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## Pamunkey Indian Reservation Shoreline Management Plan

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*Pamunkey Indian Reservation  
Shoreline Management Plan*



*November 2019*

# Pamunkey Indian Reservation Shoreline Management Plan

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September 2019

## Table of Contents

Table of Contents .....	1
1 Introduction .....	2
2 Methods .....	3
3 Site Assessment .....	3
3.1 Habitats .....	4
3.2 Geology, Shoreline Morphology, and Shoreline Change .....	5
3.2 Hydrodynamics .....	6
4 Shoreline Management Planning.....	8
4.1 Phase 1 Project.....	9
4.2 Next Phase .....	13
5 Summary .....	17
6 References .....	18

Appendix A. Pamunkey Indian Reservation Living Shoreline Project Plans

Appendix B. Pamunkey Indian Reservation Living Shoreline Project Permits

Appendix C. Pamunkey Indian Reservation Living Shoreline Project Next Phase Conceptual Plans

# 1 Introduction

In 2015, the federal government officially recognized the Pamunkey Indian tribe. The tribe has a reservation located on the Pamunkey River in King William County (Figure 1-1) and is one of the nation's oldest, dating back to 1646 (Encyclopedia Virginia, 2015). The Reservation has about 13 miles of shoreline encompassing about 1,100 acres. According to the National Wetlands Inventory (US Fish and Wildlife Service, 2016), the Reservation has about 80 acres of freshwater emergent wetland and 530 acres of freshwater forested/shrub wetland. Approximately 90 people live on the Reservation and up to 600 people visit in a year.

The goal of this project that was funded by the 2017 Chesapeake Bay Small Watershed grant from the National Fish and Wildlife Foundation (NFWF) is to develop strategies for coastal resiliency along the Pamunkey Indian Reservation. This was achieved by evaluating the shoreline for coastal erosion issues. This plan applies living shoreline best management practices to the entire Reservation, though shore protection plans were only developed for inhabited areas and sections with eroding upland. In addition, two sections were identified as erosional areas of concern along the hatchery and boat ramp shorelines (Figure 1-1) and comprise Phase 1 of the overall shore protection system. Site 1 is located on the northwestern side of the reservation near where railroad tracks cross the Reservation and is adjacent to the boat ramp that the Tribe uses to access the River. Site 2 is on the eastern side of the peninsula where the fish hatchery is located. Phase 1 included the construction of low sills on these shorelines, also funded by the NFWF Small Watershed Grant. The plan establishes living shoreline best management practices which benefit local wildlife species and reduce sediment and nutrient inputs to the Bay. The protection at the boat ramp was necessary for the Tribe to have access to the River and provide recreational access as well.

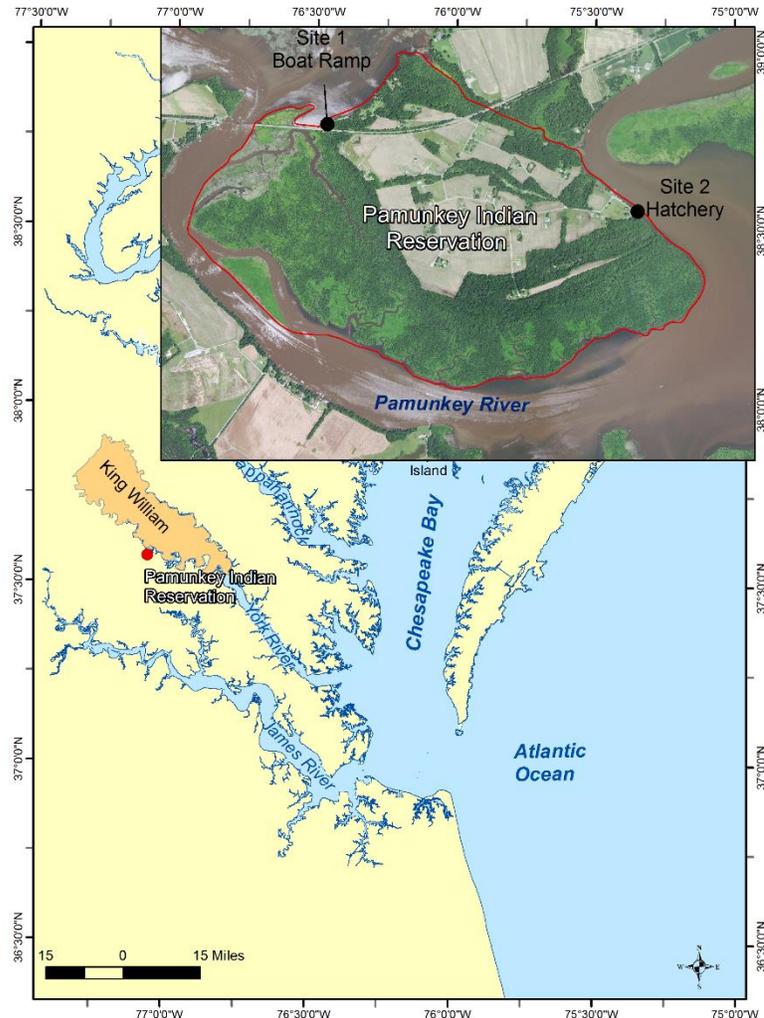


Figure 1-1. Location of Pamunkey Indian Reservation.

As a newly recognized Tribe, the Pamunkey Indians will be able to access future funding to protect and restore their shoreline. The plan will allow the Tribal Council to be proactive in terms of managing their shorelines so that vital habitats can be enhanced as well as improve the coast's resiliency to sea-level rise. This project will create/restore estuarine intertidal and riparian habitat, provide sustainable coastal hazards protection, and provide the structure to mitigate the effects of sea level rise. The desired restoration goal is a diverse coastal habitat supporting aquatic, terrestrial, and avian fauna while providing protection from storms and sea-level rise. Having a plan in place utilizing best management strategies will allow members to construct living shorelines that work on a reach basis rather than protecting individual sections with various strategies in order to promote environmental stewardship on the Reservation.

## 2 Methods

For the plan development, site-specific conditions were assessed using both new and existing data. Vertical and oblique aerial photography taken on 21 April 2018 was used to assess the entire Reservation shoreline. Vertical imagery was mosaicked so that it could be used in the geographic information system (GIS). In addition, historic shorelines from the Shoreline Studies Program Shoreline Change Database (Hardaway et al., 2018) and the Digital Shoreline Analysis System (DSAS) were used to determine the rates and patterns of shoreline change between 1937 and 2009. Other maps and databases including the geology of Virginia, Lidar, and submerged aquatic vegetation were used to determine site conditions.

The site was surveyed on 1 December 2017 using Real Time Kinematic (RTK) Global Positioning System (GPS). The survey was tied into horizontal and vertical survey control system (NAD 83 horizontal datum/NAVD 88 vertical datum) and adjusted to mean low water (MLW). Using this data, a shore protection design was created for sites 1 and 2 at the hatchery and at the boat ramp. The plans are shown in Appendix A. A Joint Permit Application was applied for based on this shore protection plan. It, along with the received permits, are shown in Appendix B.

## 3 Site Assessment

Elements to consider in planning shoreline protection include: existing habitats, underlying geology, historic erosion rate, wave climate, level of expected protection (which is based on storm surge and fetch), shoreline length, proximity of upland infrastructure (houses, roads, etc.), and the onsite geomorphology which gives an individual piece of property its observable character (e.g. bank height, bank slope). These parameters along with estimated cost help determine the management solution that will provide the best shore protection.

### 3.1 Habitats

The Pamunkey Indian Reservation lies on a peninsula that extends into the Pamunkey River and is bounded by a tight meander of the river. Together, the Pamunkey and Mattaponi Rivers support one of the largest complexes of brackish to tidal fresh marshes in North America. Silberhorn and Zacherle (1987) mapped the marshes along the Reservation. Most of the marshes are pocket marshes which are embayed in a tidal swamp (Figure 3-1).

They found that the yellow pond lily and arrow arum/pickerel weed communities have invaded previously unvegetated mudflats in several areas in this reach and are prevalent species. Other prevalent marsh species includes sweet flag and wild rice.

Extensive forested wetlands cover a significant portion of the waterway and are subject to tidal flooding. Tidal hardwood swamps occur along all of the major eastern Virginia rivers from the James River northward, but are most extensively developed along the Pamunkey and Mattaponi Rivers, where regular tidal inundation is unimpeded by levees or channel alteration (Figure 3-1). These swamp habitats are influenced by lunar tides, but diluting freshwater flows from upstream keep salinity levels below 0.5 ppt. Communities in this group are structurally complex, with semi-open overstories and diverse multiple lower strata. Rheinhardt (1992) found that along the Pamunkey River, five species of trees accounted for over 95% of the total area of forested wetlands. These were ash, swamp blackgum, red

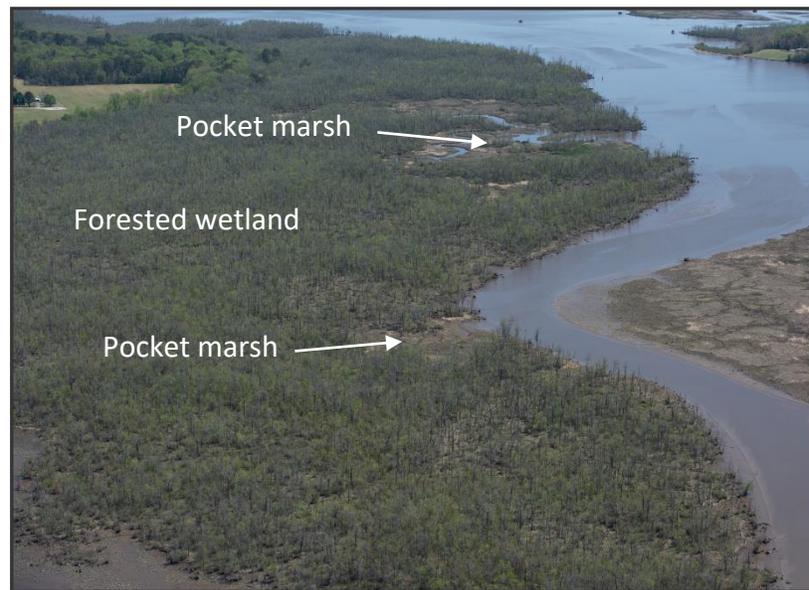


Figure 3-1. An extensive forested wetland occurs along the south of the peninsula on which the Pamunkey Indian Reservation occurs. Photo date: 21 Apr 2018.

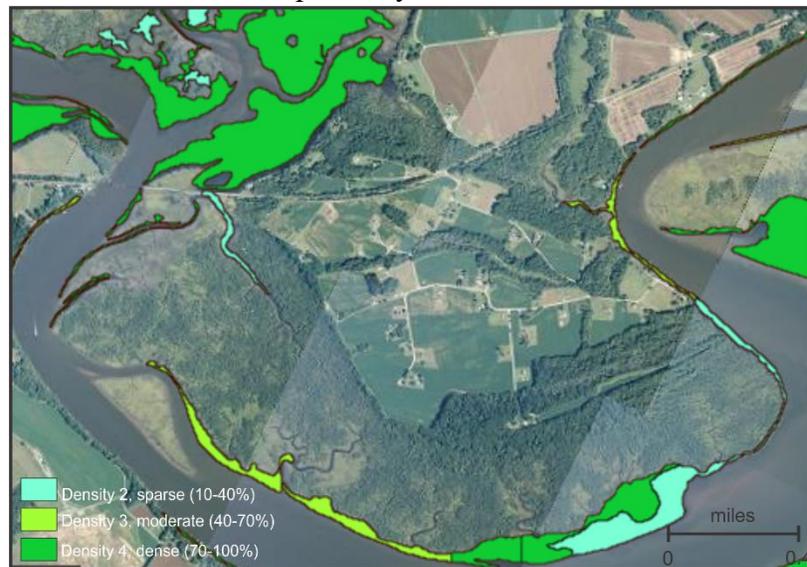


Figure 3-2. Submerged aquatic vegetation density distribution around the Reservation in 2018. From the VIMS SAV mapper.

maple, bald cypress, and sweetgum. However, overall, the Pamunkey River tidal swamps appear to be of two types: ash-blackgum and maple-sweetgum. The environmental differences between these two communities may be related to their flooding regimes.

Submerged aquatic vegetation (SAV) occurs along most of the Reservation shoreline (Figure 3-2). Data from the VIMS SAV program shows that in 2018, plant density varied between sparse to dense, though most of the shoreline is either moderate or dense. The SAV occurs directly adjacent to the shoreline both as narrow bands or extensively in the nearshore. These habitats along the Pamunkey River provide excellent spawning and nursery habitat for several anadromous fish species including river herring (both alewife and blueback herring), shad (American and hickory) and striped bass.

### 3.2 Geology, Shoreline Morphology, and Shoreline Change

The geology of the peninsula that the Reservation sits on is relatively new. Much of the forested swamps are located on Holocene alluvium (loose, unconsolidated sediment that has been eroded and redeposited) which has been deposited in the last 10,000 to 15,000 years (Figure 3-3). The Tabb Formation was deposited in the upper Pleistocene several hundred thousand years ago. It consists of several members including, from youngest to oldest, the Poquoson member, Lynnhaven member, and the Sedgefield member. These members are upward-fining sedimentary deposits, although the Lynnhaven member tends to be finer than the others. The Sedgefield Member of the Tabb Formation can be more than 60 ft deep where it fills old paleochannels and tends to be fine to medium sand (Peebles et al., 1984).

The elevations of the peninsula are reflective of its geology (Figure 3-4). The Holocene alluvium typically has elevations less than 2 ft NAVD88 (3.6 ft MLW). This area is the forested swamp that makes

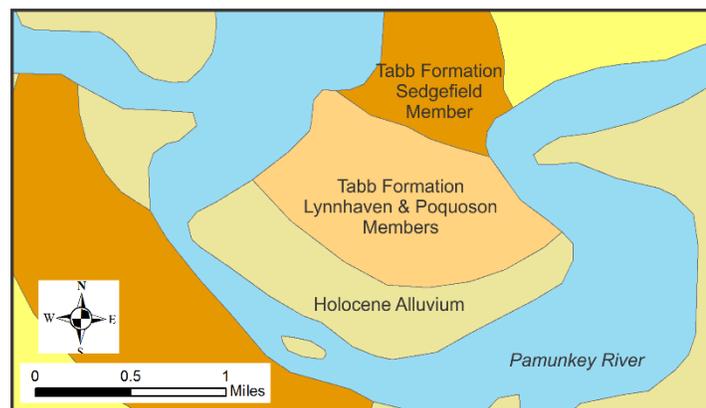


Figure 3-3. Geologic formations of the Pamunkey Indian Reservation. From Mixon et al., 1989.

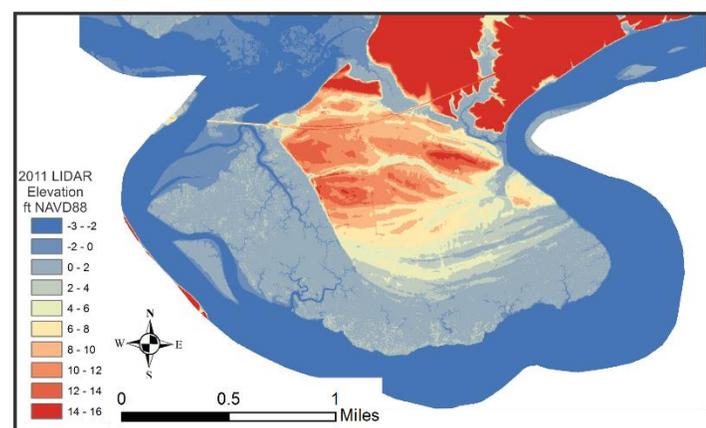


Figure 3-4. Lidar data taken of the Reservation in 2011. Elevations are in feet and relative to the North American Vertical Datum of 1988 (NAVD88).

up much of the southern portion of the peninsula. The Lynnhaven and Poquoson members of the Tabb Formation are higher with elevations ranging from 2-14 ft NAVD88 (3.6 ft-15.6 ft MLW). The older Sedgefield member has elevations greater than 16 ft NAVD88 (17.6 ft MLW).

Generally, the shoreline along the Reservation has a very low erosion rate (Figure 3-5). The rate varied between 0 and -1 ft/yr from 1937 to 2009 (Hardaway et al., 2018). Though low, erosion is occurring along the shoreline. The extensive swamp forests are eroding as evidenced by the fallen trees and exposed roots along the shoreline (Figure 3-6). The exception is the area near the railroad bridge on the western side of the peninsula. The offshore marsh island is disappearing at rates ranging from -1 ft/yr to -5 ft/yr (Figure 3-7).

### 3.2 Hydrodynamics

The Pamunkey River is relatively narrow and deep around the Reservation (Figure 3-8). At the narrowest points of the river, the channel can reach 30 ft to 40 ft deep. In the broader sections of the river, channel depths are much shallower ranging from 15 ft to 20 ft. The nearshore has a gentler slope in the broader sections of the river. The 6 ft contour can be 500 ft to 1,000 ft offshore. Tidal flats also can occur along these less energetic shorelines. Overall, with limited fetch distances of less than 1 mile, this section of the river can be considered low energy.

Tide range is 2.8 ft. MLW was determined to be 1.6 ft below NAVD88. Storm surge frequency elevations were determined by FEMA (2015) for King William County. A 10% event (10 yr) has an elevation of 7.1 ft MLW, a 2% even (50 yr) has an elevation of 8.2 ft MLW, a 1%

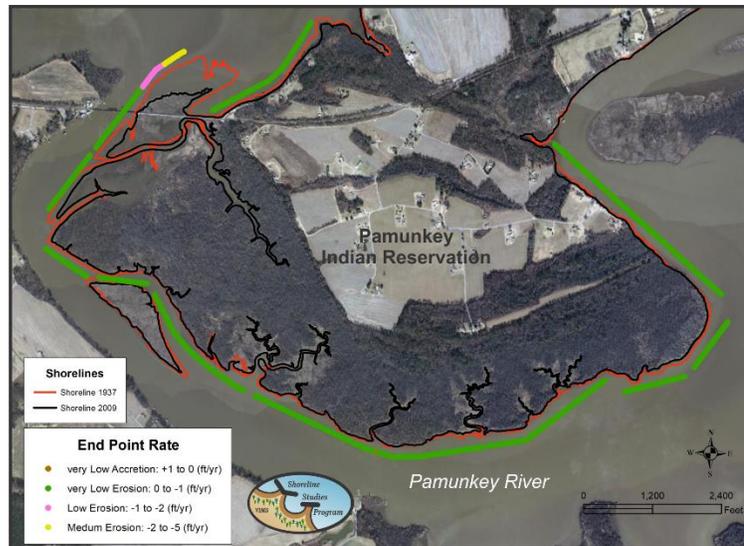


Figure 3-5. Shoreline erosion rates along the Reservation between 1937 and 2009 (Hardaway et al., 2018).



Figure 3-6. Eroding swamp forest along the Pamunkey River on the south side of the Reservation peninsula. Photo taken at low tide on 21 Apr 2018).

event (100 yr) has an elevation of 8.7 ft MLW, and a 0.2% event (500 yr) has an elevation of 11.9 ft MLW.

Sea-level rise was calculated by the National Oceanic and Atmospheric Administration (NOAA) for Yorktown, Virginia which is the closest tide gauge. At that gauge, sea-level is rising at about 4.76 mm/yr (1.56 ft/century). However, Holdahl and Morrison (1974) calculated that the lower portions of the Pamunkey and Mattaponi Rivers was sinking at a rate of 3.2 mm/yr (1.05 ft/century). This results in an accelerated rate of rise for the region making it difficult for marshes to maintain themselves in the face of sea-level rise.



Figure 3-7. Aerial photo looking south along the western shoreline of the Reservation toward the railroad bridge. The marsh island north of the bridge has a low to medium erosion rate. Photo taken at low tide on 21 Apr 2018.

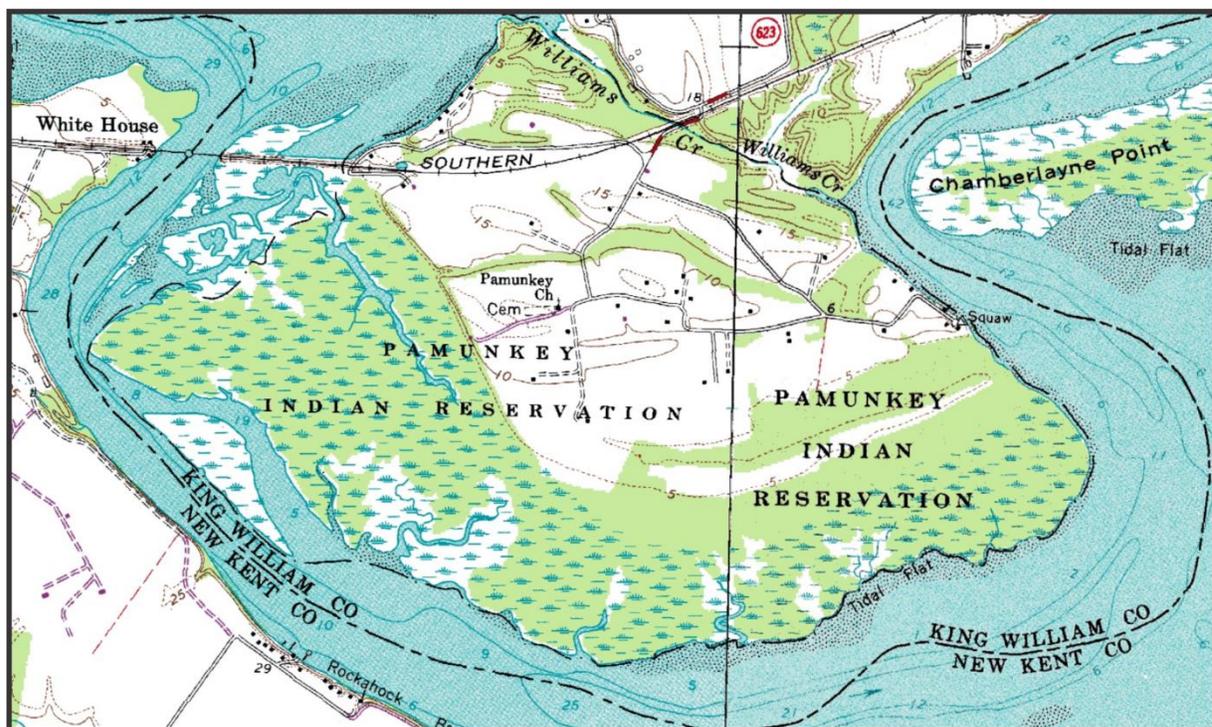


Figure 3-8. Topographic map of the Reservation peninsula.

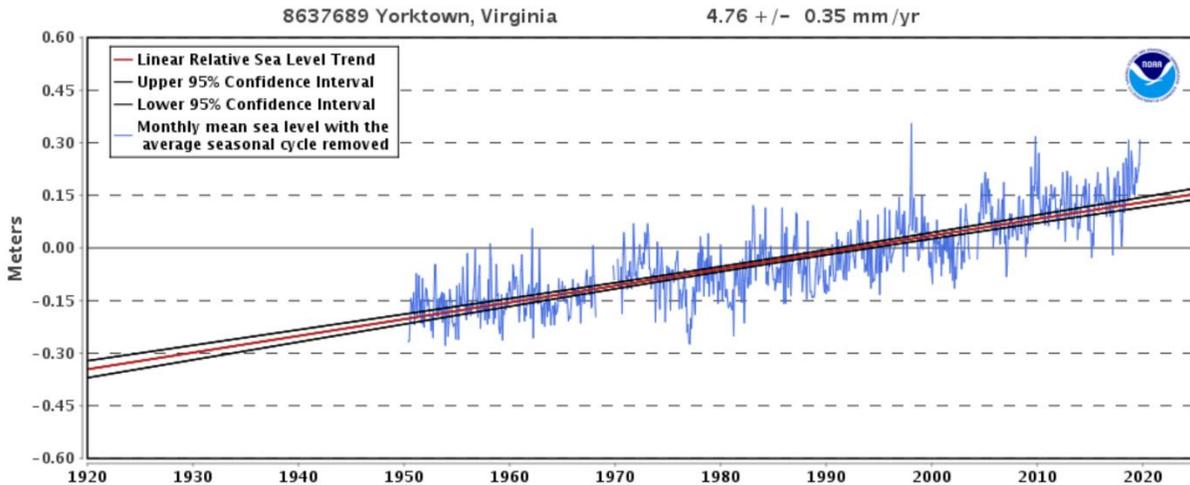


Figure 3-9. Sea-level rise at Yorktown, Virginia, the closest tide gauge to the Reservation. From NOAA Tides and Currents.

## 4 Shoreline Management Planning

Shoreline Best Management Practices (Shoreline BMPs) endeavor to create an erosion control option that minimizes impacts to ecological services while providing adequate protection to reduce erosion on a particular site. Best management practices were applied to all of the Reservation's 13 miles of shoreline. In many cases this could be the do-nothing approach along many areas of the extensive marsh and swamp forest shoreline. Along inhabited areas and areas with eroding upland, living shoreline strategy recommendations were made. These recommendations were included in the development of preliminary structural design to provide shoreline protection and habitat creation along eroding sections of the Reservation shoreline.

When fetch exposure increases beyond about 1,000 ft, as it is along much of the Reservation's shoreline, the intertidal marsh width generally is not sufficient to attenuate wave action. In these instances, the addition of sand can increase the elevation of the intertidal substrate as well as the backshore region. With increased wave exposure, the inclusion of some sand-retaining structure generally is required to prevent sand from being transported away from the site. This is where a marsh sill is appropriate.

The stone sill has been used extensively in the Chesapeake Bay over the years. It is a rock structure placed parallel to the shore so that a marsh can be planted behind it. Typically, the sand for the wetland substrate is placed on a slope approximating 10:1 from the base of the bank to the back of the sill (Hardaway et al., 2017). The elevation of the intersection of the fill at the bank and tide range will determine, in part, the dimensions of the sill system.

## 4.1 Phase 1 Project

Because Sites 1 and 2 (Figure 1-1) were pre-identified as areas of concern, they were targeted for shore protection and habitat rehabilitation. For this project, preliminary plans (30% design) were developed for use in permitting (Appendix B). Final construction plans were developed in consultation with the Tribe (Appendix A). These plans were used for construction. Two consultants assisted VIMS personnel with the plan development: Bayside Construction Management provided engineering consultation, and Wetlands Design and Restoration provided plant and planting specifications. The construction plans included Tribe volunteers to plant the grasses behind the structures. Coastal Design and Construction, Inc. from Gloucester County, VA was selected to build Phase 1 at a cost of \$118,000 in March 2019.

The project establishes a living shoreline BMP which will benefit local wildlife species and reduce sediment and nutrient inputs to the Bay. This plan creates/restores estuarine intertidal and riparian habitat, provides sustainable coastal hazards protection, and delivers the structure to mitigate the effects of sea level rise. The desired restoration goal is a diverse coastal habitat supporting aquatic, terrestrial, and avian fauna while providing protection from storms and sea-level rise. The construction of these sills at these sites resulted in the reduction of 63,080 lbs/year of sediment, 0.6 lbs/year of total phosphorus (TP), and 1509 lbs/year of total nitrogen (TN) entering the Bay through upland and marsh erosion. Along the length of Phase 1, approximately 5,365 ft<sup>2</sup> of restored freshwater marsh habitat were created and 2,678 ft<sup>2</sup> was protected.

Site 1 is located on the northwestern side of the reservation near where railroad tracks cross the Reservation. Site 1 is adjacent to the boat ramp that the Tribe uses to access the River (Figure 4-1). Erosion is threatening both the ramp and the road which is located immediately adjacent to the eroding bank (Figure 4-2). Along several sections of shoreline, a wide marsh fringe exists along the shoreline. In addition, a pond drains through a pipe to the river. Both of these were taken into consideration during the design process.

The construction plans are shown in Appendix A. Along the boat ramp shoreline, a series of sills with sand fill and marsh plantings were designed. Though the design included the entire shoreline extent shown in Figure 4-1, funding was only available to build one traditional



Figure 4-1. Extent of Site 1 area of concern that was used in Phase 1 of the project. Photo taken at low tide on 21 Apr 2018.

sill (Sill 1-1) (Figure 4-3), enhance the boat ramp with rocks on either side of the cement ramp, install innovative large stone sills (Sills 1-2, 1-3, and 1-4). Small rock was also placed along the bank near the pipe to protect the pipe and provide additional protection for the road because the shoreline had eroded dangerously close to it.



Figure 4-2. Ground photo of Site 1 at the boat ramp. A low eroding bank and marsh fringe occurs at the site. Photo date 28 Apr 2017.

The large stone sills that were conceived to provide shore protection while also preserving the marsh consisted of a line of large rocks placed along the shore and secured into the clay substrate (Figure 4-4). A traditional trapezoidal stone sill with sand fill would have covered the marsh. The marsh grasses were planted in June 2019 and took hold very well. After just one growing season, the marsh is full (Figures 4-5 & 4-6).



Figure 4-3. Post construction of sill 1-1 and the boat ramp at Site 1 before planting. Photo date 12 Apr 2019.

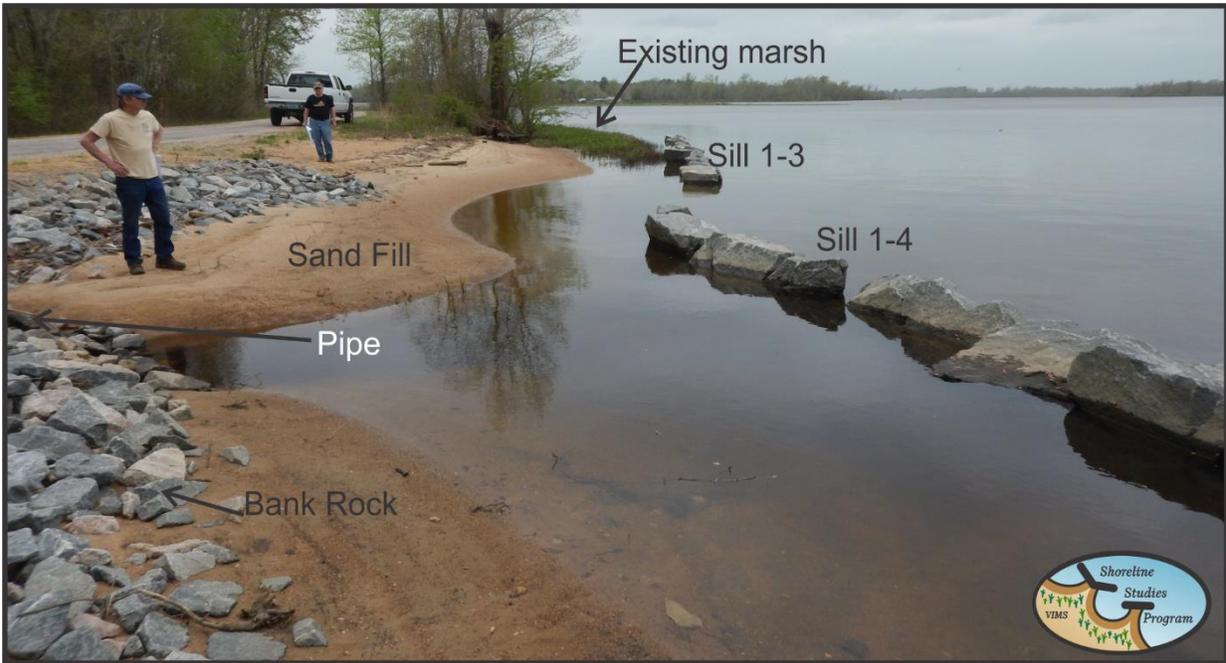


Figure 4-4. Post construction of sills 1-3 and 1-4 at Site 1 before planting. Photo date 12 Apr 2019.



Figure 4-5. Sill 1-1 at Site 1 after one growing season. Photo date 28 Sep 2019.



Figure 4-6. Sill 1-3 at Site 1 after one growing season. Photo date 28 Sep 2019.

Site 2 is on the northeast shoreline near the inhabited section of shoreline and the fish hatchery (Figure 1-1). A section of shoreline in front of a residence has a low, scarped, bank and little vegetation along the shoreline. Several trees have roots exposed and could be in danger of falling, creating more erosion of the bank. A series of sills with sand fill was designed for this section of shoreline near the hatchery (Appendix A). Due to funding constraints, only sills 1-1 and 1-2 were built as part of Phase 1 (Figure 4-7). After only one growing season, the marsh has filled in very well behind the sills (Figure 4-8).



Figure 4-7. Post construction of sills 1-1 and 1-2 at Site 2 near the hatchery before planting. Photo date 12 Apr 2019.

## 4.2 Next Phase

Much of the eroding shoreline along the Reservation is the swamp forest. Though this shoreline could be protected with sills like those installed in Phase 1, without infrastructure to protect, a do-nothing approach is reasonable for most of the Reservation shoreline. The only areas that are inhabited are at Site 1 and Site 2 (Figures 4-9 and 4-10). The next phase conceptual plans are shown in more detail in Appendix C.



Figure 4-8. Sill 1-3 at Site 2 after one growing season. Photo date 28 Sep 2019.

At Site 1, homes occur along the shoreline north of the Phase 1 project at the boat ramp. The shoreline is eroding, and some areas have exposed banks (Figure 4-11). As with the Phase 1 shoreline, a marsh fringe exists along the shoreline. For the next phase, the living shoreline sill projects can be extended from the boat ramp area. A combination of traditional sills and sand fill can be used in front of the houses at Site 1 (Figure 4-12). Between these sills, where the land is forested, the large single rock structures can be used to reduce the overall cost of the project. The typical cross-sections for these structures are shown in Figure 4-13. These structures are gapped to allow access to the water both to the residents and fauna.

The northern section of the Site 2 shoreline has an existing bulkhead that runs under the raised houses along the shoreline (Figure 4-14). Though not very visible in this photo, some marsh does exist in front of the bulkhead. Though most of this shoreline is protected, the marsh in front is being reduced. To preserve this habitat, the large, single rock sills are recommended for this section of shoreline (Figure 4-15). In addition, because the houses are located on the shoreline, it would be difficult to construct a traditional sill. The northernmost residence is not protected by a bulkhead. A large stone sill also is recommended here, although additional sand may be needed to raise the backshore elevation (Figure 4-13). This will depend on site conditions at the time of construction.

Some concern has been stated by members of the Tribe regarding several permitted structures along the southern section of Site 2 (Sills 2-1 and 2-2, shown in Appendix C). The area these structures are located is in the coastal region where the members have traditional dug clay for their pottery. This is an important cultural component of the Tribe. As such, these

structures can be modified to increase the gap and including small rock against the bank to reduce erosion of the upland. Alternatively, the sills could be replaced with a revetment; however, this would require a permit modification.

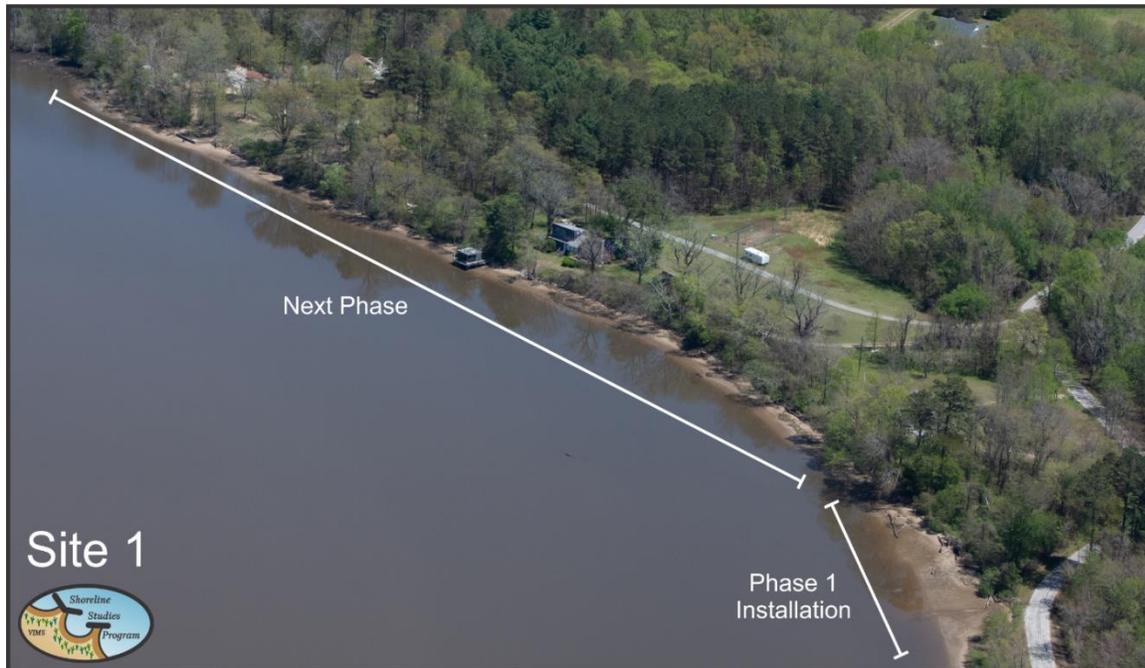


Figure 4-9. Residential properties along the northern section of Site 1. Photo date 21 Apr 2018.



Figure 4-10. Residential properties along the northern section of Site 2. Photo date 21 Apr 2018.



Figure 4-11. Eroding shoreline along the northern section of Site 1 near the residential properties. Photo date 19 July 2019.

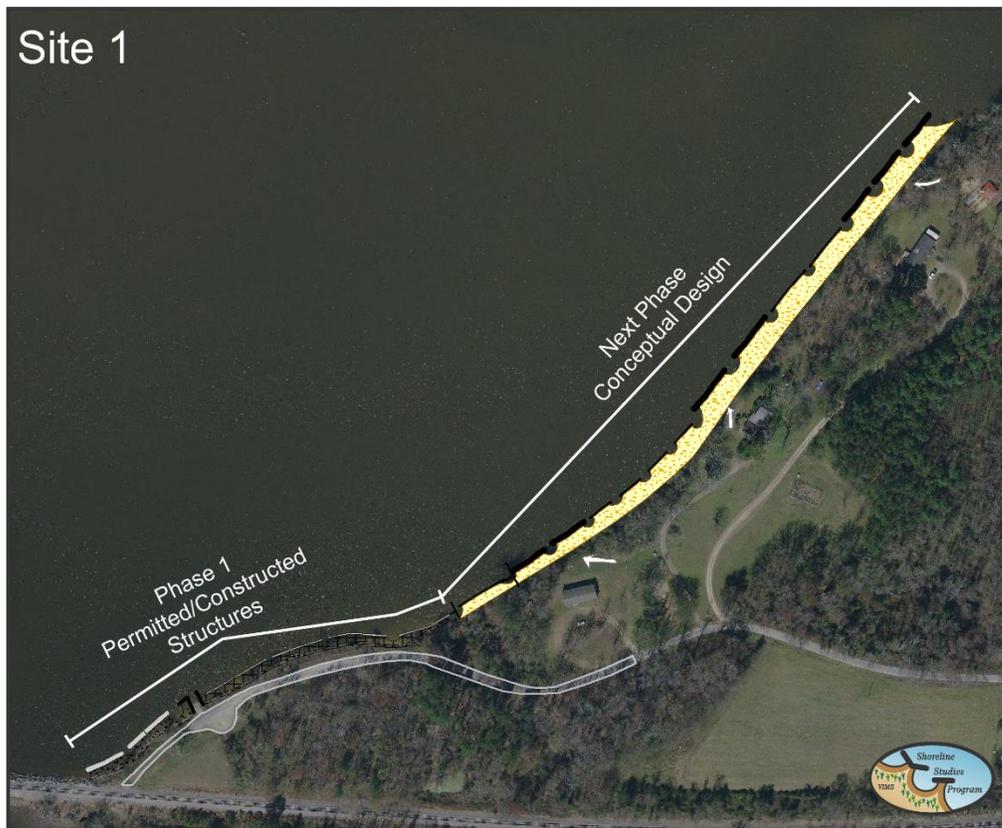


Figure 4-12. Conceptual design of traditional sills and large single rock sills for the northern section of Site 1 for the next phase.

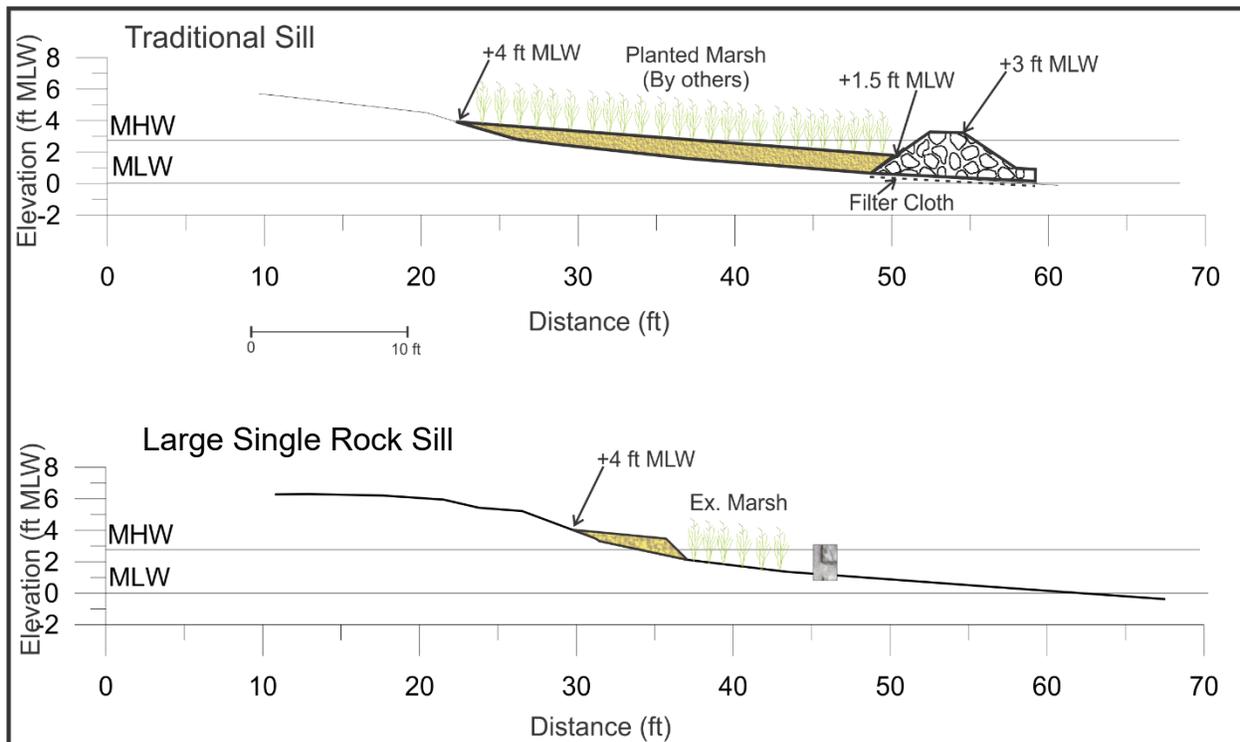


Figure 4-13. Site 1 and Site 2 typical cross-sections.

For the structures that are already permitted (as shown in Appendix B) at the boat ramp and the hatchery, the estimated cost to construct is \$255,000. For the construction of structures along the northern sections of Site 1 and 2, the cost is about \$510,000 at the boat ramp and \$240,000 at the hatchery. The total amount needed to fully



Figure 4-14. The northern section of Site 2 is protected by a bulkhead. Some marsh exists in front of the structure. Photo date 28 Apr 2017.

protect those inhabited eroding sections of the reservation is \$1,005,000. If all these structures are constructed as designed/permitted, they will result in the creation of 57,700 ft<sup>2</sup> of marsh and the enhancement of 20,000 ft<sup>2</sup> of marsh.



Figure 4-15. Conceptual design of large single rock sills for the northern section of Site 2 for the next phase.

## 5 Summary

The holistic approach to shoreline management as well as assessing waterfront properties on a reach basis has been the guiding philosophy at VIMS for many years (Hardaway & Byrne, 1999). Moving forward with emphasis on sediment reduction and coastal resiliency has been the foundation of the project along the Reservation coast. The completed sections of the project are providing the shore erosion control and habitat enhancement that was envisioned from the beginning of this project. Implementation of the next phase will complete the upland shore protection and habitat restoration goals of this shoreline management plan.

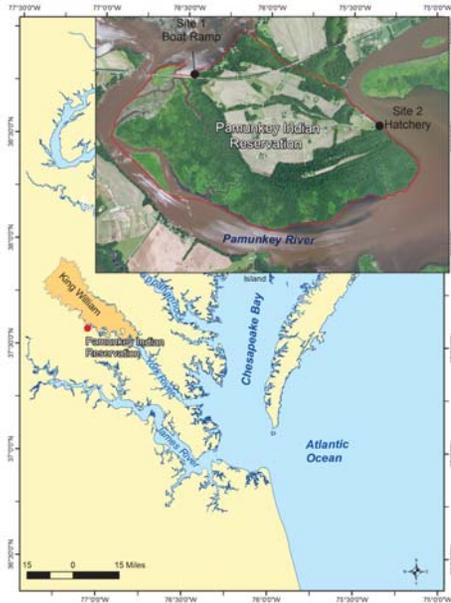
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## **Appendix A**

Pamunkey Indian Reservation  
Living Shoreline Project Plans

# Pamunkey Indian Reservation Living Shoreline Project



## GENERAL NOTES

1. Mean tide range is 2.8 ft (1983-2001)
2. Horizontal control was established by Real Time Kinematic Global Positioning System (RTK-GPS) and is shown in UTM, zone 18, NAD83, *ifl*.
3. Vertical control is MLW, MLW (1983-2001) was determined to be 1.5 ft below NAVD88 at the Hatchery site and 1.7 ft below NAVD88 at the Boat Ramp.
4. Topographic data obtained on 1 December 2017 using RTK-GPS.
5. All dimensions and coordinates are given in feet.
6. Plans were created in Esri ArcGIS.

## CONSTRUCTION SCHEDULE FOR SEDIMENT AND EROSION CONTROL

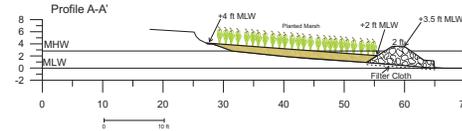
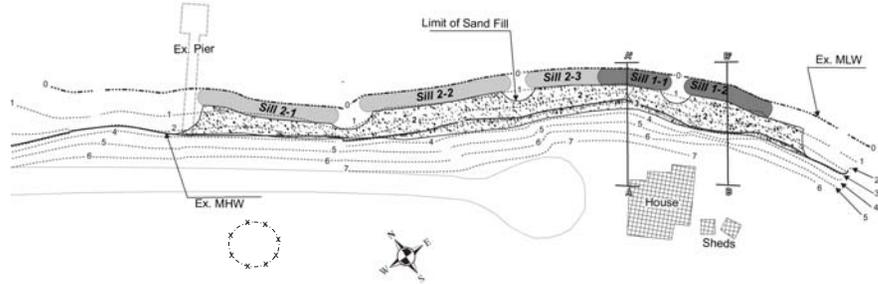
1. Contractor to notify VIMS of the date construction is to begin at least seven (7) days prior to the date (Time Frame = 1 day).
2. Install silt fences, erosion and sediment control measures and turbidity curtain, as needed (1 day).
3. Remove all debris interfering with shoreline construction as construction proceeds (continuous). Clear trees and underbrush within designated areas as construction proceeds (continuous). Disposal on site.
  1. Install stone sills.
  2. Install bank rock and associated HDPE plastic drain pipe.
  3. Place sand as a vegetative terrace.
  4. Plant vegetative planting terrace as specified (by others).
5. Stabilize and seed all upland disturbed areas as specified.
6. Remove turbidity curtain (1 day).
7. After establishment of vegetative cover on site, remove silt fence and other erosion and sediment control measures.

## Index

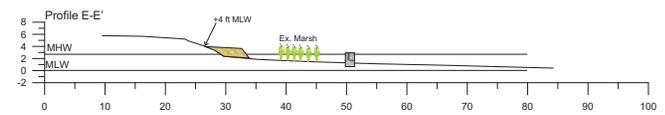
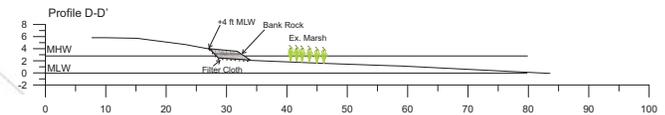
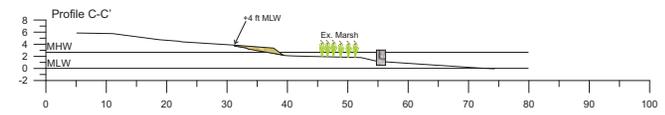
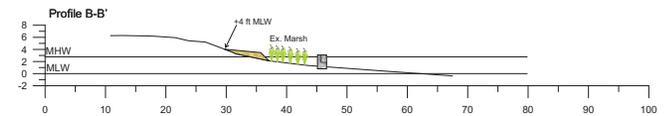
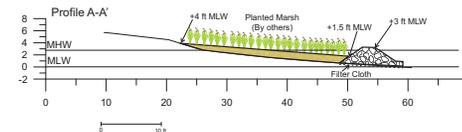
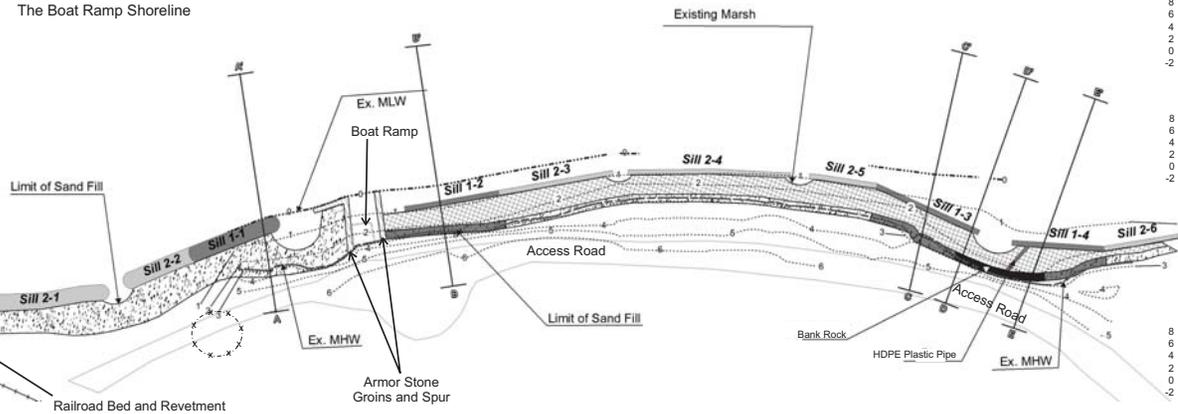
No.	Drawing Title
	Cover Sheet
Sheet 1	Plan and Cross-sections
Sheet 2	Erosion and Sediment Control



The Hatchery Shoreline



The Boat Ramp Shoreline



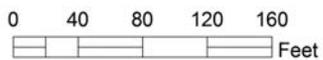
Legend

Existing

- Railroad
- Profile
- Contours
- Ex. MLW
- Ex. MHW
- Boat Ramp
- Bank Rock
- Road

Proposed

- Limit of Fill - Phase I
- Limit of Fill - Phase II
- Marsh
- Silt - Phase I
- Silt - Phase II
- Stone Spur/Groin - Phase II
- Stockpile with Silt Fence



Project Title  
Pamunkey Living Shoreline Subproject

Issued for  
Final Plan  
Drawing Title  
Plan and Baseline

Date  
16 Jan 2019  
Scale  
Plan 1"=40'  
Sheet  
1 of 2  
Cross-Section 1"=10'

**Virginia Erosion and Sediment Control Notes (VAESCH)**

ES-1: Unless otherwise indicated, all vegetative and structural erosion and sediment control practices will be constructed and maintained according minimum standard and specifications of the Virginia erosion and sediment control handbook and the Virginia erosion and sediment control regulations (9VAC25-840)

ES-2: VIMS must be notified one week prior to the pre-construction conference, one week prior to the commencement of the land disturbing activity and one week prior to the final inspection. The name of the responsible land disturber must be provided to the plan approving authority prior to actual engagement in land-disturbing activity shown on the approved site plan. If the name is not provided prior to engaging in the land-disturbing activity, the plan's approval will be revoked.

ES-3: All erosion and sediment control measures are to be placed prior to or as the first step in clearing.

ES-4: A copy of the Virginia erosion and sediment control handbook shall be maintained on the site at all times.

ES-5: Prior to commencing land disturbing activities in areas other than indicated on these plans (including, but not limited to, off-site borrow or water areas), the contractor shall submit a supplementary erosion control plan to the owner for review and approval by the plan approving authority.

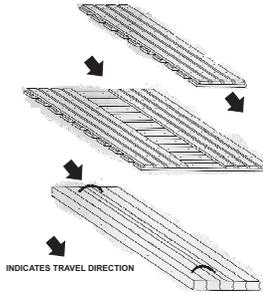
ES-6: The contractor is responsible for installation of any additional erosion control measures necessary to prevent erosion and sedimentation as determined by the plan approving authority.

ES-7: The contractor shall inspect all erosion control measures at least weekly and immediately after each runoff-producing rainfall event. Any necessary repairs or cleanup to maintain the effectiveness of the erosion control devices shall be made immediately.

ES-8: The contractor is responsible for the daily removal of sediment that has been transported onto a paved or public road surface.

ES-9: The contractor shall be responsible for preventing surface and air movement of dust from exposed soils which may present health hazards, traffic safety problems, or harm animal or plant life.

ES-10: All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local program. Trapped sediment and disturbed soil areas resulting from the disposition measures shall be permanently stabilized to prevent further erosion and sedimentation.



LOGGING MAT: (if needed)

**Definition:**

A logging mat is a portable fabrication usually of boards or timbers held together by bolts or cable to provide temporary protection of a forest harvest entrance or haul road.

**Purpose:**

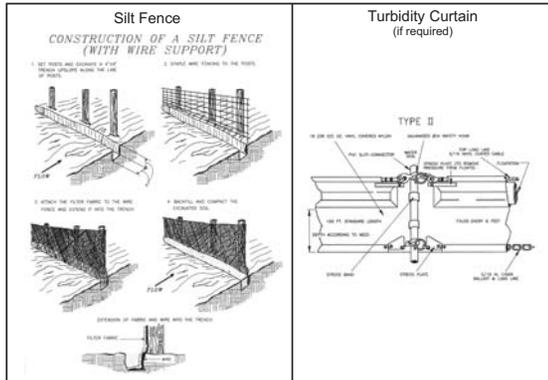
This practice protects the surface soil structure from excessive compaction and rutting.

**Conditions where practice applies:**

This practice applies to any part of the forest harvest access system where rutting could be an erosion or water handling problem. It is often used as a substitute for stone or other stabilization materials at the entrance of a forest harvest site and isolated wet areas on haul roads or skid trails. They are also used to access shoreline construction sites.

**Specifications:**

1. Mats shall be placed end to end to form a continuous span for the entire length of the area to be protected.
2. Mats can be used as substitute for or in conjunction with stone, gravel, wood chips, culverts, and other stabilizing material at the entrance to the harvest site.
3. Mats shall be inspected frequently and maintained or replaced as necessary to ensure their proper function.



Project Title  
Pamunkey  
Living Shoreline Subproject

Issued for  
Final Plan  
Drawing Title  
Erosion and Sediment Control

Date  
16 Jan 2019 Scale

Sheet  
2 of 2

**Appendix B**  
Pamunkey Indian Reservation  
Living Shoreline Project  
Submitted Joint Permit Application  
Permit Letters Received

Note: some personal information was redacted

Randy Owen  
2600 Washington Ave., 3<sup>rd</sup> Floor  
Newport News, VA 23607

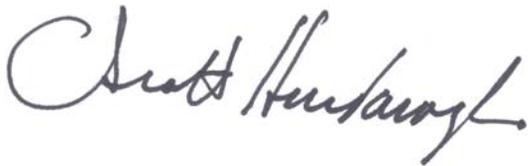
7 September 2018

Dear Mr. Owen,

Please find enclosed an application for two shore protection project permits for the Pamunkey Indian Reservation. This project is being funded through a grant by the National Fish and Wildlife Foundation. VIMS, in conjunction with the tribal council, have created a proposed system that will protect the shoreline.

If you have any questions, please contact Scott Hardaway at 804-684-7596 or Kathryn MacCormick at 513-885-5289.

Thanks you,



C. Scott Hardaway, Jr.  
Professional Faculty  
Shoreline Studies Program  
Department of Physical Science  
Virginia Institute of Marine Science  
William & Mary

- ❖ 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](http://ccrm.vims.edu/permits_web/guidance/local_wetlands_boards.html).

<b>FOR AGENCY USE ONLY</b>	
	Notes:
	JPA #

## APPLICANTS

### Part 1 – General Information

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

<b>County or City in which the project is located:</b> _____				
<b>Waterway at project site:</b> _____				
<b><i>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)</i></b>				
Historical information for past permit submittals can be found online with VMRC - <a href="https://webapps.mrc.virginia.gov/public/habitat/">https://webapps.mrc.virginia.gov/public/habitat/</a> - or VIMS - <a href="http://ccrm.vims.edu/perms/newpermits.html">http://ccrm.vims.edu/perms/newpermits.html</a>				
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

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) \_\_\_\_\_

## Part 1 - General Information (continued)

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.

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

(\_\_\_\_) \_\_\_\_\_

## Part 1 - General Information (continued)

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):

Site 1 \_\_\_\_\_ / - \_\_\_\_\_ (Example: 36.41600/-76.30733)

Site 2 37.57514 -76.99107

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.”

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.*

## Part 1 - General Information (continued)

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.

## 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.

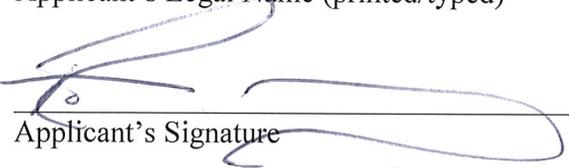
**CERTIFICATION:** I am hereby applying for all permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project 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.

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.

Robert Gray

\_\_\_\_\_  
Applicant's Legal Name (printed/typed)

\_\_\_\_\_  
(Use if more than one applicant)

  
\_\_\_\_\_  
Applicant's Signature

\_\_\_\_\_  
(Use if more than one applicant)

*5 Sep 18*  
\_\_\_\_\_  
Date

*see above*  
\_\_\_\_\_  
Property Owner's Legal Name (printed/typed)  
(If different from Applicant)

\_\_\_\_\_  
(Use if more than one owner)

\_\_\_\_\_  
Property Owner's Signature

\_\_\_\_\_  
(Use if more than one owner)

\_\_\_\_\_  
Date

## Part 2 – Signatures (continued)

### 2. Applicants having agents (if applicable)

#### CERTIFICATION OF AUTHORIZATION

I (we), Robert Gray, hereby certify that I (we) have authorized Kathryn MacCormick  
(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.

Kathryn MacCormick  
(Agent's Signature)

\_\_\_\_\_  
(Use if more than one agent)

9/5/18  
(Date)

[Signature]  
(Applicant's Signature)

\_\_\_\_\_  
(Use if more than one applicant)

5 Sep 18  
(Date)

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

#### CONTRACTOR ACKNOWLEDGEMENT

I (we), \_\_\_\_\_, have contracted \_\_\_\_\_  
(Applicant's legal name(s)) (Contractor's name(s))  
to perform the work described in this Joint Permit Application, signed and dated \_\_\_\_\_.

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

\_\_\_\_\_  
Contractor's name or name of firm

\_\_\_\_\_  
Contractor's or firms address

\_\_\_\_\_  
Contractor's signature and title

\_\_\_\_\_  
Contractor's License Number

\_\_\_\_\_  
Applicant's signature

\_\_\_\_\_  
(use if more than one applicant)

\_\_\_\_\_  
Date

## Part 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](http://ccrm.vims.edu/coastal_zone/living_shorelines/index.html).**

- 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:

	Site 1	Site 2
2. What is the maximum encroachment channelward of mean high water? _____ feet.		32 ft
Channelward of mean low water? _____ feet.		0 ft
Channelward of the back edge of the dune or beach? _____ feet.		0 ft
	Site 1	Site 2
3. Please calculate the square footage of encroachment over:		
• Vegetated wetlands _____ square feet	3,102 sqft	
• Non-vegetated wetlands _____ square feet	7,468 sqft	
• Subaqueous bottom _____ square feet	0 sqft	
• Dune and/or beach _____ square feet	0 sqft	

- 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.

### 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 \_\_\_\_\_  
 Large stone sill    1,000 pounds per stone    Class size III

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

	Site 1	Site 2
• Volume of material	_____ cubic yards channelward of mean low water	0
	_____ cubic yards landward of mean low water	740 cy
	_____ cubic yards channelward of mean high water	703 cy
	_____ cubic yards landward of mean high water	37 cy
• Area to be covered	_____ square feet channelward of mean low water	0
	_____ square feet landward of mean low water	6,781 sqft
	_____ cubic yards channelward of mean high water	5,671 sqft
	_____ cubic yards landward of mean high water	1,110 sqft

- 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>:

## Attached Sheet

### #4 Pamunkey Indian Reservation

Two sites on the Pamunkey Indian Reservation have been identified as erosional and in need of shore protection. The entire project will be built in two phases. The first phase has been funded and will be constructed in winter 2019 while funding is being sought for Phase 2. Rock sills and groins will be used for this project. It is anticipated that the material will be placed with an excavator. The project consists of clean sand and armor stone. Minor tree clearing may be required at both sites.

#### Site 1: Boat Ramp

Site 1 is 750 feet long, faces north and is located at the only boat ramp that exists on the Reservation. The project site has some existing marsh grass; as such, sand fill will be limited to the base of the bank in some sections. Access will be via land from the road leading to the boat ramp. In some areas, the road is close to the erosional bank. No grading will occur as the bank is low. Rock and sand will be temporarily stockpiled at the end of the road near the railroad bed.

#### Site 2: Hatchery

Site 2, along the residential shoreline near the Hatcher, is located on the east side of the Reservation. The project site is 400 feet long and is designed for shore protection. Access will be via land from the road. No grading will occur. Rock and sand will be temporarily stockpiled across the street from the project site in an open field.

### Appendix B.1 Pamunkey Indian Reservation

#### Site 1: Boat Ramp

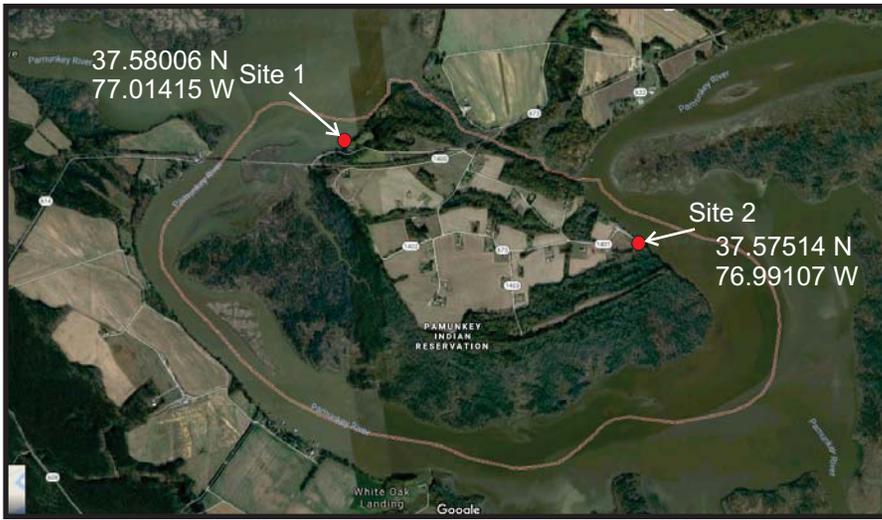
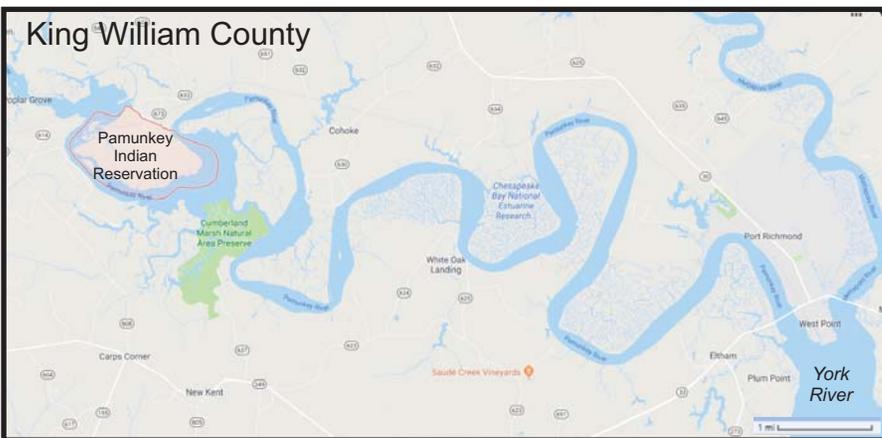
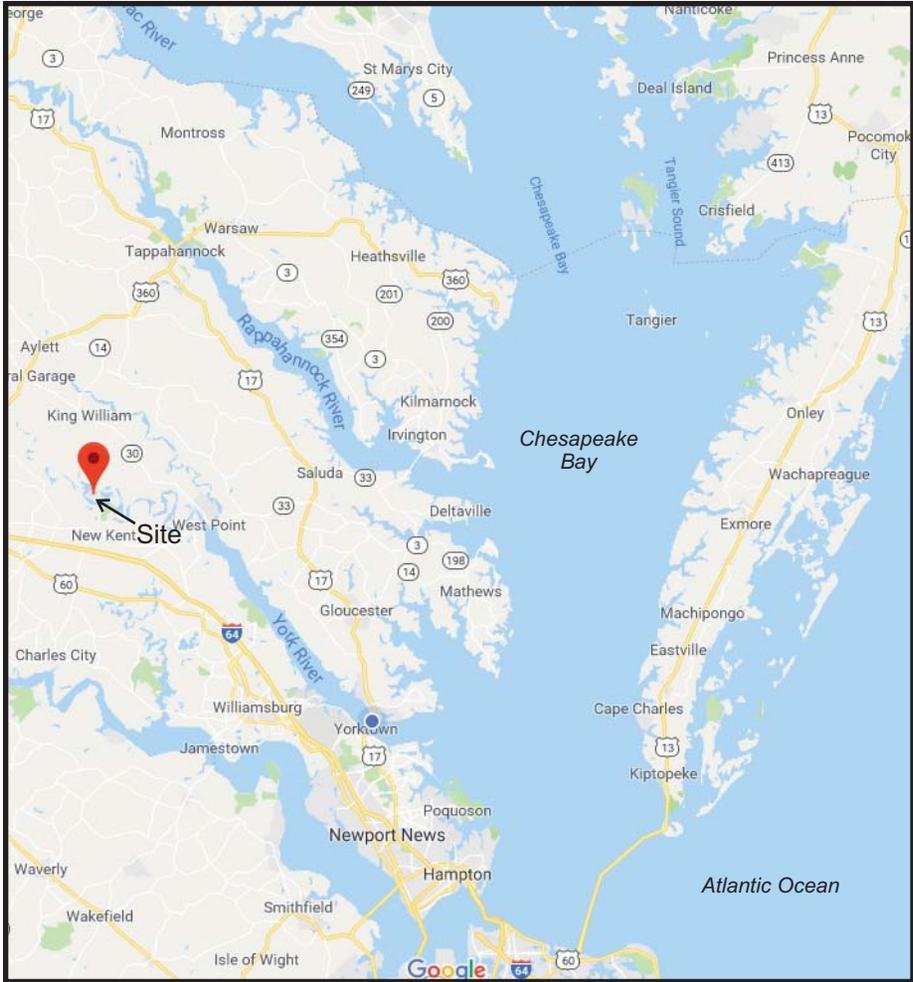
The project at the boat ramp consists of two rock sills with sand fill and marsh grass plantings west of the boat ramp where the shoreline is significantly scarped (Sills 1 and 2). Sill 1 will interface with the railroad bed revetment. Sills 3-6 will be built east of the boat ramp. These will not be conventional sills, but will consist of a single row of armor rock placed along the shoreline. Due to bottom conditions, building a traditional sill in this area would be difficult. A great deal of existing marsh occurs along this shoreline which would have to be covered by a sand road in order for a conventional sill to be constructed from land. It is too shallow to build from the river side. A single armor stone will be placed along the shoreline and pushed into the bottom for stability. Sand will be placed only along the back shore to interface with the eroding bank and planted. In the area of the gap between Sills 5 and 6, rock will be placed along the bank to protect the boat ramp access road which comes close to the shoreline in that area. The boat ramp will be enhanced with rock groins and a spur on the western side to interface with Sill 2.

#### Site 2: Hatchery

The project at the Hatchery consists of four rock sills, sand fill, and marsh grass plantings in front of two houses. The sills extend from the existing pier east.

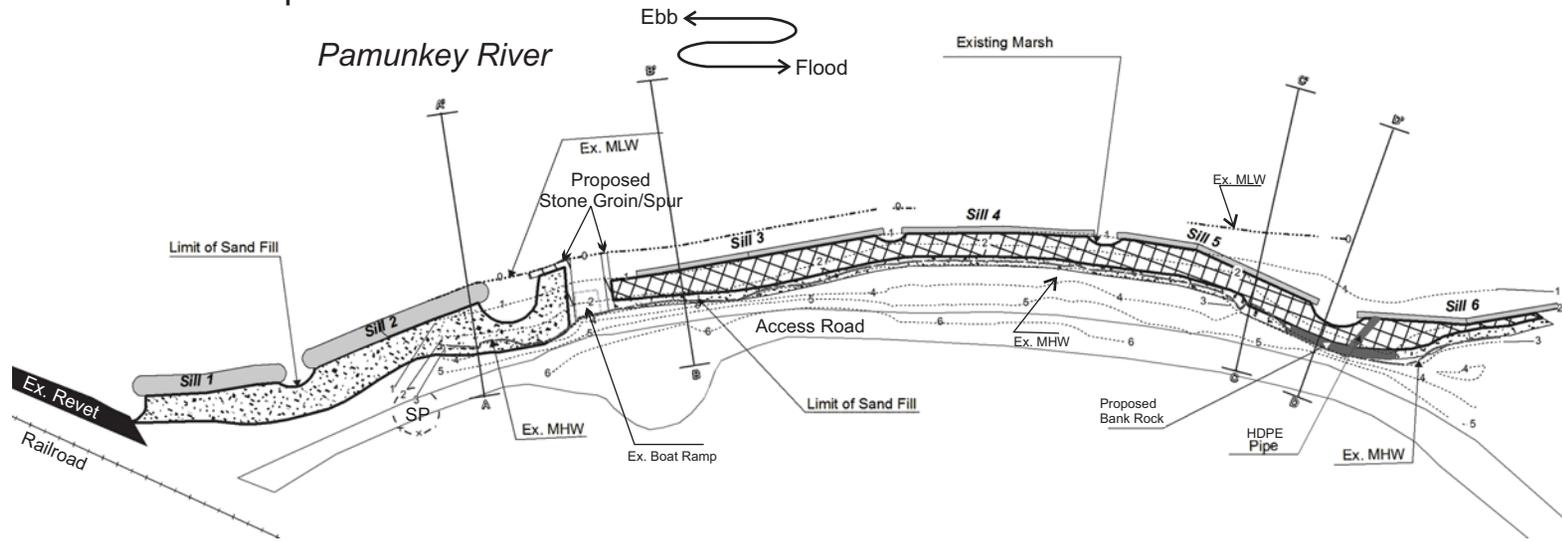
Pamunkey Living Shoreline														
Site 1: The Boat Ramp														
4573			<b>Habitat Created</b>		<b>Encroachment</b>		<b>Impacts: Rock</b>			<b>Impacts: Sand</b>				<b>Existing Marsh</b>
	Structure	Length	Low Marsh	High Marsh	Max MHW	Max MLW	Vegetated Wetlands	Nonveg Wetlands	Subaqueous Bottom	Veg. Wetlands	Nonveg Wetlands	Area		Preserved
	Name	Type (ft)	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft)	(ft)	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	<MLW (ft <sup>2</sup> )	>MLW (ft <sup>2</sup> )	(ft <sup>2</sup> )
	Sill 1	Sill	80	1,040	1,040	27		797		592	604		1,196	
	Bay A	Bay	10		213			0		344	88		432	
	Sill 2	Sill	103	1,339	1,339	32		1,023		936	859		1,795	
	Bay B	Bay	22	416	416			0		64	473		537	
	Boat Ramp Spur/Groin	Groin/Spur						171		165	271		436	
	Boat Ramp Groin	Groin					30	100		0			0	
	Bay C	Bay	14					0		68			68	148
	Sill 3	Sill	136			24		418		629			629	1814
	Bay D	Bay	10					0		79			79	163
	Sill 4	Sill	100			20		330		446			446	1,151
	Bay E	Bay	12					0		89			89	217
	Sill 5	Sill	112			22		366		477			477	1,471
	Bay F	Bay	21					0		0			0	200
	Sill 6	Sill	105			38		340		402			402	776
	Bank Rock	Revetment	57				282	0		0				354
	<b>Total</b>		<b>782</b>	<b>2,795</b>	<b>3,008</b>			<b>312</b>	<b>3,545</b>		<b>4,291</b>	<b>2,295</b>	<b>6,586</b>	<b>6,294</b>

Pamunkey Living Shoreline													
Site 2: The Hatchery													
33,102			<b>Habitat Created</b>		<b>Encroachment</b>		<b>Impacts: Rock</b>			<b>Impacts: Sand</b>			
		Length	Low	High	Max	Max	Vegetated	Nonveg	Subaqueous	Veg.	Nonveg	Area	
Structure	Structure		Marsh	Marsh	MHW	MLW	Wetlands	Wetlands	Bottom	Wetlands	Wetlands	<MLW	>MLW
Name	Type	(ft)	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft)	(ft)	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )	(ft <sup>2</sup> )
Sill 1	Sill	94	564	564	30	0	0	1,016	0	921	281	0	1,202
Bay A	Bay	15		150	0	0	0	0	0	33	210	0	243
Sill 2	Sill	100	1,000	1,000	28	0	0	1,086	0	528	1,313	0	1,841
Bay B	Bay	10		150	0	0	0	0	0	156	238	0	394
Sill 3	Sill	96	1,460	1,460	26	0	0	1,041	0	577	846	0	1,423
Bay C	Bay	8		80	0	0	0	0	0	198	82	0	280
Sill 4	Sill	60	600	600	32	0	0	646	0	689	709	0	1,398
<b>Total</b>		<b>383</b>	<b>3,624</b>	<b>4,004</b>			<b>0</b>	<b>3,789</b>	<b>0</b>	<b>3,102</b>	<b>3,679</b>	<b>0</b>	<b>6,781</b>

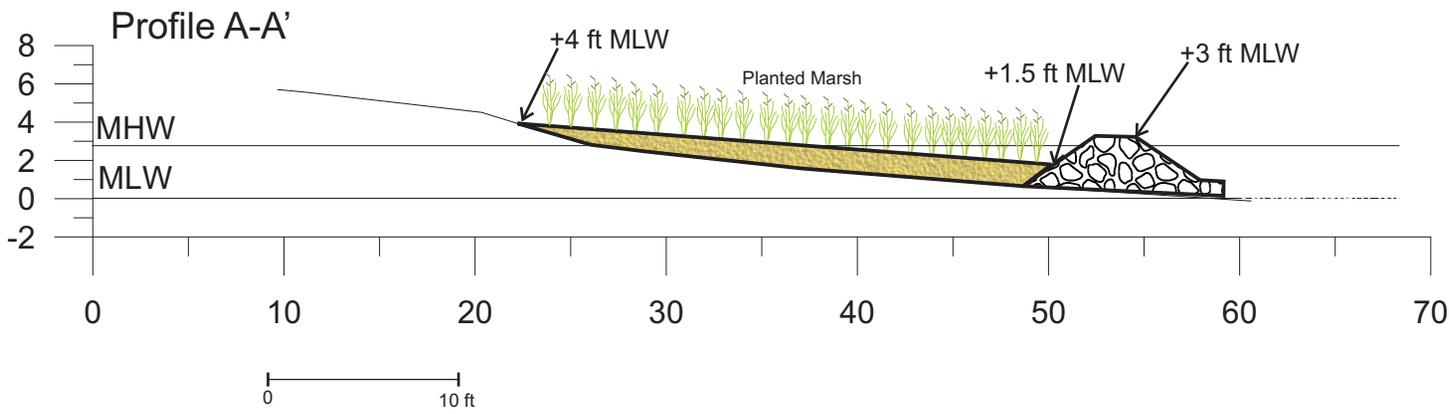


ADJACENT PROPERTY OWNERS:	Pamunkey Indian Reservation Living Shoreline Project		APPLICATION BY:
DATUM: MLW			AT: IN:

# Site 1: Boat Ramp

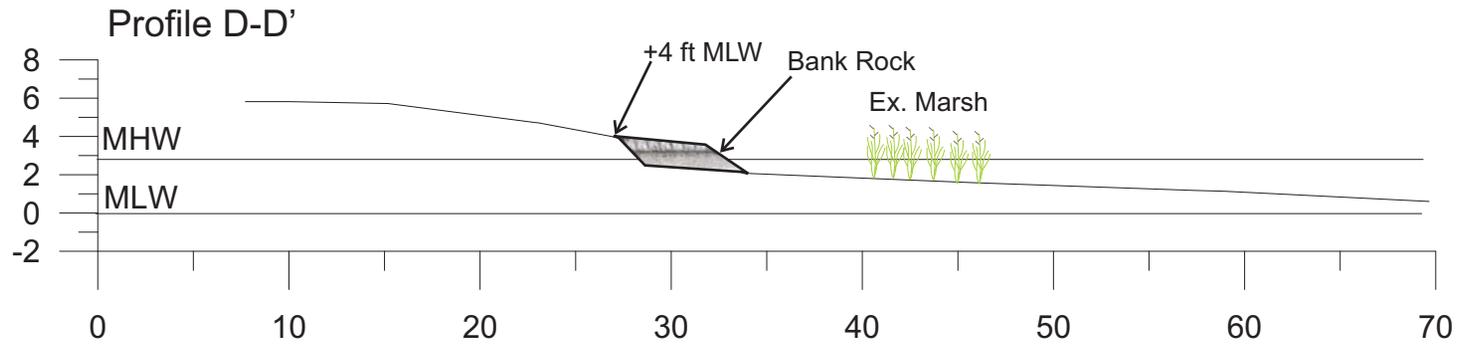
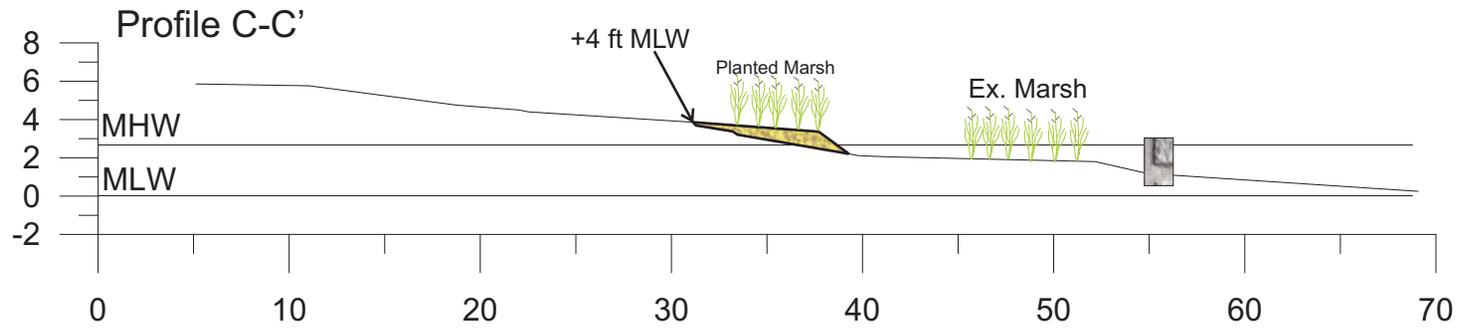
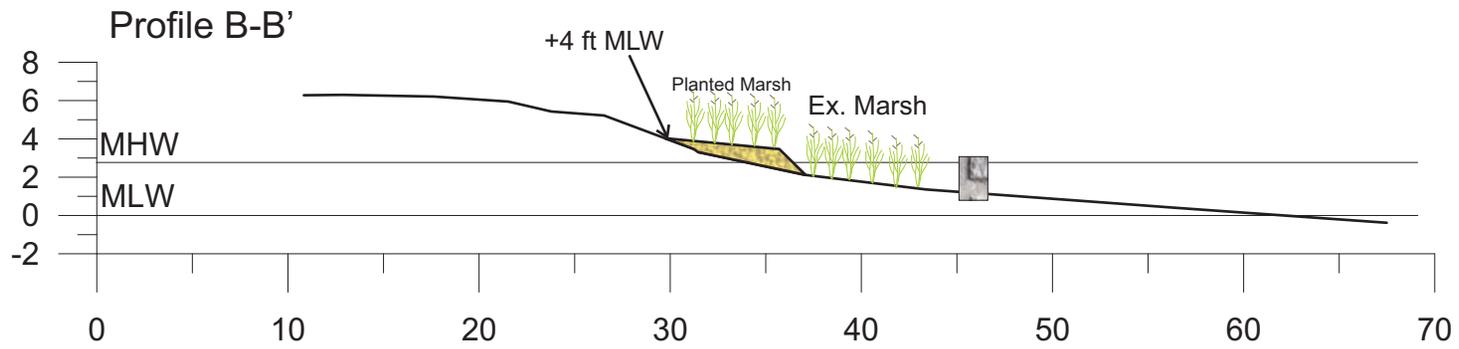


- Existing**
- Profiles
  - Boat Ramp
  - ▨ Marsh
  - - - Ex. MLW
  - Ex. MHW
  - ⋯ Ex. Contours
- Proposed**
- ⊠ Stock Pile
  - ▤ Limit of Fill
  - Sill
  - ▨ Stone Groin/Spur
  - Bank Rock



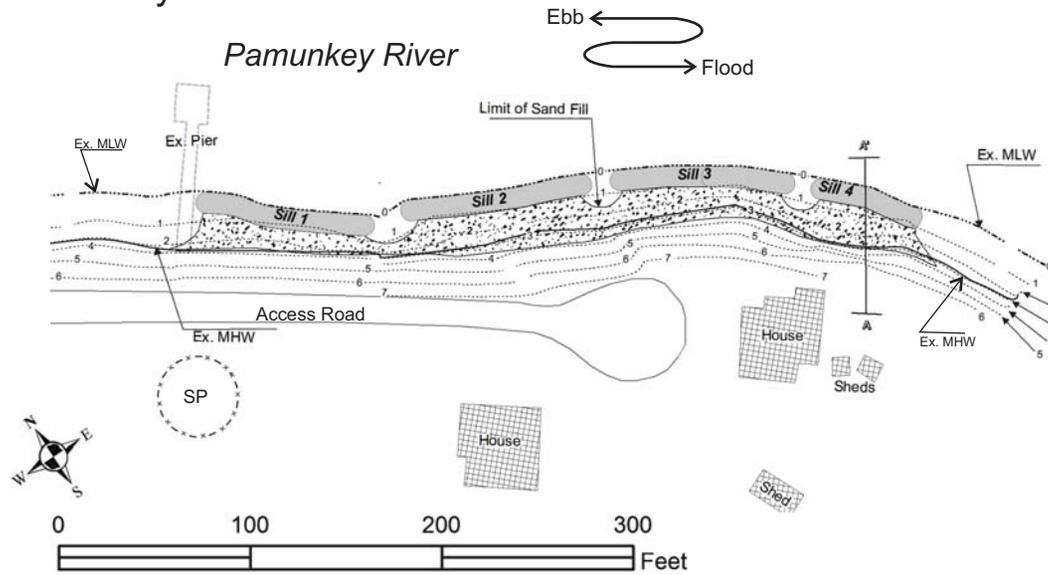
**VIMS** | WILLIAM & MARY  
VIRGINIA INSTITUTE OF MARINE SCIENCE

ADJACENT PROPERTY OWNERS:	Pamunkey Indian Reservation Living Shoreline Project		APPLICATION BY:
			DATE: 8/22/2018
DATUM:	AT: IN:	PURPOSE:	SHEET 2 of 4



	ADJACENT PROPERTY OWNERS:	Pamunkey Indian Reservation Living Shoreline Project		APPLICATION BY:
	DATUM:			AT: IN:
				SHEET 3 of 4

# Site 2: Hatchery



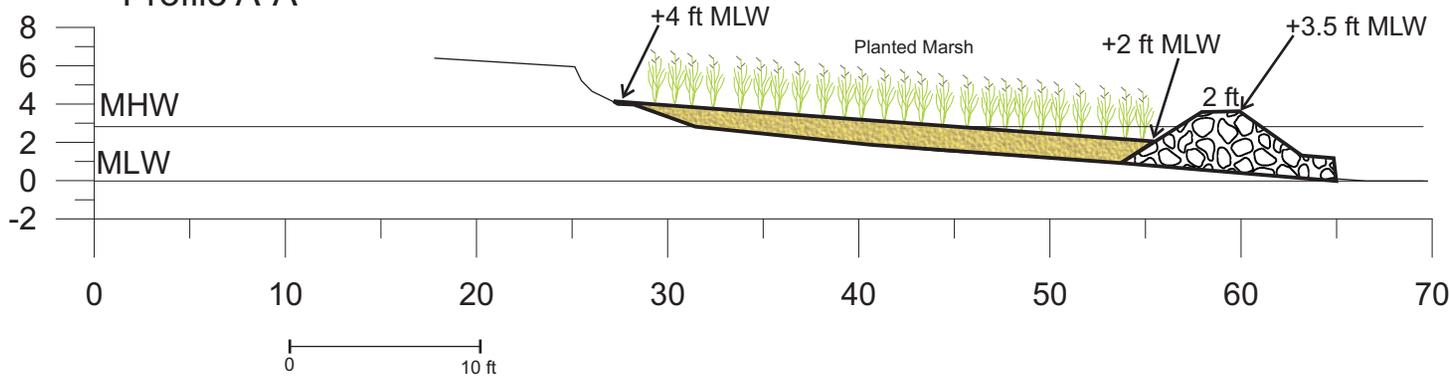
## Existing

- Profiles
- Pier
- Ex. MLW
- Ex. MHW
- Ex. Contours

## Proposed

- Stock Pile
- Limit of Fill
- Sill

## Profile A-A'



ADJACENT PROPERTY OWNERS:	Pamunkey Indian Reservation Living Shoreline Project		APPLICATION BY:
	DATUM:	AT: IN:	DATE: 8/22/2018
		PURPOSE:	SHEET 4 of 4



# COMMONWEALTH of VIRGINIA

*Marine Resources Commission*  
2600 Washington Avenue  
Third Floor  
Newport News, Virginia 23607

Matthew J. Strickler  
Secretary of Natural Resources

Steven G. Bowman  
Commissioner

September 24, 2018

Pamunkey Indian Tribe  
Attn: Chief Robert Gray  
c/o Ms. Kathryn MacCormick  
463 Pamunkey River Road  
King William, VA 23086

Re: VMRC #18-1439

Dear Chief Gray:

I am writing to acknowledge receipt of your application requesting authorization to construct a total of ten (10) rock sills and two (2) stone groins along approximately 1,150 linear feet of the Pamunkey River shoreline to abate shoreline erosion and facilitate construction of the Pamunkey River Indian Reservation Living Shoreline Project.

Provided your proposal does not extend landward of the mean low water mark and will not involve State-owned submerged lands, no authorization is required from the Marine Resources Commission. For your information you may need authorization from your local wetlands board, the Department of Environmental Quality (DEQ), and/or the U.S. Army Corps of Engineers prior to commencing your project. Your application has been forwarded to these agencies.

If I may be of further assistance, please contact me at (757) 247-2251.

Sincerely,

A handwritten signature in black ink, appearing to be "R", representing Randal D. Owen.

Randal D. Owen  
Environmental Engineer

RDO/lra  
HM  
Enclosure

cc: Department of Environmental Quality #5  
U. S. Army Corps of Engineers #13  
King William County Wetlands Board  
Applicant *An Agency of the Natural Resources Secretariat*

[www.mrc.virginia.gov](http://www.mrc.virginia.gov)

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD



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

November 14, 2018

Northern Virginia Regulatory Section  
NAO-2010-01645 (Pamunkey River)

Chief Robert Gray  
Pamunkey Indian Tribe  
c/o Kathryn MacCormick  
463 Pamunkey River Road  
King William, Virginia 23086

Dear Chief Gray:

This correspondence is in reference to the Department of the Army application (NAO-2010-01645 / VMRC#18-1439) submitted for activities associated with a living shoreline project at two locations within the Pamunkey Indian Reservation in King William County, Virginia. The work will include construction of ten (10) stone sills and two (2) stone groins as well as placement of approximately 1260 cubic yards of sand nourishment landward of the sills. The sand nourishment areas will be planted with *Schoenoplectus pungens* within the intertidal zone and with *Spartina cynosuroides* and/or *Panicum virgatum* landward of mean high water. Your proposed project as described above and depicted on the attached drawings entitled "Pamunkey Indian Reservation Living Shoreline Project (Sheets 1 through 4)", dated August 22, 2018 and stamped as received by our office on September 10, 2018, satisfies the terms and conditions of Norfolk District's Regional Permit 19 (18-RP-19), Activities #2 and #5. Provided that you follow the general and permit specific conditions of 18-RP-19, as well as the additional special conditions that have been included below, no further authorization will be required from the Corps.

Special Conditions:

1. A monitoring report will be submitted to the Corps at the end of the first full growing season following planting, and after the second year of establishment. Site monitoring should be conducted between June and September of each year. The reports may be submitted via email (keith.r.goodwin@usace.army.mil) or via standard mail to U.S. Army Corps of Engineers, Regulatory Office, and ATTN: Keith Goodwin, 803 Front Street Norfolk, Virginia 23510 and should include at a minimum: The project location, the Corps project number, representative photos of the site, and a brief statement on the success of the project. Should the completed project result in a net loss of vegetated wetlands, additional planting or remediation work may be required.

The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein

authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Incidents where any individuals of sea turtles, Atlantic sturgeon, or any species listed by NOAA Fisheries under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the United States or structures or work in navigable waters of the United States authorized by this RP shall be reported to NOAA Fisheries, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the Norfolk District of the U.S. Army Corps of Engineers at 757-201-7652. The finder should leave the animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure, or some unnatural cause. The finder may be asked to carry out instructions provided by NOAA Fisheries, Office of Protected Resources, to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

Enclosed is a "compliance certification" form, which must be signed and returned within 30 days of completion of the project. Your signature on this form certifies that you have completed the work in accordance with the regional permit terms and conditions.

This verification is valid until the RP is modified, reissued, or revoked. 18-RP-19 is scheduled to be modified, reissued, or revoked on September 5, 2023. Activities which have commenced (i.e. under construction) or are under contract to commence in reliance upon this RP will remain authorized provided the activity is completed within twelve (12) months of the date of the RP's expiration, modification, or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization. Activities completed under the authorization of the RP which was in effect at the time the activity was completed continue to be authorized by that RP.

The State Water Control Board provided conditional §401 Water Quality Certification for this RP. Therefore, the activities that qualify for this RP meet the requirements of the Department of Environmental Quality's (DEQ) Virginia Water Protection Permit Regulation, provided that the permittee abides by the conditions of this RP. You will not be required to obtain a separate §401 Water Quality Certification from DEQ. This authorization does not relieve your responsibility to comply with local requirements pursuant to the Chesapeake Bay Preservation Act (CBPA), nor does it supersede local government authority and responsibilities pursuant to the Act. You should contact your

local government before you begin work to find out how the CBPA applies to your project.

Pursuant to the Coastal Zone Management Act (CZMA) of 1972, the Virginia Department of Environmental Quality Virginia Coastal Zone Management Program (VCP) completed its review of the Federal Consistency Determination (FCD) for this RP on August 16, 2018, and provided concurrence that this RP is consistent with the VCP. Therefore, no further coordination with the VCP is required. Authorizations under this RP do not supersede State or local government authority or responsibilities pursuant to any State or local laws or regulations.

In granting an authorization pursuant to this permit, the Norfolk District has relied on the information and data provided by the permittee. If, subsequent to notification by the Corps that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the authorization may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings. Please note that you should obtain all required State and local authorizations before you proceed with the project.

If you have any questions and/or concerns about this permit authorization, please contact Keith Goodwin via telephone at (757) 201-7327 or via email at [keith.r.goodwin@usace.army.mil](mailto:keith.r.goodwin@usace.army.mil).

Sincerely,



Keith R. Goodwin  
Environmental Scientist  
Northern Virginia Regulatory Section

Enclosures

Cc: Scott Hardaway – Virginia Institute of Marine Science  
Virginia Marine Resources Commission  
King William County



U.S. Army Corps  
Of Engineers  
Norfolk District

**CERTIFICATE OF COMPLIANCE  
WITH  
ARMY CORPS OF ENGINEERS PERMIT**

Permit Number: NAO-2010-01645

VMRC Number: 18-1439

Corps Contact: Keith Goodwin

Name of Permittee: Pamunkey Indian Tribe

Date of Issuance: November 14, 2018

Permit Type: Regional Permit 19

**Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:**

US Army Corps of Engineers - Norfolk District  
CENAO-WR-R  
Attn: Keith Goodwin  
803 Front Street  
Norfolk, VA 23510-1096

Or scan and send via email to [keith.r.goodwin@usace.army.mil](mailto:keith.r.goodwin@usace.army.mil)

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

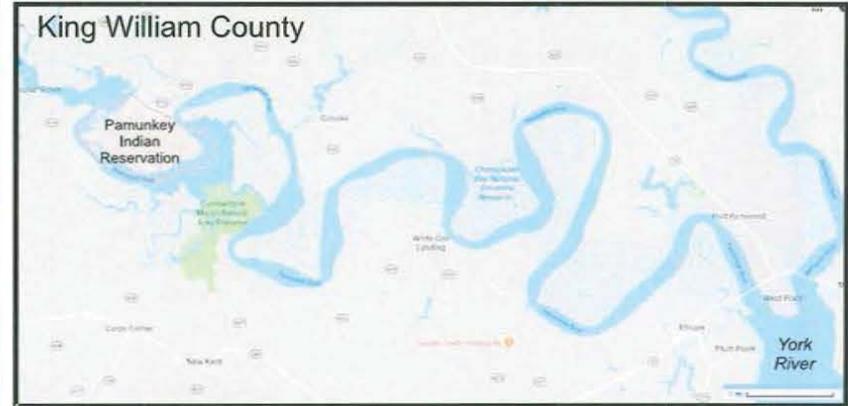
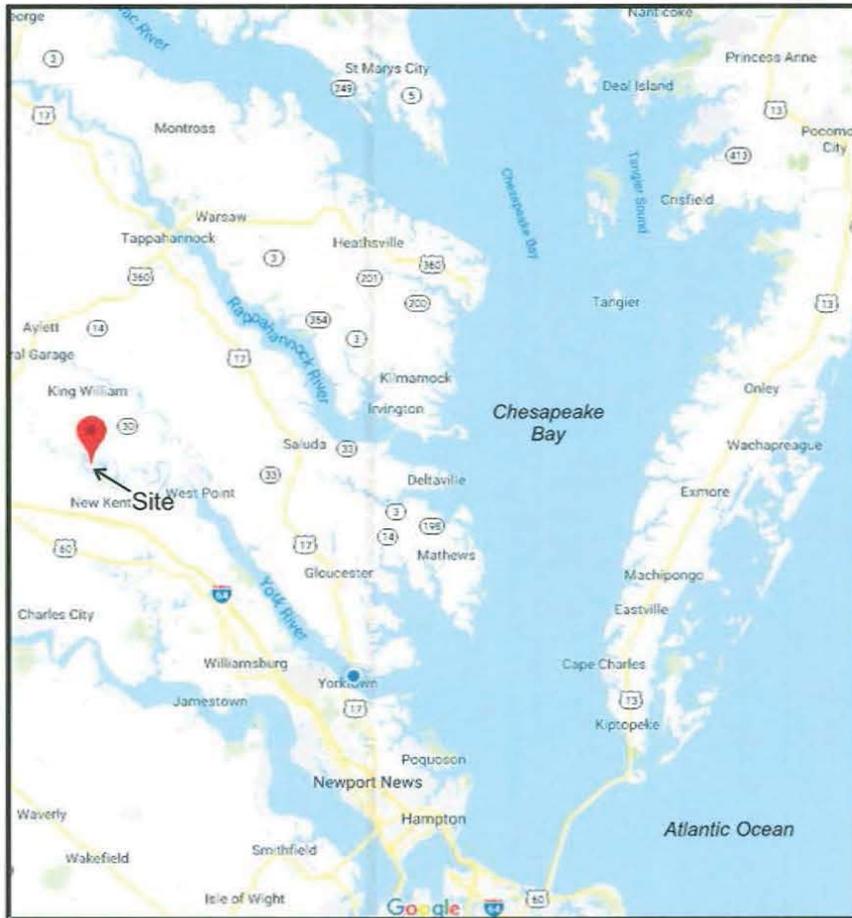
I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

---

Signature of Permittee

---

Date



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 SEP 07 2018  
 MARINE RESOURCES  
 COMMISSION

ADJACENT PROPERTY OWNERS:

Pamunkey Indian Reservation Living Shoreline Project

APPLICATION BY:

DATUM: MLW

AT:  
IN:

PURPOSE:  
Shoreline Protection

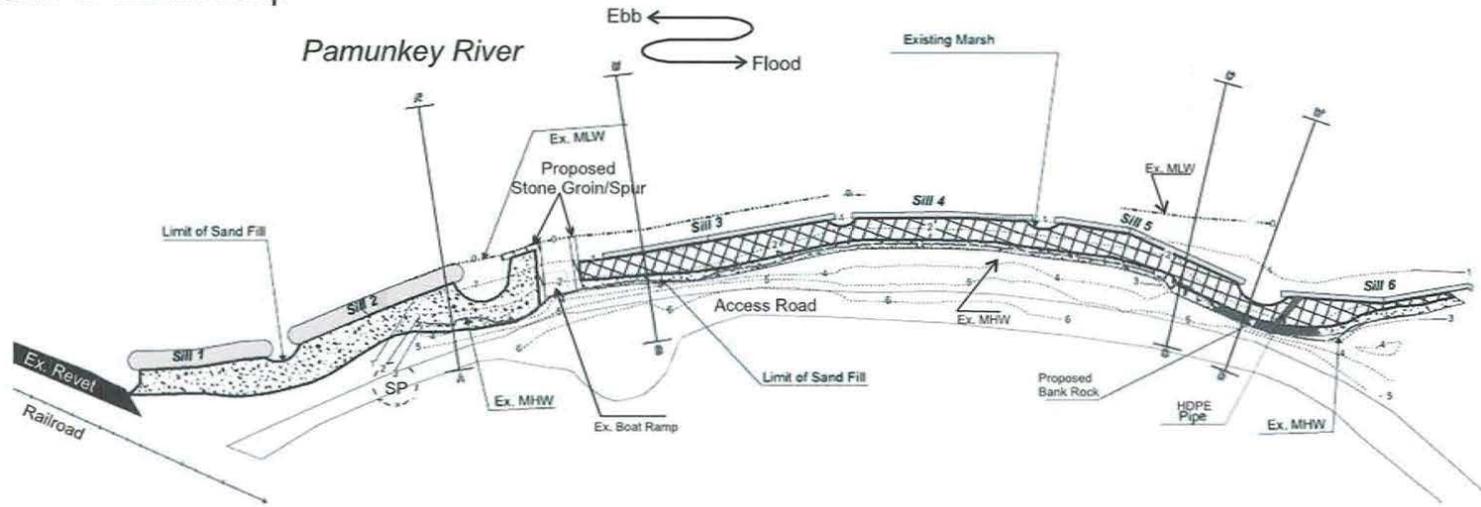
DATE: 8/22/2018

SHEET 1 of 4

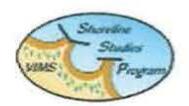


U.S. Army Corps of Engineers  
 Norfolk District  
 Regulatory Branch  
 Received: September 10, 2018

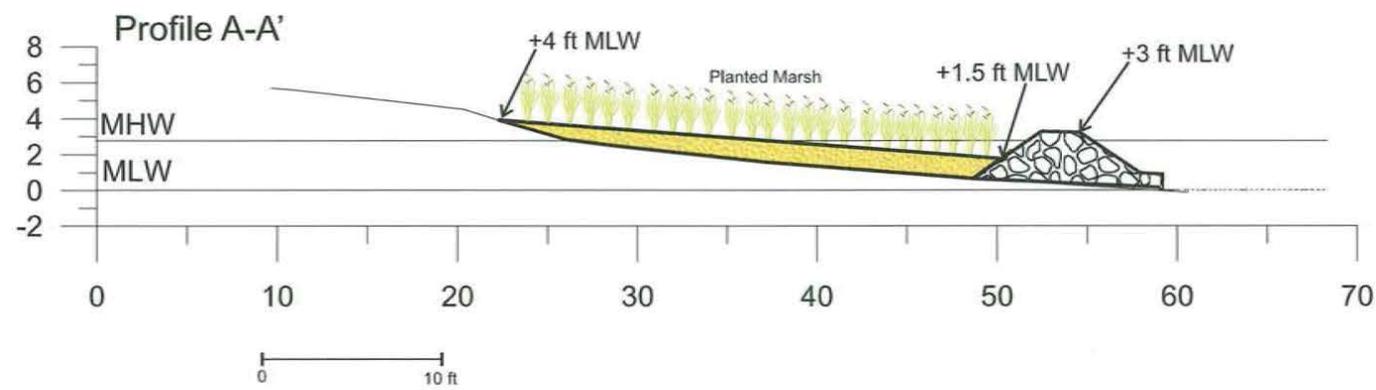
# Site 1: Boat Ramp



- Existing**
- Profiles
  - Boat Ramp
  - ▨ Marsh
  - Ex. MLW
  - Ex. MHW
  - Ex. Contours
- Proposed**
- ⊠ Stock Pile
  - ▤ Limit of Fill
  - Sill
  - ▨ Stone Groin/Spur
  - Bank Rock



**VIMS** | WILLIAM & MARY  
 VIRGINIA INSTITUTE OF MARINE SCIENCE



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	DATUM:			AT: IN:
				SHEET 2 of 4

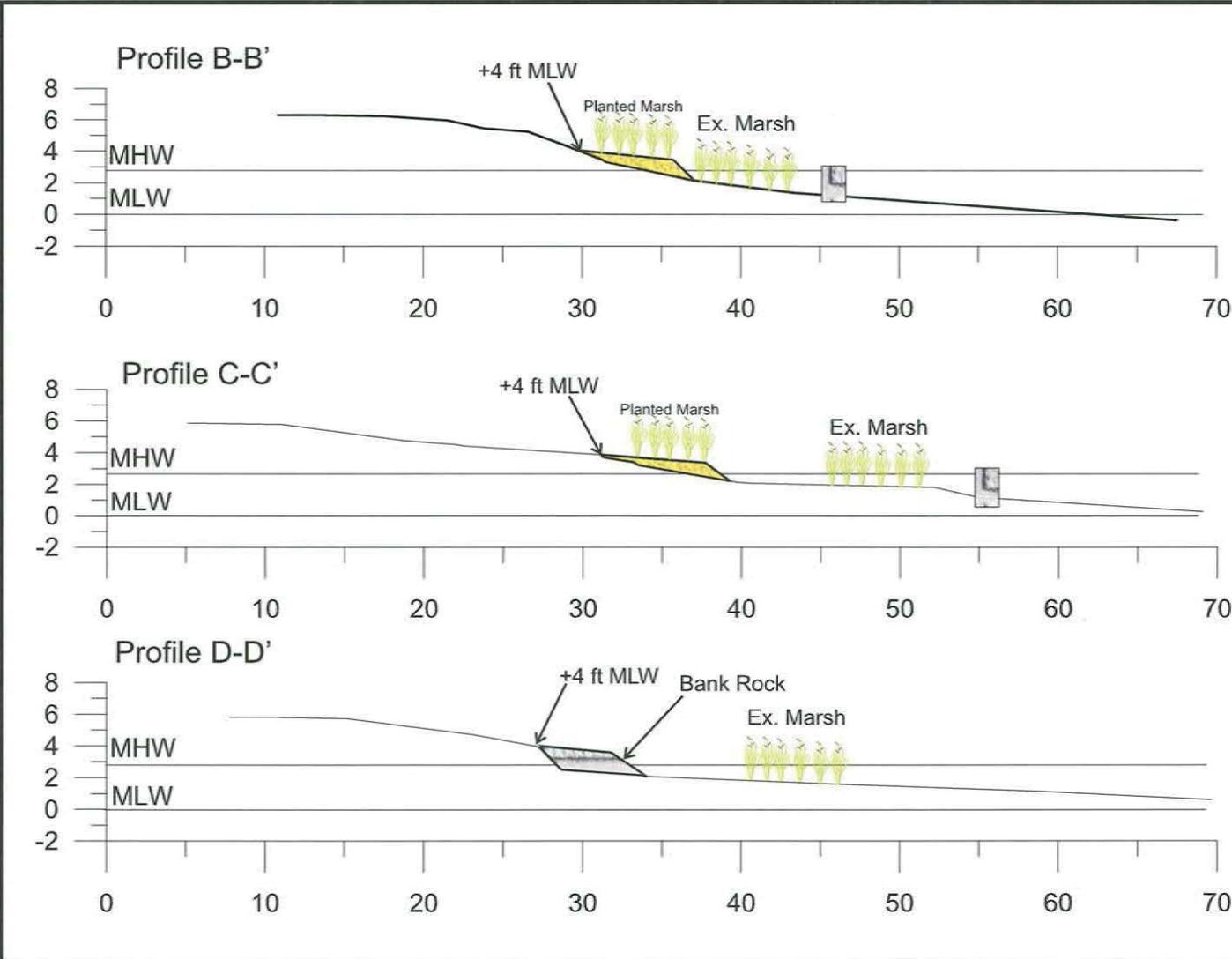
**U.S. Army Corps of Engineers**  
 Norfolk District  
 Regulatory Branch  
 Received: September 10, 2018

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 SEP 07 2018  
 MARINE RESOURCES  
 COMMISSION

0 10 ft



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 VIRGINIA INSTITUTE OF MARINE SCIENCE

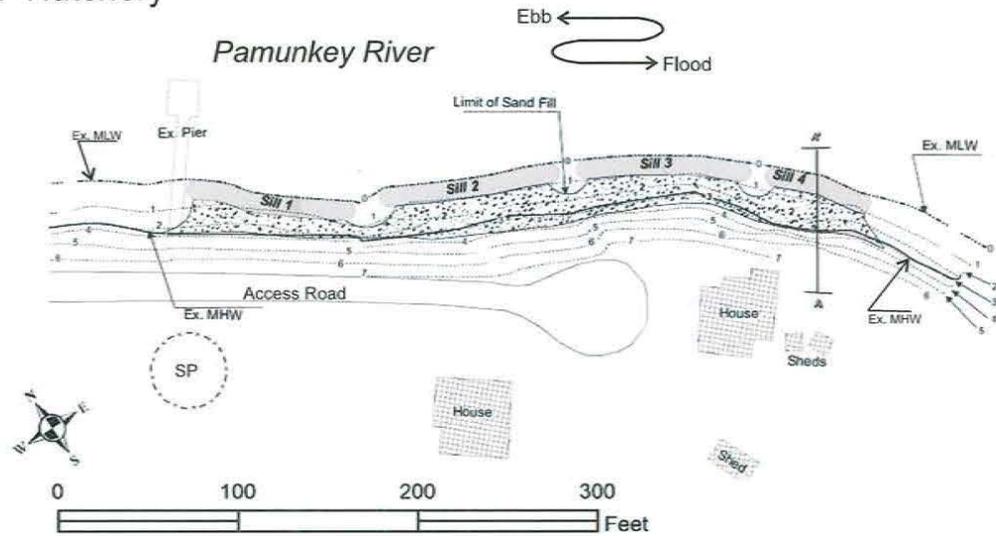


ADJACENT PROPERTY OWNERS:	Pamunkey Indian Reservation Living Shoreline Project		APPLICATION BY:
	DATUM:	AT: IN:	DATE: 8/22/2018
		PURPOSE:	SHEET 3 of 4



U.S. Army Corps of Engineers  
 Norfolk District  
 Regulatory Branch  
 Received: September 10, 2018

Site 2: Hatchery

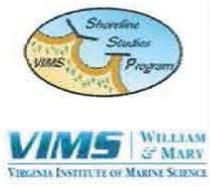
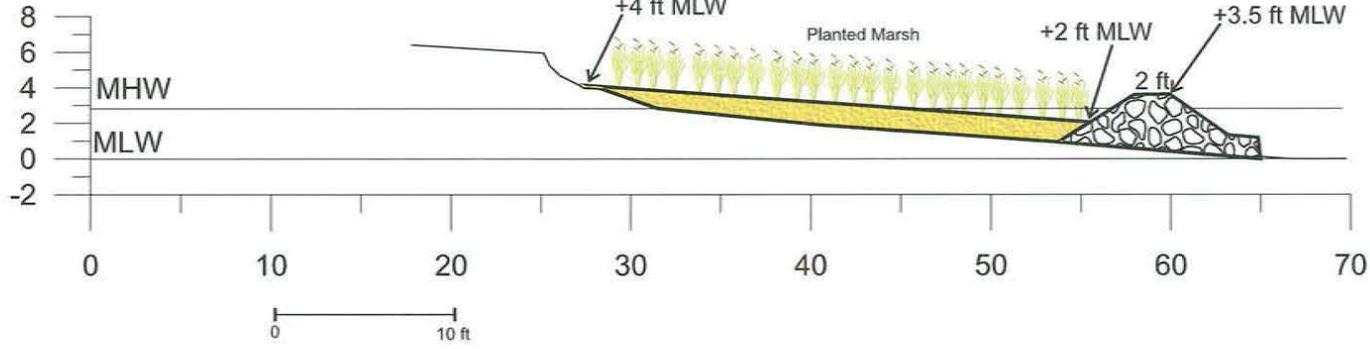


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 SEP 07 2018  
 MARINE RESOURCES  
 COMMISSION

- Existing**
- Profiles
  - Pier
  - ▬ Ex. MLW
  - ▬ Ex. MHW
  - Ex. Contours
- Proposed**
- ⊠ Stock Pile
  - ▨ Limit of Fill
  - Sill



Profile A-A'



ADJACENT PROPERTY OWNERS:  DATUM:	<b>Pamunkey Indian Reservation Living Shoreline Project</b>  AT: IN:	APPLICATION BY:  DATE: 8/22/2018 SHEET 4 of 4
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## **Appendix C**

Pamunkey Indian Reservation

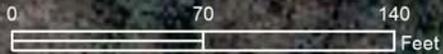
Living Shoreline Project

Next Phase Conceptual Plans

# Site 1 The Boat Ramp



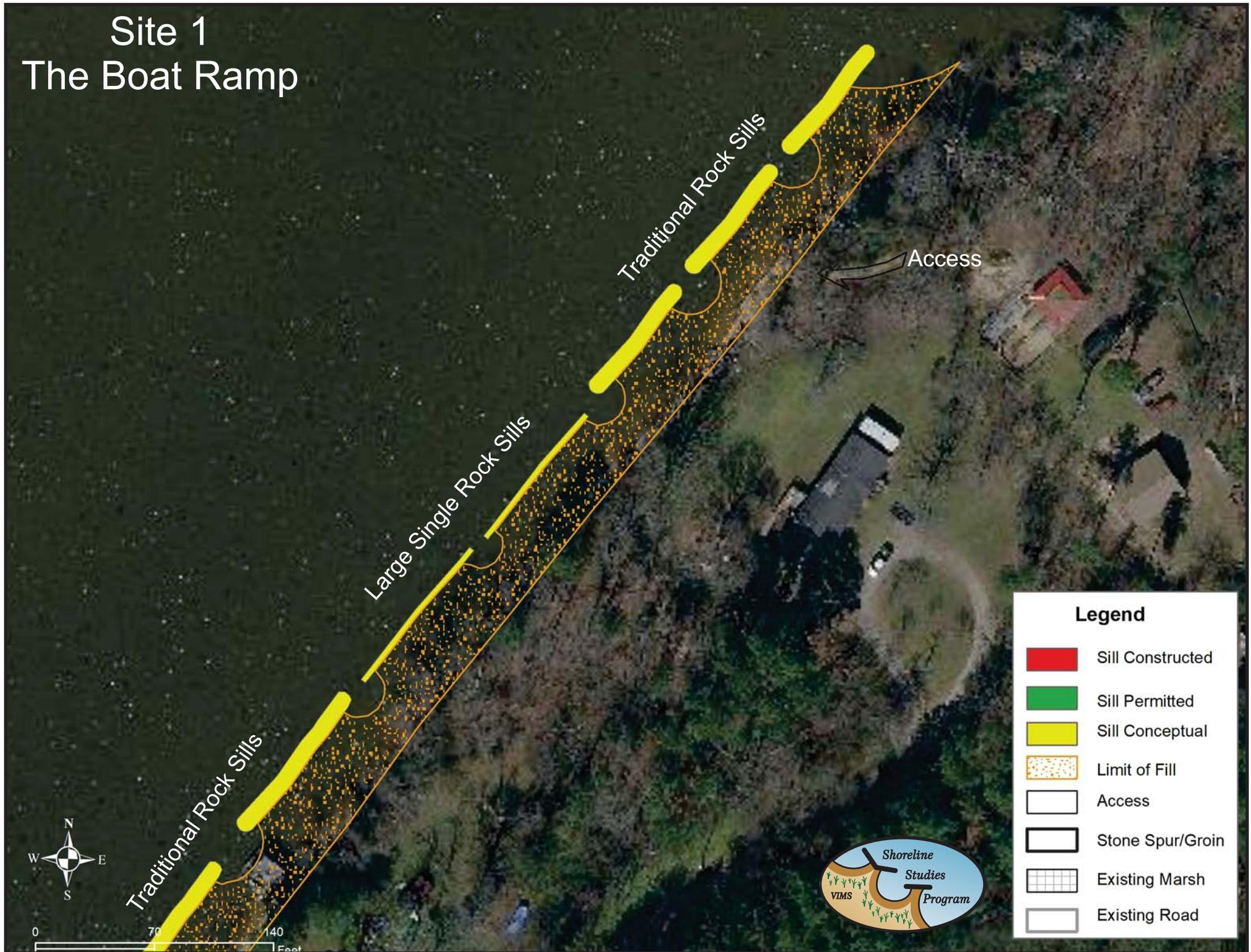
Legend	
	Sill Constructed
	Sill Permitted
	Sill Conceptual
	Limit of Fill
	Access
	Stone Spur/Groin
	Existing Marsh
	Existing Road



# Site 1 The Boat Ramp



# Site 1 The Boat Ramp



# Site 2 The Hatchery

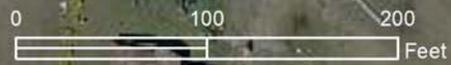
Large Single Rock Sills

Large Single Rock Sills

Traditional Rock Sills

**Legend**

- Limit of Fill
- Sills Constructed
- Sills Permitted
- Sills Conceptual



Sill 2-1  
Sill 2-2  
Sill 2-3  
Sill 1-1  
Sill 1-2