5.9 Pohick – Upper Watershed Management Area

Upper Pohick Watershed Management Area has a total area of approximately 4.85 square miles and is comprised of 18 subwatersheds. It is bound to the north by Braddock Road, to the northeast by portions of Rolling Road, to the south by portions of Old Keene Mill Road and to the west by portions of Guinea Road. It is bisected from southwest to northeast by Burke Lake Road and from east to west by the rail line that carries the Virginia Railway Express (VRE) through portions of Northern Virginia.

The WMA has approximately 21.48 miles of stream, which flow from northwest to southeast. The area consists mainly of single-family detached residential homes, with some significant areas of multi-family residential development in established neighborhoods. Land cover consists primarily of impervious surface associated with residential development (i.e., rooftops, sidewalks and roadways) and landscaping, including managed turf. The area is approximately 29 percent impervious. Notable features include Lake Braddock, Lake Braddock Secondary School and the Rolling Valley Virginia Railway Express station.

In the Upper WMA the most prevalent stream condition problems noted include disturbed stream buffers and stream channel widening and erosion/incision. In addition, pipes and ditches discharge directly into the WMA's and have created impacts, including some severe impacts on the main stem of Pohick Creek. Upstream of Lake Braddock several road crossing impacts are noted, some severe.

The watershed restoration projects for this WMA include a host of projects, such as retrofitting stormwater ponds, restoring streams, outfall improvements, and BMP/LID projects at school sites, including bioretention landscaping features and installing rain barrels. Finally, a dumpsite/obstruction removal and a buffer restoration project are proposed. Descriptions of the 0 – 10-year-plan projects and non-structural projects follow. Also, a map of this WMA and a list of all the projects proposed in it are provided. For more information see the 0 – 10-year-plan project fact sheets at the end of this section.

5.9.1 Structural Projects

<u>PC9126 Stormwater Pond Retrofit</u>

This project is proposed to retrofit an existing pond at White Oaks Elementary School to create an extended detention basin with a sediment forebay. The pond size will be increased and the outfall structure will be modified to increase the stormwater detention time. This will improve the stormwater runoff quality and quantity. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.

<u>PC9132 Stormwater Pond Retrofit</u>

This project is proposed to retrofit the large pond behind Lakepointe Drive, by creating an extended detention dry pond with a sediment forebay. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids. The retrofit will modify the existing pond to provide adequate downstream channel protection and allow for better function of temporary ponding using a control structure, which enables particulate settlement.

<u>PC9133 Stormwater Pond Retrofit</u>

This project is proposed to retrofit an existing pond at Lake Braddock Secondary School to create an extended detention dry pond with a sediment forebay. The pond receives runoff from a fairly large impervious drainage area, including the school and adjacent residential area to the

north. The pond will be retrofitted into an extended detention pond by modifying the existing discharge structure to increase the time stormwater remains in the pond. The pond size will be enlarged to handle the larger detention volume. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.

PC9136 Stormwater Pond Retrofit

This project is proposed to retrofit an existing pond near Dahlgreen Place Playground. The existing pond will be modified to create an extended detention dry pond with a sediment forebay. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids. The retrofit will modify the existing control structure to increase the detention time of stormwater runoff. This will reduce downstream channel erosion and allow more time for particulate pollutants to settle out.

PC9227 Stream Restoration

A closed system collects runoff from Capella Avenue. and a large surrounding area, including residential development. The pipe outfalls into a stream east of Capella Drive. The stream is in a wooded area behind White Oaks Elementary School. Due to poor channel morphology, this project is proposed to daylight the outfall farther upstream to restore the water to its natural state before reaching the stream. Energy dissipation devices, which will consist of a series of reinforced step pools will be put in place to reduce velocity of water entering the stream.

PC9228 Stream Restoration Suite

Subproject A is a stream restoration of the stream west of Shiplett Boulevard and northwest of Glenbard Road, and is located on Fairfax County Park Authority land. This project is proposed to repair bank and bed erosion, restoring the channel morphology. Stream stabilization will reduce sediment loads to the stream while maintaining capacity of the channel and controlling unwanted meander. Subproject B is an obstruction removal in the stream north of Buffie Court and west of Orion Court. The obstruction was verified during a field visit. This project proposes to remove the obstructions blocking the stream channel to restore natural conditions. Removal of obstructions will help restore the function of the stream.

PC9230 Stream Restoration

The stream east of Wilmington Drive and north of Rand Drive has poor channel morphology. This project is proposed to repair bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric and rapid vegetation establishment. The stream stabilization will reduce sediment loads while maintaining the capacity of the stream and controlling unwanted meander.

PC9234 Stream Restoration

This project is proposed to repair bank and bed erosion, restoring channel morphology to a stream north of Nantick Road. The stream receives runoff from a residential neighborhood by direct runoff and from a closed system. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The primary indicator is poor stream stabilization.

PC9235 Stream Restoration

Two inlets collect runoff from Veranda Drive and pipe it to an adjacent stream to the east. Due to poor channel morphology, this project has been proposed to daylight the pipe farther

upstream by creating an open channel and using an energy dissipation device. This device consists of a series of step pools reinforced with either rocks or logs. The daylighting will help reduce the velocity of the water entering the stream.

PC9242 Stream Restoration

This project is proposed to repair bank and bed erosion to a stream north of Burke Towne Court. The primary indicator is poor channel morphology. The stream receives runoff from adjacent residential neighborhood. The stream stabilization will reduce sediment loads while maintaining capacity of the stream and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment.

PC9245 Stream Restoration

This project is proposed to repair bank and bed erosion to restore channel morphology of the stream north of Burke Road. The primary indicator is poor channel morphology. The stream conveys runoff from adjacent single-family residential neighborhoods to the stream through closed systems or direct runoff. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment.

PC9249 Stream Restoration

This project is proposed on the stream northwest of Parliament Drive, and is located in the open space owned by Signal Hill Homes Association. This project is proposed to repair bank and bed erosion and restore channel morphology. The primary indicator is poor channel morphology. Stream stabilization will reduce sediment loads while maintaining capacity and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric and rapid vegetation establishment.

PC9251 Stream Restoration

This stream is located between Olley Lane and Winbourne Road. The stream conveys runoff from adjacent roads and single-family residential neighborhoods. The stream conveys runoff from both a closed system and sheet flow from roads and homes to the north, east and west. The banks of the existing stream are significantly eroded. This project is proposed to repair bank and bed erosion to restore channel morphology.

PC9252 Stream Restoration

This project is proposed to repair bank and bed erosion to restore channel morphology of the stream adjacent to Wallingford Drive. Stream stabilization will reduce sediment loads to the stream while maintaining the capacity and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric and rapid vegetation establishment.

PC9257 Stream Restoration

This project addresses restoration of a stream near Fairleigh Court, which receives runoff from closed storm systems that drain residential neighborhoods. The primary indicator is poor channel morphology. Stream stabilization will reduce sediment loads to the stream while maintaining stream capacity and controlling unwanted meander. The project will improve storm outfalls to the stream and daylight a portion of the storm system.

PC9258 Stream Restoration

This project is proposed to daylight a pipe from a residential neighborhood (Dahlgreen Place) farther upstream. The primary indicator is poor channel morphology. This project will return the water to its natural state. This will reduce the velocity at which stormwater enters the stream. Additionally, the daylighting will provide more opportunity for the stormwater to infiltrate. This will help reduce runoff rates and stream erosion.

PC9525 BMP/LID

This project is proposed to incorporate BMP inlet inserts or manufactured BMP filtration systems to provide pollutant removal at Rolling Valley Mall north of Old Keene Mill Road. Typical inserts act as baskets that collect sediment and larger debris such as trash and leaves. Filters should be selected to target the known pollutants. The filters need to be cleaned on a routine basis, typically every 6 months. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids. Filtration will capture and treat stormwater runoff from highly impervious areas before the stormwater enters the storm drain system.

PC9544 BMP/LID Suite

This suite of projects is the installation of bioswales at Lake Braddock Park near the game fields. The bioswales would receive sheet flow from the fields and would increase infilitration and reduce pollutants, such as excessive fertilizer, grass clippings or animal waste. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.

PC9704 Outfall Improvement

This project is the construction of a new storage and treatment area below the outfall of a closed system from Lake Braddock Drive. The improvement will include an energy dissipation device and wetland plantings. The primary indicators include instream sediment. Outfall storage will reduce erosive velocities and sediment loads at the outfall and improve downstream habitats.

5.9.2 Non-Structural Projects

PC9527 BMP/LID

This project is a rain barrel/cistern at White Oaks Elementary School off Sideburn Road. This will capture, store and reuse runoff from the rooftop. The primary indicators are high impervious areas directly connected to the stormwater system. The cisterns can be used by students for hands-on educational programs.

PC9530 BMP/LID

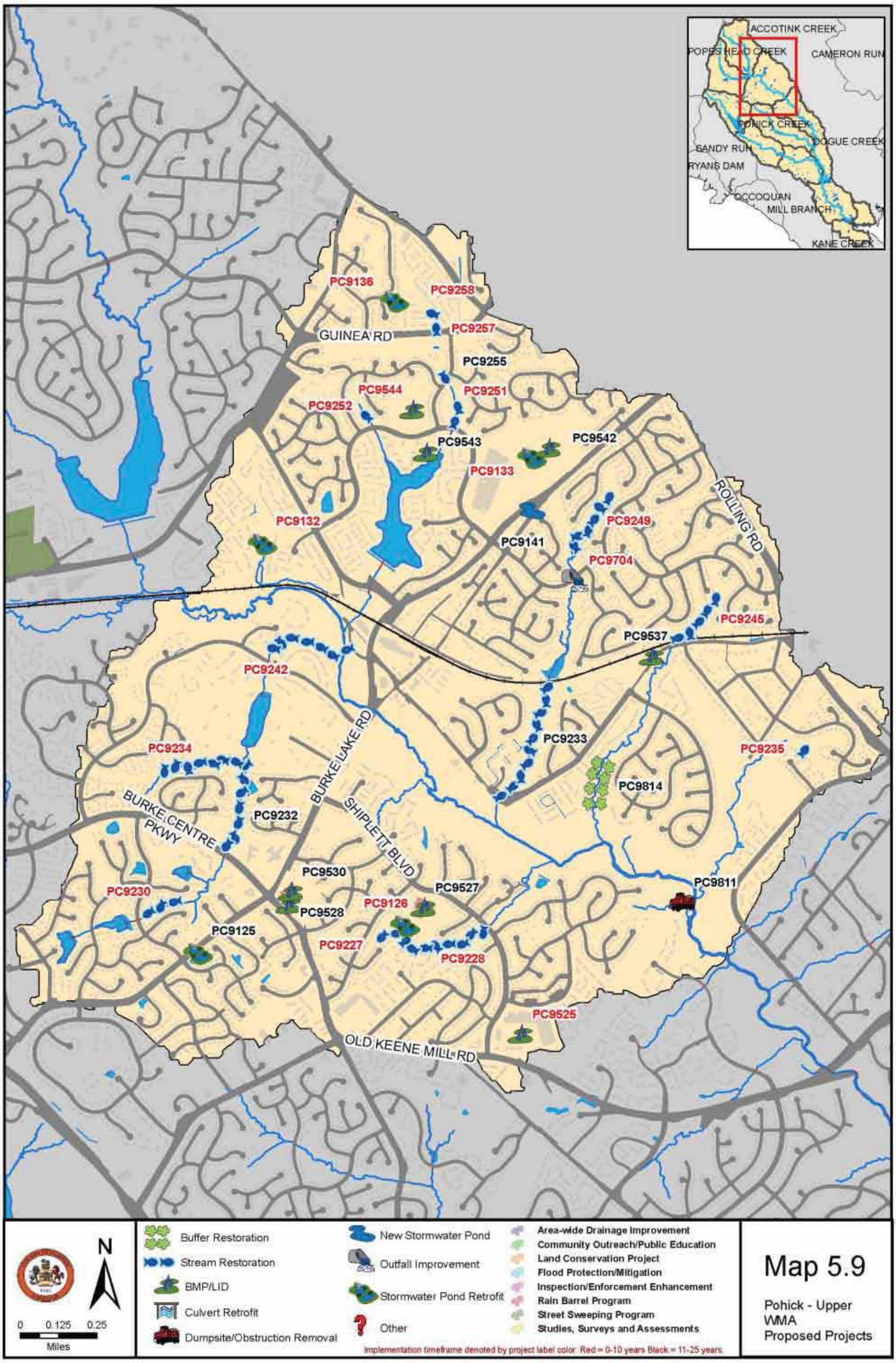
The project is a rain barrel/cistern at Burke Center School northeast of Lee Chapel Road southeast of Burke Lake Road. This will capture, store and reuse runoff from the rooftop. The primary indicators are high impervious areas directly connected to the stormwater system. The rain barrels can be used by students for hands-on educational programs.

PC9811 Dumpsite/Obstruction Removal

The stream north of Rathlin Drive has an obstruction. The primary indicators are flood complains and the obstruction has been field verified as gabions in the stream channel. This project is proposed to remove obstructions blocking the stream channel to restore natural conditions. Removal of obstruction will reduce flood complaints and help restore the natural shape and function of the stream.

PC9814 Buffer Restoration

This project is proposed to re-plant a stream buffer to re-establish the RPA east of Bonnie Bern Court. Indicators are stream bank buffer deficiencies. Increased vegetation from buffer repair will provide additional filtration of pollutants and will reduce runoff by intercepting the water and increasing surface storage and infiltration.



Map 5.9

Pohick - Upper WMA
Proposed Projects

Table 5-9: Project List - WMA (Pohick - Upper Pohick)

Structural Projects[1]						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PC9126	Stormwater Pond Retrofit	PC-PC-0044	16130 Shiplett Blvd., White Oaks Elementary School	Water quality and quantity control	Public/Local - FCPS	0-10
PC9132	Stormwater Pond Retrofit	PC-PC-0055	Behind 9713 Lakepointe Dr.	Water quality and quantity control	Private - HOA	0-10
PC9133	Stormwater Pond Retrofit	PC-PC-0046	9200 Burke Lake Rd., Lake Braddock Secondary School	Water quality and quantity control	Public/Local - FCPS	0-10
PC9136	Stormwater Pond Retrofit	PC-PC-0054	Behind 5120 Dahlgreen Pl., Playground	Water quality and quantity control	Private - HOA	0-10
PC9227	Stream Restoration	PC-PC-0044	Behind 9500 Orion Ct.	Water quality and quantity control	Public/Local - FCPS	0-10
PC9228	Stream Restoration Suite	PC-PC-0044	Behind 6300 Glenbard Rd.	Water quality control	Public/Local - FCPA, FCPS, Private - HOA	0-10
PC9230	Stream Restoration	PC-PC-0050	Behind 9820 Rand Dr.	Water quality control	Private - Residential	0-10
PC9234	Stream Restoration	PC-PC-0049	Behind 9840 Natick Rd.	Water quality control	Private - Residential	0-10
PC9235	Stream Restoration	PC-PC-0041	Behind 5913 Veranda Dr.	Water quality and quantity control	Private - HOA	0-10
PC9242	Stream Restoration	PC-PC-0049	Behind 5753 Burke Towne Ct.	Water quality control	Public/Local - FCPA	0-10
PC9245	Stream Restoration	PC-PC-0042	Behind 5801 Banning Pl.	Water quality control	Private - HOA, Public/State - VDOT	0-10
PC9249	Stream Restoration	PC-PC-0046	Behind 5565 Queen Victoria Ct.	Water quality control	Private - HOA	0-10
PC9251	Stream Restoration	PC-PC-0053	Behind 9313 Winbourne Rd.	Water quality control	Private - HOA	0-10

[1] **Only 10-yr structural projects will have associated project fact sheets at the end of section 5.**

Structural Projects[1]						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PC9252	Stream Restoration	PC-PC-0052	Next to 9535 Wallingford Dr.	Water quality control	Private - HOA	0-10
PC9257	Stream Restoration	PC-PC-0054	Next to 9404 Fairleigh Ct.	Water quality control	Private - HOA	0-10
PC9258	Stream Restoration	PC-PC-0054	Next to 5101 Dahlgreen Pl.	Water quality and quantity control	Private - HOA	0-10
PC9525	BMP/LID	PC-PC-0039	9230 Old Keene Mill Rd., Rolling Valley Mall	Water quality control	Private - Commercial	0-10
PC9544	BMP/LID Suite	PC-PC-0053	9450 Lake Braddock Dr., Lake Braddock Park	Water quality and quantity control	Public/Local - FCPA	0-10
PC9704	Outfall Improvement	PC-PC-0046	Next to 9199 Lake Braddock Dr.	Water quality and quantity control	Private - HOA	0-10
PC9125	Stormwater Pond Retrofit	PC-PC-0050	Behind 6301 Wilmington Dr.	Water quality and quantity control	Private - HOA	11-25
PC9141	New Stormwater Pond	PC-PC-0046	Behind 5550 Queen Victoria Ct.	Water quality and quantity control	Public/State - VDOT	11-25
PC9232	Stream Restoration	PC-PC-0049	Behind 9623 Woodedge Dr.	Water quality control	Private - Residential	11-25
PC9233	Stream Restoration	PC-PC-0045	Near intersection of Burke Rd. and Heritage Square Rd.	Water quality control	Private - HOA, Public/State - VDOT	11-25
PC9255	Stream Restoration	PC-PC-0053	Behind 5208 Olley La.	Water quality and quantity control	Private - HOA	11-25
PC9528	BMP/LID	PC-PC-0049	9654 Burke Lake Rd., Burke Center School	Water quality and quantity control	Public/Local - FCPS	11-25
PC9537	BMP/LID	PC-PC-0040	9016 Burke Rd., VA Railway Exp. - Rolling Rd. Station	Water quality and quantity control	Public/Local - FCPS	11-25

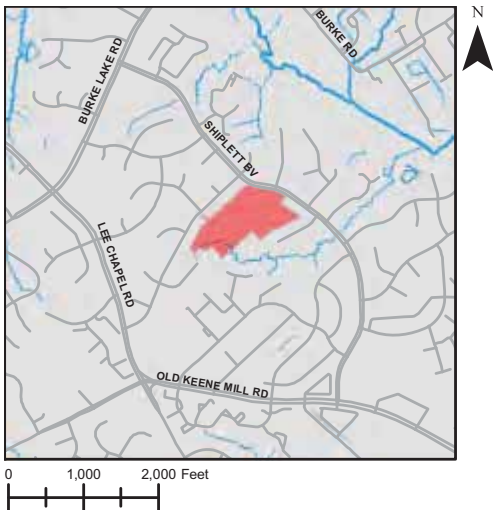
[1] **Only 10-yr structural projects will have associated project fact sheets at the end of section 5.**

Structural Projects[1]						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PC9542	BMP/LID Suite	PC-PC-0046	9200 Burke Lake Rd., Lake Braddock Secondary School	Water quality and quantity control	Public/Local - FCPS	11-25
PC9543	BMP/LID	PC-PC-0051	9333 Lake Braddock Rd., Lakeside Pool - Lake Braddock C.A.	Water quality and quantity control	Private - HOA	11-25

Non-Structural Projects[1]					
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**
PC9527	BMP/LID	PC-PC-0044	16130 Shiplett Blvd., White Oaks Elementary School	Water quality and quantity control	Public/Local - FCPS
PC9530	BMP/LID	PC-PC-0049	9645 Burke Lake Rd., Burke Center School	Water quality and quantity control	Public/Local - FCPS
PC9811	Dumpsite/ Obstruction Removal	PC-PC-0039	Near 6223 Rathlin Dr.	Water quality control	Public/Local - FCPA
PC9814	Buffer Restoration	PC-PC-0040	Behind 6025 Bonnie Bern Ct.	Water quality control	Private - HOA

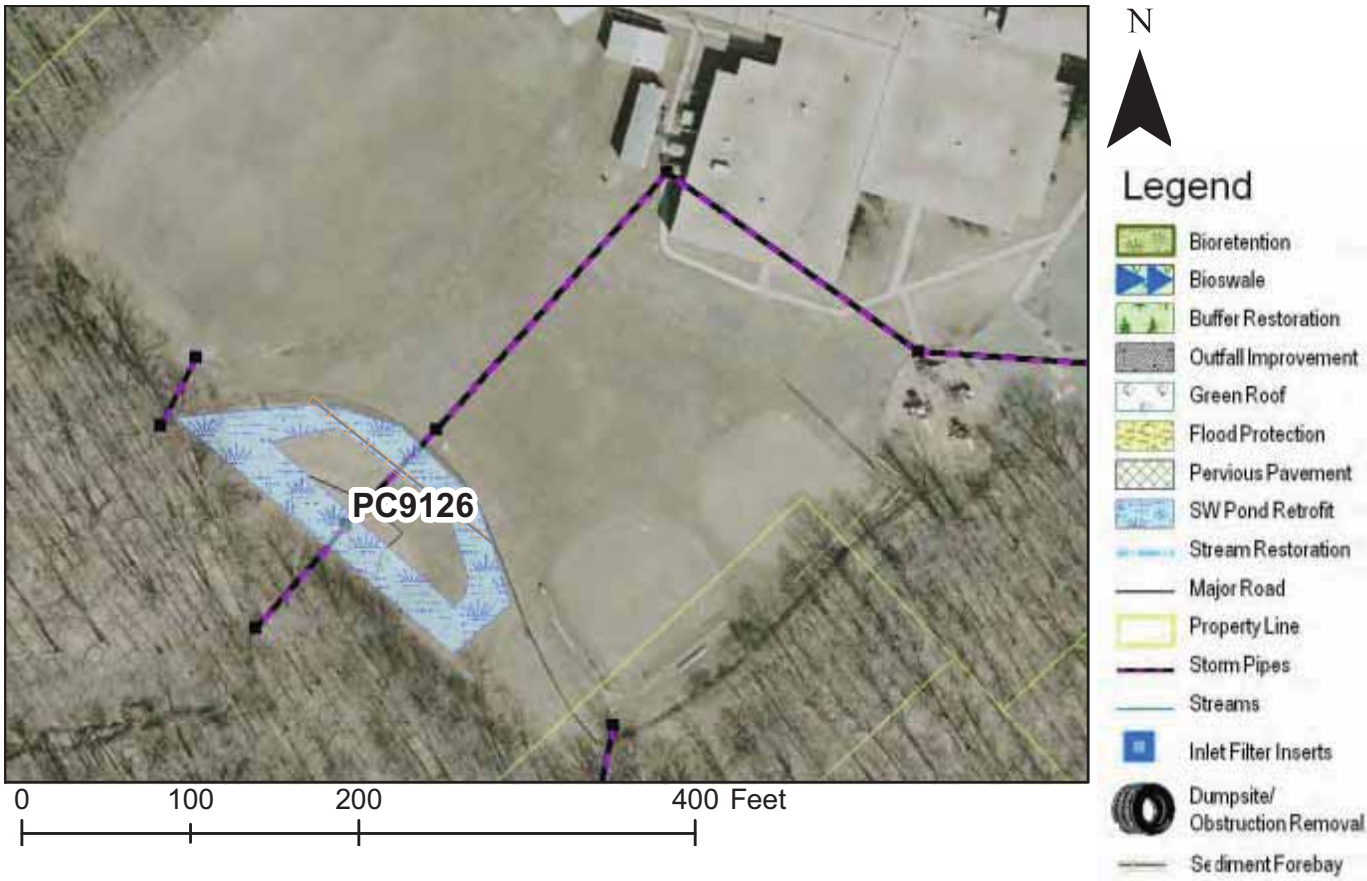
[1] **Only 10-yr structural projects will have associated project fact sheets at the end of section 5.**

PC9126 Stormwater Pond Retrofit



Address: 16130 Shiplett Blvd, Burke, Virginia
Location: White Oaks Elementary School
Land Owner: Public/Local – School Board of Fairfax County
PIN: 0784 13 A
Control Type: Water quality and quantity control
Drainage Area: 4.60 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the retrofit of an existing pond at White Oaks Elementary School to create an extended detention basin with a sediment forebay. The pond size will be increased and the outfall structure will be modified to increase the stormwater detention time. This will improve the stormwater runoff quality and quantity. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.



Project Benefits: An estimated 1.66 lbs/year of phosphorus will be removed. This retrofit will modify the existing pond to provide adequate downstream channel protection and allow for better function of temporary ponding using a control structure which promotes the settlement of pollutant particulates.

Project Design Considerations: An additional inlet or swale on the east side of the playground should be added to capture runoff and direct it to the existing dry pond. The forebay should be sized as approximately 10% of the pond area. There is ample room for expansion and a significant amount of impervious areas contributing runoff. The retrofit will add a discharge control structure to increase the detention time of the stormwater in the pond. An aquatic bench will be added as shown on the project area map. The planting plan will include wetland plants and buffer areas that will promote greater wildlife and water fowl use. The Watershed Advisory Group supports this project and says this project is important.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$8,500	$1,700
Grading and Excavation	1000	CY	$35	$35,000
Structural BMP Retrofit and Incidentals	1	LS	$10,000	$10,000
Embankment	50	CY	$50	$2,500
Outflow Pipe	75	LF	$125	$9,375
Rip Rap Stabilization	75	SY	$100	$7,500
Organic Compost Soil Amendment	160	CY	$40	$6,400
Plantings	1	LS	5%	$3,624
Ancillary Items	1	LS	5%	$3,624
Erosion and Sediment Control	1	LS	10%	$7,248
			Base Construction Cost	$86,970
			Mobilization (5%)	$4,349
			Subtotal 1	$91,319
			Contingency (25%)	$22,830
			Subtotal 2	$114,148
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$51,367
			Total	$165,515
			Estimated Project Cost	$170,000

PC9126_1 Existing dry pond

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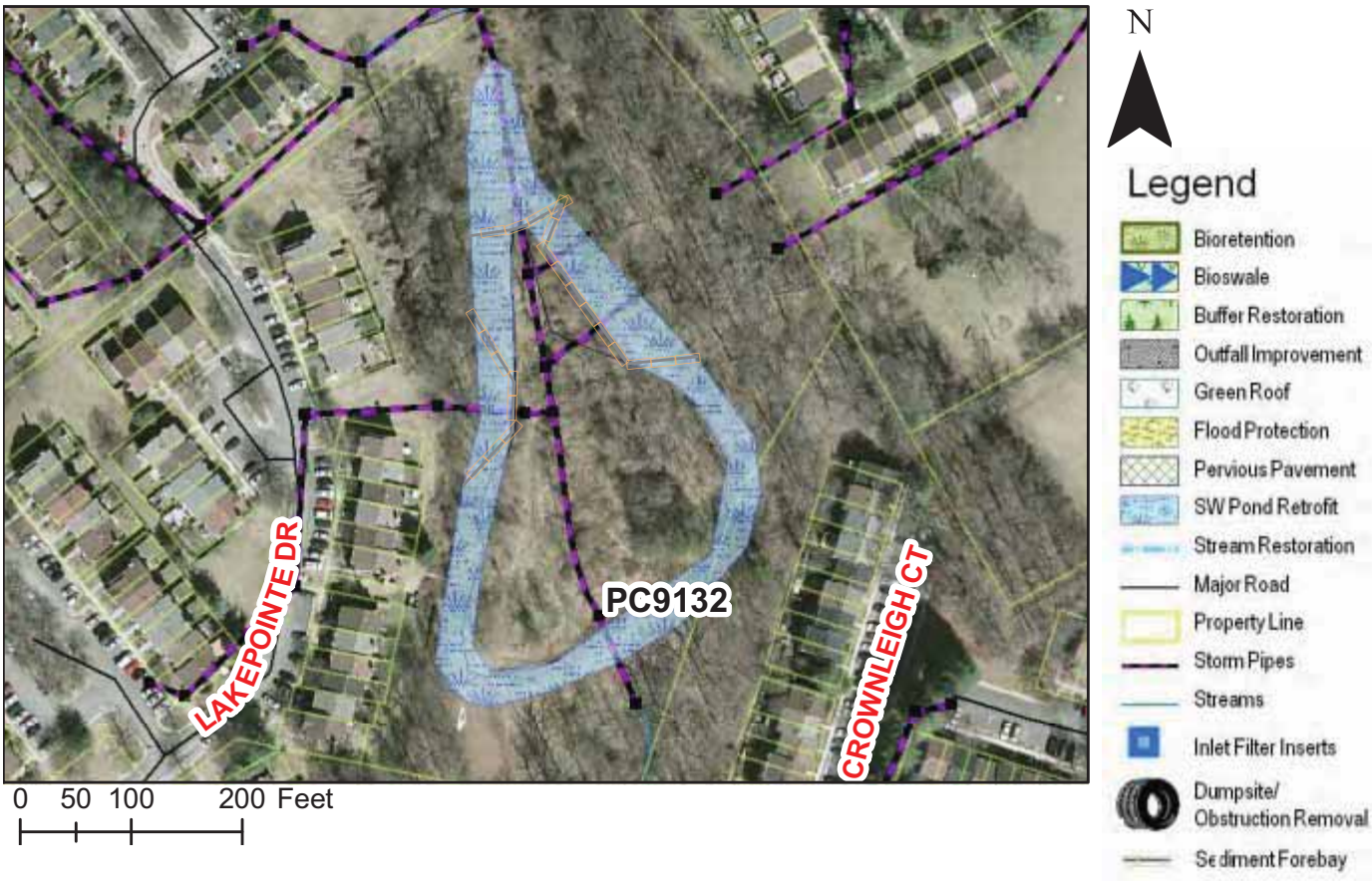
PC9132 Stormwater Pond Retrofit

Address: 9713 Lakepointe Dr., Burke, Virginia
Location: Pond behind Houses along Lakepointe Dr.
Land Owner: Private – Lakepointe Townhome Association
PIN: 0781 16 H
Control Type: Water quality and quantity control
Drainage Area: 71.39 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project is the large pond behind Lakepointe Drive. The project proposes the retrofit of the pond to create an extended detention dry pond with a sediment forebay. The primary indicators are pollutants including nitrogen, phosphorus and total suspended solids. The retrofit will modify the existing pond to provide adequate downstream channel protection and allow for better function of temporary ponding using a control structure, which enables particulate settlement.



Project Benefits: This project will remove approximately 20.62 lb/year of additional phosphorus. The retrofit will modify the existing pond to provide adequate downstream channel protection and allow for better function of temporary ponding using a control structure, which enables particulate settlement. Sediment forebays will reduce debris and coarse sediment in the pond. This will reduce costly maintenance and improve water quality. The planting in the proposed aquatic bench will increase the ponds biological uptake of pollutants, such as nitrogen and phosphorus.

Project Design Considerations: This project is located on private property owned by Lakepointe Townhome Association. Potential for pond expansion is diminished due to existing vegetation. Efforts should be made to have minimal impacts to existing mature vegetation. Sediment forebays should be constructed for inflows that drain 10% or more of the contributing drainage area. The total area of the sediment forebays should be approximately 10% of the pond's surface.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.98	AC	$8,500	$8,330
Grading and Excavation	3500	CY	$35	$122,500
Structural BMP Retrofit and Incidentals	1	LS	$15,000	$15,000
Embankment	100	CY	$50	$5,000
Outflow Pipe	75	LF	$125	$9,375
Rip Rap Stabilization	150	SY	$100	$15,000
Organic Compost Soil Amendment	750	CY	$40	$30,000
Plantings	1	LS	5%	$10,260
Ancillary Items	1	LS	5%	$10,260
Erosion and Sediment Control	1	LS	10%	$20,521
			Base Construction Cost	$246,246
			Mobilization (5%)	$12,312
			Subtotal 1	$258,558
			Contingency (25%)	$64,640
			Subtotal 2	$323,198
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$145,439
			Total	$468,637
			Estimated Project Cost	$470,000

PC9132_1.jpg Bird's eye view of pond 1

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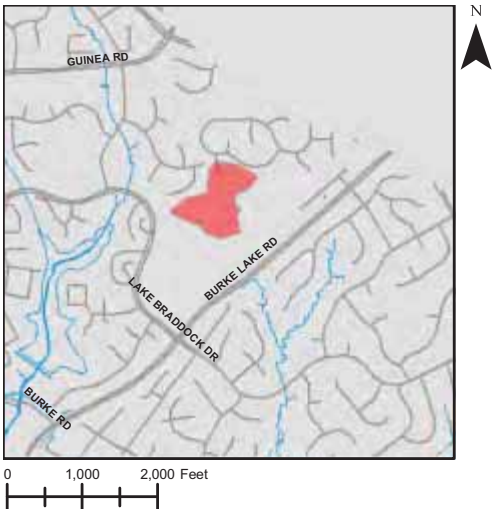
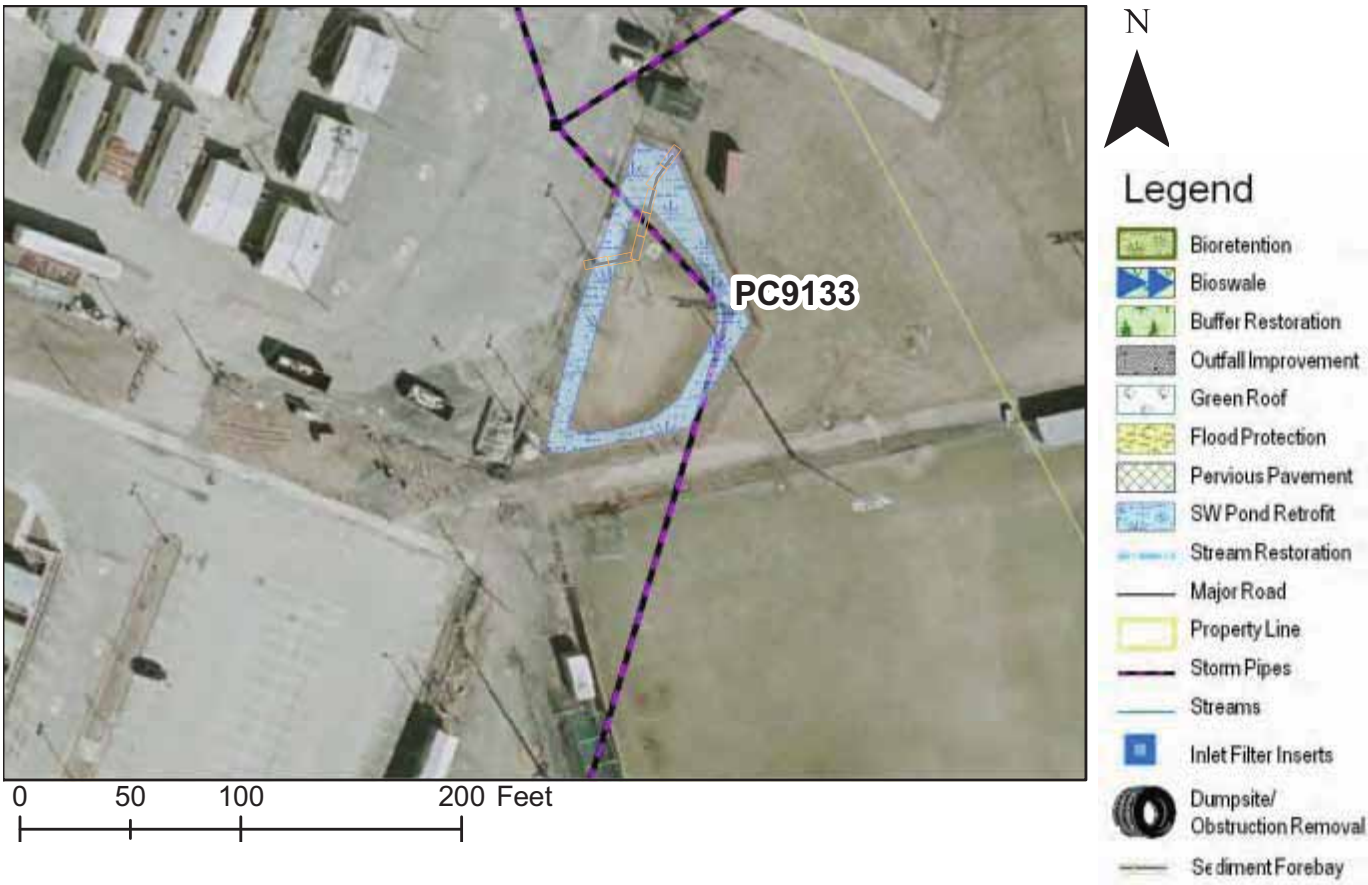
PC9133 Stormwater Pond Retrofit



Address: 9200 Burke Lake Rd., Burke, Virginia
Location: Lake Braddock Secondary School
Land Owner: Public/Local – School Board of Fairfax County
PIN: 0782 07 B
Control Type: Water quality and quantity control
Drainage Area: 13.96 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the retrofit of an existing pond at Lake Braddock Secondary School to create an extended detention dry pond with a sediment forebay. Pond receives runoff from a fairly large impervious drainage area, including the school and adjacent residential area to the north. The pond will be retrofitted into an extended detention pond by modifying the existing discharge structure to increase the time stormwater remains in the pond. The pond size will be enlarged to handle the larger detention volume. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.



Project Benefits: An estimated 2.23 lbs/year of phosphorus will be removed. Extending the pond detention time will provide better downstream channel protection and promote settlement of particulate pollutants. Installing a sediment forebay will reduce the debris and coarse sediment in the pond, which will reduce pond maintenance.

Project Design Considerations: Pond is located at Lake Braddock Secondary School. County records show no existing easements for the pond. The existing pond is behind a fence close to playing fields. The sediment forebay should account for approximately 10% of the pond area. The pond size would be increased as shown on the project map. The vegetative buffer should be 10-15' off of the top of bank. Efforts should be made to minimize impacts to existing mature vegetation.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$8,500	$850
Grading and Excavation	510	CY	$35	$17,850
Structural BMP Retrofit and Incidentals	1	LS	$10,000	$10,000
Embankment	20	CY	$50	$1,000
Outflow Pipe	75	LF	$125	$9,375
Rip Rap Stabilization	75	SY	$100	$7,500
Organic Compost Soil Amendment	65	CY	$40	$2,600
Plantings	1	LS	5%	$2,459
Ancillary Items	1	LS	5%	$2,459
Erosion and Sediment Control	1	LS	10%	$4,918
			Base Construction Cost	$59,010
			Mobilization (5%)	$2,951
			Subtotal 1	$61,961
			Contingency (25%)	$15,490
			Subtotal 2	$77,451
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$34,853
			Total	$112,303
			Estimated Project Cost	$120,000

PC9133_1.jpg View of existing pond

PC9133_2.jpg View of existing pond

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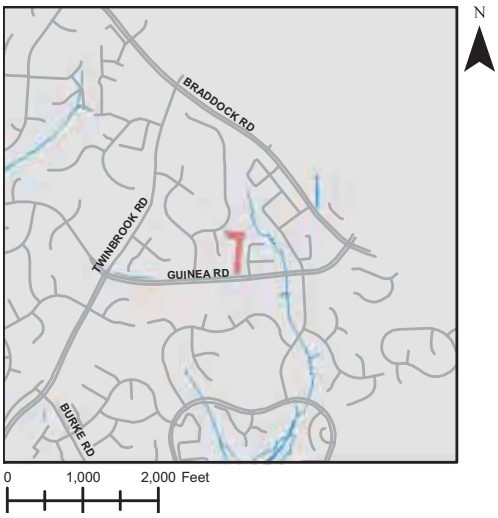
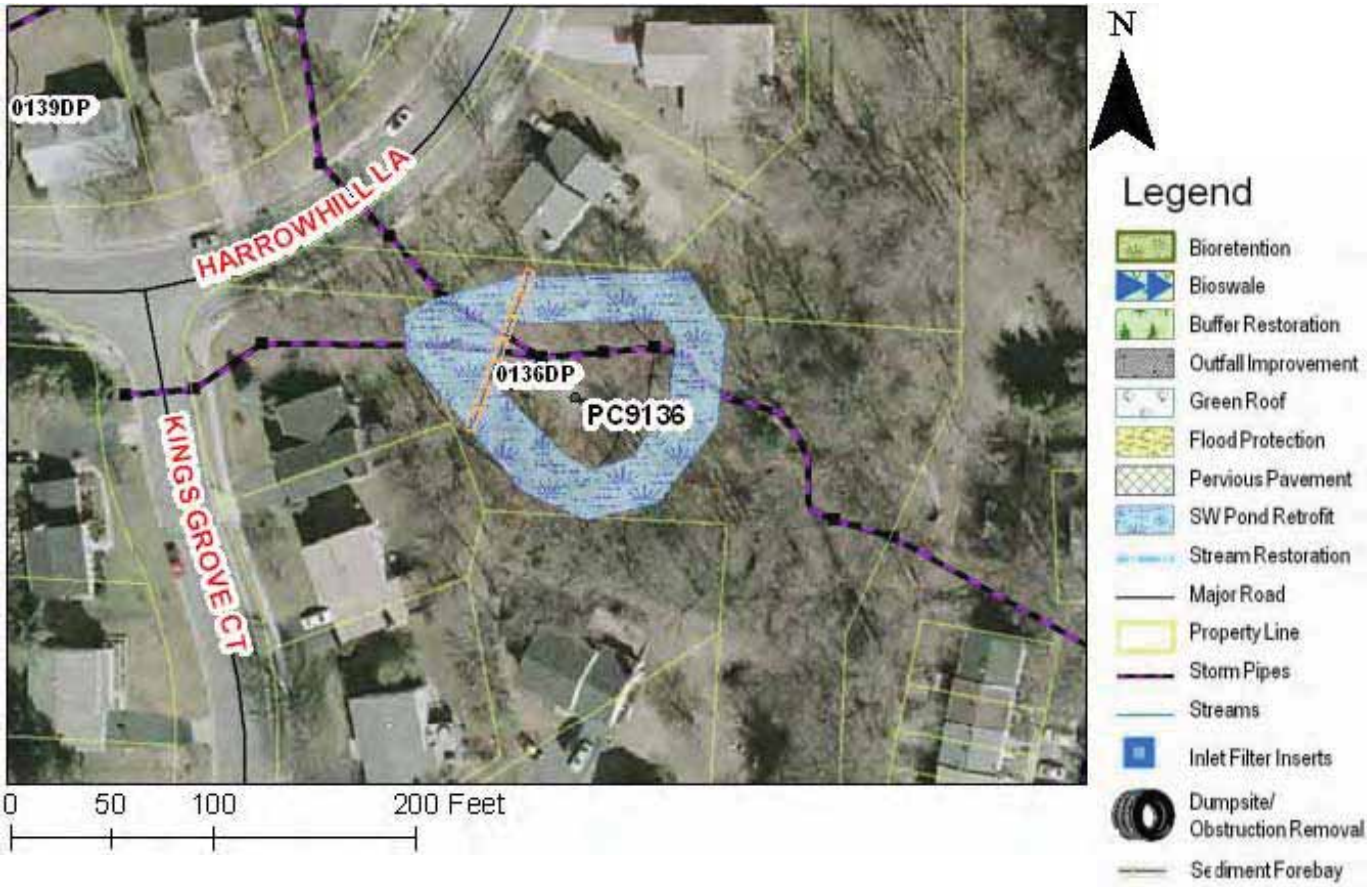
PC9136 Stormwater Pond Retrofit



Address: Behind 5120 Dahlgreen Place, Burke, Virginia
Location: Dahlgreen Place Playground
Land Owner: Private – Queens Gate Homeowners Association, Kings Grove Community Association
PIN: 0693 16 B, 0693 10 A1
Control Type: Water quality and quantity control
Drainage Area: 8.70 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the retrofit of an existing pond near Dahlgreen Place Playground. The existing pond will be modified to create an extended detention dry pond with a sediment forebay. The primary indicators are pollutants including nitrogen, phosphorus and total suspended solids. The retrofit will modify the existing control structure to increase the detention time of stormwater runoff. This will reduce downstream channel erosion and allow more time for particulate pollutants to settle out.



Project Benefits: The enlarged pond and modified outfall structure will increase the detention time for stormwater. This will help lessen stream erosion downstream. Also, the increased detention time will increase pollutant settling and biological uptake of the pollutants. An estimated 1.19 lbs/year of phosphorus will be removed with this pond retrofit project.

Project Design Considerations: The pond size will probably need to be increased to provide adequate detention time. The current pond size is limited on the north, west and south by single family homes. Therefore the pond will have to be enlarged on the east side. Records show that the pond is located in a storm drain easement. The easement will have to be enlarged as well. To access the pond on the north side an easement on the Queens Gate Homeowners Association open space may need to be obtained. A channel is deeply cut on the side of pond. This will have to be addressed. The pond has two inflows and will require a sediment forebay, and the existing control structure will need to be modified. The existing vegetation should be retained as much as possible when the pond is expanded. The landscaping plan should allow the pond to mature into a native forest in the right places yet keep mowable turf along the embankment and all access areas.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.22	AC	$8,500	$1,870
Grading and Excavation	1370	CY	$35	$47,950
Structural BMP Retrofit and Incidentals	1	LS	$10,000	$10,000
Embankment	55	CY	$50	$2,750
Outflow Pipe	50	LF	$125	$6,250
Rip Rap Stabilization	50	SY	$100	$5,000
Organic Compost Soil Amendment	170	CY	$40	$6,800
Plantings	1	LS	5%	$4,031
Ancillary Items	1	LS	5%	$4,031
Erosion and Sediment Control	1	LS	10%	$8,062
			Base Construction Cost	$96,744
			Mobilization (5%)	$4,837
			Subtotal 1	$101,581
			Contingency (25%)	$25,395
			Subtotal 2	$126,977
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$57,139
			Total	$184,116
			Estimated Project Cost	$190,000

PC9136_1.jpg Outfall control structure

PC9136_2.jpg View of pond inflow

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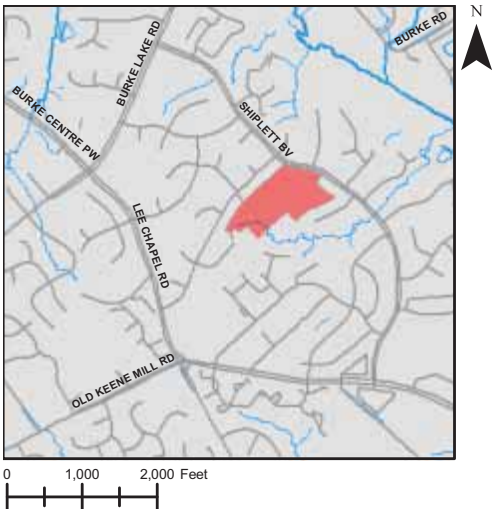
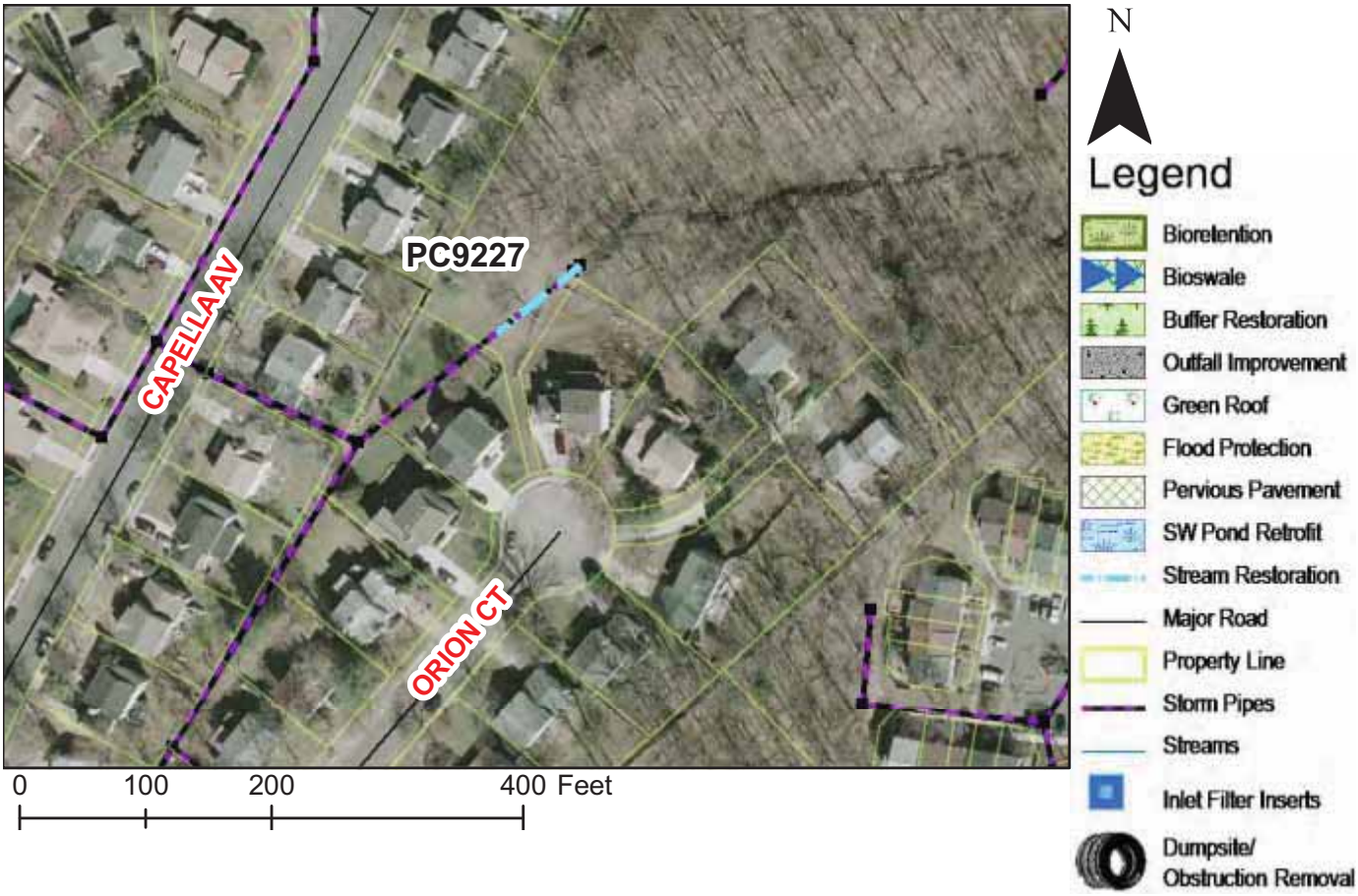
PC9227 Stream Restoration



Address: Behind 9500 Orion Court, Burke, Virginia
Location: Daylight stream near Orion Court
Land Owner: Public/Local – Fairfax County Public School
PIN: 0784 13 A
Control Type: Water quality and quantity control
Drainage Area: 9.12 acres
Receiving Waters: Tributary of Pohick Creek

Description: A closed system collects runoff from Capella Ave. and a large surrounding area, including residential development. A pipe outfalls into the stream east of Capella Drive. This stream is in wooded area behind White Oaks Elementary School. Due to poor channel morphology, this project proposes daylighting the outfall farther upstream to restore the water to its natural state before reaching the stream. Energy dissipation devices, which will consist of a series of reinforced step pools will be put in place to reduce velocity of water entering the stream.



Project Benefits: An estimated 1.03 lbs/year of phosphorus will be removed. Daylighting will help poor channel morphology by redirecting a closed system back to an aboveground channel, returning the water to its natural state. This will reduce velocities entering stream and minimize stream erosion.

Project Design Considerations: This project is on Fairfax County Public School property. The number of step pools required will be determined by the slope and length of pipe daylighted. Efforts should be made to minimize impacts to mature vegetation. Daylighting will occur in open space behind several residential houses. There is an access point on Orion Court. Pipe currently outfalls at the upstream most point of the stream. Project will extend the length of the stream. Stream section to be daylighted is close to residential lot, and therefore extra precautions may need to be taken. A construction easement may need to be obtained or slope stabilization may need to be done near the residential lot.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	90	LF	$200	$18,000
Clear and Grub	0.1	AC	$10,000	$1,000
Plantings	0.1	AC	$25,000	$2,500
Additional Cost, First 500 LF	90	LF	$200	$18,000
Erosion and Sediment Control	1	LS	10%	$3,950
Ancillary Items	1	LS	5%	$1,975
			Base Construction Cost	$45,425
			Mobilization (5%)	$2,271
			Subtotal 1	$47,696
			Contingency (25%)	$11,924
			Subtotal 2	$59,620
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$26,829
			Total	$86,449
			Estimated Project Cost	$90,000

PC9227_1.jpg View of daylighting area

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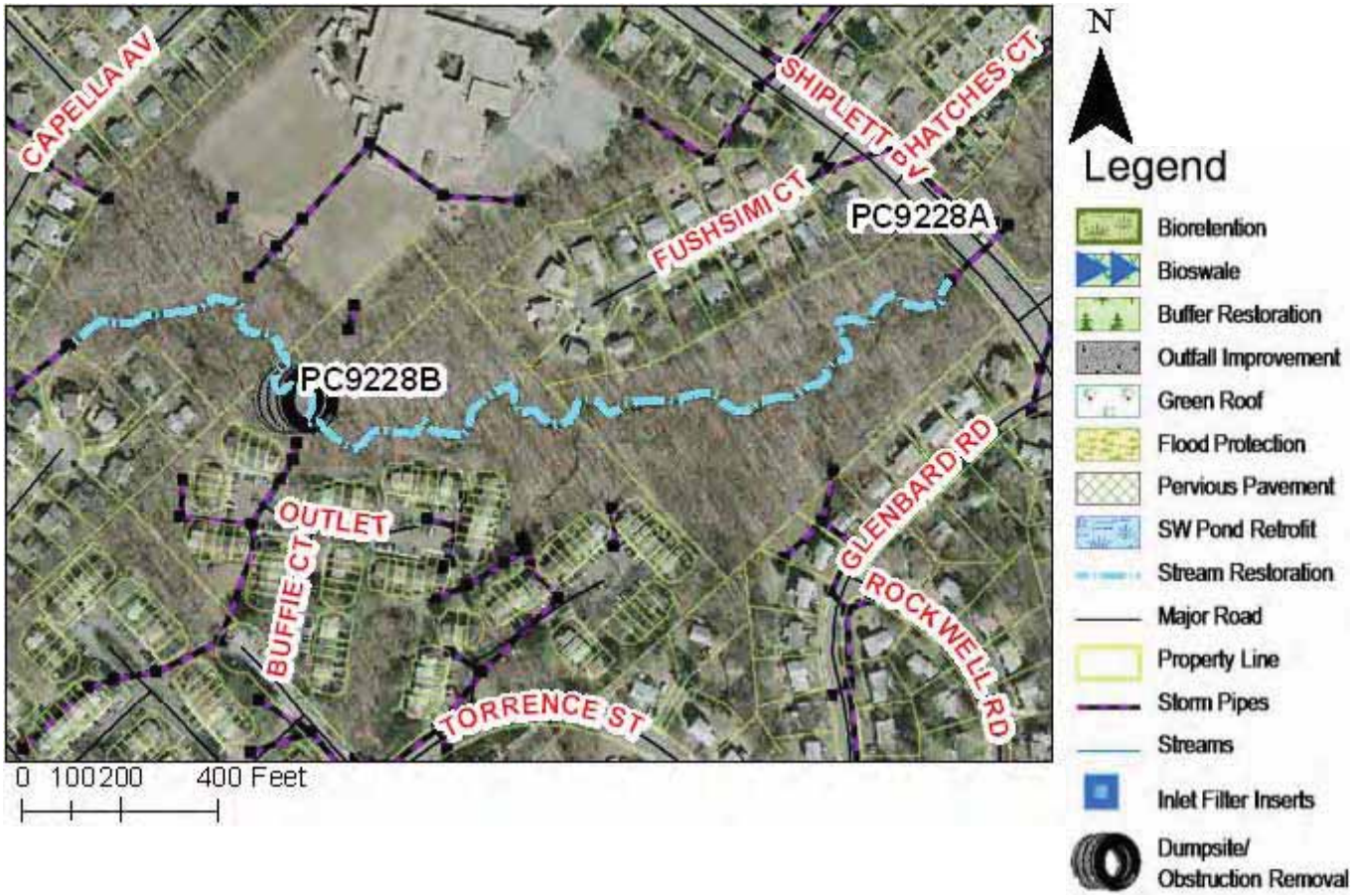
PC9228 Stream Restoration Suite

Address: Behind 6300 Glenbard Road, Burke, Virginia
Location: Stream near Glenbard Road
Land Owner: Public/Local/Private – Fairfax County Park Authority, School Board of Fairfax County, Old Mill Community Council
PIN: 0784 24 B, 0784 13 A, 0783 06 D1
Control Type: Water quality control
Drainage Area:
Receiving Waters: Tributary of Pohick Creek

Description: Subproject A is a stream restoration of the stream west of Shiplett Boulevard and northwest of Glenbard Road, and is located on Fairfax County Park Authority land. This project proposes repairing bank and bed erosion, restoring the channel morphology. Stream stabilization will reduce sediment loads to the stream while maintaining capacity of the channel and controlling unwanted meander. Subproject B is an obstruction removal in the stream north of Buffie Court and west of Orion Court. The obstruction was verified during a field visit. This project proposes to remove the obstructions blocking the stream channel to restore natural conditions. Removal of obstructions will help restore the function of the stream.



Project Benefits: Restoring 2,515 feet of this stream would reduce erosion along this section and would reduce instream sediment, resulting in an estimated 18.43 lbs/year of phosphorus removal. The obstruction removal would help improve the function of the stream and with coordination of the community could improve local stewardship of the stream.

Project Design Considerations: Streambed is excessively wide and dry. Measures should be implemented to help restore baseflow. These measures could include rock vane deflectors, which would help concentrate flow to a stable deeper baseflow channel. During larger flows caused by storm events the water would utilize the entire streambank width. Other measures to improve water quality should include improving outfall connections to the stream for the six outfalls discharging runoff from the townhomes and single family homes. A positive condition for the success of this restoration is that there is a good existing stream buffer.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Subproject A	Stream South of Fushsimi Ct.			
Construct New Channel	2515	LF	$200	$503,000
Clear and Grub	2.9	AC	$10,000	$29,000
Plantings	2.9	LS	$25,000	$72,500
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$70,450
Ancillary Items	1	LS	5%	$35,225
Subproject B	Obstruction Removal Near Lakehaven Lane.			
Obstruction Removal	1	LS	$5,250	$5,250
			Base Construction Cost	$815,425
			Mobilization (5%)	$40,771
			Subtotal 1	$856,196
			Contingency (25%)	$214,049
			Subtotal 2	$1,070,245
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$481,610
			Total	$1,551,856
			Estimated Project Cost	$1,560,000

PC9228_1.jpg Storm Pipe discharging to stream

PC9228_2 Streambed with dry weather

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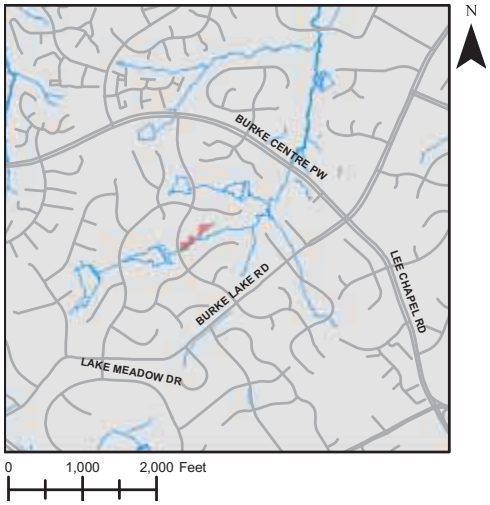
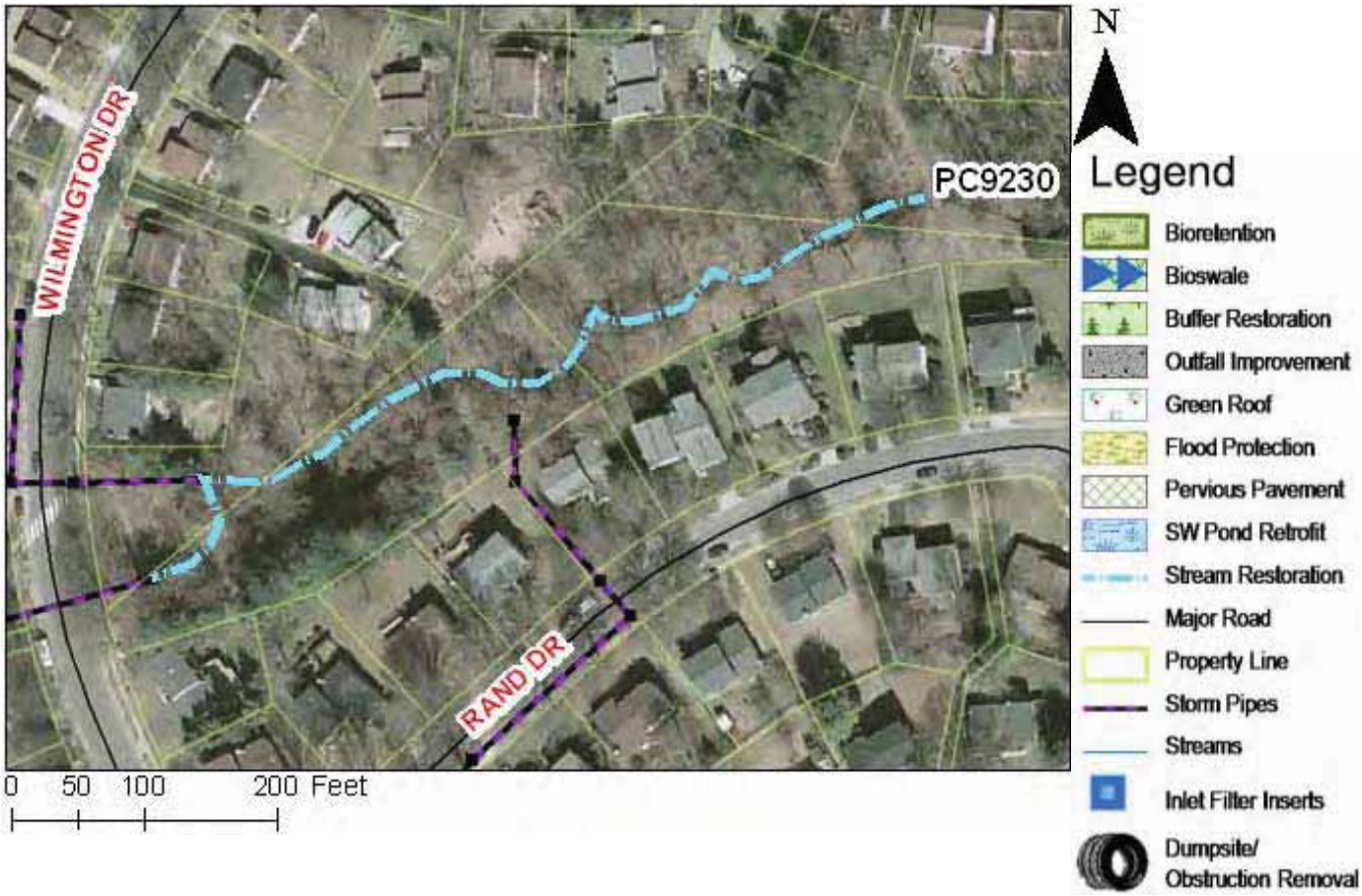
PC9230 Stream Restoration



Address: Behind 9820 Rand Drive, Burke, Virginia
Location: Stream near Rand Drive
Land Owner: Private - Burke Centre Conservancy
PIN: 0783 11 S, 0783 10 Q, 0783 10 B
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: The stream east of Wilmington Drive and north of Rand Drive has poor channel morphology. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric, and rapid vegetation establishment. The stream stabilization will reduce sediment loads while maintaining the capacity of the stream and controlling unwanted meander.



Project Benefits: Restoring 740 feet of this stream will reduce erosion and instream sediment, resulting in an estimated 6.14 lbs/year of phosphorus reduction.

Project Design Considerations: Fully developed single family residential area drains to this stream with no stormwater management. The stream has a longitudinal slope of approximately 2.5%. Upstream end of restoration is Wilmington Drive culvert. Downstream of restoration is the confluence of another stream. Significant impervious area drains to the stream and there is minimal buffer between the residential area and the stream. Stream receives sheet flow from back of houses and runoff from two storm pipe outfalls. Installing settling basins at these outfalls will reduce erosive flow velocities and reduce roadway sediment.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	740	LF	$200	$148,000
Clear and Grub	0.85	AC	$10,000	$8,500
Plantings	0.85	LS	$25,000	$21,250
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$27,775
Ancillary Items	1	LS	5%	$13,888
			Base Construction Cost	$319,413
			Mobilization (5%)	$15,971
			Subtotal 1	$335,383
			Contingency (25%)	$83,846
			Subtotal 2	$419,229
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$188,653
			Total	$607,882
			Estimated Project Cost	$610,000

PC9230_1.jpg View of Stream

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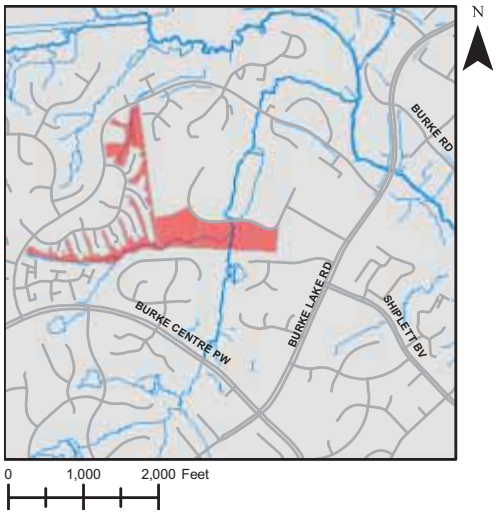
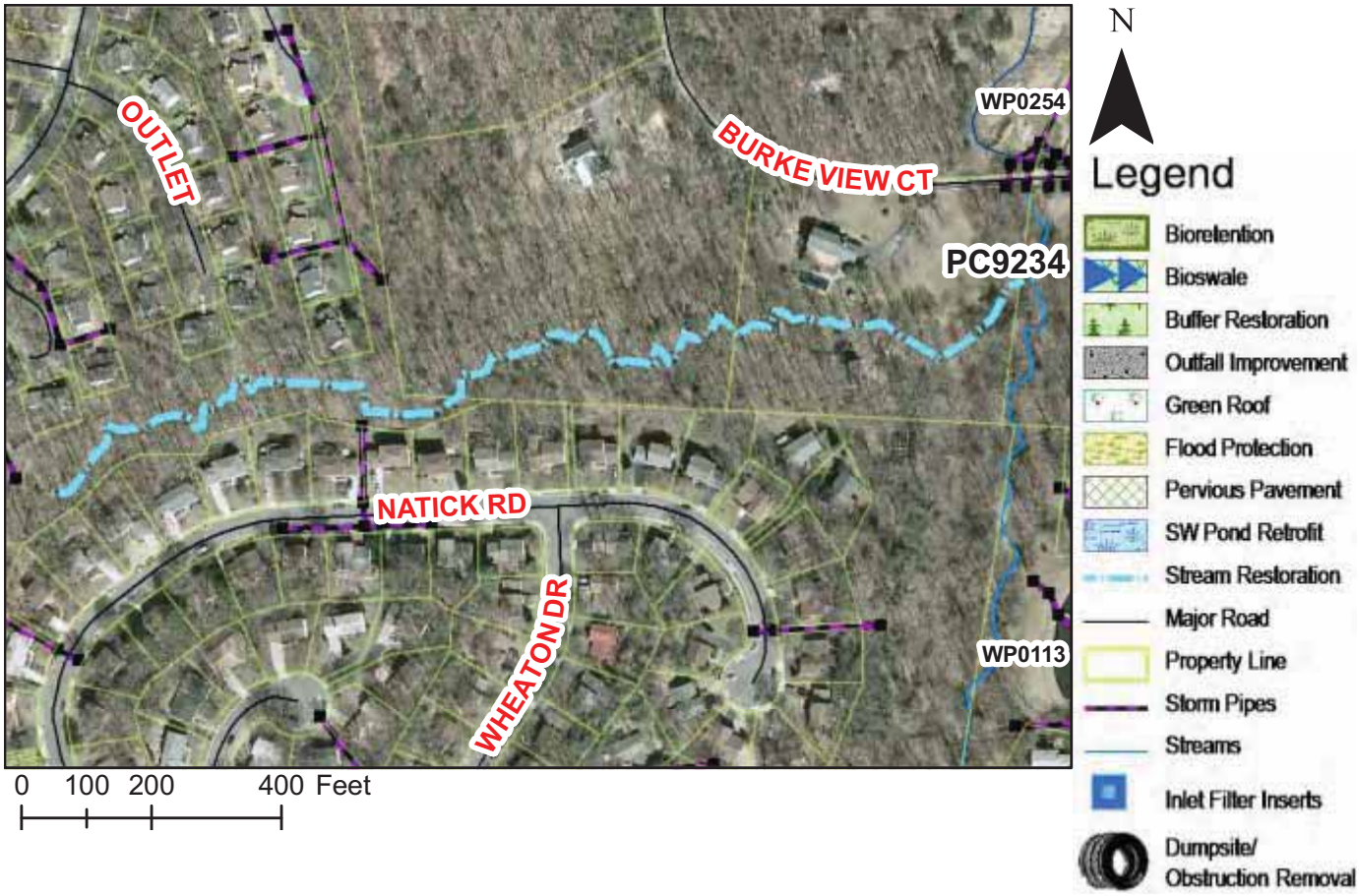
PC9234 Stream Restoration



Address: Behind 9840 Natick Rd., Burke, Virginia
Location: Stream near Natick Rd.
Land Owner: Private – Burke Centre Conservancy, Private Homeowners
PIN: 0781 14 L, 0783 02 0009A, 0783 02 0010, 0783 02 0011
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes repairing bank and bed erosion, restoring channel morphology to a stream north of Nantick Road. Stream receives runoff from a residential neighborhood by both direct runoff and from a closed system. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment. The primary indicator is poor stream stabilization.



Project Benefits: An estimated 31.72 lbs/year of phosphorus will be removed. This project will reduce sediment loads while maintaining the capacity of the stream and controlling unwanted meander. Repairing the stream erosion will also help minimize erosion of the streambanks over time.

Project Design Considerations: About half of the stream length to be restored is on property owned by the Burke Centre Conservancy, however the rest of the stream is on lots with private homeowners. According to County-provided GIS, no easements exist on these properties. Efforts should be made to insure that disturbance to existing mature vegetation is minimized.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1980	LF	$200	$396,000
Clear and Grub	2.3	AC	$10,000	$23,000
Plantings	2.3	AC	$25,000	$57,500
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$57,650
Ancillary Items	1	LS	5%	$28,825
			Base Construction Cost	$662,975
			Mobilization (5%)	$33,149
			Subtotal 1	$696,124
			Contingency (25%)	$174,031
			Subtotal 2	$870,155
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$391,570
			Total	$1,261,724
			Estimated Project Cost	$1,270,000

PC9234_1.jpg View of streambed

PC9234_2.jpg View of streambanks

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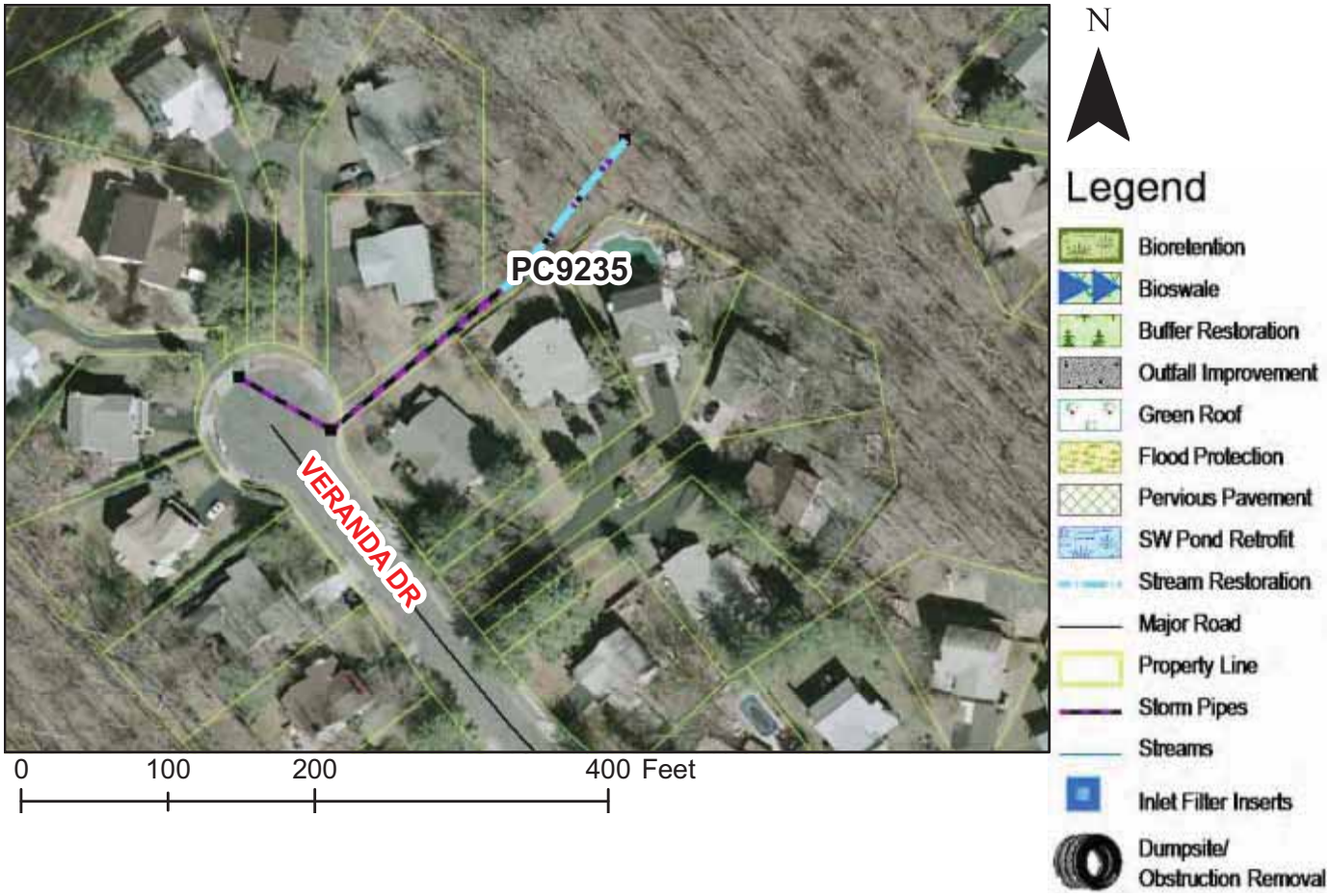
PC9235 Stream Restoration

Address: Behind 5913 Veranda Drive, Springfield, Virginia
Location: Stream near Veranda Drive
Land Owner: Private – The Crossings Homeowners Association
PIN: 0793 16 A
Control Type: Water quality and quantity control
Drainage Area: 3.12 acres
Receiving Waters: Tributary of Pohick Creek

Description: Two inlets collect runoff from Veranda Drive and pipe it to an adjacent stream to the east. Due to poor channel morphology, this project has been proposed to daylight the pipe farther upstream by creating an open channel and using an energy dissipation device. This device consists of a series of step pools reinforced with either rocks or logs. The daylighting will help reduce the velocity of the water entering the stream.



Project Benefits: An estimated 1.43 lbs/year of phosphorus will be removed. Daylighting will help poor downstream channel morphology by redirecting a closed system back to its natural state prior to entering the stream area, thereby reducing runoff rates and minimizing stream erosion.

Project Design Considerations: The property is owned by The Crossings Homeowners Association. There are no on-site easements according to the County-provided GIS. Efforts should be made to minimize impacts to existing mature vegetation.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	140	LF	$200	$28,000
Clear and Grub	0.16	AC	$10,000	$1,600
Plantings	0.16	AC	$25,000	$4,000
Additional Cost, First 500 LF	140	LF	$200	$28,000
Erosion and Sediment Control	1	LS	10%	$6,160
Ancillary Items	1	LS	5%	$3,080
			Base Construction Cost	$70,840
			Mobilization (5%)	$3,542
			Subtotal 1	$74,382
			Contingency (25%)	$18,596
			Subtotal 2	$92,978
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$41,840
			Total	$134,817
			Estimated Project Cost	$140,000

PC9235_1 View of daylighting area

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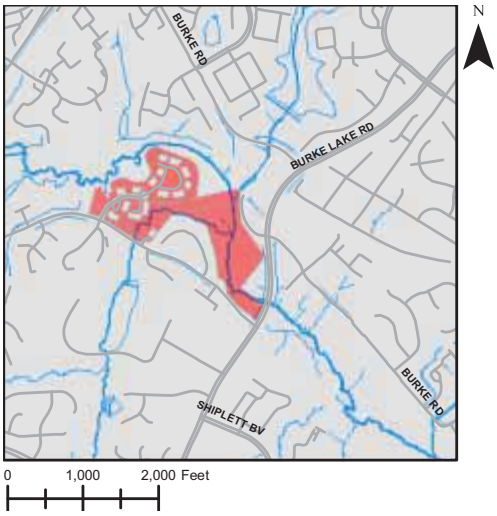
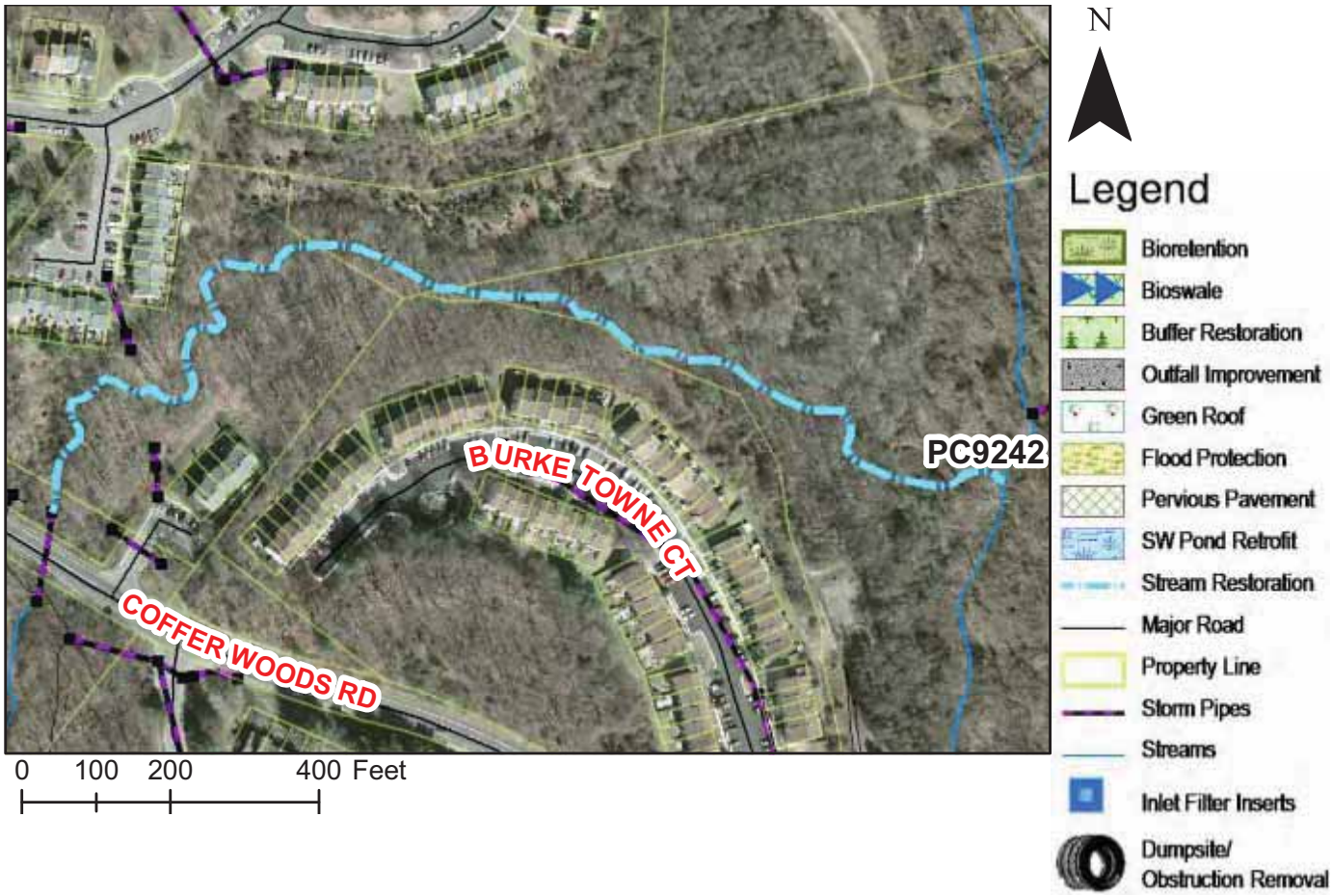
PC9242 Stream Restoration



Address: Behind 5753 Burke Towne Ct, Burke, Virginia
Location: Stream near Burke Towne Ct.
Land Owner: Public/Local – Fairfax County Park Authority
PIN: 0781 19 A, 0781 21 B, 0781 21 A, 0781 13 A3
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the repair of bank and bed erosion to a stream north of Burke Towne Court. The primary indicator is poor channel morphology. Stream receives runoff from adjacent residential neighborhood. The stream stabilization will reduce sediment loads while maintaining capacity of the stream and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment.



Project Benefits: Stabilizing 1,790 feet of this stream will reduce erosion and instream sediment, resulting in an estimated 17.49 lbs/year of phosphorus reduction. The stream stabilization will reduce sediment while maintaining the capacity and controlling unwanted meander of the stream. Project will not only repair existing erosion but prevent future erosion over time by implementing the measures above.

Project Design Considerations: Stream restoration starts at downstream point of culvert under Coffer Woods Road and extends to intersection with another stream. Stream runs close to dense residential development on Burke Towne Court and Mason Bluff Court. Stream is in dense woods. Efforts should be made to minimize impacts to existing mature vegetation.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1790	LF	$200	$358,000
Clear and Grub	2.05	AC	$10,000	$20,500
Plantings	2.05	AC	$25,000	$51,250
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$52,975
Ancillary Items	1	LS	5%	$26,488
			Base Construction Cost	$609,213
			Mobilization (5%)	$30,461
			Subtotal 1	$639,673
			Contingency (25%)	$159,918
			Subtotal 2	$799,591
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$359,816
			Total	$1,159,408
			Estimated Project Cost	$1,160,000

PC9242_1.jpg Birds eye view of stream

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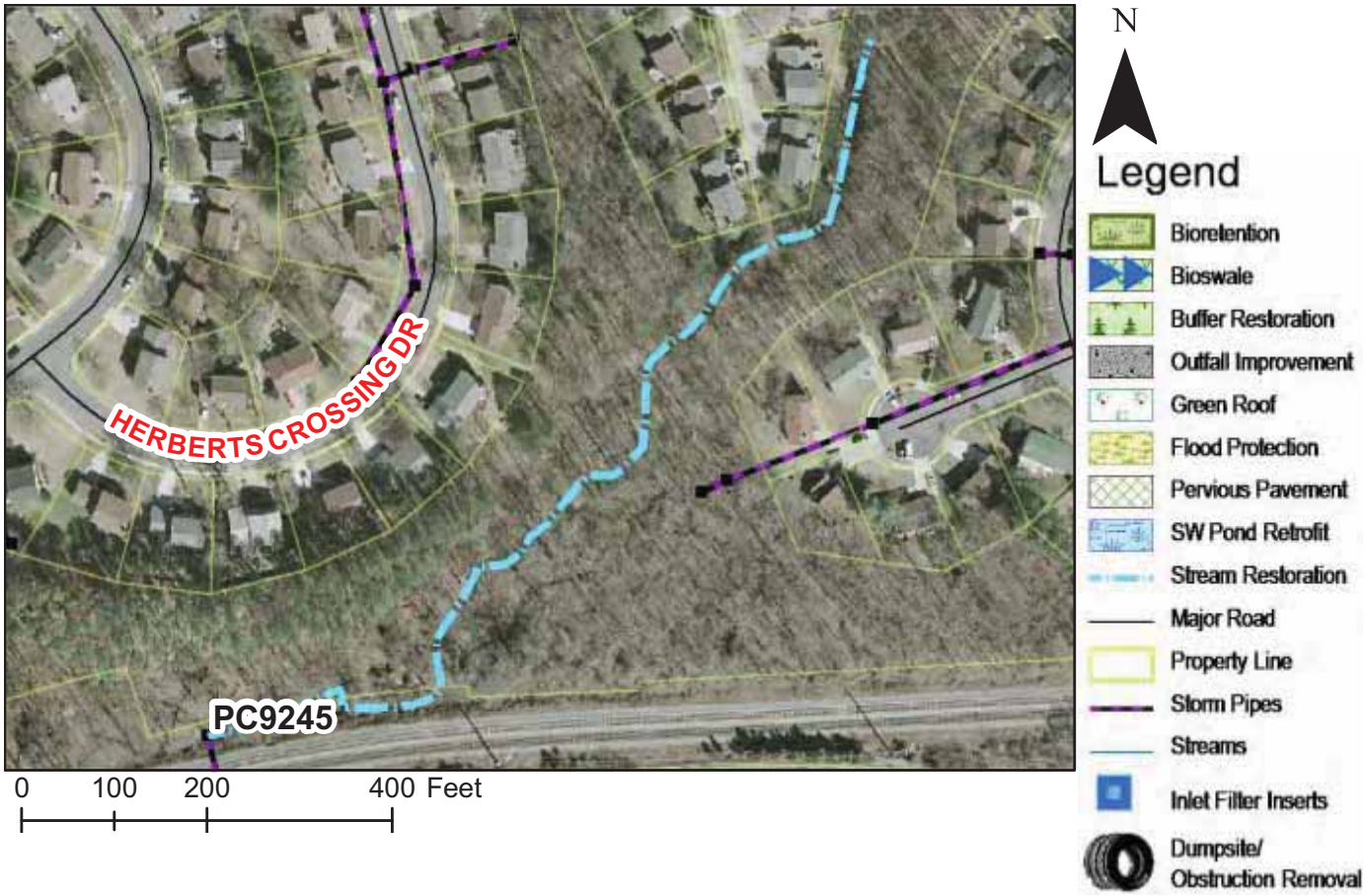
PC9245 Stream Restoration

Address: Behind 5801 Banning Pl., Burke, Virginia
Location: Stream along Burke Rd
Land Owner: Private – Signal Hill Homeowners Association, Southern Railway
PIN: 0782 14 A, 0782 01 0047
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes repairing bank and bed erosion to restore channel morphology of the stream north of Burke Road. Primary indicator is poor channel morphology. Stream conveys runoff from adjacent single family residential neighborhoods to the stream through closed systems or direct runoff. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment.



Project Benefits: An estimated 7.77 lbs/year of phosphorus will be removed. Stream stabilization will reduce sediment loads to the stream while maintaining the capacity of the channel and controlling unwanted meander. Repairing the stream erosion will also help minimize erosion of the streambanks over time. Erosion needs to be minimized, especially because of proximity to private homes.

Project Design Considerations: Stream area is surrounded by significant dense residential development. Property is owned by Signal Hill Homeowners Association and does not have any easements on it, according to County-provided GIS. Efforts should be made to minimize impacts to existing vegetation. Portions of stream are very close to private lots and roadways. Upstream portion of stream (as shown) is a concrete channel.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1210	LF	$200	$242,000
Clear and Grub	1.39	AC	$10,000	$13,900
Plantings	1.39	AC	$25,000	$34,750
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$39,065
Ancillary Items	1	LS	5%	$19,533
			Base Construction Cost	$449,248
			Mobilization (5%)	$22,462
			Subtotal 1	$471,710
			Contingency (25%)	$117,927
			Subtotal 2	$589,637
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$265,337
			Total	$854,974
			Estimated Project Cost	$860,000

PC9245_1.jpg View of stream erosion

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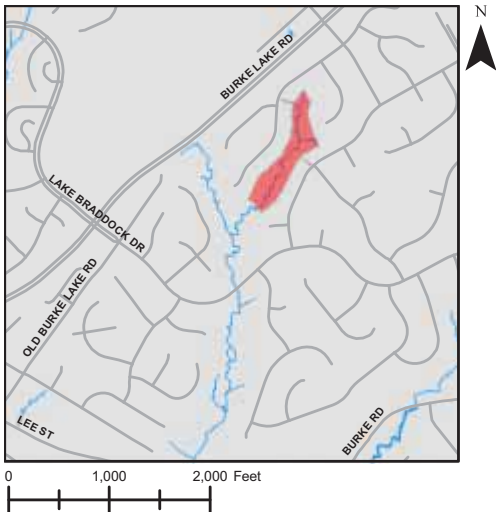
PC9249 Stream Restoration



Address: Behind 5565 Queen Victoria Court, Burke, Virginia
Location: Stream near Queen Victoria Court
Land Owner: Private – Southport Homeowners Association, Signal Hill Homes Association
PIN: 0782 19 A, 0782 16 C, 0782 14 B
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: The project is proposed on the stream northwest of Parliament Dr, and is located in the open space owned by Signal Hill Homes Association. This project proposes to repair bank and bed erosion and restore channel morphology. The primary indicator is poor channel morphology. Stream stabilization will reduce sediment loads while maintaining capacity and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric, and rapid vegetation establishment.

Project Benefits: Restoring 1,550 feet of this impaired stream will reduce erosion and instream sediment, resulting in an estimated 54.8 lbs/year of phosphorus removal. The restoration will improve the three stormwater outfalls to this section of the stream and will reduce the roadway sediment loading to the stream.

Project Design Considerations: This restoration is located in the Signal Hills open space. It appears that the Signal Hills development has no stormwater facilities. This area appears completely developed, so the channel's geomorphology should be stable making this site favorable for stream improvements. Possible stream bank repair measures include rootwad revetments, streambank shaping, erosion control fabrics, or live stakes.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1550	LF	$200	$310,000
Clear and Grub	1.78	AC	$10,000	$17,800
Plantings	1.78	AC	$25,000	$44,500
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$47,230
Ancillary Items	1	LS	5%	$23,615
			Base Construction Cost	$543,145
			Mobilization (5%)	$27,157
			Subtotal 1	$570,302
			Contingency (25%)	$142,576
			Subtotal 2	$712,878
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$320,795
			Total	$1,033,673
			Estimated Project Cost	$1,040,000

PC9249_1.jpg View of stream

PC9249_2.jpg View of stream

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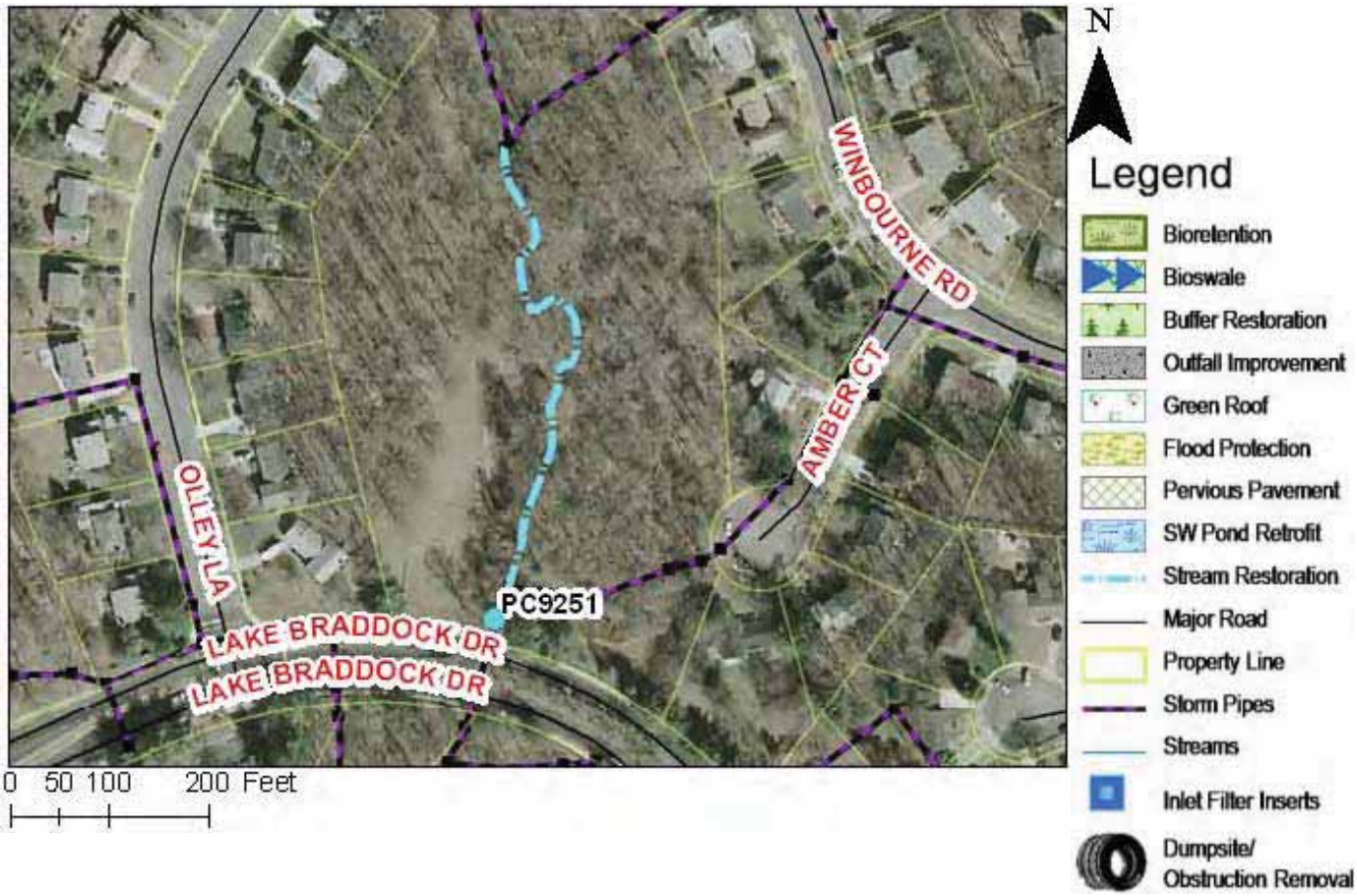
PC9251 Stream Restoration

Address: Behind 9313 Winbourne Road, Burke, Virginia
Location: Stream near Winbourne Road
Land Owner: Private – Lake Braddock Community Association
PIN: 0694 10 A
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: The stream is located between Olley Lane and Winbourne Road. The stream conveys runoff from adjacent roads and single family residential neighborhoods. Stream conveys runoff from both a closed system and sheet flow from roads and homes to the north, east and west. The banks of the existing stream are significantly eroded. This project proposes repairing bank and bed erosion to restore channel morphology.



Project Benefits: An estimated 5.10 lbs/year of phosphorus will be removed. Stream stabilization will reduce sediment loads to the stream, maintain the capacity of the stream channel, and control unwanted meander. These measures will help reduce the erosion that is occurring over time.

Project Design Considerations: Existing stream bed is dry and appears to have been reinforced with riprap in sections. The restoration will focus on improving the connection of the three storm pipes to the stream. Areas of streambed erosions will be stabilized by using bank shaping techniques such as rock toe enforcements, bank revegetation, and erosion control fabric reinforcements. The stream is located on open space property.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	570	LF	$200	$114,000
Clear and Grub	0.65	AC	$10,000	$6,500
Plantings	0.65	AC	$25,000	$16,250
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$23,675
Ancillary Items	1	LS	5%	$11,838
			Base Construction Cost	$272,263
			Mobilization (5%)	$13,613
			Subtotal 1	$285,876
			Contingency (25%)	$71,469
			Subtotal 2	$357,345
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$160,805
			Total	$518,150
			Estimated Project Cost	$520,000

PC9251_1.jpg Meandering section of stream

PC9251_2.jpg Dry stream bed

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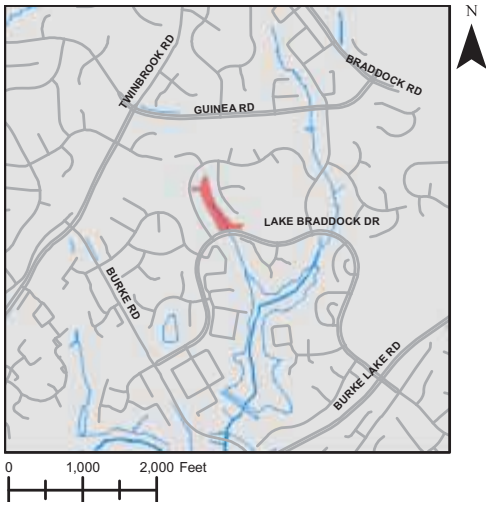
PC9252 Stream Restoration



Address: Next to 9535 Wallingford Drive, Burke, Virginia
Location: Stream near Wallingford Drive
Land Owner: Private – Lake Braddock Homeowners Association
PIN: 0693 06 G
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes repairing bank and bed erosion to restore channel morphology of the stream near Wallingford Drive. Stream stabilization will reduce sediment loads to the stream while maintaining the capacity and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe of slope protection, erosion control fabric, and rapid vegetation establishment. Stream is adjacent to the roadway.

Project Benefits: Restoring 400 feet of this stream will reduce erosion and instream sediment, resulting in an estimated 2.17 lbs/year of phosphorus reduction.

Project Design Considerations: This stream is located in the Lake Braddock open space and is near a stream daylighting project (PC9253 – middle left of restoration length) and a bioswale project (PC9544C – southeast of cul-de-sac). This project should be coordinated with the other project to maximize its benefits and minimize costs. This stream receives runoff from an upstream culvert and two other storm pipe outfalls.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	400	LF	$200	$80,000
Clear and Grub	0.46	AC	$10,000	$4,600
Plantings	0.46	AC	$25,000	$11,500
Additional Cost, First 500 LF	400	LF	$200	$80,000
Erosion and Sediment Control	1	LS	10%	$17,610
Ancillary Items	1	LS	5%	$8,805
			Base Construction Cost	$202,515
			Mobilization (5%)	$10,126
			Subtotal 1	$212,641
			Contingency (25%)	$53,160
			Subtotal 2	$265,801
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$119,610
			Total	$385,411
			Estimated Project Cost	$390,000

PC9252_1.jpg View of Stream Section

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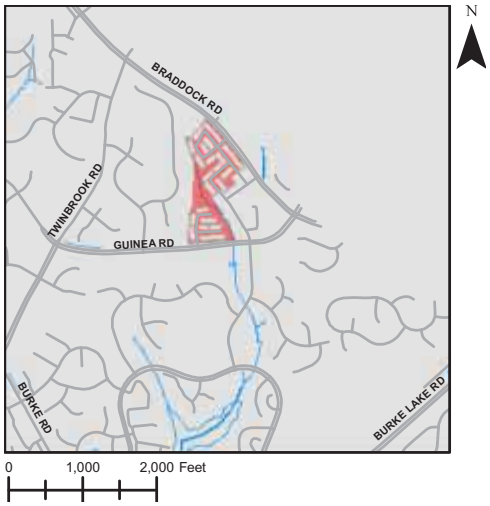
PC9257 Stream Restoration



Address: Next to 9404 Fairleigh Court, Burke, Virginia
Location: Stream near Fairleigh Court
Land Owner: Private –Lake Braddock Community Association
PIN: 0694 11 C, 0694 11 D
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project consists of restoration of a stream near Fairleigh Court, which receives runoff from closed storm systems that drain residential neighborhoods. The primary indicator is poor channel morphology. Stream stabilization will reduce sediment loads to the stream while maintaining stream capacity and controlling unwanted meander. The project will improve storm outfalls to the stream and daylight a portion of the storm system.

Project Benefits: Improving 350 LF of this stream will reduce erosion from this section of the stream. This will remove an estimated 3.18 lbs/year of phosphorus. Improving the storm pipe outfalls to stream bed connections will help reduce sediment from the untreated roadway runoff. Daylighting the storm pipe will allow for greater infiltration, baseflow, and a decrease in stormwater temperature.

Project Design Considerations: Project is just downstream of another pipe daylighting project, PC9258. Both projects are located on Lake Braddock open space. This stream is believed to be a primary source of downstream sediment. In fact, the dry pond downstream has recently been cleaned, but there is concern of the pond having insufficient infiltration of stormwater due to sediment clogging the pond floor. Daylighting the upstream storm system and creating sediment forebays for the storm outfalls will help reduce sediment, improve water quality, and increase infiltration. Currently the stream is dry, eroded, and has debris (see photo).

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	350	LF	$200	$70,000
Clear and Grub	0.4	AC	$10,000	$4,000
Plantings	0.4	AC	$25,000	$10,000
Additional Cost, First 500 LF	350	LF	$200	$70,000
Erosion and Sediment Control	1	LS	10%	$15,400
Ancillary Items	1	LS	5%	$7,700
			Base Construction Cost	$177,100
			Mobilization (5%)	$8,855
			Subtotal 1	$185,955
			Contingency (25%)	$46,489
			Subtotal 2	$232,444
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$104,600
			Total	$337,043
			Estimated Project Cost	$340,000

PC9257_1 Dry stream bed with debris

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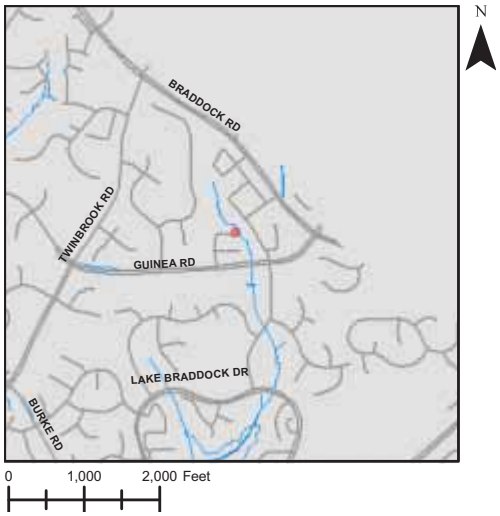
PC9258 Stream Restoration



Address: Next to 5101 Dahlgreen Place, Burke, Virginia
Location: Stream near Dahlgreen Place
Land Owner: Private – Lake Braddock Community Association
PIN: 0694 11 D
Control Type: Water quality and quantity control
Drainage Area: 4.98 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes daylighting a pipe from a residential neighborhood (Dahlgreen Place) farther upstream. The primary indicator is poor channel morphology. This project will return the water to its natural state. This will reduce the velocity at which stormwater enters the stream. Additionally, the daylighting will provide more opportunity for the stormwater to infiltrate. This will help reduce runoff rates and stream erosion.

Project Benefits: Restoring 115 feet of this stream will lessen the amount of erosion downstream and result in less instream sediment. An estimated 1.02 lbs/year of phosphorus will be removed by this project. Daylighting this pipe will allow the stormwater to return to a natural state earlier, which will allow the water to infiltrate better and will help reduce erosive velocities.

Project Design Considerations: This project is located in Lake Braddock Community open space. Records show no easements. Stormwater runoff from these townhouses receives no treatment before being directly discharged to the stream. The existing outfall is reinforced with rip rap, but still shows signs of scour from erosive velocities. Daylighting the existing pipe farther upstream would increase the chance for the stormwater to infiltrate and for vegetation to absorb/ breakdown some of the pollutants. Depending on the slope of the pipe, stepping pools may be required. Other measures at this site could be the creation of storage below the outfall.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	115	LF	$200	$23,000
Clear and Grub	0.15	AC	$10,000	$1,500
Plantings	0.15	AC	$25,000	$3,750
Additional Cost, First 500 LF	115	LF	$200	$23,000
Erosion and Sediment Control	1	LS	10%	$5,125
Ancillary Items	1	LS	5%	$2,563
			Base Construction Cost	$58,938
			Mobilization (5%)	$2,947
			Subtotal 1	$61,884
			Contingency (25%)	$15,471
			Subtotal 2	$77,355
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$34,810
			Total	$112,165
			Estimated Project Cost	$120,000

PC9258_1.jpg Stormwater outfall to be removed and stream daylighted farther upstream

PC9258_2.jpg Bird's eye view of area where stream will be daylighted (looking from the west)

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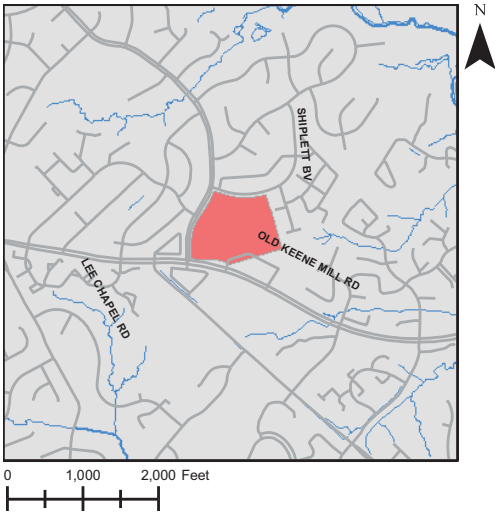
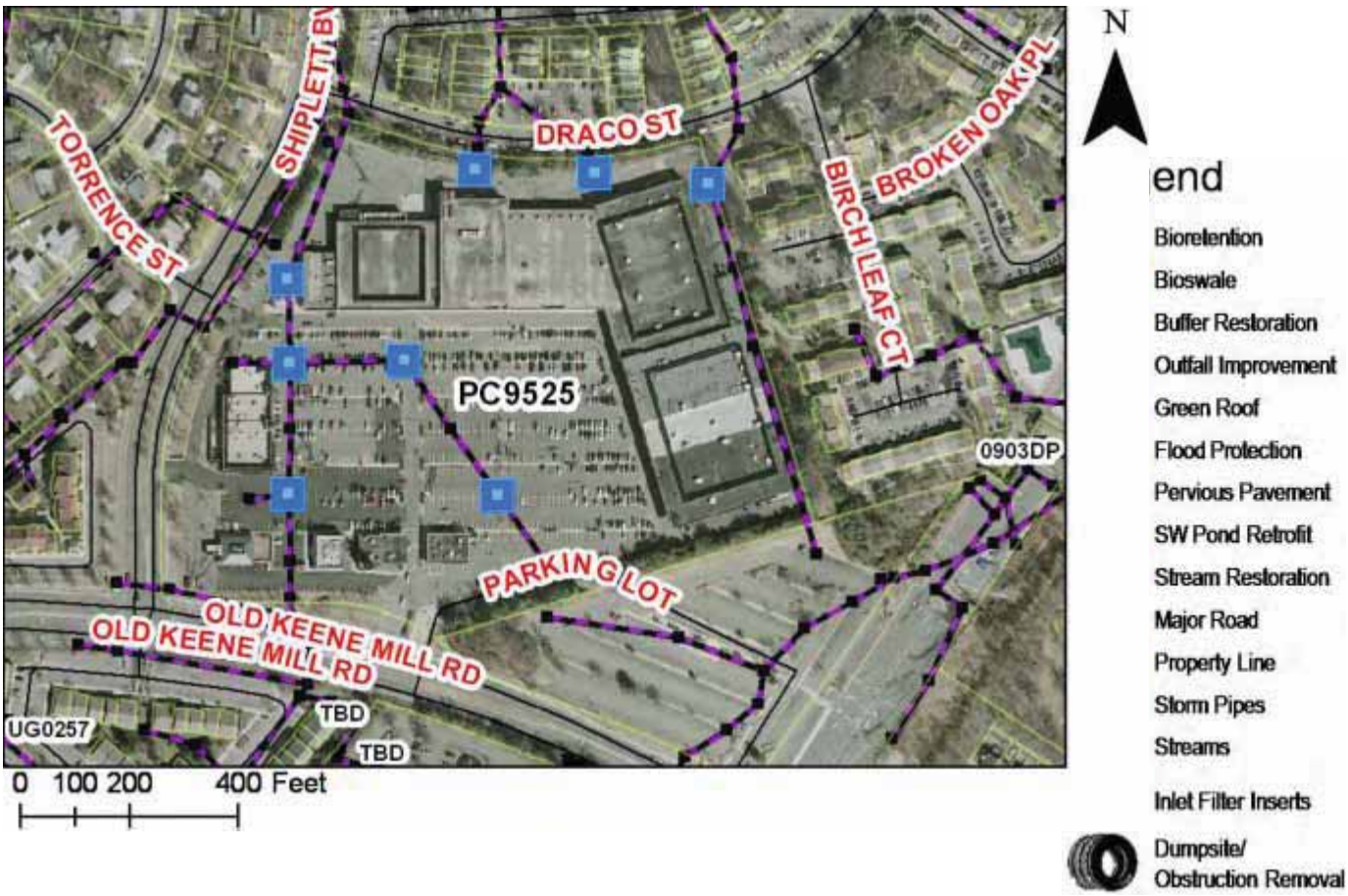
PC9525 BMP/LID



Address: 9230 Old Keene Mill Rd., Burke, Virginia
Location: Rolling Valley Mall
Land Owner: Private – Rolling Valley Mall, LLC
PIN: 0882 01 0004A
Control Type: Water quality control
Drainage Area: 18.46 acres
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the incorporation of BMP inlet inserts or manufactured BMP filtration systems to provide pollutant removal at Rolling Valley Mall north of Old Keene Mill Road. Typical inserts act as baskets that collect sediment and larger debris such as trash and leaves. Filters should be selected to target the known pollutants. The filters need to be cleaned on a routine basis, typically every 6 months. The primary indicators are pollutants including nitrogen, phosphorus and total suspended solids. Filtration will capture and treat stormwater runoff from highly impervious areas prior to entering the storm drain system.



Project Benefits: An estimated 10.68 lbs/year of phosphorus will be removed. The shopping center is highly impervious and is not treated before ultimately discharging into a stream. This project will treat the on-site runoff before it leaves the site. This will greatly reduce the pollutants entering the stream from this site. This retrofit method is the best solution due to this site's space limitations.

Project Design Considerations: Inserts should be placed at several inlets on site that will have the greatest benefit without exceeding the capacity of the system in place. In order to keep cost down, the existing system should be utilized to the greatest extent possible. A maintenance schedule will need to be enforced to ensure maximum benefits.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Manufactured BMP	8	LS	$10,000	$80,000
Plantings	1	LS	5%	$2,500
Ancillary Items	1	LS	5%	$2,500
Erosion and Sediment Control	1	LS	10%	$5,000
			Base Construction Cost	$90,000
			Mobilization (5%)	$4,500
			Subtotal 1	$94,500
			Contingency (25%)	$23,625
			Subtotal 2	$118,125
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$53,156
			Total	$171,281
			Estimated Project Cost	$180,000

PC9525_1.jpg View of parking area

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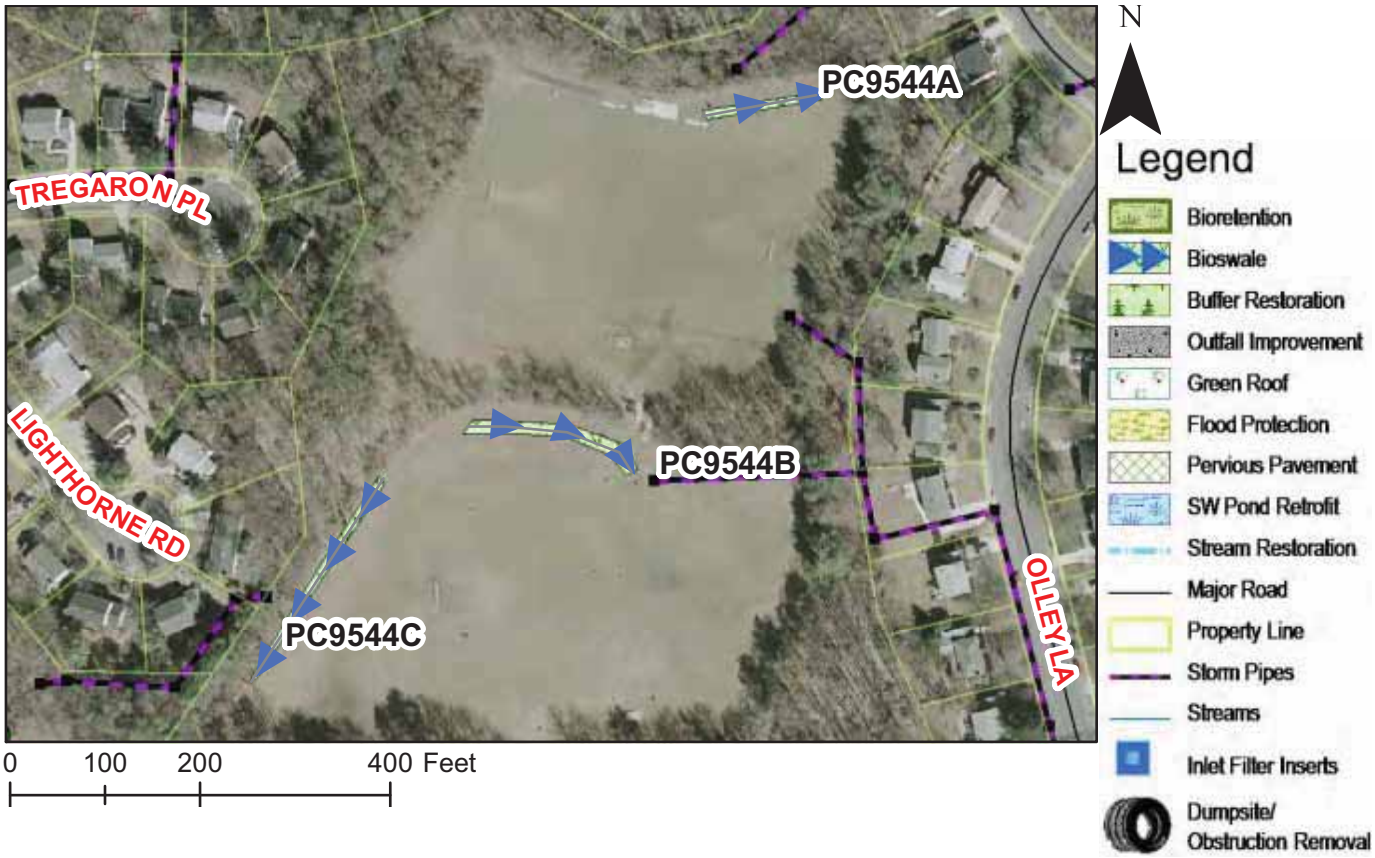
PC9544 Suite of BMP/LID Projects

Address: 9450 Lake Braddock Dr., Burke, Virginia
Location: Lake Braddock Park
Land Owner: Public/Local – Fairfax County Park Authority
PIN: 0693 06 P
Control Type: Water quality and quantity control
Drainage Area: 0.96 acres
Receiving Waters: Tributary of Pohick Creek

Description: This suite of projects proposes the installation of bioswales at Lake Braddock Park near the game fields. The bioswales would receive sheet flow from the fields and would increase infilitration and reduce pollutants, such as excessive fertilizer, grass clippings or animal waste. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids.



Project Benefits: An estimated 1.51 lbs/yr of phosphorus will be removed if all three bioswales are installed. The bioswales will capture sheet flow and create an ideal environment for filtration, biological uptake and microbial activity, providing both pollutant removal and groundwater recharge.

Project Design Considerations: There appears to be adequate open space for construction of the bioswales. These bioswales would provide a good education opportunity. The existing storm pipes are not in easements, but the park is owned by Fairfax County Park Authority. Two stream restoration projects are in the vicinity, projects PC9251 and PC9252. Coordination and sequencing of these projects should be considered to allow sharing of mobilization fees and staging areas.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Subproject A				
Percolation/Infiltration Trench	125	SY	$75	$9,375
Subproject B				
Percolation/Infiltration Trench	290	SY	$75	$21,750
Subproject C				
Percolation/Infiltration Trench	230	SY	$75	$17,250
Plantings	1	LS	5%	$2,419
Ancillary Items	1	LS	5%	$2,419
Erosion and Sediment Control	1	LS	10%	$4,838
			Base Construction Cost	$58,050
			Mobilization (5%)	$2,903
			Subtotal 1	$60,953
			Contingency (25%)	$15,238
			Subtotal 2	$76,191
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$34,286
			Total	$110,476
			Estimated Project Cost	$120,000

PC9544_1.jpg View of Proposed Bioswale Area

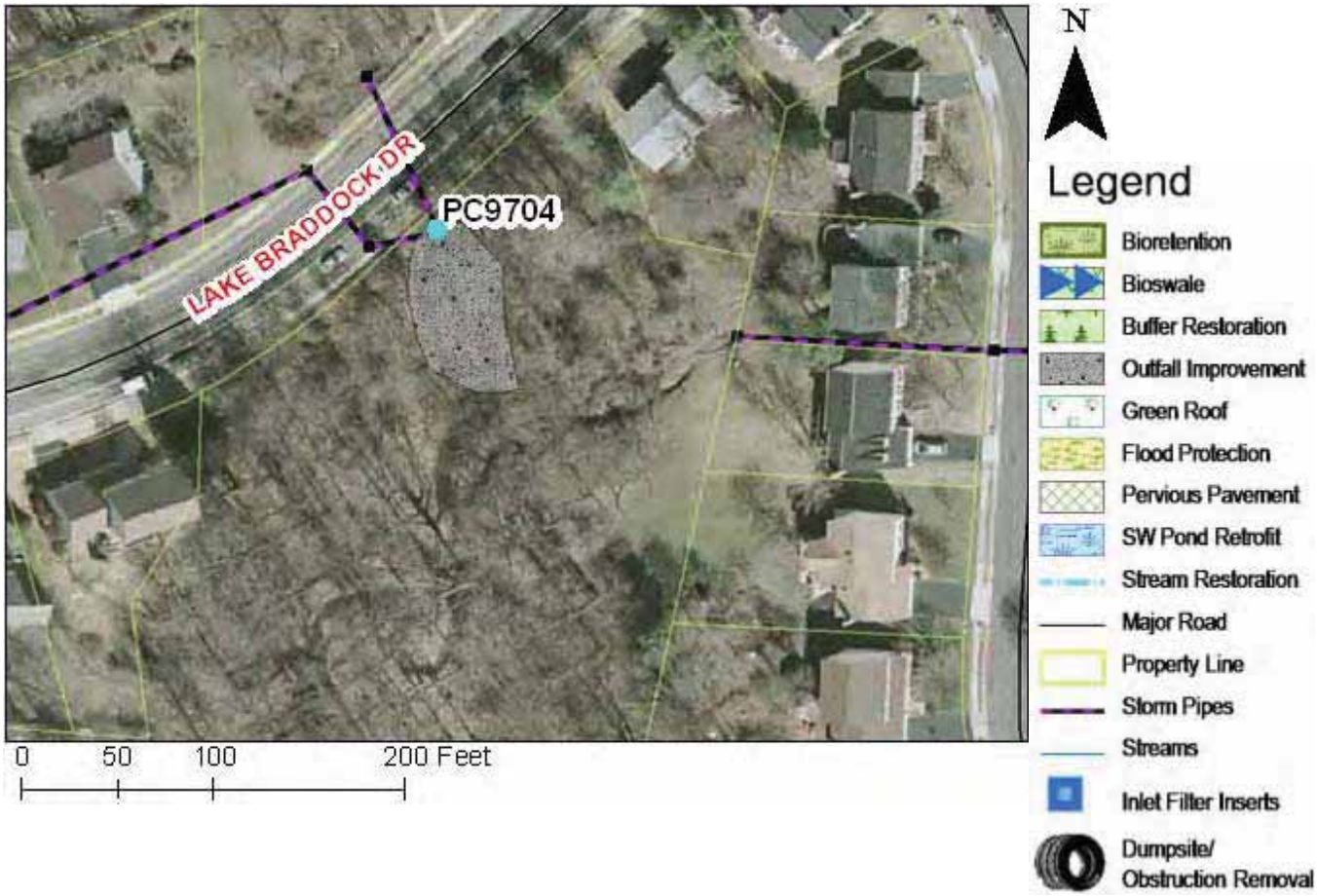
PC9544_2.jpg View of Proposed Bioswale Area

PC9544_3.jpg View of Proposed Bioswale Area

PC9704 Outfall Improvement

Address: Next to 9199 Lake Braddock Drive, Burke, Virginia
Location: Outfall near Lake Braddock Drive
Land Owner: Private – Southport Homeowner's Association
PIN: 0782 19 B1
Control Type: Water quality and quantity control
Drainage Area: N/A
Receiving Waters: Tributary of Pohick Creek

Description: This project proposes the construction of a new storage and treatment area below the outfall of a closed system from Lake Braddock Drive. The improvement will include an energy dissipation device and wetland plantings. The primary indicators include instream sediment. Outfall storage will reduce erosive velocities and sediment loads at the outfall and improve downstream habitats.



Project Benefits: The new storage and treatment area will reduce the velocity of runoff entering the stream and help minimize erosion. The settling basin will decrease the debris and sediment contributed to the stream by the untreated runoff from the closed stormwater collection system

Project Design Considerations: This project is located in Southport open space. The project is located in Southport HOA open space. Records show no existing stormwater easements. This area receives flow from two stormwater pipes. One pipe conveys the runoff from Lake Braddock Dr. and has no prior stormwater quality or quantity management. The pipe is a culvert to convey water under Lake Braddock Dr. This project would consist of a settling basin and possible level spreader. The area of the proposed project is relatively flat.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$8,500	$850
Grading and Excavation	6700	CY	$35	$234,500
Plantings	1	LS	5%	$11,768
Ancillary Items	1	LS	5%	$11,768
Erosion and Sediment Control	1	LS	10%	$23,535
			Base Construction Cost	$282,420
			Mobilization (5%)	$14,121
			Subtotal 1	$296,541
			Contingency (25%)	$74,135
			Subtotal 2	$370,676
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$166,804
			Total	$537,481
			Estimated Project Cost	$540,000

PC9704_1.jpg Dry stream at culvert outfall

PC9704_2.jpg Bird's eye view of outfall area looking from the west

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5.10 Pohick – Upper South Run Watershed Management Area

Upper South Run Watershed Management Area has a total area of approximately 3.19 square miles and is comprised of 11 subwatersheds. It is located in the western part of the Pohick Creek Watershed. It is roughly bounded on the west and south by Ox Road and to the north by Fairfax County Parkway.

The WMA has approximately 12.90 miles of stream, which primarily flow from north to south, ultimately reaching Burke Lake. Burke Lake accounts for approximately 10 percent of the surface area of the WMA. The area consists mainly of single-family residential homes. Land cover consists primarily of impervious surfaces related to residential development (i.e., rooftops, sidewalks and roadways) and landscaping, including managed turf. The area is 11 percent impervious. Notable features of the WMA are Burke Lake Park (including golf course), approximately two miles of Fairfax County Parkway and the Fairfax Baptist Temple and Academy.

In the Upper WMA the most prevalent stream condition features noted include disturbed stream buffers and stream channel widening and erosion/incision. In addition, pipes and ditches discharging into the WMA's streams have demonstrated impacts, including some severe impacts on the main stem of Pohick Creek. These pipes and ditches discharge stormwater runoff directly into the streams in many instances, contributing to the observed widening and erosion conditions.

The watershed restoration projects proposed in the 10-year plan for this WMA include: retrofitting stormwater ponds and a stream restoration. No non-structural projects are proposed in the 10-year plan. Descriptions of the 0 – 10-year plan follow. Also, a map of this WMA and a list of all the projects proposed in it are provided. For more information see the 0 – 10-year-plan project fact sheets at the end of this section.

5.10.1 Structural Projects

PC9003 Stormwater Pond Retrofit

This project is proposed to retrofit an existing regional pond (0922DP), north of Fairfax County Parkway and south of Lake Meadow Drive, into a constructed wetland system with a sediment forebay and bench planting. This pond is upstream of another pond, and is located across Lake Meadow Drive. The primary problem indicators are poor wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids.

PC9004 Stream Restoration Suite

The first subproject is the stabilization of the stream upstream of Burke Lake. The main indicator is poor channel morphology. This project is proposed to repair bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The second subproject is proposed to remove an obstruction south of Burke Lake Road, east of the pond. The obstruction was verified during field visit.

PC9007 Stormwater Pond Retrofit

The dry pond northeast of Fairfax County Parkway receives runoff from adjacent neighborhoods and outfalls into culvert under the road and ultimately into the stream. This project is proposed to retrofit the pond to create a wetland system with a sediment forebay and bench planting. The sediment forebay will provide pretreatment of stormwater runoff and the bench planting will increase pollutant removal. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids.

PC9008 Stormwater Pond Retrofit

This project is proposed to retrofit of an existing stormwater pond southeast of Rice Field Place to create an extended detention dry pond with sediment forebays and additional planting. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids. The pond collects runoff from a large drainage area that is mostly single-family residential development and roadways. Three separate systems outfall into the pond. All outfalls will have a forebay installed to collect coarse sediments and debris. The pond outfalls into a stream at the south end.

PC9121 Stormwater Pond Retrofit

This project is proposed to retrofit an existing pond northeast of Fairfax County Parkway at Burke Community Church. The project will create a wetland system with construction of a sediment forebay and the addition of low marsh and high marsh plantings. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids. The pond receives runoff from the church and parking lot. The retrofit will modify the existing pond to increase pollutant removal and to provide adequate channel protection. The retrofit will create a better functioning environment for gravitational settling, biological uptake and microbial activity.

PC9124 Stormwater Pond Retrofit

This project is proposed to retrofit two connecting ponds at Fairfax Baptist Temple Academy to create an extended detention dry pond with sediment forebays. The retrofit will install sediment forebays on the inflow pipes, remove the pilot channels, add an aquatic bench with an engineered landscaping plan and modify the outlet structure to increase the stormwater treatment time. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids. The pond is bisected by an access road. A pipe goes under the access road to connect the two ponds.

PC9223 Stream Restoration

This stream outfalls into a pond northeast of Lake Meadow Drive. It collects runoff by sheetflow from an adjacent single-family housing development. The primary indicator is poor channel morphology. The project proposes repairing bank and bed erosion, thereby restoring channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment.

5.10.2 Non-Structural Projects

No projects are proposed.

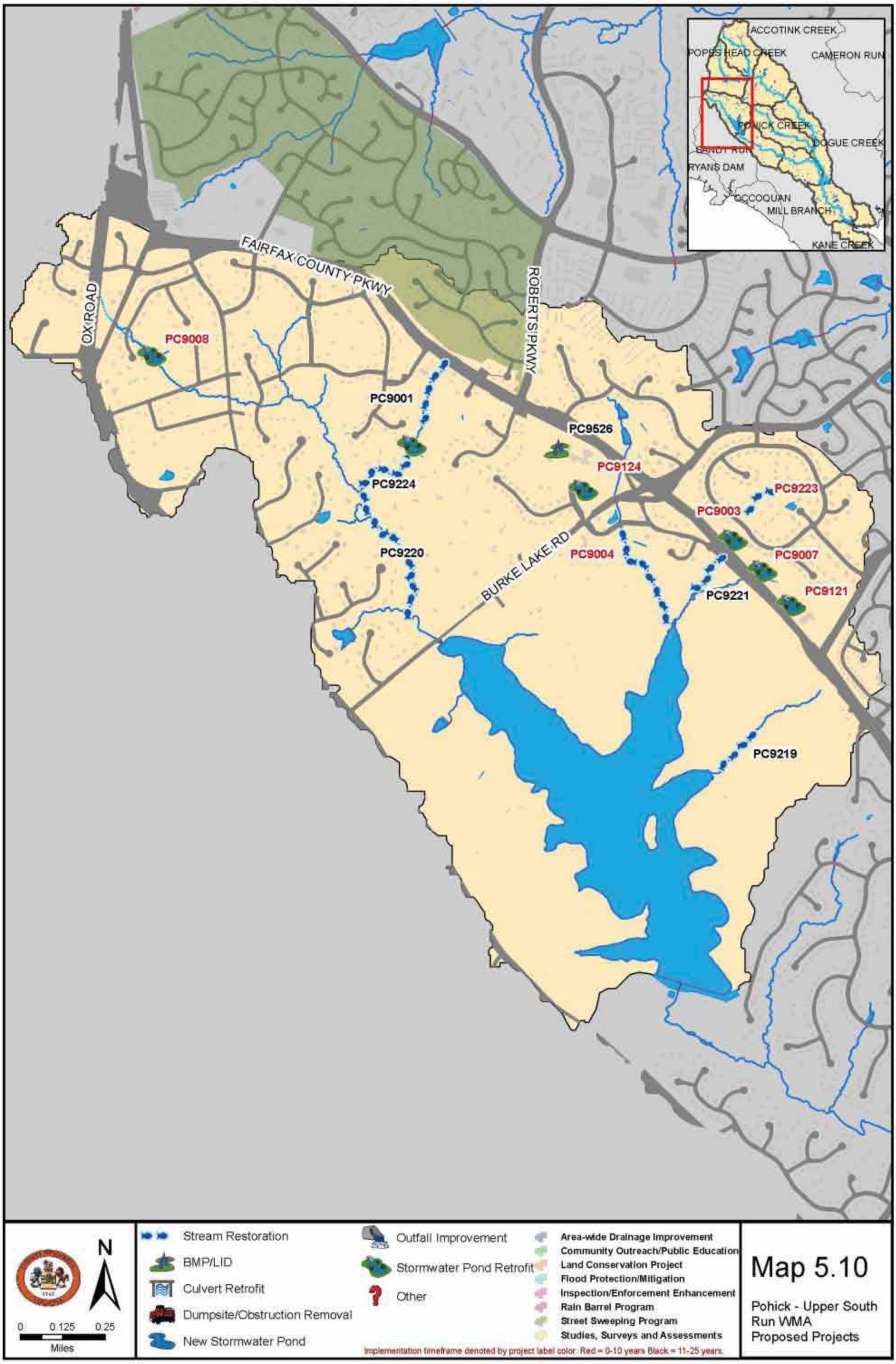

ACCOTINK CREEK
POPES HEAD CREEK
CAMERON RUN
POHICK CREEK
DOGUE CREEK
SANDY RUN
RYANS DAM
OCCOQUAN
MILL BRANCH
KANE CREEK
FAIRFAX COUNTY PKWY
OX ROAD
ROBERTS PKWY
BURKE LAKE RD
PC9008
PC9001
PC9526
PC9124
PC9223
PC9003
PC9224
PC9220
PC9004
PC9007
PC9121
PC9221
PC9219
N
0 0.125 0.25
Miles
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Area-wide Drainage Improvement
Community Outreach/Public Education
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments
Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.
Map 5.10
Pohick - Upper South Run WMA Proposed Projects

Table 5-10: Project List - WMA (Pohick - Upper South Run)

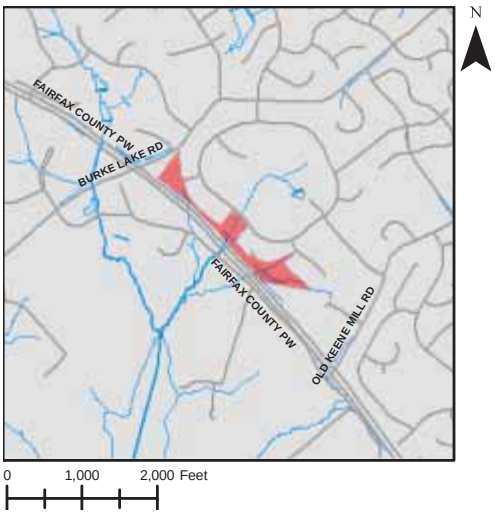
Structural Projects[1]						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PC9003	Stormwater Pond Retrofit	PC-SR-0022	Next to 6424 Lake Meadow Dr.	Water quality and quantity control	Private - HOA	0-10
PC9004	Stream Restoration Suite	PC-SR-0020	Near 10127 Lakehaven La., Accotink Unitarian Church	Water quality control	Public/Local - FCPA	0-10
PC9007	Stormwater Pond Retrofit	PC-SR-0020	Behind 6416 Lake Meadow Dr.	Water quality and quantity control	Private - HOA	0-10
PC9008	Stormwater Pond Retrofit	PC-SR-0026	Next to 10995 Rice Field Pl.	Water quality and quantity control	Private - Residential	0-10
PC9121	Stormwater Pond Retrofit	PC-SR-0020	9900 Old Keene Mill Rd. , Burke Community Church	Water quality and quantity control	Private - Church	0-10
PC9124	Stormwater Pond Retrofit	PC-OS-0001	6401 Missionary La., Fairfax Baptist Temple Academy	Water quality and quantity control	Private - Church	0-10
PC9223	Stream Restoration	PC-SR-0022	Between Waterside Dr. & Burke Woods Dr.	Water quality control	Private - HOA	0-10
PC9001	Stormwater Pond Retrofit Suite	PC-SR-0024	Across from 10503 Pohick Ct., Church of Latter Day Saints	Water quality and quantity control	Public/Local - FCPA, Private - Residential, Private - HOA	11-25
PC9219	Stream Restoration	PC-SR-0017	Northwest of Old Keene Mill Rd. & Fairfax Co. Pkwy.	Water quality control	Public/State - Game and Inland Fisheries Commission	11-25
PC9220	Stream Restoration	PC-SR-0023	Behind 6803 Jeremiah Ct.	Water quality control	Public/Local - FCPA, Private - Residential	11-25
PC9221	Stream Restoration	PC-SR-0020	Along Fairfax County Pkwy. behind Deckhand Dr.	Water quality control	Private - Residential Conservation	11-25
PC9224	Stream Restoration	PC-SR-0023	East of Ox Croft Ct.	Water quality control	Public/Local - FCPA, Private - Residential	11-25
PC9526	BMP/LID	PC-OS-0001	6401 Missionary La., Fairfax Baptist Temple Academy	Water quality and quantity control	Private - Church	11-25

[1] **Only 10-yr structural projects will have associated project fact sheets at the end of section 5.**

Non-Structural Projects[1]					
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**
N/A	No projects	N/A	N/A	N/A	N/A

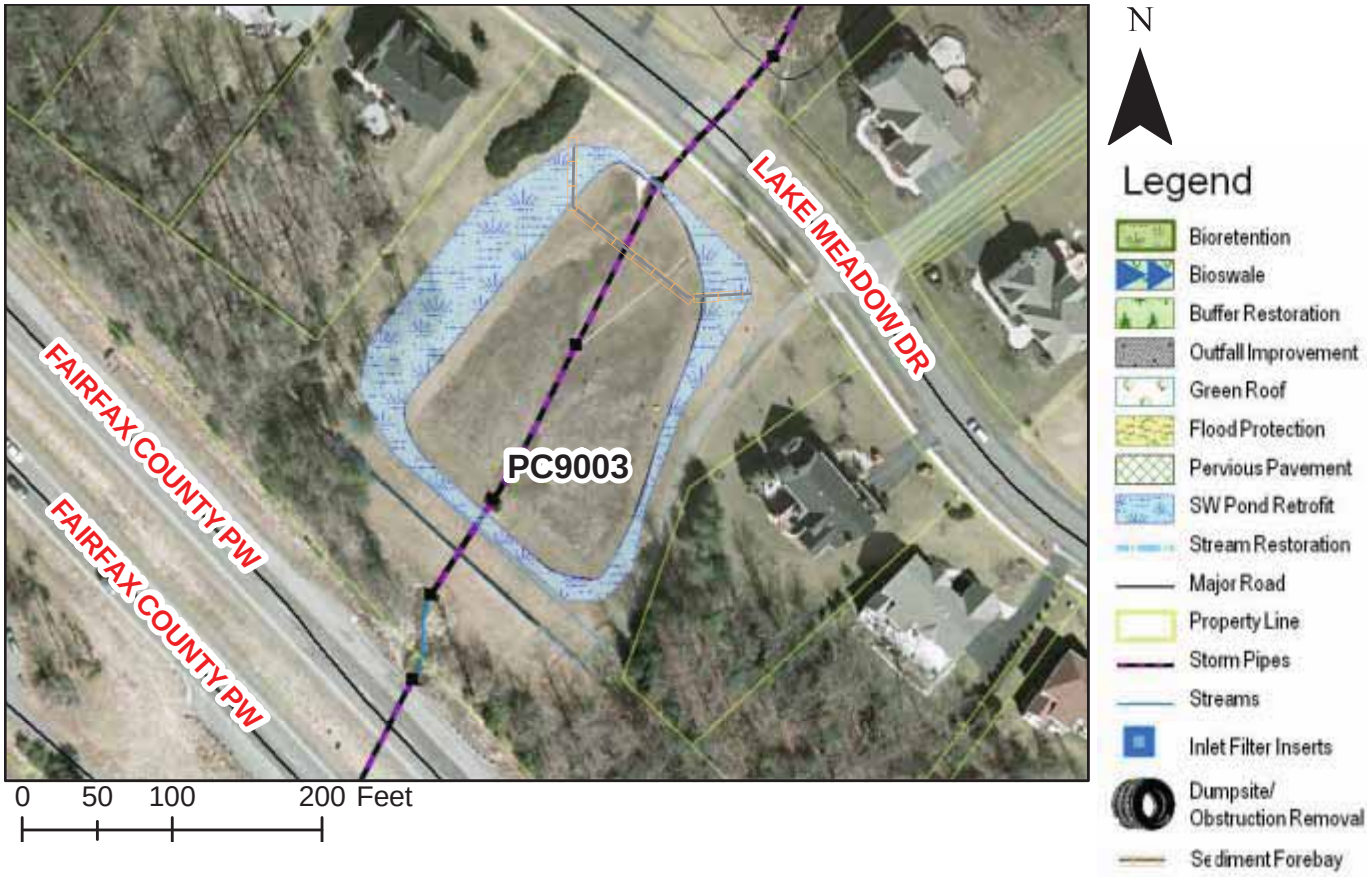
[1] **Only 10-yr structural projects will have associated project fact sheets at the end of section 5.**

PC9003 Stormwater Pond Retrofit



Address: Next to 6424 Lake Meadow Dr., Burke, Virginia
Location: Regional pond near Lake Meadow Dr.
Land Owner: Private – Edgewater Land Bays 2&3 Homeowners Association
PIN: 0872 08 A
Control Type: Water quality and quantity control
Drainage Area: 18.22 acres
Receiving Waters: Tributary of South Run

Description: This project proposes retrofitting an existing regional pond (0922DP) north of Fairfax County Parkway and south of Lake Meadow Drive into a constructed wetland system with a sediment forebay and bench planting. This pond is upstream of another pond, which is in series and is located across Lake Meadow Drive. The primary problem indicators are poor wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids.



Project Benefits: An estimated 2.07 lbs/year of phosphorus will be removed. The retrofit will increase the time that stormwater travels through the facility, which will increase pollutant particulate settlement and provide a better environment for biological uptake and microbial activity. Adding a permanent pool prevents resuspension of sediments and other pollutants. Also increasing the time stormwater stays in the facility will provide better channel protection. Lastly, installing the sediment forebay will reduce debris and coarse sediment in the facility and will reduce maintenance requirements.

Project Design Considerations: Property is owned by local homeowners association, but is in a drainage easement, according to County records. The existing easement might have to be enlarged to allow facility to be expanded on the northwest side. (See project map.) Project is easily accessible and should not have any major impacts, however efforts should be made to minimize such impacts to existing mature vegetation. The sediment forebay should be 10% of the surface area of the pond. The aquatic bench should be planted 10 to 15' inward from top of bank. The vegetative buffer should be 10 to 15' outward from the top of bank. The existing concrete pilot channels should be removed.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.35	AC	$8,500	$2,975
Grading and Excavation	2350	CY	$35	$82,250
Structural BMP Retrofit and Incidentals	1	LS	$15,000	$15,000
Embankment	50	CY	$50	$2,500
Outflow Pipe	100	LF	$125	$12,500
Rip Rap Stabilization	100	SY	$100	$10,000
Organic Compost Soil Amendment	300	CY	$40	$12,000
Plantings	1	LS	5%	$6,861
Ancillary Items	1	LS	5%	$6,861
Erosion and Sediment Control	1	LS	10%	$13,723
			Base Construction Cost	$164,670
			Mobilization (5%)	$8,234
			Subtotal 1	$172,904
			Contingency (25%)	$43,226
			Subtotal 2	$216,129
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$97,258
			Total	$313,388
			Estimated Project Cost	$320,000

PC9003_1.jpg View of existing pond

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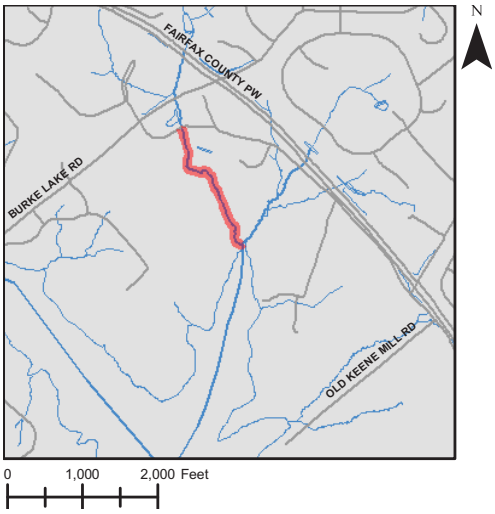
PC9004 Stream Restoration Suite



Address: 10125 Lakehaven Court, Springfield, Virginia
Location: Roads – Lakehaven Court and Deckhand Drive
Land Owner: Private/Public –Accotink Unitarian Church, Fairfax County Park Authority, Common Wealth of Virginia Commision of Game and Inland Fisheries
PIN: 0872 01 0026, 0872 01 0029, 0874 01 0003
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of South Run

Description: The first subproject is the stabilization of the stream upstream of Burke Lake. The main indicator is poor channel morphology. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment. The second subproject proposes removing an obstruction south of Burke Lake Road, east of the pond. Obstruction was verified during field visit.

Project Benefits: An estimated 12.35 lbs/year of phosphorus will be removed. The stream stabilization will reduce sediment loads to the stream, maintaining the capacity of the stream and controlling unwanted meander. Removing the obstruction will help restore the stream channel to its natural conditions and improve the function of the stream. This suite of projects will help to return the stream to its natural condition and reduce pollutant loads and erosion.

Project Design Considerations: Obstruction removal is on private residential property. Records show a storm drainage easement is located along Burke Lake Road at the entrance of the stream with the obstruction. Stream for restoration is located on property that is both publicly and privately owned. Efforts should be made to minimize impacts to mature vegetation.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Subproject A	Stream Restoration East of Pohick Ct.			
Construct New Channel	2380	LF	$200	$476,000
Clear and Grub	2.73	AC	$10,000	$27,300
Plantings	2.73	AC	$25,000	$68,250
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$67,155
Ancillary Items	1	LS	5%	$33,578
Subproject B	Obstruction Removal Near Lakehaven La.			
Obstruction Removal	1	LS	$5,250	$5,250
			Base Construction Cost	$777,533
			Mobilization (5%)	$38,877
			Subtotal 1	$816,409
			Contingency (25%)	$204,102
			Subtotal 2	$1,020,511
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$459,230
			Total	$1,479,742
			Estimated Project Cost	$1,480,000

PC9004_1.jpg View of stream

PC9004_2.jpg View of erosion in stream

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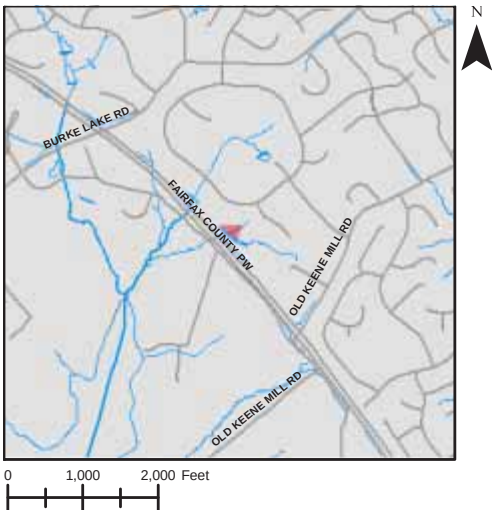
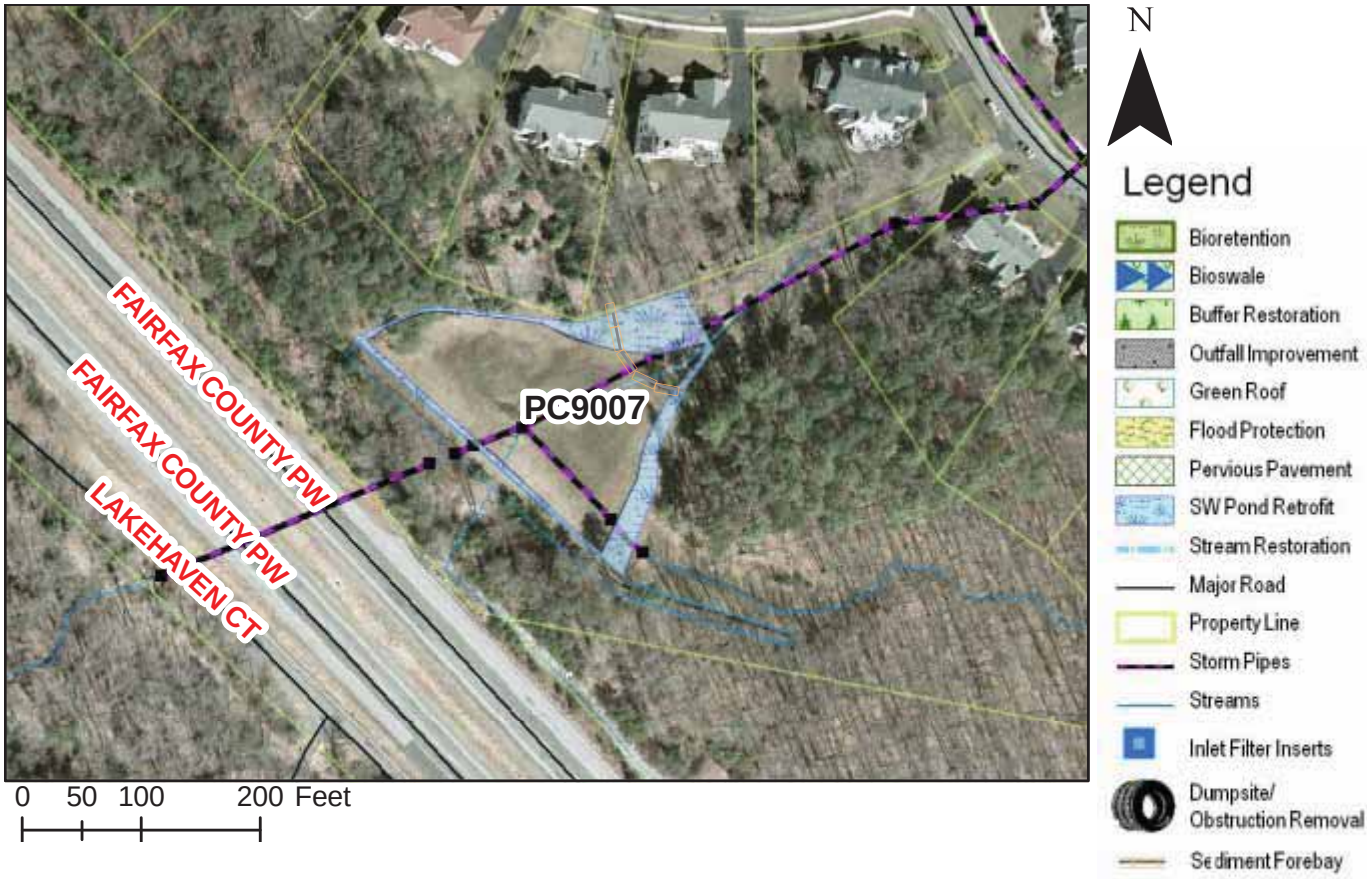
PC9007 Stormwater Pond Retrofit



Address: Behind 6416 Lake Meadow Dr., Burke, Virginia
Location: Regional Pond #2 near Lake Meadow Dr.
Land Owner: Private – Edgewater Land Bay 2 & 3 Homeowners Association
PIN: 0872 08 A
Control Type: Water quality and quantity control
Drainage Area: 25.26 acres
Receiving Waters: Tributary of South Run

Description: The dry pond northeast of Fairfax County Parkway receives runoff from adjacent neighborhoods and outfalls into culvert under road and ultimately into a stream. This project proposes to retrofit the pond to create a wetland system with a sediment forebay and bench planting. The sediment forebay will provide pretreatment of stormwater runoff and the bench planting will increase pollutant removal. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids.



Project Benefits: An estimated 3.76 lbs/year of phosphorus will be removed. The retrofit will increase pollutant removal and provide adequate channel protection above the permanent pool. The retrofit will create a better functioning environment for gravitational settling, biological uptake and microbial activity.

Project Design Considerations: Pond is located within a stormwater easement on private property. Additional easements may be required to prevent loss of existing mature vegetation. The sediment forebay should be no less than 10% of the size of the pond. The aquatic bench should be planted 10-15' inward from the water's edge. The vegetative buffer should be 10 to 15' outward from the water's edge. Effort should be made to minimize impacts to existing mature vegetation. Adjacent property owner said swale leading from his property to dry pond has eroded significantly. Rip rap and check dams have been placed in swale recently. Project will also address swale leading into the pond.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$8,500	$1,700
Grading and Excavation	1300	CY	$35	$45,500
Structural BMP Retrofit and Incidentals	1	LS	$15,000	$15,000
Embankment	60	CY	$50	$3,000
Outflow Pipe	75	LF	$125	$9,375
Rip Rap Stabilization	100	SY	$100	$10,000
Organic Compost Soil Amendment	160	CY	$40	$6,400
Plantings	1	LS	5%	$4,549
Ancillary Items	1	LS	5%	$4,549
Erosion and Sediment Control	1	LS	10%	$9,098
			Base Construction Cost	$109,170
			Mobilization (5%)	$5,459
			Subtotal 1	$114,629
			Contingency (25%)	$28,657
			Subtotal 2	$143,286
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$64,479
			Total	$207,764
			Estimated Project Cost	$210,000

PC9007_1.jpg View of existing pond

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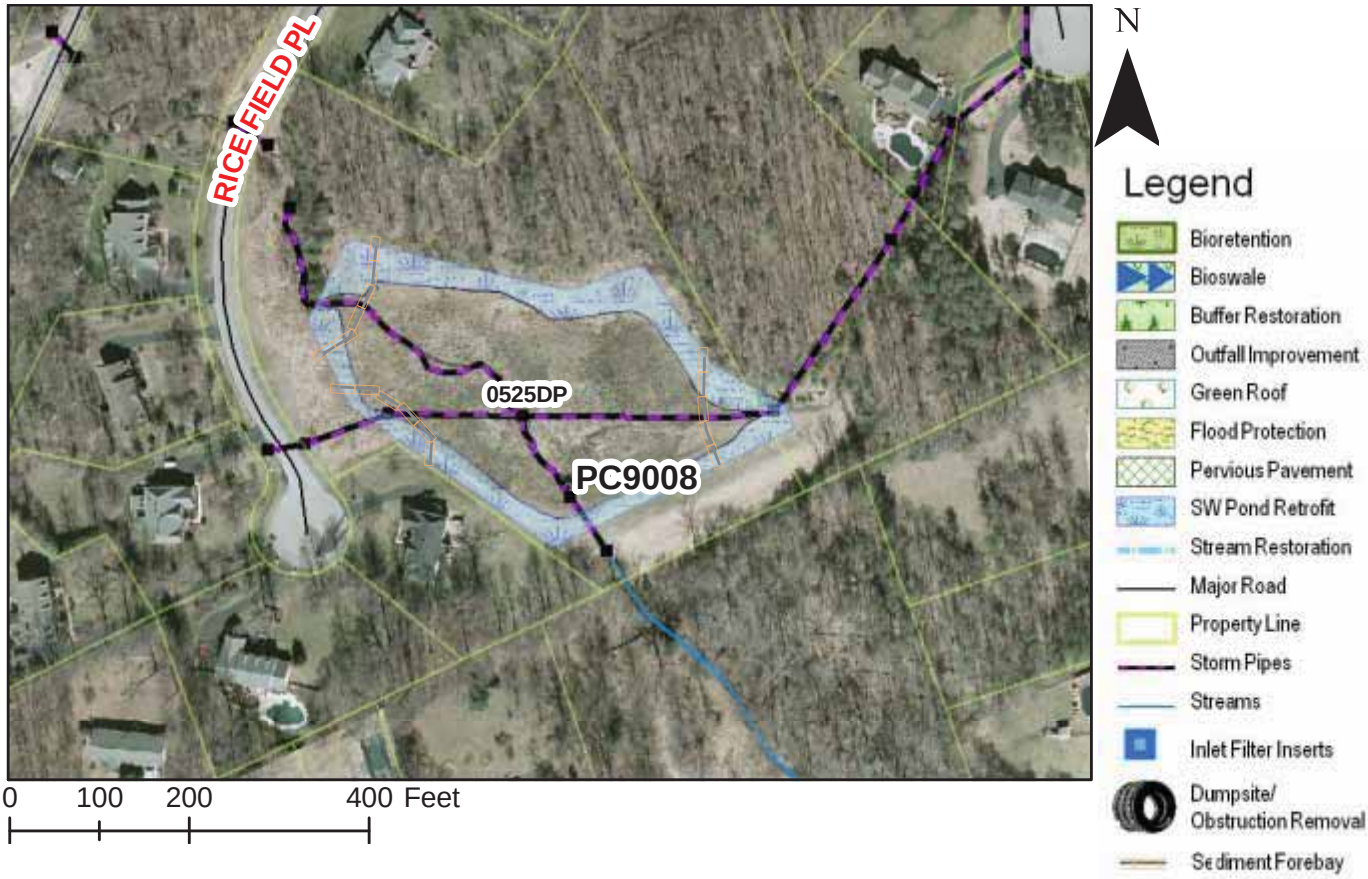
PC9008 Stormwater Pond Retrofit

Address: Next to 10995 Rice Field Pl, Fairfax Station, Virginia
Location: Wet Pond near Rice Field Pl
Land Owner: Private – Private Owner
PIN: 0773 12 A1, 0773 12 C
Control Type: Water quality and quantity control
Drainage Area: 121.67 acres
Receiving Waters: Tributary of South Run

Description: This project proposes the retrofit of an existing stormwater pond southeast of Rice Field Place to create an extended detention dry pond with sediment forebays and additional planting. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids. The pond collects runoff from a very large drainage area that is mostly single family residential development and roadways. Three separate systems outfall into the pond. All outfalls will have a forebay installed to collect coarse sediments and debris. The pond outfalls into a stream at the south end.



Project Benefits: This pond retrofit will result in estimated 17.20 lbs/year of additional phosphorus removal. Extending the detention time of water in the pond will provide better downstream channel protection, create a better functioning environment for gravitational settling of pollutant particulates, increase biological uptake of polluntants and increase stormwater infiltration. Lastly, adding the the sediment forebays will prevent debris and coarse sediment from entering the pond and will reduce maintenance.

Project Design Considerations: Pond is easily accessible because it is close to a roadway and access will not impact vegetation. Pond is on private property. Records show no onsite drainage easements. Pond can expand on all sides, especially to the north. (See project map.) Retrofit should not require significant tree removal. The sediment forebays should account for approximately 10% of the pond area. The vegetative buffer should be 10-15' off of the top of bank.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.8	AC	$8,500	$6,800
Grading and Excavation	5000	CY	$35	$175,000
Structural BMP Retrofit and Incidentals	1	LS	$20,000	$20,000
Embankment	100	CY	$50	$5,000
Outflow Pipe	100	LF	$125	$12,500
Rip Rap Stabilization	200	SY	$100	$20,000
Organic Compost Soil Amendment	635	CY	$40	$25,400
Plantings	1	LS	5%	$13,235
Ancillary Items	1	LS	5%	$13,235
Erosion and Sediment Control	1	LS	10%	$26,470
			Base Construction Cost	$317,640
			Mobilization (5%)	$15,882
			Subtotal 1	$333,522
			Contingency (25%)	$83,381
			Subtotal 2	$416,903
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$187,606
			Total	$604,509
			Estimated Project Cost	$610,000

PC9008_1.jpg View of pond

PC9008_2.jpg Existing control structure

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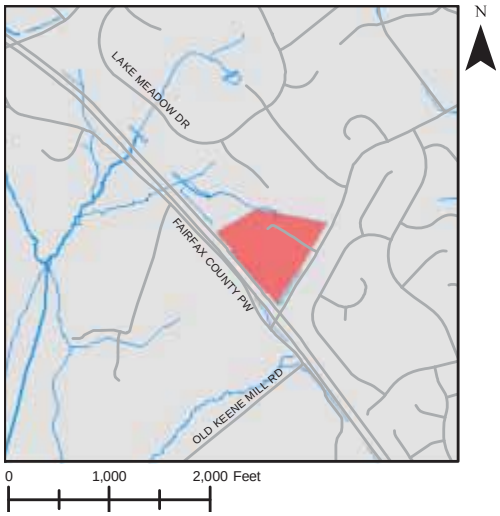
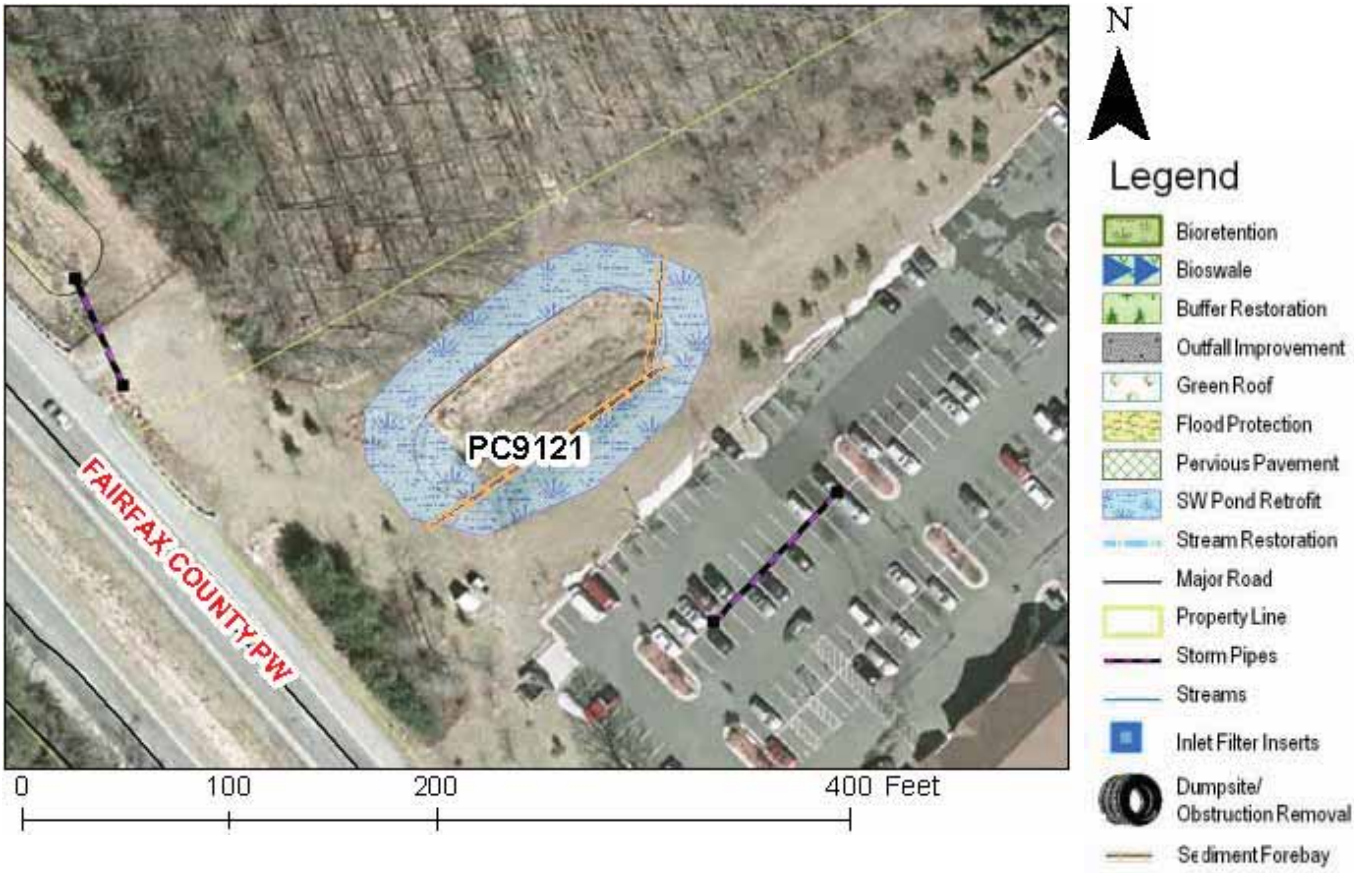
PC9121 Stormwater Pond Retrofit



Address: 9900 Old Keene Mill Road, Burke, Virginia
Location: Burke Community Church
Land Owner: Private - Burke Community Church
PIN: 0881 01 0007A
Control Type: Water quality and quantity control
Drainage Area: 7.63 acres
Receiving Waters: Tributary of South Run

Description: This project proposes to retrofit an existing pond northeast of Fairfax County Parkway at Burke Community Church to create a wetland system with construction of a sediment forebay and the addition of low marsh and high marsh plantings. The primary indicators are wetland habitat and pollutants, including nitrogen, phosphorus and total suspended solids. The pond receives runoff from the church and parking lot. The retrofit will modify the existing pond to increase pollutant removal and to provide adequate channel protection. The retrofit will create a better functioning environment for gravitational settling, biological uptake and microbial activity.



Project Benefits: An estimated 4.08 lbs/year of phosphorus will be removed. The extended detention basin and sediment forebay will provide additional stormwater management. The sediment forebay and increased detention time will increase sediment settling and biological uptake. Enlarging the pond and adjusting the outfall structure will decrease the ponds peak discharge which will protect the downstream channel.

Project Design Considerations: This pond receives a significant amount of runoff due to the impervious parking lot. Due to this pond being labeled TBD in the County's system (meaning To Be Determined), it appears that this pond's maintenance is not reviewed by the County. Improving this facility to meet today's standards, would help insure proper maintenance for this facilitiy and incorporation into the County's system. This project appears feasibile due to the fact that there is available space. The records do not show this pond as being located in an easement.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.25	AC	$8,500	$2,125
Grading and Excavation	1000	CY	$35	$35,000
Structural BMP Retrofit and Incidentals	1	LS	$10,000	$10,000
Embankment	50	CY	$50	$2,500
Outflow Pipe	50	LF	$125	$6,250
Rip Rap Stabilization	75	SY	$100	$7,500
Organic Compost Soil Amendment	175	CY	$40	$7,000
Plantings	1	LS	5%	$3,519
Ancillary Items	1	LS	5%	$3,519
Erosion and Sediment Control	1	LS	10%	$7,038
			Base Construction Cost	$84,450
			Mobilization (5%)	$4,223
			Subtotal 1	$88,673
			Contingency (25%)	$22,168
			Subtotal 2	$110,841
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$49,878
			Total	$160,719
			Estimated Project Cost	$170,000

PC9121_1 Control structure

PC9121_2.jpg Dry pond

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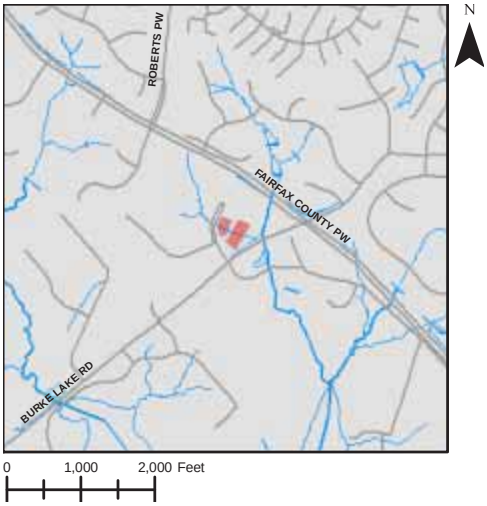
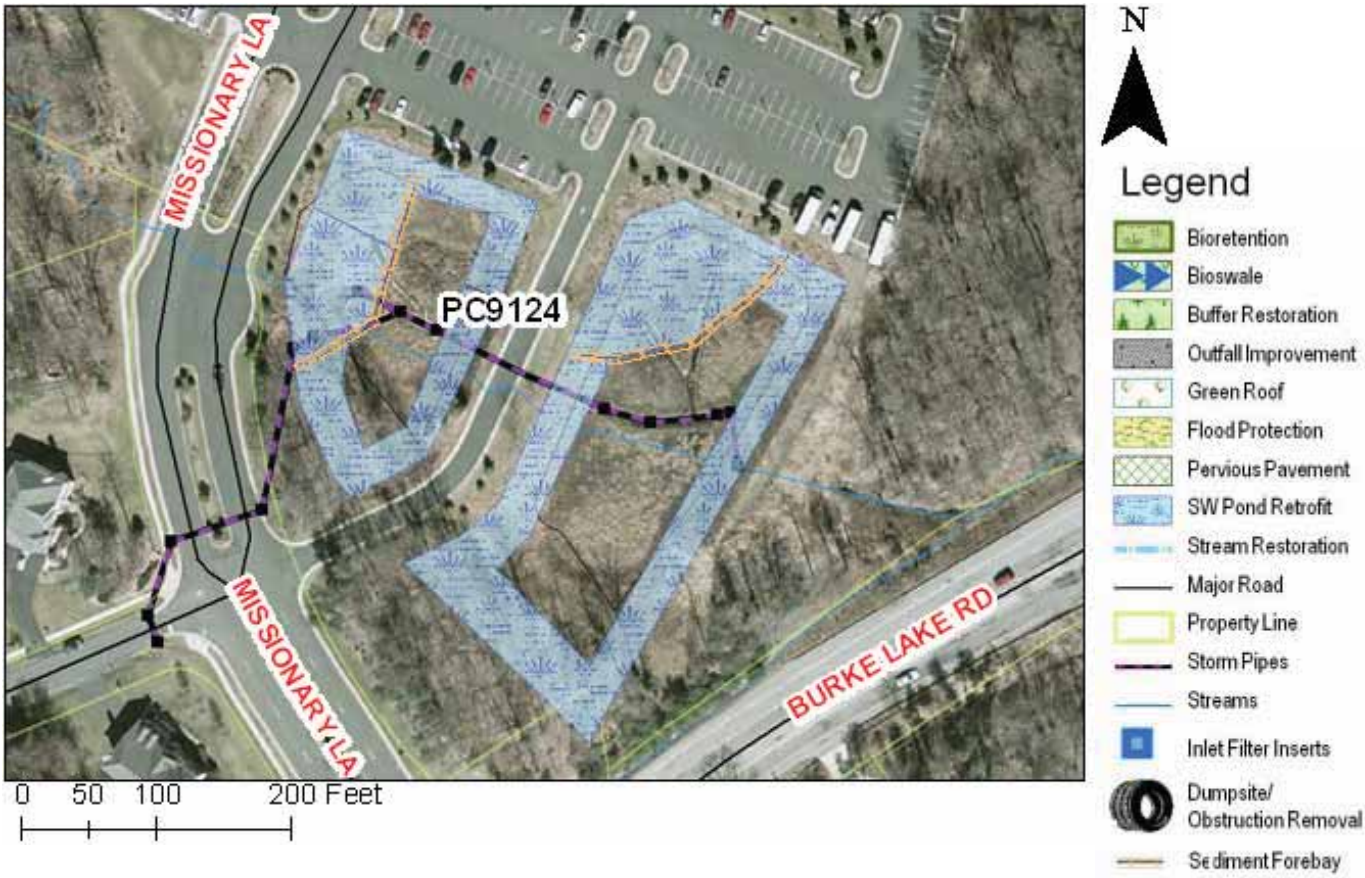
PC9124 Stormwater Pond Retrofit



Address: 6401 Missionary Lane, Fairfax Station, Virginia
Location: Fairfax Baptist Temple Academy
Land Owner: Private – Fairfax Baptist Temple
PIN: 0872 01 0036
Control Type: Water quality and quantity control
Drainage Area: 37.90 acres
Receiving Waters: Tributary of Oppossum Branch

Description: This project proposes the retrofit of two connecting ponds at Fairfax Baptist Temple Academy to create an extended detention dry pond with sediment forebays. The retrofit will install sediment forebays on the inflow pipes, remove the pilot channels, add an aquatic bench with an engineered landscaping plan, and modify the outlet structure to increase the stormwater treatment time. The primary indicators are pollutants, including nitrogen, phosphorus and total suspended solids. Pond is bisected by an access road. A pipe goes under the access road to connect the two ponds.



Project Benefits: An estimated 6.41 lbs/year of phosphorus will be removed. Extending the detention of stormwater in this pond will provide better downstream channel protection and more time to promote particulate pollutant settlement. The new sediment forebays will reduce debris and coarse sediment that typically wash off of parking lots. The sediment forebay, if maintained properly, will decrease the necessary maintenance to the rest of the pond. Lastly, removing the pilot channels will allow the pond to better treat runoff from small storms which yield runoff with high pollutant concentrations.

Project Design Considerations: There appears to be room for expansion and enhancement of existing ponds. The pond is on property owned by Fairfax Baptist Temple. Both ponds have inflow pipes and concrete pilot channels. Sediment forebays should be installed on the inflow pipes and be sized no less than 10% of the size of the pond. To install the sediment forebays and extend the stormwater detention the size of the pond may have to be increased. Efforts should be made to minimize impacts to existing vegetation. The concrete pilot channels should be removed and the landscaping plan should allow the pond to mature into a native forest in the right places yet keep mowable turf along the embankment and along access areas.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	2	AC	$8,500	$17,000
Grading and Excavation	4000	CY	$35	$140,000
Structural BMP Retrofit and Incidentals	1	LS	$15,000	$15,000
Embankment	150	CY	$50	$7,500
Outflow Pipe	280	LF	$125	$35,000
Rip Rap Stabilization	125	SY	$100	$12,500
Organic Compost Soil Amendment	800	CY	$40	$32,000
Plantings	1	LS	5%	$12,950
Ancillary Items	1	LS	5%	$12,950
Erosion and Sediment Control	1	LS	10%	$25,900
			Base Construction Cost	$310,800
			Mobilization (5%)	$15,540
			Subtotal 1	$326,340
			Contingency (25%)	$81,585
			Subtotal 2	$407,925
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$183,566
			Total	$591,491
			Estimated Project Cost	$600,000

PC9124_1.jpg Downstream section of existing pond

PC9124_2.jpg Upstream section of existing pond

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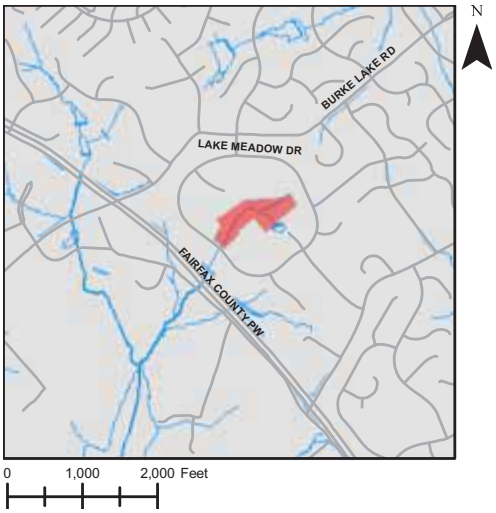
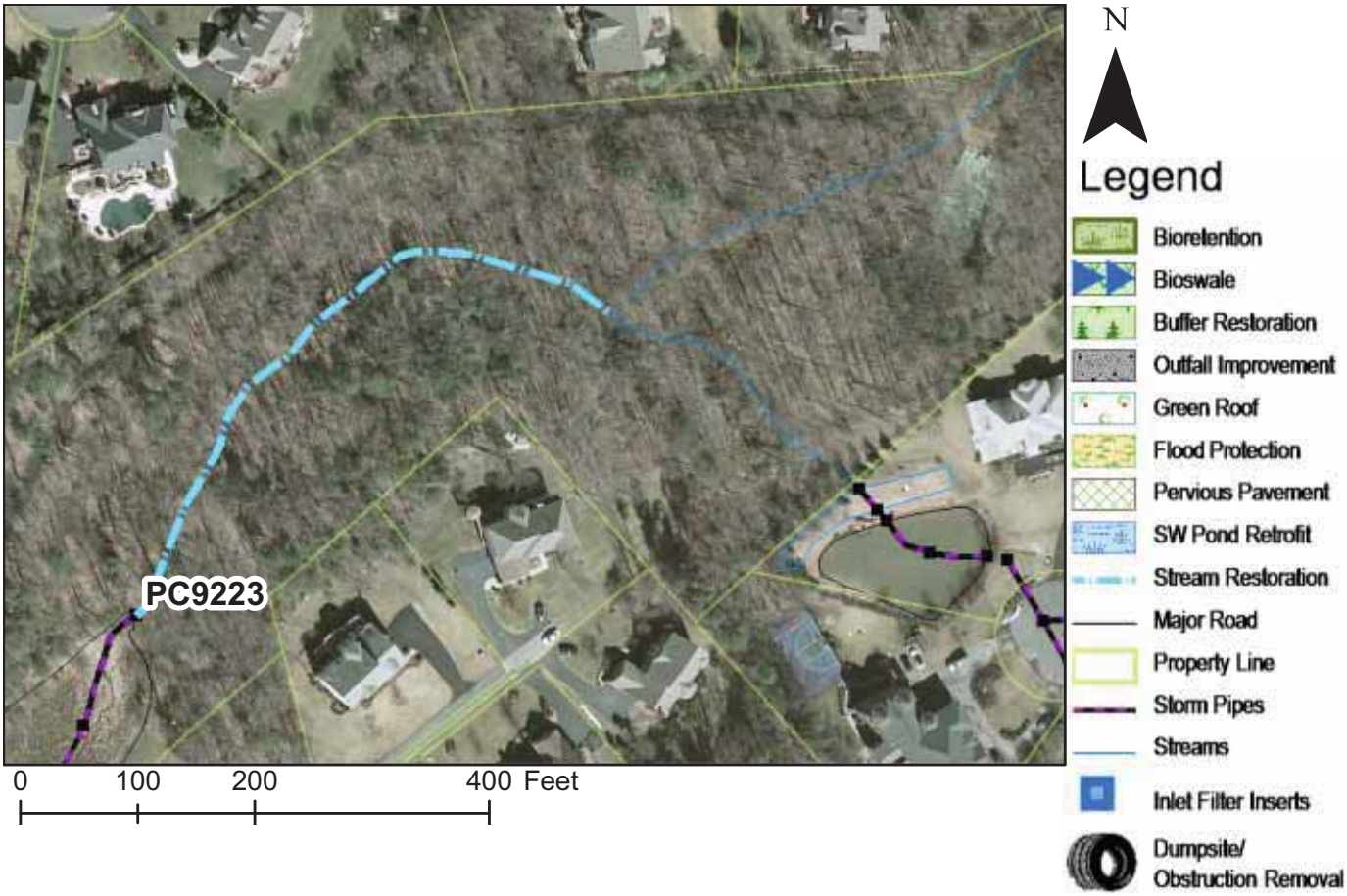
PC9223 Stream Restoration



Address: In open space between Waterside Dr. & Burke Woods Dr., Burke, Virginia
Location: Stream between Waterside Dr. & Burke Woods Dr.
Land Owner: Private – Edgewater Land Bays 2&3 Homeowners Association
PIN: 0881 28 B
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of South Run

Description: The stream outfalls into a pond northeast of Lake Meadow Drive. The stream collects runoff by sheetflow from adjacent single family housing development. The primary indicator is poor channel morphology. The project proposes repairing bank and bed erosion, thereby restoring channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment.



Project Benefits: An estimated 3.59 lbs/year of phosphorus will be removed. Stream stabilization will reduce sediment loads to the stream, maintaining capacity of the stream channel and controlling unwanted meander of the stream. Repairing the stream will help minimize erosion of the streambanks over time.

Project Design Considerations: There are two stormwater ponds downstream of this location. Property is owned by homeowners association. A stormwater drainage easement exists over this segment of stream and includes the surrounding buffers and downstream ponds. Efforts should be made to minimize impacts to existing vegetation. Streambed is lined in places with very large stones.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	590	LF	$200	$118,000
Clear and Grub	0.68	AC	$10,000	$6,800
Plantings	0.68	AC	$25,000	$17,000
Additional Cost, First 500 LF	500	LF	$200	$100,000
Erosion and Sediment Control	1	LS	10%	$24,180
Ancillary Items	1	LS	5%	$12,090
			Base Construction Cost	$278,070
			Mobilization (5%)	$13,904
			Subtotal 1	$291,974
			Contingency (25%)	$72,993
			Subtotal 2	$364,967
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$164,235
			Total	$529,202
			Estimated Project Cost	$530,000

PC9223_1.jpg View of stream

PC9223_2.jpg View of stream