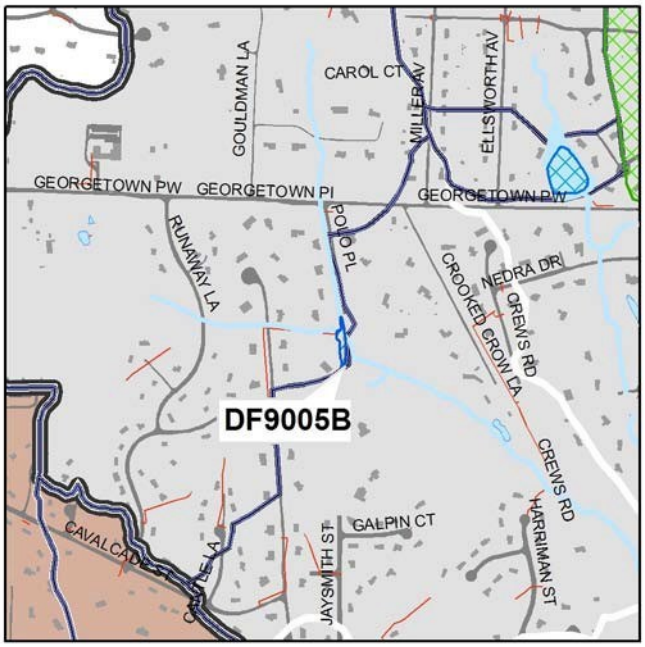
Project Number: DF9005B
Catchment Code: DFCH0002
Candidate Site: D-05

Project Type: Culvert Retrofit
Project Size: 0.3 acres
Treated Area: 235 acres

Project Location: On the upstream side of Polo Place.

Project Description: This project consists of modifying the existing culvert crossing at Polo Place to provide detention storage. The drainage area of this system is made up of large lot residential units with little or no stormwater management facilities. There is an established wetland within the project limits, providing increased nutrient uptake from vegetation.



Potential Project Benefits:

Streamflow	This site provides approximately 20% of the channel protection storage for the drainage area.
Water Quality	The main water quality improvements from this project would be nutrient uptake from vegetation.

Potential Project Constraints:

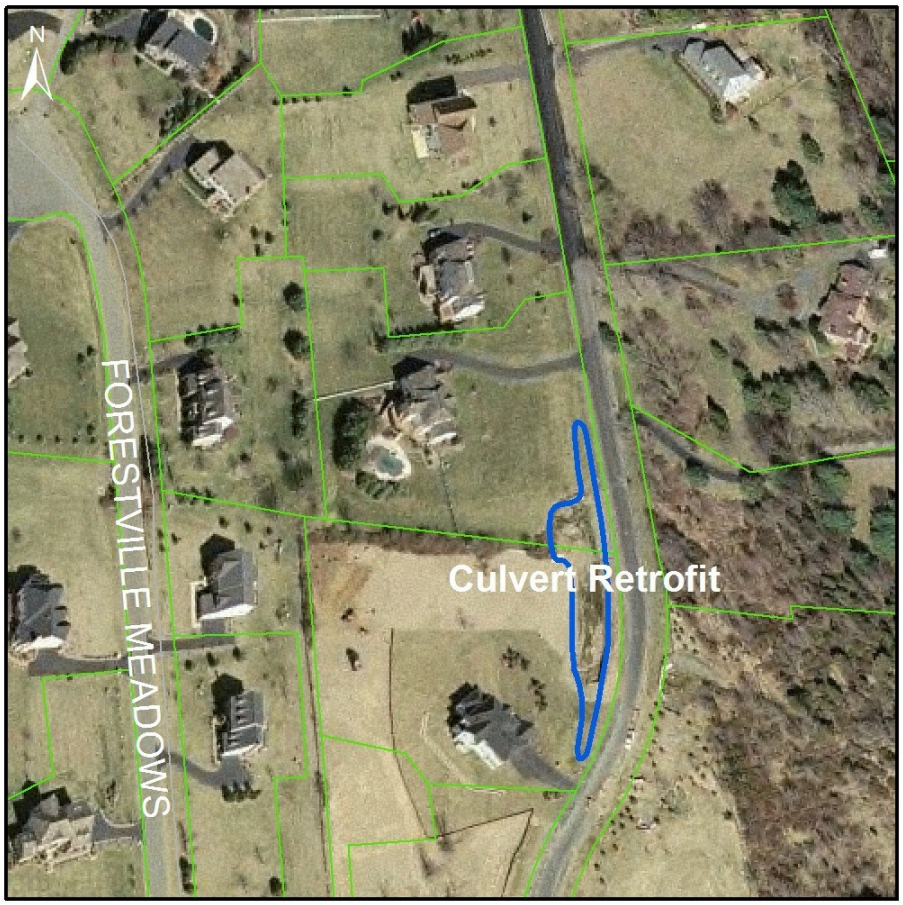
Environmental	This project is located between a stormwater outfall and a culvert, so permitting requirements should be minor. There will be wetland impacts, but the loss will be mitigated or replaced by the project. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility is excellent along Polo Place.
Design / Construction	No design or construction issues were identified.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$5,000.00	$500
Excavation	520	CY	$35.00	$18,200
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	240	SY	$2.50	$600
Wetland Planting	80	SY	$2.00	$160
			Base Construction Cost	**$24,460**
			Mobilization (5%)	$1,223
			Subtotal 1	**$25,683**
			Contingency (25%)	$6,421
			Subtotal 2	**$32,104**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$14,447
			Estimated Project Cost	**$47,000**

This project is part of the alternative project group for Regional Pond D-05. See Table 5-2 for the recommended disposition.

Concept Sketch:

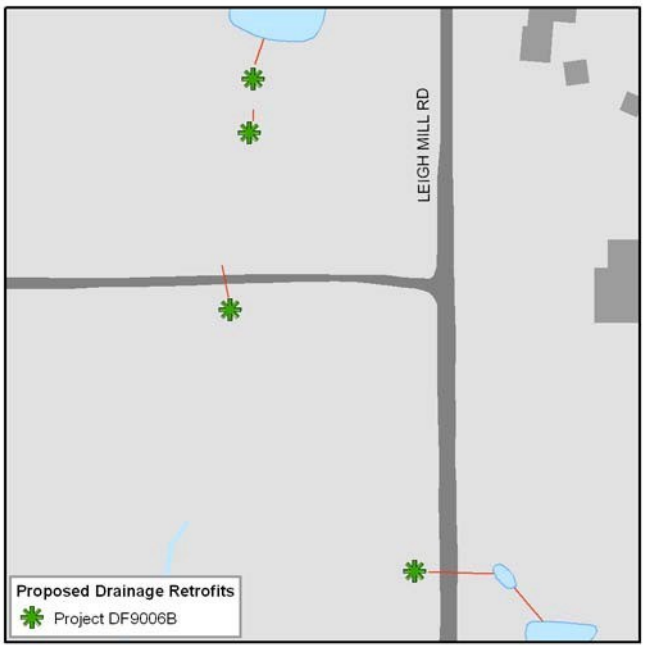


Project Number: DF9006B
Catchment Code: DFCH9701
Candidate Site: D-06

Project Type: Drainage Retrofit
Project Size: 4 Sites

Project Location: Along Hickory Run Road at all culvert outlets.

Project Description: The stream channel shows signs of erosion and scour in the upper reach of this catchment from the existing farm pond down to the main floodplain valley. This erosion appears to be related to the steep channel slope and the influences of the series of driveway culverts and the one culvert under Hickory Run. This project would consist of providing outlet protection on the downstream side of each of these culverts.



Potential Project Benefits:

Streamflow	The project will reduce velocity from the culvert outlets and erosive potential immediately downstream.
Water Quality	The primary benefit to the water quality would come from the reduction of sediment loads associated with high velocity at the culvert locations.

Potential Project Constraints:

Environmental	No environmental constraints or permitting issues are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Excellent access to this site can be obtained from the roadway and driveways.
Design / Construction	No significant design or construction issues were identified for this project.

Costs:

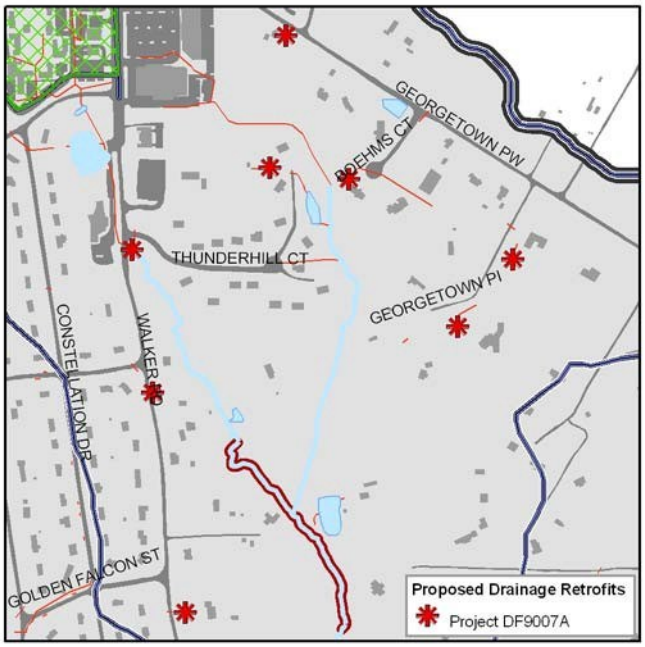
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	4	EA	$8,000.00	$32,000
			Base Construction Cost	**$32,000**
			Mobilization (5%)	$1,600
			Subtotal 1	**$33,600**
			Contingency (25%)	$8,400
			Subtotal 2	**$42,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$18,900
			Estimated Project Cost	**$61,000**

This project is part of the alternative project group for Regional Pond D-06. See Table 5-2 for the recommended disposition.

This page intentionally left blank.

Project Number: DF9007A
Catchment Code: DFCH9801
Candidate Site: D-07

Project Type: Drainage Retrofit
Project Size: 8 Outlets



Project Location: This project will be distributed throughout the catchment where piped drainage systems outfall into natural channels. Two locations that may need particular attention are the outfall locations near high impervious levels in the commercial areas.

Project Description: In this catchment, there are signs of erosion and scour at each location where the drainage network discharges into the floodplain. Improvements are recommended throughout the catchment to provide adequate energy dissipation at every interface from storm drain systems to natural channels.

Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfall and erosive potential immediately downstream.
Water Quality	The primary benefit to the water quality would come from the reduction of sediment loads associated with high velocity at the outfall locations.

Potential Project Constraints:

Environmental	No environmental constraints or permitting requirements are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Generally, access can be obtained from adjacent roads or storm drain easements.
Design / Construction	No significant design or construction issues were identified for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	8	EA	$8,000.00	$64,000
			Base Construction Cost	**$64,000**
			Mobilization (5%)	$3,200
			Subtotal 1	**$67,200**
			Contingency (25%)	$16,800
			Subtotal 2	**$84,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$37,800
			Estimated Project Cost	**$122,000**

This project is part of the alternative project group for Regional Pond D-07. See Table 5-2 for the recommended disposition.

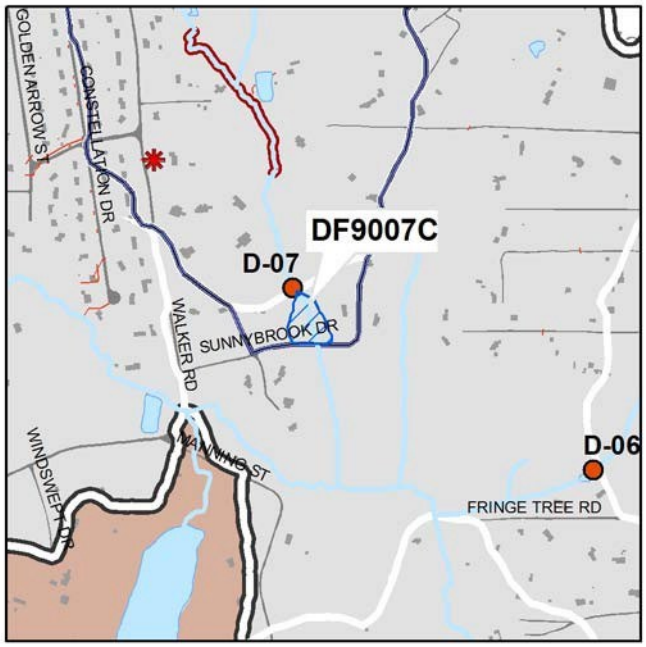
This page intentionally left blank.

Project Number: DF9007C
Catchment Code: DFCH9801
Candidate Site: D-07

Project Type: Culvert Retrofit
Project Size: 1.7 acres
Treated Area: 208 acres

Project Location: This project is on the north side of Sunnybrook Drive.

Project Description: The culvert at Sunnybrook Drive is a low head crossing with a wide floodplain and has an established wetland upstream. The project would consist of a redundant embankment which would retain stormwater within the floodplain temporarily and would not have a permanent pool. This facility would also settle out sediment and allow vegetative uptake to reduce pollutant loads.



Potential Project Benefits:

Streamflow	The project would provide about 30% of the channel protection volume.
Water Quality	Water quality improvements could be accomplished via nutrient uptake from the wetland and additional landscaping. Some settling of sediment on the floodplain is expected.

Potential Project Constraints:

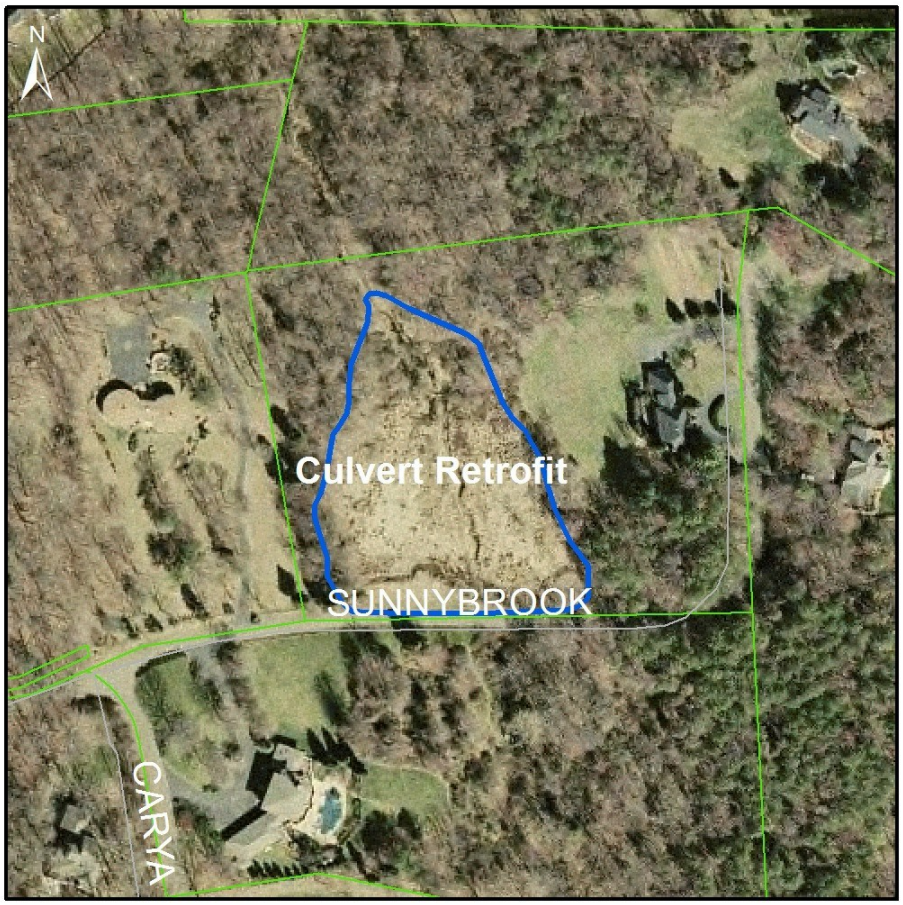
Environmental	Some wetland impacts are expected with construction of the impoundment; however, these should be mitigated onsite in the facility. Permits will be required from the Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access from Sunnybrook Drive is excellent.
Design / Construction	No significant design or construction issues were noted.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.4	AC	$5,000.00	$2,000
Excavation	850	CY	$35.00	$29,750
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	1,020	SY	$2.50	$2,550
Wetland Planting	1,020	SY	$2.00	$2,040
			Base Construction Cost	**$41,340**
			Mobilization (5%)	$2,067
			Subtotal 1	**$43,407**
			Contingency (25%)	$10,852
			Subtotal 2	**$54,259**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$24,416
			Estimated Project Cost	**$79,000**

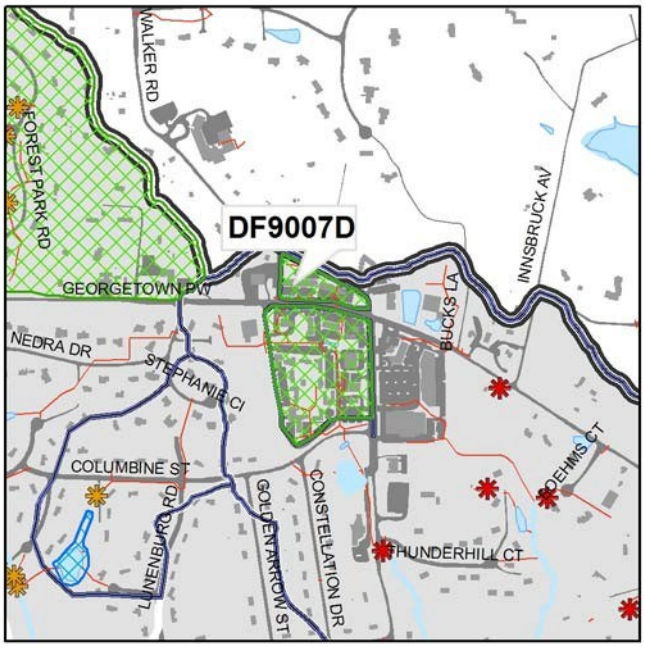
This project is part of the alternative project group for Regional Pond D-07. See Table 5-2 for the recommended disposition.

Concept Sketch:



Project Number: DF9007D
Catchment Code: DFCH9801
Candidate Site: D-07

Project Type: LID Retrofit
Project Size: 746 SY
Treated Area: 15.0 acres



Project Location: This project is located at the intersection of Georgetown Pike and Walker Road.

Project Description: LID or Filterra systems would be installed at storm drain inlets and parking islands where high impervious levels are located in a commercial area west of Walker Road. Approximately 750 SY of bioretention, swales, or other structural LID controls would be installed to treat the existing impervious area. The project would be designed to reduce pollutant loads; storage volume for channel protection is not provided.

Potential Project Benefits:

Streamflow	Some improvement may occur in runoff volume from reduction of impervious area and the detention and infiltration components of the LID systems.
Water Quality	Water quality will be improved from filtration and nutrient uptake in bioretention or Filterra systems.

Potential Project Constraints:

Environmental	No environmental constraints or permitting issues are anticipated.
Facility Access	Access to the site is excellent by public roads and parking areas.
Design / Construction	No significant design or construction issues were noted.

Costs:

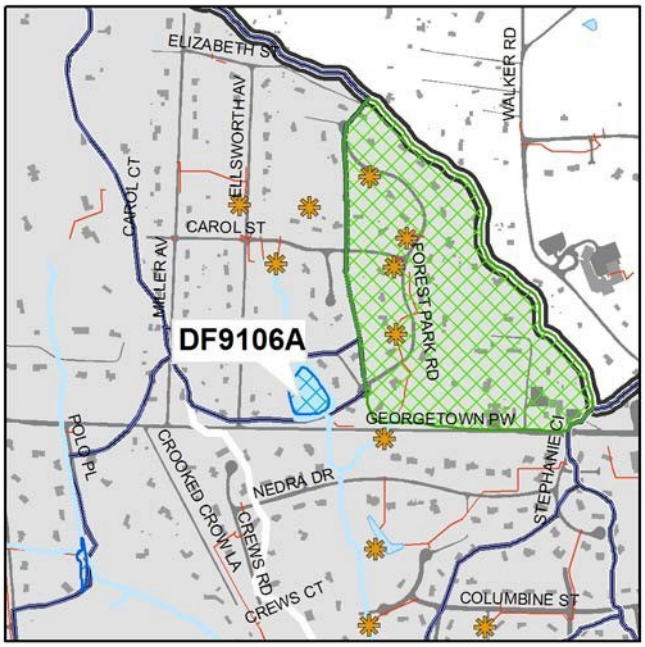
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
LID Structural Control	746.0	SY	$120.00	$89,520
			Base Construction Cost	**$89,520**
			Mobilization (5%)	$4,476
			Subtotal 1	**$93,996**
			Contingency (25%)	$23,499
			Subtotal 2	**$117,495**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$52,873
			Estimated Project Cost	**$170,000**

This project is part of the alternative project group for Regional Pond D-07. See Table 5-2 for the recommended disposition.

Concept Sketch:

Project Number: DF9106A
Catchment Code: DFCH0003
Candidate Site: C06

Project Type: Pond Retrofit
Project Size: 1.4 acres
Treated Area: 96 acres



Project Location: This project is located upstream of Georgetown Pike.

Project Description: The existing pond facility is mature and is showing signs of conversion into a wetland area. The wet storage volume within this pond meets the water quality storage volume value, with enough excess storage volume to construct an aquatic bench around the entire perimeter of this facility. The control structure should be upgraded to a multi-stage riser with a low flow orifice sized for channel protection. Sediment should be removed and the basin should be regraded to a shallower depth to increase the surface to depth ratio.

Potential Project Benefits:

Streamflow	100% of the channel protection volume can be achieved by modifying the control structure.
Water Quality	100% of the water quality volume can be met at this location.

Potential Project Constraints:

Environmental	Environmental permitting issues would not be expected for this project. There are no significant environmental impacts. Projects in RPAs may require exceptions or waivers.
Facility Access	Facility access is excellent, both from the roadway and the private drive.
Design / Construction	No significant design or construction issues were identified. County staff will coordinate with the facility owner to implement the project.

Costs:

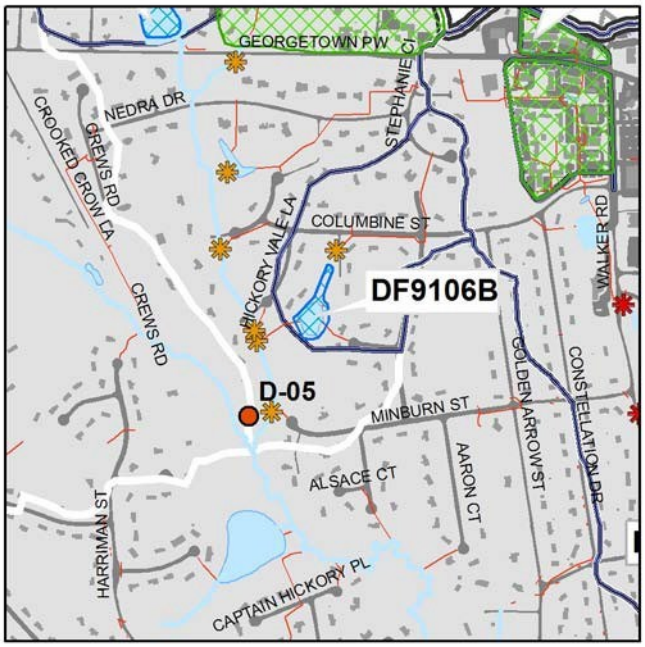
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$5,000.00	$500.00
Excavation/Grading (aquatic bench)	1552	CY	$30.00	$46,560.00
Riser	1	LS	$10,000.00	$10,000.00
Wetland Planting (aquatic bench)	806	SY	$2.00	$1,612
			Base Construction Cost	**$58,672**
			Mobilization (5%)	$2,934
			Subtotal 1	**$61,606**
			Contingency (25%)	$15,401
			Subtotal 2	**$77,007**
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$34,653
			Estimated Project Cost	**$112,000**

No Site Photo

Concept Sketch:

Project Number: DF9106B
Catchment Code: DFCH0003
Candidate Site: C06

Project Type: Pond Retrofit
Project Size: 1.4 acres
Treated Area: 31 acres



Project Location: This project is located south of Columbine Street.

Project Description: The pond at this site treats storm drain runoff from residential properties off of Columbine Street. This retrofit project will focus on maximizing the performance of the facility within its existing footprint. Increased management of high frequency storm events can be achieved by installing a multistage control structure. Water quality treatment can be improved by reducing erosive velocities at the outfall and also encouraging vegetative uptake of nutrients. A sediment forebay is proposed at the base of the single inflow pipe to treat runoff.

Potential Project Benefits:

Streamflow	This project will reduce peak discharge rates and provide 20% of the channel protection volume.
Water Quality	A combination of extended detention, sediment forebay and scour reduction at the outfall will improve water quality.

Potential Project Constraints:

Environmental	There are minimal environmental impacts associated with this retrofit, and no permitting issues are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Facility access is fair from the existing roadway.
Design / Construction	No unusual design or construction issues were noted. County staff will coordinate with the facility owner to implement the project.

Costs:

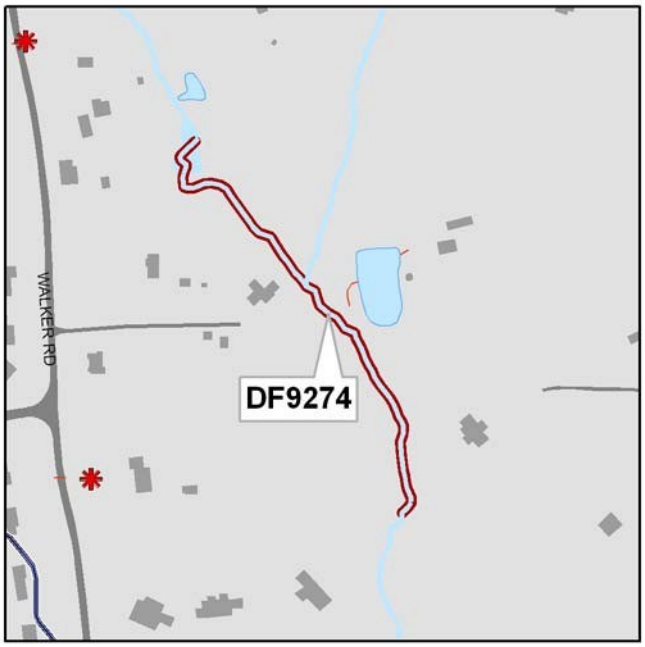
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$5,000.00	$500.00
Forebay	98	CY	$45.00	$4,410.00
Outlet Protection	1	EA	$8,000.00	$8,000.00
Riser	1	LS	$10,000.00	$10,000.00
			Base Construction Cost	**$22,910**
			Mobilization (5%)	$1,146
			Subtotal 1	**$24,056**
			Contingency (25%)	$6,014
			Subtotal 2	**$30,069**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$13,531
			Estimated Project Cost	**$44,000**

Site Photo:

Concept Sketch:

Project Number: DF9274
Catchment Code: DFCH9801
Candidate Site: S74

Project Type: Stream Restoration
Project Size: 1,294 Linear Feet



Project Location: This project is located between a private driveway off of Walker Road and Sunnybrook Road.

Project Description: This stream reach is moderately to severely incised with raw, eroding, near vertical banks. The bed has eroded to weathered rock and riffle pool bed forms are largely absent. The stream is located in an open pasture area between several private residences.

The proposed restoration would involve complete reconstruction of the stream within the existing floodplain, and abandonment of the incised channel to be filled or converted to ponds. The reconstructed channel would be developed with a pattern, dimension, and profile designed for existing flows and consistent with a natural stream. This would prevent further mass erosion associated with channel widening and bank failure, would improve instream habitat, and provide access to a functional floodplain. The buffer area in the new floodplain would be planted with native woody vegetation and grasses.

Potential Project Benefits:

Stream Stability	The pattern, dimension, and profile of the stream will be reconstructed and a floodplain connection will be created.
Water Quality	Water quality will be improved by a significant reduction in current and future bank and bed erosion.
Instream Habitat	Erosion reduction, recreated stream channel, and establishment of a riparian buffer will improve physical habitat conditions.

Potential Project Constraints:

Environmental	The site will not require forest clearing or impacts to jurisdictional wetlands. However, it will require a permit from both the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property but is open and unconstrained adjacent to the stream.
Design / Construction	Design efforts are moderate compared to other stream restoration projects. General constructability is good.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct new channel	1294	LF	$200.00	$258,800
Buffer restoration	included above	LF	$25.00	$0
Add'l cost, first 500 LF	500	LF	$200.00	$100,000
			Base Construction Cost	**$358,800**
			Mobilization (5%)	$17,940
			Subtotal 1	**$376,740**
			Contingency (25%)	$94,185
			Subtotal 2	**$470,925**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$211,916
			Estimated Project Cost	**$683,000**

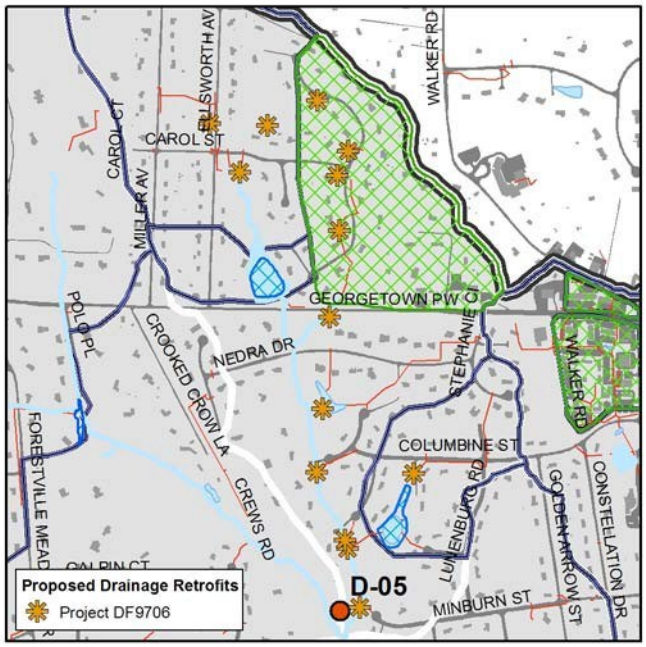
Concept Sketch:

Project Number: DF9706
Catchment Code: DFCH0003
Candidate Site: C06

Project Type: Drainage Retrofit
Project Size: 14 Outfalls

Project Location: This project is located at various locations distributed throughout the catchment.

Project Description: This project consists of providing additional outlet protection to locations where the storm drainage system discharges into the natural channel. Significant erosion and scour was noted in these areas.



Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfalls and help reduce erosive potential immediately downstream.
Water Quality	Water quality improvements would be associated with the reduction of scour at outfall locations and within the channels downstream from them.

Potential Project Constraints:

Environmental	There are no environmental constraints or permitting issues associated with this project. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to these sites can be obtained from roads, driveways, and drainage easements.
Design / Construction	No significant design or construction issues were identified for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	14	EA	$8,000.00	$112,000
			Base Construction Cost	**$112,000**
			Mobilization (5%)	$5,600
			Subtotal 1	**$117,600**
			Contingency (25%)	$29,400
			Subtotal 2	**$147,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$66,150
			Estimated Project Cost	**$213,000**

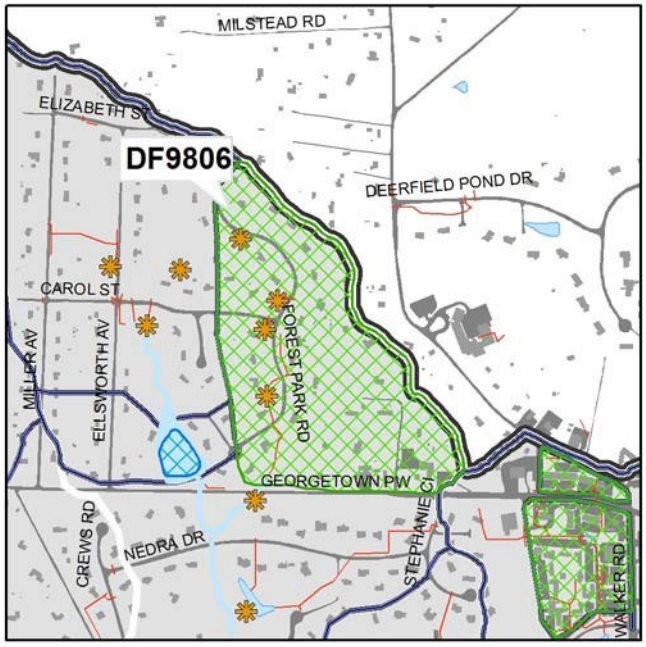
This page intentionally left blank.

Project Number: DF9806
Catchment Code: DFCH0003
Candidate Site: C06

Project Type: LID Retrofit
Project Size: 637 SY
Treated Area: 52.6 acres

Project Location: This project is located along the large natural gas easement upstream of Georgetown Pike.

Project Description: This project will consist of the replacement of a concrete channel with a LID system made up of a bioswale, bioretention facility and natural channel improvement. The area draining to this point in the catchment does not appear to be treated by any structural stormwater management measures and is made up of light to moderate residential land uses.



Potential Project Benefits:

Streamflow	Some improvement may occur in runoff volume from the detention and infiltration components of the LID systems.
Water Quality	This facility would be expected to provide water quality benefits though filtration and nutrient uptake.

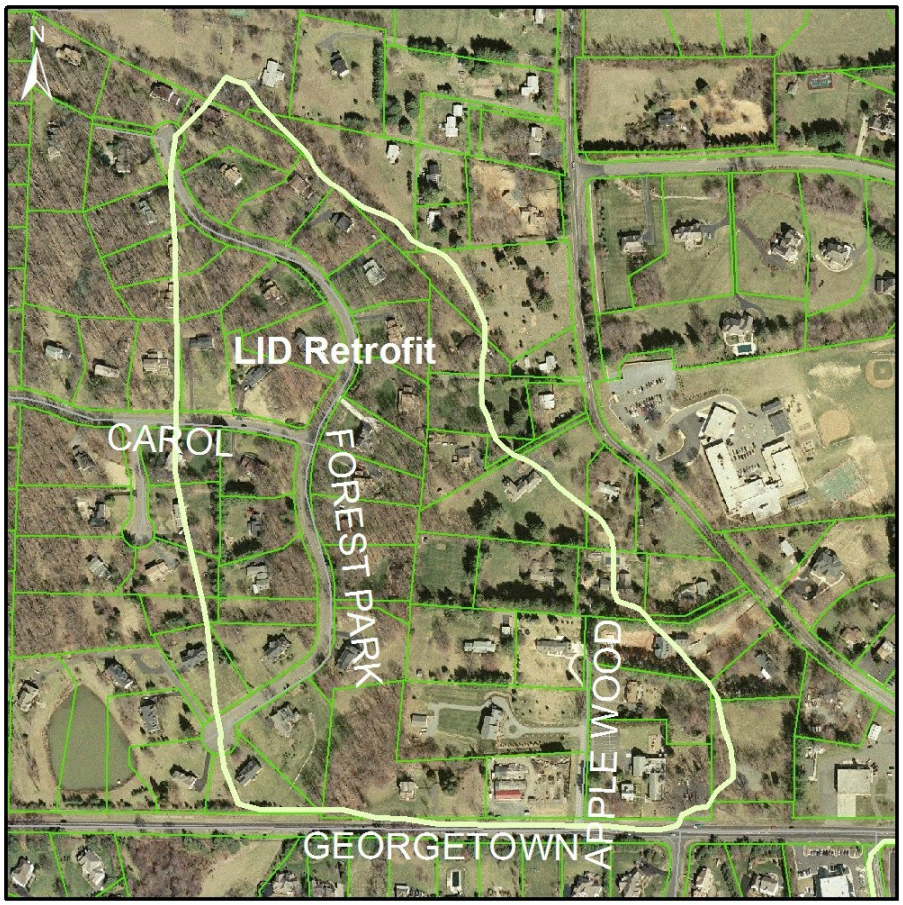
Potential Project Constraints:

Environmental	Environmental permitting issues are expected to be minimal. There are no forest or wetland impacts.
Facility Access	Access to this facility is very good.
Design / Construction	The primary constraint is the location in the gas easement and any restrictions that may be associated with it. Relocation of the drainage course may be necessary.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
LID Structural Control	637.0	SY	$120.00	$76,440
			Base Construction Cost	**$76,440**
			Mobilization (5%)	$3,822
			Subtotal 1	**$80,262**
			Contingency (25%)	$20,066
			Subtotal 2	**$100,328**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$45,147
			Estimated Project Cost	**$145,000**

Concept Sketch:

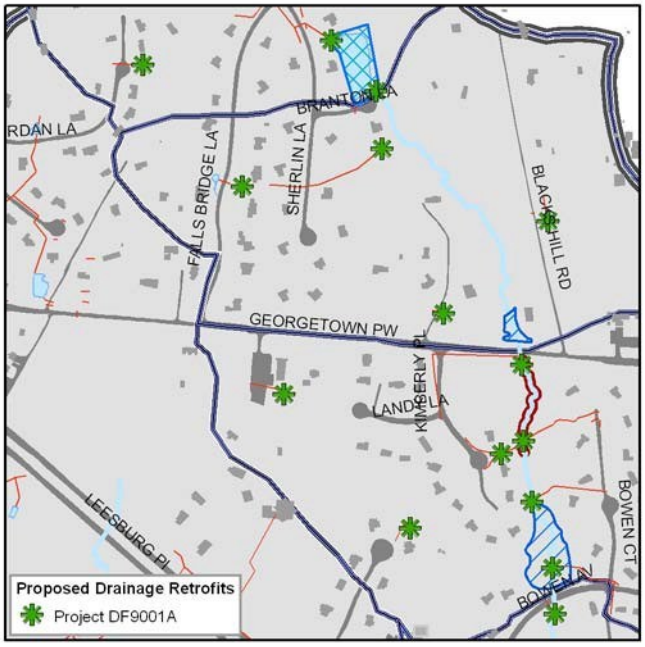


Project Number: DF9001A
Catchment Code: DFDG0002
Candidate Site: D-01

Project Type: Drainage Retrofit
Project Size: 15 Outfalls

Project Location:
This project will be distributed throughout the catchment.

Project Description:
There are signs of erosion and scour distributed throughout this catchment. This project will provide improvements to the drainage infrastructure by improving outlet protection at the storm sewer outfalls.



Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfalls and erosive potential immediately downstream.
Water Quality	The primary benefit to water quality would come from the reduction of sediment loads associated with high velocity at the outfall locations.

Potential Project Constraints:

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads.
Design / Construction	No significant design or construction issues were identified for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	15	EA	$8,000.00	$120,000
			Base Construction Cost	**$120,000**
			Mobilization (5%)	$6,000
			Subtotal 1	**$126,000**
			Contingency (25%)	$31,500
			Subtotal 2	**$157,500**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$70,875
			Estimated Project Cost	**$228,000**

This project is part of the alternative project group for Regional Pond D-01. See Table 5-2 for the recommended disposition.

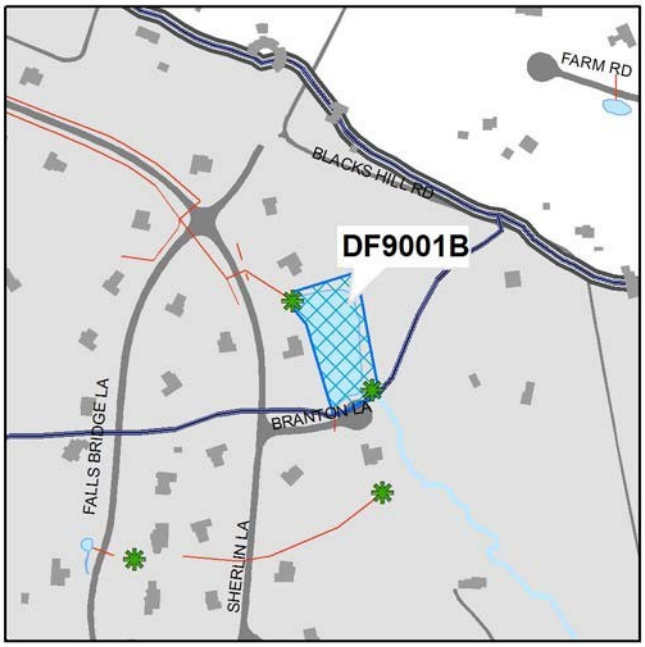
This page intentionally left blank.

Project Number: DF9001B
Catchment Code: DFDG0002
Candidate Site: D-01

Project Type: Pond Retrofit
Project Size: 1.5 acres
Treated Area: 62.5 acres

Project Location: This project is located at the end of Branton Lane.

Project Description: This facility is bordered on all sides by private property and therefore all retrofit improvements should be contained within the existing pond boundaries. The upstream portion of the pond will be excavated out to create a flat bottom. The center of the facility will be reconstructed to direct runoff into a wet marsh.



Potential Project Benefits:

Streamflow	100% of the channel protection volume can be created by excavation and by modifying the control structure.
Water Quality	100% of the water quality volume can be stored in this project.

Potential Project Constraints:

Environmental	No environmental constraints are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility is very good from Branton Lane.
Design / Construction	No significant design or construction issues were identified for this project. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.7	AC	$5,000.00	$3,500
Grading and Excavation	1852	CY	$30.00	$55,560
New Embankment	725	CY	$60.00	$43,500
Riser	1	LS	$3,000.00	$3,000
Rip Rap Stabilization	100	LF	$50.00	$5,000
Wetland Planting	1947	SY	$2.00	$3,894
Dry Landscaping	1370	SY	$2.50	$3,425
			Base Construction Cost	**$117,879**
			Mobilization (5%)	$5,894
			Subtotal 1	**$123,773**
			Contingency (25%)	$30,943
			Subtotal 2	**$154,716**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$69,622
			Estimated Project Cost	**$224,000**

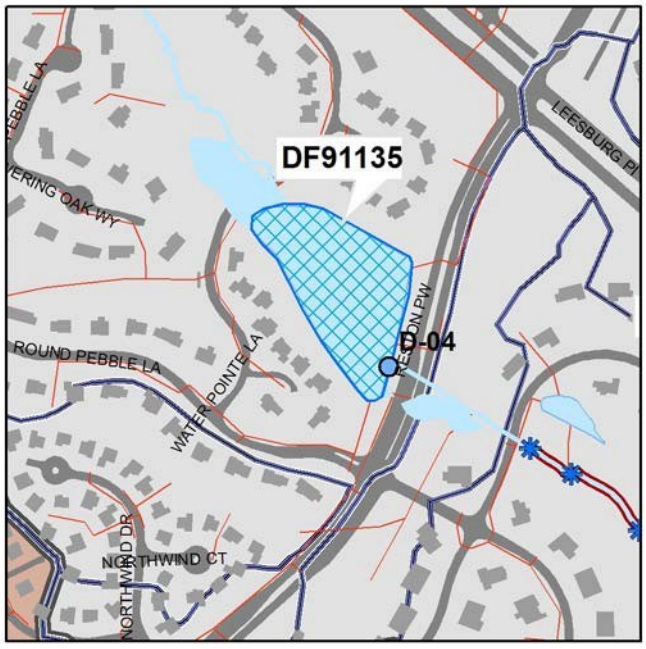
This project is part of the alternative project group for Regional Pond D-01. See Table 5-2 for the recommended disposition.

Concept Sketch

Project Site

Project Number: DF91135
Catchment Code: DFDG9901
Candidate Site: C135

Project Type: Pond Retrofit
Project Size: 3.5 acres
Treated Area: 187.8 acres



Project Location: This project is located upstream of Reston Parkway.

Project Description: The control structure of this pond can be modified for extended detention of the 1-year storm event by raising the principal weir crest and notching an orifice at the water surface, which will meet the channel protection volume. The water quality volume is completely met within the wet storage of this pond. Also, an existing vegetated aquatic bench and areas of wetland planting are evident around sections of the wet perimeter. This project will enhance these components by extending the existing aquatic bench around the entire perimeter of the pond.

Potential Project Benefits:

Streamflow	100% of the channel protection can be met by modifying the control structure.
Water Quality	100% of the water quality volume is met within the wet storage of this pond.

Potential Project Constraints:

Environmental	No environmental constraints are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this area is very good by way of public roads.
Design / Construction	No design or construction problems are anticipated for this project. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Excavation/Grading (aquatic bench)	9111	CY	$30.00	$273,330.00
Riser	1	LS	$3,000.00	$3,000.00
Wetland Planting (aquatic bench)	1656	SY	$2.00	$3,312.00
			Base Construction Cost	**$279,642**
			Mobilization (5%)	$13,982
			Subtotal 1	**$293,624**
			Contingency (25%)	$73,406
			Subtotal 2	**$367,030**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$165,164
			Estimated Project Cost	**$532,000**

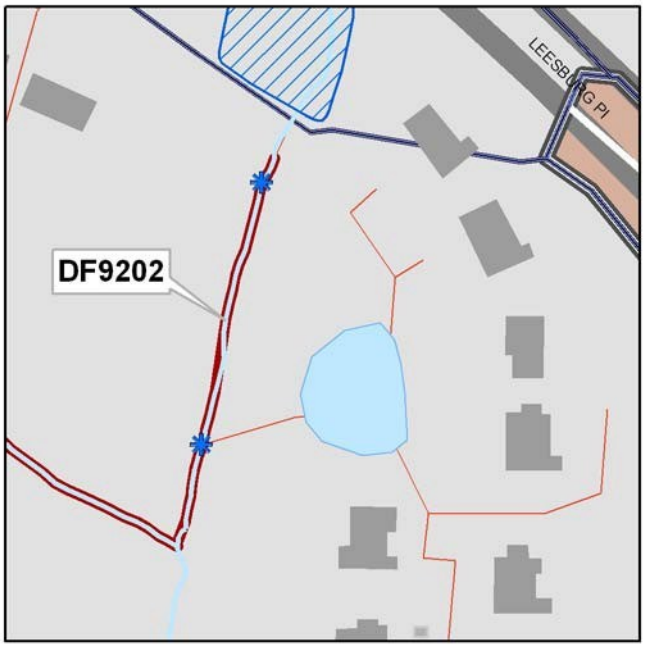
Concept Sketch

Project site:

Project Number: DF9202
Catchment Code: DFDG0003
Candidate Site: S02

Project Type: Stream Restoration
Project Size: 484 Linear Feet

Project Location: This project is located southwest of Leesburg Pike and east of Reston Parkway.



Project Description:
The stream has raw eroding streambanks and is moderately incised. The stream appears to be historically straightened and lacks strong riffle pool morphology. The stream will be re-meandered with a pattern, dimension and profile more consistent with a natural stream. Banks will be stabilized and a floodplain connection will be recreated. Stream buffers will be restored on all project reaches.

Potential Project Benefits:

Stream Stability	The pattern, dimension, and profile of the stream will be reestablished and a floodplain connection will be recreated.
Water Quality	Water quality will be improved by a significant reduction in current and future bank and bed erosion.
Instream Habitat	Erosion reduction, created bed features, and establishing a riparian buffer will improve physical habitat conditions.

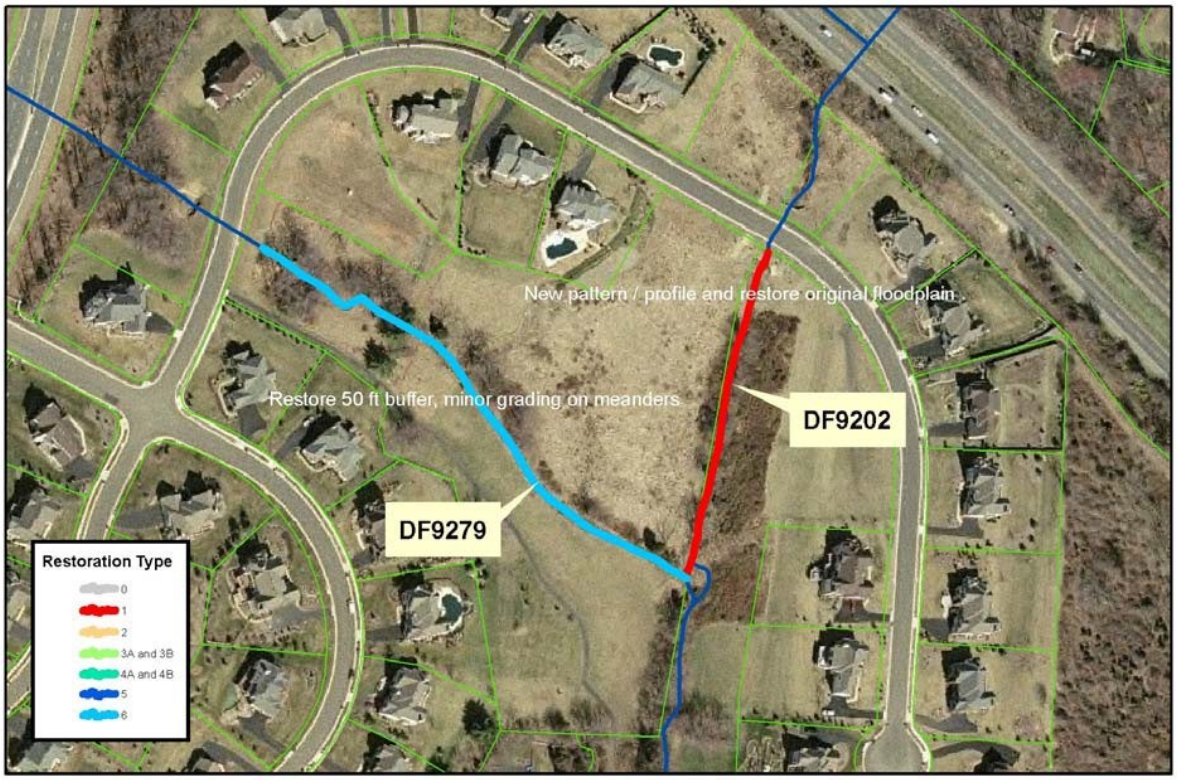
Potential Project Constraints:

Environmental	The site will not require forest clearing but will impact jurisdictional wetlands. It will require a permit from the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property and some clearing of scrub vegetation.
Design / Construction	Design efforts are moderate compared to other stream restoration projects. General constructability is good.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct new channel	484	LF	$200.00	$96,800
Add'l cost, first 500 LF	484	LF	$200.00	$96,800
			Base Construction Cost	**$193,600**
			Mobilization (5%)	$9,680
			Subtotal 1	**$203,280**
			Contingency (25%)	$50,820
			Subtotal 2	**$254,100**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$114,345
			Estimated Project Cost	**$368,000**

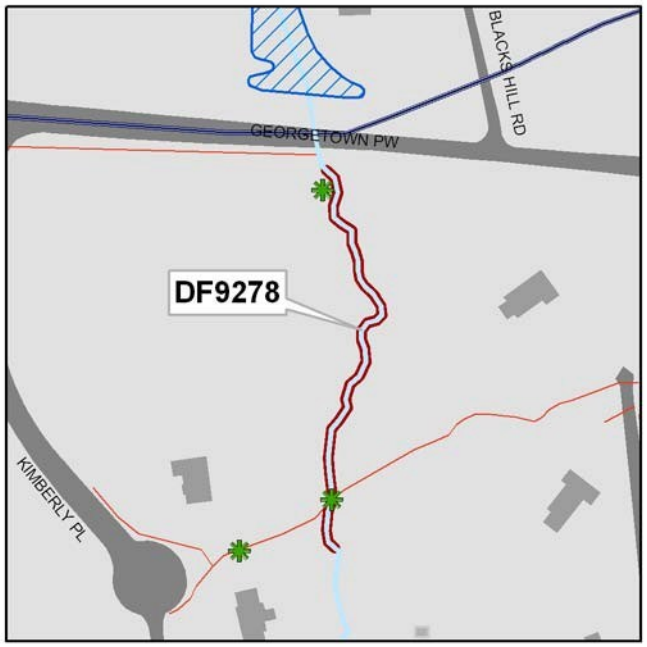
Concept Sketch



Project Number: DF9278
Catchment Code: DFDG0002
Candidate Site: S78

Project Type: Stream Restoration
Project Size: 558 Linear Feet

Project Location: This project is located to the south of Georgetown Pike



Project Description:
The stream is eroding its banks and is incised. The stream is straight in the upper portion but has re-established a meander pattern in the downstream portion. The streambed has moderate riffle pool morphology. A pattern, dimension and profile more consistent with a natural stream will be recreated. Banks will be stabilized and a floodplain connection will be established. Two eroding side channels will also be restored as part of the project. A vegetated stream buffer will be re-established on all project reaches.

Potential Project Benefits:

Stream Stability	The pattern, dimension, and profile of the stream will be corrected and a floodplain connection will be recreated.
Water Quality	Water quality will be improved by a significant reduction in current and future bank and bed erosion.
Instream Habitat	Erosion reduction, created bed features, and establishing a riparian buffer will improve physical habitat conditions.

Potential Project Constraints:

Environmental	The site will require some tree removal and impacts to jurisdictional wetlands. It will require a permit from both the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property and improvements to the project area.
Design / Construction	Design efforts are significant compared to other stream restoration projects. General constructability is constrained by access.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct new channel	384	LF	$200.00	$76,800
Reconstruct new pattern and profile	174	LF	$250.00	$43,500
Add'l cost, first 500 LF	500	LF	$200.00	$100,000
			Base Construction Cost	**$220,300**
			Mobilization (5%)	$11,015
			Subtotal 1	**$231,315**
			Contingency (25%)	$57,829
			Subtotal 2	**$289,144**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$130,115
			Estimated Project Cost	**$419,000**

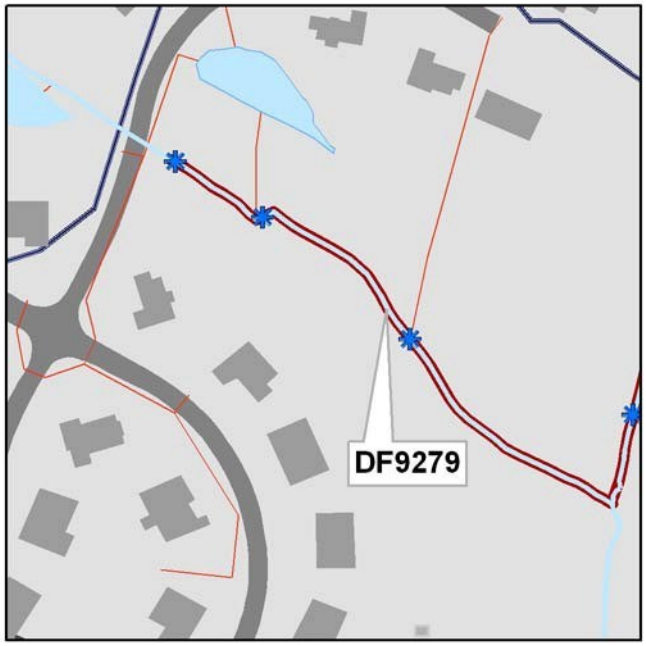
Concept Sketch

Project Number: DF9279
Catchment Code: DFDG0003
Candidate Site: S79

Project Type: Buffer Restoration
Project Size: 810 Linear Feet

Project Location: This project is located southwest of Leesburg Pike and east of Reston Parkway.

Project Description:
The stream has poor habitat and is missing the buffer on both banks. It also shows evidence of being channelized in the past. The project will restore a forested buffer, but stream stabilization and restoration is not required.



Potential Project Benefits:

Stream Stability	The buffer will provide some stabilization by vegetating the streambanks.
Water Quality	Minor improvements to water quality will occur due to shading and cooler temperatures.
Instream Habitat	Increase in shade, detritus, woody plant material and cooler water temperatures will improve habitat.

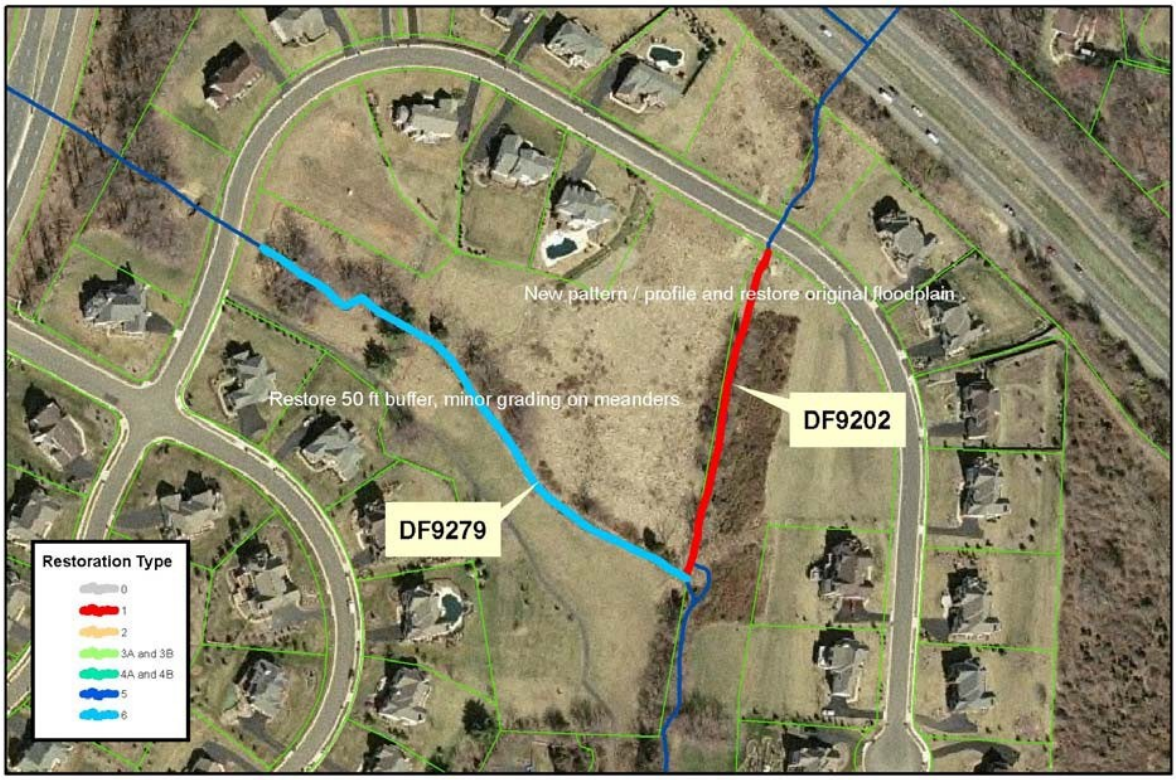
Potential Project Constraints:

Environmental	The site will not require forest clearing but will impact to jurisdictional wetlands. It will require a permit from the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property ands some clearing of scrub vegetation.
Design / Construction	Design efforts are minor. General constructability is good.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Buffer restoration	810	LF	$25.00	$20,250
			Base Construction Cost	**$20,250**
			Mobilization (5%)	$1,012
			Subtotal 1	**$21,262**
			Contingency (25%)	$5,315
			Subtotal 2	**$26,578**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$11,960
			Estimated Project Cost	**$39,000.00**

Concept Sketch

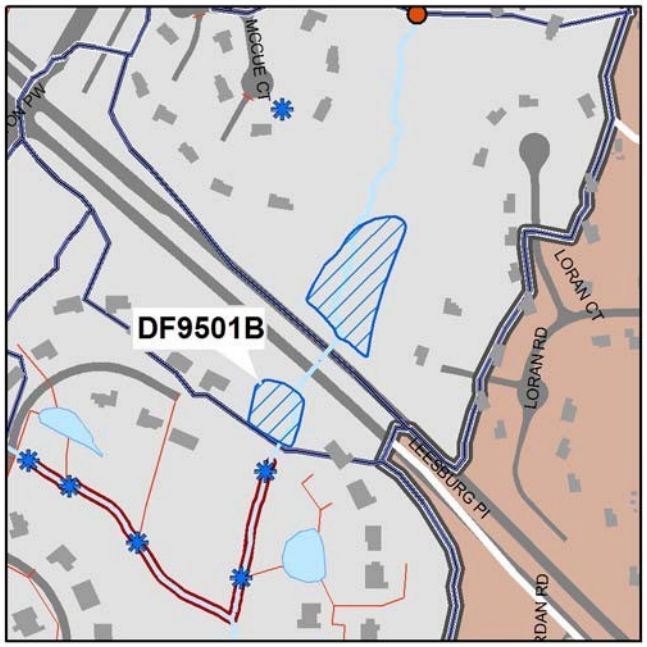


Project Number: DF9501B
Catchment Code: DFDG0003
Candidate Site: C01

Project Type: Culvert Retrofit
Project Size: 0.5 acres
Treated Area: 35.3 acres

Project Location: On the upstream side of Stones Throw Drive

Project Description: The retrofit to this existing culvert would make use of the floodplain area for detention and water quality treatment, and could be accomplished with a small enough footprint as to have minimum impact on the existing stream ecology. This facility should focus on providing dry detention that maintains base flow rates and channel forming flows.



Potential Project Benefits:

Streamflow	The site can provide storage for 90% of the channel protection volume.
Water Quality	Water quality would benefit from the reduction of scour inducing peak flow rates, and the use of floodplain areas for detention and vegetative uptake.

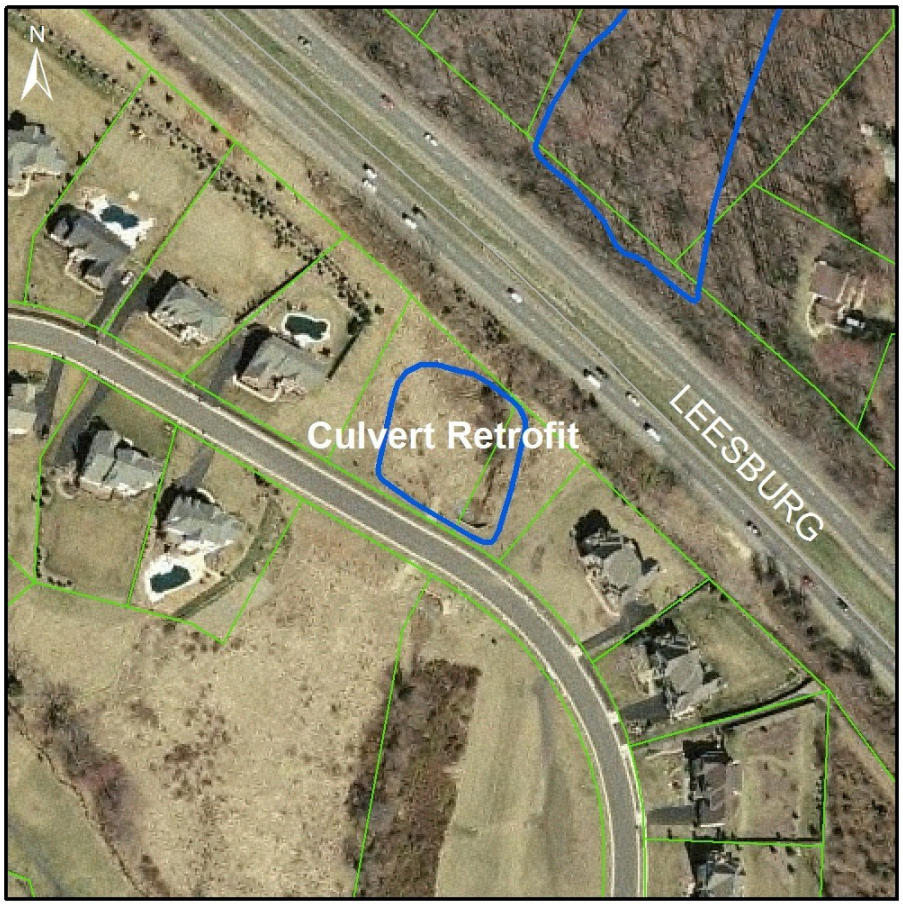
Potential Project Constraints:

Environmental	It will require a permit from both the U.S. Army Corps of Engineers and VDEQ. The area is open and no forest impacts are expected. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility is very good from the roadway.
Design / Construction	No design or construction issues were noted for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.10	AC	$5,000.00	$522
Excavation	590	CY	$35.00	$20,650
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	480	SY	$2.50	$1,200
Wetland Planting	160	SY	$2.00	$320
			Base Construction Cost	**$27,692**
			Mobilization (5%)	$1,385
			Subtotal 1	**$29,077**
			Contingency (25%)	$7,269
			Subtotal 2	**$36,346**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$16,356
			Estimated Project Cost	**$53,000**

Concept Sketch

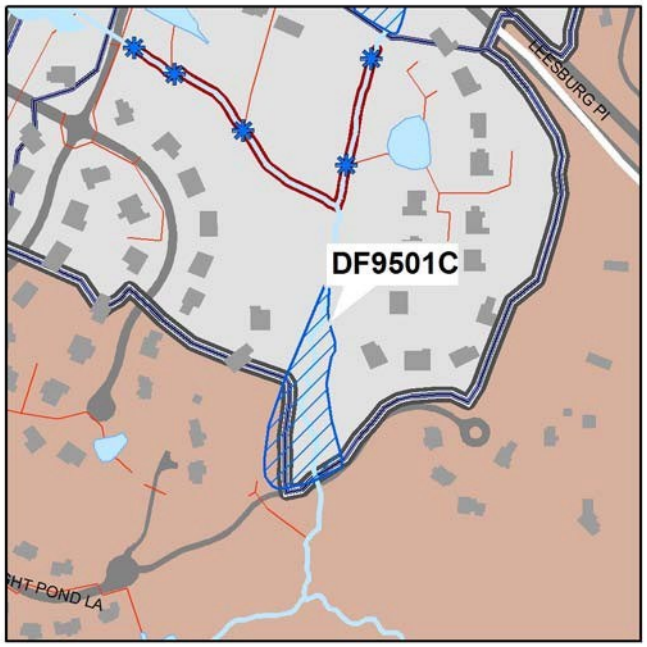


Project Number: DF9501C
Catchment Code: DFDG0003
Candidate Site: C01

Project Type: Culvert Retrofit
Project Size: 1.8 acres
Treated Area: 39.3 acres

Project Location: This project is located on the upstream side of the driveway at the end of Bright Pond Lane.

Project Description: There is a low head culvert along this drive and the area to either side of this culvert has been left natural and unmanaged. The potential depth of a pond for this location is low due to the driveway's vertical alignment, but there is an opportunity to provide beneficial storage and treatment.



Potential Project Benefits:

Streamflow	This project can meet 100% of the channel protection storage volume.
Water Quality	There is sufficient volume at this site to meet five times the water quality storage.

Potential Project Constraints:

Environmental	The project will require a permit from both the U.S. Army Corps of Engineers and VDEQ. Some forest impacts will be incurred. Projects in RPAs may require exceptions or waivers.
Facility Access	Access for this project is very good from the pipestem drive.
Design / Construction	No design or construction issues were noted for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.37	AC	$5,000.00	$1,832
Excavation	1,540	CY	$35.00	$53,900
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	1,670	SY	$2.50	$4,175
Wetland Planting	560	SY	$2.00	$1,120
			Base Construction Cost	**$66,027**
			Mobilization (5%)	$3,301
			Subtotal 1	**$69,329**
			Contingency (25%)	$17,332
			Subtotal 2	**$86,661**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$38,997
			Estimated Project Cost	**$126,000**

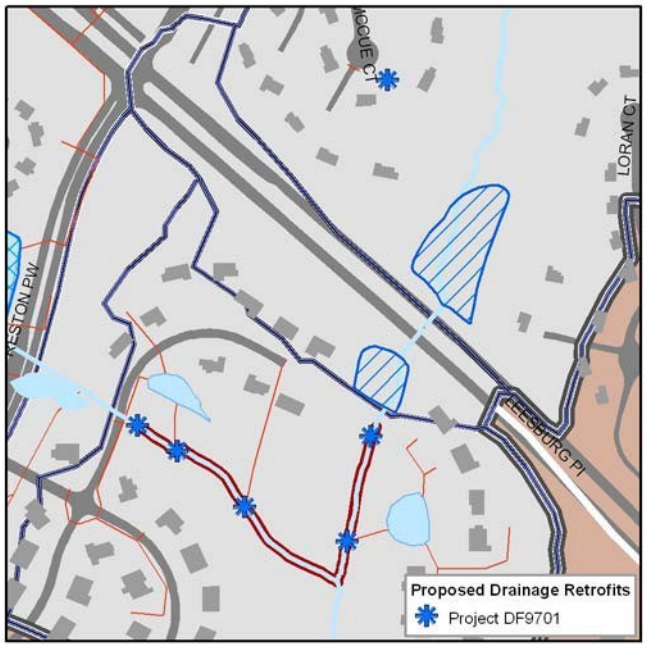
Concept Sketch

Project Number: DF9701
Catchment Code: DFDG0003
Candidate Site: C01

Project Type: Drainage Retrofit
Project Size: 6 acres

Project Location: This project is distributed throughout the catchment.

Project Description: The majority of this catchment consists of large lot residential areas with considerable open space. The developed area (i.e. houses and roads) is served by storm drains with outfalls that are experiencing erosion and scour. This project consists of implementing appropriate energy dissipation and outlet protection in each of these cases.



Potential Project Benefits:

Streamflow	The project will reduce velocity from each outfall and erosive potential immediately downstream.
Water Quality	The primary benefit to the water quality would come from the reduction of sediment loads associated with excessive flow momentum at the outfall locations. Reduction of sediment and velocity will also improve stream habitat.

Potential Project Constraints:

Environmental	No environmental constraints or permits are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Generally, access can be obtained from the roadway.
Design / Construction	No design or construction constraints are anticipated.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	6	EA	$8,000.00	$48,000
			Base Construction Cost	**$48,000**
			Mobilization (5%)	$2,400
			Subtotal 1	**$50,400**
			Contingency (25%)	$12,600
			Subtotal 2	**$63,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$28,350
			Estimated Project Cost	**$91,000**

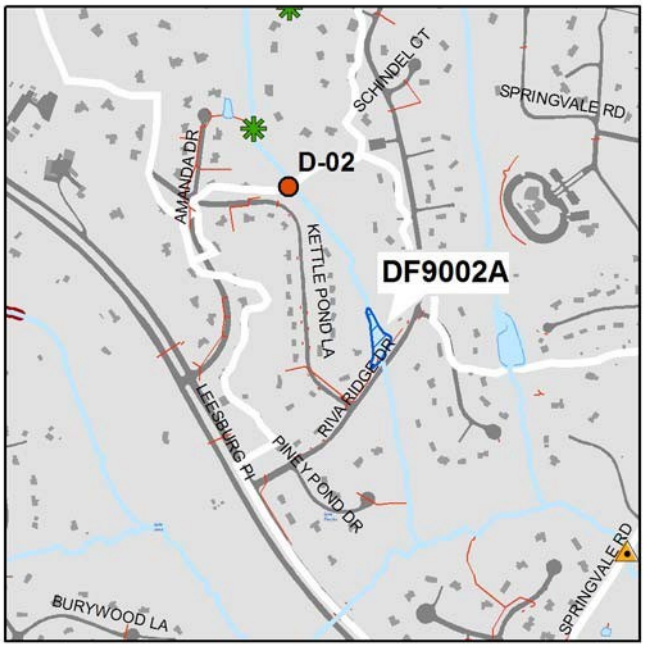
This page intentionally left blank

Project Number: DF9002A
Catchment Code: DFPR9701
Candidate Site: D-02

Project Type: Culvert Retrofit
Project Size: 0.6 acres
Treated Area: 55 acres

Project Location: This project is located at the upstream side of Riva Ridge Drive east of Kettle Pond Lane.

Project Description: This project consists of a culvert retrofit to create a wetland storage area that would help to reduce erosive flows downstream. While not designed for water quality storage, some improvements would be expected due to impoundment on the floodplain, settling of sediment, and vegetative uptake.



Potential Project Benefits:

Streamflow	This retrofit would provide approximately 65% of the channel storage volume and help to reduce erosive flows downstream.
Water Quality	Improvements to the water quality will be obtained through the reduction in scour forming discharges, sediment settlement, and vegetative uptake.

Potential Project Constraints:

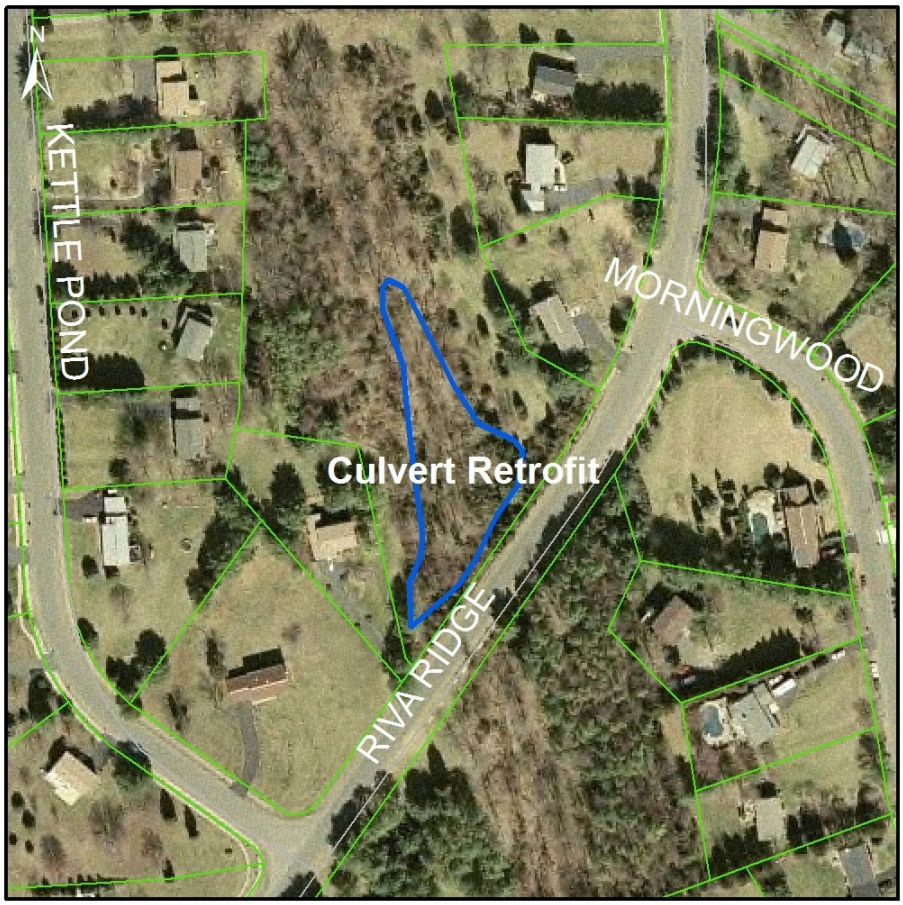
Environmental	There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain above this culvert. Some forest impacts would occur during construction. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this project is very good from the roadway.
Design / Construction	No unusual design or construction issues were found.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000.00	$1,000
Excavation	480	CY	$35.00	$16,800
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	520	SY	$2.50	$1,300
Wetland Planting	180	SY	$2.00	$360
			Base Construction Cost	**$24,460**
			Mobilization (5%)	$1,223
			Subtotal 1	**$25,683**
			Contingency (25%)	$6,421
			Subtotal 2	**$32,104**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$14,447
			Estimated Project Cost	**$47,000**

This project is part of the alternative project group for Regional Pond D-02. See Table 5-2 for the recommended disposition.

Concept Sketch

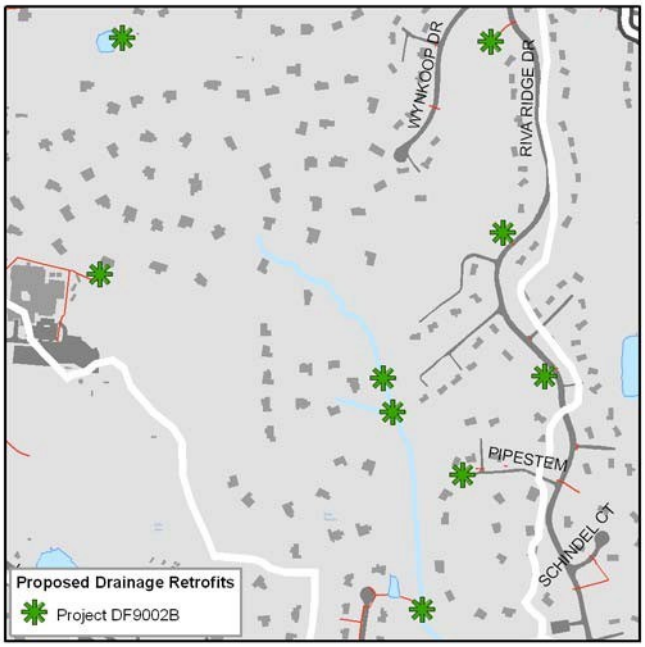


Project Number: DF9002B
Catchment Code: DFPR9701
Candidate Site: D-02

Project Type: Drainage Retrofit
Project Size: 9 Outfalls

Project Location: This project is located at various points throughout the catchment.

Project Description: This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream and may help prolong the life of the farm ponds throughout the catchment



Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfalls and erosive potential immediately downstream.
Water Quality	The primary benefit to the water quality would come from the reduction of sediment loads associated with high velocity at the outfall locations. Reduction of sediment and velocity will also improve stream habitat

Potential Project Constraints:

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers.
Facility Access	Some locations are better than others, but generally speaking access can be obtained from the roadway.
Design / Construction	There are no unusual design or construction issues with this project.

Costs:

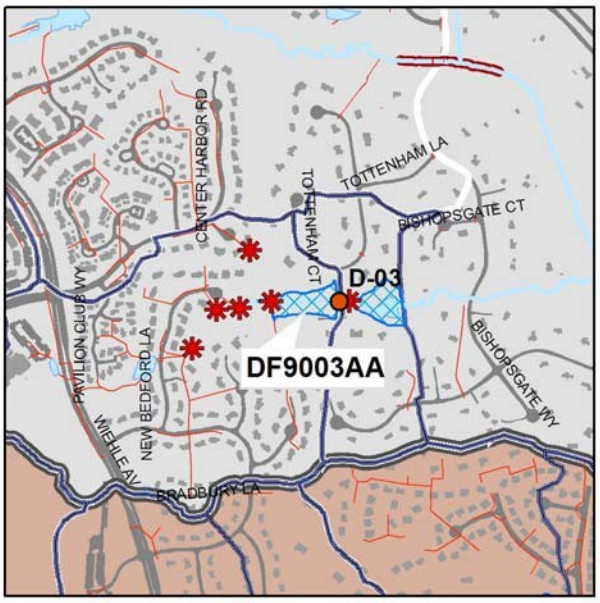
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	9	EA	$8,000.00	$72,000
			Base Construction Cost	**$72,000**
			Mobilization (5%)	$3,600
			Subtotal 1	**$75,600**
			Contingency (25%)	$18,900
			Subtotal 2	**$94,500**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$42,525
			Estimated Project Cost	**$137,000**

This project is part of the alternative project group for Regional Pond D-02. See Table 5-2 for the recommended disposition.

This page intentionally left blank.

Project Number: DF9003AA
Catchment Code: DFPR9801
Candidate Site: D-03

Project Type: Pond Retrofit
Project Size: 1.7 acres
Treated Area: 80.7 acres



Project Location: This project is on the west side of the private drive south of Tottenham Ct

Project Description: This facility can be retrofitted for increased management of high frequency storm events by excavating within the existing pond footprint and modifying the riser structure. Removing the concrete pilot channels and excavating the pond bottom down to the invert of the existing channel will create additional volume. Peak flow attenuation will be improved by installing a multi-stage riser with a low flow orifice. Additional water quality treatment can be created by further excavating the pond bottom to create wetland areas throughout the facility. Replacing the concrete channel located to north of this facility with a dry swale will treat impervious runoff prior to entering the stream. This facility should be designed in conjunction with downstream project DF9003AB as a series system.

Potential Project Benefits:

Streamflow	Approximately 25% of the channel protection volume can be achieved.
Water Quality	10% of the wet storage volume is available. Water quality will also be improved with pre-treatment by the swale and wetland landscaping.

Potential Project Constraints:

Environmental	Environmental permitting issues would be minimal. No wetland or forest impacts are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Access for this project is very good from the private drive.
Design / Construction	No specific design or construction issues were noted for this project. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.3	AC	$5,000	$1,500
Remove Pilot Channels	300	LF	$6.00	$1,800
Grading and Excavation	1175	CY	$30.00	$35,250
Dry Swale	150	LF	$35.00	$5,250
Riser	1	LS	$10,000.00	$10,000
Rip Rap Stabilization	20	LF	$50.00	$1,000
Wetland Planting	417	SY	$2.00	$834
Dry Landscaping	788	SY	$2.50	$1,970
			Base Construction Cost	**$57,604**
			Mobilization (5%)	$2,880
			Subtotal 1	**$60,484**
			Contingency (25%)	$15,121
			Subtotal 2	**$75,605**
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$34,022
			Estimated Project Cost	**$110,000**

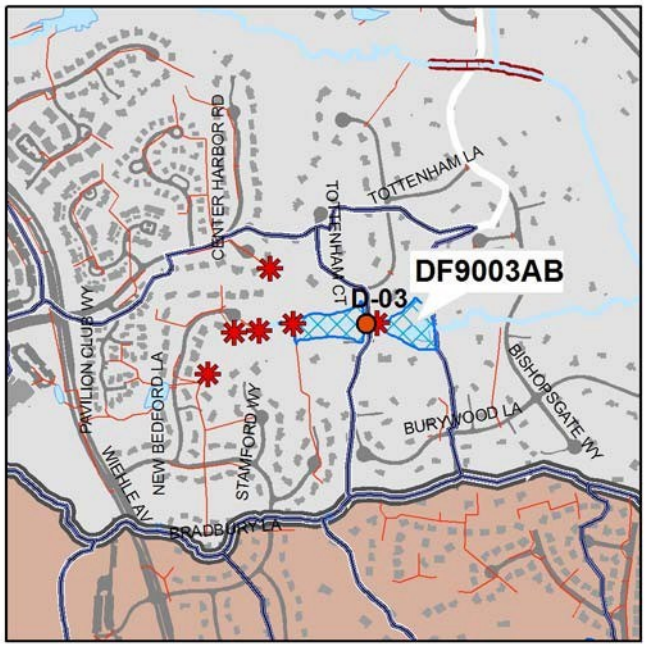
This project is part of the alternative project group for Regional Pond D-03. See Table 5-2 for the recommended disposition.

Site Photo:

Concept Sketch:

Project Number: DF9003AB
Catchment Code: DFPR9801
Candidate Site: D-03

Project Type: Pond Retrofit
Project Size: 1.6 acres
Treated Area: 24.6 acres



Project Location: This project is on the east side of the private drive south of Tottenham Court

Project Description: The channel protection volume for this facility can be met by excavating within the existing pond footprint and modifying the riser structure. Storage volume in this area will be maximized by removing the concrete pilot channel and excavating the available grassy area between the embankment and the wood line. Water quality treatment components can be created by further excavating the pond bottom to create wetlands throughout. Removing or replacing the concrete pilot channel with meandering flow paths through the marshy area will provide optimal removal of nutrients and sediment. This facility should be designed in conjunction with upstream project DF9003AA as a series system.

Potential Project Benefits:

Streamflow	100% of the channel protection volume can be achieved in this retrofit.
Water Quality	30% of the required wet storage volume is met at this location, which can be designed as a sediment forebay and micropool. Water quality treatment will also occur through vegetative uptake by wetland plants.

Potential Project Constraints:

Environmental	Environmental permitting issues would be minimal. No wetland or forest impacts are anticipated. Projects in RPAs may require exceptions or waivers.
Facility Access	Access for this project is very good from the private drive.
Design / Construction	No specific design or construction issues were noted for this project. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000	$1,000
Remove Pilot Channels	45	LF	$6.00	$270
Grading and Excavation	965	CY	$30.00	$28,950
Riser	1	LS	$10,000.00	$10,000
Rip Rap Stabilization	80	LF	$50.00	$4,000
Wetland Planting	334	SY	$2.00	$668
Dry Landscaping	1023	SY	$2.50	$2,558
			Base Construction Cost	**$47,446**
			Mobilization (5%)	$2,372
			Subtotal 1	**$49,818**
			Contingency (25%)	$12,454
			Subtotal 2	**$62,272**
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$28,022
			Estimated Project Cost	**$90,000**

This project is part of the alternative project group for Regional Pond D-03. See Table 5-2 for the recommended disposition.

Site Photo:

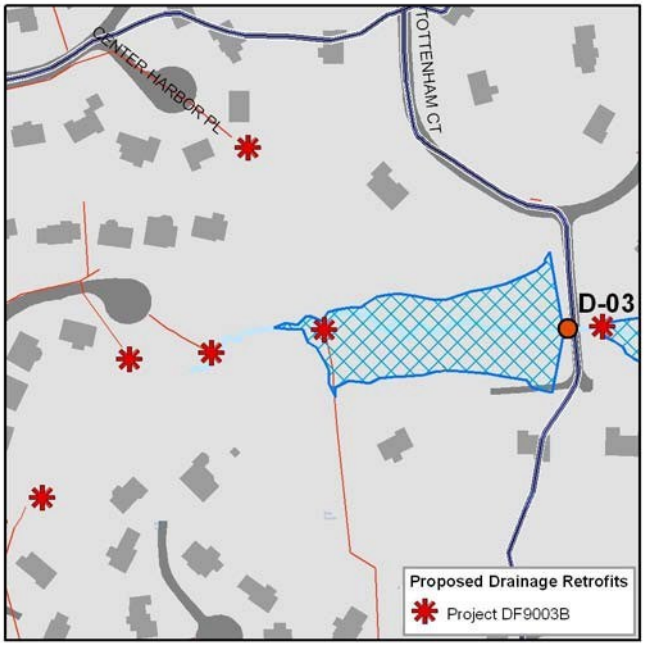
Concept Sketch:

Project Number: DF9003B
Catchment Code: DFPR9801
Candidate Site: D-03

Project Type: Drainage Retrofit
Project Size: 6 Outfalls

Project Location: This project will be distributed throughout the catchment

Project Description: This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream.



Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfalls and help reduce erosive potential immediately downstream.
Water Quality	Water quality improvements would be associated with the reduction of scour at outfall locations and within the downstream channels. Habitat would be improved by reducing sediment loads from erosion.

Potential Project Constraints:

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads.
Design / Construction	No unusual design or construction issues were identified.

Costs:

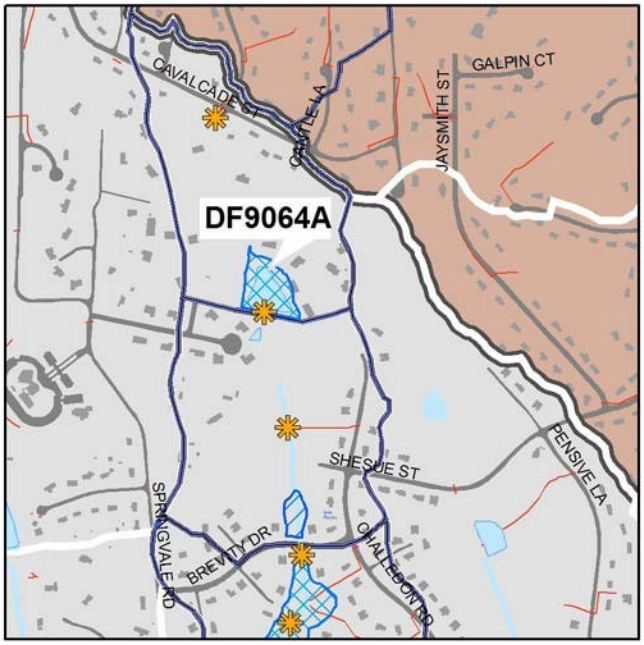
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	6	EA	$8,000.00	$48,000
			Base Construction Cost	**$48,000**
			Mobilization (5%)	$2,400
			Subtotal 1	**$50,400**
			Contingency (25%)	$12,600
			Subtotal 2	**$63,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$28,350
			Estimated Project Cost	**$91,000**

This project is part of the alternative project group for Regional Pond D-03. See Table 5-2 for the recommended disposition.

This page intentionally left blank.

Project Number: DF9064A
Catchment Code: DFPR9501
Candidate Site: D-64

Project Type: Pond Retrofit
Project Size: 2.3 acres
Treated Area: 36.3 acres



Project Location: This project is located behind the private residences on Challedon Road.

Project Description: It is likely that channel protection storage can be achieved in this retrofit by installing a multi-stage riser. The permanent wet storage volume within this pond meets the calculated water quality volume. There is sufficient wet storage to construct an aquatic bench around the entire facility. A permanent sediment forebay will be constructed in the channel downstream of the inflow, which will treat runoff prior to entering the pond. It is recommended that woody vegetation be removed from the embankment and that the erosion at the south side of the pond be stabilized.

Potential Project Benefits:

Streamflow	100% of the channel protection volume can be achieved.
Water Quality	100% of the water quality volume is met at this location. Water quality features such as an aquatic bench and sediment forebay will help increase pollutant removal.

Potential Project Constraints:

Environmental	Environmental impacts and permitting issues should be minimal. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to the facility is somewhat limited due to the adjacent houses.
Design / Construction	The improvements will involve coordination with homeowner(s). County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000	$1,000
Excavation/Grading (aquatic bench)	927	CY	$30.00	$27,810
Forebay	49	CY	$45.00	$2,205
Outlet Protection	1	EA	$8,000.00	$8,000
Riser	1	LS	$10,000.00	$10,000
Wetland Planting (aquatic bench)	673	SY	$2.00	$1,346
			Base Construction Cost	**$50,361**
			Mobilization (5%)	$2,518
			Subtotal 1	**$52,879**
			Contingency (25%)	$13,220
			Subtotal 2	**$66,099**
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$29,744
			Estimated Project Cost	**$96,000**

This project is part of the alternative project group for Regional Pond D-64. See Table 5-2 for the recommended disposition.

Site Photo:

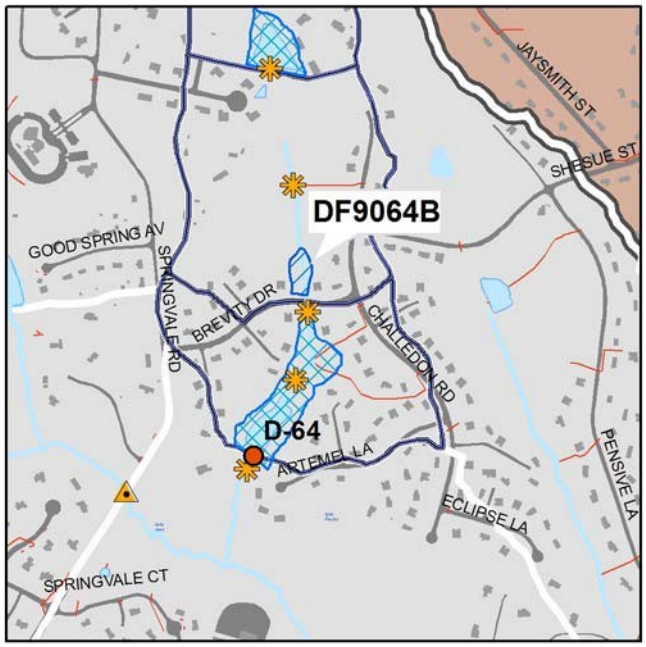
Concept Sketch:

Project Number: DF9064B
Catchment Code: DFPR9501
Candidate Site: D-64

Project Type: Culvert Retrofit
Project Size: 0.7 acres
Treated Area: 42.5 acres

Project Location: This project would be located on the upstream side of Brevity Drive.

Project Description: The site of this retrofit is relatively flat, so a significant amount of storage is available by using the floodplain, with some additional excavation. There is sufficient storage at the site to provide both water quality and channel protection. Water quality benefits can be optimized through the use of vegetation and micro-pools. This facility should be designed in conjunction with downstream pond retrofit DF9064C as a series system.



Potential Project Benefits:

Streamflow	100% of the channel protection volume can be provided.
Water Quality	100% of the water quality volume can be provided. Use of wetland vegetation and a micro-pool will improve treatment effectiveness.

Potential Project Constraints:

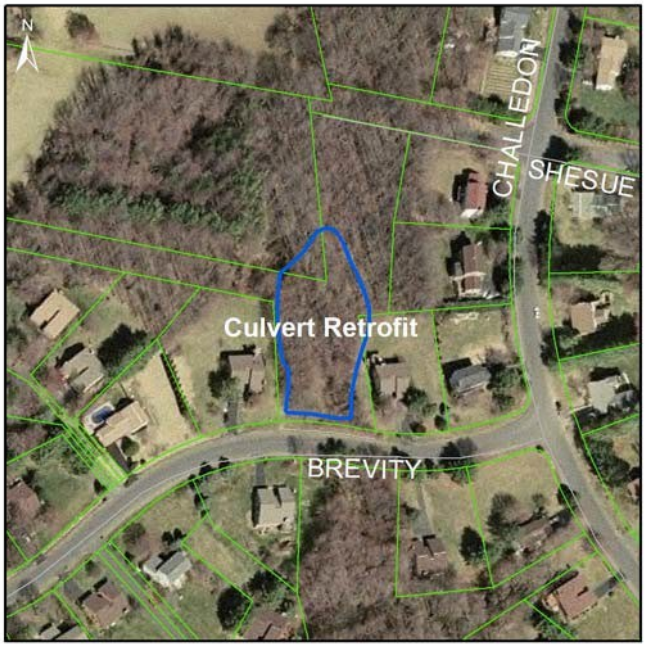
Environmental	Environmental permitting issues would be anticipated for any activity in and around a stream corridor. Forest and wetland impacts are anticipated during construction. Projects in RPAs may require exceptions or waivers.
Facility Access	Access is very good from the roadway
Design / Construction	No significant design or construction issues were noted.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000.00	$1,000
Excavation	1,920	CY	$35.00	$67,200
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	670	SY	$2.50	$1,675
Wetland Planting	230	SY	$2.00	$460
			Base Construction Cost	**$75,335**
			Mobilization (5%)	$3,767
			Subtotal 1	**$79,102**
			Contingency (25%)	$19,775
			Subtotal 2	**$98,877**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$44,495
			Estimated Project Cost	**$143,000**

This project is part of the alternative project group for Regional Pond D-64. See Table 5-2 for the recommended disposition.

Concept Sketch:

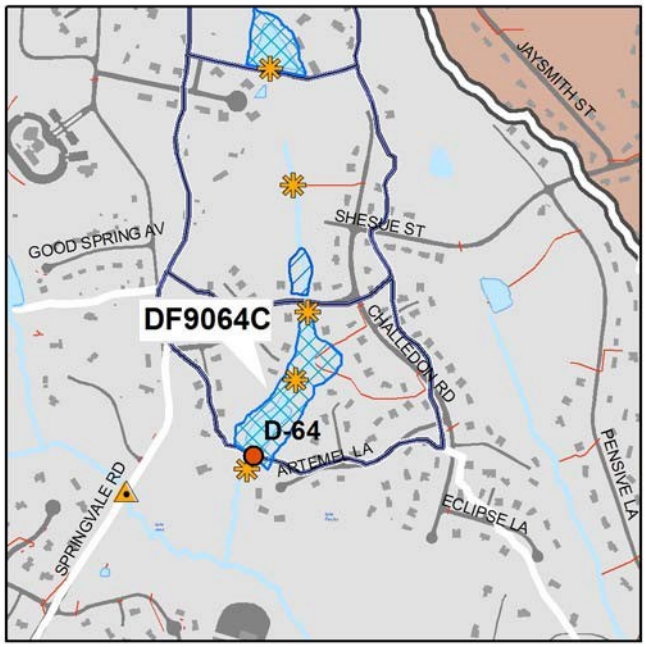


Project Number: DF9064C
Catchment Code: DFPR9501
Candidate Site: D-64

Project Type: Pond Retrofit
Project Size: 5.3 acres
Treated Area: 33.3 acres

Project Location: This project would be located at the end of Artemel Lane.

Project Description: The existing facility is a dry pond. It is possible to provide the channel protection volume by installing a multi-stage control structure on the existing outlet pipe. The channel below the pond outfall will be stabilized. This facility should be designed in conjunction with upstream culvert retrofit DF9064B as a series system.



Potential Project Benefits:

Streamflow	100% of the calculated channel protection volume can be met by installing a multi-stage control structure.
Water Quality	While not the focus of the retrofit, some water quality and habitat improvements will occur from reduction of erosive flows downstream.

Potential Project Constraints:

Environmental	Environmental impacts and permitting issues should be minimal for minor improvements to the existing facility. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility is good from the roadway.
Design / Construction	No significant design or construction issues have been noted. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outlet Protection	1	EA	$8,000.00	$8,000
Rip Rap Stabilization	75	LF	$50.00	$3,750
			Base Construction Cost	**$11,750**
			Mobilization (5%)	$588
			Subtotal 1	**$12,338**
			Contingency (25%)	$3,084
			Subtotal 2	**$15,422**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$6,940
			Estimated Project Cost	**$22,000**

This project is part of the alternative project group for Regional Pond D-64. See Table 5-2 for the recommended disposition.

Site Photo:

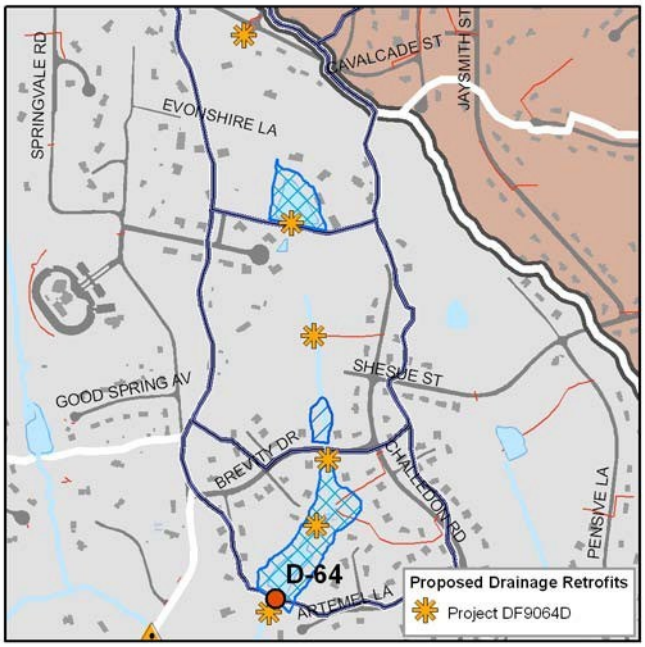
Concept Sketch:

Project Number: DF9064D
Catchment Code: DFPR9501
Candidate Site: D-64

Project Type: Drainage Retrofit
Project Size: 6 Outfalls

Project Location: This project is located throughout the catchment. An area of specific concern is at the outfall to the culvert under Brevity Drive.

Project Description: This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream.



Potential Project Benefits:

Streamflow	The project will reduce velocity from the outfalls and help reduce erosive potential immediately downstream.
Water Quality	Water quality improvements would be associated with the reduction of scour at outfall locations and within the downstream channels. Habitat would be improved by reducing sediment loads from erosion.

Potential Project Constraints:

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads.
Design / Construction	No unusual design or construction issues were identified.

Costs:

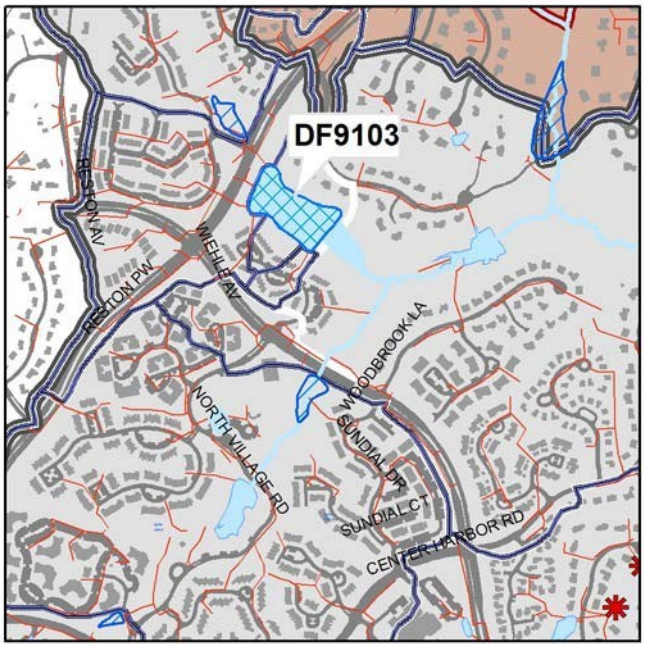
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	6	EA	$8,000.00	$48,000
			Base Construction Cost	**$48,000**
			Mobilization (5%)	$2,400
			Subtotal 1	**$50,400**
			Contingency (25%)	$12,600
			Subtotal 2	**$63,000**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$28,350
			Estimated Project Cost	**$91,000**

This project is part of the alternative project group for Regional Pond D-64. See Table 5-2 for the recommended disposition.

This page intentionally left blank.

Project Number: DF9103
Catchment Code: DFPR9901
Candidate Site: C03

Project Type: Pond Retrofit.
Project Size: 3.2 acres
Treated Area: 36.1 acres



Project Location: This project is located between Bright Pond Lane and Fieldview Drive.

Project Description: This wet pond is located between residential communities east of Reston Parkway. There is sufficient storage to improve channel protection by modifying the orifice of the control structure to raise the 1-year water surface elevation. Due to the location and elevation of this facility, this energy dissipation measure to reduce peak flow velocities entering the downstream channel is particularly beneficial. The water quality volume at this site is met within the wet storage of the pond. Also, a variety of water quality components around the pond perimeter are currently in place and should not be disturbed.

Potential Project Benefits:

Streamflow	100% of the channel protection volume can be met.
Water Quality	100% of the water quality volume is met in wet storage. Additional features such as wetland vegetation should improve pollutant removal.

Potential Project Constraints:

Environmental	Environmental permitting issues would not be anticipated for this project. There are no environmental constraints. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this area is good by way of public roads.
Design / Construction	No specific design or construction issues were noted for this project. County staff will coordinate with the facility owner to implement the project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$5,000	$500
Riser	1	LS	$10,000.00	$10,000
			Base Construction Cost	**$10,500**
			Mobilization (5%)	$525
			Subtotal 1	**$11,025**
			Contingency (25%)	$2,756
			Subtotal 2	**$13,781**
			Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)	$6,202
			Estimated Project Cost	**$20,000**

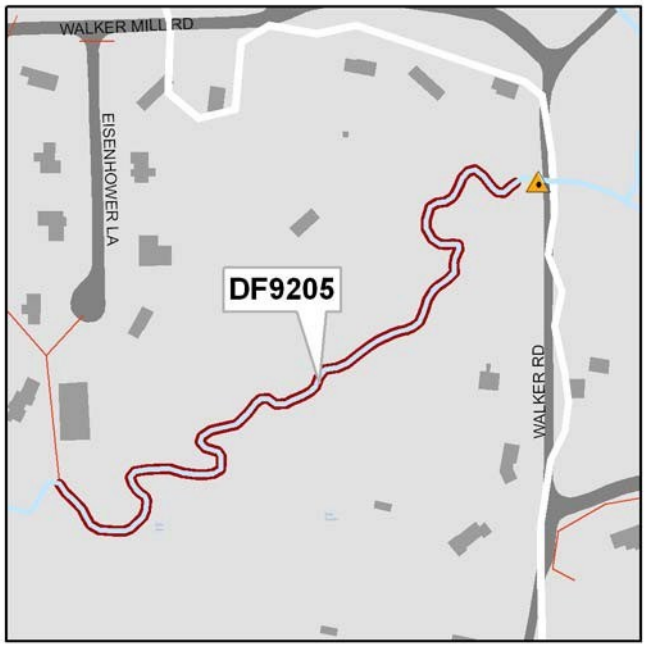
Site Photo:

Concept Sketch:

Project Number: DF9205
Catchment Code: DFPR0006
Candidate Site: S05

Project Type: Stream Restoration
Project Size: 1,794 Linear Feet.

Project Location: This project is located south of Walker Mill Road and west of Walker Road.



Project Description: The upper section of the identified reach is recovering, the middle section is eroding its outer meanders, and the lower section has erosive banks on both sides. The lower section is slightly incised with good riffle pool morphology and some bed scour. Some portions of the riparian area are not forested.
Most of the reach can be stabilized in place with moderate regrading. Some sections will require reshaping of the plan and profile to cut off excessive meanders. A floodplain bench will be created in these sections. The riparian area will be planted with native trees and shrubs.

Potential Project Benefits:

Stream Stability	The stream banks will be stabilized and a floodplain bench will be created to reduce future erosion.
Water Quality	Water quality will be improved by a significant reduction in current and future bank and bed erosion.
Instream Habitat	Habitat will be improved with a stable aquatic channel and restored riparian buffers.

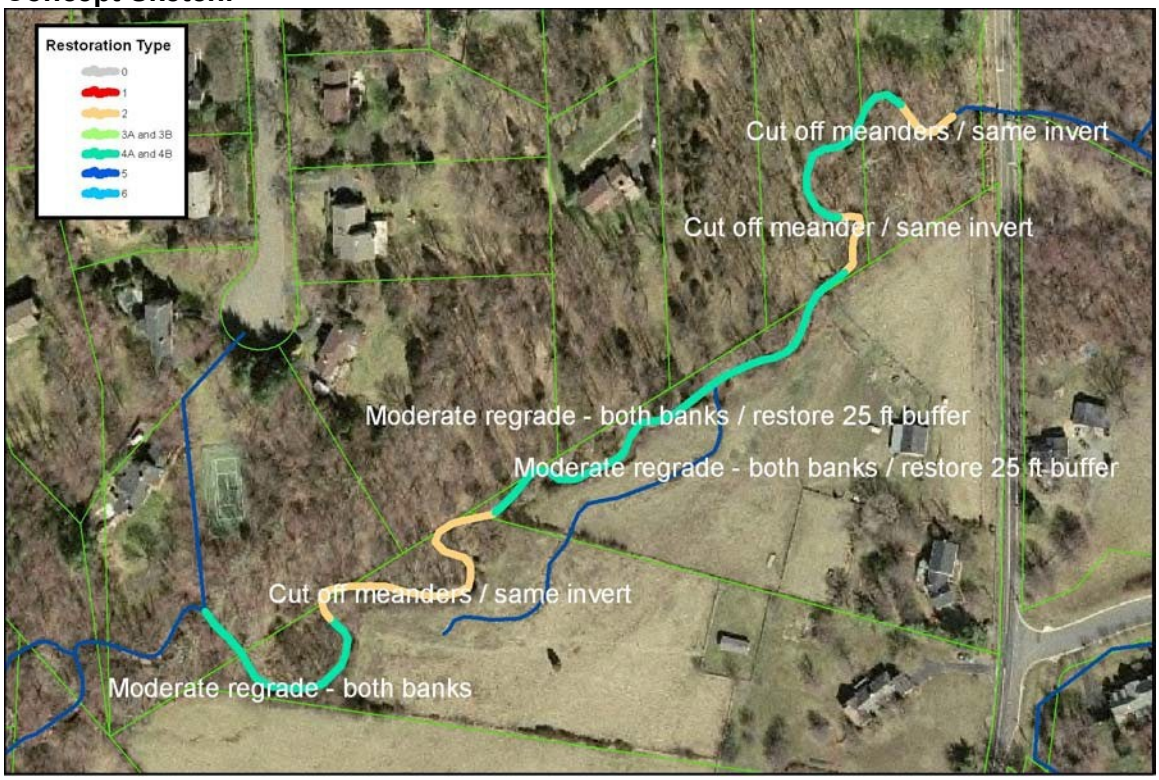
Potential Project Constraints:

Environmental	The site will require minimal forest clearing and possible impacts to wetlands. It will require a permit from both the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property.
Design / Construction	Design efforts are minimal compared to other stream restoration projects. General constructability is good.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Reconstruct new pattern and profile	614	LF	$250.00	$153,500
Stabilize in place – grading	1179	LF	$175.00	$206,325
Buffer restoration	included above	LF	$25.00	$0
Add'l cost, first 500 LF	500	LF	$200.00	$100,000
			Base Construction Cost	**$459,825**
			Mobilization (5%)	$22,991
			Subtotal 1	**$482,816**
			Contingency (25%)	$120,704
			Subtotal 2	**$603,520**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$271,584
			Estimated Project Cost	**$875,000**

Concept Sketch:

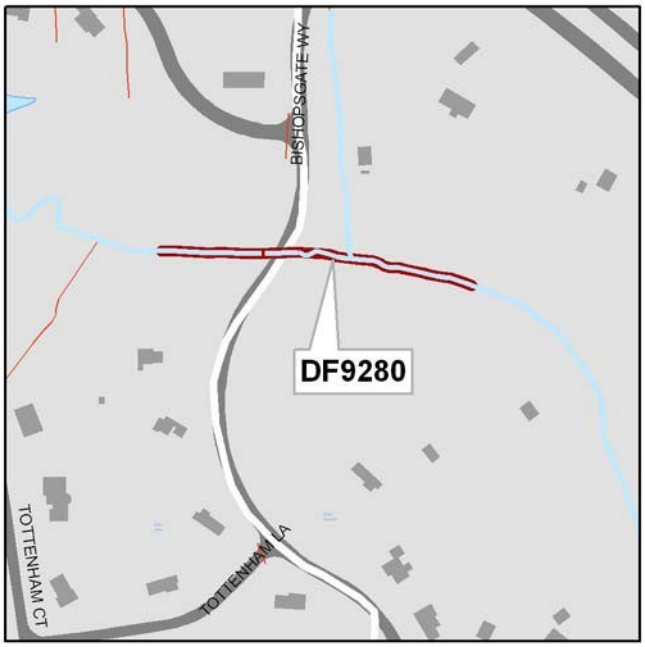


Project Number: DF9280
Catchment Code: DFPR0002, DFPR0003
Candidate Site: S80

Project Type: Buffer Restoration
Project Size: 684 Linear Feet

Project Location: This project is located to the south of Leesburg Pike and to the east and west of Bishops Gate Way.

Project Description: Two areas of the riparian zone are non-forested. The stream appears to be located on Park Authority land. The non-forested areas of the riparian zone will be replanted with native trees and shrubs.



Potential Project Benefits:

Stream Stability	Reestablishing the buffer will provide root mass that will help stabilize the stream over time.
Water Quality	Water quality will be improved by the filtering properties of the riparian plantings.
Instream Habitat	Establishing a forested riparian buffer will provide shading to the stream, which will improve habitat.

Potential Project Constraints:

Environmental	The site will not require forest clearing or impacts to jurisdictional wetlands. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will be from Bishops Gate Road
Design / Construction	Design efforts are minimal compared to other stream restoration projects. General constructability is good.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Buffer restoration	684	LF	$25.00	$17,100
			Base Construction Cost	**$17,100**
			Mobilization (5%)	$855
			Subtotal 1	**$17,955**
			Contingency (25%)	$4,489
			Subtotal 2	**$22,444**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$10,100
			Estimated Project Cost	**$33,000**

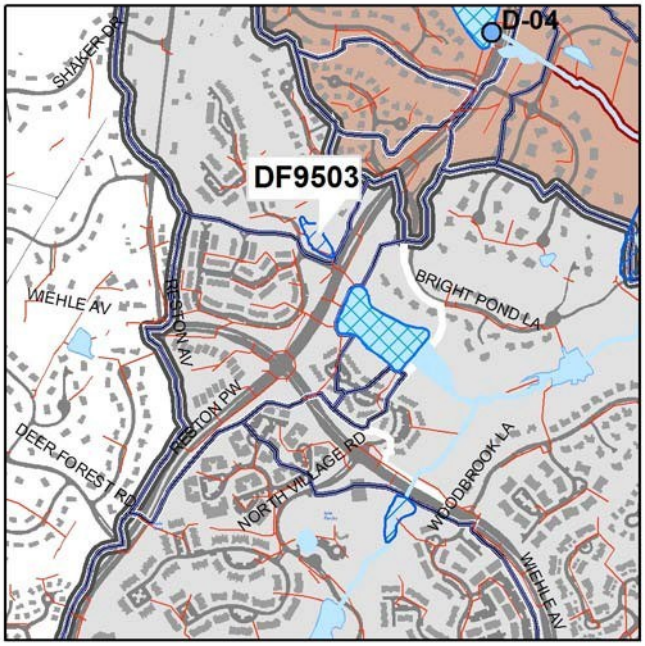
Concept Sketch:

Project Number: DF9503
Catchment Code: DFPR9901
Candidate Site: C03

Project Type: Culvert Retrofit
Project Size: 0.6 acres
Treated Area: 44.5 acres

Project Location: This project is located on the Northwest corner of the intersection of Hawthorne Court and Reston Parkway.

Project Description: The area upstream of the culvert is a low-lying, broad, wet weather floodplain. This project will involve building a weir at road height upstream of the culvert to create detention storage. There is a gas utility that would need to be relocated for the implementation of this project.



Potential Project Benefits:

Streamflow	This project would provide approximately 60% of the channel protection volume.
Water Quality	Improvements to the water quality should be obtained through the reduction in scour forming discharges downstream, sedimentation on the floodplain, and vegetative uptake.

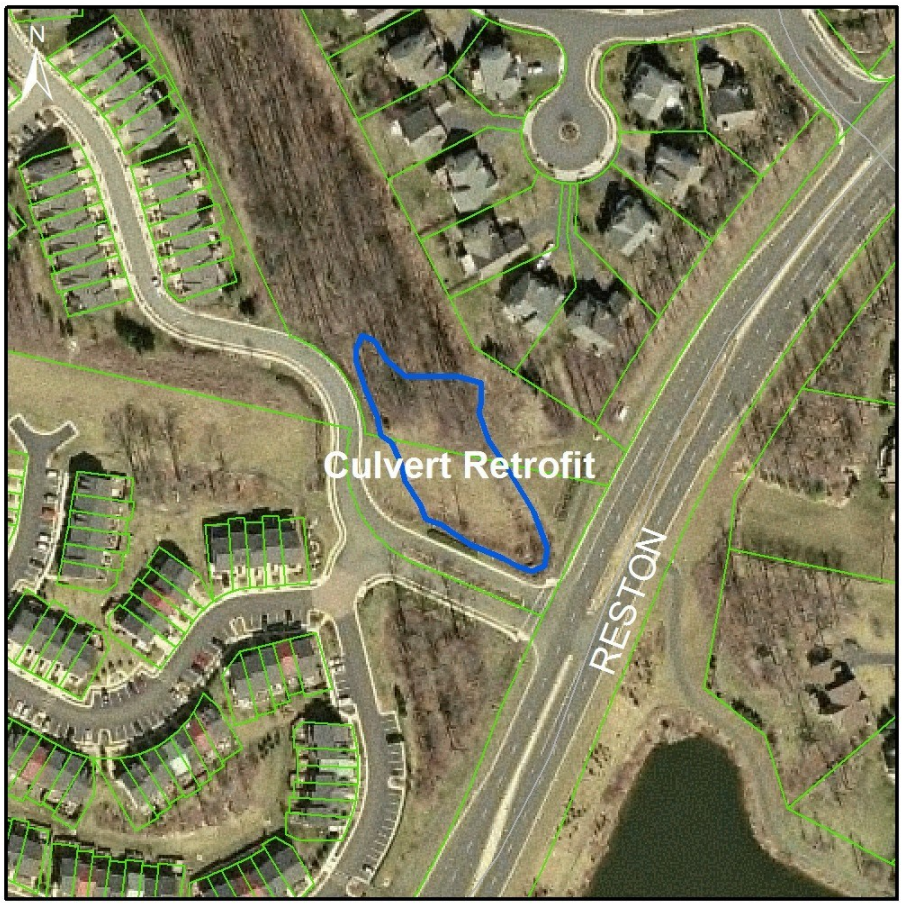
Potential Project Constraints:

Environmental	Environmental permitting issues would not be anticipated for this project. Projects in RPAs may require exceptions or waivers.
Facility Access	Access is very good from Hawthorne Court.
Design / Construction	The gas pipeline would have to be relocated.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000.00	$1,000
Excavation	400	CY	$35.00	$14,000
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	520	SY	$2.50	$1,300
Wetland Planting	180	SY	$2.00	$360
			Base Construction Cost	**$21,660**
			Mobilization (5%)	$1,083
			Subtotal 1	**$22,743**
			Contingency (25%)	$5,686
			Subtotal 2	**$28,429**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$12,793
			Estimated Project Cost	**$41,000**

Concept Sketch:

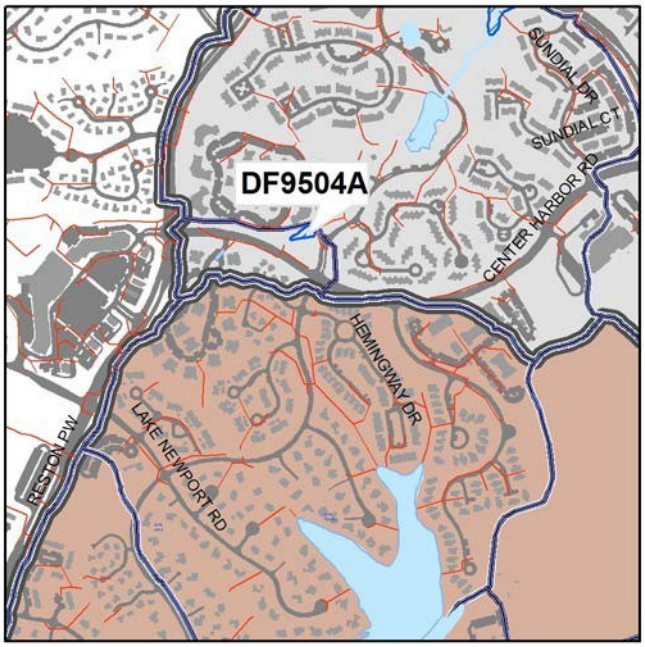


Project Number: DF9504A
Catchment Code: DFPR0001
Candidate Site: C04

Project Type: Culvert Retrofit
Project Size: 0.2 acres
Treated Area: 8.7 acres

Project Location: Upstream side of Tiverton Circle near North Village Road.

Project Description: This project consists of a culvert retrofit on the upstream side of Tiverton Circle. The retrofit would be a dry pond facility that will allow an increase in the detention time and reduction in the peak flows. Minor excavation to increase the area and depth of the resulting pond would only require the loss of two trees.



Potential Project Benefits:

Streamflow	This retrofit would provide approximately 50% of the channel storage volume and help to reduce erosive flows downstream.
Water Quality	Improvements to water quality would occur through the reduction in erosive flows downstream and vegetative uptake at the site.

Potential Project Constraints:

Environmental	Environmental permitting issues would not be anticipated for this project. Some loss of trees would occur during excavation. Projects in RPAs may require exceptions or waivers.
Facility Access	Access is generally good.
Design / Construction	No specific design or construction issues were noted for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	$5,000.00	$500
Excavation	440	CY	$35.00	$15,400
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	150	SY	$2.50	$375
Wetland Planting	50	SY	$2.00	$100
			Base Construction Cost	**$21,375**
			Mobilization (5%)	$1,069
			Subtotal 1	**$22,444**
			Contingency (25%)	$5,611
			Subtotal 2	**$28,055**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$12,625
			Estimated Project Cost	**$41,000**

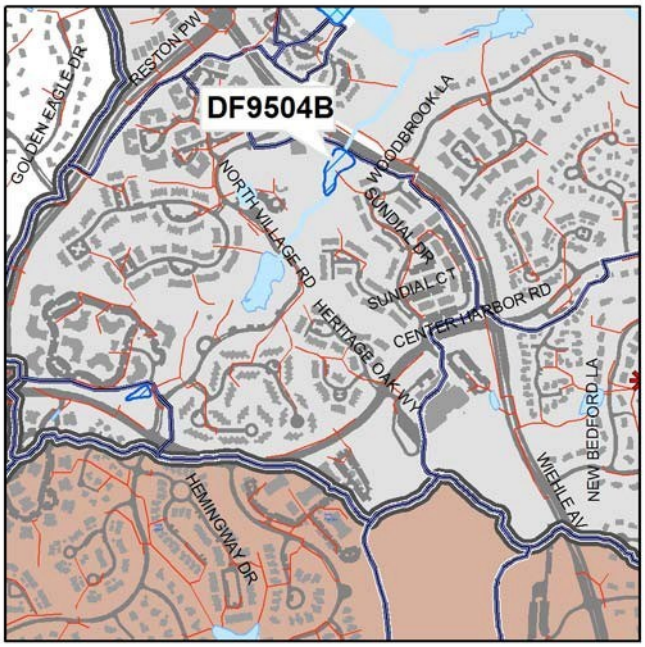
Concept Sketch:

Project Number: DF9504B
Catchment Code: DFPR0001
Candidate Site: C04

Project Type: Culvert Retrofit.
Project Size: 0.6 acres
Treated Area: 119 acres

Project Location: This project is upstream of the culvert under Wiehle Avenue at the outlet of the catchment.

Project Description: This project is a dry detention facility designed for channel protection to help reduce peak flows downstream. There is area to excavate and increase the footprint of the pond without significant forest impacts.



Potential Project Benefits:

Streamflow	The project will provide approximately 25% of the channel protection volume for the entire upstream area, which is also treated by the existing wet pond at North Village Road.
Water Quality	Improvements to water quality would occur through the reduction in erosive flows downstream and vegetative uptake at the site.

Potential Project Constraints:

Environmental	There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain above this culvert. Some forest impacts can be expected during construction. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this project is good by way of public roads.
Design / Construction	No specific design or construction issues were noted for this project.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$5,000.00	$1,000
Excavation	1,700	CY	$35.00	$59,500
Impoundment Structure	1	LS	$5,000.00	$5,000
Landscaping	610	SY	$2.50	$1,525
Wetland Planting	210	SY	$2.00	$420
			Base Construction Cost	**$67,445**
			Mobilization (5%)	$3,372
			Subtotal 1	**$70,817**
			Contingency (25%)	$17,704
			Subtotal 2	**$88,522**
			Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)	$39,835
			Estimated Project Cost	**$128,000**

Concept Sketch: