DC9510 BMP/LID

Address:	7630 Telegraph Road
Location:	Hayfield Secondary School
Land Owner:	County - FCPS
PIN:	0914 01 0028
Control Type	Water Quality
Drainage Area	8.58 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Hayfield Secondary School parking lot runoff would be treated by installing bioretention filters and basins in the medians and adjacent grassy areas. The facilities would be installed by grading the low open area downstream side of each parking lot which will treat the runoff for pollutants like nitrogen, phosphorus and total suspended solids.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Bioretention filters and basins remove oil and grease, heavy metals, nutrients including phosphorus and nitrogen, and suspended solids from storm water runoff. It is estimated that a total of 720 lbs of sediment, 3.8 lbs of nitrogen and 1.6 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff. Since this site is located on school grounds, the need for land purchase or acquisition is eliminated while providing an environmental education/stewardship opportunity for students and parents within the community.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Signs promoting environmental education/stewardship could be used at this site to educate students and parents in the community. Access to the proposed sites is excellent from the school parking lots.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Bioretention Filters & Basin	650	SY	$150.00	$97,500
			Initial Project Cost	**$97,500**
Plantings	1	LS	5% of project (excluding pervious pavement)	$4,875
Ancillary Items	1	LS	5% of project	$4,875
Erosion and Sediment Control	1	LS	10% of project	$9,750
			Base Construction Cost	**$117,000**
			Mobilization (5%)	$5,850
			Subtotal 1	**$122,850**
			Contingency (25%)	$30,713
			Subtotal 2	**$153,563**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$69,103
			Estimated Project Cost	**$223,000**

DC9510_1.jpg: Parking lot area at Hayfield Secondary School

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DC9511 BMP/LID

Address:	Hayfield Rd and Telegraph Rd
Location:	Hayfield Plaza parking lot
Land Owner:	Private - Commercial
PIN:	0914 01 0031
Control Type	Water Quality
Drainage Area	5.22 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: The project proposes implementation of bioretention areas to receive parking lot runoff at Hayfield Plaza. The southern grassy area of the parking lot can be graded to create bioretention areas. The runoff from the parking lot will primarily be treated to reduce nitrogen, phosphorus and total suspended solids.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Implementation of bioretention filters and basins will provide water quality treatment for this parking lot during storm events. It is estimated that a total of 1,000 lbs of sediment, 12.8 lbs of nitrogen and 2.0 lbs of phosphorus would be reduced annually by this project. These facilities remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Access to the proposed sites is excellent from roads and the commercial parking lot. Property ownership is most likely private and coordination with the shopping center owner/management will be necessary for these sites. A temporary or permanent loss of parking spaces can be expected with these sites.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Bioretention Filters & Basin	666	SY	$150.00	$99,900
			Initial Project Cost	**$99,900**
Plantings	1	LS	5% of project (excluding pervious pavement)	$4,995
Ancillary Items	1	LS	5% of project	$4,995
Erosion and Sediment Control	1	LS	10% of project	$9,990
			Base Construction Cost	**$119,880**
			Mobilization (5%)	$5,994
			Subtotal 1	**$125,874**
			Contingency (25%)	$31,469
			Subtotal 2	**$157,343**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$70,804
			Estimated Project Cost	**$228,000**

DC9511_1.jpg: Parking lot area at Hayfield Plaza

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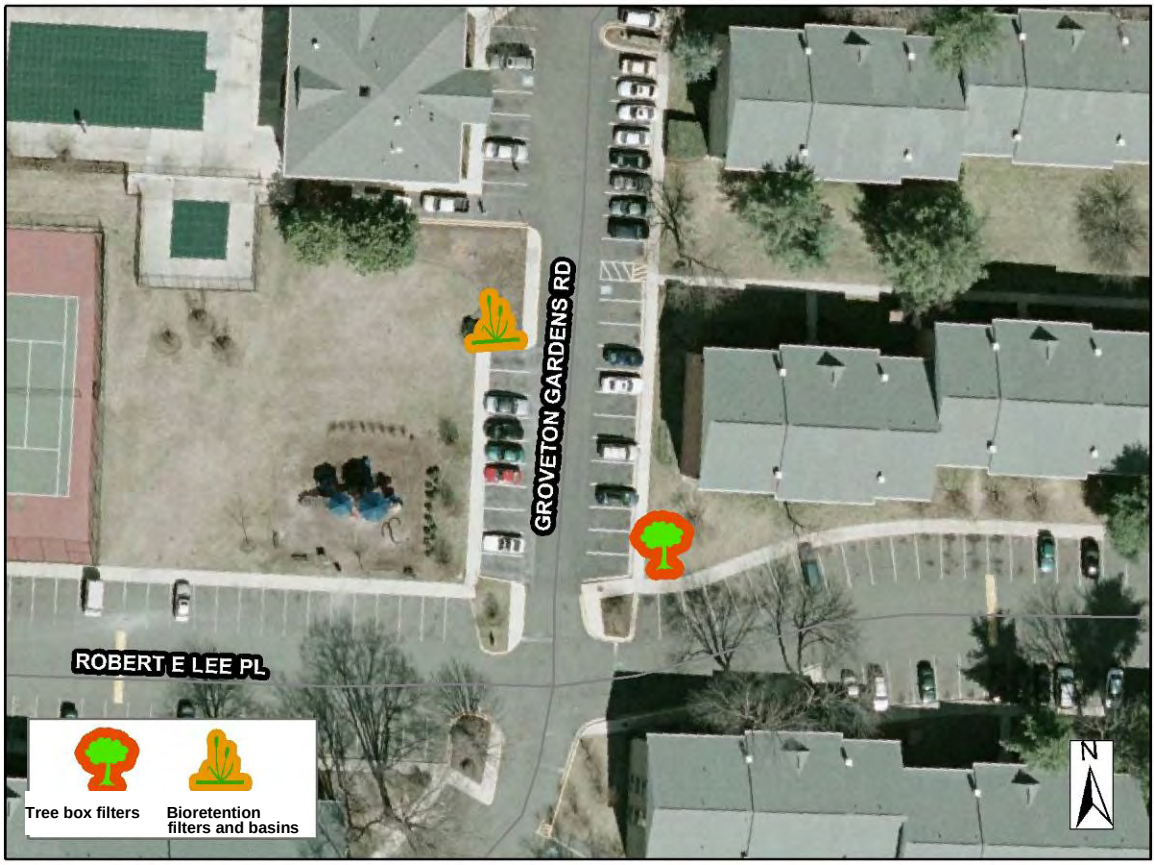
DC9512 BMP/LID

Address:	7140 Block, Groveton Gardens Rd
Location:	Parking lots
Land Owner:	Private
PIN:	0924 01 0013
Control Type	Water Quality
Drainage Area	0.43 acres
Receiving Waters	Unknown tributary of Barnyard Run

Description: This project proposes installation of tree box filters and creation of bioretention areas to receive the runoff from parking lots at Groveton Gardens. One existing storm drain inlet will be retrofitted with a filter and low open area adjacent to the parking lot will be graded to create a bioretention area. The runoff from the parking lot will be treated to reduce nitrogen, phosphorus and total suspended solids..



Project Area Map: Conceptual plan showing potential project location

Project Benefits: Tree box filters and bioretention filters and basins remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. It is estimated that a total of 223 lbs of sediment, 2.6 lbs of nitrogen and 0.5 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Access to the proposed sites is excellent in the residential parking lots; however, property ownership is private and coordination with the owners/management will be necessary. A temporary or permanent loss of parking spaces can be expected with these sites.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	1	EA	$10,000.00	$10,000
Bioretention Filters & Basin	32	SY	$150.00	$4,800
			Initial Project Cost	**$14,800**
Plantings	1	LS	5% of project (excluding pervious pavement)	$740
Ancillary Items	1	LS	5% of project	$740
Erosion and Sediment Control	1	LS	10% of project	$1,480
			Base Construction Cost	**$17,760**
			Mobilization (5%)	$888
			Subtotal 1	**$18,648**
			Contingency (25%)	$4,662
			Subtotal 2	**$23,310**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$10,490
			Estimated Project Cost	**$34,000**

DC9512_1.jpg: View of the parking lot

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DC9513 BMP/LID

Address:	6900 Harrison Lane
Location:	Groveton Elementary School
Land Owner:	County - FCPS
PIN:	0922 01 0008
Control Type	Water Quality
Drainage Area	0.65 acres
Receiving Waters	Unknown tributary of Barnyard Run

Description: A tree box filter and bioretention filters and basins are proposed in the Groveton Elementary School parking lot to treat stormwater runoff. Field assessment showed that this parking lot was currently treated for quantity control. A bioretention area will be created in the open space south of the parking lot and one tree box filter will be installed at the existing inlet for quality control. The runoff from the parking lot will be treated to reduce nitrogen, phosphorus and total suspended solids.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Tree box filters and bioretention filters and basins remove oil and grease, heavy metals, nutrients including phosphorus and nitrogen, and suspended solids from storm water runoff. It is estimated that a total of 368 lbs of sediment, 6.5 lbs of nitrogen and 1.2 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff. Since this site is located on school grounds, the need for land purchase or acquisition is eliminated while providing an environmental education/stewardship opportunity for students and parents within the Dogue Creek Watershed community.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Signs promoting environmental education/stewardship could be used at this site to educate students and parents in the community. Access to the proposed sites is excellent from the school parking lot.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	1	EA	$10,000.00	$10,000
Bioretention Filters & Basin	65	SY	$150.00	$9,750
			Initial Project Cost	**$19,750**
Plantings	1	LS	5% of project (excluding pervious pavement)	$988
Ancillary Items	1	LS	5% of project	$988
Erosion and Sediment Control	1	LS	10% of project	$1,975
			Base Construction Cost	**$23,701**
			Mobilization (5%)	$1,185
			Subtotal 1	**$24,886**
			Contingency (25%)	$6,222
			Subtotal 2	**$31,108**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$13,999
			Estimated Project Cost	**$45,000**

DC9513_1.jpg: View of the parking lot

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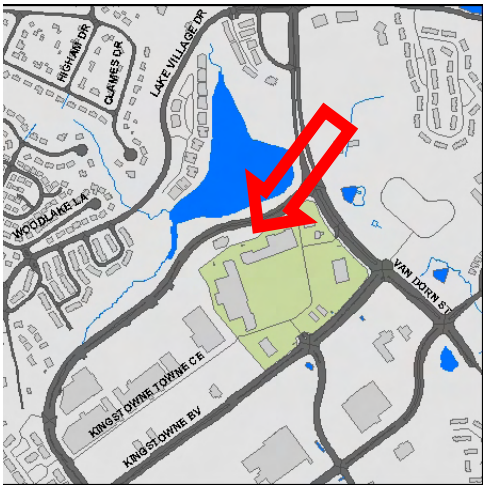
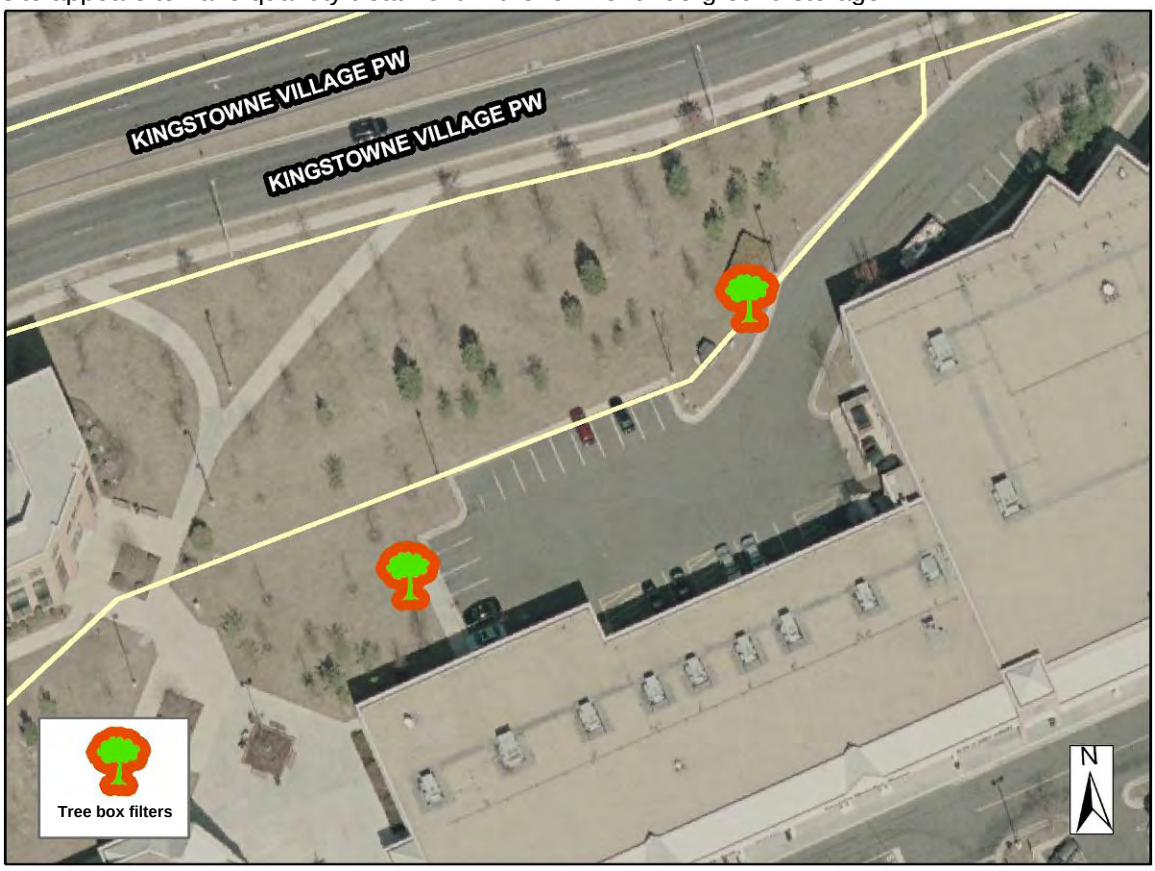
DC9518 BMP/LID



Address:	580 Block, Kingstowne Center
Location:	Kingstowne Village
Land Owner:	Private - Commercial
PIN:	0912 01 0032A
Control Type	Water Quality
Drainage Area	0.58 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Installation of tree box filters are proposed to provide water quality treatement for runoff from the parking lot behind the commercial strip mall located along Kingstowne Village Parkway. Currently, the site appears to have quantity treatment in the form of underground storage.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: Tree box filters remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. It is estimated that a total of 572 lbs of sediment, 3.3 lbs of nitrogen and 0.8 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Access to the proposed sites is excellent from the parking lot; however, the property ownership is private and coordination with the owners/management will be necessary. Modifications to the existing storm drain system may be necessary to drain these proposed sites.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	2	EA	$10,000.00	$20,000
			Initial Project Cost	**$20,000**
Plantings	1	LS	5% of project (excluding pervious pavement)	$1,000
Ancillary Items	1	LS	5% of project	$1,000
Erosion and Sediment Control	1	LS	10% of project	$2,000
			Base Construction Cost	**$24,000**
			Mobilization (5%)	$1,200
			Subtotal 1	**$25,200**
			Contingency (25%)	$6,300
			Subtotal 2	**$31,500**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$14,175
			Estimated Project Cost	**$46,000**

DC9518_1.jpg: Parking lot area at Kingstowne Village

DC9518_2.jpg: Existing inlet in parking lot

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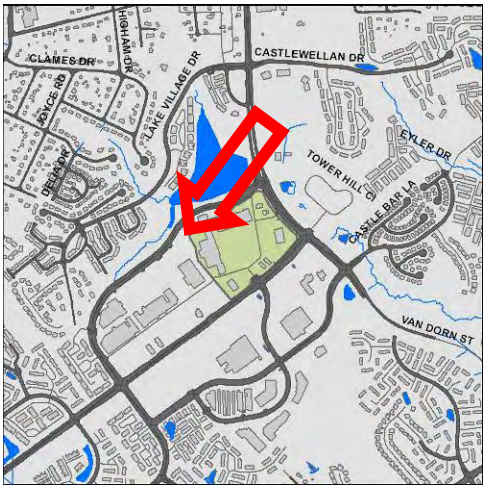
DC9519 BMP/LID



Address:	580 Block, Kingstowne Center
Location:	Kingstowne Village
Land Owner:	Private - Commercial
PIN:	0912 01 0032A
Control Type	Water Quality
Drainage Area	1.44 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Installation of bioretention filters and basins and tree box filters are proposed to treat runoff from the driveways and parking lots behind the commercial strip mall located between Kingstowne Boulevard and Kingstowne Village Parkway. The open area between the parking lots will be used for bioretention and one existing inlet will be retrofitted with a tree box filter.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Tree box filters and bioretention filters and basins remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. It is estimated that a total of 1,160 lbs of sediment, 4.8 lbs of nitrogen and 1.3 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Access to the proposed sites is excellent from driveways and parking lots; however, the property ownership is private and coordination with the owners/management will be necessary.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	1	EA	$10,000.00	$10,000
Bioretention Filters & Basin	104	SY	$150.00	$15,600
			Initial Project Cost	**$25,600**
Plantings	1	LS	5% of project (excluding pervious pavement)	$1,280
Ancillary Items	1	LS	5% of project	$1,280
Erosion and Sediment Control	1	LS	10% of project	$2,560
			Base Construction Cost	**$30,720**
			Mobilization (5%)	$1,536
			Subtotal 1	**$32,256**
			Contingency (25%)	$8,064
			Subtotal 2	**$40,320**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$18,144
			Estimated Project Cost	**$58,000**

DC9519_1.jpg: View of parking lot

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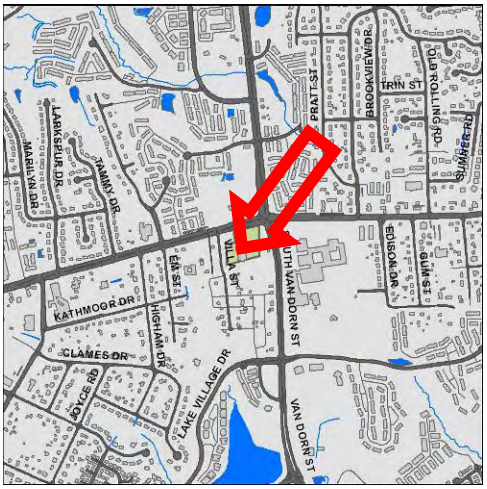
DC9520 BMP/LID



Address:	5900 Block, Franconia Road
Location:	Church of Jesus Christ of Latter Day Saints
Land Owner:	Private - Church
PIN:	0814 03 0006A
Control Type	Water Quality
Drainage Area	4.21 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Installation of bioretention filters and basins and tree box filters are proposed to treat runoff from the parking lot surrounding the church along Villa Street. Tree box filters can be added near the church building. Parking lot islands as well as adjacent grassy areas could be modified for bioretention filters and basins. The primary indicators are pollutants nitrogen, phosphorus and total suspended solids.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Bioretention filters and basins and tree box filters remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. It is estimated that a total of 556 lbs of sediment, 6.9 lbs of nitrogen and 1.4 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff. Since this site is located on church grounds, an environmental education/stewardship opportunity for residents within the community exists.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Signs promoting environmental education/stewardship could be used at this site to educate residents in the community. Minimal tree removal may be required for the proposed island sites. Access to the proposed sites is excellent from the church parking lot; however, the property ownership is private and coordination with the church will be necessary. Modifications to the existing storm drain system may be necessary to drain these proposed sites. A temporary or permanent loss of parking spaces may occur.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	2	EA	$10,000.00	$20,000
Bioretention Filters & Basin	343	SY	$150.00	$51,450
			Initial Project Cost	**$71,450**
Plantings	1	LS	5% of project (excluding pervious pavement)	$3,573
Ancillary Items	1	LS	5% of project	$3,573
Erosion and Sediment Control	1	LS	10% of project	$7,145
			Base Construction Cost	**$85,741**
			Mobilization (5%)	$4,287
			Subtotal 1	**$90,028**
			Contingency (25%)	$22,507
			Subtotal 2	**$112,535**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$50,641
			Estimated Project Cost	**$163,000**

DC9520_1.jpg: View of parking lot

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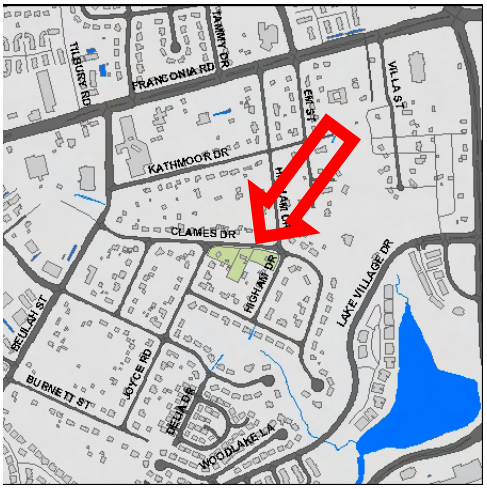
DC9522 BMP/LID



Address:	6000 Block, Clames Drive
Location:	Clames Drive
Land Owner:	State – VDOT
PIN:	NA
Control Type	Water Quality
Drainage Area	0.72 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Installation of vegetated swales is proposed to treat road and residential runoff along Clames Drive and Higham Drive. The right-of-way along Clames Drive appears to have enough room for placement of the proposed projects. Coordination with existing driveway culverts and property owners will be needed.

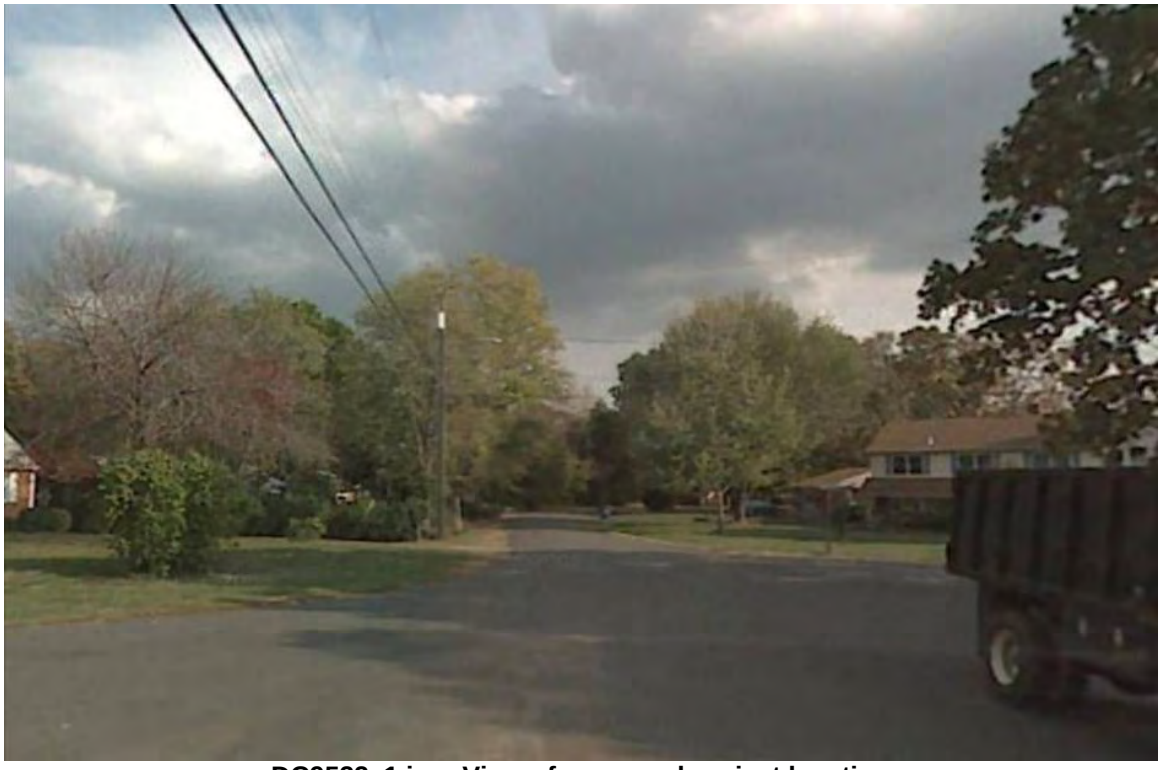
Project Area Map: Conceptual plan showing potential project location

Project Benefits: These vegetated swales will trap suspended solids, reduce trace metals and uptake nutrients including phosphorus and nitrogen from storm water runoff. It is estimated that a total of 327 lbs of sediment, 4.0 lbs of nitrogen and 0.8 lbs of phosphorus would be reduced annually by this project. Vegetated swales also promote infiltration and can reduce the flow velocity of storm water runoff.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. No tree removal is required for this site. Access to the proposed site is good from Clames Drive; however, private driveways and landowners will need to be coordinated with. Current driveway culverts may impact the design of these swales.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale	180	SY	$50.00	$9,000
			Initial Project Cost	**$9,000**
Plantings	1	LS	5% of project (excluding pervious pavement)	$450
Ancillary Items	1	LS	5% of project	$450
Erosion and Sediment Control	1	LS	10% of project	$900
			Base Construction Cost	**$10,800**
			Mobilization (5%)	$540
			Subtotal 1	**$11,340**
			Contingency (25%)	$2,835
			Subtotal 2	**$14,175**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$6,379
			Estimated Project Cost	**$21,000**



DC9522_1.jpg: View of proposed project location

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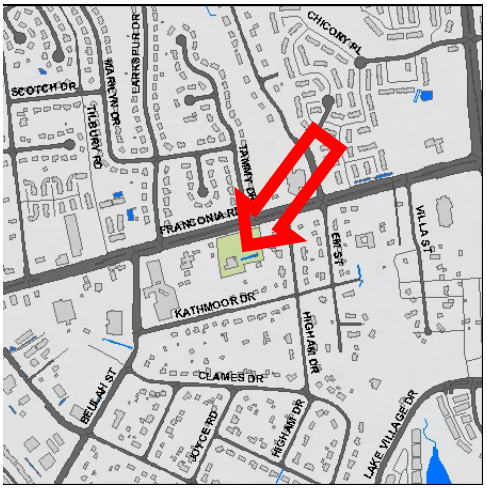
DC9523 BMP/LID



Address:	6021 Franconia Road
Location:	Virginia Presbyterian Church
Land Owner:	Private - Church
PIN:	0814 02 0005A
Control Type	Water Quality
Drainage Area	1.24 acres
Receiving Waters	Unknown tributary of Dogue Creek

Description: Bioretention filters and basins and rooftop disconnection are proposed to treat Virginia Presbyterian Church runoff before the runoff enters an existing dry pond located on the east side of the property. In particular, the drains located on the west side of the church could be disconnected and allowed to drain onto open area for filtration and bioretention filters and basins could be placed at the edge of the parking lot to treat water before entering the dry pond.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: Bioretention filters and basins remove suspended solids, heavy metals, nutrients including phosphorus and nitrogen, oil and grease from storm water runoff. It is estimated that a total of 327 lbs of sediment, 3.5 lbs of nitrogen and 0.7 lbs of phosphorus would be reduced annually by this project. They also prevent trash and debris from entering the storm drain system and have the ability to cool down warm runoff. Since this site is located on church grounds, an environmental education/stewardship opportunity for residents within the community exists.

Project Design Considerations: No environmental constraints or permitting issues are anticipated. Signs promoting environmental education/stewardship could be used at this site to educate residents in the community. No tree removal is required. Access to the proposed sites is excellent from the church parking lot; however, the property ownership is private and coordination with the church will be necessary.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Bioretention Filters & Basin	140	SY	$150.00	$21,000
			Initial Project Cost	**$21,000**
Plantings	1	LS	5% of project (excluding pervious pavement)	$1,050
Ancillary Items	1	LS	5% of project	$1,050
Erosion and Sediment Control	1	LS	10% of project	$2,100
			Base Construction Cost	**$25,200**
			Mobilization (5%)	$1,260
			Subtotal 1	**$26,460**
			Contingency (25%)	$6,615
			Subtotal 2	**$33,075**
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$14,884
			Estimated Project Cost	**$48,000**

DC9523_1.jpg: View of proposed bioretention site

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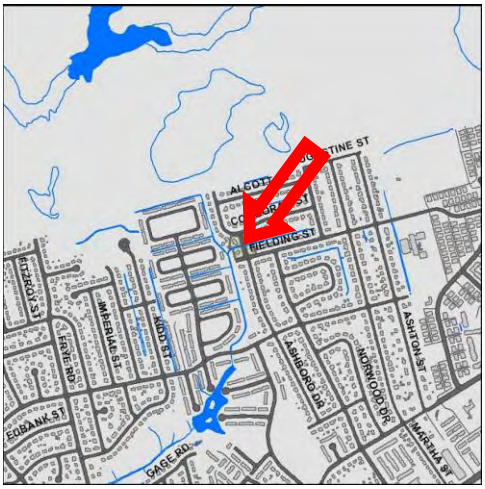
DC9600 Flood Protection/Mitigation



Address:	7918 to 7921 Ashboro Drive
Location:	Culvert under Ashboro Drive
Land Owner:	State - VDOT
PIN:	
Control Type	Peak flow control
Drainage Area	
Receiving Waters	Unknown Tributary of Dogue Creek

Description: The crossing at Ashboro Drive overtops and several upstream buildings are within the modeled 100-year flood limit. Reconstruction of the culvert to allow 100-yr event flows will reduce the backwater effects. The primary indicators are number of flooded buildings and the magnitude of the road hazard.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: The reconstruction of the structure under Ashboro Dr. will be able to convey the 100-year storm reducing the modeled overtopping at this location.

Project Design Considerations: The concrete channel under the crossing needs maintenance as the banks are overgrowing into the channel. Small widening of the structure is required which involves tearing down the existing box culvert. No other projects are located within the immediate vicinity. Homes in the vicinity are located close to the project area, therefore specific care should be taken to reduce impacts to private property. The project site can be accessed from Ashboro Dr.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Excavation	2100	CY	$30.00	$63,000
Stabilization graded base	600	CY	$50.00	$30,000
Structure (3 x 100 ft 4.5 CMP)	1	LS	$100,000.00	$100,000
Graded Base	560	SY	$15.00	$8,400
Curb and gutter	200	LF	$30.00	$6,000
Turfgrass establishment	480	SY	$3.00	$1,440
Placing topsoil	480	SY	$5.00	$2,400
Soil Stabilization matting	480	SY	$5.00	$2,400
			Initial Project Cost	**$213,640**
Plantings	1	LS	5% of project	$10,682
Ancillary Items	1	LS	5% of project	$10,682
Erosion and Sediment Control	1	LS	10% of project	$21,364
			Base Construction Cost	**$256,368**
			Mobilization (5%)	$12,818
			Subtotal 1	$269,186
			Contingency (25%)	$67,297
			Subtotal 2	$336,483
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$151,417
			Estimated Project Cost	**$488,000**

DC9600_1.jpg: View of existing culvert under Ashboro Dr

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