

**FIRST DRAFT**

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**OPPORTUNITIES TO IMPROVE  
ENVIRONMENTAL PROTECTION  
IN THE CRITICAL AREA OF  
SAINT MARY'S COUNTY**

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*A Preliminary Analysis*

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At the Request Of The

**Potomac River Association**

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## **SUMMARY**

The Potomac River Association retained Community & Environmental Defense Services (CEDS) to evaluate major development projects approved for sites in the Chesapeake Bay Critical Area of Saint Mary's County between 2002 and 2005. The Association's goal was to identify opportunities to improve the level of protection afforded the fish, wildlife, and human uses associated with the critical area.

The study designed by CEDS to meet the Association's goal called for a thorough examination of approximately ten critical area projects. After completing a review of project files compiled by two County agencies - Department of Land Use & Growth Management (LUGM) and the Department of Public Works & Transportation (DPWT) - an initial visit was scheduled to the project sites. The purpose of this first visit was to verify that each project had been completed, determine stormwater facilities and other features were accessible from public areas, and to get a feel for likely opportunities to enhance environmental protection.

During the initial visit on October 19<sup>th</sup> the Association and CEDS found that the stormwater facilities at three of four sites had been poorly maintained and were in a condition precluding prevention of pollution and other environmental impacts. The Association directed CEDS to halt all other work on the project except that necessary to:

- get the failing facilities repaired;
- determine why the facilities had not been properly maintained;
- develop recommendations for improving maintenance; and
- assess whether these were isolated deficiencies or if 75% of the 379+ stormwater facilities in the County were in an equally deplorable condition.

CEDS reported the failing facilities to the Department of Land Use & Growth Management on October 20<sup>th</sup>. As of the date of this report, we have not heard the results of the Department's inspections. These results and subsequent discussions with Department officials should reveal the causes of the maintenance deficiencies. This information should then allow CEDS to draft recommendations for how the Association can support the County in improving this critically important quality of life protection program.

The 379+ existing stormwater facilities drain about 4,000 acres or 11% of the developed portions of Saint Mary's County. To determine the extent of the maintenance deficiencies the Association directed CEDS to develop a program to train volunteers in how to assess the condition of a stormwater facility. The Association has set the goal of conducting the first volunteer recruitment drive and training session next Spring, 2008.

## INTRODUCTION

The Potomac River Association has a long history of advocating for the environmental resources of Saint Mary's County and the uniquely high quality of life these resources afford. The Association began this essential work long before the passage of the 1984 Critical Areas Act. However, the Critical Areas Act did hold out the promise of greatly advancing the preservation of the County's most sensitive waters while allowing a reasonable amount of growth.

The Association commissioned Community & Environmental Defense Services (CEDS) to conduct an assessment of how well the Saint Mary's Critical Area Program is achieving these benefits. Specifically, the Association directed CEDS to seek answers to the following ten questions regarding development projects recently completed in the Chesapeake Bay Critical Area of Saint Mary's County:

1. How closely did the approved development plan for each project conform to program requirements?
2. Did County records for the project show that:
  - a. the County performed the research needed to document all sensitive resources (submerged aquatic vegetation, shellfish beds, etc.) potentially affected by a project; and
  - b. that the applicant was required to use measures which would fully protect these resources?
3. Did the final approved plan incorporate the use of highly-effective environmental protection measures, such as infiltration, filters, Low-Impact Development techniques, Environmentally-Sensitive Design, etc.?
4. How could the plan have been modified to reduce loads of nitrogen and other pollutants?
5. Can it be demonstrated that the affected waters would be of significantly better quality because of the use highly-effective environmental protection measures?
6. Were any variances granted to program requirements and, if so, did these variances significantly diminish protection of water quality and habitat?
7. Was the project exempted from environmental protection requirements due to grandfathering provisions?
8. How much better would affected waters have been protected without the variances or grandfathering?

9. What is the level of compliance with the final approved plan on completed sites with respect to:
  - a. Buffer requirements;
  - b. Installation and maintenance of environmental protection structures; and
  - c. Other plan conditions essential to environmental protection?
  
10. Is there evidence of adverse impacts in the waters associated with recently completed sites, such as:
  - a. Fresh deposits of sediment from upland erosion;
  - b. Reduced water clarity in the vicinity of the site compared to adjacent waters; or
  - c. Changes in the distribution of submerged aquatic vegetation in the immediate vicinity of the site compared to adjacent areas?

#### **CRITICAL AREA PROGRAM PURPOSE**

The Chesapeake Bay Critical Area extends 1,000 feet inland from the head of tide. A total of 43,700 acres or 18% of Saint Mary's County lies within the critical area.

The Maryland General Assembly declared the following findings as justifying the decision to regulate growth in the critical area:

- (1) The Chesapeake and the Atlantic Coastal Bays and their tributaries are natural resources of great significance to the State and the nation;
- (2) The shoreline and adjacent lands constitute a valuable, fragile, and sensitive part of this estuarine system, where human activity can have a particularly immediate and adverse impact on water quality and natural habitats;
- (3) The capacity of these shoreline and adjacent lands to withstand continuing demands without further degradation to water quality and natural habitats is limited;
- (4) Human activity is harmful in these shoreline areas, where the new development of nonwater-dependent structures or the addition of impervious surfaces is presumed to be contrary to the purpose of this subtitle, because these activities may cause adverse impacts, of both an immediate and a long-term nature, to the Chesapeake and Atlantic Coastal Bays, and thus it is necessary wherever possible to maintain a buffer of at least 100 feet landward from the mean high water line of tidal waters, tributary streams, and tidal wetlands;

- (5) National studies have documented that the quality and productivity of the waters of the Chesapeake Bay and its tributaries have declined due to the cumulative effects of human activity that have caused increased levels of pollutants, nutrients, and toxics in the Bay System and declines in more protective land uses such as forestland and agricultural land in the Bay region;
- (6) Those portions of the Chesapeake and the Atlantic Coastal Bays and their tributaries within Maryland are particularly stressed by the continuing population growth and development activity concentrated in the Baltimore-Washington metropolitan corridor and along the Atlantic Coast;
- (7) The quality of life for the citizens of Maryland is enhanced through the restoration of the quality and productivity of the waters of the Chesapeake and the Atlantic Coastal Bays, and their tributaries;
- (8) The restoration of the Chesapeake and the Atlantic Coastal Bays and their tributaries is dependent, in part, on minimizing further adverse impacts to the water quality and natural habitats of the shoreline and adjacent lands, particularly in the buffer
- (9) The cumulative impact of current development and of each new development activity in the buffer is inimical to these purposes; and
- (10) There is a critical and substantial State interest for the benefit of current and future generations in fostering more sensitive development activity in a consistent and uniform manner along shoreline areas of the Chesapeake and the Atlantic Coastal Bays and their tributaries so as to minimize damage to water quality and natural habitats.

The Maryland General Assembly also set forth two purposes the Act was to achieve:

- (1) To establish a Resource Protection Program for the Chesapeake and the Atlantic Coastal Bays and their tributaries by fostering more sensitive development activity for certain shoreline areas so as to minimize damage to water quality and natural habitats; and
- (2) To implement the Resource Protection Program on a cooperative basis between the State and affected local governments, with local governments establishing and implementing their programs in a consistent and uniform manner subject to State criteria and oversight.

The findings and purpose of the Maryland General Assembly are also presented in Section 40.1, of the *Saint Mary's County Comprehensive Zoning Ordinance*. This section sets forth the following purpose for the Chesapeake Bay Critical Area Overlay

1. The Chesapeake Bay Critical Area Overlay implements Comprehensive Plan policies to protect land and water resources in the Chesapeake Bay Critical Area. The developmental and land use controls within the overlay will minimize adverse impacts on water quality from run off from surrounding lands. It will conserve fish, wildlife, and plant habitat. Finally, this district establishes land use regulations for development that accommodate growth and also address the fact that, even if pollution is controlled, the number, movement, and activities of persons in that area can create adverse environmental impacts.
2. Land use development standards and requirements established in Chapter 41 are intended to foster more sensitive development activity for shoreline areas and to minimize the adverse impacts of development and land use activities on water quality and natural habitats pursuant to the Natural Resources Article, Subtitle 18 of the Annotated Code of Maryland and COMAR 27.01.

The General Assembly established a Maryland Critical Area Commission to draft and administer the regulations setting forth how further growth would be managed to achieve the purposes of the Act in the 1,000-foot extending from head of tide. The findings and purpose statements presented above show three overarching goals<sup>1</sup>:

- Minimize adverse impacts to water quality from run-off;
- Conserve fish, wildlife, and plant habitat; and
- Establish land use policies for development that accommodate growth -and address the fact that the number, movement and activities of people in the Critical Area can have adverse environmental impacts.

The regulations adopted by the Commission sought to achieve these goals through the following six measures:

- Residential development intensity was reduced in 56% of the critical area (380,000 acres) from one- to three-houses per acre (for the most part) to one house per 20 acres;
- Impervious surface coverage was limited to 15% in the majority of the critical area;<sup>2</sup>

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<sup>1</sup> These three goals come from a 2007 presentation made by Commission staff to the Maryland Association of Counties: <http://www.dnr.state.md.us/criticalarea/download/MACO-07.pdf>

<sup>2</sup> The 15% limit was originally based upon a study published by the author of this report *Urbanization & Stream Quality Impairment* (Klein 1979) which showed that aquatic resource degradation becomes unacceptable when watershed imperviousness exceeds 15%. Grandfathered lots in the critical area may be up to 25% impervious. The impervious area limit does not apply to the Intensely Developed Area.

- Most disturbances were prohibited within a minimum 100-foot buffer extending inland from the tide line;
- Any trees or forest stands cleared within the critical area must be replaced;
- The use of more effective stormwater management measures was required; and
- Additional protection was afforded to uniquely important habitats.

For the most part, the six preceding measures were not required for development within 1,000-feet of tide prior to the promulgation of the Maryland critical area regulations. While these measures still permit some development in the critical area, particularly the 44% designated for Limited Development and Intense Development, the overall amount of growth was reduced dramatically. Though there have been a number of challenges to the Critical Area Act and regulations over the past 23 years, the Maryland General Assembly has refused to weaken the law. In fact, the law was strengthened on several occasions. The General Assembly and the state-local officials who administer the law are to be commended for their steadfast commitment to the goal of preserving the Chesapeake Bay and its tributaries.

Collectively, the six measures should have brought about a dramatic reduction in the impact of new development within the critical area. The Potomac River Association commissioned CEDS to determine if, in fact, this reduction was being achieved in the Saint Mary's County portion of the critical area.

## **METHODS**

The Association decided to focus on major development project involving more than four lots or any nonresidential (commercial, industrial, institutional, etc.) within the critical area. This focus was selected to minimize cost while concentrating attention on the projects with the greatest impact potential. The Association also opted to focus on projects approved after the year 2000 when the Maryland Department of the Environment (MDE) required local jurisdictions to comply with more the effective requirements set forth in the *2000 Maryland Stormwater Design Manual*<sup>3</sup>. Finally, the Association wanted to assess projects that had likely been completed so full compliance could be evaluated.

CEDS used the Maryland Archives *Digital Image Reference System for Land Survey, Subdivision, and Condominium Plats*<sup>4</sup> to identify a population of projects meeting the Association's criteria. This online resource allows the user to view the plat recorded for development projects. CEDS focused on the 847 project plats recorded between 2002 and 2005.

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<sup>3</sup> The *2000 Maryland Stormwater Design Manual* can be viewed online at: [http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater\\_design/index.asp](http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp)

<sup>4</sup> This resource is online at: <http://www.msa.md.gov/megafile/msa/stagser/s1500/s1529/html/0000.html>

This period was selected since plats recorded during this period would likely have been required to comply with the 2000 MDE stormwater manual and there was a good chance project construction would have been completed.

CEDS then requested access to the files for projects meeting the evaluation criteria. This request was submitted to two County agencies: the Department of Land Use & Growth Management (LUGM) and Department of Public Works & Transportation (DPWT). With respect to DPWT, we only asked for access to stormwater management files and had hoped to obtain the approved stormwater management plans along with the hydrology and hydraulic computations report for each project. The entirety of LUGM files was requested for each project. We sought to obtain the following for each project: the final approved site plan or subdivision plan, the critical area report, and the staff report. These documents would contain the information needed to answer the ten questions posed by the Association.

LUGM files were reviewed on September 20<sup>th</sup>. Because some of the project files were not available on the first date, additional files were reviewed on October 19<sup>th</sup>. The DPWT files were reviewed on September 21<sup>st</sup>. Copies of letter- and legal-size documents were obtained with a portable scanner. Digital images were taken of plans and other oversize documents. Copies were also requested of the project plans most relevant to this study.

On October 19<sup>th</sup> Association president Erik Jansson, Association Board member Bob Elwood, and CEDS president Richard Klein visited ten of the fourteen project sites to:

- verify that construction had been completed;
- determine if the critical area portion of the sites was open to the public; and
- to conduct an initial assessment of compliance with final approved plans.

## **RESULTS**

Of the 847 plats recorded during the four-year period of 2002 to 2005, 21 were located in the critical area.<sup>5</sup> All 21 projects were residential and 14 met the criteria of consisting of five lots or more. These 14 projects are listed in Table 1.

As shown in Table 1, a total of 226 lots were platted on the 942 acres encompassed by the 14 project sites. Three overlay districts are applied to land located within the critical area. Table 2, below, provides a comparison of the general requirements associated with these three overlay districts. Table 1, shows that the critical area portion of ten of the 14 project sites has a Resource Conservation Area (RCA) overlay, three have a Limited Development Area (LDA) overlay, and

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<sup>5</sup> The general notes on each of the 847 plats shows the zoning and overlay districts for the project site. A project was assumed to be in the critical area if one of the three following overlay zones was noted as present on the site: RCA (Resources Conservation Area), LDA (Limited Development Area), or IDA (Intensely Developed Area).



one has an Intensely Developed Area (IDA) overlay. Table 2, shows that RCA is the most restrictive and affords the greatest protection from development impacts. Of the 18% of the County in the Chesapeake Bay Critical Area, 77% has an RCA overlay.

**Table 2: Chesapeake Bay Critical Area Overlay District Characteristics**

Overlay District	Development Intensity	Impervious Area	Tree Clearing Limit	Other
Resource Conservation	1 lot per 20 acres	15% Limit <sup>1</sup>	20%-30%	No new commercial or industrial uses without growth allocation,
Limited Development	Moderate density	15% Limit <sup>1</sup>	20%-30%	
Intensely Developed	High density	None	None; planting of permeable when possible	Minimum 10% pollutant load reduction

1. Small, grandfathered lots may be 25% impervious.

### File Review Results

A request was made to review the files compiled by two County agencies for the 14 projects: the Department of Land Use & Growth Management (LUGM) and Department of Public Works & Transportation (DPWT). A summary of the information obtained from these files is presented in Table 3, 4, and 5.

**Department of Land Use & Growth Management:** The Saint Mary's County Department of Land Use & Growth Management (LUGM) produced files for 12 of the 14 projects. Department staff could not locate the files for the Bell Property or Golden Eye. The Bell Property plat shows that the Department approved lots 1-5 on April 7, 2005. The Golden Eye subdivision plat was approved by LUGM on March 22, 2002<sup>6</sup>. Given the fact that the Department had approved both projects, it is unclear why the file containing documents supporting the approvals were not present among the Department records.

Plans depicting each project as approved by the Department were present in the LUGM files for the 12 projects. A critical area report was present for only one of the 12 project files - Hanover at Breton Bay. This was also the only project which included a water-dependent facility - a community pier and picnic area.

Three Sections (3, 4, 5) of the Greens Rest project were among the projects. The plats for all three sections indicated each was located within the critical area. However, plans for all three sections showed none extended into the critical area. A closer inspection of the other nine projects showed that Lots 1-5 of the Bell Property are also located outside the critical area.

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<sup>6</sup> In 2002, LUGM was known as the Department of Planning & Zoning

From the review of several project plans it initially appeared that most lots were located outside the critical area. Table 3, was prepared to determine if this perception was correct. But Table 3, shows that 35% of the area of the 14 projects is located within the critical area along with 40% of the lots.

**Department of Public Works & Transportation:** Access was requested to DPWT stormwater management files for the 14 projects. Files were provided for 11 of the projects but not for the Bell Property, the portion of the Cedar Cove PUD known as Kedges Strait, and Golden Eye.

With respect to Cedar Cove, the DPWT files did contain stormwater plans for two other phases: Swash Bay and Walnut Point, but not Kedges Strait. Actually, there were two sets of Cedar Cove stormwater plans. The first were joint plans for Swash Bay and Walnut Point approved in 1990. In 1997, stormwater plans for just Swash Bay were approved. The layout of Swash Bay depicted in the 1990 plans did not conform to the project as shown on the 1997 plans and as it was subsequently built.

Those seeking approval of stormwater plans must submit a set of hydrologic and hydraulic computations showing how the project will change pre-development runoff patterns and what measures will be used to prevent undue flooding. Since the adoption of the *2000 Maryland Stormwater Design Manual*<sup>7</sup>, applicants have also been required to submit computations showing that a project complies with requirements for channel erosion protection, water quality protection, and maintenance of groundwater recharge.

It was hoped that stormwater computations would be available for each project since this would make it easier to compute the pre- and post-development pollutant loads requested by the Association. As shown in Table 4, computations were present for four of the projects and absent for seven others. The three other projects were Sections 3, 4, and 5 of Greens Rest. Since all three sections are outside the critical area the DPWT file for each section was not reviewed.

Table 5, summarizes stormwater management information relevant to the purpose of this study. The DPWT files for seven of the projects contained records showing that compliance was required with the generally more effective practices presented in the *2000 Maryland Stormwater Design Manual*. Compliance with the 2000 manual should also be required for the Bell Property since the plat was approved in 2005. Projects were not required to comply with the 2000 manual if they received preliminary plan approval prior to the date of adoption. The plats for Cedar Cove Kedges Strait, Goldeneye, and Villas at Waters Edge were recorded in 2001 and 2002. Plat approval comes months after preliminary plan approval. So projects platted in 2001 or 2002 were likely grandfathered under the stormwater requirements preceding the 2000 Manual.

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<sup>7</sup> The *2000 Maryland Stormwater Design Manual* can be viewed online at:  
[http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater\\_design/index.asp](http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp)







### Highly-Effective Stormwater Management Measures

In Table 5, a distinction is made between *highly-effective* measures and other stormwater management Best Management Practices (BMPs). CEDS defines highly-effective measures as those capable of reliably:

- achieving a high degree pollutant removal from runoff generated on impervious surfaces;
- maintaining predevelopment groundwater recharge rates by allowing impervious surface runoff to infiltrate the soil; and
- reducing runoff volume through infiltration and thereby increasing the likelihood that channel erosion will not be accelerated.

Measures presented in the *2000 Maryland Stormwater Design Manual* meeting the preceding definition of highly-effective are<sup>8</sup>:

- infiltration trench;
- infiltration basin;
- surface sand filter (designed to infiltrate runoff);
- underground sand filter (designed to infiltrate runoff);
- perimeter sand filter (designed to infiltrate runoff);
- organic filter (designed to infiltrate runoff);
- pocket sand filter (designed to infiltrate runoff);
- bioretention (designed to infiltrate runoff);
- dry swale; and
- dry well.

Other *2000 Maryland Stormwater Design Manual* measures which do not meet the CEDS definition of highly-effective are:

- micropool extended detention pond;
- wet pond;
- wet extended detention pond;
- multiple pond system;
- pocket pond;
- shallow wetland;
- extended-detention shallow wetland;
- pond/wetland system;
- pocket wetland;
- wet swale;
- surface sand filter (when fitted with an underdrain preventing infiltration);

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<sup>8</sup> Illustrations of the highly-effective and other measures are presented in Chapter 3, of the *2000 Maryland Stormwater Design Manual* which can be viewed at: <http://www.mde.state.md.us/assets/document/chapter3.pdf>

- underground sand filter (when fitted with an underdrain preventing infiltration);
- perimeter sand filter (when fitted with an underdrain preventing infiltration);
- organic filter (when fitted with an underdrain preventing infiltration);
- pocket sand filter (when fitted with an underdrain preventing infiltration);
- bioretention (when fitted with an underdrain preventing infiltration);
- Natural Area Conservation Credit;
- Disconnection of Rooftop Runoff Credit;
- Disconnection of Non Rooftop Runoff Credit;
- Sheet Flow to Buffers Credit;
- Open Channel Use Credit; and
- Environmentally Sensitive Development Credit.

It is far more likely that the sensitive aquatic resources of the critical area will continue to thrive if impervious surfaces drain first to one of the ten highly-effective measures listed above. The level of protection is generally further enhanced if excess runoff then flows to one of the “other” measures presented above. Even more beneficial are those sites where Natural Area Conservation and Environmentally Sensitive Development can be maximized. However, it is unlikely sensitive species will continue to thrive when abutting large development projects do not employ highly-effective measures.

Table 5, shows the percentage of impervious areas draining to highly-effective measures. Only the following projects (or portions thereof) were designed to direct 100% of impervious surface runoff to highly-effective measures:

- Community area of Hanover at Breton Bay;
- Hearts Desire Farmsteads;
- Lots 1-11 of Saint George’s Peninsulas at Piney Point;
- Lot 2 at Saint Jerome’s Crossroads; and
- lots draining to the Slye Foxe dry swales.

Since stormwater plans for four of the projects were not present among the files provided by DPWT, it is not known if highly-effective measures were required.

While Saint George’s Peninsulas at Piney Point stormwater plans show extensive use of highly-effective measures for the lots, the lengthy road network serving these lots drain to grass filter strips or grass swales, both of which are ineffective at protecting sensitive aquatic resources. Grass swales are particularly ineffective.

While grass swales do retain a portion of the pollutants washed from impervious surfaces during frequent, low-volume rain events the retention is temporary. Various research studies show that

pollutants are mostly retained at or on the soil surface within a grass swale.<sup>9</sup> The high velocity flow associated with large-volume storms scours pollutants from the surface of the swale for transport into nearby waterways. Swales can be highly-effective if designed to allow runoff to infiltrate at a fairly rapid rate so pollutants can be transported sufficiently deep in the soil column to preclude resuspension and scour. In fact, this is the philosophy underlying the design of the dry swale presented in Section 3.5, of the *2000 Maryland Stormwater Design Manual*.<sup>10</sup>

### **Initial Site Visit**

On October 19<sup>th</sup> Association president Erik Jansson, Association Board member Bob Elwood, and CEDS president Richard Klein visited ten of the fourteen project sites to:

- verify that construction had been completed;
- determine if the critical area portion of the sites was open to the public; and
- to conduct an initial assessment of compliance with final approved plans.

### **Project Completion Status**

Table 6, shows that of the 14 projects, 9 had been completed as of October 19, 2007. A 15<sup>th</sup> project - Cedar Cove Swash Bay - had also been completed. Saint George's Peninsulas at Piney Point was under construction at the time. Because of the alarming condition of storm facilities described below, an initial visit was not made to three project sites: Bell Property, Golden Eye, and Saint Jerome's Crossroads.

### **Public Access To Sites**

Table 6, also shows whether two features could be examined from public areas at each site: the condition of stormwater facilities and the integrity of the 100-foot buffer.

Stormwater facilities could be viewed from areas open to the public at four of the 15 sites. Basin No. 1, at Hearts of Desire Farmsteads was accessible while the other two basins were not. None of the Slye Foxe stormwater facilities were accessible.

With respect to accessibility of the 100-foot buffer, the plans for five of the projects show no disturbance proposed within the critical area and, therefore, no impact to the 100-foot buffer. The plans for two projects - Hanover at Breton Bay Community Area and Saint George's Pier - do show intrusion into the 100-foot buffer. Both intrusion areas are visible from locations open to the public. Both intrusions did occur and conform to that shown on project plans. Of course, the 100-foot buffer is visible from the tidal waters adjoining all other sites.

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<sup>9</sup> See Section 4.2B, in *Design of stormwater filtering systems*, by R.A. Claytor and T.R. Schueler, 1996. Center for Watershed Protection, 8391 Main Street, Ellicott City, Maryland 21043 410-461-8323

<sup>10</sup> Section 3.5 can be viewed at: <http://www.mde.state.md.us/assets/document/chapter3.pdf>



### **Condition of Stormwater Facilities**

The last column in Table 5, shows the condition of stormwater facilities serving the projects.

Stormwater plans were not present in DPWT files for five projects. Without this information one could not be certain of the location and type of facilities or even if any were required.

Saint George's Peninsulas at Piney Point was under construction on October 19<sup>th</sup> so the facilities could not be evaluated.

An initial evaluation was made on October 19<sup>th</sup> of stormwater facilities at four sites: Cedar Cove Swash Bay, Hanover at Breton Bay Community Area, Hearts Desire Farmsteads Basin #1, and Saint George Pier. As will be shown below, the facilities at three of the four sites were in a very severe state of disrepair and were providing virtually no protection for the sensitive aquatic communities located downstream. This disturbing finding caused the Association to halt all work on this project other than that needed to initiate corrective action at the three problem sites and to determine why these facilities had not been properly maintained. Because of this the initial visit was not made to the other sites.

On October 20<sup>th</sup> CEDS reported the deficiencies at all three sites to the Department of Land Use & Growth Management. As of the date of this report we had not heard back from the Department.

**Cedar Cove Swash Bay:** The 1997 stormwater plan shows a single facility, which was a large extended-detention pond. On October 19<sup>th</sup> the pond was full of sediment with little, if any, storage capacity. The dewatering device also appeared damaged. Without sufficient storage capacity and a functional dewatering device, this pond would provide little attenuation of project impacts to sensitive aquatic resources located in the critical area downstream of the site.

**Hanover at Breton Bay Community Area:** The stormwater plans showed two bioretention facilities to treat the runoff from the paved access road and the impervious surfaces at the community area. When well maintained, bioretention facilities are among the most effective of all stormwater BMPs. However, both bioretention facilities serving the community area had been severely damaged by runoff. Erosion and sediment deposition had eliminated the runoff storage area at the surface of both facilities. Without this surface storage area runoff would not be retained for a period sufficient to allow percolation down through the facility. It is this percolation which results in the very high pollutant removal and groundwater recharge rate attainable with bioretention facilities. It appeared that a flow-splitter serving the upper facility was not functioning properly and allowed high-volume discharges into the bioretention area.

**Hearts Desire Farmsteads Basin #1:** The stormwater plans show that Basin #1 was designed to serve as an infiltration facility. Runoff collected in the basin from frequent storm events could only exit the pond by flowing through a gravel trench in the floor of the basin then infiltrating into the adjoining soils. The plans showed a perforated pipe at the base of the gravel trench to dewater the facility for maintenance. The plans also show that the pipe was to be capped at all

other times. Without the cap in place runoff would quickly flow down through the gravel trench and discharge out the pipe providing little, if any, pollutant removal or groundwater recharge. The cap was missing from the end of the pipe on October 19<sup>th</sup>. Therefore Basin #1 was providing little protection to sensitive aquatic resources located downstream.

**Saint George Pier:** The stormwater plans showed that this 12-unit townhouse project was served by two facilities: an organic filter and a pond. Both the pond and filter were in the locations depicted on the plans. The pond appeared to be in good condition. But because the filter is below ground the condition of this facility could not be fully assessed during the initial evaluation of October 19<sup>th</sup>. After discussing this problem the Association and CEDS decided on an effort to gain the cooperation of Saint George Pier residents in assessing the condition of the filter. Residents would be asked to measure water depth in the filter monitoring wells during a wet period. These measurements would show whether runoff is being retained for a period sufficient for pollutant removal and whether clogging has occurred.

## **DISCUSSION**

The original intent of this research was to identify opportunities to improve the effectiveness of water quality and habitat protection within Saint Mary's County portion of the Chesapeake Bay Critical Area. To achieve this goal a number of specific issues would be examined, such as compliance with the 100-foot buffer and other habitat protection measures along with implementation and maintenance of various Best Management Practices (BMPs).

Stormwater management BMPs are arguably the most important measures for preserving critical area water quality and habitat. When initial site visits showed that the stormwater BMPs on three out of four sites were in a severe state of disrepair, the Association directed CEDS to halt all other efforts except that necessary to:

- initiate facility repairs;
- determine why the facilities had not been properly maintained;
- develop recommendations for how the Association could support the County in improving facility maintenance; and
- determine if the 75% failure rate was unique to the four projects or extended to all other stormwater facilities in the County.

On October 20<sup>th</sup> the facility deficiencies were reported to the Department of Land Use & Growth Management. As of the date of this report we had not heard back from the Department. The Department's findings should help identify the cause(s) of poor maintenance.

The scope of the maintenance problem could be considerable. According to a database obtained from the Maryland Department of the Environment (MDE), there are at least 379 stormwater

facilities in Saint Mary's County. Unfortunately, the database does not distinguish between those in the 18% of the County within the critical area or elsewhere.

The 379 facilities capture runoff from at least 2,341 acres and possibly as much as 4,000 acres (6.25 square miles), which is about 11% of all the developed land in the County. If all 379+ facilities were fully functional then a tremendous quantity of pollutants would be kept out of the County's waterways. However, if the results of the Association's limited study of critical area facilities is representative of conditions throughout the County, then 75% (284) of these stormwater BMPs could be in a condition precluding any significant pollutant removal.

The Association directed CEDS to recommend options for determining the extent of the stormwater BMP maintenance problem. The best option is obvious:

*Develop a program to recruit and train volunteers to assess the condition of stormwater BMPs visible from areas open to the public.*

CEDS is now in the process of putting the training program together. Volunteers will also learn how to assess whether BMPs can be modified (retrofitted) to improve the level of water quality and habitat protection. For example, the MDE database shows that a third of the 379 existing BMPs are dry ponds.

A dry pond has a large opening at the bottom which allows the facility to drain completely. The opening also prevents the retention of pollutants within the facility. Instead, all the nutrients, toxic metals, and other contaminants washed from impervious surfaces into the pond discharge to downstream waters. It is relatively inexpensive to retrofit dry ponds so each retains a third to half the pollution load.

Stormwater management is a key component in efforts to maximize the many benefits growth brings to Saint Mary's County residents while minimizing impacts to their quality of life. It is likely that many County residents, as well as their elected officials, assume that stormwater BMPs are being employed in a way that substantially reduces the impact of growth on key quality of life components, such as the health of the waters they treasure. In fact, most decisions to allow more intense land uses are predicated upon the assumption that programs, such as stormwater management, are working properly. If those living near the County's many creeks knew that this critical program was not performing as expected surely they would call for far a number of actions, including a reduction in the intensity of development permitted in the watershed of their creek. Hopefully the Association will succeed in providing the County with the public support needed to keep stormwater BMPs functioning at a high level of effectiveness. Otherwise, serious consideration should be given to options such as adjusting future watershed land use to that needed to preserve the rights and quality of life of those who treasure the County's waters.