Attachment A: STRATEGY TABLES for St Mary's County Phase II WIP for June 2012 Submission

Table A-1: Proposed Implementation through 2017 based on existing commitments

Sector	Strategy	Description NP = Nothing planned	Units	2010-2011	2012-2017	Total	Estimated Cost	In a CIP or Budget	Supported by adopted plans, policies, programs
Point Sources	Major WWTPs	Upgrade Marlay-Taylor Wastewater Treatment Plant to Maryland's Enhanced Nutrient Removal (ENR) standards (Status: in design, to be online in 2014, operational at 4 mgl for 6 mg/day (Currently 8 mgl for 4 mg/day).	plants		1	1	$36,087,500	☑	☑
Point Sources	Major WWTPs	Marlay-Taylor Wastewater Treatment Plant: Methane Power Co-generation and Digester Upgrade FY10 upgrade to use methane to produce electricity to produce enough rejected heat to supply the digesters heating requirements).	plants	1		1	$3,943,000	☑	☑
Point Sources	Major WWTPs	Water Reuse of 10-12 million gallons of treated effluent for: 350 acres of irrigation on ag land, 9-11M gallons for golf course irrigation 0.25M gallons for cooling towers and industrial testing processes Off-site irrigation for parks, athletic fields, fire protection systems, and dual plumbed buildings.	Millions of gallons reduced for effluent at average 6 mgl for Nitrogen		11	11	$4,095,000	☑	☑
Point Sources	Major WWTP	Upgrade Leonardtown's WWTP to Maryland's ENR Standards (Status: In design phase, to be online in June, 2014. Current permit 4 mg/L for 680,000 gpd plant. Design to ENR standards of 3 mg/L.)	Plant		1	1	$6,000,000	☑	☑
Point Sources	Major WWTP	Expansion of Leonardtown's WWTP from 0.75 mgd to 0.94 mgd (Status: construction begins Sept. 2013, completion Sept 2015)	Plant		1		$16,400,000	☑	☑
Point Sources	Major or Minor WWTPs: Sewer system expansion to serve planned service areas	Accommodate limited growth (including possible connection of OSDS to sewer)	systems		1	1	$1,789,000	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Point Sources	Major or Minor WWTPs: Sewer system expansion to serve planned service areas	FY 2015-FDR Boulevard Sewer main (32 EDU's)	systems		1	1	$37,000	☑	☑
Point Sources	New Large Minor Municipal WWTPs (0.1-0.5 MGD)	Charlotte Hall/ New Market Sewer (status: FY2015 capital project for Biolac Waste water treatment system and rapid infiltration basins)	plants		1	1	$5,332,500	☑	☑
Point Sources	New Large Minor Municipal WWTPs (0.1-0.5 MGD)	Leonardtown spray irrigation (status: Tentative project 0.3 mg) Note: In CIP for future possibility of land application or water re-use system - No current plans to build before 2017 (8/30/2011 BCC meeting)				1		☑	☑
Point Sources	New Large Minor Municipal WWTPs (0.1-0.5 MGD)	St Clements Shores WWTP (spray irrigation) FY 2015 capital project for expansion of existing system to serve failed systems only (149 EDU's)	plants			1	See connection of failed septic systems	☑	☑
Point Sources	Major or Minor WWTPs: Sewer system expansion to serve planned service areas	ENR Retrofits at Webster Field minor Federal WWTP: (Status: Permit for 45,000g/day actual discharge 50% of permitted; average discharge for 2007 thru 2011 222 lbs/yr P & 1380 lbs/yr N, Discharges to St. Mary's River, Pretreatment installed waiting final permit criteria)	plants	1		1	Completed	☑	☑
Point Sources	Major or Minor WWTPs: Sewer system expansion to serve planned service areas	FY 2014-Hollywood Town Center	expansion			1	$1,789,000	☑	☑
Point Sources	Federal facilities - minor	ENR Retrofits at Webster Field minor Federal WWTP	plants	1		1	Complete	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Septic	Existing level of effort: Continue Upgrade of expanded, failing and new Septic Systems in the Critical Area 125 since 2007 in CA and 6 since 2007 out of CA	Retrofit 60 septic systems per year through 2017 with current program using best available technology	systems	55 retrofit CA 2 retrofit non-CA	360 retrofit	537 Retrofit	Annual cost: $684,000 Total cost: $5,472,000 (BFR Grant program average cost/BAT installed $11,400,)	☑	☑
Septic	Septic hookups to ENR plants: Connect failing septic systems to Wastewater Treatment Plants with advanced nutrient removal technologies.	FY2010-Oliver Drive (5 homes)	systems	5		5	$558,000	☑	☑
Septic	Programmatic changes:	Programmatic changes necessary to enable potential connection of OSDS to sewer in rural areas: 1) Change CWSP policy and add a category designation to allow rural sewer for WIP purposes in the absence of septic failures; 2) Revision of PFA funding restrictions.	Program changes		2	2	Consider as part of regularly scheduled CWSP update process	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Urban Stormwater	Existing Urban Nutrient Management Law Fertilizer applications regulated on commercial/institutional property through Maryland's Nutrient Management Law. Work with public land managers to develop lower input management strategies for lawns and mowed areas on public lands	4,722 acres including: County parks, public landings, museums, schools and county owned facilities: 2,343 acres managed in 103 locations including 116 athletic fields, multi purpose fields and practice areas: (1,370 acres parkland; 973 acres county-owned facilities and school property) PNAS: (1,421 acres of managed turf, 389 acres of Ag leases) Webster Field: (307 acres of managed turf, 130 acres of Ag leases)CSM (12 acres estimated) SM Hospital (20 acres estimated) Governmental Center complex (62 acres estimated) Fairgrounds (38 acres estimated) Establish landscape and maintenance standard for landscape contracts to reduce frequency and intensity of maintenance and allow natural regeneration of diverse native vegetation in low maintenance areas.	acres (annual)			3,000	Net reduction in expense for all property managers/owners. Nutrient management and conversion to lower input maintenance strategies are expected to result in savings of up to 50% per acre: Per County Parks' data: Average cost for mowing is $408 per acre; Average cost for maintenance of fields and multipurpose areas is $52 per acre.	☑	☑
Urban Stormwater	Existing Urban Nutrient Management Law:	SM College of MD, Golf Courses (Winpisinger, Wicomico, Breton Bay, Pax River) VFD and rescue Squads (acres TBD)	acres (annual)			TBD	Nutrient management and conversion to lower input maintenance strategies are expected to result in savings of up to 50% per acre:	☑	☑
Urban Stormwater	Removal of Impervious Surfaces	County: Regulatory requirements for reduced impervious surfaces (or add equivalent SWM) to achieve 20% reduction in lot coverage.	square feet			TBD	I.S. reduction for redevelopment projects paid for as a part of each project. No new cost to County	☑	☑
Urban Stormwater	Removal of Impervious Surfaces	Leonardtown: Port of Leonardtown 3 ac. Public Park - Removal of impervious asphalt and replacement with pervious surface.	square feet	67,611 s.f.		67,611 s.f.	Completed at cost of $4,000,000	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Urban Stormwater	Removal of Impervious Surfaces	Leonardtown: Washington St. Public Parking Lot - Removal of impervious asphalt and replacement with pervious pavers.	square feet	8,000 s.f.		8,000 s.f.	$3,000,000	☑	☑
Urban Stormwater	Prepare for required MS4 Phase I permit: Prepare for required MS4 Phase I permit:	St. Mary's' County is required to develop MS4 Phase II Permit based on 2010 population of 105,151. Permit will require Nutrient and Sediment reductions equivalent to stormwater treatment on 20% of the impervious surface that does not have adequate stormwater controls. While development of the County's permit is not anticipated in MDE's work plan until at 2015, St. Mary's County has been and will continue to prepare for permit development through CIP	Development of NPDES permit by 2017					☑	☑
		Analyze and recommend funding mechanisms (e.g. stormwater utility, public private partnerships, grants, low cost loan programs)	Planning and analysis				$50,000	☑	☑
		Identify potential retrofit sites and implement pilot projects. Funding for pilot projects and NPDES related planning and analysis approved in 2013 -2018 CIP	Analysis and pilot projects		9 pilot projects	15 pilot projects	$7,093,325 in CIP thru FY 2018 $774,000 Operational Budget	☑	☑
		Procure consultant services for WIP related project identification, cost benefit analysis, and milestone development	Planning and analysis				$50,000	☑	☑
Urban Stormwater	Street Sweeping	Leonardtown: Contracts regularly scheduled street sweeping over all Town streets. Some areas are swept daily & some are done bi-weekly.	Miles	10	10	10	$27,810 annually	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Urban Stormwater	Enhanced Urban Nutrient Management State mandated modification of lawn fertilizer formulation to eliminate phosphorus to the extent practicable and requires the use of slow release nitrogen fertilizers on lawns and managed turf. **GIS estimated area in lawns: 50,217 acres**	Provide improved management on 20,000 ac. of lawn Work with Environmental organizations/agencies to implement homeowner education programs to promote "BayWise"- type lawn management practices.	acres (annual)		14,000	20,000	1. Ongoing effort: Existing Extension Service Master Gardeners & watershed organizations working on this issue. 2. In process to develop a local Watershed Stewardship Academy to train volunteers to assist landowners in development. Coordinated by UMD Maryland Sea Grant Extension Program Watershed Restoration Specialist 3. In process to develop an online system to track homeowner actions. Funded through grant to UMD Maryland Sea Grant Extension Program	☑ ☑ ☑	☑ ☑ ☑
Natural Filters on Public and Private Land	Tree Planting--Municipal	Port of Leonardtown 3 ac. Public Park - located adjacent to McIntosh Run. Planted approx. 1 ac. of new trees and other landscaping.	acres	1			$10,000	☑	☑

Table A-1: Proposed Implementation through 2017 based on existing commitments									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Natural Filters on Public and Private Land	Grassland	Restore 45 acres of Grassland on public land. Grass planted next to waterways filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat.	acres	45		45	$20,000	☑	☑
OTHER	Keep/strengthen regulations re: environmental Buffers: Retain existing 100' perennial and 50' intermittent stream buffers, 25' wetland, buffer and 50 foot floodplain buffers plus the provide for expansion for steep slopes, and hydric and highly erodible soils per 2010 CZO.	These buffers based in scientific recommendations for minimum buffers have been determined to provide environmental services that protect water quality, minimize sedimentation, and protect property from hazards (onsite and downstream flooding, and onsite erosion) and minimize SWM facility construction and O&M, and minimize stream degradation that would require future capital expense for retrofits.					$0 cost to retain regulation currently in place.	☑	☑
OTHER	Mining operations	Abandoned mine reclamation: (assumed 50%of active mine acres will be reclaimed under permits issued)	acres			250	Required operating cost for mine approval--No cost to jurisdiction	☑	☑

Table A-2: Implementation Options to Consider for future Milestones									
Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Agriculture	Streamside Forest Buffers	Retire marginal crop and pasture land and use GIS data to target restoration			280	400	$52,000 per year	☐	☑
Agriculture	Vegetative Environmental Buffers	Retire marginal crop and pasture land and use GIS data to target restoration			140	200	$26,000 per year	☐	☑
Point Sources	Major Industrial	Continue Retrofits and Optimization at Major Industrial Treatment Plants to meet the Tributary Strategy load cap.	plants				TBD	☐	☐
Point Sources	Minor Industrial	Identify loading targets and issue schedules in permits by 2017 for reductions of approximately 23.5%, representing approximately 143,000 lbs/yr reduction, for minor industrial sources	plants				TBD	☐	☐
Point Sources	Upgrade Large Minor Municipal WWTPs (0.1-0.5 MGD))	Point Lookout WWTP--NP	plants				See connection of failed septic systems	☐	☐
		Wicomico Shores WWTP (spray irrigation)-- NP	plants				--	☐	☐
		Charlotte Hall Veteran Home (large scale septic) --NP	plants				--	☐	☑
		Airedele Road (large scale mound)-- NP	plants				--	☐	☑
		Forest Farm (large scale mound)-- NP	plants				--	☐	☐
		Charlotte Hall: Burch system-- NP	plants				--	☐	☑
Point Sources	Upgrade Private WWTPs	Charlotte Hall: Burroughs system--NP	plants				--	☐	☑
		Charlotte Hall: WaWa system--NP	plants				--	☐	☑
Septic	Existing level of effort: Continue requirement for BAT for new Septic Systems in the Critical Area Projected growth rate for new OSDS in CA:	100 new systems from 1/07 to 6/11	Avg. 28 new DU in CA/year 1/07 to 6/11	Avg. 28 DU/ year (based on new 100 DU in CA 1/07 to 6/11)	176 new	252 New	Annual cost: $319,200 Total cost: $2,006.400	☑ N/A individual landowner expense	☑

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Septic	Increased level of effort due to regulatory change: Require new and expanded, Septic Systems in nutrient impaired watersheds to upgrade to BAT	2012 regulatory proposal by MDE: Outside the Critical Area the 2011 impact would have been 131 homes and 14 renovations requiring septic upgrade	systems				Annual cost: $ Total cost: $ (BFR Grant program average cost/BAT installed $11,400)	☑	☑
Septic	Septic hookups to ENR plants: Connect failing septic systems to Wastewater Treatment Plants with advanced nutrient removal technologies.	FY2016-St Clement Shores vicinity (149 homes) FY2017-Holly Gaf Sewer (152 homes, 70 failed)			149 70	149 70	$2,554,500 $1,714,500	☑	☑
Septic	Septic Hookups to ENR Plants--Leonardtown	Only 4 septic systems remain within Town limits. All other residences are connected to Town WWTP -- NP			4		--	☐	☐
Septic	Additional effort to upgrade remaining Critical Area OSDS's to BAT	In FY13, assess options to phase in requirement to retrofit all septic systems in the Critical Area (the land within 1000 feet of tidal waters) using best available technology. Assess viability of tax credits, income based criteria for grant eligibility and other means to facilitate upgrades. (BAT upgrade of additional 3,862 systems in Critical Area for a total of 5,605 systems. Note: SMCo has 7,929 parcels in the CA outside sewer service areas. The 5,605 MAST estimate for CA OSDS's appears to be low. Developed parcels estimated at 6,610. Projection accounts for existing retrofits and sewer connection noted in the above strategies	systems		2,860	3,862	Annual cost: $4,890,600 $44,026,800 total cost	☐	☐

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Septic	Non-CA OSDS within 1000' of streams to BAT	Programmatic change. In FY13, assess options to phase in requirement to retrofit existing OSDS on land within 1000 feet of perennial streams mapped by MDNR using best available technology. Assess viability of tax credits, income based criteria for grant eligibility and other means to facilitate upgrades.	systems		3, 976	5,537	Annual cost: $7,013,500 Total cost: $63,121,800	☐	☐
Septic	OSDS retrofit program for densely developed areas outside sewer service areas.	Potential areas for comprehensive projects to retrofit existing OSDS in areas inside of PFA's and/or inside of designated Growth Areas. Potential areas include:							
		Lexington Park: Town Creek/ Esperanza/ Leverings and vicinity	1290 OSDS				$14,706,000	☐	☐
		Leonardtown: Society Hill and vicinity	786 OSDS				$8,960,400	☐	☐
		Hollywood: Scotch Neck/ Blackstone Farm and vicinity	346 OSDS				$3,944,400	☐	☐
		Piney Point to Callaway: 249 Corridor/ Callaway	409 OSDS				$4,662,600	☐	☐
Septic	OSDS retrofit program for densely developed areas outside sewer service areas.	Potential areas for comprehensive projects to retrofit existing OSDS in areas outside of PFA's and/or outside of designated Growth Areas. Potential areas include:							
		Coltons Point and vicinity	232 OSDS				$2,644,800	☐	☐
		Country Lakes and Vicinity	1159 OSDS				$13,212,600	☐	☐
		Golden Beach and Vicinity	1444 OSDS				$16,461,600	☐	☐
		Hollywood Shores and Vicinity	302 OSDS				$4,867,800	☐	☐
		Millpoint Shores and Longview Beach	472 OSDS				$4,867,800	☐	☐
		Sandgates and Vicinity	390 OSDS				$4,446,000	☐	☐
		Scotland and Rodo Beaches	110 OSDS				$1,254,000	☐	☐

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Septic	OPTION FOR FURTHER ANALYSIS: Connect existing of OSDS's within Growth Areas and adjacent to existing sewer infrastructure	Potential areas for comprehensive projects to retrofit existing OSDS in areas inside of PFA's and/or inside of designated Growth Areas. Potential areas include:							
		Lexington Park: Town Creek/ Esperanza/ Leverings and vicinity	1290 OSDS				$27,440,968	☐	☑
		Leonardtown: Society Hill and vicinity	786 OSDS				$39,307,772	☐	☑
		Hollywood: Scotch Neck/ Blackistone Farm and vicinity	346 OSDS				$6,823,029	☐	☑
		Piney Point to Callaway: 249 Corridor/ Callaway	409 OSDS				$29,911,157	☐	☑
Septic	OPTION FOR FURTHER ANALYSIS: Expanded Sewerage Systems including new rural sewer planned service areas	Investigate feasibility of providing sewer in areas with concentrated existing development, may include connection to nearby existing system infrastructure or development of new land application systems. May require expansion of existing system capacity to receive additional EDU's and provide for limited infill on undeveloped existing lots in the service areas Potential areas include:							
		Coltons Point and vicinity	232 OSDS				$9,392,536	☐	☐
		Country Lakes and Vicinity	1159 OSDS				$50,667,939	☐	☐
		Golden Beach and Vicinity	1444 OSDS				$48,556,335	☐	☐
		Hollywood Shores and Vicinity	302 OSDS				$10,851,702	☐	☐
		Millpoint Shores and Longview Beach	472 OSDS				$13,695,003	☐	☐
		Sandgates and Vicinity	390 OSDS				$12.864.682	☐	☐
		Scotland and Rodo Beaches	110 OSDS				$4,182,785	☐	☐

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Sector	**Strategy**	**Description** NP = Nothing planned	**Units**	**2010-2011**	**2012-2017**	**Total**	**Estimated Cost**	**In a CIP or Budget**	**Supported by adopted plans, policies, programs**
Septic	OPTION FOR FURTHER ANALYSIS: Implement Growth Area Connection policy and program	As sewer is extended within Growth Areas require adjacent development on OSDS to connect to sewer. Update and clarify connection and service charge policy to: 1) Mandate connection to sewer as sewer infrastructure becomes available in the vicinity of new and existing development CWSP; and 2) Assure contribution to capital costs for all properties in areas designated for sewer service. OR 3) Alternatively, consider comprehensive connection program to connect up to 707 CA units and 2,306 Non-CA units on existing SDS's in NPS & S6-D categories to sewer in those GA areas that have reasonable access to existing sewer infrastructure	Programmatic change 1 1 3,013 OSDS				-- -- TBD based on areas selected-	N/A N/A ☐	☑ ☑ ☐
Septic	OPTION FOR FURTHER ANALYSIS: Require all development that receives a waiver or exemption of sewer connection within a planned sewer service area to install new BAT OSDS's or to retrofit existing systems to BAT	Proposed 2012 MDE regulation re: installation of BAT for new and expanded OSDS outside the Critical Area in impaired watersheds addresses this requirement	Programmatic change				--	N/A	☐
Urban Stormwater	Prepare for required MS4 Phase I permit:	Develop and phase in implementation programs likely to be required under the permit that can assist now in meeting TMDL load reductions.	Programmatic changes and pilot projects				--	☐	☑

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Urban Stormwater	Prepare for required MS4 Phase I permit:	Implement nutrient and sediment reductions to achieve stormwater treatment : Work with SHA to address loads originating on SHA property. In preparation recommend working with SCS and interns (St. Mary's College of MD, College of Southern MD, other higher education institutions) to ID those eroded/undercut SHA "Flume" locations that are contributing large sediment loads to streams	Offset or reduce 20% of the impervious surface that does not have adequate stormwater controls.				--	☐	☑
Urban Stormwater	Regenerative Stormwater Conveyance	Implement stream restoration and connection to the flood plain to mimic natural stream conditions and provide a nutrient and sediment reduction.	Linear feet		500	500	$400,000 Complete pilot projects totaling 500 lf @ $800/lf (AA Co. data) Encourage SHA to use for "Flume" repair, formally ID sites and estimate linear miles/feet. (Prior analysis estimated at least 30 sites with significant erosion issues due to runoff from State-owned roads.)	☐	☑
Urban Stormwater	Regenerative Stormwater Conveyance	Consider adoption of regulations similar to AA County for use of Step Pool Conveyance Systems for SWM	Program change			1		☐	☑
Urban Stormwater	Street Sweeping	County Urban Roads: 1076 acres in DD roads—assume urban sections and 10% sweeping monthly ($754/acre annual cost)	acres	20 (estimated)	180	180	$135,720 FY 2012-13 ($814,320 over 6 years)	☐	☐
Urban Stormwater	Street Sweeping	County Rural Roads: County roads with curb and gutter estimated 198 miles @ avg. 30'wide pavement swept monthly @ $450/ac /year	acres	0	0	0		☐	☐

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Natural Filters on Public and Private Land	Use currently collected fees and fines collected to fund natural filters on public or Private land	Programmatic decision: Policy decision and Program development is needed regarding use of locally collected* mitigation fees, environmental fines and fees-in-lieu funds : 1) Continue use of funds** for land conservation to protect existing forest (Strategy limits forest loss but provides no new nutrient reduction toward meeting WIP goal) 2) Establish and promote new formal rural residential and urban tree canopy programs OR forest mitigation banks with a goal to convert 10% of existing turf or fallow land to forest cover. (Strategy increases forest cover and provides new nutrient reduction toward meeting WIP goal) 3) Establish mitigation bank for targeted habitat and forest restoration (Strategy increases forest cover and provides new nutrient reduction toward meeting WIP goal) * $35,000 is the average annual amount collected via existing local programs: FCA, CA, & FIDS mitigation and fee–in-lieu funds ** All available FCA funds used for land conservation in FY12 Other funding sources include Maryland's Ecosystem Enhancement Program, Program Chesapeake and Atlantic Coastal Bays 2010 Trust Fund, Transportation Enhancement Program and Corporate Wetlands Restoration Partnership and county planting funds.	Program Change		1		TBD		

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Natural Filters on Public and Private Land	Streamside Forest Buffers	Strengthen regulations to prioritize planting of stream and waterway buffers.	Program Change					☐	☑
Natural Filters on Public and Private Land	Rural Residential Tree Planting and Urban Tree Canopy: Increase rural residential tree planting and encourage forest establishment on homeowner association property including conversion of turf grass to tree covers.	Seek willing landowners to accept trees planting on private lands using available fees-in-lieu and mitigation payments received from FCA and CA permits. Est. $3,500/ acre total project cost	Acres	35	168	240	$840,000	☐	☑
Natural Filters on Public and Private Land	Wetland Restoration	Utilize wetland mitigation funding generated by development activity in targeted areas Est. $8,000/ acre total project cost	acres			10	$80,000	☑	☑
Natural Filters on Public and Private Land	Streamside Forest Buffers	Plant forest vegetation next to waterways to filter and take up nutrients coming off the land, stabilize the soil and provide wildlife habitat. Improve effectiveness of existing planting programs by first contacting land owners identified through the DNR Riparian Buffers gap analysis: 1,859 ac. of un-forested 100' stream buffer 2,361 ac. of un-forested 100' shoreline buffer Est. $3,500/ acre total project cost	acres			10	$35,000	☑	☑

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OTHER	Equine facilities	Manure Composting for horses other livestock: Develop a central compost facility to receive and process compost and distribute finished product	facility		1			☐	☐
OTHER	Hot spots	To be addressed as part of the future NPDES program: scrap yards, gas stations and motor vehicle service facilities, carwash facilities, fleet maintenance facilities					Regulator enhancements to require necessary nutrient, sediment and pollutant controls.	☐	☑
OTHER	Deicing: Urea does not harm aircraft or alter stream salinity like salt does but it does contribute significant nitrogen loads to streams. Calcium Magnesium Acetate (CMA) has been approved as an airport runway de-icer by the FAA and has fewer environmental impacts than salt or urea.	Patuxent River NAS Webster Field Duke Airport At present, CMA is produced from petroleum-derived acetic acid at a market price of about $700 per ton. Chloride road salts are available for $20-40/ton and material cost for urea is around $100/ton. The cost of CMA seems high compared to traditional deicers. However, when the effects of chloride salts are considered, e.g., damage to highways, bridges, concrete structures, vehicles, roadside vegetation, ground water contamination and other environmental effects with a cost range from $1000 to 2000/ton of salt. Urea has high side effect costs for the installation of BMPs to offset the nutrient inputs to waterways. In this light, the price of CMA becomes more reasonable.	Acres	639		639	639 acres =27,834,840 s.f. @ 5 lbs/1000 s.f.=139174 lbs. = 69 tons of CMA or rock salt required per application x 10 applications per year $487,109 for CMA with no side effect costs	☐	☐