

AC9300 – Area-Wide Drainage Improvement



Address:	Various
Location:	Pohick Estates neighborhood
Land Owner:	Private-Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	74 acres
Receiving Waters	Unknown Tributary of Accotink Creek

Description: Subwatershed AC-AC-0080 is a medium density residential area with no stormwater management. Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Pohick Estates neighborhood by installing tree box filters at curb inlets and rain gardens at yard inlets.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, uptake by vegetation, and infiltration. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced, thus improving in-stream habitat. It is estimated that 5,034 lbs of sediment, 14 lbs of nitrogen and eight lbs of phosphorus would be reduced each year by this project. There may also be some improvement in the peak flow attenuation due to increased infiltration.

Project Design Considerations: Environmental constraints, if any, will be small as the disturbance will only be in the immediate vicinity of the project. Rain gardens would require utility research to ensure there are no conflicts. Some modification of the storm drain system may be required. Projects located on private property need to be coordinated with and approved by the property owner.

Costs:

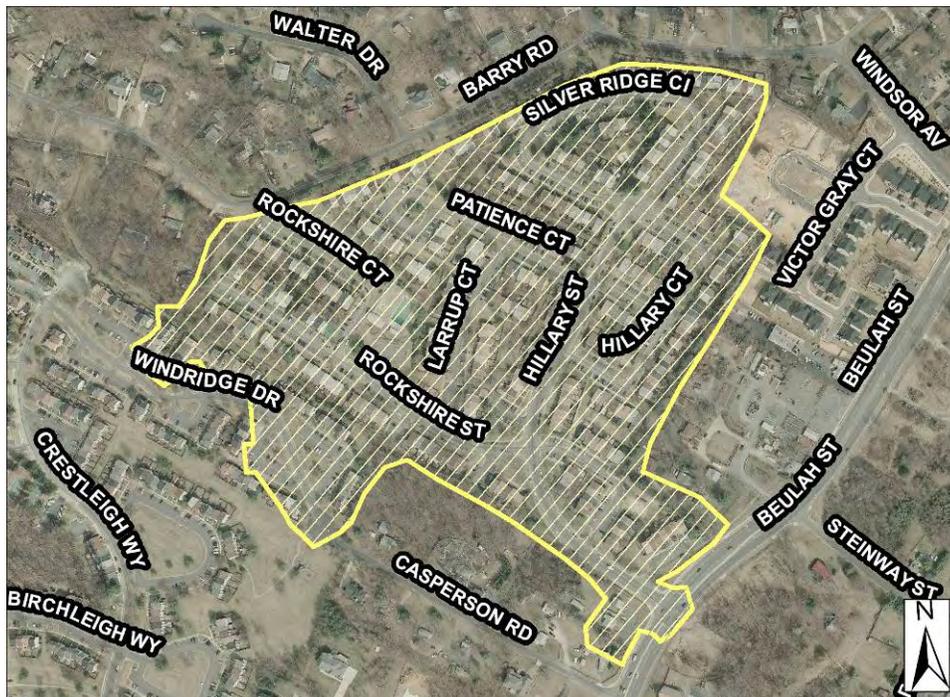
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	32	EA	\$10,000.00	\$320,000
Rain Garden	595	SY	\$50.00	\$29,750
			Initial Project Cost	\$349,750
Plantings	1	LS	5% of project	\$17,488
Ancillary Items	1	LS	5% of project	\$17,488
Erosion and Sediment Control	1	LS	10% of project	\$34,975
			Base Construction Cost	\$419,701
			Mobilization (5%)	\$20,985
			Subtotal 1	\$440,686
			Contingency (25%)	\$110,172
			Subtotal 2	\$550,858
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$247,886
			Estimated Project Cost	\$799,000

AC9301 – Area-Wide Drainage Improvement



Address:	Various
Location:	Windsor Park
Land Owner:	Private–Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	46 acres
Receiving Waters	Unknown Tributary of Long Branch South

Description: AC-LA-0055 is a high density residential area which was developed without stormwater management. The water quality downstream of this subwatershed is impaired with few opportunities for treatment. This area-wide improvement would treat the runoff in the Windsor Park neighborhood before it enters the conveyance system, with installation of tree box filters and rain gardens at storm drain inlets.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration, and uptake from vegetation. It is estimated that 7,578 lbs of sediment, 89 lbs of nitrogen and 18 lbs of phosphorus would be reduced each year by this project. There will also be some improvement in the peak flow attenuation due to attenuation through filter media and increased infiltration.

Project Design Considerations: Environmental constraints will be minimal as the disturbance will only be in the immediate vicinity of the project. Installation of rain gardens will require utility research to ensure there are no conflicts. Some modification of the storm drain system may be required. Projects located on private property need to be coordinated with and approved by the property owner.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	42	EA	\$10,000.00	\$420,000
Rain Garden	702	SY	\$50.00	\$35,100
			Initial Project Cost	\$455,100
Plantings	1	LS	5% of project	\$22,755
Ancillary Items	1	LS	5% of project	\$22,755
Erosion and Sediment Control	1	LS	10% of project	\$45,510
			Base Construction Cost	\$546,120
			Mobilization (5%)	\$27,306
			Subtotal 1	\$573,426
			Contingency (25%)	\$143,357
			Subtotal 2	\$716,783
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$322,552
			Estimated Project Cost	\$1,040,000

AC9302 Area-Wide Drainage Improvement



Address:	Various
Location:	Ravenworth neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	35 acres
Receiving Waters	Unknown tributary of Lake Accotink

Description: Area-wide drainage improvements are recommended to treat the runoff from the large medium-density residential area in the Ravensworth neighborhood by installing tree box filters at various inlets throughout the neighborhood.



Project Area Map

Project Benefits: This project will provide water quality treatment for stormwater runoff through the removal of pollutants and increased infiltration. This will improve instream water quality and instream habitat. It is estimated that project implementation will reduce annual pollutant loads by approximately 2,976 lbs of sediment, 39 lbs of total nitrogen and seven lbs of total phosphorus.

Project Design Considerations: No other projects are recommended in this subwatershed. No environmental constraints are anticipated since the disturbance would be limited to the area immediately around the projects. Projects located on private property need to be coordinated with the property owner.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	32	EA	\$10,000.00	\$320,000
			Initial Project Cost	\$320,000
Plantings	1	LS	5% of project	\$16,000
Ancillary Items	1	LS	5% of project	\$16,000
Erosion and Sediment Control	1	LS	10% of project	\$32,000
			Base Construction Cost	\$384,000
			Mobilization (5%)	\$19,200
			Subtotal 1	\$403,200
			Contingency (25%)	\$100,800
			Subtotal 2	\$504,000
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				\$226,800
			Estimated Project Cost	\$731,000

AC9303 – Area-Wide Drainage Improvement



Address:	Various
Location:	Kings Park neighborhood
Land Owner:	Private–Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	114 acres
Receiving Waters	Unknown Tributary of Accotink Creek

Description: Area-wide drainage improvements are recommended to treat the runoff from the untreated medium-density residential area in the Kings Park subdivision by installing tree box filters at inlets, disconnecting downspouts and installing rain gardens.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration and uptake by vegetation. Nutrients, suspended solids, and other pollutants will be reduced, thus improving in-stream habitat. It is estimated that project implementation will reduce annual pollutant loads by approximately 8,679 lbs of sediment, 116 lbs of nitrogen and 21 lbs of phosphorus. There will also be some improvement in the peak flow attenuation due to the disconnection of impervious surfaces and increased infiltration.

Project Design Considerations: If there are any environmental constraints, they will be limited as the disturbance will only be in the immediate vicinity of the project. Rain gardens would require utility research to ensure there are no conflicts. Some modification of the storm drain system may be required. Projects located on private property need to be coordinated with and approved by the property owner.

Costs:

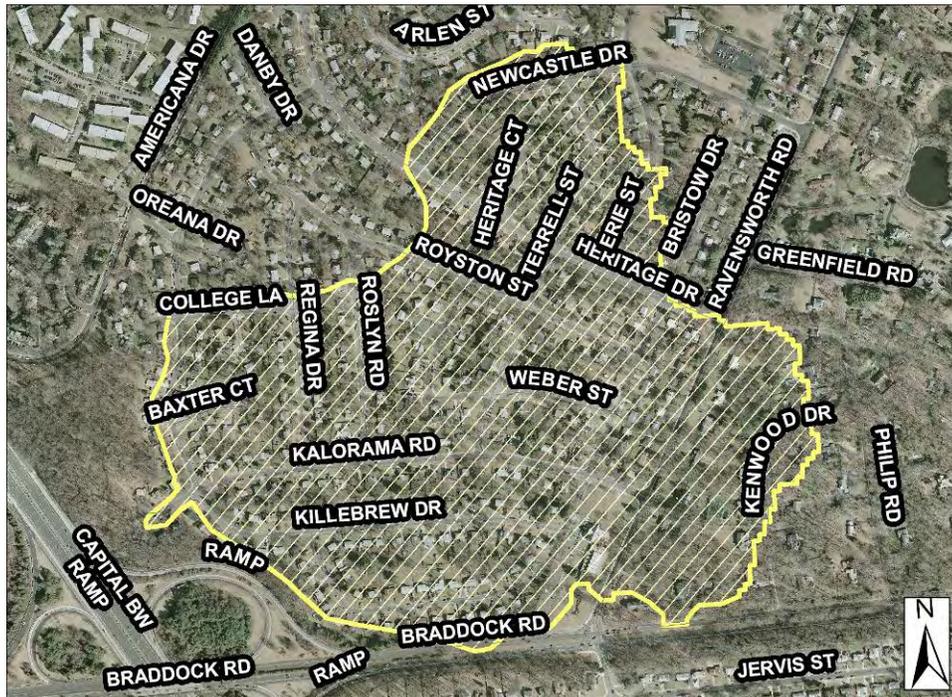
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	59	EA	\$10,000.00	\$590,000
Rain Garden	1117	SY	\$50.00	\$55,850
			Initial Project Cost	\$645,850
Plantings	1	LS	5% of project	\$32,293
Ancillary Items	1	LS	5% of project	\$32,293
Erosion and Sediment Control	1	LS	10% of project	\$64,585
			Base Construction Cost	\$775,021
			Mobilization (5%)	\$38,751
			Subtotal 1	\$813,772
			Contingency (25%)	\$203,443
			Subtotal 2	\$1,017,215
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$457,747
			Estimated Project Cost	\$1,475,000

AC9304 – Area-Wide Drainage Improvement



Address: Various
Location: Ravensworth Park and Bristow neighborhoods
Land Owner: Private - Residential
PIN: Multiple
Control Type: Water Quality
Drainage Area: 139 acres
Receiving Waters: Unknown Tributary of Accotink Creek

Description: There are no existing stormwater management facilities in the subwatershed. Area-wide drainage improvements are recommended to treat the runoff from the medium-density Ravensworth Park and Bristow residential areas through a combination of tree box filters, swales and bioretention filters.



Project Area Map: Conceptual plan showing potential project location

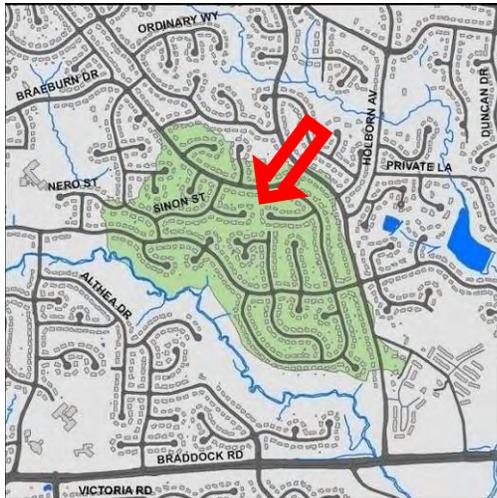
Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration, and uptake by vegetation in all three types of improvements. The amount of nutrients and suspended solids will be reduced within the stream, thus improving in-stream habitat. . It is estimated that project implementation will reduce annual pollutant loads by approximately 10,571 lbs of sediment, 137 lbs of nitrogen and 26 lbs of phosphorus. There will also be some peak flow reduction due to increased infiltration and attenuation.

Project Design Considerations: Environmental constraints will be minimal as the disturbance will only be in the immediate vicinity of the project. Utility research may be required to ensure there are no conflicts. Any project located outside of the right-of-way and on private property will need to be coordinated with and approved by the property owner.

Costs:

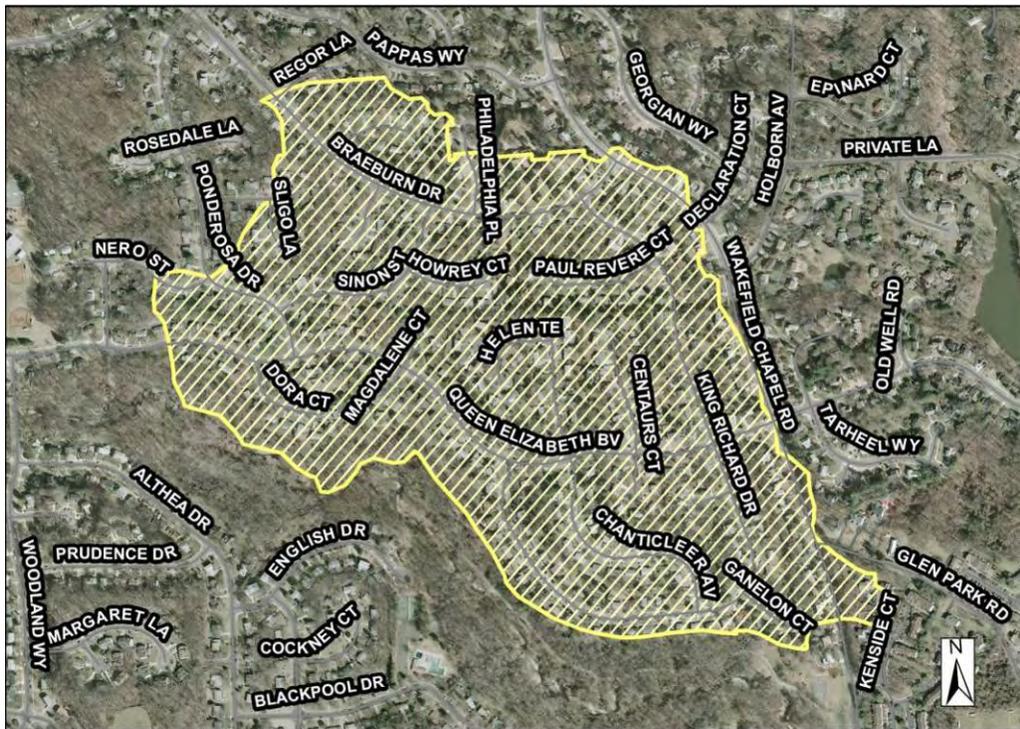
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	67	EA	\$10,000.00	\$670,000
Vegetated Swale	144	SY	\$50.00	\$7,200
Rain Garden	1177	SY	\$50.00	\$58,850
			Initial Project Cost	\$736,050
Plantings	1	LS	5% of project	\$36,803
Ancillary Items	1	LS	5% of project	\$36,803
Erosion and Sediment Control	1	LS	10% of project	\$73,605
			Base Construction Cost	\$883,261
			Mobilization (5%)	\$44,163
			Subtotal 1	\$927,424
			Contingency (25%)	\$231,856
			Subtotal 2	\$1,159,280
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$521,676
			Estimated Project Cost	\$1,681,000

AC9305 Area-Wide Drainage Improvement



Address:	Various
Location:	Canterbury Woods neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	138 acres
Receiving Waters	Unknown tributary of Long Branch Central

Description: The majority of the subwatershed has been developed with medium density residential land use, without stormwater management facilities. The water quality downstream of this subwatershed is impaired with few opportunities for retrofits. This area-wide improvement would treat the stormwater runoff before it enters the conveyance system through installation of tree box filters at curb inlets and rain gardens around yard inlets.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration, and uptake by vegetation. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving instream habitat. It is estimated that project implementation will reduce annual pollutant loads by approximately 10,368 lbs of sediment, 137 lbs of nitrogen and 25 lbs of phosphorus. There will also be a slight improvement in the peak flow attenuation due to increased infiltration.

Project Design Considerations: Environmental constraints will be minimal as the disturbance will only be in the immediate vicinity of the existing storm drain system. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drainage system may be required. Projects located on private property need to be coordinated with the property owner. Easements would be required for rain gardens on private property.

Costs:

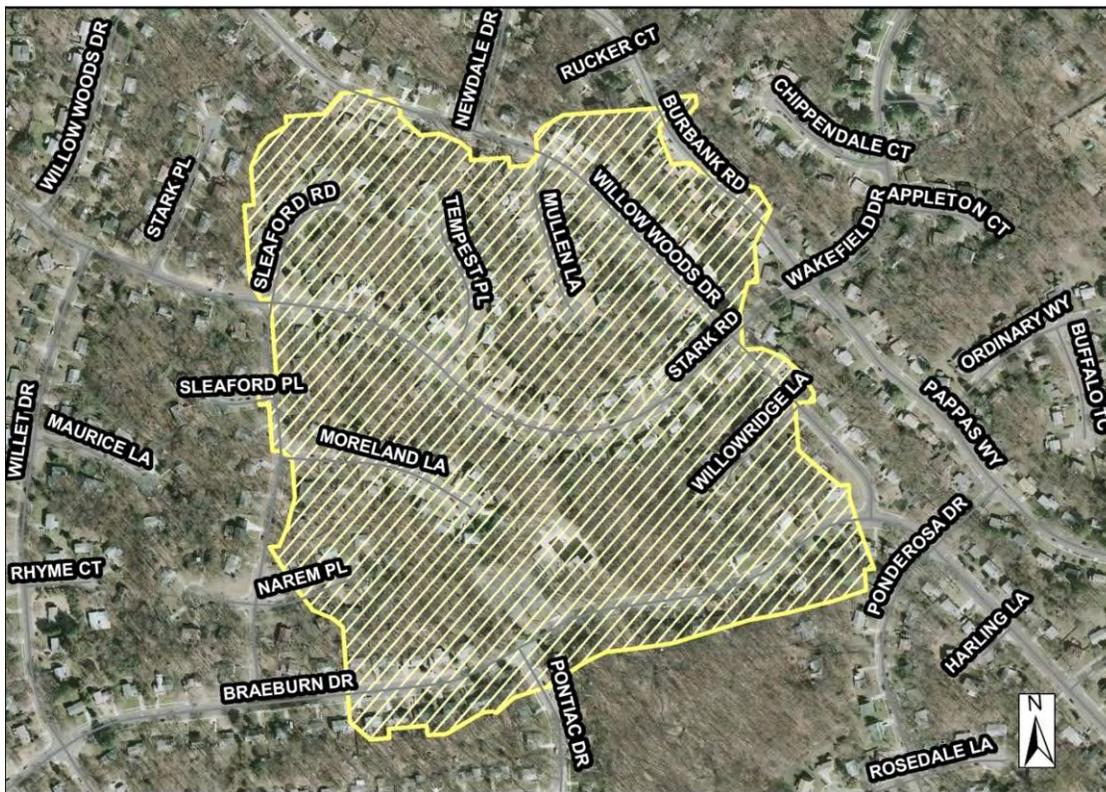
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	65	EA	\$10,000.00	\$650,000
Rain Garden	1415	SY	\$50.00	\$70,750
			Initial Project Cost	\$720,750
Plantings	1	LS	5% of project	\$36,038
Ancillary Items	1	LS	5% of project	\$36,038
Erosion and Sediment Control	1	LS	10% of project	\$72,075
			Base Construction Cost	\$864,901
			Mobilization (5%)	\$43,245
			Subtotal 1	\$908,146
			Contingency (25%)	\$227,037
			Subtotal 2	\$1,135,183
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$510,832
			Estimated Project Cost	\$1,647,000

AC9306 Area-Wide Drainage Improvement



Address: Various
Location: Willow Woods neighborhood
Land Owner: Private - Residential
PIN: Multiple
Control Type: Water Quality
Drainage Area: 64 acres
Receiving Waters: Unknown tributary of Long Branch Central

Description: In this medium density residential neighborhood, there are no stormwater management facilities to treat runoff. Water quality downstream of the area is impaired. This project will treat stormwater before it enters the conveyance system. Rain gardens will be placed around yard inlets and tree box filters will be placed at curb inlets throughout the neighborhood.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff through infiltration, filtration, and uptake by vegetation. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving instream habitat. It is estimated that project implementation will reduce annual pollutant loads by approximately 4,775 lbs of sediment, 64 lbs of nitrogen and 12 lbs of phosphorus. There may also be some improvements in peak flow attenuation due to increased infiltration throughout the subwatershed.

Project Design Considerations: Environmental constraints, if any, are expected to be minor as the disturbance will only be in the immediate vicinity of the existing storm drains. Some sites may require utility research to ensure there are no conflicts or modification of the storm drain system. Projects located on private property need to be coordinated with property owners.

Costs:

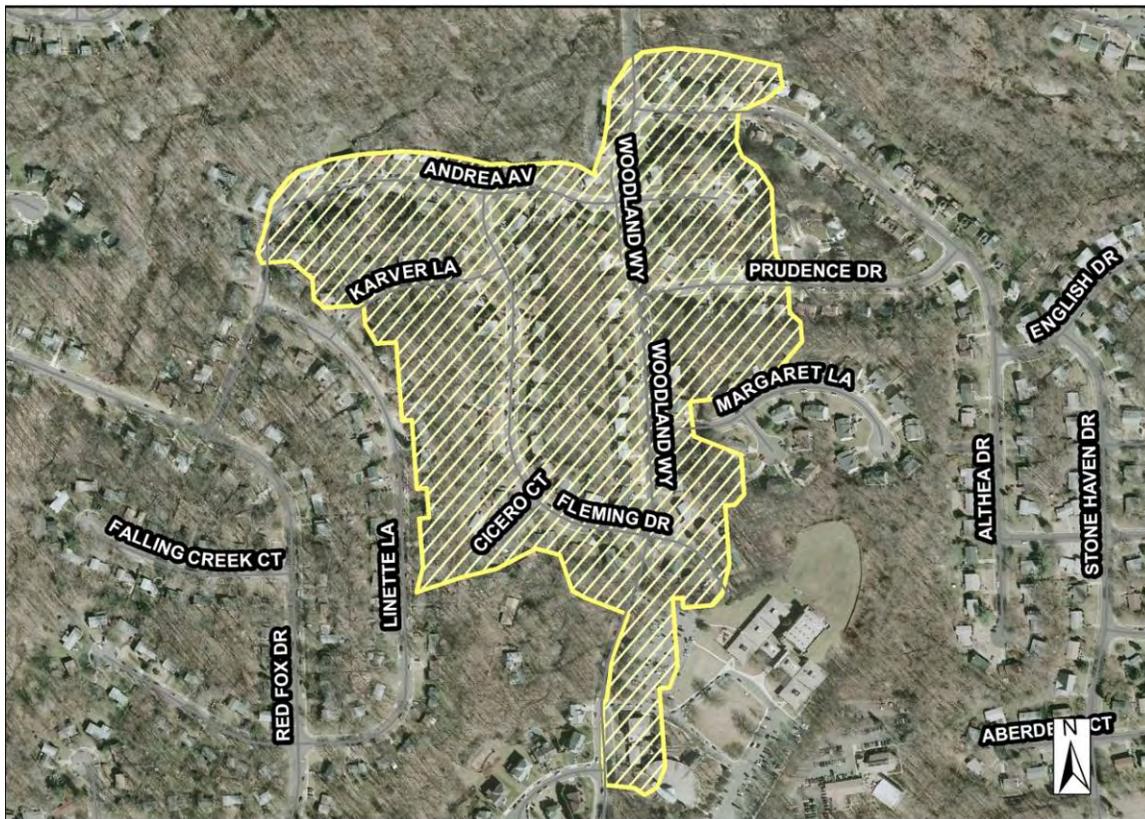
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	30	EA	\$10,000.00	\$300,000
Rain Garden	626	SY	\$50.00	\$31,300
			Initial Project Cost	\$331,300
Plantings	1	LS	5% of project	\$16,565
Ancillary Items	1	LS	5% of project	\$16,565
Erosion and Sediment Control	1	LS	10% of project	\$33,130
			Base Construction Cost	\$397,560
			Mobilization (5%)	\$19,878
			Subtotal 1	\$417,438
			Contingency (25%)	\$104,360
			Subtotal 2	\$521,798
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$234,809
			Estimated Project Cost	\$757,000

AC9307 Area-Wide Drainage Improvement



Address:	Various
Location:	Woodland Forest neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	41 acres
Receiving Waters	Unknown tributary of Long Branch Central

Description: Woodland Forest is a medium density residential neighborhood downstream of instream detention pond 1022DP. This project is located in a headwater subwatershed and would improve the water quality of stormwater runoff before it enters the Long Branch Central tributary. Water quality improvements would consist of tree box filters placed at curb inlets and rain gardens installed adjacent to yard inlets.



Project Area Map

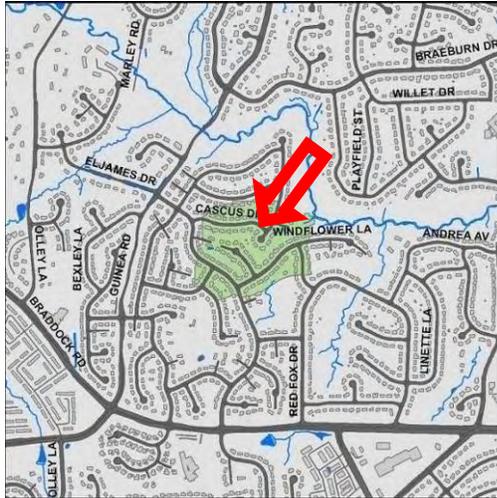
Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration, and uptake by vegetation. It is estimated that project implementation will reduce annual pollutant loads by approximately 3,374 lbs of sediment, 44 lbs of nitrogen and eight lbs of phosphorus. There may also be some improvement in peak flow attenuation due to increased infiltration.

Project Design Considerations: There are no environmental constraints as the disturbance will be limited to the area immediately around the existing storm drains. Projects located on private property need to be coordinated with the property owner. For rain gardens located on private property, an easement will be required for installation and maintenance.

Costs:

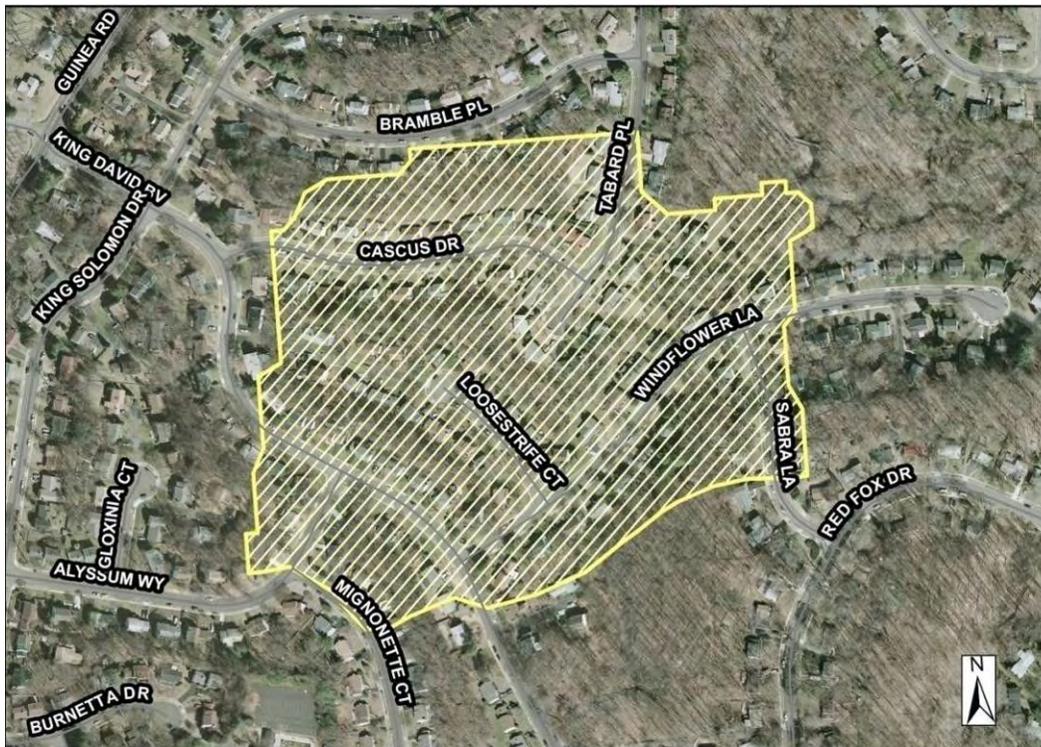
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	20	EA	\$10,000.00	\$200,000
Vegetated Swale	157	SY	\$50.00	\$7,850
Rain Garden	465	SY	\$50.00	\$23,250
			Initial Project Cost	\$231,100
Plantings	1	LS	5% of project	\$11,555
Ancillary Items	1	LS	5% of project	\$11,555
Erosion and Sediment Control	1	LS	10% of project	\$23,110
			Base Construction Cost	\$277,320
			Mobilization (5%)	\$13,866
			Subtotal 1	\$291,186
			Contingency (25%)	\$72,797
			Subtotal 2	\$363,983
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$163,792
			Estimated Project Cost	\$528,000

AC9308 Area-Wide Drainage Improvement



Address:	Various
Location:	Canterbury Woods and Long Branch neighborhoods
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	30 acres
Receiving Waters	Unknown tributary of Long Branch Central

Description: Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Canterbury Woods and Long Branch neighborhoods which do not have any stormwater management facilities. The water quality downstream of this subwatershed is impaired. This area-wide improvement would treat runoff at the source, before it enters the stream. This project involves the installation of tree box filters at curb inlets and rain gardens adjacent to yard inlets.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff through various methods of treatment. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving instream habitat. Project implementation is expected to reduce annual pollutant loads by approximately 3,440 lbs of sediment, 32 lbs of nitrogen and six lbs of phosphorus. There will also be a slight improvement in the peak flow attenuation due to the disconnection of rooftops and increased infiltration.

Project Design Considerations: Environmental constraints will be minor as the disturbance will only be in the immediate vicinity of the existing storm drain system. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drainage system may be required. Projects located on private property need to be coordinated with the property owner.

Costs:

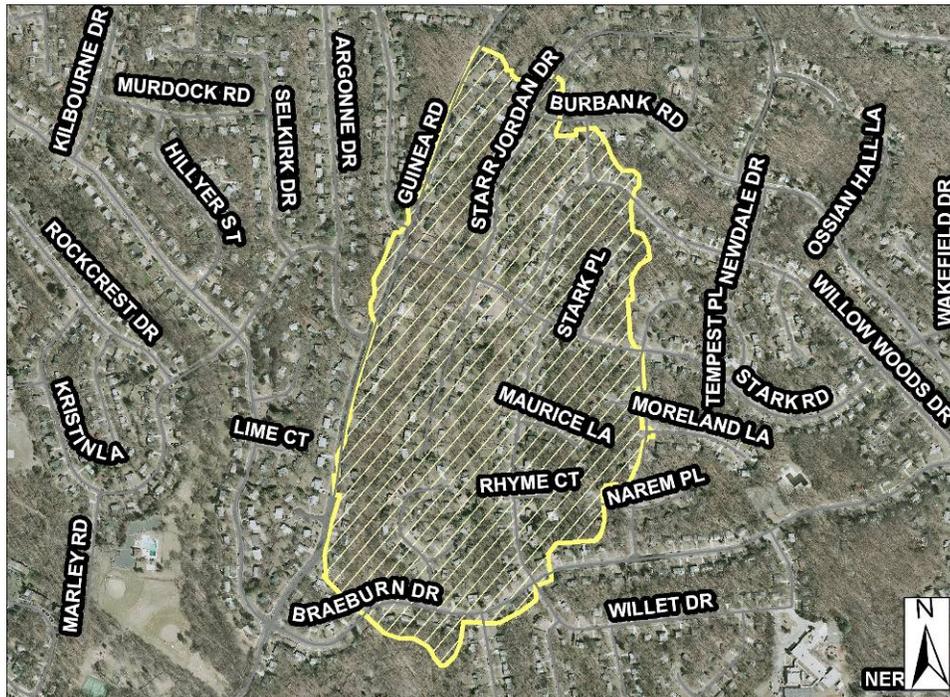
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	14	EA	\$10,000.00	\$140,000
Rain Garden	329	SY	\$50.00	\$16,450
			Initial Project Cost	\$156,450
Plantings	1	LS	5% of project	\$7,823
Ancillary Items	1	LS	5% of project	\$7,823
Erosion and Sediment Control	1	LS	10% of project	\$15,645
			Base Construction Cost	\$187,741
			Mobilization (5%)	\$9,387
			Subtotal 1	\$197,128
			Contingency (25%)	\$49,282
			Subtotal 2	\$246,410
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$110,885
			Estimated Project Cost	\$358,000

AC9309 – Area-Wide Drainage Improvement



Address: Various
Location: Springbook Forest, Willow Woods and Woods of Ilda neighborhoods
Land Owner: Private - Residential
PIN: Multiple
Control Type: Water Quality
Drainage Area: 110 acres
Receiving Waters: Unknown Tributary of Long Branch Central

Description: There are no existing stormwater management facilities in the Springbook Forest, Willow Woods and Woods of Ilda neighborhoods so area-wide drainage improvements are recommended to treat the runoff through installing tree box filters and rain gardens at stormwater inlets.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment of stormwater runoff through various filtration, infiltration, and uptake by vegetation associated with the tree box filters and rain gardens. It is estimated that project implementation will reduce annual pollutant loads by 7,859 lbs of sediment, 106 lbs of nitrogen and 20 lbs of phosphorus, which would help improve in-stream habitat. There may also be some peak flow reduction due to the disconnection of impervious surfaces and increased infiltration.

Project Design Considerations: Environmental constraints will be minimized as the disturbance will only be in the immediate vicinity of the project. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drain system would be required. Any project located outside of the right-of-way and on private property needs to be coordinated with and approved by the property owner.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	45	EA	\$10,000.00	\$450,000
Rain Garden	778	SY	\$50.00	\$38,900
			Initial Project Cost	\$488,900
Plantings	1	LS	5% of project	\$24,445
Ancillary Items	1	LS	5% of project	\$24,445
Erosion and Sediment Control	1	LS	10% of project	\$48,890
			Base Construction Cost	\$586,680
			Mobilization (5%)	\$29,334
			Subtotal 1	\$616,014
			Contingency (25%)	\$154,004
			Subtotal 2	\$770,018
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$346,508
			Estimated Project Cost	\$1,117,000

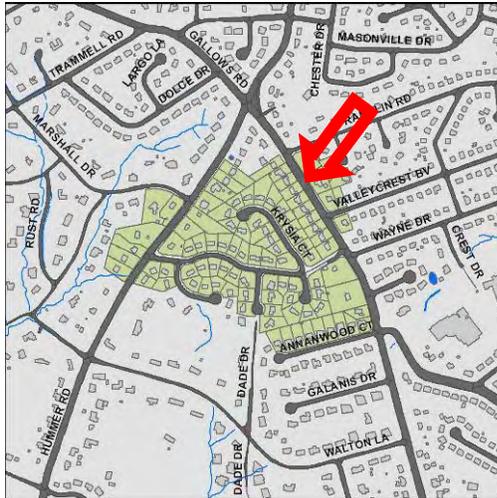
Project Benefits: This project will provide water quality treatment for stormwater runoff through the removal of pollutants and increased infiltration. Project implementation is estimated to reduce annual pollutant loads by approximately 13,774 lbs of sediment, 182 lbs of nitrogen and 34 lbs of phosphorus. This is expected to help improve instream water quality and instream habitat.

Project Design Considerations: No environmental constraints are anticipated as the disturbance would be limited to the area immediately around the projects. Projects located on private property will need to be coordinated with property owners.

Costs:

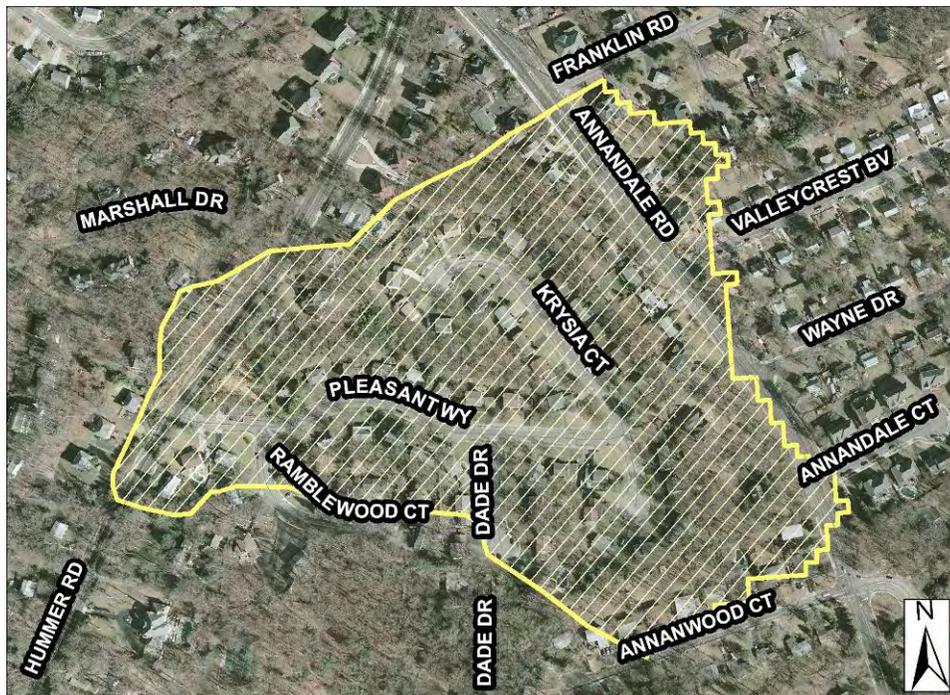
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	74	EA	\$10,000.00	\$740,000
Rain Garden	1705	SY	\$50.00	\$85,250
			Initial Project Cost	\$825,250
Plantings	1	LS	5% of project	\$41,263
Ancillary Items	1	LS	5% of project	\$41,263
Erosion and Sediment Control	1	LS	10% of project	\$82,525
			Base Construction Cost	\$990,301
			Mobilization (5%)	\$49,515
			Subtotal 1	\$1,039,816
			Contingency (25%)	\$259,954
			Subtotal 2	\$1,299,770
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$584,897
			Estimated Project Cost	\$1,885,000

AC9311 – Area-Wide Drainage Improvement



Address:	Various
Location:	Ramblewood neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	33 acres
Receiving Waters	Unknown Tributary of Coon Branch

Description: Area-wide drainage improvements are recommended to treat the runoff from the untreated medium-density areas of the Ramblewood subdivision are recommended here. This area-wide improvement would treat the runoff at the source, before it enters the stream through the installation of tree box filters and rain gardens at storm drain inlets.



Project Area Map: Conceptual plan showing potential project location

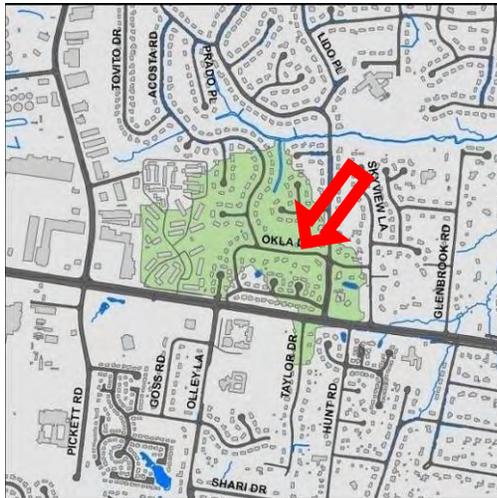
Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration, infiltration, and uptake by vegetation. Nutrients and suspended solids will be reduced within the stream, which will help to improve instream habitat. It is estimated that project implementation will reduce annual pollutant loads by approximately 2,369 lbs of sediment, 33 lbs of nitrogen and six lbs of phosphorus. There will also be some improvement in the peak flow attenuation due increased infiltration.

Project Design Considerations: Environmental constraints, if any, will be limited as the disturbance will only be in the immediate vicinity of the projects. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drain system may be required. Projects located on private property need to be coordinated with and approved by the property owner.

Costs:

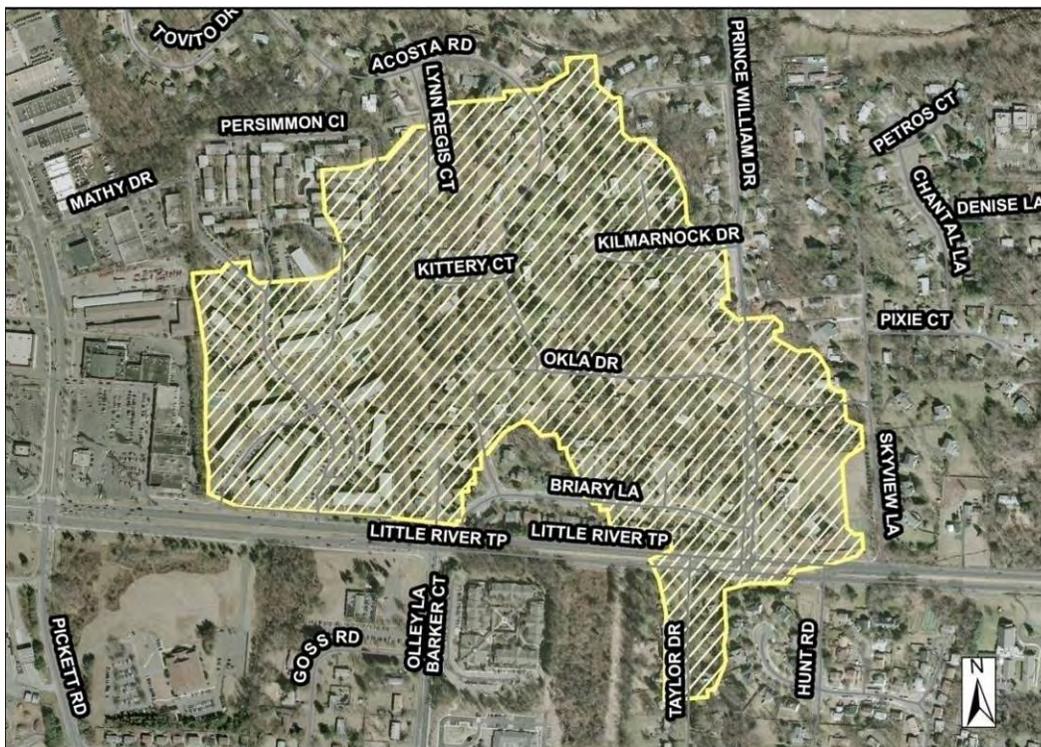
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	17	EA	\$10,000.00	\$170,000
Rain Garden	295	SY	\$50.00	\$14,750
			Initial Project Cost	\$184,750
Plantings	1	LS	5% of project	\$9,238
Ancillary Items	1	LS	5% of project	\$9,238
Erosion and Sediment Control	1	LS	10% of project	\$18,475
			Base Construction Cost	\$221,701
			Mobilization (5%)	\$11,085
			Subtotal 1	\$232,786
			Contingency (25%)	\$58,197
			Subtotal 2	\$290,983
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$130,942
			Estimated Project Cost	\$422,000

AC9312 Area-Wide Drainage Improvement



Address:	Various
Location:	Westchester and Briars of Westchester neighborhoods
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	85 acres
Receiving Waters	Unknown tributary of Crook Branch

Description: This is a low and medium density residential neighborhood downstream of dry pond 0200DP. This project is located in a headwater subwatershed and would improve the water quality of the runoff after it flows through the dry pond and before it enters the tributary of Crook Branch. Tree box filters will be installed at curb inlets, rain gardens will be installed at yard inlets and vegetated swales will be installed in place of paved ditches.



Project Area Map

Project Benefits: While there may be some improvement in peak flow attenuation due to increased infiltration and removal of the paved ditches, the project is primarily intended to provide water quality treatment of stormwater runoff. Project implementation is expected to reduce annual pollutant loads by 7,497 lbs of sediment, 96 lbs of nitrogen and 18 lbs of phosphorus.

Project Design Considerations: There are no environmental constraints as the disturbance will be limited to the area immediately around existing storm drains. Projects located on private property need to be coordinated with property owners.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	48	EA	\$10,000.00	\$480,000
Rain Garden	823	SY	\$50.00	\$41,150
			Initial Project Cost	\$521,150
Plantings	1	LS	5% of project	\$26,058
Ancillary Items	1	LS	5% of project	\$26,058
Erosion and Sediment Control	1	LS	10% of project	\$52,115
			Base Construction Cost	\$625,381
			Mobilization (5%)	\$31,269
			Subtotal 1	\$656,650
			Contingency (25%)	\$164,163
			Subtotal 2	\$820,813
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$369,366
			Estimated Project Cost	\$1,191,000

AC9313 Area-Wide Drainage Improvement



Address:	Various
Location:	Langhorne Acres neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	80 acres
Receiving Waters	Unknown tributary of Crook Branch

Description: The project area is a low and medium density residential neighborhood which was developed with no stormwater management facilities. It is located in a headwater subwatershed, which is an ideal location to implement runoff treatment to improve water quality before it flows to Crook Branch. Proposed treatment systems include tree box filters installed at various street inlets and rain gardens installed at yard inlets.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff. It is estimated that project implementation will reduce annual pollutant loads by 6,315 lbs of sediment, 84 lbs of nitrogen and 16 lbs of phosphorus. There will also be a small amount of improvement in peak flow attenuation due to increased infiltration and removal of the paved ditches.

Project Design Considerations: There are no environmental constraints anticipated as the disturbance will be limited to immediately around the project. Projects located on private property need to be coordinated with property owners. An easement will be required for projects on private property.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	28	EA	\$10,000.00	\$280,000
Rain Garden	683	SY	\$50.00	\$34,150
			Initial Project Cost	\$314,150
Plantings	1	LS	5% of project	\$15,708
Ancillary Items	1	LS	5% of project	\$15,708
Erosion and Sediment Control	1	LS	10% of project	\$31,415
			Base Construction Cost	\$376,981
			Mobilization (5%)	\$18,849
			Subtotal 1	\$395,830
			Contingency (25%)	\$98,958
			Subtotal 2	\$494,788
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$222,655
			Estimated Project Cost	\$718,000

AC9314 – Area-Wide Drainage Improvement



Address:	Various
Location:	Dunn Loring Village neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	28 acres
Receiving Waters	Unknown Tributary of Long Branch North

Description: Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Dunn Loring Village neighborhood south of I-66 with no stormwater management. Stream assessments showed that the water quality downstream of this subwatershed is impaired. This project involves the installation of tree box filters and rain gardens to treat the runoff at the source, before it enters the storm drain system.



Project Area Map: Conceptual plan showing potential project location

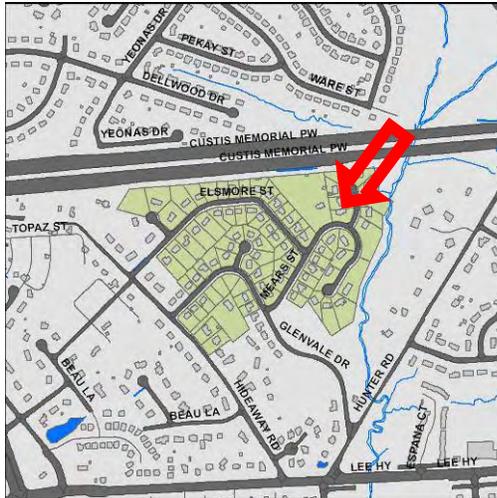
Project Benefits: This project will provide water quality treatment of stormwater runoff through various filtration, infiltration, and uptake by vegetation. It is estimated that project implementation will reduce pollutant loads by approximately 4,802 lbs of sediment, 56 lbs of nitrogen and 11 lbs of phosphorus each year. There may also be some improvement in the peak flow attenuation due to increased infiltration.

Project Design Considerations: Environmental constraints are not anticipated as the disturbance will only be in the immediate vicinity of the project. Rain gardens would require utility research to ensure there are no conflicts. Some modification of the storm drain system may be required. Projects located on private property need to be coordinated with property owners.

Costs:

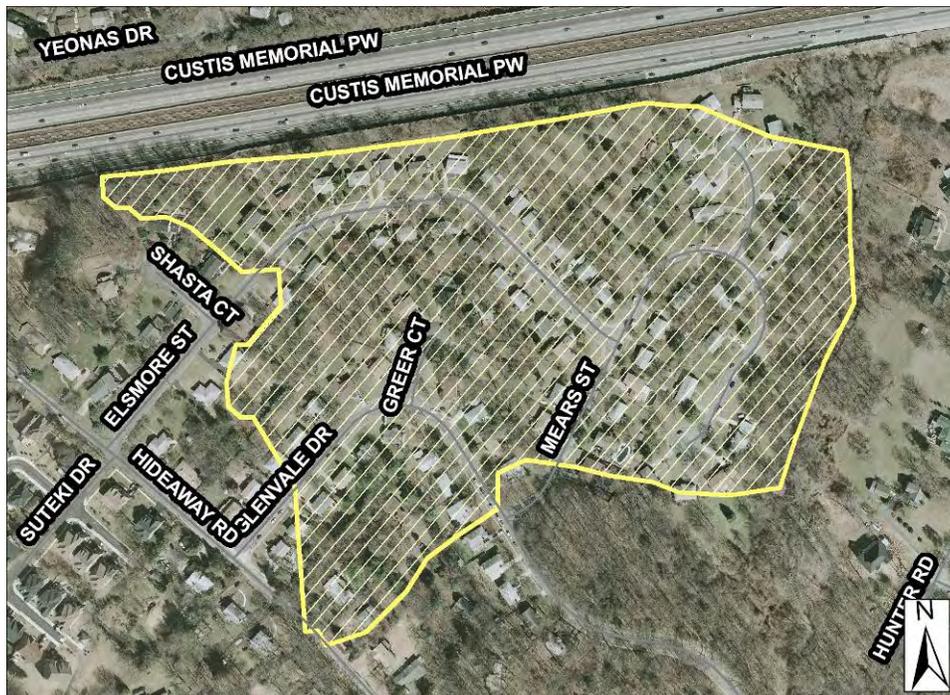
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	19	EA	\$10,000.00	\$190,000
Rain Garden	286	SY	\$50.00	\$14,300
			Initial Project Cost	\$204,300
Plantings	1	LS	5% of project	\$10,215
Ancillary Items	1	LS	5% of project	\$10,215
Erosion and Sediment Control	1	LS	10% of project	\$20,430
			Base Construction Cost	\$245,160
			Mobilization (5%)	\$12,258
			Subtotal 1	\$257,418
			Contingency (25%)	\$64,355
			Subtotal 2	\$321,773
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$144,798
			Estimated Project Cost	\$467,000

AC9315 – Area-Wide Drainage Improvement



Address:	Various
Location:	Hideaway Park neighborhood
Land Owner:	Private - Residential
PIN:	Multiple
Control Type	Water Quality
Drainage Area	33 acres
Receiving Waters	Bear Branch

Description: The project site lies within a subwatershed which is developed primarily with medium density residential housing with no stormwater management. This project is located south of I-66 and involves the installation of tree box filters and rain gardens at the existing stormwater inlets. The area-wide improvement would treat the runoff as it enters the storm drain system, before it enters the stream.



Project Area Map: Conceptual plan showing potential project location

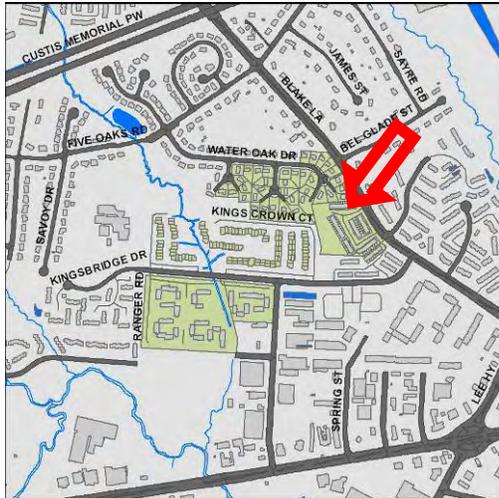
Project Benefits: This project will provide water quality treatment of stormwater runoff through filtration and vegetative uptake. The amount of nutrients and suspended solids will be reduced within the stream, thus improving in-stream habitat. Implementing this project is expected to reduce pollutant loads by approximately 2,368 lbs of sediment, 32 lbs of nitrogen and six lbs of phosphorus annually. There will also be some peak flow reduction due to the increased infiltration.

Project Design Considerations: No environmental constraints are anticipated as the disturbance will only be in the immediate vicinity of the project. Utility research would be required to ensure there are no conflicts. Some modification of the storm drain system would be required. While most of the improvements should be located inside of right-of-way; however, coordination with private property owners will be needed for work done on privately-owned property.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	11	EA	\$10,000.00	\$110,000
Rain Garden	271	SY	\$50.00	\$13,550
			Initial Project Cost	\$123,550
Plantings	1	LS	5% of project	\$6,178
Ancillary Items	1	LS	5% of project	\$6,178
Erosion and Sediment Control	1	LS	10% of project	\$12,355
			Base Construction Cost	\$148,261
			Mobilization (5%)	\$7,413
			Subtotal 1	\$155,674
			Contingency (25%)	\$38,919
			Subtotal 2	\$194,593
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$87,567
			Estimated Project Cost	\$283,000

AC9316 – Area-Wide Drainage Improvement



Address: Various
Location: Hawthorne Village Apts, Five Oaks Place and Cedar Grove Park neighborhoods
Land Owner: Private - Residential
PIN: Multiple
Control Type: Water Quality
Drainage Area: 49 acres
Receiving Waters: Unknown Tributary of Accotink Creek

Description: The project will be implemented in an area which has been developed as a medium and high density residential neighborhood with no stormwater management. This headwater subwatershed is a location where runoff treatment would improve the water quality before it enters Crook Branch instead of downstream of the impairment. The project consists of installing tree box filters at curb and street inlets and rain gardens adjacent to yard inlets.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment of stormwater runoff. Nutrients, suspended solids, and other harmful pollutants will be removed at the source, and thus within the stream, which will improve in-stream habitat. It is estimated that project implementation will reduce annual pollutant loads by 5,278 lbs of sediment, 62 lbs of nitrogen and 12 lbs of phosphorus. There will also be a small amount of improvement in peak flow attenuation due to increased infiltration.

Project Design Considerations: There are no environmental constraints anticipated as the disturbance will be limited to immediately around the project. Projects located on private property need to be coordinated with the property owner.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	42	EA	\$10,000.00	\$420,000
Rain Garden	691	SY	\$50.00	\$34,550
			Initial Project Cost	\$454,550
Plantings	1	LS	5% of project	\$22,728
Ancillary Items	1	LS	5% of project	\$22,728
Erosion and Sediment Control	1	LS	10% of project	\$45,455
			Base Construction Cost	\$545,461
			Mobilization (5%)	\$27,273
			Subtotal 1	\$572,734
			Contingency (25%)	\$143,184
			Subtotal 2	\$715,918
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$322,163
			Estimated Project Cost	\$1,039,000