BOARD OF SUPERVISORS WORK SESSION
GOVERNMENT CENTER BOARD ROOM
JUNE 22, 2010 - 4 P.M.

A. Call to Order
B. Roll Call
C. Board Discussions

1. Proposed Spending Plan for Stormwater Capital Projects Fiscal Years 2011-2021

(Memorandum) (Attachment 1) (Attachment 2)

2. Stormwater Referendum (Attachment)
3. Watershed Management Planning Update (PowerPoint Presentation in PDF) (Attachment)
4. Stormwater Retention Pond Study Meeting (Memorandum)

D. Break

Davenport
& Company LLC
Est. 1863 - Member NYSE - FINRA - SIPC

One James Center
901 East Cary Street
11th Floor
Richmond, Virginia 23219

Capital Funding Discussion Prepared for:

James City County, Virginia

June 22, 2010

Initial Observations

1. $30 million Program can be responsibly incorporated into the County's overall Debt Profile utilizing interim funding and timing of long term debt issuance.
    - However, Debt Capacity considerations prohibit the County from issuing all $30 million at once (i.e. in Fiscal Years 2011-12).
    - Federal and State permitting requirements, necessary easements and project management constraints also do not allow the County to spend all $30 million within the IRS tax-exempt guidelines (generally within 3 years).
2. The Equivalent Tax Impact of a $30 million program is 2.25 cents on the Real Estate Tax Rate (Assumes $1.1 million per penny).
3. The County's exceptional bond rating(s) will allow for it to access either the short-term or long-term credit markets at highly competitive rates.
4. Given both the preliminary nature of the spending estimates and expectation(s) of a lengthy spend down period, and Debt Capacity considerations the County may wish to consider an Interim Funding approach to meet its initial spending requirements, thus reducing cash flow strains in the early years.

Key Considerations for Funding a Multi-Year Stormwater Management Program

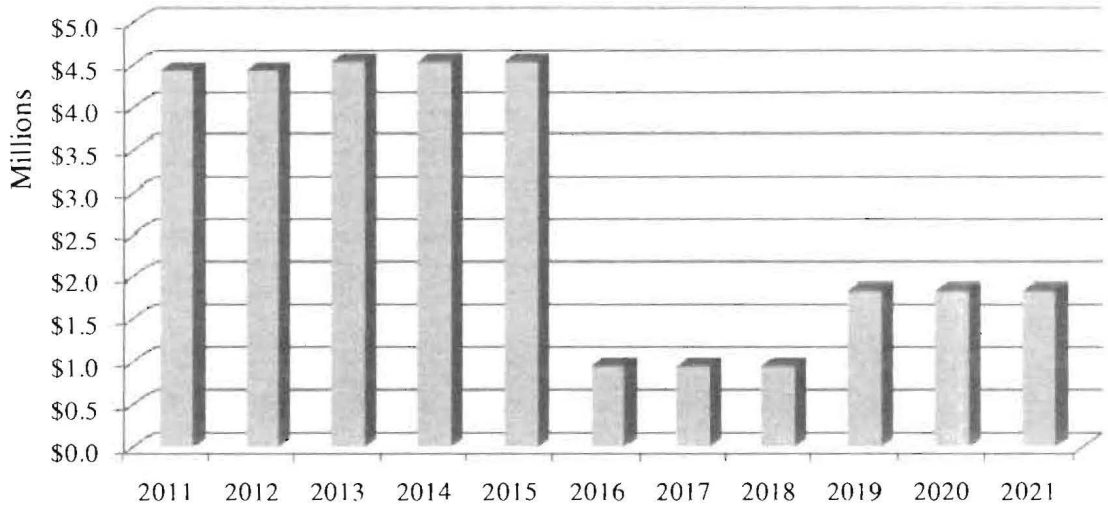
- Approximate size of the program - $30 million over 11 years.
- Determine the County's Debt Capacity and Debt Affordability when looking at implementing such program.
  - Debt Affordability is the cash flow needed to repay the debt service.
  - Debt Capacity is the ability to issue debt and stay within existing Financial Policies.
- Consider the current and expected interest rate and lending environment.
- Enactment of the 2.25 cents early in the program does two things:
  - Builds up equity for project funding
  - Increases overall revenues of the County increasing debt capacity
- Develop a program that allows for eligibility to borrow at the lowest cost of funds (i.e., Tax-Exempt and/or Build America Bonds).

Ratings Trends (past 15 Years) - General Obligation Ratings

A History of the City of James City County's General Obligation Credit Ratings

Year	Moody's	Standard & Poor's	Fitch Ratings
1994	A1	A+	--
1995	A1	A+	--
2003	Aa3	AA	--
2005	Aa2	AA	AA+
2006	Aa2	AA+	AA+
2009	Aa2	AA+	AA+
Current	***Aa1***	***AA+***	***AAA***

Proposed Stormwater CIP Spending Plan



DISTRICT	FY 11-12	FY 13-15	FY16-18	FY19-21	SUBTOTAL
Berkeley	$1,032,000	$6,000,000	$188,000	$515,000	$7,735,000
Jamestown	1,430,000	2,972,000	50,000	500,000	4,952,000
Multiple	1,575,760	0	0	3,100,000	4,675,760
Powhatan	1,565,000	425,000	825,000	525,000	3,340,000
Roberts	1,235,000	2,900,000	0	830,000	4,965,000
Stonehouse	2,030,000	1,320,000	1,800,000	50,000	5,200,000
TOTAL	**$8,867,760**	**$13,617,000**	**$2,863,000**	**$5,520,000**	**$30,867,760**

PROJECT TYPE	SUBTOTAL
New BMPs and Retrofits	$7,690,000
Drainage Improvements	6,725,000
Flood Mitigation	6,890,000
Stream Restoration	7,887,000
Project Management	1,675,760
TOTAL PROJECT	**$30,867,760**

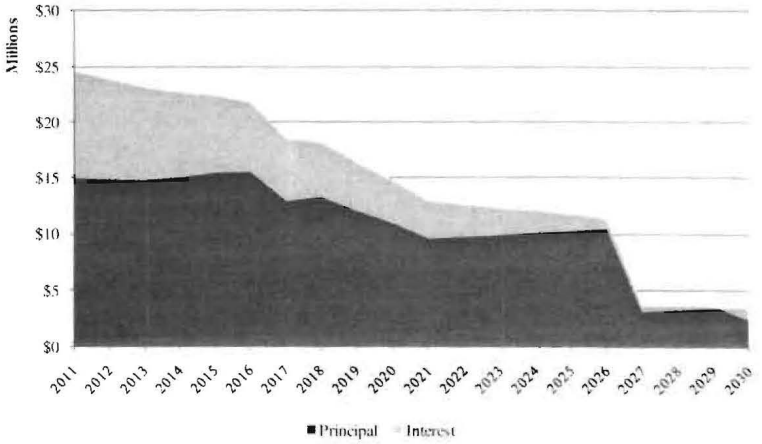
Permanent Financing

- Construction Amount $30 million
- Assumed Interest Rate 5%
- Amortization Period 20 Years
- Debt Structure Level Payments
- Annual Debt Service $2,415,000
- Equivalent Penny $1.1 million
- Equivalent Penny Impact 2.25 cents

Date	Principal	Interest	Total
FY 2011	$835,000	$1,375,000	$2,210,000
FY 2012	955,000	1,458,250	2,413,250
FY 2013	1,005,000	1,410,500	2,415,500
FY 2014	1,050,000	1,360,250	2,410,250
FY 2015	1,105,000	1,307,750	2,412,750
FY 2016	1,160,000	1,252,500	2,412,500
FY 2017	1,220,000	1,194,500	2,414,500
FY 2018	1,280,000	1,133,500	2,413,500
FY 2019	1,345,000	1,069,500	2,414,500
FY 2020	1,410,000	1,002,250	2,412,250
FY 2021	1,480,000	931,750	2,411,750
FY 2022	1,555,000	857,750	2,412,750
FY 2023	1,635,000	780,000	2,415,000
FY 2024	1,715,000	698,250	2,413,250
FY 2025	1,800,000	612,500	2,412,500
FY 2026	1,890,000	522,500	2,412,500
FY 2027	1,985,000	428,000	2,413,000
FY 2028	2,085,000	328,750	2,413,750
FY 2029	2,190,000	224,500	2,414,500
FY 2030	2,300,000	115,000	2,415,000
Total	**$30,000,000**	**$18,063,000**	**$48,063,000**

Existing Debt

	Principal	Interest Net of DSRF and BAB	Total	Payout Ratio
2011	$14,974,035	$9,706,041	$24,680,076	7%
2012	14,851,290	9,070,244	23,921,534	14%
2013	14,781,385	8,408,232	23,189,617	21%
2014	15,046,300	7,720,033	22,766,333	28%
2015	15,447,400	7,017,710	22,465,110	35%
2016	15,520,400	6,316,962	21,837,362	42%
2017	12,936,000	5,645,966	18,581,966	49%
2018	13,283,000	4,999,199	18,282,199	55%
2019	12,038,000	4,387,794	16,425,794	60%
2020	10,960,000	3,803,433	14,763,433	66%
2021	9,605,000	3,321,382	12,926,382	70%
2022	9,745,000	2,878,940	12,623,940	75%
2023	9,915,000	2,420,250	12,335,250	79%
2024	10,100,000	1,951,324	12,051,324	84%
2025	10,285,000	1,466,856	11,751,856	89%
2026	10,480,000	972,985	11,452,985	94%
2027	3,155,000	505,734	3,660,734	95%
2028	3,300,000	358,202	3,658,202	97%
2029	3,450,000	211,659	3,661,659	98%
2030	3,595,000	(1,152,823)	2,442,177	100%
Total	**$213,467,810**	**$80,010,124**	**$293,477,934**	

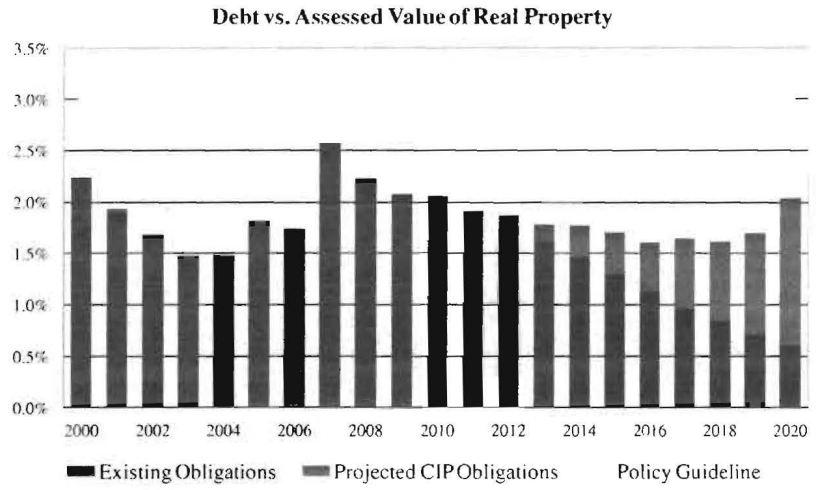


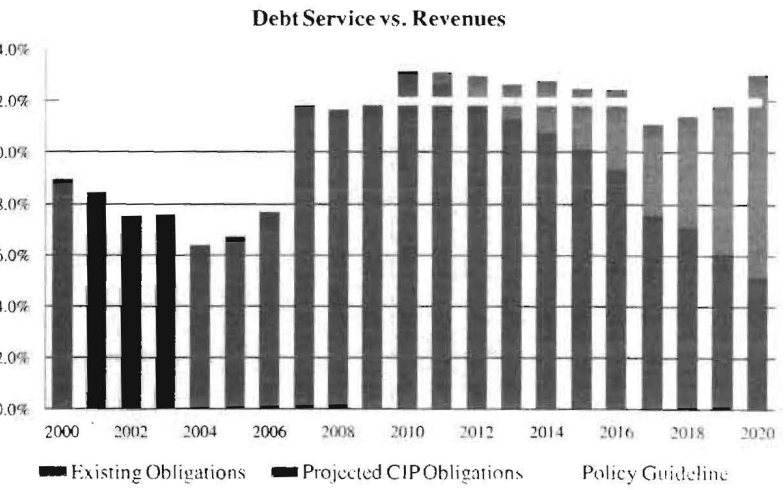
Projected Bond Financed Projects

Projects to be Bond Financed	Amount	Year of Issuance
Schools/Greenspace	$12,000,000	2011
Public Facilities	7,000,000	2012
Schools/Greenspace	19,000,000	2013
School Cap Maint	6,000,000	2014
Stormwater (3 Year BAN takeout)	8,867,760	2014
Community Gym/Gen Serv Bldg	12,000,000	2015
Elem School	30,000,000	2016
Fire Station 6	5,000,000	2017
Stormwater (3 Year BAN takeout)	13,617,000	2017
Shaping Our Shores /Aquatics/Comm Ctr	36,000,000	2018
High School	60,000,000	2019
Library/Pub Safety Training Fac	14,000,000	2019
Elem School / Middle School	75,000,000	2020
Stormwater (3 Year BAN takeout)	2,863,000	2020
Stormwater (3 Year BAN takeout)	5,520,000	2022
Total	$306,867,760	

Projects from 2016 and beyond are based upon assumed growth and facility needs. Debt issuance assumes Cost of Issuance of 1.5% and interest rates of 5% with level payments over 20 Years.

Projected Debt Capacity Ratios



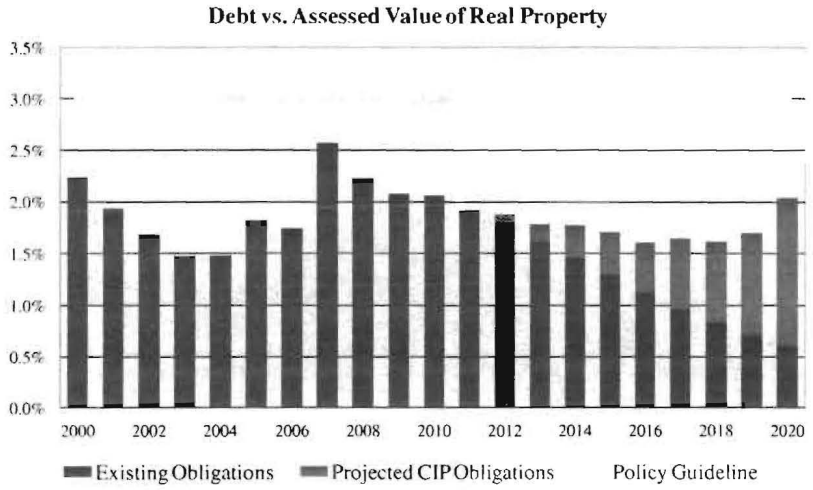


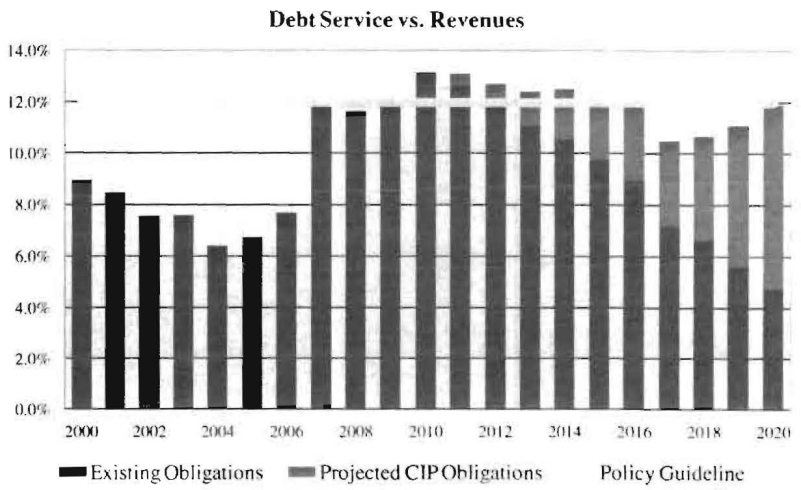
Key Assumptions

	2011	2012	2013	2014	2015/After
Assessed Value	0.1%	0.7%	1.0%	2.0%	3.0%
Revenues	-1.3%	0.7%	4.4%	3.0%	5.0%
Interest Rate			5.0%		
Amortization			20 Years		
Debt Structure			Level Debt Service		

Based upon the Projected Bond Financed Projects and the Assumed Revenue Growth rate the County would violate its Debt Service to Revenues ratio in certain years.

Projected Debt Capacity Ratios





Key Assumptions

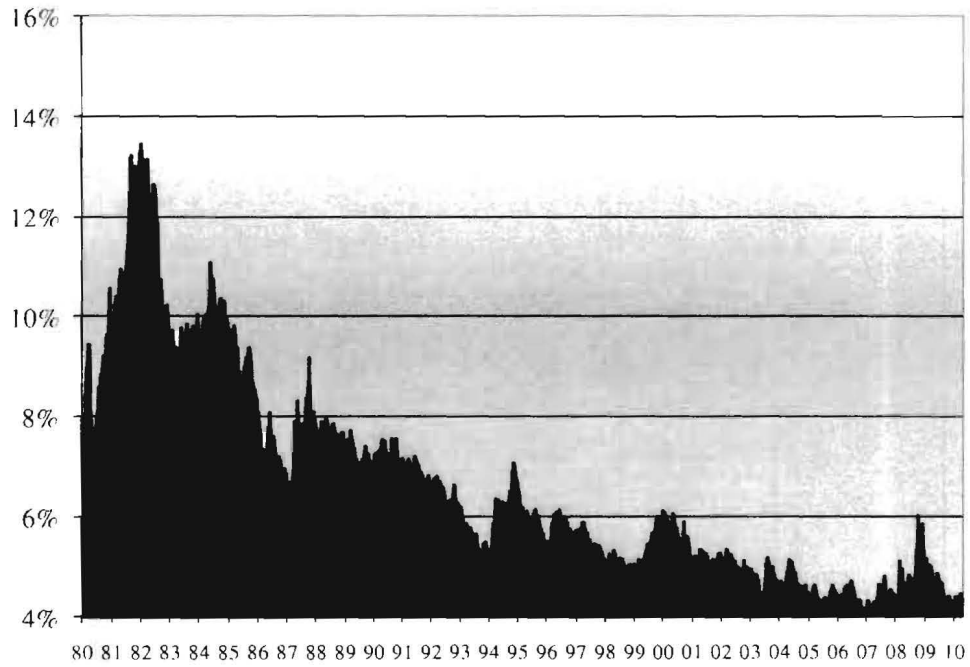
	2011	2012	2013	2014	2015/After
Assessed Value	0.1%	0.7%	1.0%	2.0%	3.0%
Revenues	-1.3%	2.7%	4.4%	3.0%	6.25%
Interest Rate			5.0%		
Amortization			20 Years		
Debt Structure			Level Debt Service		

With increased revenue growth the County's Debt Service to Revenues ratio is only slightly above the guideline. Revenue growth of around 6.25% per year beginning in FY 2015 would keep the County in compliance in the out years.

Appendix

Interest Rate Environment

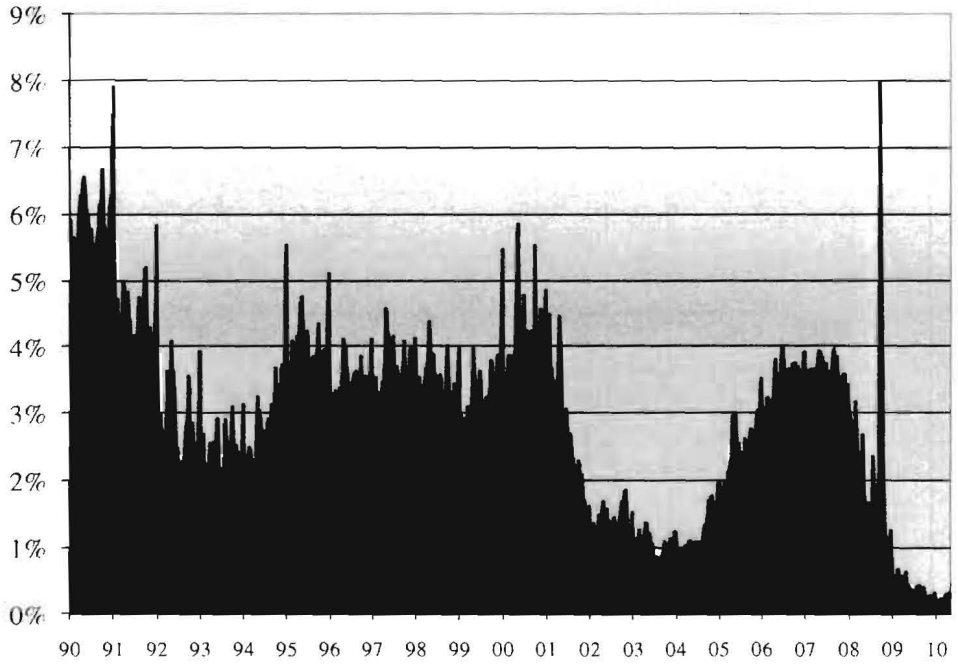
20-Bond GO Index (1980-Present)



	GO-Bond Index
10-Year Average	4.75%
5-Year Average	4.53%
Current Rate	4.37%

Interest Rate Environment

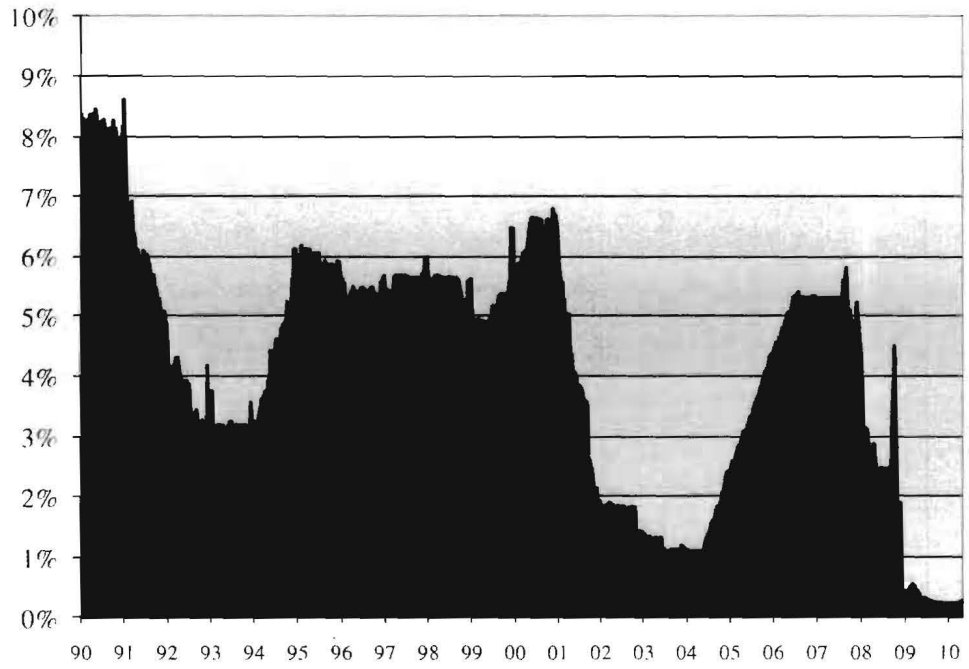
SIFMA Index (1990-Present)



	SIFMA Index
10-Year Average	2.15%
5-Year Average	2.31%
Current Rate	0.30%

Interest Rate Environment

1-Month LIBOR (1990-Present)



	1-Month LIBOR
10-Year Average	2.70%
5-Year Average	3.21%
Current Rate	3.00%

WORK SESSION

M E M O R A N D U M

DATE: June 22, 2010

TO: The Board of Supervisors

FROM: Frances C. Geissler, Stormwater Director

SUBJECT: Proposed Spending Plan Fiscal Years 2011-2021

The attached proposed spending plan for Fiscal Years 2011 through 2021 is grouped by voting district and, to some extent, by fiscal year. Permitting and easement acquisition usually take the most time to complete and are the most difficult to predict. As a result, we have made some assumptions about certain projects, our ability to move projects forward, and have grouped them into multi-year work units. This will allow us to focus on easement acquisition for a large number of projects almost immediately. We believe the attached list can be accomplished using a mix of approaches including traditional design and construction, design-build alternatives, and accelerated easement acquisition and project management.

Some projects have been color-coded as follows:

- Green - These projects are on private property and the owners may be able to undertake or contribute to successful project completion. In some cases, the County may be reimbursed over time.

- Orange - These projects are on State-owned property or within Virginia Department of Transportation (VDOT) rights-of-way. The projects are included because they meet specific County goals.

- Blue - These projects are County-owned.

While we expect that other projects will become apparent over the next five to ten years, the attached spending plan reflects our current understanding of need.

Frances C. Geissler

CONCUR:

John T.P. Horne

FCG/gb
Fy11-21ProSpend_mem

Attachments

Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
DI	Chisel Run Neighborhood Drainage Improvements	Will upgrade existing storm drain system to accommodate large storm flows - currently undersized outlet	Berkeley	$500,000				$500,000
STREAM	Whistle Walk Channel Stabilization	350 LF stream restoration to protect property, utility connections, improve WQ and flood storage capacity. Will require permission from a large number of property owners	Berkeley	$300,000				$300,000
BMP	Powhatan Plantation #2 stream restoration	Highly incised channel along west side of Powhatan Plantation property. Retrofit of dry pond to provide channel protection is recommended in conjunction with stream rehabilitation.	Berkeley	$200,000				$200,000
DI	Powhatan Secondary Drainage Improvements	Chronic complaints regarding drainage problems and intersection innundation at Old Cart Rd and Barley Mill Place. Currently working with HOA management company on improvements. May need to consider enlarging system to mitigate intersection and yard flooding. Outfall channel unstable in rear yards.	Berkeley	$25,000				$25,000
FM	Fieldcrest Pump Discharge Flood Mitigation	Project will install and maintain a pump system in the neighborhood BMP to lower water levels prior to small storms. Lowering the water level in the BMP will partially mitigate neighborhood drainage problems. The project is hydraulically dependant on the Rt 5 Flood Mitigation Project. **This project will not work without the Rt 5 project.** Needs a Phase 2 feasibility study to address operation and maintenance.	Berkeley	$7,000		$63,000		$70,000
FM	Jamestown 1607 Powhatan Floodway Mitigation	Project will address known floodway problems in older residential area along the Powhatan Creek by enlarging bridge to lower riverine flood levels.	Berkeley		$5,000,000			$5,000,000
FM	Rt 5 Flood Mitigation	Project replaces existing Rt 5 culverts to improve 100 Yr runoff conditions upstream of Rt 5 in the area of Greensprings Swamp. Will require substantial stream modifications downstream of new culverts and will not fully mitigate conditions in the the Fieldcrest neighborhood	Berkeley		$750,000			$750,000
BMP	Powhatan Plantation BMP Retrofit (PC-006)	In conjunction with the second Powhatan Plantation stream restoration (south), this project will modify an existing dry pond to provide channel protection for the completed restoration project.	Berkeley		$250,000			$250,000
BMP	Powhatan Crossing BMP Retrofit (PC-025)	Project will retrofit an existing BMP that discharges to an eroding stream channel. Retrofit will provide for improved channel stability.	Berkeley			$100,000		$100,000
STREAM	Chisel Run (North & South Branch) stream restoration	The lower portion of this highly incised and degraded reach would benefit from both upstream on-site stormwater retrofits and stream restoration.	Berkeley			$25,000	$475,000	$500,000
STREAM	Eastern State #2 stream restoration	3000 LF of incised, degraded stream with headcuts in the Powhatan Cr Watershed	Berkeley				$40,000	$40,000
			Berkeley Total	**$1,032,000**	**$6,000,000**	**$188,000**	**$515,000**	**$7,735,000**

Color Key: Green = private responsibility, Orange = state property, Blue = JCC property

Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
BMP	Mill Cr Outfall BMP upgrades	Energy dissipation structures to address unmanaged stormwater in headwater streams - multiple sites	Jamestown	$500,000				$500,000
DI	Fernbrook Drainage Repairs	Poorly constructed failing stormwater system, includes multiple sink hole repairs between lots or along lot lines. JCC contribution to HOA for non-VDOT portion for all non-VDOT locations. Can be phased.	Jamestown	$300,000				$300,000
STREAM	Mill Cr (East Branch) Stream Restoration Sites	East of Jamestown Road - degraded stream channels in conjunction with uncontrolled growth in upper Mill Creek watershed. Project located between many single family residences. Sanitary sewer exposed in several areas. Severe headcuts.	Jamestown	$200,000	$876,000			$1,076,000
STREAM	Mill Cr (West Branch) Stream Restoration Sites	4000LF of stream restoration to protect property, utility connections, improve WQ and flood storage capacity. Will require permission from a large number of property owners	Jamestown	$200,000	$876,000			$1,076,000
DI	Cooley Rd Drainage Improvements	Repair and upgrade to aging system	Jamestown	$100,000				$100,000
DI	Paddock Ln Drainage Improvements	Undersized VDOT culvert causes localized yard and roadway flooding, will need to ensure that outfall is adequate to receive increased discharge	Jamestown	$100,000				$100,000
DI	Brookhaven Drainage Improvements	Older neighborhood with persisitent drainage problems - houses built in the RPA and close to perennial stream. Investigating opportunities for water quality enhancements.	Jamestown	$30,000	$170,000			$200,000
BMP	Mill Cr biorentention BMP upgrades	bioretention/infiltration retrofits to address unmanaged stormwater in neighborhoods with high impervious cover	Jamestown		$600,000			$600,000
BMP	Mill Cr BMP retrofits	Retrofits to existing BMPS to improve water quality and quantity conditions	Jamestown		$450,000			$450,000
BMP	Drummonds Field Drainage Improvements & Regional BMP	Project will realign existing outfall pipes to design grade to lessen the occurance of stormwater entering residence with on-grade first floor elevation and provide water quality and volume control for currently untreated residential area that has poor soils and drainage. Project will also provide treatment for existing horse farm. Highly variable costs due to permitting and outfall conditions.	Jamestown			$50,000	$500,000	$550,000
			Jamestown Total	**$1,430,000**	**$2,972,000**	**$50,000**	**$500,000**	**$4,952,000**

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Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
PM	Capital Project Management Services	Consulting services to manage capital projects, assumed 3% of total cost - use of limited term employee may result in substantial savings	Multiple	$875,760				$875,760
BMP	JCC BMP Repairs, Modifications & Upgrades Phases I & II	I -Evaluation of existing JCC stormwater facilities to detemine which non-routine repairs, modificiation or water quality retrofits are needed and /or possible. Anticipate that 1/3 to 1/2 will need some kind of non-routine repair. II - Non-routine repairs, modifications and upgrades to existing JCC stormwater facilities to ensure working order and readiness for expected requirements under the Ches Bay TMDL.	Multiple	$500,000				$500,000
PM	Easement Acquisition for Capital Improvements	Project will work with property owners to secure needed access and easement to complete stream restoration and drainage improvement projects. Project does not include funds for easement purchases.	Multiple	$200,000				$200,000
BMP	Bacteria Mitigation BMP Retrofits	Retrofits of specific wet ponds in watersheds with bacterial impairments as listed in the state 303(d) list in accordance with TMDL implementation plans	Multiple				$3,100,000	$3,100,000
			Multiple Total	**$1,575,760**	**$0**	**$0**	**$3,100,000**	**$4,675,760**

Color Key: Green = private responsibility, Orange = state property, Blue = JCC property

Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
FM	Warhill Tr Dam Upgrade	Upgrades are needed to bring the dam into compliance with State Dam Safety Regulations. A 100 yr floodplain downstream of the dam complicates compliance. Seeking to decommission dam in order to reduce risk to JCC and neighborhood.	Powhatan	$750,000				$750,000
FM	Freedom Pk Beaver Dam Stabilization	Stabilization of Beaver Dam in Freedom Park to attenuate stormflows. May need hydraulic modeling to determine feasibility	Powhatan	$320,000				$320,000
BMP	Chisel Run Headwaters Impervious Site Mitigation BMP	Project will mitigate impervious areas by installing rain gardens or other appropriate BMPs. Have not been able to secure landowner permission (Rt 60 commercial area)	Powhatan	$200,000				$200,000
STREAM	Scotts Pond stream restoration II	Eroded channel and nick points in headwater stream between Scotts Pond Dr and Essex	Powhatan	$150,000				$150,000
DI	Allyson Dr Drainage Improvement	Residential flooding due to undersized/nonexistent drainage system. Will reduce 1st floor flooding but will not provide volume control or WQ treatment, inc property purchase for Raintree Reg BMP	Powhatan	$120,000				$120,000
STREAM	Villages of Westminster stream restoration	Restoration associated with incised, degraded stream channel conditions found along active nick points in the northern tributary.	Powhatan	$25,000	$225,000			$250,000
DI	Pheasants Run Drainage Improvements	Chronic drainage problems inc stormwater entering garages. Looking for a combination LID - traditional piping solution	Powhatan		$200,000			$200,000
BMP	Raintree Regional BMP	Project will provide water quality and volume control for currently untreated older residential area. The purchase of at least one residential lot, possibly two, will be necessary . CSX Railroad will need to be involved as a partner.	Powhatan			$400,000		$400,000
STREAM	Windsor Forest stream restoration	Multiple degraded channels totalling 1400 LF, one in conjunction with sanitary sewer. Sanitary sewer exposed in several areas. Severe headcut.	Powhatan			$400,000		$400,000
STREAM	Westmorland Stream restoration	Stream restoration associated with possible stormwater retrofit near Hornsby apartments.	Powhatan			$25,000	$225,000	$250,000
BMP	James Shire Settlement Outfall BMP	Project will provide water quality and channel protection volumes for an existing development by creating a small wet pond . Will result in loss of at least three large trees, but will control runoff from dense development.	Powhatan				$200,000	$200,000
STREAM	Cold Spring Swamp Channel Stabilization	Project will stabilize and enhance the stream channel immediately downstream from the News Road culverts - dependant on VDOT's News Rd armoring project	Powhatan				$100,000	$100,000
			Powhatan Total	**$1,565,000**	**$425,000**	**$825,000**	**$525,000**	**$3,340,000**

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Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
DI	James Terrace Drainage System Improvements	Repair and upgrade to aging system, working to incorporate water quality enhancements through natural stream channel design. Some instances of undercutting and unsafe drainage channels. Includes drainage problems in the Gibson Mobile home park	Roberts	$1,000,000				$1,000,000
DI	Grove Outfalls Drainage and WQ Imrpovements	Project consists of installation of an adequate drainage system to eleviate existing flooding, support future development/redevelopment, and provide water quality treatment. Project along both north and south sides of Rt 60 in the vicinity of Church St. Construction costs will be substantial due to the number of utilities which will need to be relocated.	Roberts	$100,000	$2,900,000			$3,000,000
DI	Adams Rd Outfall Drainage Repair	Repair of damaged outfall at intersection of Adams Rd and Merrimac Tr outside the VDOT ROW. Historic filling has blocked outfall creating upstream flooding.	Roberts	$90,000				$90,000
STREAM	Skiffes Cr Restoration (Greenmount)	Headcuts and incised, degrading channels - multiple locations north and south of Rt 60 in the Greenmount area.	Roberts	$45,000				$45,000
STREAM	James River Commerce Center stream restoration	James River Commerce Park - end of Columbia Drive. Approximately 2500 lf of severely degraded stream channel. Talking with Economic Development to secure easements for inclusion into stream bank program	Roberts				$800,000	$800,000
STREAM	Ball Metal BMP Outfall Enhancements	Project will retrofit an existing BMP to add volume control to stabilize the receiving channel. Included in this project maybe the relocation of an existing outfall to improve the usability of an industrial lot in accordance with JCC EDA needs. Will be coordinated w/ JCC EDA.	Roberts				$30,000	$30,000
			Roberts Total	**$1,235,000**	**$2,900,000**	**$0**	**$830,000**	**$4,965,000**

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Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
PM	Watershed Management Planning	Project will complete management plans for the Ware, York, and Diascund Watersheds. College Creek will be included dependant on available funding and City of WBG involvement.	Stonehouse	$600,000				$600,000
STREAM	Centerville Tributaries I &II Stream Restoration & Enhancement	Channel Stabilization: Upper reaches of Subwatershed 105. Experiencing headcutting and erosion (Several thousand feet of channel is affected). NOTE: Centerville Tribs II is dependent on construction of new BMP (Centerville Tribs III)	Stonehouse	$400,000	$400,000			$800,000
BMP	Centerville Tributaries III BMP	New BMP to protect channel stabilization in the upper reaches of Subwatershed 105. Experiencing headcutting and erosion (Several thousand feet of channel is affected).	Stonehouse	$400,000				$400,000
BMP	Yarmouth Tributaries I & II BMP Retrofits	2 retrofits to protect channel stabilization for two reaches on the south side of Kristiansand neighborhood experiencing streambank erosion and headcutting.	Stonehouse	$200,000				$200,000
BMP	Norge Crossing II BMP Retrofits	This project is the 2nd phase of identified WQ enhancements and will include LID and hydrocarbon treatment. Owners have provided verbal approvals but will need to sign updated maintenance covenants.	Stonehouse	$150,000				$150,000
STREAM	Stonehouse ES Stream Restoration	Stabilization of outfall, incised, eroding channel needs stabilization	Stonehouse	$150,000				$150,000
BMP	Mirror Lake Orphan BMP	Non-routine repair to existing BMP owned by defunct neighborhood association	Stonehouse	$90,000				$90,000
DI	Toano Drainage and Water Quality Improvements	Project consists of installation of an adequate drainage system to eleviate existing flooding, support future development/redevelopment, and provide water quality treatment, will also address unexplained erosion site affecting sanitary sewer	Stonehouse	$40,000		$1,000,000		$1,040,000
STREAM	Ware Creek Tributaries Stream Restoration, Stabilization & Enhancement	Multiple headcuts & degraded channels. Stonehouse - Development Areas 2 and 3. One landowner - Should actively pursue and include in stream bank program to give coverage in the York River HUC. No known infrastructure impacts. Will be evaluated as part of the Ware Cr WSMP	Stonehouse		$500,000			$500,000
STREAM	Yarmouth Tributaries III Channel Stabilization	Channel stabilization for two reaches on the south side of Kristiansand neighborhood experiencing streambank erosion and headcutting. NOTE: This phase dependent on Yarmouth Tribs I& II	Stonehouse		$400,000			$400,000
STREAM	Norge Farm Headcuts Restoration, Stabilization & Enhancement	East of Candle Factory project. Severe headcut coming from farm field. Approximate length 3000lf. No known infrastructure impacts. One, possibly two property owners. Possible inclusion in stream bank program. Stream restoration for stream reach adjacent to the west side of the Kristiansand neighborhood in Subwatershed 104	Stonehouse		$20,000	$780,000		$800,000
BMP	Toano Trace BMPs #1 & 2 Retrofit (YC-019, 020)	Enhancements to existing dry ponds, including addition of a sediment forebay and expansion of the wet pool area to incorporate greater water quality. This is a straight forward retrofit project.	Stonehouse			$10,000		$10,000

Color Key: Green = private responsibility, Orange = state property, Blue = JCC property

Type of Project	Project Name	Description	BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
BMP	Toano Woods BMP Retrofit (YC-013)	Project adds a forebay to an existing wet pond. This is a straightforward retrofit to an otherwise adequate facility.	Stonehouse			$10,000		$10,000
STREAM	Cranstons Mill Pond channel stabilization	Channel Stabilization: Roadside ditch adjacent to Cranston Mill Pond Rd eroding soil into Yarmouth Creek - VDOT maintenance issue	Stonehouse				$50,000	$50,000
			Stonehouse Total	**$2,030,000**	**$1,320,000**	**$1,800,000**	**$50,000**	**$5,200,000**
			Grand Total	**$8,867,760**	**$13,617,000**	**$2,863,000**	**$5,520,000**	**$30,867,760**

Color Key: Green = private responsibility, Orange = state property, Blue = JCC property

Proposed Spending Plan for Stormwater Capital Projects Fiscal Years 2011-2021

June 22, 2010

Board of Supervisors' Work Session

10-Year Summary

BOS District	FY11-12	FY13-15	FY16-18	FY19-21	Estimated TOTAL Cost
Berkeley	$ 1,032,000	$ 6,000,000	$ 188,000	$ 515,000	$ 7,735,000
Jamestown	$ 1,430,000	$ 2,972,000	$ 50,000	$ 500,000	$ 4,952,000
Multiple	$ 1,575,760	$ -	$ -	$ 3,100,000	$ 4,675,760
Powhatan	$ 1,565,000	$ 425,000	$ 825,000	$ 525,000	$ 3,340,000
Roberts	$ 1,235,000	$ 2,900,000	$ -	$ 830,000	$ 4,965,000
Stonehouse	$ 2,030,000	$ 1,320,000	$ 1,800,000	$ 50,000	$ 5,200,000
Grand Total	**$ 8,867,760**	**$ 13,617,000**	**$ 2,863,000**	**$ 5,520,000**	**$ 30,867,760**

10-Year Summary by Type

Project Type	Total
New BMPs & Retrofits	$ 7,690,000
Drainage Improvements	$ 6,725,000
Flood Mitigation	$ 6,890,000
Stream Restoration	$ 7,887,000
Project Management	$ 1,675,760
Grand Total	**$ 30,867,760**

New BMPs, Retrofits & Repairs

- Provide treatment for previously untreated development
  - Reduce volume, treat for water quality
- Improve existing BMPs' function
  - Install pre-treatment forebays, increase retention time, add plantings
- Fix the ravages of time

New BMPs, Retrofits & Repairs

Warhill High School BMP

Stonehouse Elementary School BMP

Drainage Improvements

- Repair and maintain existing infrastructure
- Install stormwater system in developed areas with no system
- Upgrade aging systems to modern standards regarding capacity and safety
- Include water quality treatment where possible

Drainage Improvements

Examples of Aging Infrastructure in James Terrace

Flood Mitigation

Mitigate *existing* impacts to property within mapped 100 year flood plains to *minimize flood damage and protect citizens*

Branscome Boulevard

Flood Mitigation

Warhill Trail Dam

Stream Restoration

- Goal = restored natural stream function
  - Stabilized stream
  - Reconnected floodplain
- Results:
  - Incremental flood mitigation
  - Less sediment clogging channel
  - Less opportunity for algae blooms, etc
  - Increased & improved wildlife habitat

Typical Restoration Sites

Stonehouse District

Whistle Walk Channel Stabilization

Results…

Powhatan Plantation Stream Restoration – Before and After

Questions?

Powhatan Creek at Sunset

WATERSHED PROTECTION AND RESTORATION GOALS AND STRATEGIC ACTIONS

a. Watershed-Wide Protection and Restoration Goals

Goal	Description
1	Minimize the further degradation of **water quality** and preserve, restore and maintain the outstanding quality of all streams within the watershed as well as tidal and nontidal wetlands.
2	Develop in a manner that is consistent with the protection of **living resources**: avoid habitat fragmentation and encourage the preservation of riparian and wildlife corridors.
3	Promote active **stewardship** among residents, community associations, businesses, and seasonal visitors.

b. Strategic Actions for Watershed Protection and Restoration and Estimated Costs

		GORDON CREEK WS			MILL CREEK WS		
Goals	**Strategic Action**	**Priority**	**Watershed Location**	**Cost to County and Action**	**Priority**	**Watershed Location**	**Cost to County and Action**
ALL	Use subwatershed maps to ensure James City County staff and stakeholder awareness of existing locations for restoration and potential conservation areas.	1	watershed wide	SMALL: internal coordination	pending	watershed wide	SMALL: internal coordination
1	Implement Special Stormwater Criteria for all new plans for development (except those with approved plans or in review)	2	watershed wide	SMALL: program ongoing	not included		
1	Update or develop new Better Site Design (BSD) educational materials to be made available to developers and homeowner's associations and conduct training.	3	watershed wide	SMALL: largely internal coordination	pending	watershed wide	SMALL: largely internal coordination
1	Continue to work with County departments to incorporate BSD requirements into applicable ordinances and into the County BMP Manual, and to develop consistent review procedures.	4	watershed wide	SMALL: largely internal coordination	pending	watershed wide	SMALL: largely internal coordination
ALL	Work with private landowner(s) to develop feasibility plans for the dams at Jolly Pond and Warburton Pond, including but not limited to evaluating potential funding sources for the repair, monitoring and maintenance of the dams and associated roadways, assessment for archaeological resources, potential impacts to archaeological and environmental resources and public health and safety associated with either dam	5	all subwatersheds except 202 (tidal mainstem)	MODERATE: $30-60K ea.	not included		
1, 3	Continue to fully implement the requirements of the County's MS4 permit in relation to watershed management throughout County.	6	watershed wide & County wide	SMALL: already underway	pending	watershed wide & County wide	HIGH: $100K / year
1	Conduct additional feasibility assessments, validate, and carry out the stormwater retrofits and stream restorations identified in this watershed plan	7	101, 105, 106, 202	MODERATE: $75-100K ea.	pending	all but tidal mainstem	HIGH: $1M±

WATERSHED PROTECTION AND RESTORATION GOALS AND STRATEGIC ACTIONS

		GORDON CREEK WS			MILL CREEK WS		
Goals	**Strategic Action**	**Priority**	**Watershed Location**	**Cost to County and Action**	**Priority**	**Watershed Location**	**Cost to County and Action**
1	Develop an inter-departmental rapid response protocol and team to deal with unforeseen and emergency threats to water quality and infrastructure (e.g., leaking sewer lines, storm-related or unpredictable channel and bank erosion, hazmat spills,	8	watershed wide & County wide	MODERATE: $15-25K	pending	watershed wide & County wide	MODERATE: $15-25K
1, 2	Provide incentives for new development and redevelopment to add intermittent stream buffers, expanded RPA and mainstem buffers, preserve identified conservation areas, minimize impervious cover, and maximize contiguous open	9	watershed wide & County wide	HIGH: >$200K	pending	watershed wide & County wide	HIGH: >$200K
2,3	Identify key stakeholders within the watershed (landowners, schools, etc.) that can help implement watershed planning objectives. Work with them to develop a shared vision for preserving natural resources through community actions and provide opportunities for them to contribute to the attainment of watershed management	10	watershed wide	SMALL: explore academic/volunteer consulting input	not included		
1, 2	Identify areas within the watershed where riparian corridors have been damaged, disturbed or are in an unnatural condition and seek ways, including incentives, to restore those areas to their natural condition.	11	watershed wide & County wide	MODERATE: $15-25K	pending	watershed wide & County wide	MODERATE: $50-100K
ALL	Promote the Purchase of Development Rights (PDR) program funds for special resource areas (e.g., riparian buffers and conservation areas).	12	watershed wide	HIGH: $1M+ / year	not included		
3	Continue to support and grow a citizen/volunteer-based team of individuals to routinely perform assessments of stream health, including sampling for benthic macroinvertebrates, water quality indicators, and photodocumentation.	13	watershed wide	SMALL: explore academic/volunteer consulting input	pending	watershed wide	SMALL: explore academic/volunteer consulting input
3	Improve the availability of educational materials by including watershed information as part of the Freedom Park environmental / interpretive area. Also use the PRIDE website. Educate people about watershed awareness including chemical disposal, pet waste, onsite waste disposal systems, rubbish, and boat wakes.	14	watershed wide	SMALL: use stakeholder meetings for insight	not included		
3	Improve the availability of educational materials by developing materials for use by HOA's and neighborhood associations. Also use the PRIDE website. Educate people about watershed awareness including proper disposal of fats, oils, grease, and other chemicals, pet waste, onsite waste disposal systems, trash and boat wakes.	not included			pending	watershed wide	SMALL: use stakeholder meetings for insight
3	Enhance stewardship by specifically addressing litter and shoreline erosion from boat wake issues	15	subwatershed 202	SMALL: use stakeholder meetings for insight	not included		

WATERSHED PROTECTION AND RESTORATION GOALS AND STRATEGIC ACTIONS

		GORDON CREEK WS			MILL CREEK WS		
Goals	**Strategic Action**	**Priority**	**Watershed Location**	**Cost to County and Action**	**Priority**	**Watershed Location**	**Cost to County and Action**
3	Enhance the stewardship of Mill Creek by specifically addressing wildlife management and proper disposal of fats, oils, and grease.	not included			pending	watershed wide	SMALL: use stakeholder meetings for insight
ALL	Continue to utilize available regional / state / federal data in the County GIS database, including but not limited to data from the DHR-DSS, DCR-DNH and DGIF to: a) assist in prioritizing conservation areas; b) ensure that potential development opportunities fully appreciate the cultural and natural resources within the footprint; and c) be	16	watershed wide & County wide	SMALL: if data available for exchange from State agencies	not included		
2,3	Consider participation in the Virginia Big Tree or similar recognition program to identify historic and specimen trees and promote the importance of trees to the landscape	17	watershed wide & County wide	MODERATE: $15-25K	pending	watershed wide & County wide	MODERATE: $15-25K
1	Fully implement the Mill-Powhatan Creek TMDL Implementation Plan in response to ongoing water quality concerns	not included			pending	watershed wide	HIGH: $1M±

Watershed Management Planning Update

June 22, 2010

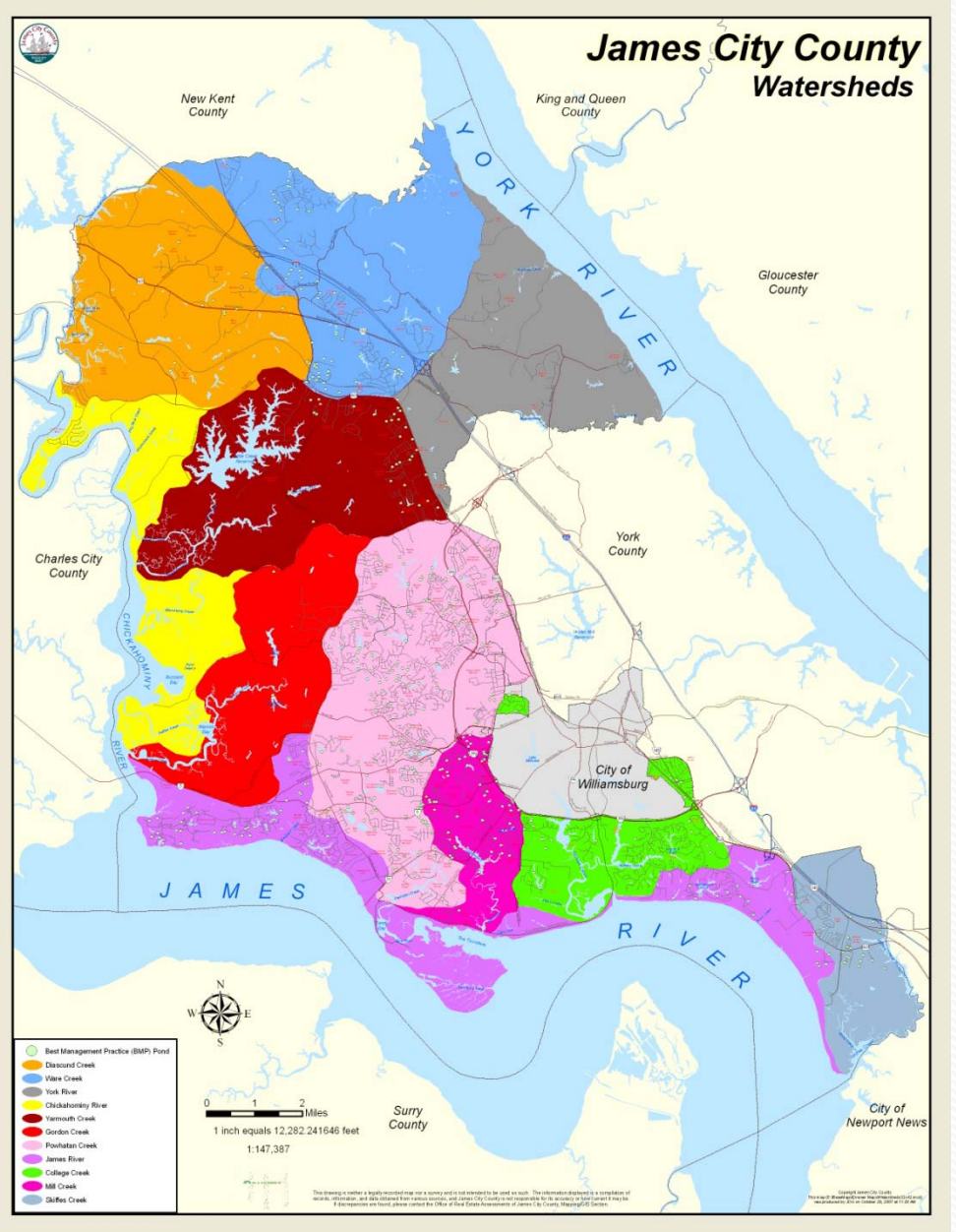
Board of Supervisors' Work Session

Why watershed management?

- To identify and address potential sources of water quality impairment
- To inform future land planning
  - identify environmentally sensitive areas
  - identify streams and stormwater infrastructure in need of restoration and retrofit
- To meet public expectations regarding management of natural resources

County Watersheds

- Completed plans
  - Powhatan Creek
  - Yarmouth Creek
  - Skiffes Creek – baseline only
- In progress
  - Gordon Creek
  - Mill Creek



Gordon Cr Baseline Assessment

- Pristine freshwater tidal marsh (VDNH)
  - Due to the rarity of this type of natural community, the marsh at Gordon Creek may be "*one of the best remaining examples of this ecosystem in America because of it's great size and excellent quality.*" (Clark, 1993)

Gordon Cr Baseline Assessment

- 13.8 square miles
- Jolly Pond Rd, Centerville Rd, Rt.5
- 86% Forested/ wetlands
- Very little existing development (less than 1.5% impervious cover)
- JCC is a major landowner

Tidal Gordon Creek

Special Gordon Communities

Tulip Poplar Specimen Tree

Eagle's Nest

Generally Pristine…

Typical Gordon Creek problems

James City County's Role

Freedom Park

Chickahominy Riverfront Park

Colby Swamp

Mill Creek Baseline Assessment

- Assess:
  - stream and floodplain condition (linear)
  - potential sources of stream impairment (points)
  - pollutant loading using simple models and land use
  - state of stormwater management practices
- Recommend:
  - areas for potential stream restoration / stabilization
  - methods of stormwater retrofit

Mill Creek Baseline Assessment

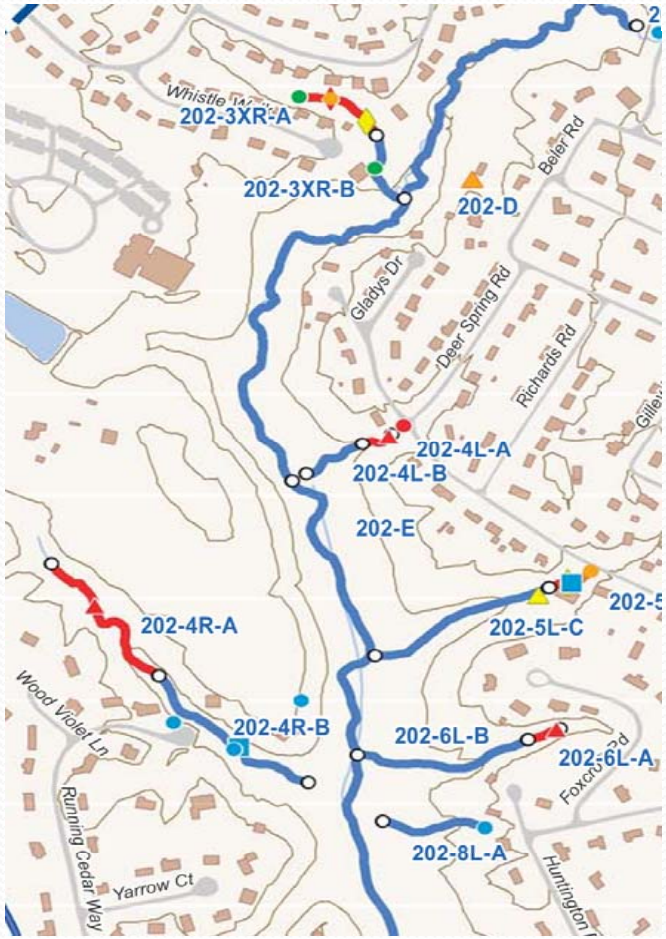
- Summary Statistics:
  - total watershed area = 5.7 square miles
  - tidal mainstem = 1.9 square miles
  - current impervious area = 21 %
  - future impervious area ~23.4%

Mill Creek Process

- Assess Stream and Floodplain Conditions
  - Rosgen Classification of Natural Rivers
  - Channel Evolution Model
  - EPA Rapid Bioassessment Protocol (RBP)
  - Stream Habitat
  - Floodplain Assessment
- Assess Potential Sources of Stream Impairment
  - stormwater outfalls, sewer line crossings, stream crossings, trash and debris, severe bank erosion, impaired riparian buffers

Mill Creek Findings – Streams

- evaluated 10.6 miles of stream
- 8.2 miles, or 77% are E-type streams
- 1.3 miles, or 12% are G-type streams
- very dissimilar in nature, typical location



Mill Creek Findings

- Fresh sedimentation notable, especially at toe of slope
- subwatershed 204 has the lowest scores – Colony Square
- BMPs working in most impervious subwatershed (201)

Example of sediment movement

Mill Creek Findings - Stormwater

- Stormwater outfalls (86 evaluated):
  - velocity dissipation limited
  - impairments correlate with G-type streams
  - undermined structures & obstructed culverts

Example of inadequate outfall

Mill Creek Findings - Neighborhoods

Typical residential neighborhood

- Most development recent
- Over half of rooftop downspouts disconnected
- Significant open-section drainage
- Little infill or redevelopment
- Most tree canopy < 40%
- About half the lawns were high maintenance
- No litter or pet waste seen
- Curb / gutter generally clean

Mill Creek Findings - Impairments

- stream crossing (17) – Colony Square
- trash and debris (5) – relatively easy cleanup
- utilities – unprotected
- buffers (2) – RPA generally performing

Developing Watershed Goals

- Baseline Assessment = snapshot of watershed
- Stakeholder Input = shared vision
- Previous Watershed Studies = consistent approach

Goal Discussion

Stakeholder meeting presentations are available at www.jccegov.com/watershed

WORK SESSION

M E M O R A N D U M

DATE: June 22, 2010

TO: The Board of Supervisors

FROM: Steven W. Hicks, Manager of Development Management

SUBJECT: Stormwater Retention Pond Study Meeting

Overview

A meeting was held on May 21, 2010, with Steven Hicks, Greg Hancock, Allen Murphy, Scott Thomas, Bill Cain, and Marcella Johnson (Intern). The topic of discussion was the background and history of Best Management Practice (BMP) monitoring study being performed by the College of William and Mary, as well as some of the findings/recommendations of the analyses. Greg Hancock is Associate Professor at the Department of Geology at the College of William and Mary, with whom we performed the study.

Important Findings

1. What are the old and new standards and practical applications?

   The old method of quantity control was per Minimum Standard No. 19 of the Virginia Erosion and Sediment Control regulations. The County adopted a more stringent stream channel protection volume method, which was allowed through State law, through the Stormwater Policy Framework Study (1998) and by implementing the County BMP Manual by Ordinance adopted on October 26, 1999. Early college BMP studies began in 2003 by college students Popkin and Fortunato. The current study is a flow (quantity) monitoring study only, not water quality monitoring. The County BMP Manual currently allows two different types of computational methods to design for Stream Channel protection volume. One is the Kerplunk method, the other is a 24-hour separation in the center of mass for the inflow volume and center of mass for the outflow volume. The College BMP study is showing problems achieving 24-hour detention time using the Kerplunk method.

2. Are we (James City County) using some of these standards and/or can we use them?

   The Minimum Standard No. 19 (Virginia Erosion and Sediment Control regulations) is the State default method for quantity control. The County has adopted more stringent criteria which is the 24-hour detention of runoff from the post development 1-year 24-hour storm, called Stream Channel Protection Volume control. This is mainly applied to wet or dry pond stormwater basin designs. Current County BMP Manual was first used starting in January 2000. At that time it was current technology. Over time, some adjustments based on technology changes may be needed. The County BMP Manual outlines channel protection criteria recommendations and adoption of more stringent criteria which was done in 1999/2000 (i.e., Stream Channel Protection Volume criteria) by implementation of the County BMP manual).

3. What have been the problems in the past that changed and how are we designing them now?

   The College's presentation will address this question.

4. How do we know today's standard is doing its job?

   The County, the development community, or plan preparers are meeting State and County requirements.

5. Are we measuring our results, (few years after) and "testing" pollutants, etc.?

   In the past it was not mimicking true runoff. However, with today's standards it is doing its job. There have been several articles in the press about the study over the past few years. It is possible that the County could get help from people who are monitoring to find out how they are performing. The County asked for a current list of site BMPs being monitored.

6. We do a great job engineering BMPs, but we don't have the ability or method of measuring how they are performing. How can we fix this?

   The County is not measuring the results because lack of resource and "data". There is stream monitoring in New Town. Some monitoring stations are proffered in the new Stonehouse Development. There was a James City County Citizens Coalition (J4C)/ Public Housing and Builders Association (PHBA) workshop on the College's BMP study in January 2009 at Building C at the Government Center. County staff attended the workshop and the Stormwater Division is monitoring streams, not BMPs.

General Information

- The origin of current stream channel protection volume design was the "James City County Stormwater Policy Framework, Final Report of the James City County BMP Policy Project," 1998 by the Center for Watershed Protection. These recommendations were presented to the Board in 1999.
- The College was a member of the Special Stormwater Criteria Task Group in 2004.
- College students first started stream flow monitoring projects and some other studies on intermittent streams. These studies lead into a bigger, long-term BMP study.
- Work with the College on this is consistent with Priority No. 17 from the adopted Powhatan Creek Watershed Management Plan and narrative text from page 31 of the Powhatan Creek Watershed Management Plan.
- Environmental Division (PRIDE PROGRAM) has routinely coordinated over the years with the College through programs such as SHARPE, Keck Lab, REU, etc.)
- The County provided a letter of support dated November 2006 when the College pursued grant funds for continuation of the BMP monitoring project.
- Typically wet/dry pond designs do not reduce volume, only peak flow rate control (attenuation).
- County has remained neutral in allowing the College to present findings of the BMP study in an academia setting (conferences, etc.). No formal submittals are made to the County for review. A brief four-page white paper was provided in December 2008, which the Environmental and County Engineer group reviewed in a cursory manner.
- Mr. Hancock is committed to presenting at the June 22, 2010, Board of Supervisors work session.
- "New" Virginia Stormwater Management Regulations will play a role in any decision-making process.

Steven W. Hicks

SWH/nb
StormwtrRet_mem

Attachment