



Project Technical Memorandum

VHB Project Number	Middle Peninsula Planning District Commission	Date
33115.00	Feasibility Study for the Middle Peninsula Tidal Wetland Bank (TWB) Shenk Parcel, Gloucester County	11/11/09

Introduction

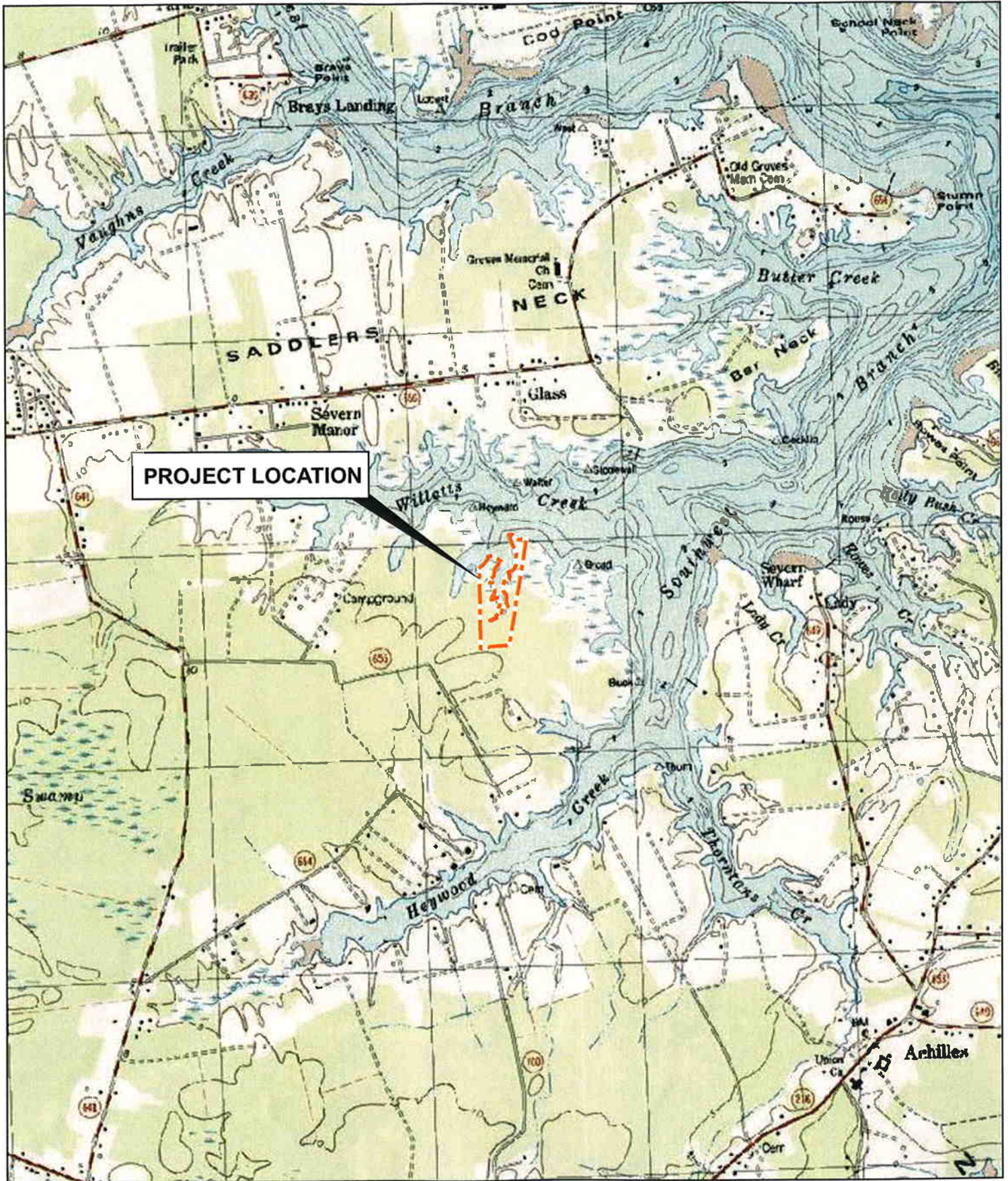
The Middle Peninsula Chesapeake Bay Public Access Authority(PAA) is investigating the feasibility of developing a regional tidal wetlands mitigation bank that would be utilized by local tidal wetland boards and citizens within the PDC. The tidal wetland mitigation bank would offer credit units to offset unavoidable impacts permitted through the local, tidal wetland boards. Projects such as erosion control structures (bulkheads and revetments), boat ramps for water access, and other waterfront improvement projects that impact vegetated and non-vegetated, tidal wetlands could rely upon the Middle Peninsula Tidal Wetland Bank (TWB) to provide mitigation credits. Currently there are few tidal banking options within the region. Some of the local wetland boards utilize an in-lieu fee fund, which serves as an acceptable option for satisfying mitigation requirements resulting from unavoidable impacts. Each locality has the ability to establish a dollar value per credit unit. Most often the collected in-lieu fee funds remain unused since the localities do not have the technical staff necessary for identifying and developing mitigation projects. As a result, the PDC is exploring other opportunities that would provide a dependable and affordable source of tidal mitigation credits to the local boards and citizens.

The Middle Peninsula Chesapeake Bay Public Access Authority (PAA) has acquired over 800 acres of multi-parcel coastal and estuarine land within the Middle Peninsula region. Many parcels were acquired through the National Ocean and Atmospheric Administration (NOAA) program, Coastal and Estuarine Land Conservation Program (CELCP). Within these lands the PAA and PDC have identified a 15-acre parcel previously owned by the Shenk family, located in the headwaters of the Severn River (Figure 1). The PDC retained Vanasse Hangen Brustlin, Inc. (VHB) to evaluate the Shenk parcel for its' potential as a tidal wetland bank and to outline the process by which the mitigation bank could be realized. The following text describes our preliminary observations, potential constraints and assets, opinion of development cost, and the possible regulatory track needed in order to become an operational facility.

Existing Conditions – Shenk Parcel

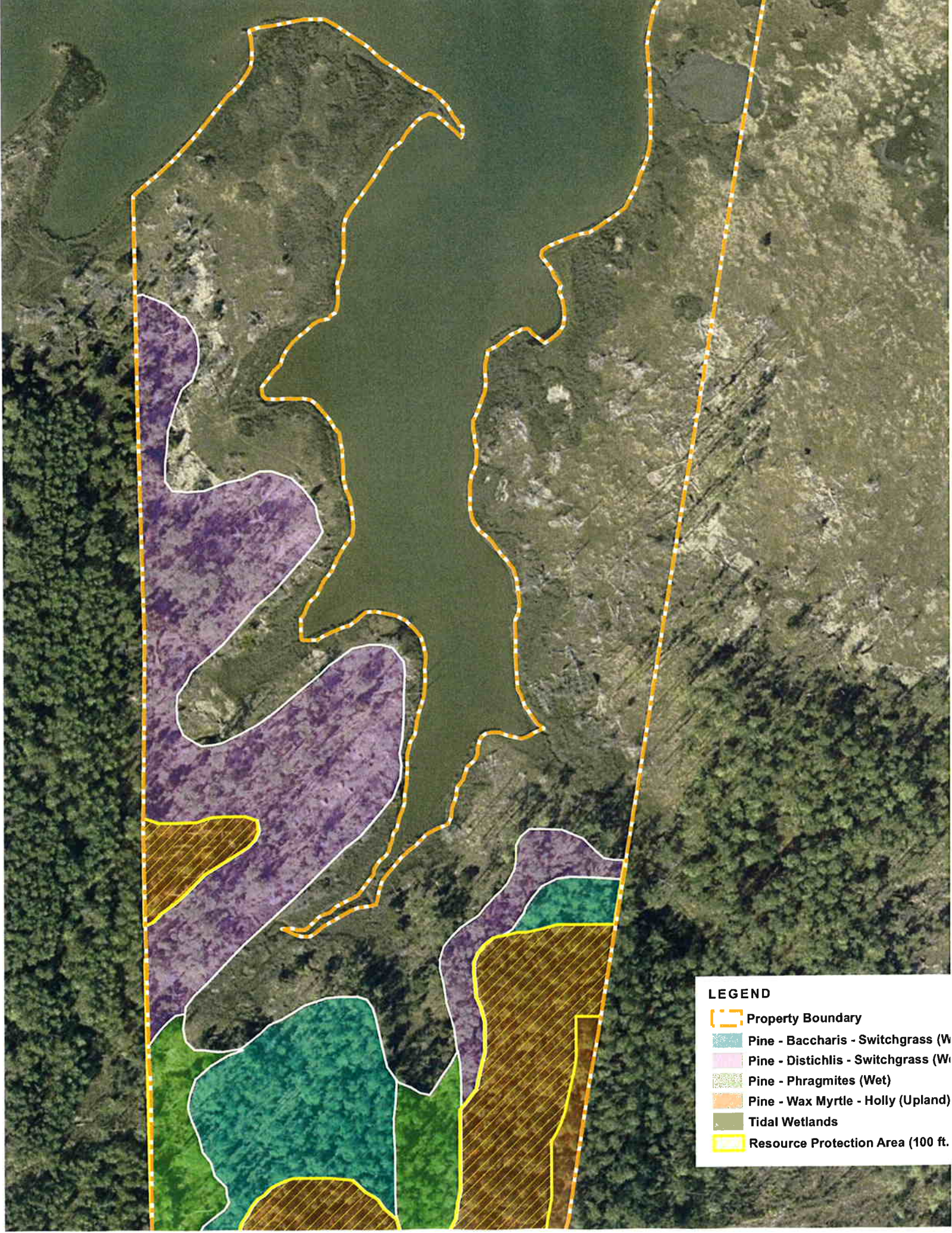
This coastal property lies within a broad transition between tidally influenced vegetative emergent communities and broad, forested flats. Although topography is not currently available for the site, we observed no more than two to three feet of relief on the property. Five vegetative community types were noted (Figure 2), four of which are wetlands. It is noted that VHB did not flag, survey, or prepare a formal wetland delineation package for the U.S. Army Corps (COE) review and approval. The onsite vegetative communities were field mapped for preliminary planning purposes, and a more detailed delineation would need to occur if the site is selected for future mitigation development. The field-mapped communities presented in Figure 2 include the following:

- Spartina Tidal Marsh (E2EM)
- Pinus-Phragmites Tidal Wetland (PFO4R)



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Figure 1
 Project Location Map



LEGEND

- Property Boundary
- Pine - Baccharis - Switchgrass (W)
- Pine - Distichlis - Switchgrass (W)
- Pine - Phragmites (Wet)
- Pine - Wax Myrtle - Holly (Upland)
- Tidal Wetlands
- Resource Protection Area (100 ft.)

- o Pinus-Baccharis-Panicum Wetland (PFO4B)
- Pinus-Distichlis-Panicum Wetland (PFO4R)
- Pinus-Myrica-Ilex Upland

Soils on the property correspond to Sulfaquents, frequently flooded associated with the tidal marsh and Lumbee fine sandy loam mapped as occurring in the pine-dominated communities just landward of the high tide line. All of the land with potential use for tidal restoration lies within the Lumbee soil type, a hydric soil. This soil is poorly drained with a seasonal high water table between 0 to 12 inches from the soil surface. It is characterized as having an argillic B-horizon starting between 6 to 19 inches below the surface of sandy clay loam or clay loam. Soil borings taken with a hand auger tended to confirm the presence of the Lumbee soil type.

The vegetative communities reflect the slight, broad transition in elevation between tidal areas and pine dominated communities. The wet pine areas abutting the marsh were observed containing a water table immediately below the soil surface. During seasonally high tides (mean tide range is estimated to be approximately 2.3 feet), portions of the pine wetlands (+3.5 to +4.5' mlw) are likely inundated. Loblolly pine (*Pinus taeda*) is the dominant tree with understory plants to include giant reed grass (*Phragmites australis*), sea grass (*Distichlis spicata*), false-willow (*Baccharis halimifolia*), soft rush (*Juncus effusus*), switchgrass (*Panicum virgatum*), seaside goldenrod (*Solidago sempervirens*), and wax myrtle (*Myrica cerifera*). Soil borings consisted of sandy loam with chroma 2 or less with redoximorphic concentrations.

The pine upland community contains loblolly pine with wax myrtle, American holly (*Ilex opaca*), blackgum (*Nyssa sylvatica*), sweet-gum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), greenbriar (*Smilax bona-nox*), and wild grape (*Vitis rotundifolia*). One soil boring found a sandy loam with chromas 2 or 3 with no redoximorphic concentrations to within 12 inches in depth. The B-horizon was below 16 inches.

Figure 2 also depicts the approximately location of the 100-foot Chesapeake Bay Resource Protection Area (RPA), which begins at the wetland/upland interface and extends landward for 100-feet. This RPA feature is, again, an approximation and provided for planning purposes only. A formal RPA line could be established and approved by Gloucester County only after the COE wetland delineation confirmation.

Proposed Conditions – Shenk Parcel

There appears to be very little potential for developing wetland areas from uplands on the Shenk Parcel due primarily to the great extent of existing wetlands. Much of the 15-acre parcel is already considered wetlands or RPA buffer. The RPA buffer is currently in a wooded condition and would not likely be given favorable consideration for conversion to intertidal wetlands, since the buffer is providing an existing water quality service to the Severn River. In addition, converting the uplands to wetlands would shift the present RPA buffer position onto the adjacent landowner. This essential shift of land-use regulations onto the adjoiner could prove to be problematic.

Another undesirable feature of the site is the underlying silt-clay soils, which are not a preferable planting medium for an emergent marsh system. Most tidal wetland mitigation sites are created in or with sandy soils, which allow vigorous root growth and lateral propagation. That being considered, the Shenk site would likely require some over-excavation, followed by placement of sandy fill material to reach final grade. This additional earthwork could increase the overall construction cost by approximately 10 to 15 percent. A final consideration for the site is how much existing habitat would have to be disturbed and/or converted in order to provide the proper hydrologic connection between the graded uplands and the adjacent tidal prism. A significant amount of existing, vegetated

wetlands would be converted to mudflat and possibly open water in order to bring enough tidal exchange up into the created wetlands. This conversion impact would have to be mitigated for from the created area, which reduces the available credits and increases the per unit cost.

Although the Shenk Parcel does not appear to be the best property for mitigation development, we have developed an overall opinion of cost for a 1.0-acre wetland mitigation site, residing in a similar landscape position. The attached opinion of cost includes design, permitting, agency approval, construction administration and oversight, construction, post-construction monitoring, and maintenance and remediation costs. Per credit costs of approximately \$8.00/sq. ft. were estimated.

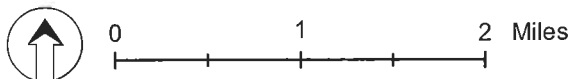
Needs Assessment

A potential mitigation site located in the headwaters of the Severn River would reside within the primary Hydrologic Unit Code of 02080102, servicing Mathews County, portions of Gloucester, Middlesex, King & Queen, and Essex Counties (Figure 3). King William County would fall within an immediately adjacent watershed and could potentially utilize the TWB facility. A cursory review of the permit records contained on the Virginia Institute of Marine Science's website shows that approximately 26,400 sq. ft. of non-vegetated and 2,240 sq. ft. of vegetated wetlands were permitted for impact during 2009 within the six county PDC region. These projects were mostly shoreline erosion control projects, such as timber bulkheads, rock groins, and rock revetments. Projects excluded from these impact totals included "living shoreline" projects, which were considered as self-mitigating. Structures such as rock sills and breakwaters with beach nourishment and wetland plantings were not included in the impact totals.

It is noted that the Virginia Institute of Marine Science suggests that non-vegetated and vegetated wetland impacts should be considered on an equal basis when considering mitigation requirements, but many localities only require mitigation for vegetated impacts. Moreover, there are some localities that do not require mitigation for any of the permitted impacts. Implementation of the mitigation policy varies from locality to locality. If mitigation for non-vegetated impacts was required at a 1:1 ratio, a 1-acre bank facility could potentially exhaust credit supply within 2 years. If, however, only vegetated impacts are required to be mitigated for, the 1-acre bank facility would satisfy the demand for well over 10 years at the 2009 impact levels. It is noted that the current recession has likely reduced the wetland impact levels below the annual average. Additional assessment of impact levels over a longer time-period will be conducted and provided as supplemental information.

Credit Establishment

We understand that during preliminary discussions with several of the regulatory agencies it was mentioned that the bank establishment process could be streamlined and made less intensive than the process outlined in VMRC's "Guidelines for Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia." VMRC's guidelines outline a procedure that mirrors the non-tidal wetland bank establishment procedures that includes submitting a prospectus, receiving review comments from the Mitigation Bank Review Team (MBRT), placing a public notice, and developing an approved banking instrument. We intend to provide additional agency feedback on whether or not this process is necessary in



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this particular case, but our current line of thinking is that it will be necessary. Anticipated review and approval times can take anywhere from six to twelve months.

Summary

The Shenk Parcel does not appear to be a good candidate for the development of a tidal wetland bank site due to the small amount of uplands, location of the uplands relative to the property boundaries and RPA limits, and the fact that existing wooded buffers would have to be removed in order to create wetland habitat. Credit needs appear to be viable if non-vegetated, tidal wetland impacts are required to be mitigated for, but recent history indicates that most Boards focus on vegetated impacts only. Therefore, demand could be relatively low unless a few large development projects are initiated in the near future that contain significant, unavoidable impacts to vegetated wetlands. Potential bank development costs on a parcel similar to the Shenk Parcel's landscape position seem to corroborate existing in-lieu fee fund costs, with some potential savings for local residents in the market for tidal banking credits.

ATTACHMENTS

1. Opinion of Cost

Project: **Shenk Property - Tidal Wetland Creation (assume 43,560 SQ. FT.)**

Location: **Headwaters of the Severn River, Gloucester**

Architect Engineer: **VHB**

Plans Dated: **11/09** Estimator: **cwf** Checked By: _____

Item No.	DESCRIPTION	QUANTITY		LABOR		MATERIAL		Total Cost
		No. Units	Unit Meas.	Per Unit	Total	Per Unit	Total	
1	DETAILED INVESTIGATIONS & DESIGN PLANS	1	LS			\$25,000.00		\$25,000.00
2	AGENCY/BANK APPROVAL PROCESS	1	LS			\$15,000.00		\$15,000.00
3	CONSTRUCTION ADMIN/OVERSIGHT	1	LS			\$10,000.00		\$10,000.00
4	CONSTRUCTION STAKEOUT	1	LS			\$2,500.00		\$2,500.00
5	MOBILIZATION	1	LS			\$10,000.00		\$10,000.00
6	CLEARING AND DEBRIS REMOVAL	1	AC			\$15,000.00		\$15,000.00
7	EXCAVATE AND SALVAGE SANDY SOILS	800	CY			\$3.50		\$2,800.00
8	EXCAVATE, HAUL, & DISPOSE EXCESS SOILS	3,200	CY			\$10.00		\$32,000.00
9	PLACE SALVAGED SANDY MATERIAL	800	CY			\$5.00		\$4,000.00
10	IMPORT AND PLACE SANDY MATERIAL	800	CY			\$15.00		\$12,000.00
11	UPLAND SEEDING & OVERSEEDING	0.25	AC			\$1,800.00		\$900.00
12	EMERGENT PLANTING (2" Plugs - 18' Centers)	19,500	EA			\$1.50		29,250.00
13	EXCLUSION FENCING	1	LS			\$7,500.00		\$7,500.00
14	SCRUB/SHRUB PLANTINGS	350	EA			\$15.00		\$5,250.00
15	MONITORING & REPORTING (5 annual events)	5	YR			\$7,500.00		\$37,500.00
16	MAINTENANCE/ERADICATION (5 annual events)	5	YR			\$3,000.00		\$15,000.00
						Subtotal		\$223,700.00
						Contingency 10%		\$22,370.00
						Wetland Total		\$246,070.00
						Per Sq. Ft. Cost *		\$8.00

Notes:
 * Unit cost has been adjusted to account for approximately 10,000 sq. ft. of habitat conversion due to channel development through existing wetland habitats. 10,000 sq. ft. has been debited from the original 43,560 sq. ft. of creation