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This document was prepared by the Environmental Finance Center in partnership with Main Street Economics, Inc.

The Environmental Finance Center (EFC) at the University of Maryland, located at the National Center for Smart Growth Research and Education, is a regional center developed by the Environmental Protection Agency to assist communities and watershed organizations in identifying innovative and sustainable ways of implementing and financing their resource protection efforts throughout the Mid-Atlantic region. The EFC is non-advocacy in nature and has assisted communities and organizations in developing effective sustainable strategies for specific watershed protection goals for a variety of clients including State and local governments, watershed organizations, and land trusts. www.efc.umd.edu

Main Street Economics is a small business located in Trappe, Maryland offering professional and technical services in the emerging market for environmental economics applications. They provide these services to government agencies, private business and non-governmental organizations. Main Streets' core capability is in the application of economic analysis to environmental and natural resources management and markets. www.mainstreeteconomics.com

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Section 1: Background and Introduction

The following document provides a final report summarizing a technical service project implemented by the Environmental Finance Center at the University of Maryland (EFC), in partnership with Main Street Economics, on behalf of the Calvert County, Maryland government. Through the support of the National Fish and Wildlife Foundation, the EFC developed a strategy to improve the capacity of Calvert County to implement water quality restoration and protection projects and practices through the use of more flexible and sustainable financing processes.

Background. Though much of the policy development and debate regarding Chesapeake Bay restoration and protection has occurred at the federal and state levels, it is local communities like Calvert County that will bear the brunt of water quality financing and funding obligations. Many of the decisions affecting nutrient pollution – planning and zoning; stormwater management; transportation; and erosion control – are made at the local level. Chesapeake Bay restoration obligations have the potential to result in significant financing obligations at the local level. For example, initial estimates indicate that Calvert County is facing a cost of $1.2 billion associated with achieving its Watershed Implementation Plan. Clearly, addressing restoration cost at those levels would require revenue increases that are by all measure impracticable. Without a more practical and efficient financing and implementation system in place, the Bay will not recover; the purpose of this project was to provide Calvert County officials with a framework for establishing that system.

Key Findings. The goal of the project was to provide Calvert County leaders with the framework for a financing system that will enable the community to achieve water quality restoration and protection goals in the most efficient and effective way possible. Specifically, through this project, the EFC and its partners developed a methodology that will enable Calvert County leaders to target investments in water quality restoration and protection in a way that reduces costs, increases benefits, and improves environmental performance. The following are some key findings.

- <u>Existing WIP cost estimates appear to be dramatically over-estimated.</u> In parallel research, Main Street Economics and Jessica Rigelman developed a means to estimate annual costs of achieving the County's nutrient and sediment load allocation using the Maryland Assessment Scenario Tool (MAST) and Chesapeake Bay Program annualized cost estimates for approved pollution abatement practices. They estimate that the County's current Watershed Implementation Plan (WIP) implies annual expenditure of just under $20 million. Though this estimate is an annual number, it is far less than any reasonable annualization of the County's $1.26 billion estimate. Still, with a current fiscal budget of $250 million, financing the 2025 WIP requirements would still require and 8% increase in fees and/or taxes.
- <u>Flexibility is key for reducing implementation costs.</u> Enabling flexibility in how the County allocates and invests fiscal resources would allow the community to achieve even greater cost reductions. Specifically, if the community were allowed to offset stormwater emissions through the appropriate investment in agricultural best management practices (within the

County and above baseline) then costs would drop to around $3.8 million annually. Meeting these costs would require a more reasonable 2% increase in County revenue.

- Costs can be reduced even further through a focus on performance. It is the EFC's belief that the County has an opportunity to further reduce water quality restoration costs in two ways: 1) by consolidating stormwater programs into a single agency and program; and, 2) through the use of performance-based financing systems that target investments to those activities that actually result in the greatest environmental benefit. Such a system would be highly innovative and would ultimately reduce the impact on County taxpayers and ratepayers.
- There is no formal stormwater program in Calvert County. Calvert County is relatively unique for a community of its size in that it does not have a stormwater permit. As a result, it has no formal stormwater management program. Though the County does invest in stormwater activities, these investments are not managed and operated by a codified stormwater program. This creates concerns as well as opportunities.

Report Structure. This project was focused on providing Calvert County decision-makers with processes and tools that will benefit the community over time. The EFC's work focused on the following components:

Costs analysis: The first step in this project was to generate an accurate planning level estimate of the costs associated with achieving the County's Watershed Implementation Plan. This was important for a variety of reasons. First, as discussed below, effective financial management requires an accurate understanding of necessary levels of service and associated revenue needs. In other words, it is necessary to know costs before revenue can be allocated. Local estimates of WIP related cost, generated through the MAST scenario tool, have varied widely from community to community across the state; this has created confusion among local decision makers and leaders. The EFC's goal was to provide some clarity and consistency to the cost evaluation process. Second, if the community adopts a financing process that focuses on results and cost effectiveness, it will be essential to have modeling tools that can assess the relative cost difference between various restoration options. This part of the project was directed and managed by Robert Wieland of Main Street Economics. Detailed results of his analysis were provided to NFWF in a separate report.

Assessing existing financing capacity: The second step in this project was to assess the capacity of Calvert County to adequately and effectively achieve water quality restoration goals and potential requirements. Included in this assessment is a review of the County's annual operational and capital improvement budgets. In addition, the EFC assessed how well coordinated and effective existing program agencies were in addressing existing stormwater needs.

Developing a financing framework: The framework developed uses the capacity assessment as a foundation, and it was designed to reduce implementation costs overtime through the use of financing programs by County officials. Part of the reason that implementation costs have become so high (presumably) is because there are very few incentives in existing financing systems designed to reduce implementation costs. The EFC believe there is an opportunity in

communities like Calvert County to change that. In short, the EFC's strategy is to develop a "credit" or market-like approach that would incentivize private actors—landowners, businesses, conservation professionals, and not-for-profit organizations—to implement water quality practices in the most cost effective manner possible. The EFC's approach borrows from a variety of models across the country.

Identifying revenue options: The EFC has outlined a process for generating sufficient revenue to support restoration programs. This specifically focuses on stormwater management and the establishment of fee-based programs.

The goal was to outline a process by which Calvert County leaders can effectively reduce the costs associated with restoring and protecting water quality. Specifically, the EFC focused on the obligations associated with the Chesapeake Bay restoration Watershed Implementation Plan and on opportunities to create efficiencies and maximize the environmental return on program investments.

Focus on stormwater. The primary focus of this project was the costs associated with stormwater management. This was for two reasons. First, by the County's estimates, stormwater management is anticipated to account for the vast majority of the costs associated with achieving the Watershed Implementation Plan. Second, wastewater management, including septic or on-site systems, are regulated and financed at the local and state levels through independent laws and programs. In addition, the agricultural component of the WIP is managed by the Maryland Department of Agriculture directly. As a result, stormwater financing is the focus of this analysis and report. This is not meant to belittle the importance of wastewater issues, or agriculture for that matter. Rather, the EFC believes that stormwater offers a unique organizational opportunity that can guide the County's entire water quality financing effort.

Section 2: Costs Analysis

The impetus for this project, and the primary focus, was to address concerns related to the anticipated costs of implementing water quality restoration obligations across the County. Costs in this context refer to two areas: 1) the design, construction, and maintenance of stormwater controls and best management practices; and, 2) the expenses associated with providing stormwater services within the community.

Best Management Practice Costs. The first step in the cost analysis was aimed at establishing a practical means to estimate the costs of achieving nutrient and sediment pollution load allocations under Maryland's Phase II Watershed Implementation Plan (WIP). More ambitiously, it sought to provide a means to associate costs with nutrient and sediment pollution reductions on a known acre, given the application of a specific management practice.

This type of cost assessment is important to Calvert County leaders. As discussed below, effective financial management requires an accurate understanding of necessary levels of service and associated revenue needs. In other words, it is necessary to know costs before revenue can be allocated. Local estimates of WIP related costs, generated through the MAST scenario tool, have varied widely from community to community across the state creating confusion and contention among local decision makers and leaders. In addition, if the community adopts a financing process that focuses on results and cost effectiveness, it will be essential to have modeling tools that can assess the relative cost difference between various restoration options.

During the course of the project, Main Street Economics and J7 LLC were able to achieve the goal of providing Calvert County with a means of calculating total and sector-specific costs, consistent with Maryland's Assessment Scenario Tool. As explained in their report, MAST is used by Maryland counties as a decision tool for identifying pollution load reduction from specified sets of BMPs with reference to their WIP II load allocations.[1] The Main Street Economics project team created and overlaid a cost calculator specific to Calvert County onto MAST, allowing users to know not only how significantly pollution loads are reduced for a given specification of BMP implementation but also how much that specification will cost per annum. Cost estimates for the project generally were acquired from unpublished Chesapeake Bay Program Office (CBPO) data. These CBPO data have been gathered over the past several years in the interest of more broadly measuring the costs of achieving the Chesapeake Bay TMDL. Some of the BMP costs used in the project are based on revised cost estimates.

As part of Maryland's WIP process, local jurisdictions have had to identify how they plan to achieve the nutrient and sediment pollution reductions necessary to meet their load allocations. County-specific plans have generally included cost estimates. In Calvert County's WIP II draft, BMP implementation was estimated to cost about $1.26 billion, which is a large expenditure for a County whose annual budget is approximately $250 million. However, there are several important caveats to this cost estimate. It includes both capital investments and

[1] This part of the project was directed and managed by Robert Wieland of Main Street Economics in partnership with Jessica Rigelman, of J7 LLC. Detailed results of their analysis were provided to the community in a separate report.

recurrent costs. Land acquisition costs are unknown, and it does not include a cost for agricultural practices. It does include wastewater treatment costs, which are not included in Main Street Economics' stormwater pollution abatement cost estimates.

Summary Modeling and Cost Assessment Results. In order to establish a more accurate cost estimate, it was necessary to synchronize the County's WIP cost estimates with the state's modeling and reporting systems. Since a fundamental goal is for counties to achieve the load allocations allowed under Maryland's WIP, costs must be estimated in a manner that is consistent with expectations about how BMPs will contribute to that goal. At the planning level, expectations about the effectiveness of actions taken to reduce nutrient and sediment loads are defined by the modeled output of MAST. Therefore, cost estimates should be consistent with MAST output.

MAST is a database management software that uses output from the Chesapeake Bay watershed model to evaluate the impact of combinations of BMPs in a given area. It is used at the county-scale to assess the pollution load reduction implications of different sets of BMPs. The Calvert County Scenario Cost Calculator created under this project sits atop MAST and allows any MAST-created scenario specific to Calvert County to be evaluated with respect to annualized costs of the BMPs specified in the scenario. The Cost Calculator multiplies the units of BMP implementation by the average cost of implementation for each BMP used in the scenario.

The project team developed MAST scenarios; the first among those was the 2025 WIP scenario, which reported the County's proposed sector-specific nutrient load reductions with associated costs. This scenario was based on the practices and levels of implementation described in the County's published Watershed Implementation Plan. The second scenario, called MAST 3.1, estimates the anticipated nitrogen reductions when allowing for flexibility across pollution sectors, specifically urban stormwater and agriculture. For the purposes of comparing EFC's results with original cost estimates, a third category or sub-scenario was included, which annualized the County's $1.26 billion cost estimate.[2]

Table 1 provides a summary of the different scenarios. These results suggest two very important things related to the County's implementation obligations. First, when comparing the County's annualized WIP estimate with the MAST 2025 Scenario costed with CBPO implementation cost estimates, total expected costs of the MAST scenario are less than half the County's estimate. It is beyond the scope of this project to evaluate in detail the accuracy of the CBPO versus County cost estimates but, clearly, there is a large discrepancy between the two totals. In addition, the MAST 2025 Scenario includes all land use best management practices, including those associated with agricultural emissions. These costs were not included in the County's original estimate, which means the MAST 2025 Scenario estimate is even less than the original estimate.

The second compelling result of the analysis is related to the MAST 3.1 Scenario results. By utilizing an optimization process wherein the greatest pollution reduction is achieved through the most cost effective best management practices, significant efficiencies are gained. This

[2] We estimated annual costs using a 30-year payback period with a discount rate of 5%.

scenario demonstrates that if the County had the flexibility to invest in the most effective and efficient pollution reductions regardless of sector—wastewater, stormwater, or agriculture—then the cost savings would be significant. Specifically, the project team estimates that the total annual costs when allowing for flexibility would be $3.8 million, more than an order of magnitude lower than the County's original cost estimate.

Table 1: Total Stormwater Implementation Costs

	County WIP Estimate	MAST 2025 Scenario	MAST 3.1 Scenario
Total Costs	$51,000,000	$19,819,850	**$3,866,879**

Administrative and Management Costs. While the EFC's analysis indicates that costs may not be so high, they are still significant. Clearly, therefore, it will be necessary to expand the County's stormwater program capacity and associated financing systems. To that end, the next step in this project was to assess anticipated capacity needs in the County's stormwater program. Included in this assessment was a review of the County's annual operational and capital improvement budgets, as well as an assessment and estimation of the increased capacity that will be necessary to achieve WIP goals.

As previously mentioned, Calvert County is relatively unique for a community its size in that it does not have a formal stormwater management program. This is most likely due to the fact that the County is not currently regulated under the state's MS4 permitting program. This does not mean, however, that the County does not implement stormwater activities, or activities closely related to stormwater management. In fact, a review of the County's 2014 budget indicates that stormwater related activities and projects are implemented across multiple agencies, including Public Works; Community Planning and Building; Development Review, and Appeal; and the Variances and Exceptions Sections of the Planning and Building Department. Using these departments as a base, the anticipated stormwater program capacity needs associated with labor and salaries, equipment, vehicles, and non-departmental related expenses were estimated.

The EFC's approach was to estimate the operating budget requirements for a codified stormwater program in Calvert County necessary for implementing programs, projects, and practices associated with achieving the WIP; this includes an estimate of the anticipated administrative expenses. The foundation for these estimates is the 2014 Calvert County Budget. It was beyond the scope of this project to complete a detailed program assessment and recommendation for building a stormwater program. Rather, the intent was to provide a planning level understanding of the resources and obligations that will be necessary for achieving the WIP requirements. Therefore, this includes estimates and metrics from EFC experience in other jurisdictions. As a result, there may be unknown facts and circumstances unique to Calvert County, or there may be conditions encountered on further examination and implementation that could have a material effect on these estimates.

It is important to note that all of the estimated stormwater related expenses in Calvert County are related to *presumed* operation and maintenance activities associated with existing infrastructure. This is important for two reasons. First, this assumes a level of service that is not specifically mentioned in the County's 2014 operational budget; this again is due to the fact that the County does not have a budgeted stormwater program. These estimates are based on experiences in other communities, and the EFC is assuming basic stormwater related activities such as maintaining stormwater inlets and outfalls, and managing construction permit activities are relatively similar across Maryland communities. Second, a review of the County's capital improvement plan indicates that there are no direct stormwater investments planned within the community. Again, this does not mean that there are no new stormwater practices being installed in the community. State stormwater laws required that advanced stormwater practices be installed on all new development and redevelopment projects. Therefore, major transportation and construction projects will require investments in stormwater management.

It was beyond the scope of this project to estimate the level of current capital investments impacting stormwater. However, the EFC is certain that the BMP cost estimates provided in the previous section of this report will require additional revenues in addition to those budgeted for existing capital projects.

Assessing existing stormwater capacity. The first step in this process was to assess the current capacity and level of spending associated with the County's existing stormwater management activities. The basis of our assessment was the County's 2014 operating budget. The EFC focused specifically on activities within what was perceived to be the four primary stormwater related agencies: Public Works; Community Planning and Building; Development Review, and Appeal; and the Variances and Exceptions sections of the Planning and Building Department. Anticipated expenditures associated with the primary stormwater related expense categories – labor and salaries; contracted, operating, and equipment services; vehicle operations; and information technology and non-departmental charges (overhead and administration) – within these four departments were then analyzed.

Stormwater Labor and Salary Expenses. As is the case with most public programs and agencies, the bulk of the expenses associated with managing and administering a stormwater program is associated with labor and salaries.[3] Stormwater management has become a highly complex activity requiring the input and engagement of multiple disciplines, skillsets, and occupations. Specifically, activities range from planning and engineering, operations and maintenance, administration, and project management. Table 2 provides a summary review of the estimated 2014 budgeted expenses related to stormwater management activities. The EFC's analysis indicates that labor expenses associated with existing stormwater management activities is $617,513 in 2014.[4]

[3] Please keep in mind that these are expenses associated with managing and administering a program. These expenses and costs are distinct from those associated with designing and constructing stormwater control structures.

[4] Please see Appendix 1 for a detailed description of the assumptions used to generate the estimate.

Table 2: Current stormwater related salary expenses

Current Department	Description	Budget (2014)
Planning and Building	Development Review	$32,752
Planning and Building	Appeals, Variances and Exceptions	$6,220
Animal Control	Animal Control	$6,539
Mosquito Control	Mosquito Control	$2,829
Public Works	Project Management Permit, inspections, E&S, SW	$113,251
Natural Resources	Maintaining Natural Areas	$128,437
Parks and Rec	Salaries	$139,999
Parks and Grounds	Salaries	$65,482
Engineering	Salaries	$106,316
General Services	Oversight of County Land and Projects	$15,688
Total		**$617,513**

Additional Stormwater Expenses. Though program salaries are the most significant expenses related to stormwater management programs, there are other essential activities that must be accounted for, including contracted services, equipment, vehicle operations, IT, and overhead. Table 3 provides a summary estimate of these additional expenses. Total estimated stormwater expenses in addition to labor and salaries are $379,300 in 2014. In summary, total labor-related estimated expenses associated with stormwater management in 2014 are ***$1,031,813.***

Table 3: Current additional program expenses including contracted, operating, and equipment services

Current Department	Description	Budget
Planning and Building	Development Review	$2,690
Planning and Building	Appeals, Variances	$1,200
Parks and Grounds	Maintenance and Repair Projects	$28,263
Parks and Grounds	Contracted Services	$29,861
Parks and Rec	Maintenance and Repair Projects	$4,250
Parks and Rec	Contracted Services	$7,150
Natural Resources	Operating Costs	$12,925
Public Works	Operating Costs	$17,897
Public Works	Contracted Services	$13,124
Sub total:		**$117,360**
IT and Non-Departmental Charges as Percentage of Total Operating Costs		
IT	IT Department Computer Operations and Maintenance	$17,099
Non-Departmental	Reserve for Contingency	$1,967
Pensions and Insurance	Pension Contributions	$65,220
Pensions and Insurance	Worker's Comp	$8,928
Pensions and Insurance	Health Insurance	$48,725
Debt Service	Existing Debt Service	$108,044
Pensions and Insurance	General Insurance	$4,691
General Services	Capital Project Oversight	$2,269
Personnel	Personnel	$4,539
Finance Department	Finance Department	$454
Sub Total:		**$261,940**
Total Additional Expenses:		**$379,300**

Expanding Stormwater Activities. The next step was to conduct a predictive pro-forma estimate of the administrative and operational resources and capacity that will be necessary for the County to address the Watershed Implementation Plan. As noted in the final section of this report addressing program recommendations, the EFC feels strongly that one of the most important things the County can do to improve financing efficiencies is to create a formal,

budgeted stormwater program. A detailed explanation of why this recommendation is made is provided below; for now, the creation of a new program is an assumption.

Using the above expense estimates for 2014 as a foundation, the necessary level of expansion within each of the program areas was predicted. This included anticipated new positions as well as expansion of current positions over a period of five years. Table 4 provides a summary of these estimates. Detailed tables, including assumptions and descriptions, are included in the appendix to this report. In Year 1, in this case 2014, a 61% increase in expenses is estimated, or $1,903,379. When accounting for inflation, the Year 5 total increases to $1,998,187.

Table 4: Predicted Estimated Stormwater Management Expenses

	Year 1	Year 2	Year 3	Year 4	Year 5
Labor and Salaries	$1,316,426	$1,349,336	$1,383,070	$1,417,646	$1,453,088
Vehicles	$58,831	$59,656	$60,634	$61,636	$62,664
Contracted and Operational	$142,360	$130,881	$134,507	$138,243	$142,090
IT and Overhead	$261,940	$244,840	$250,912	$257,136	$263,515
Total	**$1,779,557**	**$1,784,714**	**$1,829,123**	**$1,874,661**	**$1,921,357**

Summary of Stormwater Costs. By EFC's estimates, the total anticipated costs of expanding the County's stormwater program would be $5.62 million annually. This includes new capital expenditures as well as expanding the County's operations and management capacity. The summary results are provided in Table 5. As stated several times in this report, these estimates are meant to be illustrative of the relative scale of funding that will be necessary for Calvert County to effectively address water quality restoration in their community. Of course, what matters the most are not cost estimates, but actual costs. The goal is to achieve the greatest level of environmental benefit per dollar spent. The first step in making that happen is to establish effective stormwater management and revenue systems. Both issues are addressed in the following section.

Table 5: Total Average Annual Estimated Stormwater Costs and Expenses

Total estimated BMP costs	$3,866,879
Total current stormwater operating expenses	$1,031,813
Total estimated additional operating expenses	$717,744
Total estimated stormwater costs and expenses	**$5,616,436**

Section 3: Revenue Options

Clearly, the construction and operation and maintenance of an expanded stormwater management program within Calvert County will involve additional expense, especially when considering the responsibilities associated with the Watershed Implementation Plan. Even with revised implementation estimates that are significantly lower than previous estimates, allocating and investing just under $6 million in new revenue is a significant issue and concern for a community like Calvert County. To that end, the following section addresses revenue options and their associated pros and cons. There are, to be sure, a variety of mechanisms that municipalities can use to fund their stormwater programs. The two most common funding options, general fund appropriations and stormwater service fees, are discussed below.

General Fund. Like Calvert County, most communities have traditionally funded stormwater management from taxes paid into their general funds. The general fund is a government's basic operating fund and accounts for everything not accounted for in other funds, such as a special revenue fund or a debt service fund. There are, of course, advantages to using general funds to support stormwater programs. Most communities have established revenue and debt programs, which makes the process of supporting new and expanding programs familiar and uncomplicated. In addition, financing through the general fund allows local leaders to consider stormwater financing relative to other community priorities. There are, however, several significant drawbacks to expanding the County's stormwater management activities through general fund financing.

In most communities, Calvert County being no exception, there is great competition for general fund dollars between municipal programs. For example, Calvert County has an annual budget of approximately $250 million.[5] As EFC's analysis in the previous section indicates, using the general fund to support the necessary growth in the County's stormwater obligations would require the County to either increase taxes by just under $6 million per year, or divert existing resources to the stormwater program. Compounding resource availability issues is the fact that stormwater management improvements typically have a low priority in many communities, unless the municipality is reacting to a recent major storm event or regulatory action.

Another deficiency of financing stormwater management through the general fund is the lack of transparency of the general fund financing system. The total cost of stormwater management is not readily apparent when these costs are dispersed among general fund departmental budgets. For example, Calvert County does not have an established stormwater program, therefore, there is no clear budgetary authority, which makes it difficult to determine where financing decisions related to stormwater management are being made. In addition, as stormwater management costs increase, general fund budgets are often not increased in parallel to meet those needs.

There is also the issue of equity and fairness in the financing system. Tax-exempt properties do not support any of the cost of stormwater management, even though it can be shown that many of them, such as governmental properties, schools, colleges, and universities are major

[5] This includes both the operational and CIP budgets.

contributors of stormwater runoff. Finally, general funds are primarily supported through property taxes, which are based on assessed property value. The cost of stormwater service to individual properties bears no relationship to the assessed value of the property. Therefore, this method of recovering stormwater management costs is more often than not inequitable.[6]

Service Fees and Stormwater Enterprise Programs. In lieu of supporting stormwater programs through the general fund, many communities prefer to establish stormwater enterprise funds. Enterprise funds are used for services provided to the public on a user charge (fee) basis, similar to the operation of a commercial enterprise.[7]

An enterprise fund establishes a separate accounting and financial reporting mechanism for municipal services for which a fee is charged in exchange for goods or services. Under enterprise accounting, the revenues and expenditures of services are separated into a distinct fund with its own financial statements, rather than commingled with the revenues and expenses of all other government activities.[8]

Enterprise funds are established to address a variety of community services and are commonly used for public utilities such as water, wastewater, trash disposal, and increasingly stormwater management. Unlike establishing a privately owned utility or public service commission, establishing an enterprise fund does not necessarily create a separate or autonomous entity from the municipal government operation.[9] The municipal department operating the enterprise service continues to fulfill financial and managerial reporting requirements like every other department.[10]

There are two key features of a stormwater enterprise program. First, a stormwater enterprise fund is by definition a public entity charged with providing a specific service. Clear budgetary authority is given to a single agency or program. As a result, the establishment of a stormwater enterprise program often results in increased efficiencies, which in turn reduces program costs. Second, stormwater enterprises result in a sustainable, dedicated revenue stream, in the form of a fee. An enterprise fund may be self-supporting or it may be subsidized (e.g., debt and capital exclusions) by the general fund.[11]

A key advantage of fee systems is that fees are charged to taxpaying and tax-exempt properties alike. As a result, stormwater utilities address the shortcomings and inequities of funding stormwater management by property taxes or water/sanitary service fees. There are currently

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[6] It should be noted that around 50% of Calvert County's budget is supported through property taxes. The next highest source is income taxes. Of course, there is very little connection between stormwater runoff and income; therefore, the argument still holds.

[7] State of Maryland Comprehensive Annual Financial Report, FY 2009. See "Fund Financial Statements," p. 12-13.

[8] Pioneer Consulting Group, Inc. Enterprise Fund Accounting System. http://www.municipalconsultants.net/enterprise_fund_accounting_systems.aspx.

[9] We are making a distinction between a utility and an enterprise program, though the two terms are most often used interchangeably. Utilities may be publicly or privately owned, but most are operated as private businesses.

[10] Pioneer Consulting Group, Inc. Enterprise Fund Accounting System. http://www.municipalconsultants.net/enterprise_fund_accounting_systems.aspx.

[11] Ibid.

more than 1,400 fee-supported stormwater systems in operation across the country.

Types of Stormwater User Fees.[12] There are three basic methods that stormwater utilities use to calculate service fees. These are sometimes modified slightly to meet unique billing requirements. Impervious area is the most important factor influencing stormwater runoff and is therefore a major element in each method.[13]

Intensity of Development (ID): This stormwater cost allocation system is based on the percentage of impervious area relative to an entire parcel's size. All parcels (including vacant and undeveloped properties) are charged a fee on the basis of their *intensity of development*, which is defined as the percentage of impervious area of the parcel. Rates are calculated for several ID categories.

- *Advantages:* The ID method accounts for stormwater from the pervious portion of parcels; therefore, it can be more equitable than other billing methods. It accounts for completely pervious parcels and therefore can allow vacant/undeveloped parcels to be billed. Even if a parcel's impervious area is increased slightly because of minor construction modification, it would not like result in a significant enough change to merit moving the parcel into the next higher ID fee category. This reduces the time required for staff to administer the program.
- *Disadvantages:* Parcels are grouped into broad categories. Parcels are not billed in direct proportion to their relative stormwater discharges. This method can be more difficult to implement because parcel pervious and impervious areas need to be calculated. It is also more complicated to explain to customers than more common billing methods.

Equivalent Hydraulic Area (EHA): Parcels are billed on the basis of the combined impact of their impervious and pervious areas in generating stormwater runoff. The impervious area is charged at a much higher rate than the pervious area.

- *Advantages*: The EHA method accounts for flow from the pervious portion of parcels; therefore, it is often seen to be more equitable than other methods. It also accounts for undeveloped/ vacant parcels and allows them to be billed. It is perceived to be fairer than the ID method because parcels are billed on the basis of direct measurements of pervious and impervious areas to which hydraulic response factors are applied to determine a unique EHA for such parcels.
- *Disadvantages:* Because pervious area analysis is required in addition to impervious area, this approach requires more time to determine the total number of billing units. It is also complicated to explain to customers.

Equivalent Residential Unit (ERU): The most widely used billing method is the ERU system. An ERU is usually the average impervious area on a single-family residential parcel, although some communities define it as the average of all residential parcels. Fees for non-residential

[12] The following section is based on a fact sheet developed by the U.S. Environmental Protection Agency: "Funding Stormwater Programs." January 2008. EPA 833-F-07-012. Updated facts and data have been provided and cited where appropriate.

[13] Establishing a Stormwater Utility in Florida, Florida Association of Stormwater Utilities, Chapter 4, Rate Structure Fundamentals.

properties are proportional to the ratio of the parcel impervious area to the ERU. National surveys show that the mean was 3,050 square feet impervious with a standard deviation of 2,134 square feet.[14]

To calculate a fee, a representative sample of parcels is reviewed to determine the impervious area of a typical parcel. This amount is called one ERU. In most cases, all parcels up to a defined maximum total area are billed a flat rate for one ERU. In some cases, several tiers of residential flat rates are established on the basis of an analysis of parcels within defined total area groups.[15] Having such a tiered, flat-rate approach improves the equitability of the bills sent to homeowners. The impervious areas of commercial parcels are usually individually measured. Each commercial impervious area is divided by the impervious area of the typical parcel to determine the number of ERUs to be billed to the parcel.

- *Advantages:* The relationship (or nexus) between impervious area and stormwater impact is relatively easy to explain to the public. The number of billable ERUs can be determined by limiting the parcel area review to impervious area only. Because pervious area analysis is not required, this approach requires the least amount of time to determine the total number of billing units.
- *Disadvantages:* Because the potential impact of stormwater runoff from the pervious area of a parcel is not reviewed, this method is sometimes considered to be less equitable than the Intensity of Development (ID) or Equivalent Hydraulic Area (EHA) methods because runoff-related expenses are recovered from a smaller area base. This method could still be used to charge a fee to all parcels, pervious as well as impervious, to cover expenses not related to area, such as administration and regulatory compliance.

In spite of the limitations associated with the ERU method, the EFC feels that it is the most efficient and effective method for communities like Calvert County.

Generating Revenue in Calvert County

Given the two available options for generating revenue to support the County's stormwater program, the EFC provides the following summary of the impact of each on the County's taxpayers and potential ratepayers. It should be noted that these estimates are meant to be illustrative of the financing options available and are therefore for planning purposes only.

Financing through the general fund. If Calvert County were to support its stormwater activities and investments through the general fund (keeping in mind that current stormwater related expenses are in fact supported through the general fund), it would result in an additional $4.6 million in expenses. This is the equivalent of 4.1% increase in the non-educational component of the County's general fund. This would obviously require a tax increase or a reallocation of existing fiscal resources.

Financing through the implementation of a fee. Again, the second option for generating revenue to support a stormwater program is through the implementation of a fee. If the County were to consider the implementation of a fee, a formal, detailed fee assessment would

[14] Western Kentucky University Stormwater Utility Survey 2013. Page 2.

[15] For example, Anne Arundel County has a tiered fee system based on zoning classification.

be in order. For the purposes of this effort, however, the EFC provides the following estimates meant to generate a better understanding of the impact that a fee would have on the County's residents and business.

According to the most recent census, Calvert County has 89,630 residents living in 31,800 households. In addition, there are approximately 1,700 non-farm business enterprises located in the County. It is the households and the businesses that will constitute the primary ratepayers in the stormwater system. This means that there will be approximately 33,500 potential ratepayers. There will of course be others: churches, nonprofit organizations, governmental agencies, etc. The contributions of each of these institutions would need to be included in a formal rate or fee analysis. Again, for discussion purposes, this estimate focuses on households and businesses.

Assuming that the County needs to generate approximately $5,616,436 in revenue, this would equate to, on average, a fee of ***$168 per year per ratepayer***.[16] Some will pay more while some will pay less.[17] Of course, the goal of the County should be to reduce those costs even further. Section 4 describes what the EFC believes is a system for doing exactly that.

[16] Please note, this would result in a decrease of $1,031,813 in general fund obligations if the entire revenue needs were met through the assessment of a fee. This decrease needs to be calculated.

[17] In Appendix 4 we provide a comparison of existing fees in other counties in Maryland.

Section 4: Moving from Costs to Investments

Establishing a formal stormwater program supported through an enterprise fund would be a major step forward in Calvert County's efforts to meet WIP obligations. The next step in the process would be to implement systems that reduce cost even further, thereby reducing the fiscal impact on the community. Rather than becoming handcuffed by expected or perceived implementation costs, the EFC believes that Calvert County has an opportunity to dramatically reduce the costs associated with achieving state mandated restoration goals, while at the same time protecting a natural resource that is integral to Calvert County's culture, heritage, and quality of life. Specifically, EFC believes that Calvert County has the opportunity to implement an innovative financing system that incentivizes cost efficiency and maximizes program effectiveness.

Performance-based financing systems. Calvert County is in the relatively unique situation for a community its size in that its stormwater program is not regulated through the NPDES permitting process. As a result, there exists an opportunity for the County to establish a formal financing program that is designed around incentivizing cost reduction and efficiency. Specifically, EFC is recommending that Calvert County design and implement a pay-for-performance financing system designed to incentivize private firms, businesses, and residents to maximize environmental benefit per every dollar spent.

What differentiates performance systems from traditional financing systems is the focus on environmental outcomes (improvements in water quality, for example) rather than outputs (the numbers of practices installed). Traditional public sector financing programs focus on achieving a pre-determined outcome in the most efficient way possible. In other words, publically financed programs and agencies create incentives for achieving a certain level of activity. This makes sense when considering traditional capital investments in critical infrastructure such as roads, schools, or water and wastewater infrastructure. This type of system does not make sense when the goal is to achieve a certain level of environmental performance over time. In these situations, it is necessary to shift financing from pre-determined activities or outputs to desired outcomes or results. In other words, the focus of investments should be on achieving an environmental goal in the most efficient way possible. This is in effect, performance-based financing.

Performance payment systems tie individual incentives to the level of environmental services actually created – performance payment systems are the most direct payment approach.[18] As described in a working paper published by the Institute for Environmental Decisions, the performance payment system looks more like paying a salesperson a commission for completed sales while an output-based approach would be the equivalent of paying an hourly wage for time spent interacting with potential buyers.[19] This type of financing creates tremendous positive incentives because it allows the suppliers of environmental services to

[18] B. Roe, A. Zabel. "Performance payments for environmental services: Lessons from economic theory on the strength of incentives in the presence of performance risk and performance measurement distortion." Institute for Environmental Decisions; working paper. June 2009. Page 3.

[19] Ibid.

identify the most efficient and effective options available. The result is the greatest amount of environmental and community benefit per dollar invested. This again was demonstrated by Robert Wieland's research described in Section 2.

In regards to the Watershed Implementation Plans, the benefits of a performance-based financing system are potentially significant. If investments are predicated on pounds of nutrient pollution reduced rather than practices installed, there is an inherent incentive built into the financing system to improve efficiency. By increasing performance at any given price point, a project implementer has an opportunity to increase their return on investment. This incentive is much less impactful in the activity-based system because the reductions in cost could be at the expense of pounds removed from the system.[20]

Perhaps the greatest advantage to Calvert County of implementing a performance-based financing system is that it will shift implementation and financing risk from public agencies and programs to private entities or project managers seeking to create and sell nonpoint source reductions.[21] With the burden of proof on project managers to document performance, it will be up to them to determine how nutrients will be reduced. Rather than being confined to choose nutrient control actions from a preselected suite of BMPs, project managers would be allowed to experiment with the most effective ways to reduce pollutant loading. This would allow landowners and operators the flexibility to determine how best to prevent pollutants from entering waters – this type of choice is at the core of an effective market-based solution.

Table 6: Comparing Traditional and Performance-Based Financing Systems

Traditional:	Performance-Based:
• Focus on known practices and technologies	• Focus on outcomes and efficiency, i.e. $/pound of pollution reduced
• Success is measured by levels of implementation	• Risk is effectively shifted to the private sector
• Few incentives to innovate and reduce costs	• Incentives on the part of the private sector to innovate and reduce costs
• Public sector maintains financing risk	• Requires smaller, more streamlined and efficient public institutions; more effective government
• Requires relatively large public programs and administration	• Greater value gained per dollar invested

[20] For example, if the County focuses its financing on acres of impervious area treated in urban areas, a performance-based system will ultimately reduce the cost of treating an acre even if that acre is not adequately performing as designed or anticipated. Cost effectiveness in this case is not associated with pollution reductions.

[21] Stephenson, K., P. Norris, and L. Shabman, 1998. "Effluent Allowance Trading: The Nonpoint Source Challenge." Contemporary Economic Policy 16(4):412-421.

Of course, the suggestion to implement this type of system is not new. In fact, a BMP cost study conducted by a team of economists on behalf of Maryland DNR in 2009 suggested that the best way to reduce these costs was to shift funding to a more performance-based system. Wieland, et al state:

> "The true costs of reducing nutrients from surface waters of the State are obscured by the fact that existing programs pay for implementing qualified BMPs and not for directly reducing nutrients. Existing programs do not offer to buy a specified amount of nutrient reduction at some agreed upon price as would happen in a market or performance-based payment regime that sought to specifically buy nutrient reductions. Instead, they compensate participants for implementing BMPs that will, in varying amounts, mitigate nutrient pollution in the state's waters…"[22]

Putting the system into action. Contrary to much of the debate regarding public/private partnerships, performance-based financing systems do not require complicated or exotic institutions or arrangements. They do, however, require some key components to work effectively, including: long-term revenue; a focus on results; robust modeling and data; and, adaptable and flexible procurement systems.

- Sustainable revenue streams: The cornerstone of performance payment systems is the interaction between public agencies and the private sector. The vast potential of performance financing exists due to the fact that private actors—residents, businesses, investors, entrepreneurs, and associated industries—are motivated and incentivized to achieve environmental goals. In short, these incentives are based on the opportunity to generate profits, reduce costs, and maximize community welfare. This all requires sustainable revenue streams.

  Consistently allocating and investing revenue sends the message to the private sector that the community leaders are committed to solving the problem. Long-term funding commitments enable private firms and investors (including residents) to make capital investments with relative certainty. In turn, they will look for opportunities to reduce costs as a way of maximizing return on investment. Over time, performance goes up, costs go down, and goals are achieved efficiently.

- A focus on delivered results: The uncertainty associated with environmental restoration and protection creates tremendous risk for the public sector. In short, it is often very difficult and time consuming to get functioning projects on the ground. This risk comes with costs that ultimately reduce the efficiency of restoration projects. A more effective approach is to transfer that risk to the private sector. The marketplace is much more adept of mitigating financing risk; it is in fact what drives market action.

[22] Wieland, R., Parker, D., Gans, W., Martin, A. "Cost and Cost Efficiencies of Some Nutrient Reduction Practices in Maryland." Prepared for the National Oceanic and Atmospheric Administration Chesapeake Bay Program Office, and the Maryland Department of Natural Resources. April 28, 2009. Page 46.

In a normal public procurement system, contracts are executed and agreed upon in advance of implementation activity. Though there are certainly incentives—legal and otherwise—on the part of contractors to implement projects as designed and contracted, the risk of project performance in fact remains with the public agency. A more efficient and less risky system for the County would instead focus on investing in delivered projects. In effect, this would create a private nutrient banking system within the County. The project performance risk would shift to the private banks themselves and as a result would ultimately improve the effectiveness of stormwater investments.

In a mitigation banking system, private investors and project managers finance and implement restoration projects and then sell the associated pollution reductions—in the form of credits—in the marketplace. The risk is entirely on the project managers as opposed to the public stormwater program. This means that the stormwater program managers will know with relative certainty that the pollution reductions have been made before payment is made.

- Robust modeling and data management systems: Any type of restoration financing system requires an understanding of where control practices and projects will have the greatest benefit to the environment. Performance payment systems are no exception. This requires models and databases that can accurately predict where the greatest environmental benefit will occur. The goal is to target investments in a way that reduces performance risk even further, thereby reducing costs and improving efficiencies. As Robert Wieland suggested in his analysis, the MAST modeling tool will be the foundation for reporting to the state on local restoration activities. Therefore, localized modeling efforts must be in synch with the MAST process.
- Adapting procurement systems: Finally, performance-financing systems are greatly benefited by a procurement process that is flexible and able to shift from project financing-based payments to performance-based purchases of pollution reductions. It is not a difficult transition to make. In fact, shifting to performance payments enables a community to rely on its existing procurement system, which keeps administrative costs low. There are examples of how this type of system has been employed in other communities, and again, it could be modified and applied in Calvert County relatively easily.[23]

Using these four components as a foundation, Calvert County can reduce the costs associated with water quality restoration and protection significantly while at the same time incentivizing innovation. In the next section the EFC offers recommendations for moving forward to make this system a reality.

[23] A good example of the type of performance system referenced here is the North Carolina Ecosystem Enhancement Program (NCEEP). NCEEP is able to disseminate Request for Proposals (RFPs) for water mitigation credits through their state procurement system. Through this method, the state is able to connect with bidders through a market approach using a platform already in place. This system could serve as a platform for local performance payment systems as well, in which the local government can use procurement platforms for other projects to meet their WIP and TMDL requirements.

Section 5: Summary Recommendations and Conclusion

In the previous sections of this report, the EFC provided accurate planning level estimates of the resources that will be required for Calvert County to effectively achieve its water quality restoration and protection goals. Though these are just estimates, they demonstrate that aspirational goals in a community are possible to achieve. In fact, EFC is convinced that these goals can be achieved more efficiently and effectively than any of us can imagine.

Contrary to what most of us have been led to believe, the limiting factor or constraint is not money or financing. Rather, the constraint that has limited effective natural resource protection in general, has been a lack of imagination and innovation. This is primarily not the fault of local decision makers. Local governments have been responding to the system that has been provided to them. Calvert County is in the unique position of being able to implement a system that will transcend the barriers to success, using financing as the catalyst for change and innovation. To that end, EFC offers the following two key recommendations:

- Establishing a stormwater enterprise program; and,
- Transitioning to a performance-based financing/payment system.

Recommendation 1: Establish a stormwater enterprise program. As discussed in Section 3 of this report, EFC believes that an enterprise program would create significant efficiencies by consolidating stormwater activities while at the same time focusing revenues on the actual service being provided to the community. In addition, the dedicated revenue stream will enable Calvert County to implement a performance system, which we believe will dramatically reduce costs and improve effectiveness in the long-term. Suggested next steps include:

- Assess the activities, resources, and anticipated expenses associated with consolidating stormwater and water quality restoration into a dedicated enterprise program. This in effect would be an extension of the analysis conducted by the EFC.[24]
- Conduct a detailed rate modeling study to determine the level of fees, types of ratepayers, and billing systems that will be necessary for generating enterprise revenue. Rate modeling software and processes designed for water and wastewater utilities have been effectively modified to provide for stormwater management activities and would be very effective at providing detailed answers to the County.

Recommendation 2: Begin transitioning to a performance-based financing/payment system. In the long-term, what will reduce costs most dramatically will be enabling a system that allows for flexibility and the ability to invest in those projects and practices, regardless of sector, that will most effectively reduce pollution in the most efficient way possible. Robert Wieland's analysis demonstrates the potential impact of this type of system. Therefore, the EFC thinks it is essential for the County to begin transitioning to this type of system. As discussed in this report, dedicated, consistent, and long-term revenue streams are essential; therefore, the most important first step in advancing a performance system is to develop and enterprise program.

[24] Appendix 4 provides a more detailed description of the type of analysis that will serve as the basis for the enterprise program process.

In addition, the EFC recommends the following next steps:

- Initiate conversations with the Maryland Department of the Environment to allow for a flexible implementation system. The cost savings identified in Mr. Wieland's analysis is predicated on the County having the flexibility to invest in the most efficient restoration practices, regardless of sector—stormwater, wastewater, or agriculture. However, this type of flexible financing system must be enabled by state regulators. Therefore, our recommendations in this regard will require the consent and cooperation from state regulators in order to be implemented effectively.
- Begin developing more effective local modeling. One thing that is totally in the community's control is the establishment of more effective modeling system that can guide water quality investments. There are a number of counties within the Maryland that are using advanced models to gain a better understanding of where water quality management efforts will be most effective. In fact, it is entirely possible that Calvert County has developed and is using similar systems. If not, the investment made in establishing more effective predictive tools will more than pay for itself in the long-term.

Conclusion: Moving from costs to investments. Finally, EFC offers a more normative assessment of the County's motivations associated with achieving water quality restoration and protection goals and requirements. Our approach with this project, as well as similar projects EFC has implemented in other communities, is to encourage local leaders to address the value or benefit associated with water quality restoration. In other words, the assumption throughout this project is that water quality restoration and protection is a priority for the community and something that it values. EFC's experience has shown that those communities that have embraced the value of environmental restoration and protection are much more successful in achieving appropriate returns on their investments. In other words, these communities have shifted from addressing costs to addressing return on investment.

Though this shift is subtle, it is profound in its implications. Investing money implies that there is a return on that investment that is valuable to the investor. Though this return is often articulated or measured in terms of financial returns, it need not always be, especially at the community level. For example, Calvert County made a decision years ago to invest in its rural heritage through the protection of farmland and open space. Certainly the goal of protecting rural heritage should be achieved in the most efficient and effective way possible; however, when County leaders recognized the value of land conservation to the community, it began an implementation and investment process that was innovative and effective, and in many ways a leading regional example of effective conservation. The EFC believes that the County has the opportunity to realize the same type of value and return on investment in regards to stormwater management.

Appendix 1: Labor

The following table provides detailed assumptions used to estimate existing stormwater financing capacity as well as anticipated future increases in capacity and expenses. The estimates are based on a combination of information included in the Calvert County 2014 Budget as well as the EFC's experience in other communities across the region.

Table 6: Detailed Calvert County Stormwater Labor Estimates

CALVERT COUNTY STORMWATER OPERATING BUDGET										
Operating Expenditures										
	Current Department / New	Description	Budget (2014)	Percentage of Time or Budget	Year 1 (2014)	Year 2 (2015)	Year 3 (2016)	Year 4 (2017)	Year 5 (2018)	Notes
Row #	***Labor***									
6	Planning and Building	Development Review	$655,045	5%	$32,752	$33,571	$34,410	$35,271	$36,152	*pg 55*
7	Planning and Building	Appeals, Variances and Exceptions	$124,394	5%	$6,220	$6,375	$6,535	$6,698	$6,865	*pg 55*
8	New	Watershed Manager	$65,000	100%	$65,000	$66,625	$68,291	$69,998	$71,748	*Land Management System Coordinator is not filled, pg 57*
9	Animal Control	Animal Control	$326,966	2%	$6,539	$6,703	$6,870	$7,042	$7,218	*pg 71*
10	Mosquito Control	Mosquito Control	$141,473	2%	$2,829	$2,900	$2,973	$3,047	$3,123	*pg 81*
11	New	Equipment Operator		100%	$65,000	$66,625	$68,291	$69,998	$71,748	
12	New	Municipal Service Worker		100%	$50,000	$51,250	$52,531	$53,845	$55,191	
13	Public Works	Project Management Permit, inspections, E&S, SW	$453,002	25%	$113,251	$116,082	$118,984	$121,958	$125,007	*page 99, 3 E&S inspectors, One PW Inspector, One Division Chief*
13.1	New	Stormwater Inspector/Project Manager			$49,000	$50,225	$51,481	$52,768	$54,087	
14	Natual Resources	Maintaining Natural Areas	$642,187	20%	$128,437	$131,648	$134,940	$138,313	$141,771	*page 87*
15	Parks and Rec	Salaries	$2,799,975	5%	$139,999	$143,499	$147,086	$150,763	$154,532	*pg 83*
16	Parks and Grounds	Salaries	$1,309,642	5%	$65,482	$67,119	$68,797	$70,517	$72,280	*pg 79*
17	Engineering	Salaries	$1,063,159	10%	$106,316	$108,974	$111,698	$114,491	$117,353	*pg 97*
18	General Services	Oversight of County Land and Projects	$313,751	5%	$15,688	$16,080	$16,482	$16,894	$17,316	*pg 75-6*
19	New	Equipment Operator - Street Sweeper	$65,000	100%	$65,000	$66,625	$68,291	$69,998	$71,748	
20	Water/Sewer Utility Billing and Accounting	Group Total	$1,619,651	25%	$404,913	$415,036	$425,411	$436,047	$446,948	*pg 131*
Labor Sub-Total					**$1,316,426**	**$1,349,336**	**$1,383,070**	**$1,417,646**	**$1,453,088**	

Planning and Building Department (rows 6 and 7): The EFC estimated that 5% of the current labor time for programs within the Planning department is related to stormwater management. The EFC also assumed that this activity is related to general issues that arise when responding to, planning for, and addressing stormwater regulations in the normal course of operations. Again, these assumptions are based on the EFC's experience in other localities.

Public Works (row 13): Currently the County employs three erosion and sediment (E&S) control inspectors, one public works inspector, and one division chief. While E&S is distinct from stormwater management, when estimating the impact of future stormwater activity for planning purposes, current E&S staffing levels can be one indicator of budget needs for the review, inspection, and administration of stormwater permits. Additionally, the EFC assumes a certain amount of current E&S inspector effort is directly related to stormwater management. Further, when communities incorporate stormwater into their current inspection programs, the duties are either outsourced or fall to the current E&S inspectors; when workload increases, additional staff is necessary. For the purposes of this estimate, the costs are assumed to be in-house; however, they could be outsourced as well. The EFC also assumed that 25% of staff time is spent responding to, planning for, and addressing stormwater regulations

Labor costs for the public works inspector and the division chief are associated with the installation of new BMP's as well as the retrofitting of existing BMP's on public projects. The 2014 Budget for the Public Works

Department is $453,002.[25] The stormwater utility program estimates that 25% of the current labor time for this department is related to stormwater management issues encountered in project management, permitting, inspections, and E&S.

Engineering Department (row 17): The 2014 budget for the Engineering Department is $1,063,159.[26] The duties of the engineering department are numerous, and the EFC estimates that 10% of the department's activities are related to stormwater management, either directly or as part of time spent on other capital projects (stormwater is generally 5 – 15% of review and construction projects costs). The EFC's experience with other communities suggests that a portion of time spent by the engineering department or third-party contract engineers is related to stormwater, either in the review of planned projects and permit submissions, inspections of current projects and existing BMP's, and design of retrofits or other projects. Additionally, the EFC has seen that when departments incorporate stormwater into their current programs, for an initial period, the duties are outsourced or fall to the current engineers, until such time as the permitting workload necessitates the adding of additional staff. For the purposes of this estimate, the costs are assumed to be in-house; however, they could be outsourced as well.

Utility Administration and Billing (row 20): Calvert County currently has a Water and Sewer Utility in place and administers the billing and financial administration of the utility. The Utility Billing and Accounting Group Labor Total is $1,619,651.[27] The Utility Billing Group services 2,876 customers and in 2014 is projected to process revenue of $8.942 million. If a stormwater utility were to be implemented, it is estimated that the billing and administration for the utility would be handled by the Utility Billing and Accounting Group. Additionally, an assumption is made that after an initial cost to set up Stormwater Utility Billing, the new Stormwater Utility would use the current systems, procedures, staff, and equipment of the Billing and Accounting Group. With those assumptions, the administration and billing of a stormwater utility is estimated to be 25% of the current costs of the Billing and Accounting Group. Should the annual level of stormwater billing and revenue, or the number of stormwater customers be significant higher or lower than 25 – 40% of the current Water and Sewer Utility levels, the estimate of 25% will need to be adjusted.

Other departments: Other departments that are impacted by stormwater – such as those that conduct stormwater activities as part of their annual mission, that manage stormwater as it relates to their projects, or that manage areas that produce stormwater runoff – include the departments of Parks and Recreation,[28] Parks and Grounds,[29] Natural Resources,[30] Animal Control,[31] and Mosquito Control.[32] Two percent of expenses related to Animal Control and Mosquito Control were estimated to be tied to activities related to the control and removal of animals and animal waste in outfalls and runoff (rows 9 and 10).

Based on the EFC's experience with other communities, an estimate of 5% of the labor time for Parks and Recreation and Parks and Grounds were allocated to stormwater management reflecting activity related to

[25] 2014 Calvert Budget, Page 99.

[26] 2014 Calvert Budget, Page 97.

[27] 2014 Calvert Budget, Page 131.

[28] 2014 Calvert Budget, Page 83.

[29] 2014 Calvert Budget, Page 79.

[30] 2014 Calvert Budget, Page 87.

[31] 2014 Calvert Budget, Page 71.

[32] 2014 Calvert Budget, Page 81.

stormwater in the installation, landscaping, and upkeep of grounds and facilities (rows 15 and 16). Also based on the EFC's past experience, it was estimated that 20% of the Natural Resources labor budget is stormwater related particularly in the maintenance of natural areas for stormwater management (row 14).

Based on a review of the budget and experience from other communities, an estimate was made that 5% of the labor time in the General Services department is for oversight of stormwater activities as part of department oversight of County land and projects (row 18).

Additional Labor Budget for Stormwater

Calvert County's 2014 Operating Budget discusses a position for a land management coordinator; however, that position has not been filled.[33] The estimated stormwater program contemplates a position similar to this, i.e. a watershed manager, being added. This position would coordinate activities and perform tasks related to the new stormwater utility and watershed management within Calvert County. This new cost is added to the budget (row 8).

Due to an increase in the estimated number of stormwater projects implemented or managed by the County, it was assumed that an additional stormwater project manager/inspector, equipment operator, and an additional municipal service worker may be needed (rows 11,12, and 13.1). The budget estimate also suggests a position for street sweeping would be added (row 19).

The total labor budget for stormwater consisting of current positions and activities as well as additional positions is $1,316,426.

[33] 2014 Calvert Budget, Page 57.

Appendix 2: Contracted and Equipment Services

Table 7: Detailed Calvert County Stormwater Contracted and Equipment Estimates

CALVERT COUNTY STORMWATER OPERATING BUDGET										
Operating Expenditures										
	Current Department / New	Description	Budget (2014)	Percentage of Time or Budget	Year 1 (2014)	Year 2 (2015)	Year 3 (2016)	Year 4 (2017)	Year 5 (2018)	Notes
Row #	*Contracted, Operating Expenses, and Equipment Services:*									
58	Planning and Building	Development Review	$53,800	5%	$2,690	$2,771	$2,854	$2,939	$3,028	*pg 55*
59	Planning and Building	Appeals, Variances	$24,000	5%	$1,200	$1,236	$1,273	$1,311	$1,351	*pg 55*
60	Parks and Grounds	Maintenance and Repair Projects	$565,259	5%	$28,263	$29,111	$29,984	$30,884	$31,810	*pg 79*
61	Parks and Grounds	Contracted Services	$597,221	5%	$29,861	$30,757	$31,680	$32,630	$33,609	*pg 79*
62	Parks and Rec	Maintenance and Repair Projects	$85,000	5%	$4,250	$4,378	$4,509	$4,644	$4,783	*pg 83*
63	Parks and Rec	Contracted Services	$143,000	5%	$7,150	$7,365	$7,585	$7,813	$8,047	*pg 83*
64	Natural Resources	Operating Costs	$64,625	20%	$12,925	$13,313	$13,712	$14,123	$14,547	*pg 87*
65	Public Works	Operating Costs	$71,588	25%	$17,897	$18,434	$18,987	$19,557	$20,143	*pg 98*
66	Public Works	Contracted Services	$52,497	25%	$13,124	$13,518	$13,924	$14,341	$14,771	*pg 98*
67	Finance and Accounting	Assumed one time charge to set up Finance and IT for SW billing (could be in house) 150 hours at $100 per hour	$15,000	100%	$15,000	$0	$0	$0	$0	
68	Finance and Accounting	Assumed annual Financial Audit	$10,000		$10,000	$10,000	$10,000	$10,000	$10,000	
Contracted Services Sub-Total					**$142,360**	**$130,881**	**$134,507**	**$138,243**	**$142,090**	

Existing expenses: When estimating Contract and Equipment Services related to stormwater, the percentage of labor estimates used in the labor calculations in Appendix 1 were used, as well as estimates based on EFC's experience with other communities, all of which was applied in the context of the corresponding department's contract and equipment services 2014 budget. Five percent of the contracted services budget for the planning department was estimated to be related to stormwater[34] (rows 58 and 59). The contracted services budget for the Parks and Grounds department and the Parks and Recreation budget were estimate to be 5% (rows 61 and 63). The budget for maintenance and repair projects within Parks and Grounds and Parks and Recreation were estimated to be 5% as well (rows 60 and 62). An estimate of 20% of the current contracted expenses and equipment budget for Natural Resources was applied[35] (row 64).

The contracted services budget and the contracted operating expenses of the Public Works Department was estimated to be 25% based on the amount of current activity as well as a planning level assumption that generally the component of stormwater costs within construction projects ranges from 5 – 15% (rows 65 and 66).

New expenses: New contracted services were estimated to be $15,000 for the assumed one-time charge to set up the billing and IT of the stormwater utility at a rate of 150 hours at $100 per hour (row 67). Additionally, it was assumed that a stormwater utility would add $10,000 to cover the cost of an annual financial audit (row 68).

[34] 2014 Calvert Budget, Page 55.

[35] 2014 Calvert Budget, Page 87.

Appendix 3: Vehicle and IT Expenses

Table 8: Detailed Calvert County Stormwater Vehicle Expense Estimates

CALVERT COUNTY STORMWATER OPERATING BUDGET										
Operating Expenditures										
	Current Department / New	Description	Budget (2014)	Percentage of Time or Budget	Year 1 (2014)	Year 2 (2015)	Year 3 (2016)	Year 4 (2017)	Year 5 (2018)	Notes
Row #	***Vehicle Operations:***									
72		Street Sweeper	$165,000		$21,443	$21,443	$21,443	$21,443	$21,443	*12 year life, 7.6% cost of capital*
73		Equipment Acquisition and Replacement Fund	$33,000	100%	$33,000	$33,825	$34,671	$35,537	$36,426	*$225,000 of equipment with 10 year useful life at 7.6%*
74		Total as % of Operating	$1,513,229	0.29%	$4,388	$4,388	$4,520	$4,656	$4,795	*pg 102*
Vehicle Sub-Total					**$58,831**	**$59,656**	**$60,634**	**$61,636**	**$62,664**	

Existing expenses: The EFC assumed that the maintenance of stormwater program equipment would be consistent with Calvert County's 2014 budget for fleet maintenance which is .29% of operating costs[36] (row 74).

New expenses: The EFC assumed that the stormwater program will need an equipment asset level of approximately $225,000 for equipment for stormwater activities, projects, and operations. The annual cost of this level of equipment was estimated at a useful life of 10 years at a 7.6% cost of capital to derive an annual stormwater equipment expense of $33,000 (row 73). The EFC also assumed that stormwater equipment would be made up of all new equipment purchases; however, as with the labor analysis above, there is a high probability that there is existing equipment currently budgeted and reserved for by the County that can be used and applied against new stormwater equipment requirements. The equipment budget also contemplates that the County will add a street sweeper. The estimated purchase price of $165,000 was annualized over a 12 year life at a 7.6% cost of capital to arrive at an annual cost of $21,443 (row 72).

IT and Non-Departmental Costs

The 2014 Calvert Operating Budget contains non-departmental items, and these were allocated to the stormwater utility estimated budget at percentages consistent with the metrics used in the Calvert Operating Budget.[37] The metric used is Non-Departmental charges as a percentage of total operating costs, or in this case as a percentage of estimated stormwater program costs.

Table 9: Detailed Calvert County Stormwater IT and Non-Departmental Costs Expense Estimates

CALVERT COUNTY STORMWATER OPERATING BUDGET										
Operating Expenditures										
	Current Department / New	Description	Budget (2014)	Percentage of Time or Budget	Year 1 (2014)	Year 2 (2015)	Year 3 (2016)	Year 4 (2017)	Year 5 (2018)	Notes
Row #	***IT and Non-Departmental Charges as Percentage of Total Operating Costs***									
88	IT	IT Department Computer Operations and Maintenance	$1,513,229	1.13%	$17,099.49	$17,527	$17,965	$18,414	$18,875	*pg 43*
89	Non-Departmental	Reserve for Contingency	$1,513,229	0.13%	$1,967.20	$1,967	$1,967	$1,967	$1,967	*pg 127*
90	Pensions and Insurance	Pension Contrib	$1,513,229	4.31%	$65,220.17	$66,851	$68,522	$70,235	$71,991	*pg 126*
91	Pensions and Insurance	Worker's Comp	$1,513,229	0.59%	$8,928.05	$9,151	$9,380	$9,615	$9,855	*pg 126*
92	Pensions and Insurance	Health Insurance	$1,513,229	3.22%	$48,725.97	$49,944	$51,193	$52,473	$53,784	*pg 126*
93	Debt Service	Exhisting Debt Service	$1,513,229	7.14%	$108,044.55	$110,746	$113,514	$116,352	$119,261	*pg 127*
94	Pensions and Insurance	General Insurance	$1,513,229	0.31%	$4,691.01	$4,808	$4,928	$5,052	$5,178	*pg 126*
95	General Services	Capital Project Oversight	$1,513,229	0.15%	$2,269.84	$2,327	$2,385	$2,444	$2,505	*pg 76*
96	Personnel	Personnel	$1,513,229	0.30%	$4,539.69	$4,653	$4,770	$4,889	$5,011	*pg 52*
97	Finance Department	Finance Department	$1,513,229	0.03%	$454	$465	$477	$489	$501	*pg 53*
IT and Non-Departmental Charges Sub-Total					**$261,940**	**$244,840**	**$250,912**	**$257,136**	**$263,515**	

[36] 2014 Calvert Budget, Page 102.

[37] 2014 Calvert Budget, Pages 43, 52, 53, 76, 126-7.

Appendix 4: Comparative Chart of Existing Stormwater Fees in Maryland

The passage of Maryland House Bill 987 in Maryland in the 2012 General Assembly required the formation (or expansion) of stormwater enterprise programs in the 10 urban subdivisions or counties within the state. The following table provides a summary comparison of those programs.

Evaluation of Maryland Jurisdiction's Response to House Bill 987								
Jurisdiction	Legal Authority; Status	General Residential Rates	EUR or IU Size (sq. ft.)	Non-res. Fee/ERU or IU	Non-res. Fee/Acre Equiva.	General Comments and Select Highlights	WIP anticipated costs	Stormwater fee anticipated revenue
Anne Arundel County	Bill2-13 was passed by County Council on April 15, 2013, vetoed by the County Executive on April 25th and the veto overridden by the Council on May 1st. Bill 40-13 amending law approved by Council on May 20th. Bills 42-13 and 43-13 amending law approved on May 23rd. Bills 44-13 and 45-13 amending law approved on June 17th.	$34, $85, or $170 per dwelling unit	2,940	$85	$1,259	1) For single family residential properties and those multi-family and non-residential properties with a base fee exceeding $500, the charges will be phased-in at 60% for 1st year, 80% for 2nd year, and 100% thereafter. 2) Base fees for non-residential properties are capped at 25% of the property's base property tax. 3) Property owned by a religious group or organization is charged a flat $1 fee. 4) Property owned by other non-profit groups or organizations will be charged $340 per 1/2 acre of impervious area or fraction thereof. 5) Fee for property owned by HOAs capped at a multipliers of number of residential accounts under HOA times 40% of property's base rate. 7) Credits amy not reduce fee to less than 50% of the base fee. 8) Non-residential properties subject to a NPDES permit with stormwater management controls are charged 30% of the base fee.	$1.8 billion	$20-25 million annually
Baltimore City	Bill 12-0155 was approved by the City Council on June 24, 2013. It directs the Director of Public Works to establish rules and regulations for its implementation.	$40, $60, or $120, in accordance w/ impervious area	1,050	$60	$2,489	1) Rates shown are annualized, to be charged in quarterly increments with water bill or by stand-alone invoice to those without water service. 2) Unless certain credits or exemptions are sought, the base fee charged to a non-single-family residential parcel may not exceed 20% of its total real property taxes. 3) Credits are available to: those parcels that approve quality or reduce quantity of stormwater discharge, properties subject to a NPDES industrial stormwater permit, historical properties required to maintain on site stormwater management facilities, and properties that discharge directly into the harbour. 4) Exemptions are available for privately maintained streets open to the public, areas where impervious caps are required by federal or state environmental authorities, and areas where stormwater is discharged into the wastewater system. 5) Property owned by non-profit religious organizations otherwise exempt from property taxes and used exclusively as places of worship or primary or secondary education are subject to a base fee charge of $12/ERU.	$250 million from 2013 to 2017	$24 million annually
Baltimore County	Bill 20-13 passed by County Council on April 15, 2013. Rates will be established annually through Executive Order, but are subject to approval by the County Council	$21*, $32*, or $39* in accordance w/ impervious area	2000	$69*	$1503*	1) Institutional, non-residential property assigned an ERU rate of $20 - not $69 as assigned to non-institutional property owners. 2) Credits may be provided for: marinas in good-standing with Maryland's Clean Marina Initiative, properties where BMPs for the treatment of stormwater are used, and improvements to properties that increase quality or decrease quantity of run-off. 3) Credits based on BMPs used at a site may not reduce the stormwater fee by more than 74%.	$33 million annually	$24.5 million in first year
Carrol County	The Board of County Commissioners passed Resolution 888-2013 on June 27, 2013, which states its intent with regards to the implementation of HB987.	n/a	n/a	n/a	n/a	According to the resolution and county press release, the County will: 1) Create and fund a Watershed Protection and Restoration Fund (WPRF), 2) fund stormwater management by depositing operating funds and other available monies, 3) have staff review and recommend funding for stormwater remediation to the Commissioners in accordance with the annual operating budget and long-term plans, and 4) "continue its commitment to funding stormwater services under the County's NPDES permit..."	$67 million	n/a
Charles County	County Commissioners passed Bill 2013-11 on June 18, 2013, which requires that the County Commission establishment a flat fee on an annual basis	$43*/ parcel	n/a	$43*/ parcel	$43*/ parcel	1) The flat fee is applicable to all properties with impervious surface regardless of the amount of impervious surface that a parcel contains. 2) Exempted properties include: those subject to a NPDES industrial stormwater permit; volunteer emergency services; those owned by the federal, state, or municipal government; and those owned by disabled veterans. 3) Credits of up to 50% of the fee are available for properties that meet or exceed the standards established in the Maryland 2000 Stormwater Design Manual.	$216 million total, $172.5 million cost to county	$2.1 million in first year

Evaluation of Maryland Jurisdiction's Response to House Bill 987

Jurisdiction	Legal Authority; Status	General Residential Rates	EUR or IU Size (sq. ft.)	Non-res. Fee/ERU or IU	Non-res. Fee/Acre Equiva.	General Comments and Select Highlights	WIP anticipated costs	Stormwater fee anticipated revenue
Frederick County	Ordinance 13-06-634 was approved on May 30, 2013.	$0.01/ parcel	n/a	$0.01/ parcel	$0.01/ parcel	Properties located within an incorporated municipality will not be charged the fee.	$1.5 billion	$482.50 annually
Harford County	Bill 13-12 was approved by the County Council and signed by the County Executive to become law on April 23, 2013. It establishes a task force on fees to report back to the Council and the Executive by November of 2013. It instructs the Department of the Treasury to devise a system to apply for financial hardship and the Department of Public Works to develop a system for calculating fee reductions.	$125/ parcel	500	$7	$610	1) Properties that: have not been improved; are located within an established municipality; are owned by state, county, or municipal governments; are owned by volunteer fire departments; or whose owners are able to show substantial financial hardship are exempt. 2) Property owned by a tax-exempt fraternal, religious, or health care organization is subject to a $125 flat fee. 3) Only 10% of the amount of established fees will be collected in July 2013. 4) Fees can be reduced by up to 100% through on-site or off-site (within watershed) actions that improve quality or reduce quantity of runoff. 5) Properties served by existing stormwater management systems will be eligible for fee deductions as well.	$70 to $90 million by 2017	$9 million annually (100%, not 10%)
Howard County	Bill 8-2013, passed as amended on March 28, 2013 sets out regulations for the assessment and collection of a stormwater fee, whose rate schedule was adopted via a Resolution 21-2013 of the City Council.	$15 per IU	500	$15 per IU	$1,306	1) All improved properties, except for those exempt under Section 4.202.1 of the Environment Article of the Annotated Code of Maryland, are subject to a fee. 2) With regard to agricultural property: only residential structures and appurtenances will be counted toward impervious surface for properties with fully implemented Soil Conservation and Water Quality Plans that have been approved by the Soil Conservation District; for properties without such plans, the entire property will be counted toward impervious surface. 3) Fee reductions of up to 50% may be granted in cases where: properties are subject to Site Development Plans filed on or after January 1, 2003, a NPDES permit, or an industrial stormwater permit that requires management of 20% of the uncontrolled impervious area of the parcel; property owners have reduced impact on the public stormwater system through the use of best management practices.	$335 to $835 million plus agricultural sector	$18 million annually
Montgomery County	Bill 34-12, adopted by the County Council on April 17, 2013 directs the executive to impose a charge on all properties in relation to the amount of stormwater they produce. Fee guidelines set by Executive Resolution 17-729, Executive Regulation 17-12AM on April 30, 2013. The charge for FY2014 was set on May 15, 2013 by Executive Resolution 17-748.	$88.40*/ EUR for multifamily, 7 single-family tiers paying 33%-300%	2,406	$88.40*/ EUR	$1,593	1) The County Council sets the rate each year. 2) The cities of Takoma Park, Gaithersburg, and Rockville are not subject to the charge. 3) Agricultural properties treated as single-family residential. 4) Non-profits given special tiers that allow for lower rates. 5) Credits of up to 60% available for stormwater management, which can occur on site or elsewhere within the drainage area. 6) The fee will be phased in such that: only one third of the calculated fee is due during FY13, and only two thirds is due during FY14.	$1.7 billion by 2025	$22.34 million in FY14
Prince George's County	Bill CB-45-2013, passed by the County Council, creates the Clean Water Act Fee, which was then specified by County Resolution CR-59-2013. The credit system will be devised by the Department of Environmental Resources.	Flat rate ($20.58) plus fee based on impervious area and zoning designation ($20.90 times 60%-200% EUR)	2,465	$20.90 plus flat fee ($20.58)	$390	1) Fees charged to include a flat fee plus a fee based on impervious area. 2) Credits to be developed in order to allow for reductions based on stormwater quality improvements and quantity reductions.	$1.2 billion over 10 years	$1.2 billion over 13 years

*Rates set annually.