

Design, Construction, and Maintenance

Practical Considerations





1

Introduction

Bay Environmental, Inc.

Jim Cahoon, Co-owner and Vice President
Virginia Tech Environmental Science graduate
Virginia Professional Wetland Delineator
27 years of experience, 15 years experience with living shorelines

Virginia based firm founded in 2002
Consultants and Contractors
Work with local and national NGO's on restoration
Primary target area is Tidewater region of Virginia
Dozens of living shorelines designed, permitted, and/or constructed to date



2

Site Conditions Dictate Everything

(Almost)

Orientation	Bank Height
Offshore Bathymetry	Fetch
Upslope Land Use/Restrictions	Adjacent Shoreline Conditions
Current Vegetation	Geotechnical Conditions
Stormwater Runoff	Overall Landscape Position



3

Site Considerations

Orientation
Direction of wind from majority of major storms

Bank shading





4

Site Considerations

Offshore Bathymetry

Too deep or too steep is a problem





5

Site Considerations

Upslope Land Use/Stormwater Runoff/Current Vegetation

Do you have room to grade the bank back or is there a structure or trees worth saving too close?

Is stormwater upslope directed towards the bank? Can it be controlled?

Are there site line restrictions (like on secure marine facilities) that dictate vegetation?

Is there significant existing Phragmites australis or other invasives on or adjacent to the project?



6

Site Considerations

Bank Height

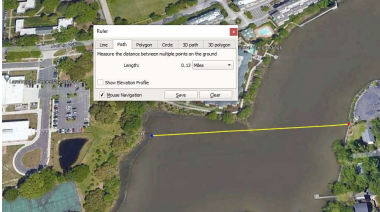


7

Site Considerations

Fetch

Direction and Distance Matter



8

Site Conditions

Adjacent Shoreline Conditions/Overall Landscape Position

Is the proposed living shoreline compatible with adjacent shoreline conditions?

Will hardened adjacent shorelines create reflective energy?

Is the proposed living shoreline in an area that will be sustainable (ie are there other marshes similarly situated on the river system)?

9

Site Conditions

Geotechnical Considerations

Will the shoreline sink?

How will it be stabilized – fabric or overload with sand?

How will the mudwave be controlled?





10

Local Considerations

Regulatory Programs at Local Level

Wetlands and Wetlands Boards
Chesapeake Bay Preservation Act
Primary Sand Dunes
Erosion & Sediment Control
VSMP Construction General Permit
Sunken Boats and Dilapidated Piers



11

Lessons Learned

Design and Construction

Accessibility
Appropriate toe treatment
Planting Seasons
Manage invasive species/plan for maintenance
Qualifications of contractor



12

Lessons Learned

Accessibility

How will you build it – water based or land based?

Where are your access points with relation to your material laydown area?

What size equipment will you need for reach and will that equipment fit where you want it to?



13

Lessons Learned

Toe Treatment

None
Coir log
Shell/shell bags
Riprap
Oyster castles

Fetch
Slope
Access
Price



14

Lessons Learned

Planting Seasons

Grasses
Spring is best

Shrubs/Trees
Fall is best

Contractual and/or grant deadlines



15

Lessons Learned

Maintenance

Living Shorelines
are gardens.

Gardens need
tending.

(May be a market for shoreline
maintenance contractors)



16

Lessons Learned

Contractor Qualifications

Have they built living shorelines before?

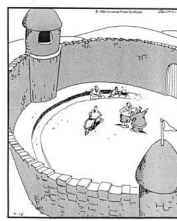
Do they have a wetland scientist on their
team?

Do they clearly understand the goals of
the project?

Consider qualified bid – low bid is not
always the best option for living shoreline
construction

THE FAR SIDE

By GARY LARSON

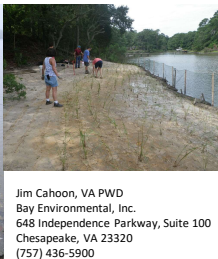


Suddenly, a heated exchange took place
between the king and the most contractor.



17

Questions?



Jim Cahoon, VA PWD
Bay Environmental, Inc.
648 Independence Parkway, Suite 100
Chesapeake, VA 23320
(757) 436-5900



18
