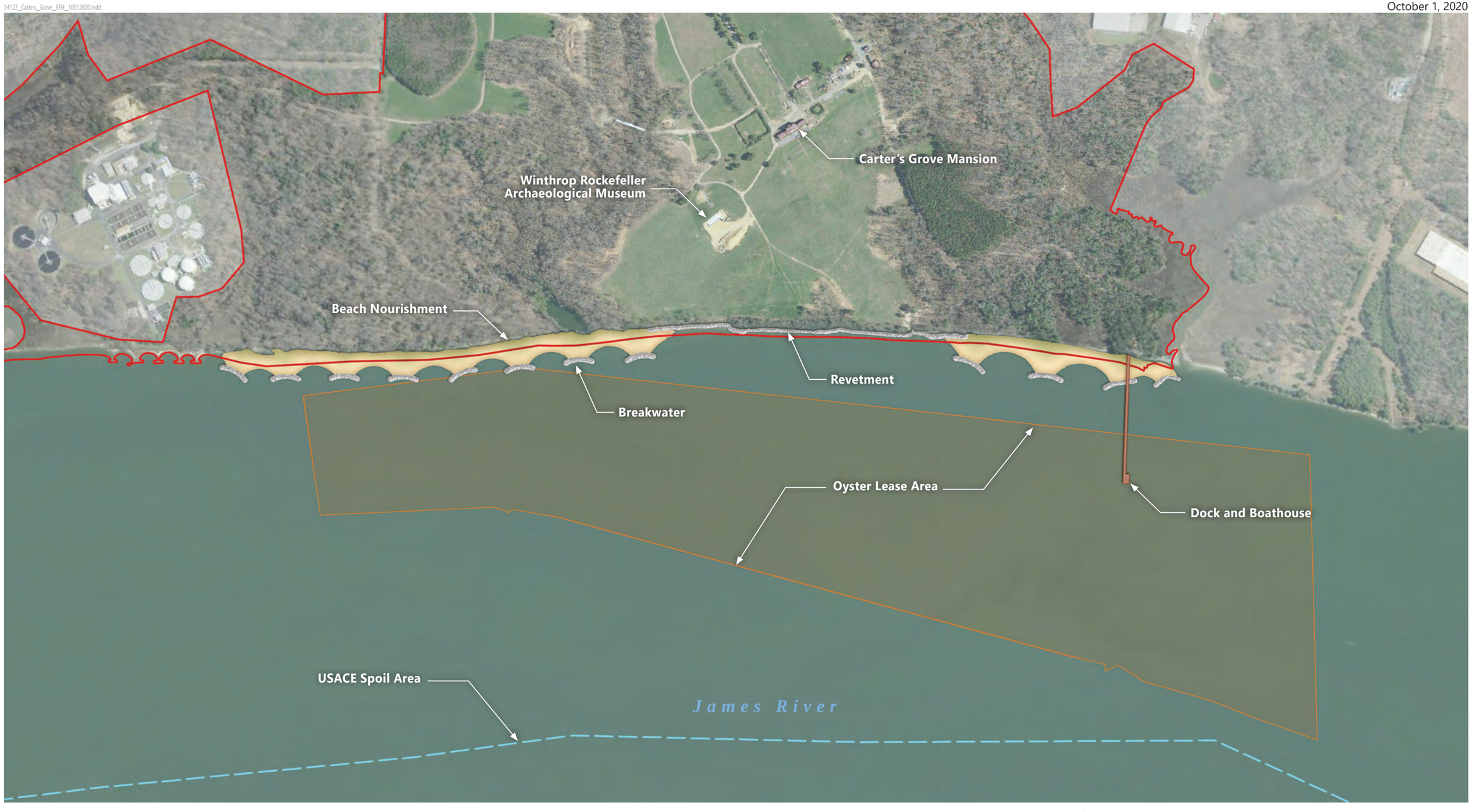
FIGURE 1

**Project Location Map**

Source: USGS 7.5 minute Hog Island and Yorktown, Virginia Quadrangles

Received by VMRC October 23, 2020 /blh

October 1, 2020




Carter's Grove Property (465.8 Ac)

North

0 600

SCALE IN FEET

Source: 2015 James City County, Virginia Orthophotography; NRCS/USDA Digital Soil Survey for James City County, Virginia

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**Carter's Grove Plantation** | James City County, Virginia

Essential Fish Habitat Assessment

FIGURE 2

**Overall Project Design**

The project also includes the installation of a open-pile, timber boat dock and boathouse, or covered boat lift. This will be a private boat dock that will only be used by the owner. The dock will be 8 feet wide and 832 feet long, with 804 feet channelward of mean high water (MHW). The boathouse will be situated at the end of the dock. The total area of the dock and boathouse over intertidal and subaqueous waters will be 7,568 square feet. Construction of the dock will include the installation of 175 12-inch timber piles by impact pile driving, with the vast majority installed within intertidal and subaqueous waters.

**ESSENTIAL FISH HABITAT**

Project activities including the living shoreline, revetment modification, revetment construction, boat dock construction, and drainage improvement as shown in Figure 2 and detailed in Attachment A, will occur within or adjacent to the James River or tributaries of the James River and as such will affect designated EFH for 10 species of fish managed under Fishery Management Plans (FMPs) (Table 1). The preferred habitats of species and lifestages with potential EFH within the project area are provided in Table 2.

This area of the James River ranges from zero to six feet in depth and is characterized as soft bottom with a substrate comprised mainly of mud. Salinity in this part of the James River typically ranges from around 8 parts per thousand (ppt) to 16 ppt. The banks of the river in the project area are characterized by steep bluffs to 40 feet in height. According to the Eroding Bank Nutrient Verification Study for the Lower Chesapeake Bay published by the Department of Conservation and Recreation Division of Soil and Water Conservation Shoreline Programs Bureau, the riverbanks in the vicinity of Carters Grove are eroding at a rate of 0.29 tons/ft-yr. The James River from bank to bank comprises the EFH for all species (Figure 4), and all 10 species are relatively common within the river. The sections below detail the effects of the project on the EFH of each species.

*Atlantic Butterfish*

Juvenile – Offshore EFH for juvenile butterfish includes the pelagic waters over the Continental Shelf, from the coast out to the limits of the Exclusive Economic Zone (EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore EFH for juvenile butterfish includes the "mixing" salinities between 0.5 and 25.0 parts per thousand (ppt),[1] or the "seawater" salinities above 25.0 ppt,[2] and also zones of estuaries along the Atlantic Coast where the butterfish are common, abundant, or highly abundant according to the Estuarine Living Marine Resources (ELMR) Database.[3] The inshore range of the juvenile butterfish EFH includes estuarine waters from Passamaquoddy Bay in Maine to the James River in Virginia. Juvenile butterfish typically inhabit pelagic waters, with depths between 33 and 1,200 feet and temperatures between 37- and 82-degrees Fahrenheit.

[1] National Centers for Coastal Ocean Science (NCCOS). 2017. Estuarine Living Marine Resources Database (ELMR). https://products.coastalscience.noaa.gov/elmr/. Accessed: February 10, 2019.
[2] NCCOS. 2017.
[3] NCCOS. 2017.

**Table 1 Species Managed under Fishery Management Plans with EFH in Project Area**

| Listed Species | Scientific Name | Lifestages | FMP |
|---|---|---|---|
| Atlantic butterfish | *Peprilus triacanthus* | Juvenile, Adult | Atlantic Mackerel, Squid, and Butterfish FMP[4] |
| Atlantic Herring | *Clupea harengus* | Juvenile, Adult | Atlantic Herring FMP[5] |
| Black Sea Bass | *Centropristis striata* | Juvenile, Adult | Summer Flounder, Scup, and Black Sea Bass FMP[6] |
| Bluefish | *Pomatomus saltatrix* | Juvenile, Adult | Bluefish FMP[7] |
| Clearnose Skate | *Raja eglanteria* | Juvenile, Adult | Northeast Skate Complex FMP[8] |
| Little Skate | *Leucoraja erinacea* | Adult | Northeast Skate Complex FMP[9] |
| Red Hake | *Urophycis chuss* | Eggs, Larvae, Juvenile, Adult | Northeast Multispecies FMP[10] |
| Summer Flounder | *Paralichthys dentatus* | Larvae, Juvenile, Adult | Summer Flounder, Scup, and Black Sea Bass FMP[11] |
| Windowpane Flounder | *Scophthalmus aquosus* | Juvenile | Northeast Multispecies FMP[12] |
| Winter Skate | *Leucoraja ocellata* | Adult | Northeast Skate Complex FMP[13] |

[4] Mid Atlantic Fishery Management Council (MAFMC) and National Marine Fisheries Service (NOAA Fisheries). 2011. *Amendment 11 to the Atlantic Mackerel, Squid, and Butterfish (MSB) Fishery Management Plan (FMP)*. Available online: https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/518968c5e4b0884a65fe5067/1367959749407/Amendment+11+FEIS+-+FINAL_2011_05_12.pdf. Accessed: September 18, 2020.
[5] New England Fishery Management Council (NEFMC) and NOAA Fisheries. 2017. *Omnibus Essential Fish Habitat Amendment 2. Volume 2: EFH and HAPC Designation Alternatives and Environmental Impacts*. Available online: https://www.habitat.noaa.gov/application/efhmapper/oa2_efh_hapc.pdf#page=86. Accessed: December 4, 2018.
[6] MAFMC and NOAA Fisheries. 1998. *Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass FMP*. Available online: https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/53e3ac8ce4b0b6a302b8dea3/1407429772601/SFSCBSB_Amend_12.pdf. Accessed: December 4, 2018.
[7] MAFMC and Atlantic States Marine Fisheries Commission. 1998. *Amendment 1 to the Bluefish FMP*. Available online: https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/53e3adade4b0a6f03dc680eb/1407430061511/Bluefish_Amend_1_Vol_1.pdf. Accessed: December 4, 2018.
[8] NEFMC and NOAA Fisheries. 2017.
[9] NEFMC and NOAA Fisheries. 2017.
[10] NEFMC and NOAA Fisheries. 2017.
[11] MAFMC and NOAA Fisheries. 1998.
[12] NEFMC and NOAA Fisheries. 2017.
[13] NEFMC and NOAA Fisheries. 2017.

**Table 2 Preferred Habitats of Species and Lifestages with EFH in the Project Area**

| Listed Species | Lifestage | Habitat | Function |
|---|---|---|---|
| Atlantic butterfish | Juvenile | Pelagic | Growth, Feeding |
| | Adult | Pelagic | Feeding |
| Atlantic Herring | Juvenile | Pelagic, soft or sand/shell bottom | Growth, Feeding |
| | Adult | Pelagic | Feeding |
| Black Sea Bass | Juvenile | Rough bottom, shellfish, eelgrass, or structure | Growth, Feeding |
| | Adult | Demersal habitats with structure | Feeding |
| Bluefish | Juvenile | Pelagic | Growth, Feeding |
| | Adult | Pelagic | Feeding |
| Clearnose Skate | Juvenile | Soft bottom, gravelly or rocky bottom | Growth, Feeding |
| | Adult | Soft bottom, gravelly or rocky bottom | Feeding |
| Little Skate | Adult | Soft, sandy, or gravelly bottom | Feeding |
| Red Hake | Eggs | Pelagic | Growth |
| | Larvae | Pelagic | Growth, Feeding |
| | Juvenile | Shell bottom | Growth, Feeding |
| | Adult | Soft or sand bottom | Feeding |
| Summer Flounder | Larvae | Pelagic | Growth, Feeding |
| | Juvenile | Demersal (All bottom types) | Growth, Feeding |
| | Adult | Demersal (All bottom types) | Feeding |
| Windowpane Flounder | Juvenile | Soft or sand bottom | Growth, Feeding |
| Winter Skate | Adult | Soft bottom, sand and gravel bottom | Feeding |

Adult – Offshore EFH for adult butterfish includes the pelagic waters over the Continental Shelf from the Gulf of Maine to Cape Hatteras, North Carolina. Estuarine EFH for adult butterfish includes the mixing or seawater zones of estuaries along the Atlantic Coast where ELMR has identified butterfish as common, abundant, or highly abundant. Their range extends from Passamaquoddy Bay in Maine to the James River in Virginia. Adult butterfish prefer pelagic waters, at depths between 33 and 1,200 feet and temperatures between 37- and 82-degrees Fahrenheit.[14]

*Atlantic Herring*

Juvenile – Offshore EFH for juvenile Atlantic herring includes pelagic waters and bottom habitats from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore EFH for juvenile Atlantic herring includes pelagic and bottom habitats within the mixing or seawater zones of estuaries from the Gulf of Maine to Cape Hatteras, North Carolina. Juvenile Atlantic Herring generally inhabit waters with water temperatures below 50-degrees Fahrenheit, water depths from 49 to 442 feet, and salinity between 26 to 32 ppt.[15]

Adult – Offshore EFH for adult Atlantic herring includes pelagic waters and bottom habitats from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore EFH for adult Atlantic herring includes pelagic and bottom habitats within the mixing or seawater zones of estuaries from the Gulf of Maine to Cape Hatteras, North Carolina. Adult Atlantic Herring generally inhabit waters with water temperatures below 50-degrees Fahrenheit, water depths from 66 to 442 feet, and salinity greater than 28 ppt.[16]

*Black Sea Bass*

Juvenile – Offshore EFH for juvenile black sea bass is the demersal waters, near the seabed, over the Continental Shelf from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore EFH for juvenile black sea bass includes the mixing or seawater zones of estuaries along the Atlantic Coast where black sea bass are common, abundant, or highly abundant. In spring and summer, juvenile black sea bass inhabit estuaries between Virginia and Massachusetts. They prefer waters warmer than 43-degrees Fahrenheit and with salinities greater than 18 ppt. In estuarine waters, juveniles usually associate with areas of rough bottom, shellfish or eelgrass beds, and manmade structures in sandy-shelly areas.[17]

Adult – Offshore EFH for adult black sea bass is the demersal waters, near the seabed, over the Continental Shelf from the Gulf of Maine to Cape Hatteras, North Carolina. Inshore EFH for adult black sea bass includes the mixing or seawater zones of estuaries where black sea bass are identified as common, abundant, or highly abundant. Adults generally inhabit estuaries along the Atlantic Coast from Massachusetts to Virginia between May and October. Adults generally winter in offshore waters between south New York and Cape Hatteras, North Carolina. Adult black sea bass require water temperatures

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[14] NOAA. 2018a. Essential Fish Habitat for Butterfish (Peprilus triacanthus). https://www.greateratlantic.fisheries.noaa.gov/hcd/butterfish.htm. Accessed: February 10, 2019.
[15] Stevenson DK, Scott ML. 2005. Essential fish habitat source document: Atlantic herring, *Clupea harengus*, life history and habitat characteristics (2nd edition). NOAA Tech Memo NMFS NE 192; 84 p.
[16] Stevenson DK, Scott ML. 2005.
[17] NOAA. 2018b. Essential Fish Habitat for Black Sea Bass (Centropristis striata). https://www.greateratlantic.fisheries.noaa.gov/hcd/blackseabass.htm. Accessed: February 10, 2019.

above 43-degrees Fahrenheit and generally prefer substrates of structured habitat (natural and manmade), shell, and sand.[18]

*Bluefish*

Juvenile – North of Cape Hatteras, offshore EFH for juvenile bluefish is the pelagic waters over the Continental Shelf to Nantucket Island, Massachusetts. South of Cape Hatteras, EFH is the pelagic waters over the Continental Shelf from the coast out to the eastern wall of the Gulf Stream to Key West, Florida. Also included in the EFH are the Gulf Stream and "slope sea" between the latitudes of 29 degrees north and 40 degrees north. Inshore EFH for juvenile bluefish includes all major estuaries from Penobscot Bay, Maine to the St. Johns River, Florida. Juvenile bluefish generally occur in North Atlantic estuaries from June to October, Mid-Atlantic estuaries from April to October, and South Atlantic estuaries from March to December. Juveniles inhabit the mixing and seawater zones of estuaries in a wide range of salinities.

Adult – North of Cape Hatteras, offshore EFH for adult bluefish is the pelagic waters over the Continental Shelf to Nantucket Island, Massachusetts. South of Cape Hatteras, EFH is the pelagic waters over the Continental Shelf from the coast out to the eastern wall of the Gulf Stream to Key West, Florida. Inshore EFH for adult bluefish includes all major estuaries from Penobscot Bay, Maine to the St. Johns River, Florida. Adults occur in the mixing and seawater zones of North Atlantic estuaries from June to October, Mid-Atlantic estuaries from April to October, and South Atlantic estuaries from March to December. Adult bluefish are highly migratory, and distribution varies seasonally according to the size of the individuals in the school. They normally occur in salinities greater than 25 ppt.[19]

*Clearnose Skate*

Juvenile – EFH for the juvenile clearnose skate consists of soft bottom and rocky or gravelly bottom habitats on the Continental Shelf or in estuaries from the Gulf of Maine to Cape Hatteras, North Carolina where it is common, abundant, or highly abundant, according to the NMFS trawl survey (1963 – 1999). Generally juvenile clearnose skates prefer depths less than 360 feet and temperatures between 48- and 70-degrees Fahrenheit in the northern part of its range and from 66 to 86 degrees Fahrenheit around North Carolina.

Adult – EFH for the adult clearnose skate consists of soft bottom and rocky or gravelly bottom habitats on the Continental Shelf or in estuaries from the Gulf of Maine to Cape Hatteras, North Carolina where it is common, abundant, or highly abundant, according to the NMFS trawl survey (1963 – 1999). Generally adult clearnose skates prefer depths less than 360 feet and temperatures between 48- and 70-degrees Fahrenheit in the northern part of their range and from 66 to 86 degrees Fahrenheit around North Carolina.[20]

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[18] NOAA. 2018b.
[19] NOAA. 2018c. Essential Fish Habitat for Bluefish (Pomatomus saltatrix). https://www.greateratlantic.fisheries.noaa.gov/hcd/bluefish.htm. Accessed: February 10, 2019.
[20] NOAA. 2018d. Essential Fish Habitat Designations for New England Skate Complex. https://www.greateratlantic.fisheries.noaa.gov/hcd/skateefhmaps.htm. Accessed: February 10, 2019.

*Little Skate*

Adult – EFH for the adult little skate includes bottom habitats with sandy, gravelly or mud substrates where the skate is common, abundant, or highly abundant. The EFH includes continental shelf and estuarine areas between Georges Bank, Maine to Cape Hatteras, North Carolina. Adult little skate prefer water depths less than 450 feet and temperatures between 35- and 60-degrees Fahrenheit.[21]

*Red Hake*

Eggs – EFH for red hake eggs consists of surface waters from the Gulf of Maine to Cape Hatteras, North Carolina. Red hake eggs typically occur in waters with surface temperatures below 50-degrees Fahrenheit with salinities less than 25 ppt. Hake egg presence peaks in June and July, but they are generally present from May through November.

Larvae – EFH for red hake larvae consists of surface waters from the Gulf of Maine to Cape Hatteras, North Carolina. Red hake larvae typically occur in waters with surface temperatures below 66-degrees Fahrenheit, water depths less than 660 feet, and salinities greater than 0.5 ppt. Hake larvae presence peaks in September and October, but they are generally present from May through December.

Juveniles – EFH for juvenile red hake includes bottom habitats with shelly substrates from the Gulf of Maine to Cape Hatteras, North Carolina. Juveniles prefer areas with an abundance of live scallops. Juvenile red hake typically occur in waters with surface temperatures below 60-degrees Fahrenheit, depths less than 330 feet, and salinities from 31 to 33 ppt.

Adult – EFH for adult red hake includes bottom habitats with a substrate of sand and mud from the Gulf of Maine to Cape Hatteras, North Carolina. Adult red hake prefer waters with temperatures below 54-degrees Fahrenheit, depths between 33 to 430 feet, and salinities from 33 to 34 ppt. [22]

*Summer Flounder*

Larvae – North of Cape Hatteras, offshore EFH for summer flounder larvae includes the pelagic waters of the Continental Shelf to the Gulf of Maine. South of Cape Hatteras, offshore EFH for summer flounder larvae includes nearshore waters (out to 50 miles) of the Continental Shelf to Cape Canaveral, Florida. Inshore EFH for summer flounder larvae includes all estuaries where ELMR identified the summer flounder as being present (rare, common, abundant, and highly abundant) in mixing and seawater zones between the Gulf of Maine and Cape Hatteras, North Carolina. Summer flounder generally prefer nearshore waters with depths between 30 and 230 feet. They typically migrate to the northern part of the Mid-Atlantic Bight from February to September and the southern part of the Bight from November to May.

Juvenile – North of Cape Hatteras, offshore EFH for juvenile summer flounder includes the demersal waters of the Continental Shelf to the Gulf of Maine. South of Cape Hatteras, offshore EFH for juvenile summer flounder includes waters of the Continental Shelf to a depth of 500 feet south to Cape Canaveral,

[21] NOAA. 2018d.
[22] Steimle FW, Morse WW, Berrien PL, Johson DL. 1999. Essential fish habitat source document: Red Hake, Urophycis chuss, life history and habitat characteristics. NOAA Tech Memo NMFS NE 133; 34 p.

Florida. Inshore EFH for juvenile summer flounder includes all estuaries where ELMR identified the summer flounder as being present in mixing and seawater salinity zones. Juvenile summer flounder use multiple estuarine habitats as nursery areas. They generally inhabit salt marsh creeks, seagrass beds, mudflats, and open bays with temperatures greater than 37-degrees Fahrenheit and salinities between 10 to 30 ppt.

Adult – North of Cape Hatteras, offshore EFH for adult summer flounder includes the demersal waters of the Continental Shelf to the Gulf of Maine. South of Cape Hatteras, offshore EFH for juvenile summer flounder includes waters of the Continental Shelf to a depth of 500 feet south to Cape Canaveral, Florida. Inshore EFH for adult summer flounder includes all estuaries where ELMR identified the summer flounder as being common, abundant, and highly abundant, in mixing and seawater zones between the Gulf of Maine and Cape Hatteras, North Carolina. Adult summer flounder generally inhabit coastal and estuarine waters during warmer months and deeper outer continental shelf waters during the colder months.

*Windowpane Flounder*

Juvenile – EFH for juvenile windowpane flounder includes bottom habitats with mud or fine-grained sand substrates. They generally occur where water temperatures are below 77-degrees Fahrenheit, depths are between 3 and 330 feet, and salinities are greater than 5.5 ppt.[23]

*Winter Skate*

Adult – EFH for adult winter skate includes bottom habitats with substrates of sand and gravel or mud where ELMR identified the winter skate as being common, abundant, and highly abundant between the Gulf of Maine and Cape Hatteras, North Carolina.

**Effects of Proposed Activities on EFH**

*Living Shoreline and Revetment*

Construction of the living shoreline will have both adverse and beneficial impacts on the EFH of multiple species. The living shoreline and stone revetment construction/modification will impact 5.52 acres of subaqueous soft bottom and open water (pelagic) habitat and 2.49 acres of intertidal soft bottom habitat. As a result, rock and sand fill will create 1.24 acres of subaqueous and intertidal rock, 2.41 acres of subaqueous sand, and 2.50 acres of intertidal sand (unvegetated). For several species with EFH within the project area, there is a potential for direct impacts, including crushing or burial, from deposition of rock and fill sand in subaqueous waters. These species include clearnose skate (juvenile and adult), little skate (adult), red hake (juvenile and adult), summer flounder (juvenile and adult), windowpane flounder (juvenile), and winterskate (adult). In general, these species are demersal predators and foragers that may rest on the substrate. Juveniles and adults will likely leave the area at the onset of disturbance and continue to avoid it until construction activities end. There is also EFH for red hake (eggs and larvae) and summer flounder (larvae), which are more likely to be impacted by deposition of construction materials

[23] Chang S, Berrien PL, Johnson DL, Morse WW. 1999. Essential fish habitat source document: Windowpane, Scophthalmus aquosus, life history and habitat characteristics. NOAA Tech Memo NMFS NE 137; 32 p.

due to limited mobility. Pelagic species are more likely to avoid adverse impacts by leaving the area once activities begin.

Construction of the living shoreline will also adversely impact EFH for species and lifestages that typically inhabit pelagic or soft bottom habitats by converting 1.88 acres of these habitat types into 1.24 acres of subaqueous and intertidal rock. Rock placement will also create 0.64 acres of rock habitat above MHW, and therefore, inaccessible to fish species. Species with designated EFH within the project area that prefer pelagic habitats include Atlantic butterfish (juvenile and adult), Atlantic herring (juvenile and adult), bluefish (juvenile and adult), red hake (eggs and larvae), summer flounder (larvae), and windowpane flounder (juvenile). Species with EFH in the project area which prefer soft bottom habitats include clearnose skate (juvenile and adult), little skate (adult), red hake (adult), summer flounder (juvenile and adult), windowpane flounder (juvenile), and winter skate (adult). Although black sea bass (juvenile and adult) and red hake (juvenile) do not prefer the habitats that the project will impact, they still may use the project area for foraging. Therefore, the living shoreline may also adversely impact the EFH of these species.

Additional adverse impacts to EFH from the living shoreline include the modification of hydrology and nearshore sediment transport. Hydraulic effects include an increase in wave energy seaward of rock breakwaters and revetments and reflected or deflected wave energy. These changes in hydraulics will particularly impact the movement of red hake (eggs and larvae) and summer flounder (larvae) adjacent to the breakwaters and revetments.

The living shoreline will provide long-term benefits to the aquatic community and improve the quality of the EFH within this stretch of the James River. The construction of the rock breakwaters in the living shoreline will provide much needed habitat diversity for fishes and benthic organisms due to the creation of structural habitat within the subaqueous zone. This will provide particular benefit to black sea bass (juvenile and adult), which prefer structures as habitat. The rock will also provide attachment substrate for eastern oysters (*Crassostrea virginica*) and hooked mussels (*Ischadium recurvum*). Crustaceans, fish, and other wildlife will use the rocks and oyster reef for shelter and refuge, and it will increase the foraging potential for fish that feed on these species.

Additionally, protection of this shoreline will provide water quality benefits. By protecting the shoreline from erosion, the total nitrogen load in the James River will be reduced by 0.34 lb/ft-yr, and the total phosphorus load will be reduced by 0.12 lb/ft-yr. A 6,500-linear-foot shoreline stabilization effort could prevent much of these loads from entering the James River by limiting future shoreline erosion.

*Boat Dock and Boat House*

The boat dock is likely to adversely impact the EFH in several ways. Placement of the pier support pilings will alter wave energy and sediment transport within the immediate area of the pier. The pier will also reduce the light levels within the water column below the structure. The area shaded by the pier and associated pilings will total 0.17 acres. Shading affects the near shore community by reducing photosynthetic output by phytoplankton and aquatic algae and limiting the ability of fish and other wildlife to rely on visual cues for predator avoidance, foraging, and prey capture. The increased shading within the EFH is likely to affect all species and lifestages, other than red hake (eggs), in similar ways. The

shading impact of the pier is partially mitigated by the pier being oriented approximately north to south (northeast to southwest). This produces a shadow which moves across the water column throughout the day and limits the area experiencing permanent shade.

Over the short term, construction of the pier will require the installation, by impact hammer, of pilings to support the structure, and is likely to disturb aquatic species near the project area. Construction will occur over open water areas with soft bottom substrates, and it will not impact SAV, existing oyster beds, reefs, or other important aquatic habitats. Construction of the pier will require installation of approximately 175 12-inch timber pilings, most of which within subtidal, open water areas in the James River.

Percussive pile driving can result in short-term effects on aquatic species.[24] In aquatic habitats, effects to invertebrates and fishes associated with pile driving may include noise and vibration, sediment deposition, and crushing. Factors that affect the physical interaction of sound with fish include the size of the fish relative to the wavelength of sound, the mass of the fish, its anatomical variation, and the location of the fish in the water column relative to the sound source.[25] The highly variable auditory sensitivity of fish means that it is impossible to generalize on the effect of impulse signals from one species to another. The maximum sound pressure level for the impact driving of this type of pile is 180 dBpeak, which is below the generally accepted injury threshold of 206 dBpeak, and the distance to the behavioral disturbance threshold is 50 meters (164 feet). Therefore, the full extent of project effects will be 1050 feet channelward of MHW at the north shoreline. Because the width of the James River at this location is approximately 2.75 miles or 14,600 feet, it is anticipated that pile driving will elicit an avoidance response in most fish species, and they will use the unaffected portions of the river for migration and foraging. Construction BMPs, outlined in the following sections, will reduce the effects of sound pressure on fish and other aquatic species within the EFH.

**MITIGATION**

To prevent and minimize potential adverse impacts associated with the project, mitigation measures will be implemented during the construction and post-construction phases of the project. General and resource-specific BMPs and mitigation measures are listed below.

*Coastal Resources and Soils, Wetland Resources, and Wildlife Habitat*

- All unimpacted resource areas will be clearly marked prior to any construction related activity.

[24] Popper, A.N. 2005. What do we know about pile driving and fish? In *Proceedings of the 2005 International Conference on Ecology and Transportation*, edited by Irwin, C.L., Garrett, P. and McDermott, K.P. Center for Transportation and the Environment, North Carolina State University, Raleigh, North Carolina.

[25] Kent, C.S. and R. McCauley. 2006. *Review of Environmental Assessment of the Batholiths Marine Seismic Survey, Inland Waterways and Near-Offshore, Central Coast of British Columbia.* Center for Marine Science and Technology, Curtin University.

- Equipment use in vegetated wetland areas will be avoided to the greatest extent possible. Mats will be used to minimize impacts where avoidance is not possible, or other measures will be taken to minimize root disturbance and to preserve preconstruction elevations.
- Appropriate measures will be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering stormwater systems, waterways, or wetlands. These include safe handling and refueling procedures and proper deployment of containment measures such as oil booms. Actions will be consistent with state water quality standards and Clean Water Act of 1972 (CWA) Section 401 certifications and Section 404 permitting requirements. A hazardous spill plan will be approved by the city prior to construction. This plan will state what actions will be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of refueling facilities, storage and handling of hazardous materials, etc.
- Regulations require that a Stormwater Pollution Prevention Plan (SWPPP) must be prepared prior to submitting a registration statement for permit coverage under the Virginia Stormwater Management Permit.
- During the design phase, the project proponent will prepare and implement Erosion and Sediment Control Plans that comply with the Virginia Erosion and Sediment Control Law. The project proponent will be responsible for overseeing onsite contractors, conducting regular field inspections, and taking prompt action against non-compliance, if necessary. Appropriate erosion and siltation controls will be maintained during construction, and all exposed soil or fill material will be permanently stabilized at the earliest practicable date.
- BMPs for drainage and sediment control will be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. BMPs will include all or some of the following actions, depending on site-specific requirements:
    - Disturbed areas will be kept as small as possible to minimize exposed soil and the potential for erosion.
    - Regular site inspections will occur during construction to ensure that erosion-control measures were properly installed and are functioning effectively.
    - Should high wave and water conditions be forecasted, equipment will be moved to a safe location within the work zone or to another location outside the work zone.
    - Pile driving will occur in the dry to the maximum extent practicable. Where in-water pile driving is unavoidable, BMPs will include all or some of the following:
        - A 20 minute "soft start" will occur at the beginning of pile driving activities to allow wildlife to leave the project vicinity before sound pressure increases.

*Vegetation*

- Where planting or seeding are required, native plant material will be obtained and used in accordance with local, state, and federal policies and guidance.
    - Management techniques will be implemented to foster rapid development of target native plant communities and to eliminate invasion by exotic or other undesirable species. Techniques may include the use of hydroseeding and a tackifier (to ensure seeds remain in place), plant inspection at delivery and before installation to ensure plant health, plant installation during appropriate planting windows and with due regard for tide forecasts, and inspection of installed plants. Planted areas will be monitored after construction to determine if efforts are successful or if plant mortality warrants replanting and controlling non-native plant species.
    - Trees impacted within the Chesapeake Bay Preservation Area (CBPA) will be replaced in accordance with the County's CBPA Guidance Document to the greatest extent practicable.

*Special Status Species*

- The project proponent will coordinate with the Virginia Marine Resources Commission (VMRC), National Oceanic and Atmospheric Administration (NOAA), and US Fish and Wildlife Service (USFWS) regarding any need for a time-of-year restriction on in-water construction activities in observance of anadromous fish. Anadromous fish use is typically noted as February 15 to June 30.[26]

**Conclusion**

The Carters Grove Shoreline Stabilization project will convert 8.02 acres of soft bottom and open water, pelagic habitat to 1.24 acres of rock breakwaters and revetments and 4.91 acres of subaqueous and intertidal sand. This will reduce the use of the project area by pelagic fish and demersal fish that require soft bottom habitat. However, this project will increase local populations of invertebrates, particularly oysters and hooked clams, and fish species that prefer structured habitats. The project will also benefit the EFH of all species by improving water quality through reduction of erosion by protecting the shoreline.

[26] Virginia Marine Resources Commission. 2018. *Historical Highlights of the Virginia Marine Resources Commission*. http://mrc.virginia.gov/vmrchist.shtm#eighteenninetyfour (accessed May 7, 2018).

Sincerely,

Vanasse Hangen Brustlin, Inc.

Sean Murray

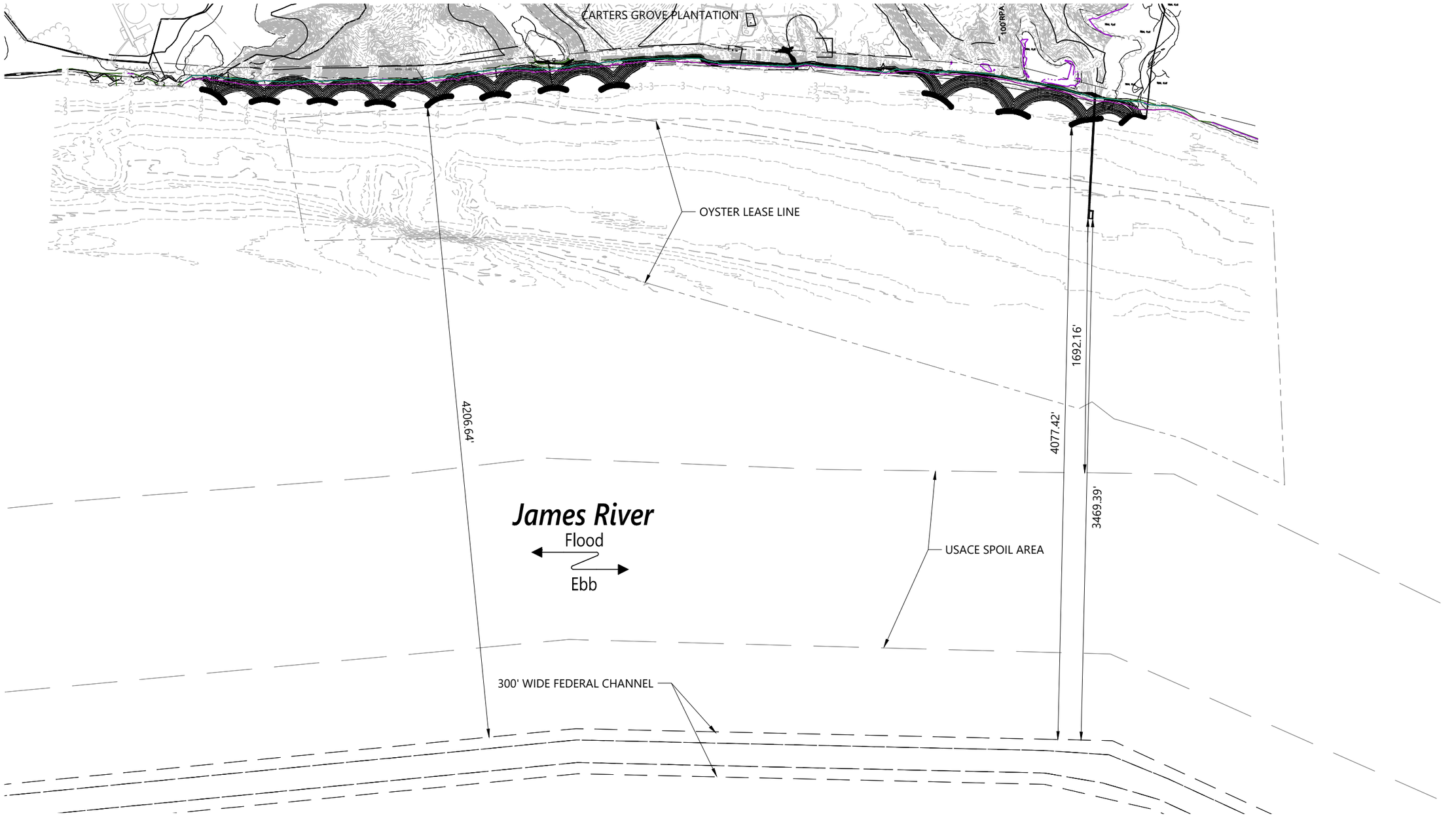
Environmental Scientist
seanmurray@vhb.com

# Attachment G

## Section 408 Exhibit

Received by VMRC October 23, 2020 /blh

\\vhb\gbl\proj\Williamsburg\34122.20 CG-Coastal_Shorelin_Stab\cad\ev\planset\3412220-EXH.dwg




Carters Grove Plantation
James River
Corps of Engineering Section 408

**Exhibit 1**

October 2020

Received by VMRC October 23, 2020 /blh

**PUBLIC HEARING NOTICE**

THE WETLANDS BOARD AND THE CHESAPEAKE BAY BOARD OF JAMES CITY COUNTY, VIRGINIA WILL HOLD A PUBLIC HEARING **WEDNESDAY JANUARY 13, 2020 AT 5 P.M.** IN THE BOARD ROOM OF BUILDING F, 101 MOUNTS BAY ROAD, JAMES CITY COUNTY, VIRGINIA.

THE WETLANDS BOARD WILL CONSIDER THE FOLLOWING CASE:

WJPA 20-0038: VHB, on behalf of Carters Grove Associates LLC, has applied for a wetlands permit for the installation of 12 breakwaters, beach nourishment, backshore plantings, a revetment and the refurbishment of an existing revetment at 8797 Pocahontas Trail, JCC Parcel No. 5910100030.

THE CHESAPEAKE BAY BOARD WILL CONSIDER THE FOLLOWING CASES:

CBPA 20-0100: Williams Landscape and Design, Inc., on behalf of Emanuel Grenspon, has filed an exception request for encroachments into the RPA buffer for the construction of a retaining wall and river rock at 5520 North Mallard Run, JCC Parcel No. 3120300039.

CBPA 20-0139: Williams Landscape and Design, Inc., on behalf of Kevin and Tami Potter, has filed an exception request for encroachments into the RPA buffer for the construction of steps and landings, a retaining wall, deck, patio and lawn at 289 Mill Stream Way, JCC Parcel No. 4711800040.

CBPA 20-0140: Roth Environmental, on behalf of Michael and Catherine Hoyt, has filed an exception request for encroachments into the RPA buffer for the construction of a retaining wall at 244 William Barksdale, JCC Parcel No. 4940300097.

CBPA 20-0141: Wahl Builders, Inc., on behalf of John and Teressa Murphy, has filed an exception request for encroachments into the RPA buffer for the construction of a deck at 137 Westbury, JCC Parcel No. 3720600053.

CBPA 20-0142: VHB, on behalf of Carters Grove Associates LLC, has filed an exception request for encroachments into the RPA buffer for the replacement of a failed concrete drainage channel, the replacement of a failing pond spillway and associated grading at 8797 Pocahontas Trail, JCC Parcel No. 5910100030.

Appeals from decisions under the Chesapeake Bay Preservation Ordinance may also be heard.

All interested parties are invited to attend the meetings. There is also a call-in option for the public hearings. To participate, call 757-253-6772 to record a comment that will be played during the meeting. Recorded comments must be submitted no later than noon on the day of the meeting. Please give your name and address for the public record and limit comments to five minutes or less. Questions? Call 757-253-6823.

The applications and plans are on file and may be viewed during normal office hours in the Stormwater and Resource Protection Division, 101-E Mounts Bay Road, James City County, Virginia.

**NOT FOR PUBLICATION**

DISPLAY: WEDNESDAY – December 30, 2020 and January 6, 2021.
ACCOUNT NO.: 0011350200 - VIRGINIA GAZETTE

COPIES: PLANNING
ASSISTANT COUNTY ATTORNEY
WETLANDS/CHESAPEAKE BAY BOARD MEMBERS

**General Services**
107 Tewning Road
Williamsburg, VA 23188
P: 757-259-4080
General.Services@jamescitycountyva.gov

**jamescitycountyva.gov**

**Capital Projects**
107 Tewning Road
Williamsburg, VA 23188
757-259-4080

**Fleet**
103 Tewning Road
Williamsburg, VA 23188
757-259-4122

**Stormwater and Resource Protection**
101-E Mounts Bay Road
Williamsburg, VA 23185
757-253-6670

**Facilities & Grounds**
113 Tewning Road
Williamsburg, VA 23188
757-259-4080

**Solid Waste**
1204 Jolly Pond Road
Williamsburg, VA 23188
757-565-0971

December 23, 2020

RE: WJPA 20-0038
8797 Pocahontas Trail
Carter's Grove Shoreline Stabilization Project – Living Shoreline

Dear Adjacent Property Owner:

In accordance with State and County Codes, this letter is to notify you that a request has been filed with the James City County Wetlands Board by VHB, Inc., on behalf of Carters Grove Associates, LLC, for encroachment into the tidal wetlands associated with the stabilization of the shoreline through the construction of a living shoreline. The project is located at 8797 Pocahontas Trail and further identified as JCC Parcel No. 5910100030.

A complete description, plan and other information are on file in the Stormwater and Resource Protection Division and are available for inspection during normal business hours, should anyone desire to review them.

The Wetlands Board will hold an advertised public hearing on **January 13, 2021 at 5:00 p.m.**, in the Board Room of Building F, 101 Mounts Bay Road, James City County, Virginia, at which time you may request to speak on the above referenced project.

Sincerely,

*Michael D. Woolson*

Michael D. Woolson
Wetlands Board Secretary
757-253-6823
michael.woolson@jamescitycountyva.gov

cc: Vanasse Hangen Brustlin, Inc., Mr. R. Neville Reynolds

MDW: jep

Mailing List for: WJPA-20-0038 – 8797 Pocahontas Trail – Living Shoreline at Carter's Grove and Drainage

Owner - 5910100030
5820100002 - 250 Ron Springs Dr
Carters Grove Associates LLC
70 West Madison Ste 4600
Chicago, IL 60602-4215

VHB, Inc.
Attn: Mr. Anthon Loubier
351 McLaws Circle, Suite 3
Williamsburg, VA 23185

5910100028 – 200 Ron Springs Rd
Colonial Investors, Inc
P.O. Box 1165
Williamsburg, VA 23187-1165

5910100029 - 150 Ron Springs Dr
150 Grove, LLC
P.O. Box 1165
Williamsburg, VA 23187-1165

5910200018H - 140 Ron Springs Dr
Remillard, Randy
16900 Holly Point Rd
Williamsburg, VA 23185-7643

5910200018I
5910200018D - 132 Ron Springs Dr
Joshua C Palmer, Jr.
138 Ron Springs Drive
Williamsburg, VA 23185-6014

5910200019- 118 Ron Springs Dr
Palmer, M Cornelius
69 Semple Farm Road
Hampton, VA 23666-1456

5910200018F - 136 Ron Springs Dr
5910200018E - 134 Ron Springs Dr
Joshua C Palmer, Sr. Estate
130 Ron Springs Drive
Williamsburg, VA 23185-6014

5910200008- 114 Ron Springs Dr
Cook, Milton, & Williams, Norrise
114 Magruder Avenue
Williamsburg, VA 23185

5910200018A - 128 Ron Springs Dr
5910200018C - 126 Ron Springs Dr
Ethelyn L Springs Estate
c/o Springs, Ethelyn L
2915 Snuggles Court
Toano, VA 23168-8943

5910200007A - 112 A Ron Springs Dr
Colonial Pipeline Co, Inc
P.O. Box 1624
Alpharetta, GA 30009-1624

5910200007D - 110 Ron Springs Dr
Bannister, Marjorie Lee
606 Tam O'Shanter Boulevard
Williamsburg, VA 23185-5922

5910200018K - 124 Ron Springs Dr
Moser, Hans W
3023 Edgewood Avenue
Parkville, MD 21234-4108

5910200018J
Sumter, Anthony & Amanda
122 Ron Springs Drive
Williamsburg, VA 23185-6014

5910200006
5910200006A - 8751 Pocahontas Tr
Wallace, Alfred, Sr. & Sissie V
104 Ron Springs Drive
Williamsburg, VA 23185-6007

5910200018
Smokstad, Taylor
120 Ron Springs Drive
Williamsburg, VA 23185-6014

5910100020 - 8758 Pocahontas Tr
Carters Cove, Inc
c/o Hudgins, George M, Jr.
203 The Maine
Williamsburg, VA 23185-1458

5910100021 - 8766 Pocahontas Tr
8766 Pocahontas, LLC
3625 Beech Down Drive
Chantilly, VA 20151-3382

5920100001 - 10 Gray Gables Dr
Newport Datsun
c/o Crumpler, Jacquelyn Q.
PO Box 1219
Kitty Hawk, NC 27949-1219

5910100023
Brennan, Rowsena & Seth
8774 Pocahontas Trail
Williamsburg, VA 23185-6026

5910100024A - 8776 Pocahontas Tr
SEJ Asset Management & Investment Company
1722 Routh St, Suite 1000
Dallas, TX 75201-2506

5940100003 - 8961 Pocahontas Tr
BASF Corporation
Attn: Tax Department
100 Park Avenue
Florham Park, NJ 07932-1049

5920100051
DYARRCC, Inc.
1708 Endeavor Drive
Williamsburg, VA 23185-6239

5910100011 - 8732 Pocahontas Tr
Wallace, George E, Jr., & Harrison, K & Addison, N
3 Colonnade Court
Hampton, VA 23666-6025

5910100017 - 8736 Pocahontas Tr
5910100018 - 8744 Pocahontas Tr
Keenan Palmer
P.O. Box 15356
Newport News, VA 23605-0026

5910100019 - 8750 Pocahontas Tr
Scarborough, Margaret
8750 A Pocahontas Trail
Williamsburg, VA 23185-6027

5920100003 - 8810 Pocahontas Tr
Heritage Community, LLC
486 Seaport Court, Suite 101
Redwood City, CA 94063-2730

5910400001A - 1900 Algonquin Tr
Pocahontas Square Townhouse Association, Inc
2310 Tower Place, Suite 105
Hampton, VA 23666-2481

5910400001B - 1899 Algonquin Tr
Pocahontas Square Townhouse Association, Inc
15064 Carrollton Blvd, Suite H
Carrollton, VA 23314-3577

5920300001A – 6.29 A
Brookside Haven Homeowners Association, Inc.
8979 Pocahontas Trail
Williamsburg, VA 23185-6243

5920100046 - 8901 Pocahontas Tr
Williamsburg-James City
County School Board
117 Ironbound Road
Williamsburg, VA 23185-2616

5920100054
Montrose, LLC
1737 Endeavor Drive
Williamsburg, VA 23185-6246

Virginia Marine Resource Center
Attn: Mr. Jeffrey P. Madden
380 Fenwick Road, Building 96
Fort Monroe, VA 23651-1064

VDOT
4451 Ironbound Road
Williamsburg, VA 23188-2621

VIMS Wetlands Program
Attn: Dawn Fleming
P.O. Box 1346
Gloucester Point, VA 23062-1346

5920100052 - 1720 Endeavor Dr
Tomco Williamsburg, LLC
4375 George Washington Memorial Hwy
Hayes, VA 23072-2822

Department of Game and Inland Fisheries
P.O Box 90778
Henrico, VA 23228-0778

Regulatory Branch Army Corps of Engineers
803 Front Street
Norfolk, VA 23510-1011

NOAA, National Marine Fisheries Service
Attn: David L. L'Brien
david.l.obrien@noaa.gov
Gloucester Point, VA

State Water Control Board
c/o Department of Environmental Quality
P.O. Box 1105
Richmond, VA 23218-1105

**AGENDA ITEM NO. F.1.**

**ITEM SUMMARY**

DATE: 1/13/2021

TO: Wetlands Board

FROM: Michael Woolson, Wetlands Board Secretary

SUBJECT: 2020 Year in Review

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**ATTACHMENTS:**

| | Description | Type |
|---|---|---|
| 🗋 | Presentation | Presentation |

**REVIEWERS:**

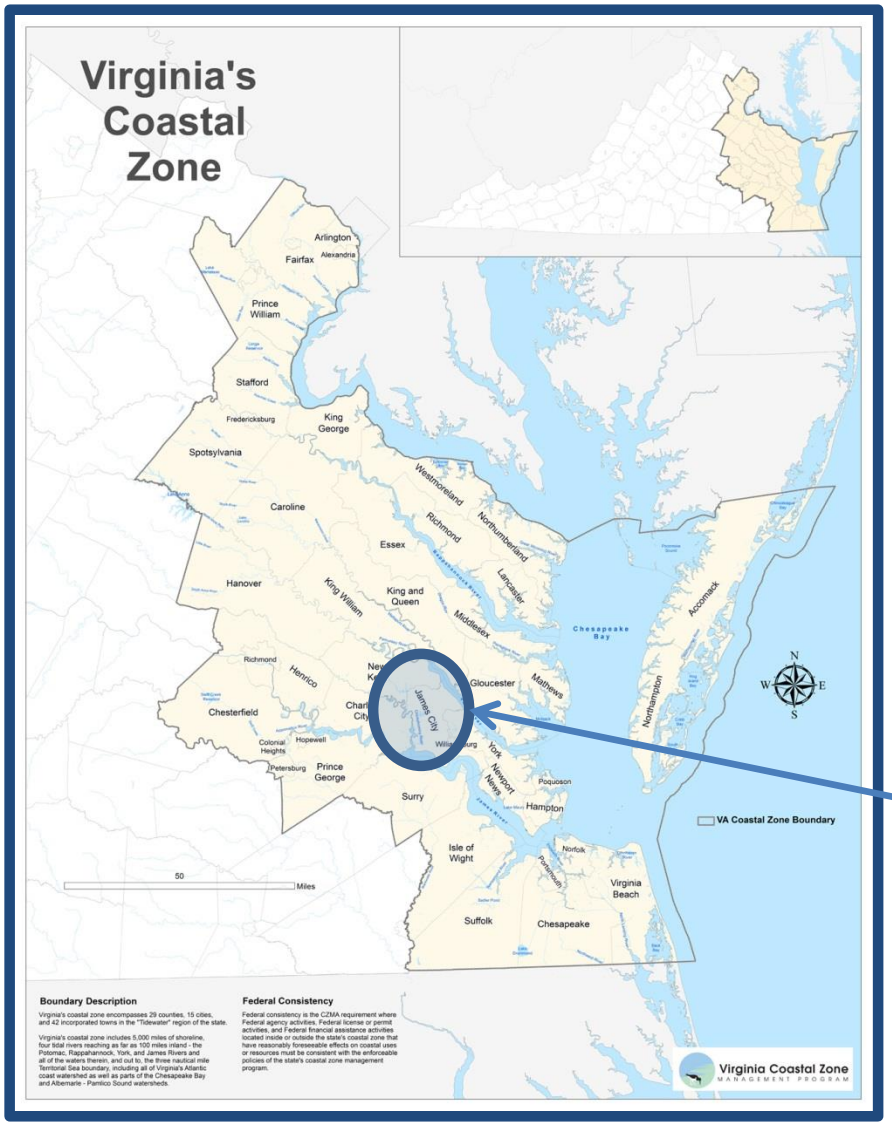
| Department | Reviewer | Action | Date |
|---|---|---|---|
| Wetlands Group | Woolson, Michael | Approved | 1/11/2021 - 12:42 PM |
| Wetlands Group | Small, Toni | Approved | 1/11/2021 - 2:15 PM |
| Publication Management | Daniel, Martha | Approved | 1/11/2021 - 2:33 PM |
| Wetlands Group | Secretary, Wetland | Approved | 1/11/2021 - 3:30 PM |

# Wetlands Board
# of James City County, Virginia

***January 13, 2021***

*End of Year Summary*

# Local Wetlands Program




**James City County is one of 34 counties and cities and two towns within Virginia' coastal zone.**

James City County

# Wetlands Program

| | | | |
|---|---|---|---|
| **Calendar Year 2020** | | | |
| WETLAND BOARD CASES | 15 | | |
| PERMIT EXTENSION | 1 | | |
| TOTAL | | **16** | |
| WETLAND – ADMINISTRATIVE | | 24 | |
| **Grand Total** | | | **40** |
| **Calendar Year 2019** | | | |
| WETLAND BOARD CASES | 9 | | |
| PERMIT EXTENSION | 3 | | |
| TOTAL | | **12** | |
| WETLAND – ADMINISTRATIVE | | 28 | |
| **Grand Total** | | | **40** |

End of Report