

June 30 2009

Ms. Jana Davis, Ph.D.
Grant Programs
Chesapeake Bay Trust
60 West St., Suite 400
Annapolis, MD 21401

Dear Dr. Davis:

The Severn River Association is pleased to support the proposal submitted by the Carrollton Manor Improvement Association (CMIA), Erosion Committee, and supporting partners, dealing with critical stormwater runoff issues. This multiyear project will install the latest best management practices (BMP) and technologies and will be an exemplar for other communities in the County and State. The bioretention cells, stormwater planters, living wall, and conservation landscaping are proven ways to improve water quality by preventing stormwater from entering our waterways. As the Director of Operation Clearwater for the Severn River Association, I can assert that stormwater is the single greatest threat to our water quality. In this program, my students and I collect samples from the creeks and mainstem of the Severn weekly throughout the summer and monitor the number of fecal bacteria, enterococci. We find 10 to 100 fold increases in enterococci at most of our stations after a summer rain event. These data are posted at <http://ola4.aacc.edu/sghornor>. These increases in bacteria render our waterways unsafe for human contact for at least 48 hours after every rain.

The Chesapeake Bay and Severn River are exceptionally important resources to our state and local communities. The Severn River, our County's only Scenic River that is entirely within County boundaries, is also officially declared impaired by the Environmental Protection Agency due to excess nutrients, sediments and bacteria. Gaining the funding support from the Chesapeake Bay Trust to carry out this project will comprise one more important step in saving our River and the Bay. In these stressed budget times, this dedicated source of funding will supplement the funding we are expending to return this national waterway treasure to its past glory. The project partners have been promised in-kind technical support from the County for this endeavor. GIS information support has already been provided, as well as consulting on project designs.

Combining efforts of CBT, the County and private property owners involved in doing their part is the only way the Bay will be restored. Citizen group initiatives such as this are a wonderful example to others. Success will only come from a concerned and active citizenry working together and multiplying their energy, efforts, and financial resources, with those of local governments to make the difference.

We strongly encourage CBT to fund this proposal in full to assist in the restoration of our River.

Sincerely,

Sally G. Hornor, Ph.D

Project Description

1. Watershed Plan Status

The contributing drainage area is discussed in the Anne Arundel County *Severn River Watershed Management Master Plan – Current Conditions*, Revised July 2003. The area fell into the fair category at that time. The situation has gotten worse in the intervening years. The lack of funding has delayed any attention to restoration or mitigation factors. The community, on its own volition, decided to tackle the issue with a series of project, involving multiple sites and BMP over a three year period. Sunset Beach restoration and mitigation efforts represent the first step in this ambitious plan.

Since 65% of the stormwater pollution originates on private property it is imperative that organizations such as SCC seek out these property owners and assist in developing effective approaches to meeting this critical challenge. Unlike local governments these private property owners, churches, communities, small businesses, etc. have little in the way of knowledge or resources to meet the challenge. The Chesapeake Bay Trust grant funding programs represent the critical success factor in meeting this need.



2. Objectives

At the CMIA public membership meeting on June 2nd 2009 the Erosion Committee was charged with meeting the following objectives:

- Reduction of stormwater runoff by 48-57% percent from area runoff through infiltration.
- Mitigate the pollutant load of the runoff by up to 77%
- Provide an educational resource for the community and collocated communities.

- d) Install interpretive signage.
- e) Provide a “quick win” project to show the full community, and surrounding communities, the necessity to do more projects to help restore their watershed.

3. Background

The CMIA committee contacted EnviroSite Design Services (ESDS) about the possibility of a partnership to start dealing with their concern about the stormwater runoff situation on common community properties, and setting an example for residents. The community borders the Severn River. The committee accepted the challenge of bringing critical environmental issues of the area to the community and to encourage them to be more actively involved in doing their part to restore the river. The committee is active in developing a long-term strategic plan for projects that will make a difference. The plan currently includes the next priority which will be the stormwater retrofit at the Crab Away pier pocket park. The plan calls for the establishment of a small living shoreline wetland to stop the severe erosion at the site and provide wildlife habitat. The first step is to implement a recently approved AACO vegetation Plan to remove foreign invasive species; Bamboo, Privet shrub, and English Ivy. The next major project currently in the conceptual design phase is to restore a completely eroded hillside that is responsible for huge silt plumes with even small rain events and is devastating to the local waters. The community is very excited about taking this first step on a long journey.

4. Criteria

1) Outcomes

This project will contribute to the improvement of water quality and the natural habitat of the Chesapeake Bay, its rivers, and streams.

- Reduce Phosphorus by 77%, reduces algae growth, oxygen depletion.
- Reduce Total Nitrogen by 74%, reduces algae growth, oxygen depletion.
- Reduces heavy metal pollutants – Copper, Zinc, and Mercury by 79 - 81 %.
- Reduces TSS carry by 98%
- Produce plant enzymes and microbic action to break down petroleum (hydrocarbon) products.
- Reduce water temperature to protect Submerged Aquatic Vegetation (SAV) destruction.
- Increase water clarity for SAV growth – Fisheries food, nursery, protection.
- Recharge ground water, source of drinking water and wells.

The project will use time tested, proven, BMP: Bioretention Cells – Rain Garden, Bioswales, Stormwater Planters, and compost filter tube living walls.

In addition to the benefits identified in Project Deliverables Table the following specifics are offered:

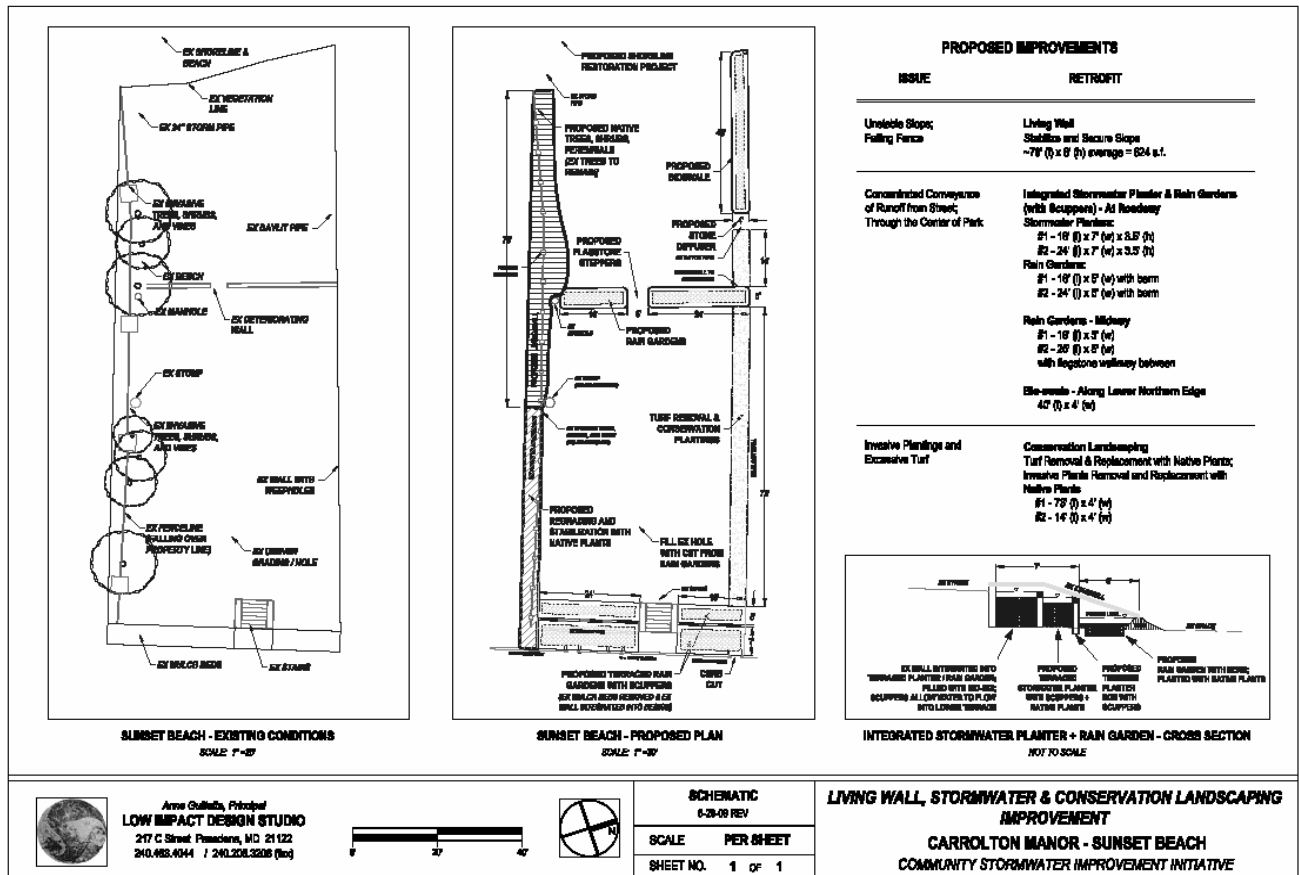
- 4.37 acres drainage area.
- 38% impervious area, thus there is 72,336 sq ft of runoff from impervious surfaces.
- 860 square feet of bioretention surface.
- 350 sq ft of conservation/wildlife landscaping, incl. 38 wildlife oriented shrubs.
- 662 sq ft of turf removal for improve infiltration.
- 800 sq ft riparian buffer area
- Runoff rate at 2.5 cubic feet per second (cfs)

2) Technical Merit

This project design was developed by the experienced members of the ESDS project team with the pro bono assistance of Anne Guillette, MLA, LEED AP, of LID Studio, with input from three potential contractors with professional engineering (PE) staffs. Mel Wilkins is leading the pre-proposal planning and coordination efforts.

This project will be managed and technically directed by the EnviroSite Design Services alliance, in coordination with the technically qualified community team and Erosion Committee.

See Attachments



Bioretention and infiltration best management practices (BMPs) are becoming some of the most frequently used stormwater management tools in urbanized watersheds. Designed to address runoff volume, peak, and quality criteria, these BMPs can be used as an integral component of stormwater systems, augmenting and in many cases replacing pure detention-based methods. Designed to infiltrate, evaporate, and filter runoff, bioretention and infiltration BMPs reduce stormwater runoff volumes and act as a filter to mitigate negative impacts from development and changing land use. A cornerstone of low-impact development (LID) design, these BMPs are at their most effective when distributed over a site and incorporated into the stormwater collection system. These control measures directly address recharge, water quality, volume, peak delay, and flow issues.

3) Sustainability

The use of the LivingWall™ BMP for bank restoration will maximize the sustainability of the mitigation, as opposed to a structural retaining wall implementation. The site plan uses low impact design features wherever feasible. See Attached Three (3) year Maintenance Plan. A summary checklist follows:

Description	Method	Frequency	Time of Year
Plant watering	By-hand/Automatic/Tree watering bags	As required, considering weather conditions	During drought, fall, early spring
Weeding	By-hand	As required, bi-annually	15 Mar – 30 Apr, and 1 Oct – 30 Nov
Plant carei	By-hand	Annually	15 Jan – 15 Mar
Mulching plants/trees	By-hand	Annually	1 Oct – 30 Nov
Tree Care	By-hand	As required, bi-annually	15 Feb – 30 Mar, and 15 Oct – 30 Nov
Organic disease control	By-hand, sprayer	As required from routine observation	All year, Per instructions
Organic Fertilizer	By-hand, spreader	Annually	1 Oct – 30 Nov
Trash removal	By-hand	As required from routine observation	Year round
Structural checks	Visual, clear by hand, repair by-hand	Routine, after heavy rain events	Year round
Plant replacement	By-hand	As required	15 Sept – 15 Nov

4) Community Engagement and Partnership

The community is partnering with the Severn River Association and Severn Riverkeeper program. The talents and skills of the organization will be brought to bear in meeting the projects objectives.

The initial volunteer involvement will be an Invasive species removal day and site preparation. As part of the project there will be a festive Planting Day event for the community, partner organizations, and the public. The local schools and scout organizations will also be invited for the project events. The Erosion Committee will be involved throughout the project and coordinating the planting event and showcasing the project to others as part of the community outreach component of the project. As noted in the demographics discussion CMIA will organize a subcommittee to encourage partnerships with the underserved communities and population.

5) Budget and Match

CMIA cash match goal is \$2500. The total match goal of 25% is addressed in the budget table Section 4.

CMIA has already paid \$2,500 to ESDS to develop the project plans and conceptual BMP designs for CMIA stormwater runoff mitigation sites, including Sunset Beach.

No paid staff from CMIA will be compensated for this project. CMIA is and all volunteer organization.

5. Experience

ESDS principals have a strong history of implementing similar scale projects and BMP technologies. Over the past ten years they have built of numerous rain gardens, swales, stormwater planters, living shorelines, living walls, and bank restorations, and other runoff control and mitigation BMP. All grant

programs have been successfully completed and managed within funded budgets. Ms Guillette brings exceptional strong credentials and low impact design experience at the National level.

6. Partnerships

Severn River Association (SRA) – SRA will assist in setting up showcase events with other communities members (over 70) and providing wide spread outreach services. They will also be involved in getting volunteers involved. Certain technically qualified members will be brought in as required to support design reviews and construction. CMIA will invite all community organizations to participate. Neighboring communities will also be asked to join the partnership.

Severn RiverKeeper (SRK) – SRK will assist in a similar fashion to SRA. SRK will have the unique capability to do water quality (WQ) test and monitoring. This will help establish a WQ baseline in the Carrollton Manor area to monitor as all future BMP are put in place.

Anne Arundel County is already providing Geographical Information System (GIS) support for design purposes.

7. Demographics

This project will engage traditionally underrepresented groups a wide audience regardless of ethnicity, nationality, origin, culture, education, or socioeconomic status. CMIA is working with local community organization, schools, churches, etc. to build a relationship with underserved and underrepresented community in the area. The Severna Park is not a highly diverse area, thus a proactive approach will be required. CMIA is working with the County community services staff to support the outreach initiative.

8. Technical Information

Expanded Technical information and site pictures follow, as well as maintenance plan and native plant list.

Project: Carrolton Manor – Sunset Beach

Community Stormwater retrofit Initiative:

Living wall, stormwater planter, bioretention cells – rain gardens, and conservation landscaping improvements

Statement of Work:

Item #1 Supply and Install per contract drawings:

Living Wall (624 square feet)

Item #2 Demolish and dispose of all debris

130 Linear Feet of Existing Fence, and 40 linear feet of Belgian Block Wall.

Note: The salvageable material from the demolition of the Belgian Block wall will be saved.

Item #3 Supply and install per contract drawings

Integrated Stormwater Planters with Scuppers

Install the Integrated Stormwater Planters using pressure treated 6"x6" timbers as specified in the plan.

Item #4 Supply and Install per contract drawings:

Rain Gardens with berms below the planter

Excavate to a depth of 2' and use spoils to fill "hole" as called out on plans. (Any spoils not used to fill existing hole will be dispersed on site.)

Install rain garden soil mix to a depth of 1.5'. The soil will consist of 50% ASTM-33 sand and 50% LeafGro. Upon completion, the rain garden will be mulched with 2" of shredded hardwood bark mulch.

Item #5 Supply and Install per contract drawings:

Rain Gardens (Midway) with flagstone stepping stones between the two proposed rain gardens.

Excavate to a depth of 2' and use spoils to fill "hole" as called out on plans. (Any spoils not used to fill existing hole will be dispersed on site.)

Install rain garden soil mix to a depth of 1.5'. The soil will consist of 50% ASTM-33 sand and 50% LeafGro.

Upon completion, the rain garden will be mulched with 2" of shredded hardwood bark mulch.

The Flagstone walkway will be constructed using a 2" thick flagstone in a random pattern. The flagstone will be dry-laid on a 4" base of CR-6 and a 2" stone dust setting bed.

Item #6 Supply and Install per contract drawings:

Bio-swale (Along Lower Northern Edge)

Excavate to a depth of 2' and use spoils to fill "hole" as called out on plans. (Any spoils not used to fill existing hole will be dispersed on site.)

Install rain garden soil mix to a depth of 1.5'. The soil will consist of 50% ASTM-33 sand and 50% LeafGro.

A stone diffuser will be installed at high side of the bio-swale. The diffuser will be constructed with 1-3" Delaware Valley River Jack stone at a depth of 6". The bottom and sides of the diffuser will be wrapped in 4 oz. grab pin point woven geo-textile fabric. The shape of the diffuser will be constructed to minimize the cutting action of the water flow before entering the bio-swale. Upon completion, the bio-swale will be mulched with 2" of shredded hardwood bark mulch.

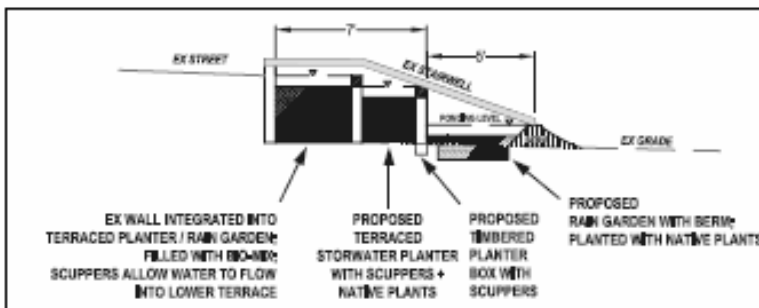
Item #7 Remove and dispose per contract drawings

Turf and Invasive Plant Removal

Note: This line item does not including any cost associated with plant material or labor to install plant material.

PROPOSED IMPROVEMENTS

ISSUE	RETROFIT
Unstable Slope; Falling Fence	Living Wall Stabilize and Secure Slope ~78' (l) x 8' (h) average = 624 s.f.
Concentrated Conveyance of Runoff from Street; Through the Center of Park	<p>Integrated Stormwater Planter & Rain Gardens (with Scuppers) - At Roadway</p> <p>Stormwater Planters: #1 - 16' (l) x 7' (w) x 3.5' (h) #2 - 24' (l) x 7' (w) x 3.5' (h)</p> <p>Rain Gardens: #1 - 16' (l) x 5' (w) with berm #2 - 24' (l) x 5' (w) with berm</p> <p>Rain Gardens - Midway #1 - 19' (l) x 5' (w) #2 - 25' (l) x 5' (w) with flagstone walkway between</p> <p>Bio-swale - Along Lower Northern Edge 40' (l) x 4' (w)</p>
Invasive Plantings and Excessive Turf	<p>Conservation Landscaping</p> <p>Turf Removal & Replacement with Native Plants; Invasive Plants Removal and Replacement with Native Plants</p> <p>#1 - 73' (l) x 4' (w) #2 - 14' (l) x 4' (w)</p>



INTEGRATED STORMWATER PLANTER + RAIN GARDEN - CROSS SECTION

NOT TO SCALE

Native Plant List:

Shrubs

- **Huckleberries**, *Gaylussacia species* (can tolerate acid soil but grow wherever there is little competition, e.g., on these eroded slopes)
- **Witch Hazel**, *Hamamelis virginiana* (next to streams, including on steep slopes) – sole nectar source for the night-flying moth that pollinates it in fall
- **Mountain Laurel** *, *Kalmia latifolia* (probably very important for erosion control, as it forms large colonies on the steepest slopes) – PLEASE BUY THE SPECIES, NOT CULTIVARS, which will seriously skew the gene pool.
- **Pinxterbloom, Wild Pink Azalea**, *Rhododendron periclymenoides* (formerly *R. nudiflorum*) – deciduous, but one of the most beautiful shrubs of all
- **Blueberries**, *Vaccinium species* (most common is Lowbush Blueberry, *V. vacillans*; Highbush Blueberry, *V. corymbosum*, from which our cultivated blueberries are bred, is common; Maine Lowbush Blueberry, *V. angustifolium*, is more common in the mountains but is sometimes found here)
- **Maple-Leaf Viburnum**, *Viburnum acerifolium*

Groundcovers

- **Striped or Spotted Wintergreen**, *Chimaphila maculata* – evergreen but sparse, technically a "sub-shrub"
- **Trailing Arbutus** *, *Epigaea repens* – also a sub-shrub, disappearing because people dig it up

Herbaceous Plants

All are ornamental.

- **Maidenhair Fern**, *Adiantum pedatum* – fronds grow from outer side of semicircular stem
- **Rue Anemone**, *Anemonella thalictroides* – white flowers in Spring
- **Alumroot**, *Heuchera americana* – evergreen foliage, sprays of greenish or reddish flowers in Spring
- **Christmas Fern**, *Polystichum acrostichoides* – evergreen fern, needs moisture
- **Wild Stonecrop**, *Sedum ternatum* – white flowers in Spring, evergreen fleshy foliage
- **Wild Pink**, *Silene caroliniana* – pink flowers in Spring
- **Star Chickweed**, *Stellaria pubera* – white flowers in Spring, exceptionally showy

Herbaceous Plants for Shade

Ferns

- **Maidenhair Fern**, *Adiantum pedatum* (rare on coastal plain) – leaves attached to an unusual semicircular stem
- **Sensitive Fern**, *Onoclea sensibilis* – leaflets rather amorphous in shape
- **Common Polypody**, *Polypodium virginianum*
- **Christmas Fern**, *Polystichum acrostichoides* is by far the most common – evergreen
- **New York Fern**, *Thelypteris noveboracensis* – narrows toward base as well as toward tip

Evergreen Groundcovers

- **Partridgeberry**, *Mitchella repens* – tiny leaves, covers ground slowly, thinly

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- **Golden Ragwort**, *Senecio aureus* – handsome, scalloped, kidney-shaped leaves; golden dandelion-like flowers on tall stems in spring; covers densely, spreads quickly – may be too aggressive in sun

Spring Wildflowers *

Those listed are especially beautiful or valuable for wildlife.

- **Jack in the Pulpit**, *Arisaema triphyllum*
- **Spring Beauty**, *Claytonia virginiana* – corms provide winter food for small mammals
- **Cut-leaved and Slender Toothwort**, *Dentaria laciniata*, *D. heterophylla*
- **Dutchman's Breeches**, *Dicentra cucullaria* and **Squirrel Corn**, *Dicentra canadensis* – corms provide winter food for small mammals
- **Wild Geranium**, *Geranium maculatum*
- **Round- and Sharp-lobed Hepatica**, *Hepatica americana*, *H. acutiloba*
- **Virginia Waterleaf**, *Hydrophyllum virginianum*
- **Showy Orchis**, *Orchis spectabilis*
- **Smooth Sweet Cicely**, *Osmorhiza longistylis*, carrot family member, presumed to be a native larval host of Eastern Black Swallowtail butterfly; flowers small, not showy
- **Mayapple**, *Podophyllum peltatum*
- **Solomon's Seal**, *Polygonatum biflorum*
- **Bloodroot**, *Sanguinaria canadensis*
- **False Solomon's Seal**, *Smilacina racemosa*
- **Star Chickweed**, *Stellaria pubera*
- **Perfoliate Bellwort**, *Uvularia perfoliata*
- **Common Blue Violet**, *Viola papilionacea*, and other blue and white violets

Summer Wildflowers

- **Black Cohosh**, Black Snakeroot, Bugbane, *Cimicifuga racemosa* – larval host for the rare Appalachian Blue butterfly; blooms in June
- **Black-eyed Susan**, *Rudbeckia fulgida var. fulgida*, state flower, low maintenance, long flowering
- **Coneflower**, *Echinacea purpurea*, low maintenance, hardy, showy, purple-red
- **Coreopsis**, Tickseed, *Coreopsis*, yellow and white, hardy, long flowering

Fall Wildflowers

These will be found at the edge of the woods, along trails, and in clearings.

- **Common Blue Wood Aster**, *Aster cordifolius* – blue flowers, often with pink centers
- **Upland Boneset***, *Eupatorium sessifolium* (needs neutral soil) – a white-flowered Joe Pye weed
- **Blue-stem Goldenrod**, *Solidago caesia* – one of the prettier goldenrods, with a long string of small flower clusters in the leaf axils