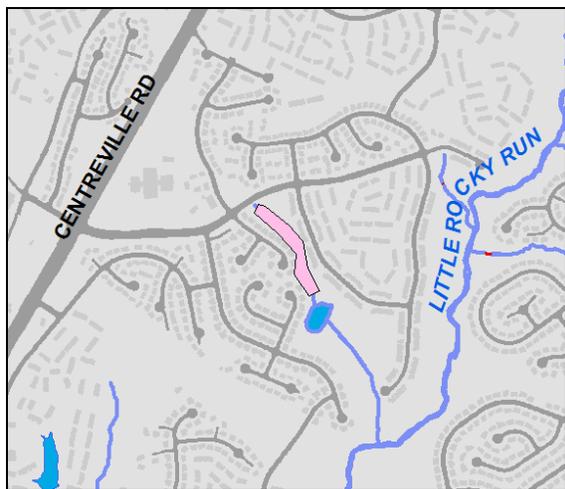


LR9201 Stream Restoration



Vicinity Map

Address	14104 Sorrel Chase Ct
Location	Subdivision
Landowner	Green Trails HOA
PIN	0654 03 C 0654 0304 M
Control Type	Water quality control
Drainage Area	188 acres
Receiving Waters	Little Rocky Run

Description: The Green Trails Homeowners Association has noted that the tributary to Little Rocky Run shown below suffers from erosion and poor flow. Subsequent field visits confirmed a stagnant system with little habitat support. Project LR9201 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

Project Benefits: Project LR9201 will reduce phosphorus, nitrogen and sediment loading in the tributary to Johnny Moore Creek, and restore 1250 linear feet of stream channel. Higher quality habitat for fish and wildlife will also be provided. Successful implementation of LR9201 may also have positive effects on nearby property values.

Project Design Considerations: New BMP/LID project LR9509 is located just upstream of LR9201, on the north side of Green Trails Blvd. Coordination and sequencing of these two projects should be considered. The project site is accessible from Green Trails Blvd or Palisades Dr, and is located on Green Trails HOA property within floodplain/storm drainage easements. Given that the Green Trails HOA brought attention to the site, significant landowner support is likely. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the LR9201 stream restoration project will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.85	AC	\$10,000.00	\$8,500.00
Construct New Channel	1250	LF	\$200.00	\$250,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	0.85	AC	\$25,000.00	\$21,250.00
			Base Construction Cost	\$379,750.00
			Mobilization (5%)	\$18,987.50
			Ancillary Items (5%)	\$18,987.50
			Erosion & Sediment Control (10%)	\$37,975.00
			Subtotal 1	\$455,700.00
			Contingency (25%)	\$113,925.00
			Subtotal 2	\$569,625.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$256,331.25
			Total	\$825,956.25
			Estimated Project Cost	\$830,000.00

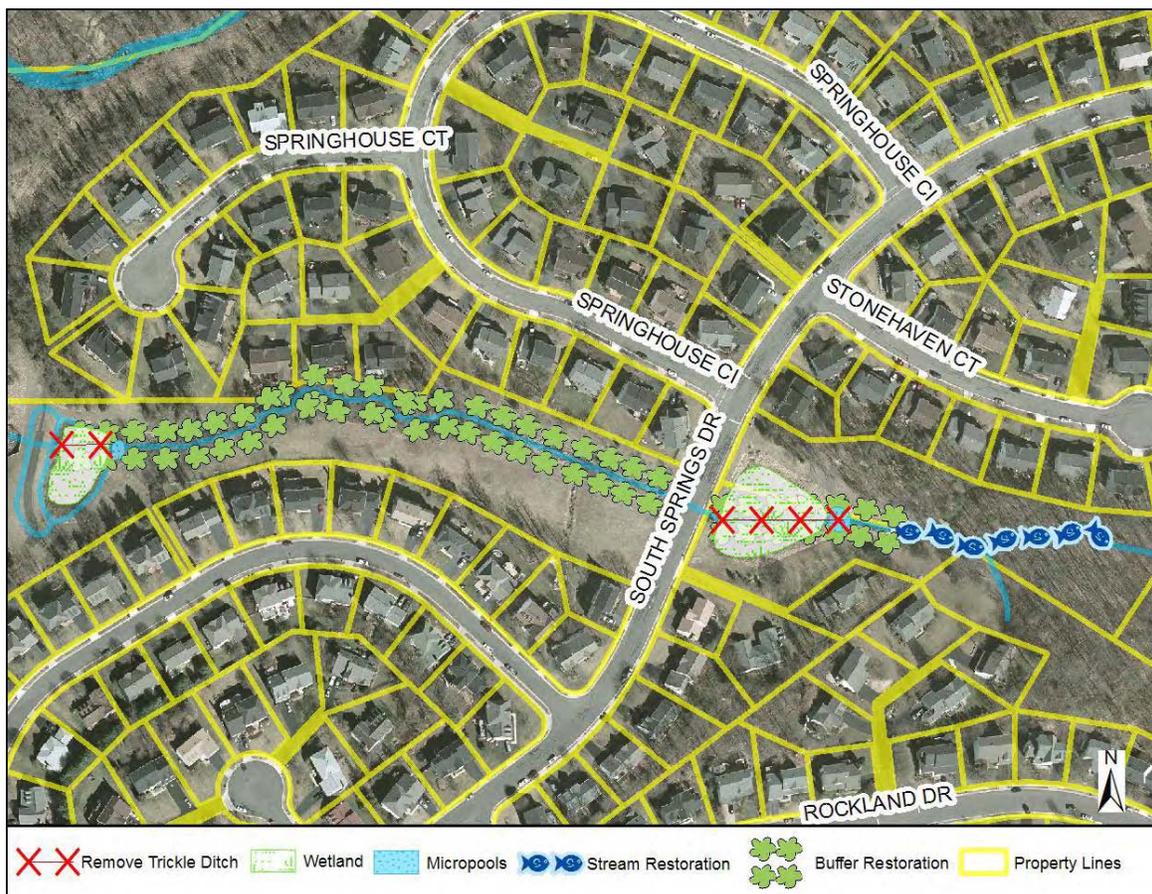
LR9202 Stream Restoration Project Suite



Vicinity Map

Address	6419 Stonehaven Ct
Location	Subdivision
Landowner	Little Rocky Run HOA
PIN	0654 04 N 0654 02 B 0654 04 Q 0654 04 R
Control Type	Water quality control
Drainage Area	141 acres
Receiving Waters	Little Rocky Run

Description: Project suite LR9202 will provide improved water quality control. It includes stream restoration, buffer restoration, and pond retrofit components.



Project Area Map

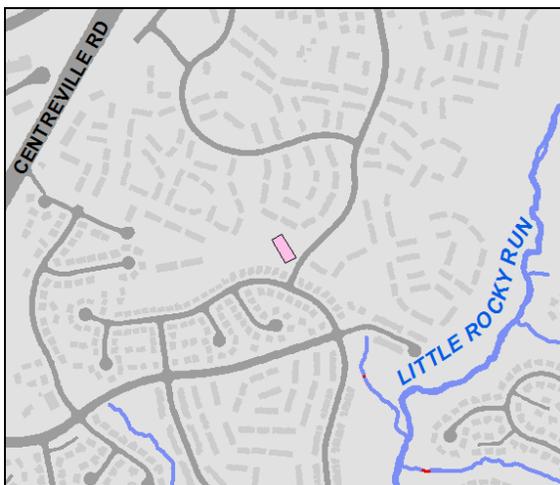
Project Benefits: Project LR9202 will improve phosphorus, nitrogen, and sediment uptake in the unnamed tributary to Little Rocky Run shown in the project area map. It will also provide improved habitat for wildlife.

Project Design Considerations: New BMP/LID project LR9507 is located approximately 0.3 miles southwest of LR9202 along South Springs Drive. Pond retrofit LR9102 is also located approximately 0.2 miles upstream of LR9202. Coordination and sequencing of these projects should be considered. Due to ongoing channel erosion, a more extensive site investigation should be conducted before implementation to determine the necessary extent of new stream channel design and construction. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of the Johnny Moore Creek Stream Restoration will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub (stream restoration)	0.35	AC	\$10,000.00	\$3,500.00
Construct New Channel	300	LF	\$200.00	\$60,000.00
Add'l Cost, first 500 LF	300	LF	\$200.00	\$60,000.00
Plantings (stream and buffer restoration)	2.35	AC	\$25,000.00	\$58,750.00
Access Road	3280	SY	\$25.00	\$82,000.00
Access Road Gate	2	EA	\$2,500.00	\$5,000.00
Clear and Grub (pond retrofits)	0.8	AC	\$8,500.00	\$6,800.00
Structural BMP and Incidentals		LS	\$10,000 - \$20,000	\$0.00
New Storm Pipe		LF	\$100 - \$300	\$0.00
Grading and Excavation	1260	CY	\$35.00	\$44,100.00
Embankment		CY	\$50.00	\$0.00
Organic Compost Soil Amendment (pond retrofits and buffer restoration)	1120	CY	\$40.00	\$44,800.00
Remove Trickle Ditch	184	SY	\$10.71	\$1,970.64
			Base Construction Cost	\$366,920.64
			Mobilization (5%)	\$18,346.03
			Plantings (pond retrofits) (5%)	\$9,233.53
			Ancillary Items (5%)	\$18,346.03
			Erosion & Sediment Control (10%)	\$36,692.06
			Subtotal 1	\$449,538.30
			Contingency (25%)	\$112,384.58
			Subtotal 2	\$561,922.88
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$252,865.29
			Total	\$814,788.17
			Estimated Project Cost	\$820,000.00

LR9203 Stream Restoration



Vicinity Map

Address	14100 Wood Rock Way
Location	Subdivision
Landowner	Heritage Forest HOA
PIN	0652 09 F2
Control Type	Water quality control
Drainage Area	20 acres
Receiving Waters	Unnamed tributary to Little Rocky Run

Description: Project LR9203 will restore the existing paved ditch shown below with a natural channel system. This small stream restoration will use step pools to dissipate excess energy and prevent future erosion.



Project Area Map

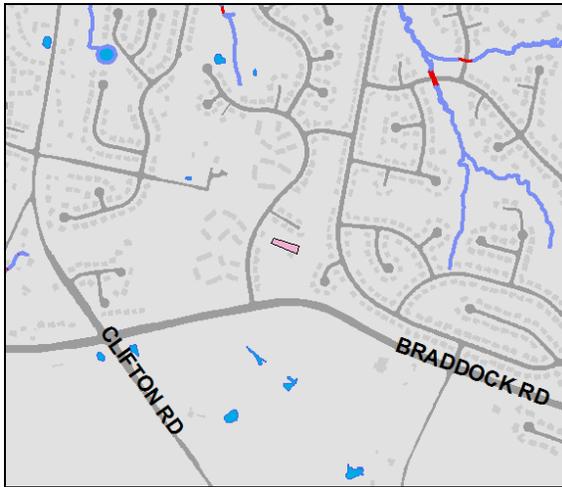
Project Benefits: LR9204 will reduce phosphorus, nitrogen, and sediment loading by restoring 330 feet of paved channel with a more natural, permeable system. Higher quality habitat for native wildlife will be created, and LR9204 may have beneficial effects on nearby property values.

Project Design Considerations: The LR9204 project site is located on Heritage Forest HOA property, within a storm drainage easement. The site can be easily accessed from Singletons Way. Permitting requirements and impacts to mature trees will be minimal, if any.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub		AC	\$10,000.00	\$0.00
Remove Concrete Ditch	380	SY	\$10.71	\$4,069.80
Construct New Channel	330	LF	\$200.00	\$66,000.00
Add'l Cost, first 500 LF	330	LF	\$200.00	\$66,000.00
Plantings	0.1	AC	\$25,000.00	\$2,500.00
		Base Construction Cost		\$138,569.80
		Mobilization (5%)		\$6,928.49
		Ancillary Items (5%)		\$6,928.49
		Erosion & Sediment Control (10%)		\$13,856.98
		Subtotal 1		\$166,283.76
		Contingency (25%)		\$41,570.94
		Subtotal 2		\$207,854.70
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$93,534.62
		Total		\$301,389.32
		Estimated Project Cost		\$310,000.00

LR9204 Stream Restoration



Vicinity Map

Address	5587A Rockpointe Dr
Location	Subdivision
Landowner	Hayden Village Community Association
PIN	0661 11 K1
Control Type	Water quality control
Drainage Area	4 acres
Receiving Waters	Unnamed tributary to Little Rocky Run

Description: Stream restoration LR9204 will restore the concrete ditch shown below to a natural stream channel. This small restoration stream restoration project will consist of linear bioretention basins – a unique stream restoration technique which will significantly reduce construction costs.



Project Area Map

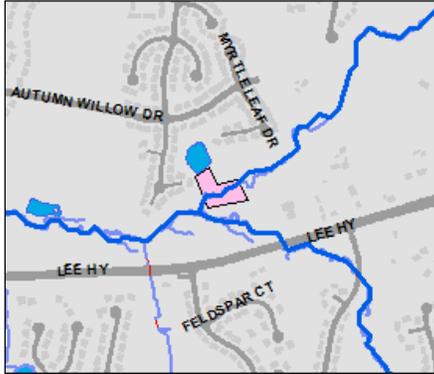
Project Benefits: LR9204 will reduce phosphorus, nitrogen, and sediment loading by restoring 230 feet of paved channel with a more natural, permeable system. Higher quality habitat for native wildlife will also be provided.

Project Design Considerations: Pond retrofit LR9111 is located approximately 1000 feet downstream of the LR9204 project site. Coordination of these two projects should be considered due to their proximity.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	\$10,000.00	\$1,000.00
Remove Concrete Ditch	167	SY	\$10.71	\$1,788.57
Bioretention Filters & Basins	300	SY	\$150.00	\$45,000.00
		Base Construction Cost		\$47,788.57
		Mobilization (5%)		\$2,389.43
		Ancillary Items (5%)		\$2,389.43
		Erosion & Sediment Control (10%)		\$4,778.86
		Subtotal 1		\$57,346.28
		Contingency (25%)		\$14,336.57
		Subtotal 2		\$71,682.86
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$32,257.28
		Total		\$103,940.14
		Estimated Project Cost		\$110,000.00

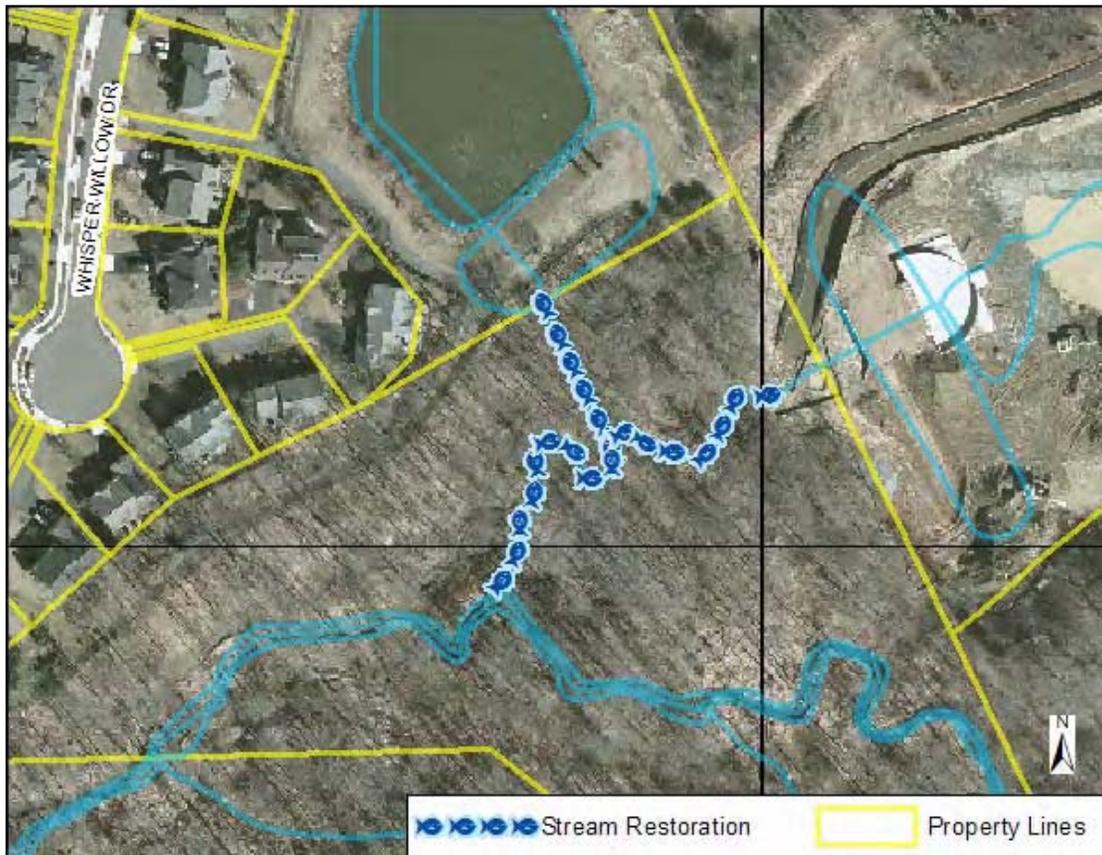
LR9205 Stream Restoration



Vicinity Map

Address	5217 Whisper Willow Dr
Location	Pond outfalls near subdivision
Landowner	Fairfax County Park Authority
PIN	0553 10 S
Control Type	Water Quality
Drainage Area	632 acres
Receiving Waters	Little Rocky Run

Description: The pond outfalls shown below that drain to Little Rocky Run are causing scouring and erosion. Stream restoration project LR9205 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



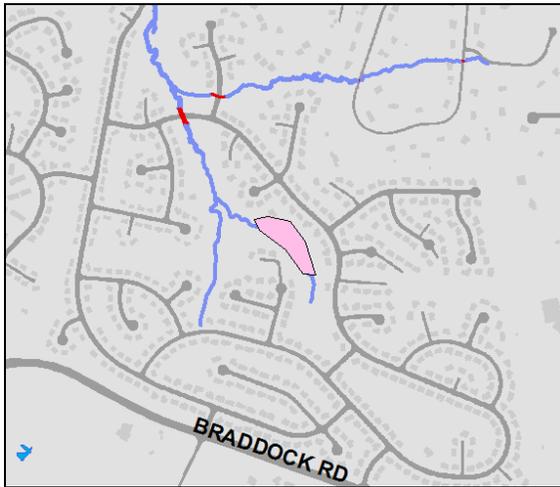
Project Area Map

Project Benefits: Stream restoration project LR9205 will remove approximately 13 tons/yr of sediment pollution from erosion, and will restore approximately 580 feet of natural stream channel. Higher quality habitat for fish and wildlife will also be provided.

Project Design Considerations: Coordination with pond retrofit LR9116 should be considered, as the pond is located just upstream of the project site (and is visible on right side of the project area map for LR9205). The site is accessible from Whisper Willow Dr and is located on Fairfax County Park Authority property. As with any stream restoration, there are significant potential permitting requirements for this project, including dam safety permits. Impacts to trees will be inevitable due to the densely wooded site, but the long-term environmental benefits of stream restoration LR9205 will outweigh the short-term environmental costs.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.46	AC	\$10,000.00	\$4,600.00
Construct New Channel	580	LF	\$200.00	\$116,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	0.46	AC	\$25,000.00	\$11,500.00
		Base Construction Cost		\$232,100.00
		Mobilization (5%)		\$11,605.00
		Ancillary Items (5%)		\$11,605.00
		Erosion & Sediment Control (10%)		\$23,210.00
		Subtotal 1		\$278,520.00
		Contingency (25%)		\$69,630.00
		Subtotal 2		\$348,150.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$156,667.50
		Total		\$504,817.50
		Estimated Project Cost		\$510,000.00

LR9207 Stream Restoration



Vicinity Map

Address	5378 Ashleigh Rd
Location	Subdivision
Landowner	Hampton Chase HOA Hampton Forest HOA
PIN	0662 05 G1 0662 05 D 0554 07 C2
Control Type	Water quality control
Drainage Area	152 acres
Receiving Waters	Unnamed tributary to Willow Spring Branch

Description: The unnamed tributary to Willow Spring Branch shown below suffers from channel erosion. LR9207 will restore the stream to a more stable, natural state to prevent future erosion and promote habitat health and diversity.



Project Area Map

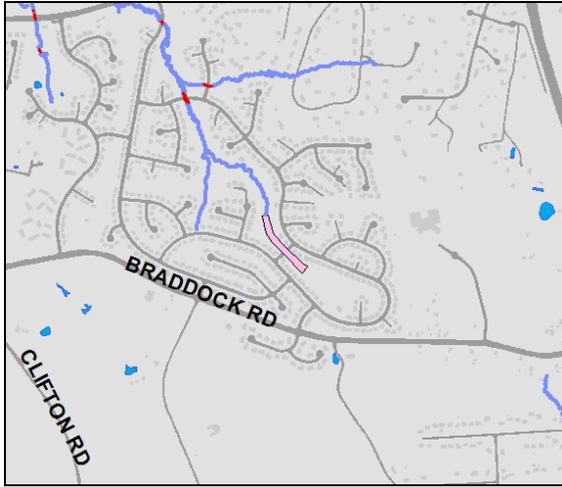
Project Benefits: LR9207 will reduce phosphorus, nitrogen and sediment loading, will and restore 850 linear feet of stream channel. Higher quality habitat for aquatic and terrestrial wildlife will also be provided. Successful implementation of LR9207 may also have positive effects on nearby property values.

Project Design Considerations: LR9207 is located on downstream of and in close proximity to stream restorations LR9208 and LR9209. Coordination of these projects should be considered to improve design and construction efficiency. It is also located on Hampton Chase HOA and Hampton Forest HOA property, within floodplain and stormwater easements. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of LR9207 will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.75	AC	\$10,000.00	\$7,500.00
Construct New Channel	850	LF	\$200.00	\$170,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	0.75	AC	\$25,000.00	\$18,750.00
			Base Construction Cost	\$296,250.00
			Mobilization (5%)	\$14,812.50
			Ancillary Items (5%)	\$14,812.50
			Erosion & Sediment Control (10%)	\$29,625.00
			Subtotal 1	\$355,500.00
			Contingency (25%)	\$88,875.00
			Subtotal 2	\$444,375.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$199,968.75
			Total	\$644,343.75
			Estimated Project Cost	\$650,000.00

LR9208 Stream Restoration



Vicinity Map

Address	5418 Ashleigh Rd
Location	Subdivision
Landowner	Hampton Forest HOA
PIN	0662 05 U 0662 05 V
Control Type	Water quality control
Drainage Area	152 acres
Receiving Waters	Willow Spring Branch

Description: The tributary to Willow Spring Branch shown below is lined by a concrete trapezoidal channel (currently being undermined) with turf grass on either side. Stream restoration project LR9208 will remove the concrete channel and restore a natural stream system and riparian buffer area.



Project Area Map

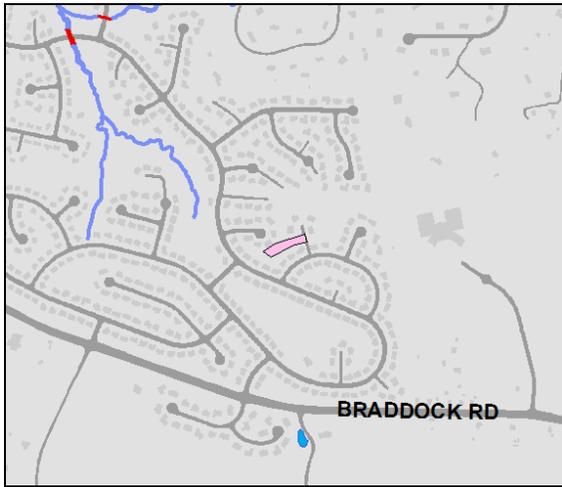
Project Benefits: Project LR9208 will reduce phosphorus and nitrogen loading in the tributary to Johnny Moore Creek, and will restore approximately 1020 linear feet of natural channel. Higher quality habitat for wildlife will also be provided. Successful implementation of LR9208 may also have positive effects on nearby property values.

Project Design Considerations: Stream restoration project LR9207 is located approximately 250 feet downstream of LR9208, and stream restoration and flood protection project LR9209 is located on a tributary of LR9208. Coordination and sequencing of these three projects should be considered. The project site is located within floodplain/storm drainage easements on Hampton Forest Homeowners Association property. Significant design and construction issues exist – especially space constraints. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of stream restoration LR9208 will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	1.1	AC	\$10,000.00	\$11,000.00
Removal of Concrete Channel	2040	SY	\$10.71	\$21,848.40
Construct New Channel	1020	LF	\$200.00	\$204,000.00
Add'l Cost, first 500 LF	500	LF	\$200.00	\$100,000.00
Plantings	1.1	AC	\$25,000.00	\$27,500.00
			Base Construction Cost	\$364,348.40
			Mobilization (5%)	\$18,217.42
			Ancillary Items (5%)	\$18,217.42
			Erosion & Sediment Control (10%)	\$36,434.84
			Subtotal 1	\$437,218.08
			Contingency (25%)	\$109,304.52
			Subtotal 2	\$546,522.60
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$245,935.17
			Total	\$792,457.77
			Estimated Project Cost	\$800,000.00

LR9209 Stream Restoration



Vicinity Map

Address	12753 Ashleigh Ct
Location	Subdivision
Landowner	Hampton Forest HOA
PIN	0662 05 X
Control Type	Water quality control
Drainage Area	43 acres
Receiving Waters	Unnamed tributary to Willow Spring Branch

Description: The unnamed tributary to Willow Spring Branch shown below is lined by a concrete trapezoidal channel (currently being undermined) with turf grass on either side. Stream restoration project LR9209 will remove the concrete channel and recreate a natural stream system and riparian buffer area. A new channel with a plunge pool and several step pools will help dissipate erosive energy.



Project Area Map

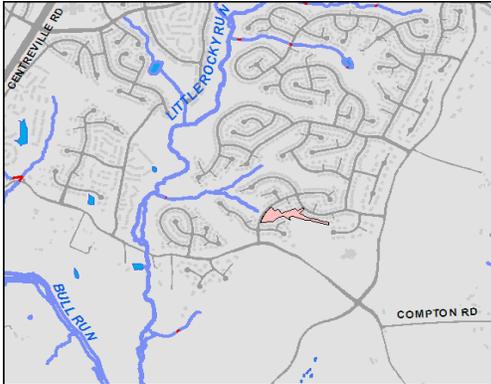
Project Benefits: Project LR9209 will reduce phosphorus and nitrogen loading in the tributary to Johnny Moore Creek, and will restore approximately 400 linear feet of natural channel. Higher quality habitat for wildlife will also be provided. Successful implementation of LR9209 may also have positive effects on nearby property values.

Project Design Considerations: LR9209 is located approximately 250 upstream of stream restoration LR9208. Due to their proximity and similar design aspects (both involve the replacement of a concrete channel with a natural stream system), coordination and sequencing should be considered. The project site is located within a storm drainage easement on Hampton Forest Homeowners Association property. Significant design and construction issues exist – especially space constraints. As with any stream restoration, there are significant environmental permitting requirements for this project. Impacts to trees will be inevitable, but the long-term environmental benefits of stream restoration LR9209 will outweigh its short-term environmental costs.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.3	AC	\$10,000.00	\$3,000.00
Construct New Channel	400	LF	\$200.00	\$80,000.00
Add'l Cost, first 500 LF	400	LF	\$200.00	\$80,000.00
Plantings	0.3	AC	\$25,000.00	\$7,500.00
Remove Concrete Ditch	230	SY	\$10.71	\$2,463.30
			Base Construction Cost	\$172,963.30
			Mobilization (5%)	\$8,648.17
			Ancillary Items (5%)	\$8,648.17
			Erosion & Sediment Control (10%)	\$17,296.33
			Subtotal 1	\$207,555.96
			Contingency (25%)	\$51,888.99
			Subtotal 2	\$259,444.95
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$116,750.23
			Total	\$376,195.18
			Estimated Project Cost	\$380,000.00

LR9504 BMP/LID



Vicinity Map

Address	13916 Rock Brook Ct
Location	Subdivision
Landowner	Little Rocky Run Homeowner's Association
PIN	0654 07 E
Control Type	Water quality control
Drainage Area	56 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: Proposed project is to retrofit existing culvert crossing to allow for water quality control. Use a gabion wall to create shallow wetland marsh upstream.



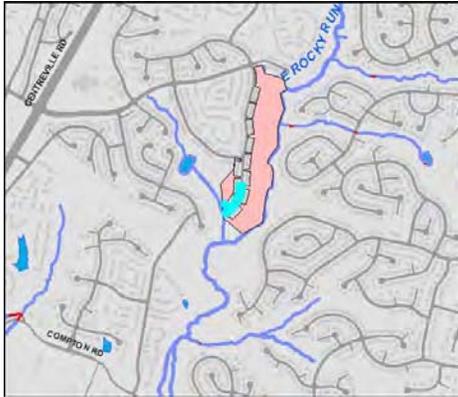
Project Area Map

Project Benefits: An estimated 5.7 lb/yr of phosphorus will be removed. The created wetland provides ideal environment for gravitational settling, biological uptake, and microbial activity. Project will provide habitat enhancement for insects, amphibians, and birds.

Project Design Considerations: This project is within an existing storm drainage easement and part of Little Rocky Run Homeowner’s association, but the implementability is still low based on the proposal to remove mature trees in favor of a created wetland environment. The long-term benefits will outweigh the short-term environmental costs. There are a few different access options. There is a proposed retrofit (LR9100) in the same subwatershed, but sequencing/coordination is not an issue since they are both proposed quality control measures only.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	250	SY	\$25.00	\$6,250.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.45	AC	\$8,500.00	\$3,825.00
Grading and Excavation	450	CY	\$35.00	\$15,750.00
New Storm Pipe		LF	\$100 - \$300	
Organic Compost Soil Amendment	100	CY	\$40.00	\$4,000.00
		Base Construction Cost		\$32,325.00
		Mobilization (5%)		\$1,616.25
		Plantings (5%)		\$1,616.25
		Ancillary Items (5%)		\$1,616.25
		Erosion & Sediment Control (10%)		\$3,232.50
		Subtotal 1		\$40,406.25
		Contingency (25%)		\$10,101.56
		Subtotal 2		\$50,507.81
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits				
		(45%)		\$22,728.52
		Total		\$73,236.33
		Estimated Project Cost		\$80,000.00

LR9508 BMP/LID



Vicinity Map

Address	6612 Creek Run Drive
Location	Subdivision
Landowner	Green Trails Homeowner's Association
PIN	0654 0304 K
Control Type	Water Quality
Drainage Area	1 Acre
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: LR9508 will construct a vegetated swale to collect runoff from the backside of townhouses (~0.2 acres of impervious surface) and direct flow to a small (~80 square yards) bioretention area. A new pipe will need to be placed through the existing paved trail to outlet to pond outfall. A tree box filter will also be placed at the bottom of the cul-de-sac.



Project Area Map

Project Benefits: An estimated 0.6 lb/yr of phosphorus will be removed. The bioretention area creates an ideal environment for filtration, biological uptake and microbial activity.

Project Design Considerations: LR9508 is in the vicinity of a large stormwater pond and adjacent to its associated easement(s), but is bordered on the opposite side by private property. Access will not be an issue, but the project resides primarily on HOA property. There are no known permitting issues. Sequencing/coordination with neighboring projects is not critical for the proposed water quality measures.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale	275	SY	\$50.00	\$13,750.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	80	SY	\$150.00	\$12,000.00
Manufactured BMP (ie:Tree Box Filter)	1	EA	\$10,000.00	\$10,000.00
Organic Compost Soil Amendment	20	CY	\$40.00	\$800.00
			Base Construction Cost	\$36,550.00
			Mobilization (5%)	\$1,827.50
			Plantings (5%)	\$1,827.50
			Ancillary Items (5%)	\$1,827.50
			Erosion & Sediment Control (10%)	\$3,655.00
			Subtotal 1	\$45,687.50
			Contingency (25%)	\$11,421.88
			Subtotal 2	\$57,109.38
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$25,699.22
			Total	\$82,808.59
			Estimated Project Cost	\$90,000.00

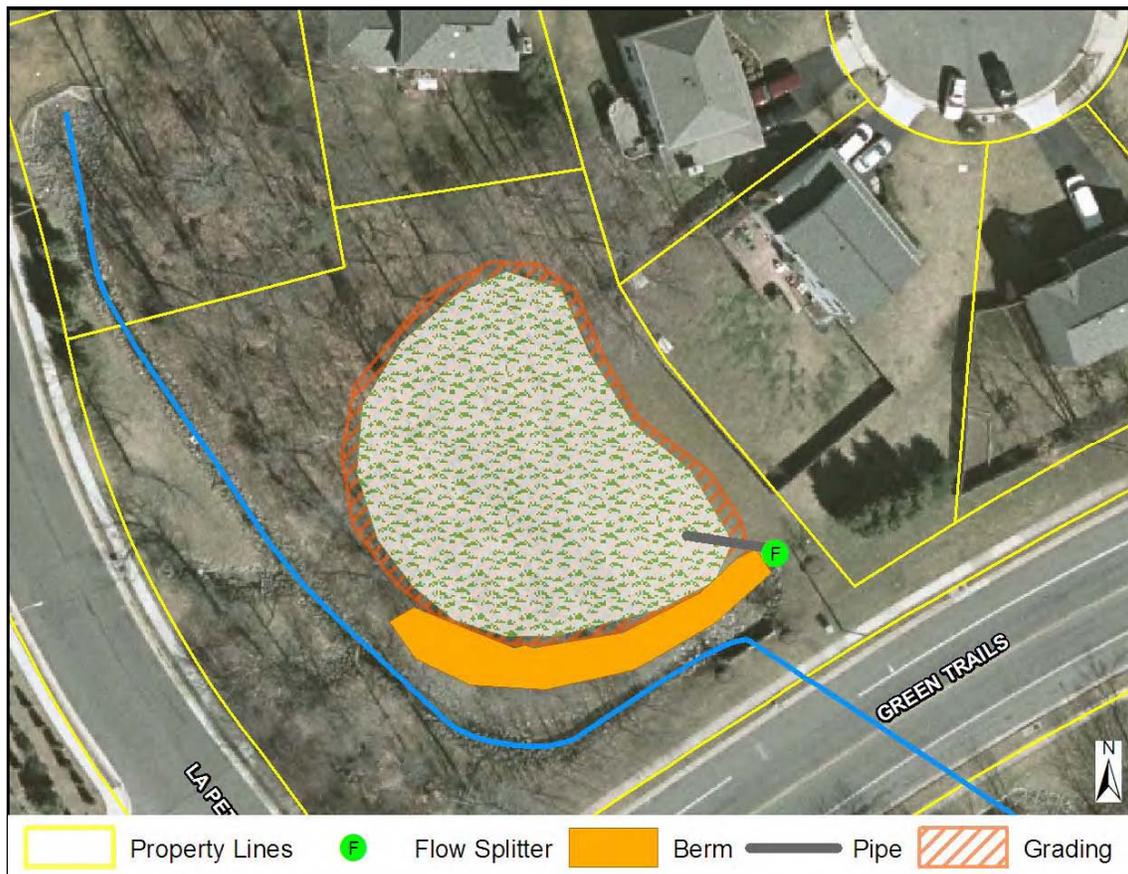
LR9509 BMP/LID



Vicinity Map

Address	6600 La Petite Place
Location	Subdivision
Landowner	Green Trails Homeowner's Association
PIN	0651 0403 F
Control Type	Water quality and quantity control
Drainage Area	78 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: Divert flow from outlet into a created wetland detention system, designed for water quality and channel protection treatment. Approximately 24 ac (6 acres of impervious runoff) will be diverted to the proposed facility. Relief is set by culvert invert, but there is room to add storage because common area inside easement averages 4 ft above invert.



Project Area Map

Project Benefits: An estimated 4.6 lbs/yr of phosphorus will be removed. Project will result in reduced 2-yr peak flow to degrading stream reach immediately downstream. System drains to existing facility downstream for quality and quantity control. There is an existing facility just upstream that treats most of the 78 acres that aren't proposed to be diverted into this wetland cell.

Project Design Considerations: Proposed Stream Restoration LR9201L is immediately downstream and addresses erosion area. Adding channel protection at existing culvert will impact this design and footprint. The site can be accessed from several locations; the cost estimate is based on access by way of Green Trails Boulevard (floodplain and storage easement exists). Common area is approximately 4 ft above culvert invert and is full of mature trees. Access and requirement to remove mature trees result in low implementability score.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	100	SY	\$25.00	\$2,500.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$10,000.00
Clear and Grub	0.2	AC	\$8,500.00	\$1,700.00
Organic Compost Soil Amendment	300	CY	\$40.00	\$12,000.00
Grading and Excavation	800	CY	\$35.00	\$28,000.00
New Storm Pipe	25	LF	\$100 - \$300	\$5,000.00
			Base Construction Cost	\$61,700.00
			Mobilization (5%)	\$3,085.00
			Plantings (5%)	\$3,085.00
			Ancillary Items (5%)	\$3,085.00
			Erosion & Sediment Control (10%)	\$6,170.00
			Subtotal 1	\$77,125.00
			Contingency (25%)	\$19,281.25
			Subtotal 2	\$96,406.25
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits			(45%)	\$43,382.81
			Total	\$139,789.06
			Estimated Project Cost	\$140,000.00

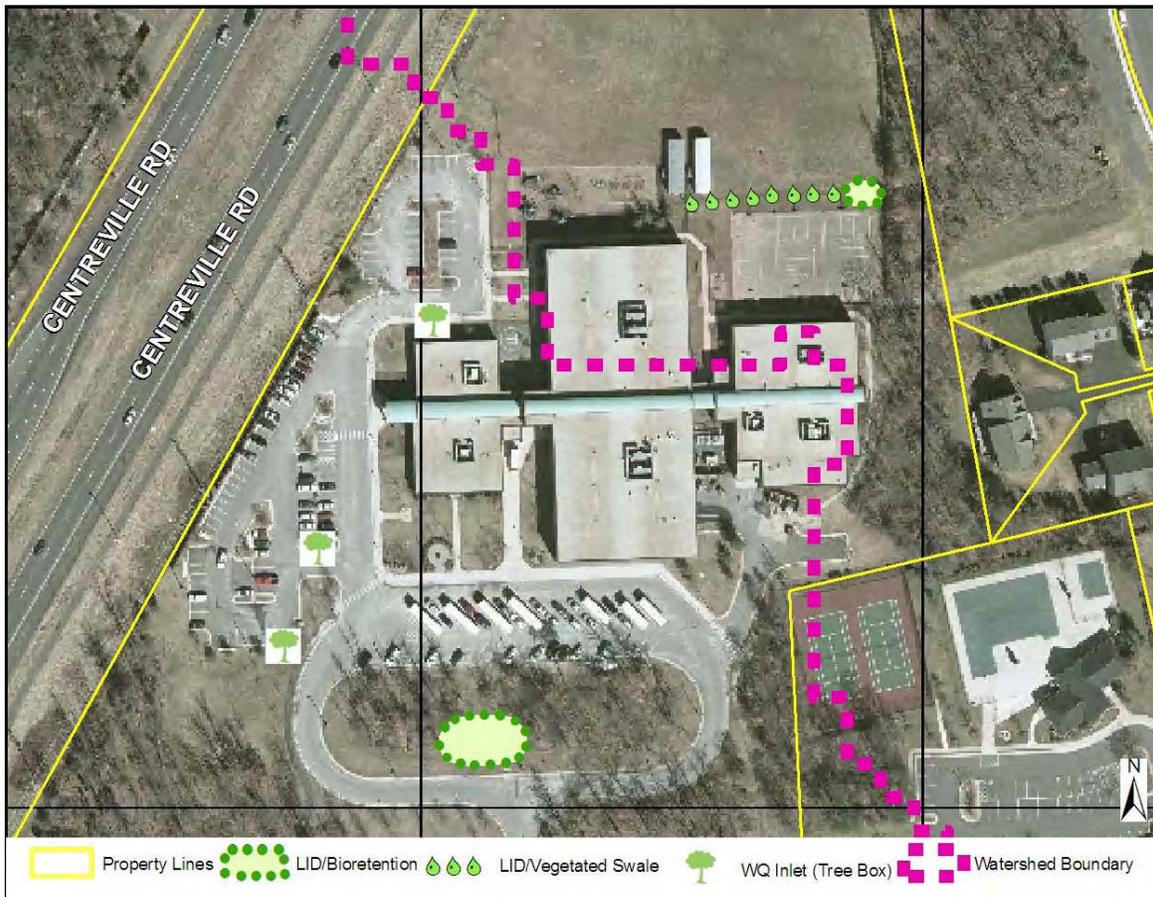
LR 9510 Low Impact Development Project Suite



Vicinity Map

Address	14330 Green Trails Bv
Location	Centreville Elementary School
Landowner	School Board of Fairfax County
PIN	0653 04 A
Control Type	Water Quality
Drainage Area	4.5 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: Construct bioretention areas and a vegetated swale to treat runoff from the roof, parking lots and all-purpose courts. Replace three curb inlets with tree box filters. This is a school site, allowing for high visibility and affording educational opportunities.



Project Area Map

Project Benefits: An estimated 1.6 lbs/yr of phosphorus will be removed. Project will enhance filtration, biological uptake and microbial activity. Educational opportunities exist for the students.

Project Design Considerations: This is a headwater site, but the school resides only partially within the Littler Rocky Run watershed. It is adjacent to the Cub Run watershed, where a project was not originally proposed. A field visit was conducted to verify stormwater infrastructure outside of Little Rocky Run and additional LID measures have been included to treat the site as a whole. Bioretention areas were sized based on approximating impervious drainage area and determining the water quality volume, but additional effort is required to accurately determine roof top drainage. Within the Little Rocky Run watershed there are two downstream projects along this tributary, an additional LID retrofit (LR9509L) and a Stream Restoration (LR9201L) that is located downstream of both retrofit sites – coordination and sequencing should be considered. The curb will have to be cut to allow drainage to the larger proposed bioretention area.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale	120	SY	\$50.00	\$6,000.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	480	SY	\$150.00	\$72,000.00
Manufactured BMP (ie:Tree Box Filter)	3	EA	\$10,000.00	\$30,000.00
Organic Compost Soil Amendment	150	CY	\$40.00	\$6,000.00
		Base Construction Cost		\$114,000.00
		Mobilization (5%)		\$5,700.00
		Plantings (5%)		\$5,700.00
		Ancillary Items (5%)		\$5,700.00
		Erosion & Sediment Control (10%)		\$11,400.00
		Subtotal 1		\$142,500.00
		Contingency (25%)		\$35,625.00
		Subtotal 2		\$178,125.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$80,156.25
		Total		\$258,281.25
		Estimated Project Cost		\$260,000.00

LR9514 BMP/LID



Vicinity Map

Address	13611 Springstone Dr
Location	Union Mills Elementary School
Landowner	School Board of Fairfax County
PIN	0652 07 B
Control Type	Water Quality
Drainage Area	1 acre
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: The site drains to existing facility 0612DP. Construct two bioretention areas to collect runoff from highly impervious areas. One will collect runoff currently entering a curb inlet. Two tree box filters will replace existing curb drop inlets.



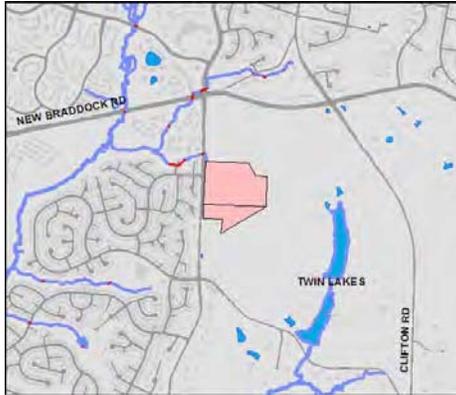
Project Area Map

Project Benefits: An estimated 0.8 lbs/yr of phosphorus will be removed. The bioretention areas promote filtration, biological uptake and microbial activity. Bioretention areas can also have high amenity value. The project affords educational opportunities at the school.

Project Design Considerations: This site drains directly to existing facility 0612DP. Though for smaller storm events there will be runoff reduction, the primary goal is to provide water quality benefits at an accessible and visible site. As a result, this project is independent of the proposed projects downstream, requiring little emphasis on sequencing/coordination. There are no known construction or permitting constraints. Replacement of existing pavement with pervious pavement can be incorporated into the design, but should be coordinated with typical maintenance/repaving activities and was not included specifically in this conceptual layout.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	130	SY	\$150.00	\$19,500.00
Manufactured BMP (ie:Tree Box Filter)	2	EA	\$10,000.00	\$20,000.00
Organic Compost Soil Amendment	11	CY	\$40.00	\$440.00
		Base Construction Cost		\$39,940.00
		Mobilization (5%)		\$1,997.00
		Plantings (5%)		\$1,997.00
		Ancillary Items (5%)		\$1,997.00
		Erosion & Sediment Control (10%)		\$3,994.00
		Subtotal 1		\$49,925.00
		Contingency (25%)		\$12,481.25
		Subtotal 2		\$62,406.25
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$28,082.81
		Total		\$90,489.06
		Estimated Project Cost		\$100,000.00

LR9516 BMP/LID



Vicinity Map

Address	6001 Union Mill Road
Location	Centreville High School
Landowner	School Board of Fairfax County
PIN	0661 01 0012A 0661 01 0012B
Control Type	Water quality control
Drainage Area	4 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: This site drains to existing facility 0325DP. Replace five curb drop inlets with tree box filters. Construct bioretention area near the parking lot. Proposed measures drain areas that are nearly 100% impervious.



Project Area Map

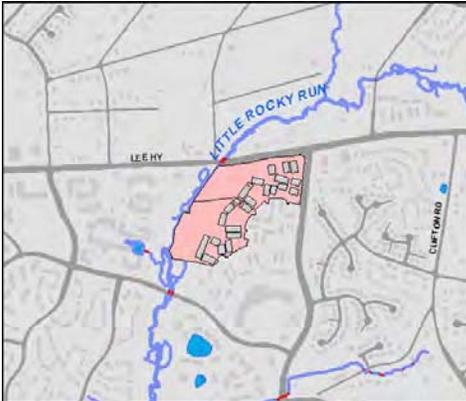
Project Benefits: An estimated 19 lbs/yr of phosphorus will be removed on a yearly basis. The bioretention area will promote filtration, biological uptake and microbial activity and has a high amenity value. The project also affords educational opportunities at the school.

Project Design Considerations: This site drains directly to existing facility 0325DP. Though for smaller storm events there will be runoff reduction, the primary goal is to provide water quality benefits at an accessible and visible site. As a result, this project is independent of the proposed projects downstream, requiring little emphasis on sequencing/coordination. There are no known construction or permitting constraints. Replacement of existing pavement with pervious pavement can be incorporated into the design, but should be coordinated with typical maintenance/repaving activities and was not included specifically in this conceptual layout.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	605	SY	\$150.00	\$90,750.00
Manufactured BMP (ie:Tree Box Filter)	5	EA	\$10,000.00	\$50,000.00
Organic Compost Soil Amendment	101	CY	\$40.00	\$4,040.00
		Base Construction Cost		\$144,790.00
		Mobilization (5%)		\$7,239.50
		Plantings (5%)		\$7,239.50
		Ancillary Items (5%)		\$7,239.50
		Erosion & Sediment Control (10%)		\$14,479.00
		Subtotal 1		\$180,987.50
		Contingency (25%)		\$45,246.88
		Subtotal 2		\$226,234.38
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$101,805.47
		Total		\$328,039.84
		Estimated Project Cost		\$330,000.00

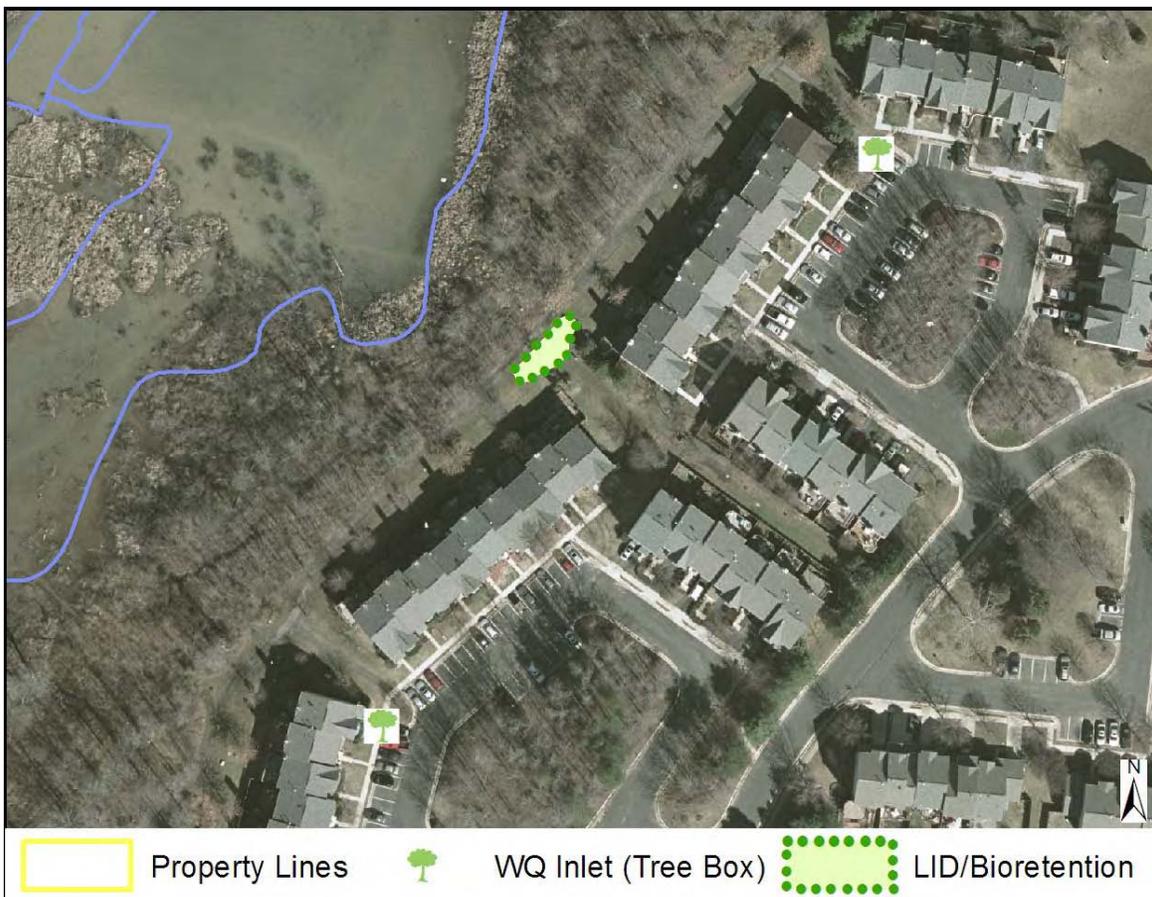
LR9521 BMP/LID



Vicinity Map

Address	13516 Canada Goose Ct
Location	Subdivision
Landowner	Union Mills Community Association
PIN	0553 0701 A1 0553 0702 A1
Control Type	Water quality control
Drainage Area	2 Acres
Receiving Waters	Little Rocky Run

Description: LID stormwater treatment is proposed for Project LR9521 for this uncontrolled area near Canada Goose Court. The project proposes collecting runoff from an existing grass swale in a new bioretention area and replacing two curb inlets with tree box filters.



Project Area Map

Project Benefits: An estimated 4lb/yr of phosphorus will be removed. The bioretention area will enhance filtration, biological uptake and microbial activity.

Project Design Considerations: No permitting, construction or access limitations exist. Drainage swale draining to proposed bioretention area was surveyed for potential enhancement, but there are several utility crossings which are likely to prohibit configuring the swale to infiltrate more water. Bioretention area proposed within floodplain easement, but outside 100-yr floodplain boundary.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	100	SY	\$150.00	\$15,000.00
Manufactured BMP (ie:Tree Box Filter)	2	EA	\$10,000.00	\$20,000.00
Organic Compost Soil Amendment	25	CY	\$40.00	\$1,000.00
		Base Construction Cost		\$36,000.00
		Mobilization (5%)		\$1,800.00
		Plantings (5%)		\$1,800.00
		Ancillary Items (5%)		\$1,800.00
		Erosion & Sediment Control (10%)		\$3,600.00
		Subtotal 1		\$45,000.00
		Contingency (25%)		\$11,250.00
		Subtotal 2		\$56,250.00
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$25,312.50
		Total		\$81,562.50
		Estimated Project Cost		\$90,000.00

LR9522 BMP/LID



Vicinity Map

Address	13340 Leland Rd
Location	Colin Powell Elementary School
Landowner	School Board of Fairfax County
PIN	0553 01 0020A
Control Type	Water quality control
Drainage Area	3 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: Project LR9522 provides stormwater retrofits at the Colin Powell Elementary School. Retrofits include: cutting curbs and installing bioretention areas in grass medians at five locations and replacing one curb inlet with a tree box filter. This LID suite will treat most of the stormwater draining from the two parking lots.



Project Area Map

Project Benefits: An estimated 26 lb/yr of phosphorus will be removed. Project will enhance filtration, biological uptake and microbial activity. Educational opportunities exist for the students.

Project Design Considerations: There are existing yard inlets on either side of the front entrance and behind the school which could be retrofitted for water quality treatment, but additional information on the pipe configuration and depths is required to determine feasibility. Consider collecting and storing roof drainage onsite. This site drains to R-161, where additional plantings have been proposed, but the two projects should not impact one another nor do they need to be constructed in a particular order. No permitting, construction or access limitations exist.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	550	SY	\$150.00	\$82,500.00
Manufactured BMP (ie:Tree Box Filter)	1	EA	\$10,000.00	\$10,000.00
Organic Compost Soil Amendment	45	CY	\$40.00	\$1,800.00
		Base Construction Cost		\$94,300.00
		Mobilization (5%)		\$4,715.00
		Plantings (5%)		\$4,715.00
		Ancillary Items (5%)		\$4,715.00
		Erosion & Sediment Control (10%)		\$9,430.00
		Subtotal 1		\$117,875.00
		Contingency (25%)		\$29,468.75
		Subtotal 2		\$147,343.75
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$66,304.69
		Total		\$213,648.44
		Estimated Project Cost		\$220,000.00

LR9523 BMP/LID



Vicinity Map

Address	13006 Feldspar Ct
Location	Subdivision
Landowner	Hayden Village Community Association
PIN	0553 08 G
Control Type	Water quality control
Drainage Area	43 Acres
Receiving Waters	Willow Springs Branch

Description: Project LR9523 is located near Feldspar Court and includes constructing a wetland detention cell to treat for water quality only. This is a large untreated area where more decentralized retrofits would be very difficult due to private property constraints.



Project Area Map

Project Benefits: An estimated 11.5 lb/yr of phosphorus will be removed. The constructed wetland will replicate natural wetland ecosystems while allowing for gravitational settling, biological uptake, and microbial activity. It will possess high amenity and habitat value.

Project Design Considerations: The feasibility of this project is low. There are significant access issues necessitating coordination with VDOT and the HOA. A wetlands permit may need to be obtained. The footprint was selected to avoid the 100 year floodplain and to be set back from existing property owners to the maximum extent practicable. Many mature trees would need to be removed. The project can be designed for channel protection volume or larger events, but the focus of this conceptual was to treat for water quality only. Floodplain and storm drainage easements exist currently. There are no sequencing concerns for this project.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	1400	SY	\$25.00	\$35,000.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	1.2	AC	\$8,500.00	\$10,200.00
Structural BMP and Incidentals	bmp riser	LS	\$10,000 - \$20,000	\$10,000.00
New Storm Pipe	40	LF	\$	\$8,000.00
Grading and Excavation	2100	CY	\$35.00	\$73,500.00
Embankment	800	CY	\$50.00	\$40,000.00
Organic Compost Soil Amendment	1100	CY	\$40.00	\$44,000.00
			Base Construction Cost	\$223,200.00
			Mobilization (5%)	\$11,160.00
			Plantings (5%)	\$11,160.00
			Ancillary Items (5%)	\$11,160.00
			Erosion & Sediment Control (10%)	\$22,320.00
			Subtotal 1	\$279,000.00
			Contingency (25%)	\$69,750.00
			Subtotal 2	\$348,750.00
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$156,937.50
			Total	\$505,687.50
			Estimated Project Cost	\$510,000.00

LR9524 New BMP/LID



Vicinity Map

Address	5355 Ashleigh Rd
Location	Subdivision
Landowner	Hampton Forest HOA
PIN	0554 07 B1
Control Type	Water quality control
Drainage Area	7 acres
Receiving Waters	Unnamed tributary to Willow Springs Branch

Description: The stormwater outfall shown below provides no water quality treatment and suffers from minor erosion. LR9524 will provide new water quality treatment with a constructed wetland area and will prevent future upstream and downstream erosion by dissipating excess energy.



Project Area Map

Project Benefits: LR9524 will improve water quality by removing approximately 1 lb of phosphorus per year. It will treat a portion of the flow draining from subbasin LR-WS-0002. It will also provide critical wetland habitat for native wildlife.

Project Design Considerations: LR9524 is located on Hampton Forest Homeowner's Association property, is mostly contained by a floodplain and storm drainage easement. If necessary, the project footprint can easily be manipulated to fit completely within the easement without sacrificing significant water quality treatment. Impacts to mature trees should be minimal.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Bioretention Filters & Basin	500	SY	\$150.00	\$75,000.00
Manufactured BMP (ie:Tree Box Filter)		EA	\$10,000.00	\$0.00
Organic Compost Soil Amendment		CY	\$40.00	\$0.00
Clear and Grub	0.2	AC	\$8,500.00	\$1,700.00
Grading and Excavation	250	CY	\$35.00	\$8,750.00
Embankment	100	CY	\$50.00	\$5,000.00
		Base Construction Cost		\$90,450.00
		Mobilization (5%)		\$4,522.50
		Plantings (5%)		\$4,522.50
		Ancillary Items (5%)		\$4,522.50
		Erosion & Sediment Control (10%)		\$9,045.00
		Subtotal 1		\$113,062.50
		Contingency (25%)		\$28,265.63
		Subtotal 2		\$141,328.13
		Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)		\$63,597.66
		Total		\$204,925.78
		Estimated Project Cost		\$210,000.00

LR9526 BMP/LID



Vicinity Map

Address	4864 Muddler Way
Location	Subdivision
Landowner	Buckley's Reserve Homeowner's Association
PIN	0554 17 A
Control Type	Water Quality
Drainage Area	22 Acres
Receiving Waters	Unnamed Tributary to Little Rocky Run

Description: Divert flow from outfall into a wetland marsh area. Wetland marsh to treat water quality volume only, channel protection treatment will require removal of trees or realigning storm sewer/outfall. There is a trail and a workout station within the proposed footprint which will need to be relocated.



Project Area Map

Project Benefits: An estimated 4.6 lb/yr of phosphorus will be removed. Signage can be provided and trail can be routed through or around wetland cell to promote quality benefit. The created wetland provides ideal environment for gravitational settling, biological uptake, and microbial activity. Project will provide habitat enhancement for insects, amphibians, and birds.

Project Design Considerations: This is the only project proposed for this subwatershed and sequencing is not an issue. Though not included as part of this estimate, channel-protection may be achieved at this location. There is an existing storm drainage easement to provide access, but the bulk of the work is on HOA property, outside of the easement.

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Access Road	210	SY	\$25.00	\$5,250.00
Access Road Gate	1	EA	\$2,500.00	\$2,500.00
Clear and Grub	0.1	AC	\$8,500.00	\$850.00
Structural BMP and Incidentals	1	LS	\$10,000 - \$20,000	\$10,000.00
Grading and Excavation	675	CY	\$35.00	\$23,625.00
Embankment	100	CY	\$50.00	\$5,000.00
New Storm Pipe	50	LF	\$100 - \$300	\$5,000.00
Organic Compost Soil Amendment	60	CY	\$40.00	\$2,400.00
			Base Construction Cost	\$54,625.00
			Mobilization (5%)	\$2,731.25
			Plantings (5%)	\$2,731.25
			Ancillary Items (5%)	\$2,731.25
			Erosion & Sediment Control (10%)	\$5,462.50
			Subtotal 1	\$68,281.25
			Contingency (25%)	\$17,070.31
			Subtotal 2	\$85,351.56
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	\$38,408.20
			Total	\$123,759.77
			Estimated Project Cost	\$130,000.00

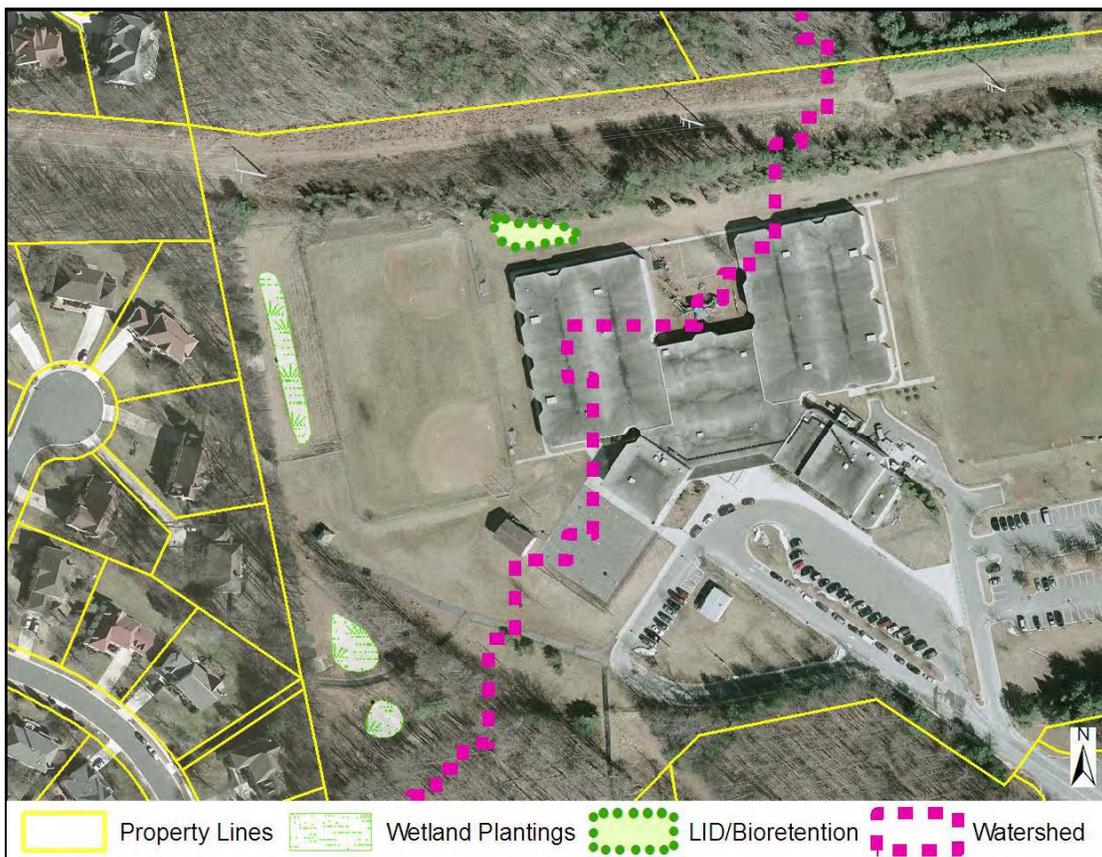
LR9527 BMP/LID



Vicinity Map

Address	5400 Willow Springs School Rd
Location	Willow Springs Elementary School
Landowner	School Board of Fairfax County
PIN	0662 01 0004A
Control Type	Water quality control
Drainage Area	7 Acres
Receiving Waters	Unnamed Tributary to Willow Springs Branch

Description: Project LR9527 provides stormwater retrofits at the Willow Springs Elementary School. Retrofits include: altering the pond geometry and adding wetland plantings to three existing dry ponds and adding a bioretention area to capture impervious runoff from the roof.



Project Area Map

Project Benefits: Project will reduce phosphorus, nitrogen and sediment loads. Plantings/geometry adjustments will promote gravitational settling, biological uptake and microbial activity while providing habitat enhancement for insects, birds, amphibians, etc. The project will provide educational opportunities for students.

Project Design Considerations: School site on border between the Little Rocky Run watershed and the Pope's Head Run watershed. A project was proposed in the latter plan on the site, so this proposal focuses solely on the drainage to Little Rocky Run. Roof drainage may need to be diverted to a bioretention area. The proposed measures are for quality control only and therefore sequencing/coordination is not critical. There are no access/permitting issues.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Vegetated Swale		SY	\$50.00	\$0.00
Pervious Pavement		SY	\$100.00	\$0.00
Vegetated Roof		SY	\$450.00	\$0.00
Percolation/Infiltration Trench		SY	\$75.00	\$0.00
Grading and Excavation	400	CY	\$35.00	\$14,000.00
Bioretention Filters & Basin	250	SY	\$150.00	\$37,500.00
Manufactured BMP (ie:Tree Box Filter)	0	EA	\$10,000.00	\$0.00
Organic Compost Soil Amendment	100	CY	\$40.00	\$4,000.00
		Base Construction Cost		\$55,500.00
		Mobilization (5%)		\$2,775.00
		Plantings (5%)		\$2,775.00
		Ancillary Items (5%)		\$2,775.00
		Erosion & Sediment Control (10%)		\$5,550.00
		Subtotal 1		\$69,375.00
		Contingency (25%)		\$17,343.75
		Subtotal 2		\$86,718.75
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$39,023.44
		Total		\$125,742.19
		Estimated Project Cost		\$130,000.00