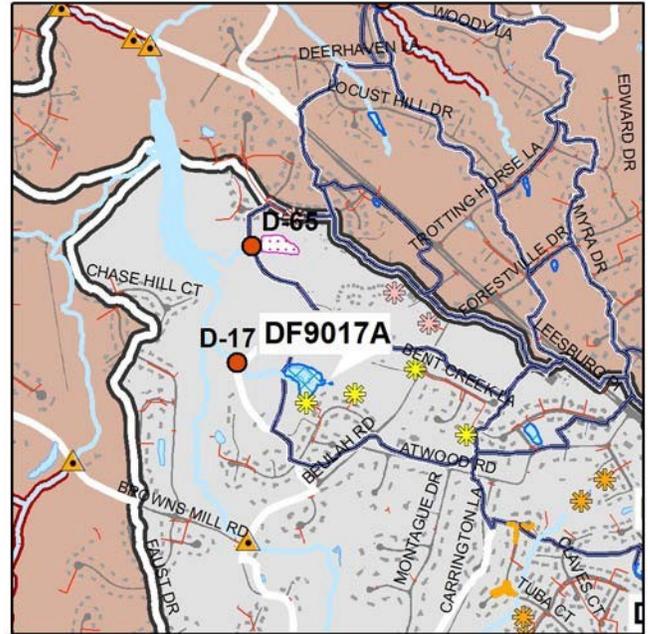


Project Number: DF9017A
Catchment Code: DFWC8901
Candidate Site: D-17

Project Type: Pond Retrofit
Project Size: 2.2 acres
Treated Area: 62.7 acres

Project Location: This project is behind private lots along Spring Ridge Lane.

Project Description: The water quality volume is completely met within the wet storage of this pond. Additional improvements in water quality can be created by planting wetland vegetation in shallow areas and constructing an aquatic bench around part of the pond perimeter. A control structure could not be located upon field visiting this pond, so it is assumed that a simple outfall pipe exists. Installing a multi-stage riser structure can significantly improve peak flow management.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | A multi-stage riser can improve the peak flow reduction function of this pond to approximately 90% of the channel protection volume. |
| Water Quality | 100% of the water quality volume is present in this pond. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | Environmental permitting should not be an issue for this retrofit project. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access will need to be obtained from adjacent property owners. |
| Design / Construction | Further investigation of existing conditions is required to determine if reconstruction of the embankment and barrel pipe is necessary. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|------------------|
| Clear and Grub | 0.1 | AC | \$5,000 | \$500 |
| Excavation/Grading (aquatic bench) | 853 | CY | \$30.00 | \$25,590 |
| Outlet Protection | 1 | EA | \$8,000.00 | \$8,000 |
| Reconstruct Embankment | 1100 | CY | \$60.00 | \$66,000 |
| Riser | 1 | LS | \$10,000.00 | \$10,000 |
| Outflow Pipe | 75 | LF | \$35.00 | \$2,625 |
| Wetland Planting | 278 | SY | \$2.00 | \$556 |
| Wetland Planting (aquatic bench) | 490 | SY | \$2.00 | \$980 |
| Base Construction Cost | | | | \$114,251 |
| Mobilization (5%) | | | | \$5,713 |
| Subtotal 1 | | | | \$119,964 |
| Contingency (25%) | | | | \$29,991 |
| Subtotal 2 | | | | \$149,954 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$67,479 |
| Estimated Project Cost | | | | \$217,000 |

This project is part of the alternative project group for Regional Pond D-17. See Table 5-2 for the recommended disposition.

Site Photo:



Concept Sketch:



Project Number: DF9017B
Catchment Code: DFWC8901
Candidate Site: D-17

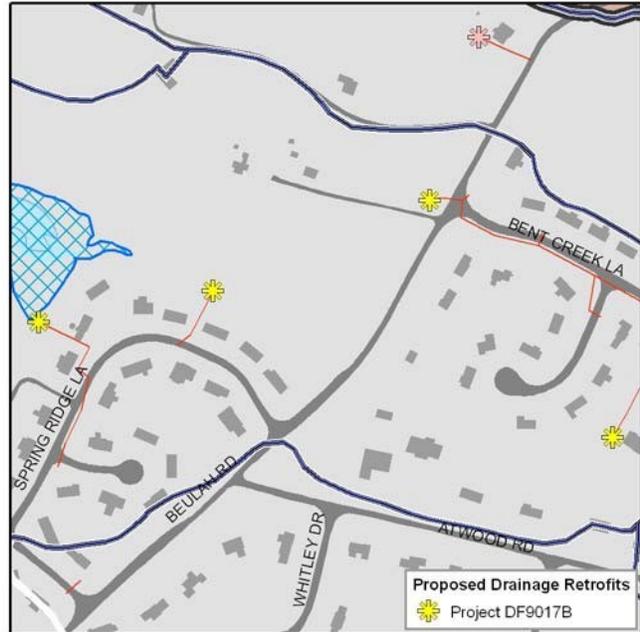
Project Type: Drainage Retrofit
Project Size: 4 Outfalls

Project Location:

This project is distributed throughout the catchment where piped drainage systems discharge into natural channels.

Project Description:

This project consists of reconfiguring outfalls or retrofitting energy dissipation structures to reduce scour and erosion where flows from the storm drainage 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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. |

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-17.

See Table 5-2 for the recommended disposition.

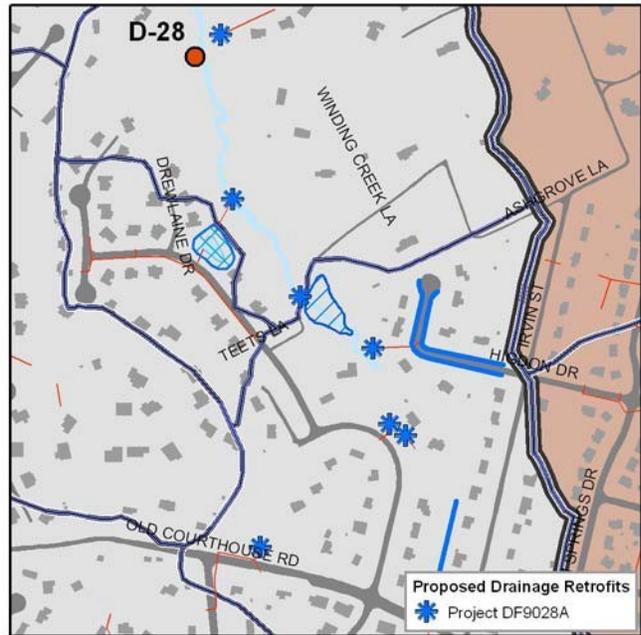
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Project Number: DF9028A
Catchment Code: DFWC9401
Candidate Site: D-28

Project Type: Drainage Retrofit
Project Size: 1685 feet of paved ditches,
 10 Outfalls

Project Location: This project is distributed throughout the catchment where piped drainage systems discharge into natural channels, and where surface runoff is conveyed by concrete ditches.

Project Description: This project will consist of two major phases of drainage retrofit. The first phase will be the elimination of paved roadside ditches widely found throughout the catchment and replacement with dry swale systems with an underdrain, which will increase filtration and infiltration. The second phase of this project will be the improvement of outlet protection at outfalls throughout the catchment.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | Peak flow rates will see significant attenuation for this catchment through the increase in time of concentration for the catchment as a whole that results from the removal of paved channel sections. |
| Water Quality | Water quality will see substantial improvements due to the reduction in sediment loading that would occur with this project. |

Potential Project Constraints:

| | |
|-----------------------|--|
| Environmental | No environmental permitting issues are anticipated for this project. Projects in RPAs may require exceptions or waivers |
| Facility Access | Access to locations where this project would be applied can, for the most part, be obtained from the roadways. |
| Design / Construction | No unusual design or construction issues were identified. Design should incorporate check dams or other features to ensure flow velocity is not erosive. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|------------------|
| Paved Ditch Demolition (Haul Away) | 1685 | LF | \$18.00 | \$30,330 |
| Dry Swale w/ Underdrain | 1685 | LF | \$50.00 | \$84,250 |
| Outfall Protection | 10 | EA | \$8,000.00 | \$80,000 |
| Base Construction Cost | | | | \$194,580 |
| Mobilization (5%) | | | | \$9,729 |
| Subtotal 1 | | | | \$204,309 |
| Contingency (25%) | | | | \$51,077 |
| Subtotal 2 | | | | \$255,386 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$114,924 |
| Estimated Project Cost | | | | \$370,000 |

This project is part of the alternative project group for Regional Pond D-28. See Table 5-2 for the recommended disposition.

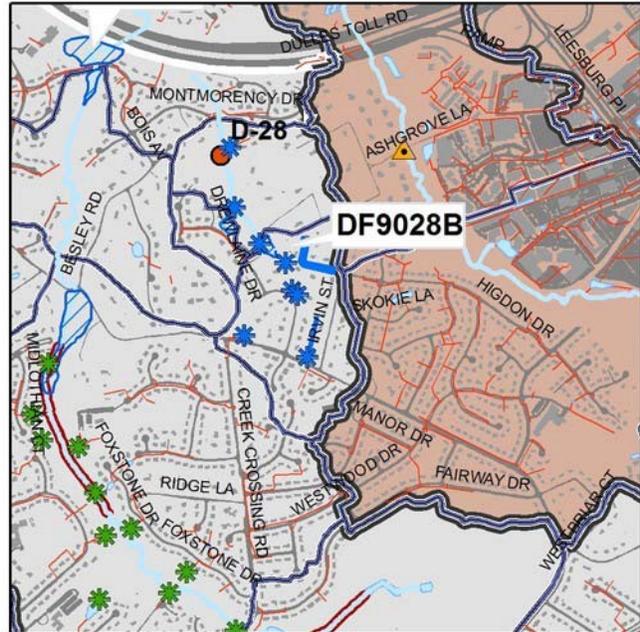
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Project Number: DF9028B
Catchment Code: DFWC9401
Candidate Site: D-28

Project Type: Culvert Retrofit
Project Size: 0.5 acres
Treated Area: 58.7 acres

Project Location: This project is located on the upstream side of Ashgrove Lane.

Project Description: This project is focused on the extended detention of storm flows for the purpose of providing channel protection. Water quality features, such as micro-pools, vegetation, etc., would be incorporated into this design to the greatest extent practicable. The retrofit would involve raising the path at the crossing with a low embankment, minor excavation, and revegetating with wetland plants.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | The project will provide approximately 50% of the channel protection volume. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with extended detention, along with vegetative uptake on the site. |

Potential Project Constraints:

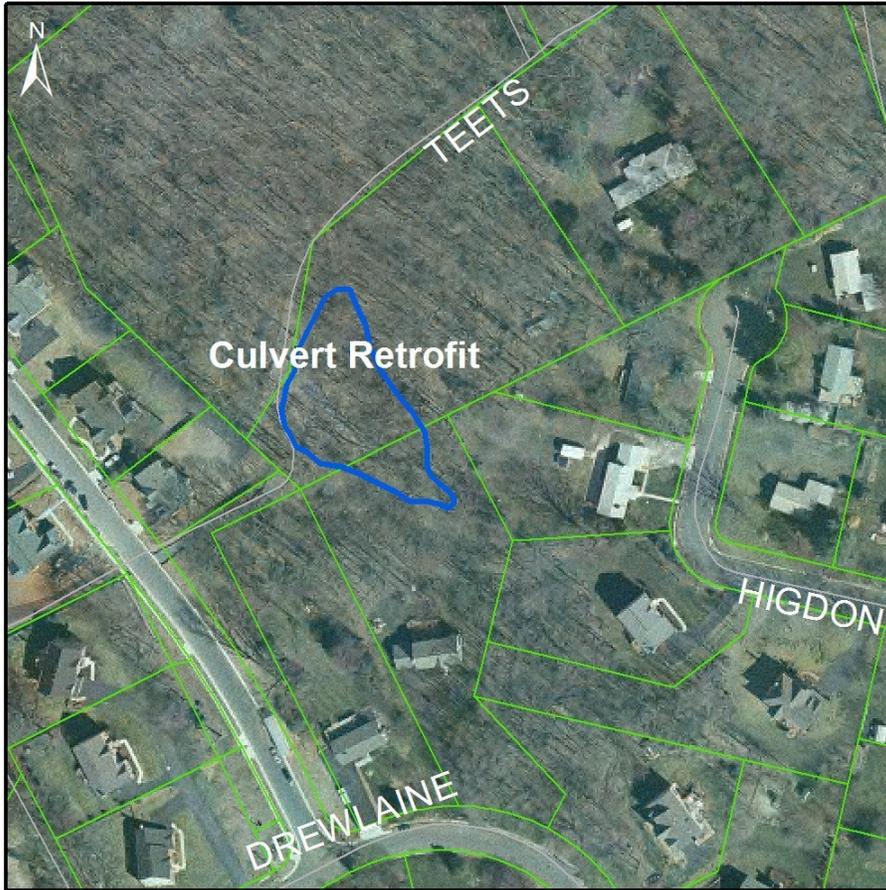
| | |
|-----------------------|--|
| Environmental | Environmental permitting issues would be anticipated for any activity in and around a stream corridor. Forest and wetland impacts are anticipated during construction. Projects in RPAs may require exceptions or waivers. |
| Facility Access | The site is accessible through an easement 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 | 520 | CY | \$35.00 | \$18,200 |
| Embankment | 840 | CY | \$35.00 | \$29,400 |
| 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 | | | | \$55,120 |
| Mobilization (5%) | | | | \$2,756 |
| Subtotal 1 | | | | \$57,876 |
| Contingency (25%) | | | | \$14,469 |
| Subtotal 2 | | | | \$72,345 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$32,555 |
| Estimated Project Cost | | | | \$105,000 |

This project is part of the alternative project group for Regional Pond D-28. See Table 5-2 for the recommended disposition.

Concept Sketch

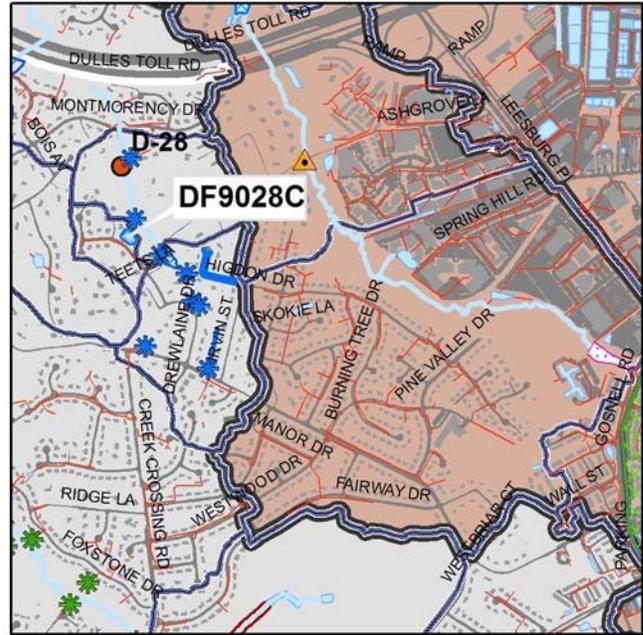


Project Number: DF9028C
Catchment Code: DFWC9401
Candidate Site: D-28

Project Type: Pond Retrofit
Project Size: 0.4 acres
Treated Area: 11.6 acres

Project Location: This project is located along Lupine Den Drive.

Project Description: The conditions surrounding this facility prevent any excavation beyond the existing pond boundaries. However, by excavating to maximize the available space within this facility and modifying the riser to convert this dry pond to a marsh system, significant improvement in peak flow reduction and water quality treatment will take place. Excavating the area between the riser and the inflow pipe will create a flat pond bottom suitable for wetland planting. This wetland area will increase the detention time of runoff entering the pond. Riprap can also be added at the storm drain outfall to reduce flow velocities of runoff exiting the facility.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | 100% of the calculated channel protection volume can be achieved. |
| Water Quality | Excavating to create a wetland area at the base of the riser will provide 45% of the required wet storage volume. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | Environmental permitting issues are not anticipated for this project. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this project is very good from the roadway. |
| Design / Construction | There are no design or construction issues noted. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|-----------------|
| Clear and Grub | 0.2 | AC | \$5,000 | \$1,000 |
| Remove Pilot Channels | 60 | LF | \$6.00 | \$360 |
| Grading and Excavation | 321 | CY | \$30.00 | \$9,630 |
| Riser | 1 | LS | \$10,000.00 | \$10,000 |
| Rip Rap Stabilization | 40 | LF | \$50.00 | \$2,000 |
| Wetland Planting | 310 | SY | \$2.00 | \$620 |
| Dry Landscaping | 263 | SY | \$2.50 | \$658 |
| Base Construction Cost | | | | \$24,268 |
| Mobilization (5%) | | | | \$1,213 |
| Subtotal 1 | | | | \$25,481 |
| Contingency (25%) | | | | \$6,370 |
| Subtotal 2 | | | | \$31,851 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$14,333 |
| Estimated Project Cost | | | | \$46,000 |

This project is part of the alternative project group for Regional Pond D-28. See Table 5-2 for the recommended disposition.

Site Photo:



Concept Sketch:

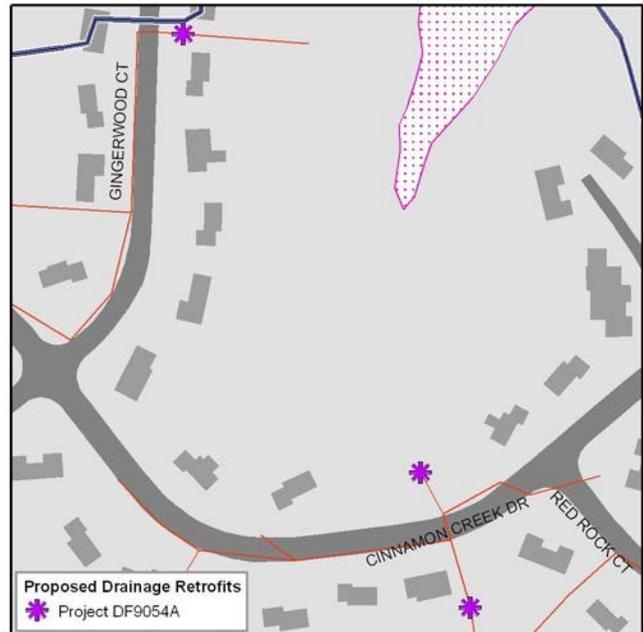


Project Number: DF9054A
Catchment Code: DFWC9101
Candidate Site: D-54

Project Type: Drainage Retrofit
Project Size: 3 Outfalls

Project Location:
 This project is distributed throughout the catchment where piped drainage systems discharge into natural channels.

Project Description:
 This project consists of reconfiguring outfalls or retrofitting energy dissipation structures to reduce scour and erosion where flows from the storm drainage 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 | Access to these sites can be obtained from the roadway or park access trail. |
| Design / Construction | No unusual design or construction issues were identified. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|-----------------|
| Outfall Protection | 3 | EA | \$8,000.00 | \$24,000 |
| Base Construction Cost | | | | \$24,000 |
| Mobilization (5%) | | | | \$1,200 |
| Subtotal 1 | | | | \$25,200 |
| Contingency (25%) | | | | \$6,300 |
| Subtotal 2 | | | | \$31,500 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$14,175 |
| Estimated Project Cost | | | | \$46,000 |

This project is part of the alternative project group for Regional Pond D-54.

See Table 5-2 for the recommended disposition.

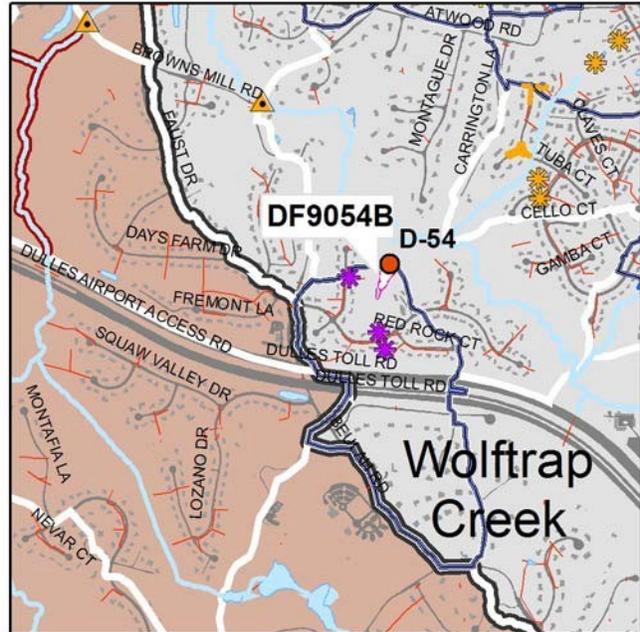
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Project Number: DF9054B
Catchment Code: DFWC9101
Candidate Site: D-54

Project Type: New Pond
Project Size: 0.8 acres
Treated Area: 93.6 acres

Project Location: This project is east of Gingerwood Court.

Project Description: This project is the implementation of a reduced-size version of planned regional pond D-54. The location has been refined to provide maximum benefit with the least amount of impact to the natural system. This facility should be designed to capture and detain as much drainage area as is feasible to ensure the peak flow rates are reduced to channel protection rates.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | The project will provide 80% of the channel protection volume estimated for this location. |
| Water Quality | The pond is planned as a dry facility and water quality improvements will be minor. |

Potential Project Constraints:

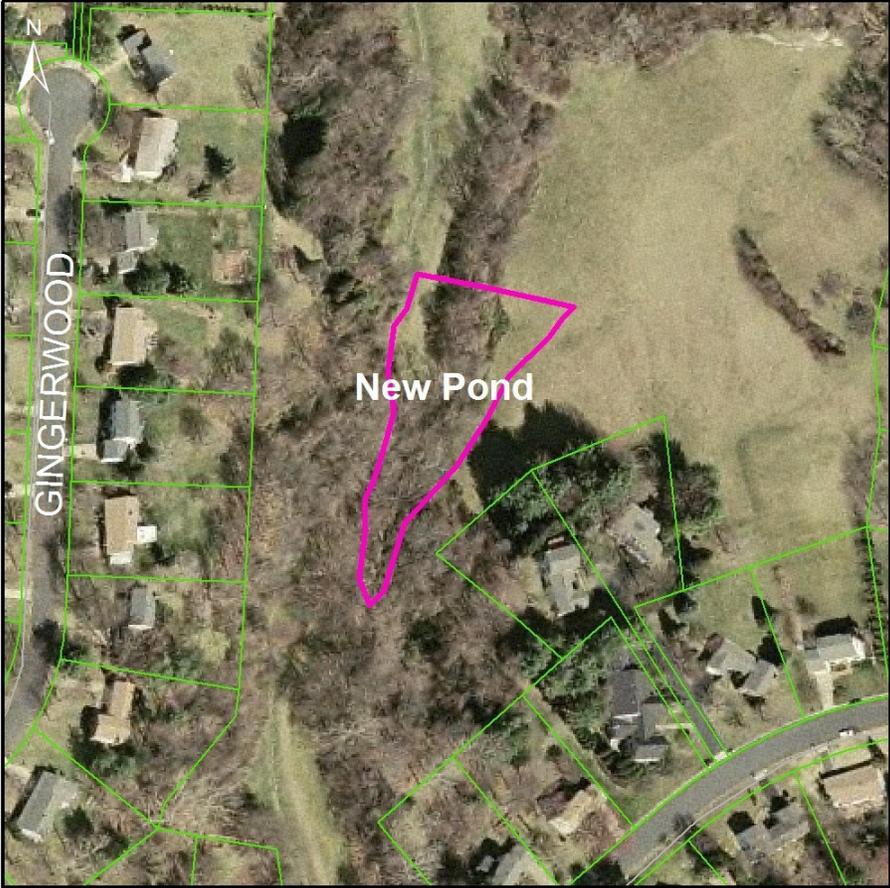
| | |
|-----------------------|--|
| Environmental | Environmental permitting issues would be anticipated for any activity in and around a stream corridor. Forest and wetland impacts are anticipated during construction. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access can be obtained from a nearby maintenance road. |
| Design / Construction | No significant design or construction issues were noted. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|------------------|
| Clear and Grub | 0.3 | AC | \$5,000.00 | \$1,500 |
| Embankment | 2,670 | CY | \$60.00 | \$160,200 |
| Riser Structure | 1 | LS | \$10,000.00 | \$10,000 |
| Landscaping | 1,400 | SY | \$2.50 | \$3,500 |
| Base Construction Cost | | | | \$175,200 |
| Mobilization (5%) | | | | \$8,760 |
| Subtotal 1 | | | | \$183,960 |
| Contingency (25%) | | | | \$45,990 |
| Subtotal 2 | | | | \$229,950 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$103,478 |
| Estimated Project Cost | | | | \$333,000 |

This project is part of the alternative project group for Regional Pond D-54. See Table 5-2 for the recommended disposition.

Concept Sketch

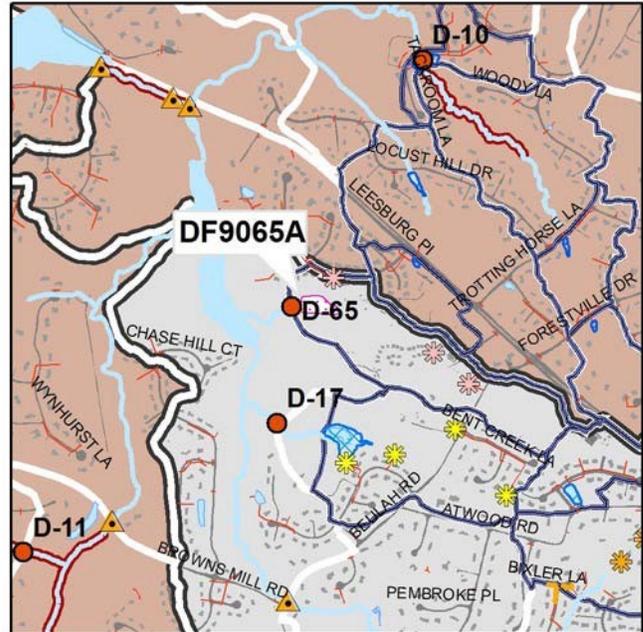


Project Number: DF9065A
Catchment Code: DFWC8901
Candidate Site: D-65

Project Type: New Pond
Project Size: 1.5 acres
Treated Area: 53.4 acres

Project Location: In line with the easement from Middleton Ridge Road

Project Description: This project is the implementation of a reduced-size version of planned regional pond D-65. The location has been refined to provide greater detention volume. This facility is proposed as an in-stream facility designed to capture as much runoff from the catchment as is feasible. There is no existing stormwater management in the drainage area to this facility.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | The project will provide about 50% of the channel protection volume estimated for this location. |
| Water Quality | The pond will remain a dry facility and water quality improvements will be minor. |

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 can be obtained from a nearby maintenance road. |
| Design / Construction | No significant design or construction issues were noted. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|--------------------|
| Clear and Grub | 0.7 | AC | \$5,000.00 | \$3,500 |
| Embankment | 12,390 | CY | \$60.00 | \$743,400 |
| Riser Structure | 1 | LS | \$10,000.00 | \$10,000 |
| Landscaping | 3,160 | SY | \$2.50 | \$7,900 |
| Base Construction Cost | | | | \$764,800 |
| Mobilization (5%) | | | | \$38,240 |
| Subtotal 1 | | | | \$803,040 |
| Contingency (25%) | | | | \$200,760 |
| Subtotal 2 | | | | \$1,003,800 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$451,710 |
| Estimated Project Cost | | | | \$1,456,000 |

This project is part of the alternative project group for Regional Pond D-65. See Table 5-2 for the recommended disposition.

Concept Sketch:

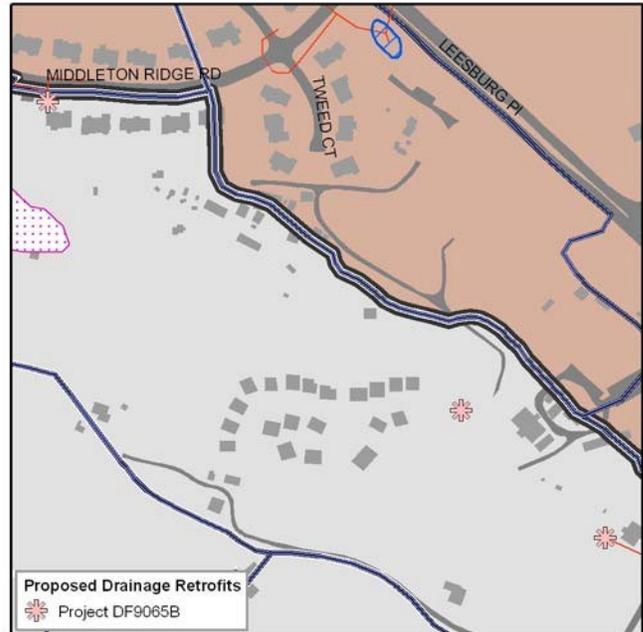


Project Number: DF9065B
Catchment Code: DFWC8901
Candidate Site: D-65

Project Type: Drainage Retrofit
Project Size: 3 Outfalls

Project Location:
 This project is distributed throughout the catchment where piped drainage systems discharge into natural channels.

Project Description:
 This project consists of reconfiguring outfalls or retrofitting energy dissipation structures to reduce scour and erosion where flows from the storm drainage 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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|-----------------|
| Outfall Protection | 3 | EA | \$8,000.00 | \$24,000 |
| Base Construction Cost | | | | \$24,000 |
| Mobilization (5%) | | | | \$1,200 |
| Subtotal 1 | | | | \$25,200 |
| Contingency (25%) | | | | \$6,300 |
| Subtotal 2 | | | | \$31,500 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$14,175 |
| Estimated Project Cost | | | | \$46,000 |

This project is part of the alternative project group for Regional Pond D-65. See Table 5-2 for the recommended disposition.

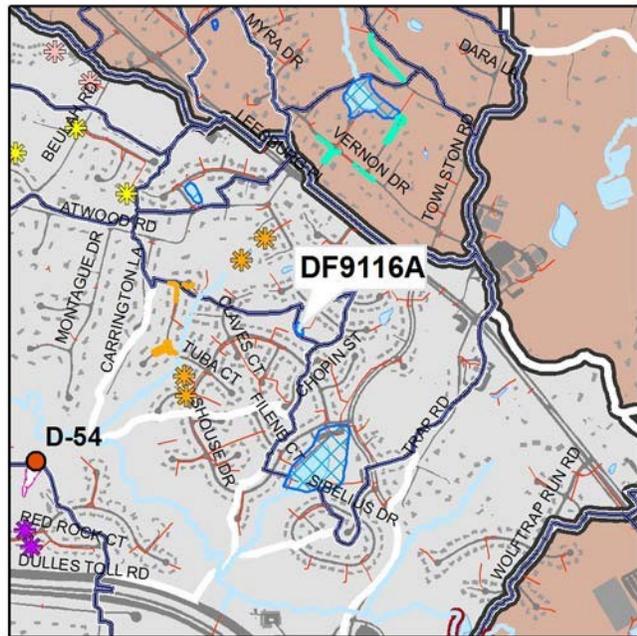
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Project Number: DF9116A
Catchment Code: DFWC9201
Candidate Site: C16

Project Type: Pond Retrofit
Project Size: 0.2 acres
Treated Area: 5.2 acres

Project Location: Between Kilby Glen Drive and Shouse Drive.

Project Description: Excavation of this dry pond to provide additional storage is recommended because this area is relatively flat and clear. By excavating part of the existing clear area in front of the outlet and installing a new multi-stage riser, significant reduction in peak flow can be achieved. Further excavation below the channel at the base of the riser will create a permanent wetland component that will provide treatment in the form of vegetative uptake of nutrients and settling of sediment.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | 100% of the channel protection requirement for this facility will be met. |
| Water Quality | Further excavation and planting to create a permanent wetland component will provide 100% of the required water quality treatment volume. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | Environmental permitting should not be an issue for this project. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this project is good from the roadway. |
| Design / Construction | No design or construction issues were identified for this project. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|-----------------|
| Clear and Grub | 0.2 | AC | \$5,000 | \$1,000.00 |
| Grading and Excavation | 335 | CY | \$30.00 | \$10,050.00 |
| Riser | 1 | LS | \$10,000.00 | \$10,000.00 |
| Rip Rap Stabilization | 25 | LF | \$50.00 | \$1,250.00 |
| Wetland Planting | 256 | SY | \$2.00 | \$512.00 |
| Dry Landscaping | 434 | SY | \$2.50 | \$1,085.00 |
| Base Construction Cost | | | | \$23,897 |
| Mobilization (5%) | | | | \$1,195 |
| Subtotal 1 | | | | \$25,092 |
| Contingency (25%) | | | | \$6,273 |
| Subtotal 2 | | | | \$31,365 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$14,114 |
| Estimated Project Cost | | | | \$45,000 |

Site Photo:



Concept Sketch:

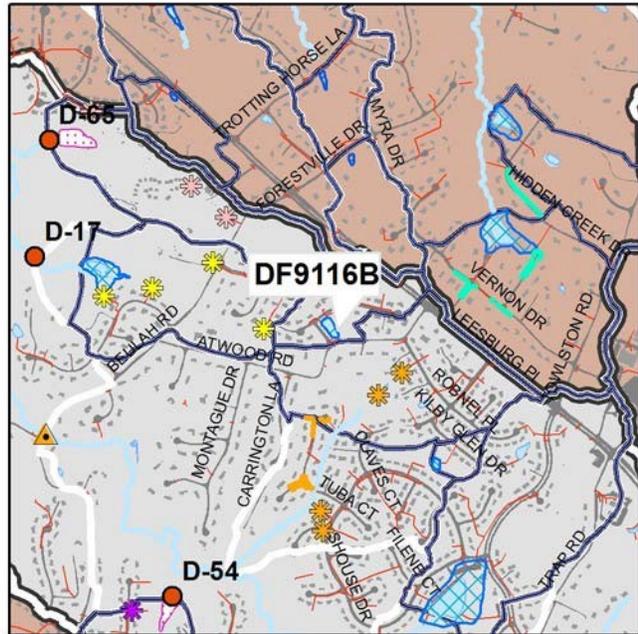


Project Number: DF9116B
Catchment Code: DFWC9201
Candidate Site: C16

Project Type: Pond Retrofit
Project Size: 0.5 acres
Treated Area: 23.6 acres

Project Location: Along Deramus Farm Drive

Project Description: The facility has existing volume within it and is adequate to be retrofitted for both water quality treatment and channel protection without excavating. A new multi-stage riser will be installed to change outflow characteristics. The proposed retrofit will create a wetland area.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | Installing a new multi-stage riser can likely meet 100% of the channel protection volume. |
| Water Quality | 100% of the water quality volume requirement can be met within the pond. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | No environmental constraints are anticipated. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this project is very good from the roadway. |
| Design / Construction | Any retrofit improvement will likely require approval by the homeowners. |

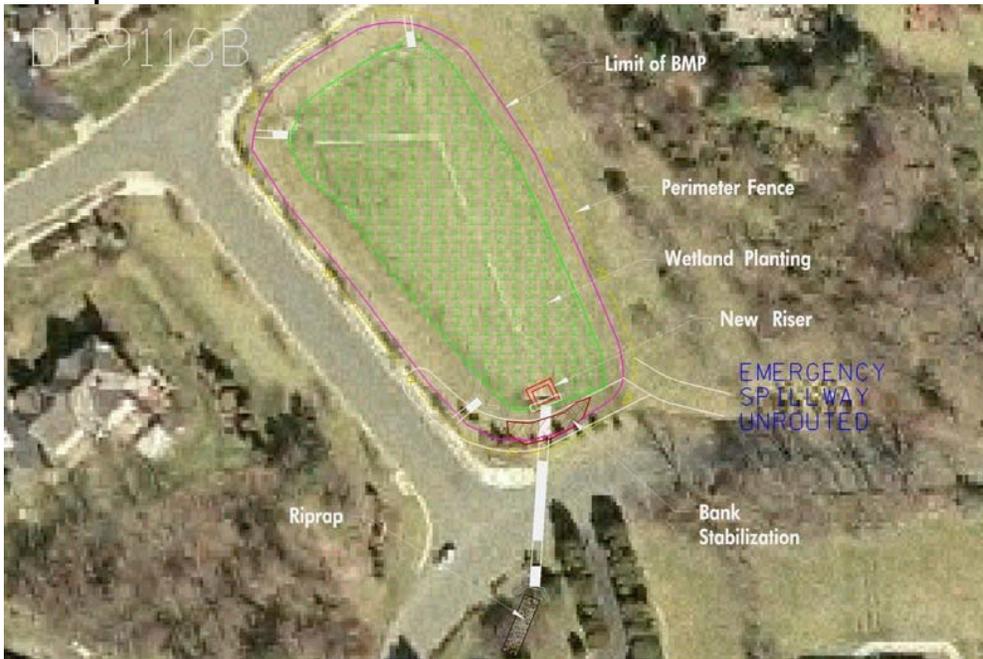
Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|-----------------|
| Clear and Grub | 0.1 | AC | \$5,000 | \$500 |
| Remove Pilot Channels | 300 | LF | \$6.00 | \$1,800 |
| Riser | 1 | LS | \$10,000.00 | \$10,000 |
| Fencing | 767 | LF | \$20.00 | \$15,340 |
| Rip Rap Stabilization | 40 | LF | \$50.00 | \$2,000 |
| Wetland Planting | 806 | SY | \$2.00 | \$1,612 |
| Base Construction Cost | | | | \$31,252 |
| Mobilization (5%) | | | | \$1,563 |
| Subtotal 1 | | | | \$32,815 |
| Contingency (25%) | | | | \$8,204 |
| Subtotal 2 | | | | \$41,018 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$18,458 |
| Estimated Project Cost | | | | \$59,000 |

Site Photo:



Concept Sketch:

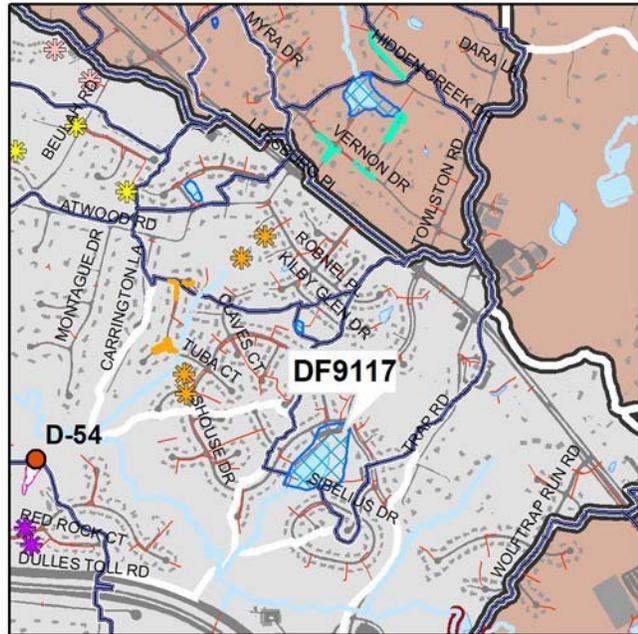


Project Number: DF9117
Catchment Code: DFWC9301
Candidate Site: C17

Project Type: Pond Retrofit
Project Size: 7.9 acres
Treated Area: 94.6 acres

Project Location: This project is located at the corner of Shouse Drive and Towlston Road.

Project Description: This facility can be retrofitted for channel protection by installing a multistage riser on the outlet. The water quality volume is met within the existing wet storage of this pond. There is also enough excess wet storage volume to construct a vegetated aquatic bench around the entire perimeter of the facility. Repairs of the moderate erosion and bent outlet pipe on the downstream side of the embankment is needed.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | 100% of the required channel protection volume can be created. |
| Water Quality | 100% of the water quality volume requirement exists as wet storage. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | No environmental constraints are anticipated. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this area is good by way of public roads. |
| Design / Construction | Improvements will likely require the approval of the homeowners. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|------------------|
| Clear and Grub | 0.3 | AC | \$5,000 | \$1,500.00 |
| Excavation/Grading (aquatic bench) | 1880 | CY | \$30.00 | \$56,400.00 |
| Outlet Protection | 1 | EA | \$8,000.00 | \$8,000.00 |
| Riser | 1 | LS | \$10,000.00 | \$10,000.00 |
| Wetland Planting (aquatic bench) | 1128 | SY | \$2.00 | \$2,256.00 |
| Base Construction Cost | | | | \$78,156 |
| Mobilization (5%) | | | | \$3,908 |
| Subtotal 1 | | | | \$82,064 |
| Contingency (25%) | | | | \$20,516 |
| Subtotal 2 | | | | \$102,580 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$46,161 |
| Estimated Project Cost | | | | \$149,000 |

Site Photo:



Concept Sketch:

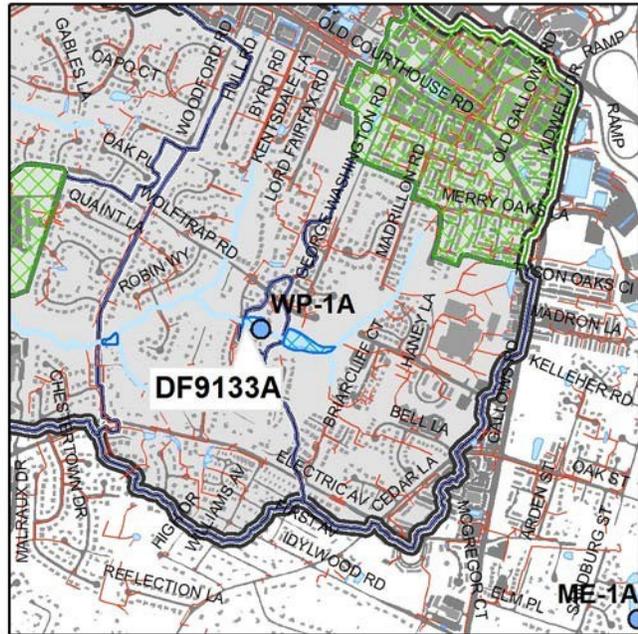


Project Number: DF9133A
Catchment Code: DFWC0001
Candidate Site: C33

Project Type: Pond Retrofit
Project Size: 1.0 acres
Treated Area: 6.4 acres

Project Location: This site is located at the upstream side of Silentree Drive.

Project Description: Management of higher frequency storms can be improved at this facility by installing a multi-stage weir in front of the headwall. Although there is no wet storage at this location, extended detention time of runoff from storm events will provide some treatment for water quality. Also, forebay(s) should be added at the inflow structures to the facility to treat runoff before flow enters the stream channel.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | Approximately 90% of the channel protection volume for this facility can be met. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with extended detention, along with vegetative uptake on the site. |

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 specific design or construction issues were noted for this project. |

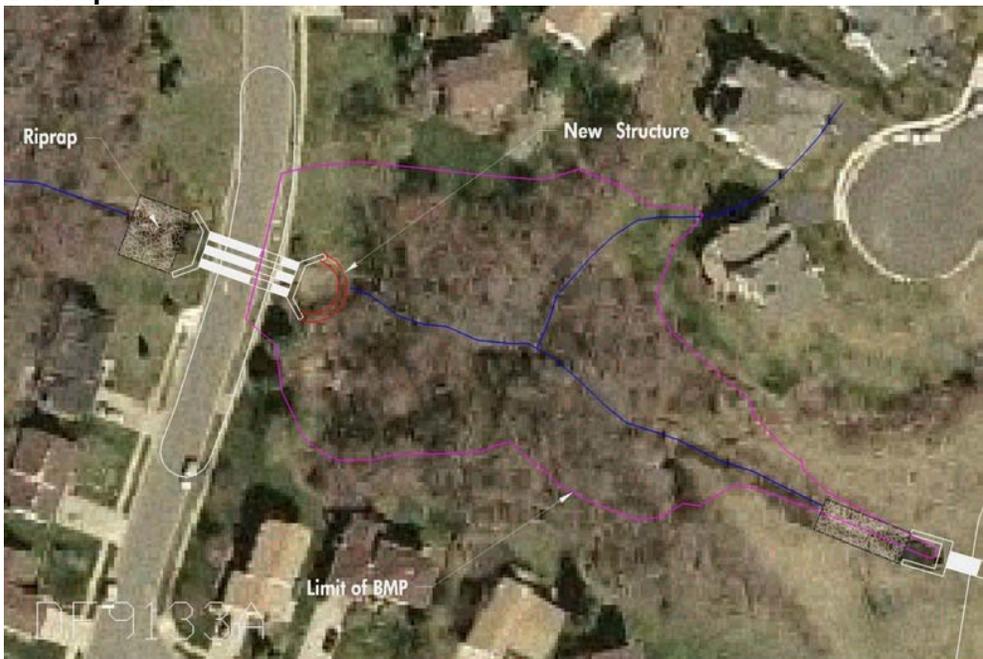
Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|-----------------|
| Clear and Grub | 0.1 | AC | \$5,000 | \$500 |
| Riser | 1 | LS | \$20,000.00 | \$20,000 |
| Rip Rap Stabilization | 40 | LF | \$50.00 | \$2,000 |
| Base Construction Cost | | | | \$22,500 |
| Mobilization (5%) | | | | \$1,125 |
| Subtotal 1 | | | | \$23,625 |
| Contingency (25%) | | | | \$5,906 |
| Subtotal 2 | | | | \$29,531 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$13,289 |
| Estimated Project Cost | | | | \$43,000 |

Site Photo:



Concept Sketch:

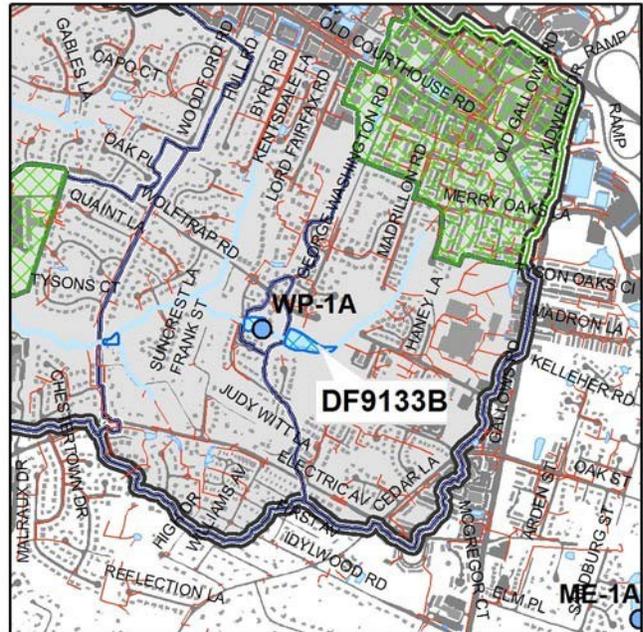


Project Number: DF9133B
Catchment Code: DFWC0001
Candidate Site: C33

Project Type: Pond Retrofit
Project Size: 1.7 acres
Treated Area: 180.2 acres

Project Location: This site is located at the upstream side of Silentree Drive.

Project Description: The combination of a stream channel, multiple ditches, and a closed storm drain system converging at this location direct a significant amount of flow to this area. Although the large drainage area and shallow embankment height limits the facility's potential, significant improvement in peak flow attenuation and pollutant load reduction can be made by replacing the existing weir with a multi-stage control structure and excavating to maximize the available storage volume. Also, anti-clogging design components should be considered, as this facility appears to be prone to accumulation of debris. The existing control structure has blocked fish passage and impounded water to convert this area into an established wet marsh. Excavation taking place within the basin of this facility will serve to maximize the storage volume. Additional wetland planting in this area will provide some of the required wet storage volume while also improving uptake of nutrients, pollutant removal, and settling of sediments.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | This project will achieve around 50% of the channel protection requirement. |
| Water Quality | 25% of the wet storage volume is created through this project. |

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 specific design or construction issues were noted for this project. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|------------------|
| Clear and Grub | 2.4 | AC | \$5,000 | \$12,000 |
| Grading and Excavation | 7602 | CY | \$30.00 | \$228,060 |
| Riser | 1 | LS | \$10,000.00 | \$10,000 |
| Rip Rap Stabilization | 100 | LF | \$50.00 | \$5,000 |
| Wetland Planting | 7841 | SY | \$2.00 | \$15,682 |
| Dry Landscaping | 3947 | SY | \$2.50 | \$9,867 |
| Base Construction Cost | | | | \$280,610 |
| Mobilization (5%) | | | | \$14,030 |
| Subtotal 1 | | | | \$294,640 |
| Contingency (25%) | | | | \$73,660 |
| Subtotal 2 | | | | \$368,300 |
| Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$165,735 |
| Estimated Project Cost | | | | \$534,000 |

Site Photo:



Concept Sketch:



Project Number: DF92124
Catchment Code: DFWC0005
Candidate Site: S124

Project Type: Stream Restoration
Project Size: 596 feet

Project Location: This project is located south of Chain Bridge Road and west of Westwood Forest Drive.

Project Description: The upper reaches of the stream are incised and actively eroding. The proposed restoration would involve regrading and creating a nested channel with a bench to restore habitat and floodplain access. The lower reach of the stream has stable bed and bank features but two of the adjacent property owners are maintaining the riparian buffer as lawn. The proposed buffer restoration will involve planting native trees and shrubs in areas of the riparian that are currently maintained as lawn and establishing an agreement with the homeowners to preserve the riparian buffer.



Potential Project Benefits:

| | |
|------------------|---|
| Stream Stability | Regrading the stream with a floodplain bench will result in lower stress on streambanks and better stability thus reducing erosion potential. |
| Water Quality | Water quality may be improved by the nutrient uptake potential of the forested buffer. |
| Instream Habitat | The buffer will provide thermal shading and decrease the amount of nutrients in the waterway by vegetative uptake. |

Potential Project Constraints:

| | |
|-----------------------|--|
| Environmental | The site will not require forest clearing or impacts to jurisdictional wetlands. It will not require a permit from the U.S. Army Corps of Engineers or 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 minimal compared to other stream restoration projects. General constructability is good. |

Difficult Run Watershed Management Plan
 Concept Plans
 Wolftrap Creek

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-----------|------------------|
| Change channel type -- nested channel | 430 | LF | \$200.00 | \$86,000 |
| Stabilize in place -- grading | 166 | LF | \$175.00 | \$29,050 |
| Add'l cost, first 500 LF | 500 | LF | \$200.00 | \$100,000 |
| Base Construction Cost | | | | \$215,050 |
| Mobilization (5%) | | | | \$10,753 |
| Subtotal 1 | | | | \$225,803 |
| Contingency (25%) | | | | \$56,451 |
| Subtotal 2 | | | | \$282,253 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$127,014 |
| Estimated Project Cost | | | | \$409,000 |

Concept Sketch

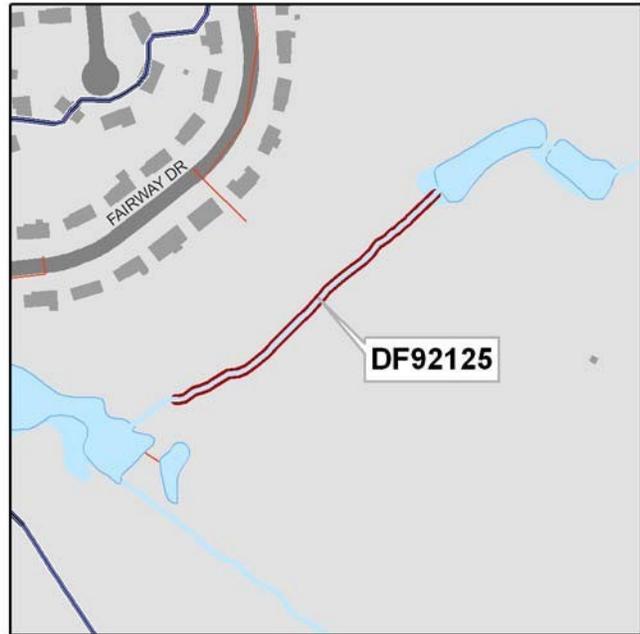


Project Number: DF92125
Catchment Code: DFWC9802
Candidate Site: S125

Project Type: Buffer Restoration
Project Size: 759 feet

Project Location: This project is located within the Westbriar Country Club golf course.

Project Description: The stream is located on a golf course and lacks a forested riparian buffer. The proposed restoration will seek, to the maximum extent practicable, to plant the riparian zone with woody trees and shrubs



Potential Project Benefits:

| | |
|------------------|--|
| Stream Stability | The project will not significantly affect stream stability. |
| Water Quality | Water quality may be improved by the nutrient uptake potential of the forested buffer. |
| Instream Habitat | The buffer will provide thermal shading and decrease the amount of nutrients in the waterway by vegetative uptake. |

Potential Project Constraints:

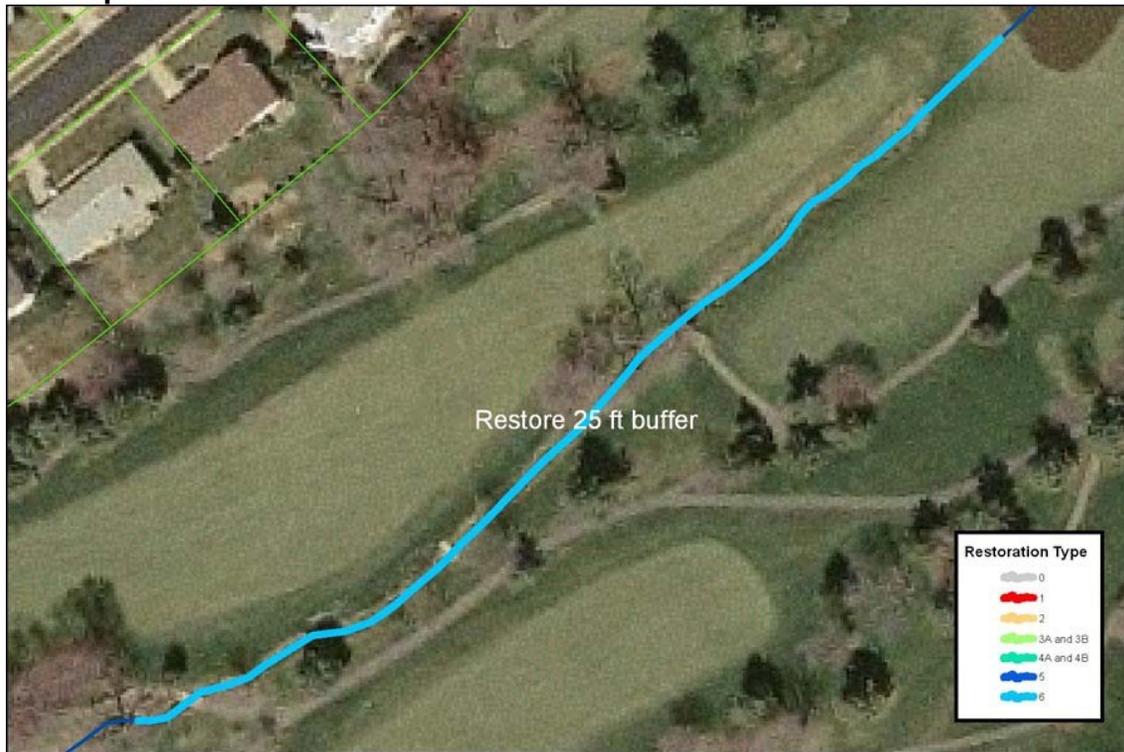
| | |
|-----------------------|---|
| Environmental | The site will not require forest clearing or impacts to jurisdictional wetlands. The project will not require a permit. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this facility will require an easement on the golf course but is open and unconstrained adjacent to the stream. |
| Design / Construction | Design efforts are minimal compared to other stream restoration projects. General constructability is good. |

Difficult Run Watershed Management Plan
 Concept Plans
 Wolftrap Creek

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-----------|-----------------|
| Buffer restoration | 759 | LF | \$25.00 | \$18,975 |
| Base Construction Cost | | | | \$18,975 |
| Mobilization (5%) | | | | \$949 |
| Subtotal 1 | | | | \$19,924 |
| Contingency (25%) | | | | \$4,981 |
| Subtotal 2 | | | | \$24,905 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$11,207 |
| Estimated Project Cost | | | | \$36,000 |

Concept Sketch

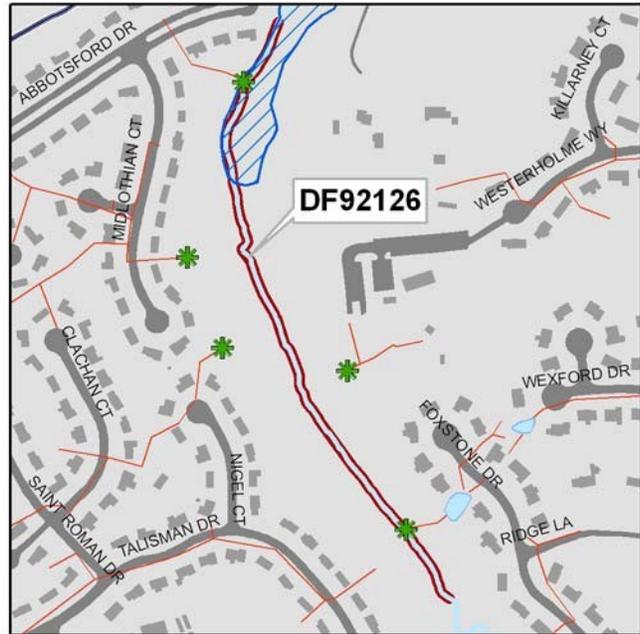


Project Number: DF92126
Catchment Code: DFWC9801
Candidate Site: S126

Project Type: Stream Restoration
Project Size: 2122 Linear Feet

Project Location: This project is located to the west of Foxstone Drive.

Project Description: The stream's riparian zone lacks woody vegetation. The stream banks are raw and eroding. However the streambed appears to be stable. The stream is located in the Wolftrap Stream Valley Park. The banks will be regraded and stabilized. The riparian areas will be planted with native trees and shrubs. A floodplain bench will be excavated and planted with native tree and shrubs. Several stormwater outfalls will be retrofitted to reduce stream scour and one section of the stream will be restored to reflect natural stream morphology patterns. An existing sanitary sewer running along the stream must be considered in the design.



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 | Erosion reduction and establishing a riparian buffer will improve physical habitat conditions. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | The site will require forest clearing 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 is available from the adjacent paved park trail. |
| Design / Construction | Design efforts are moderate compared to other stream restoration projects. General constructability is good. A parallel sanitary sewer line will have to be factored into the design and construction efforts. |

Difficult Run Watershed Management Plan
 Concept Plans
 Wolftrap Creek

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-----------|------------------|
| Stabilize in place -- grading | 1528 | LF | \$175.00 | \$267,400 |
| Stabilize in place -- armoring | 34 | LF | \$225.00 | \$7,650 |
| Excavate and create low-flow channel | 560 | LF | \$150.00 | \$84,000 |
| Add'l cost, first 500 LF | 500 | LF | \$200.00 | \$100,000 |
| Base Construction Cost | | | | \$459,050 |
| Mobilization (5%) | | | | \$22,953 |
| Subtotal 1 | | | | \$482,003 |
| Contingency (25%) | | | | \$120,501 |
| Subtotal 2 | | | | \$602,503 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$271,126 |
| Estimated Project Cost | | | | \$874,000 |

Concept Sketch

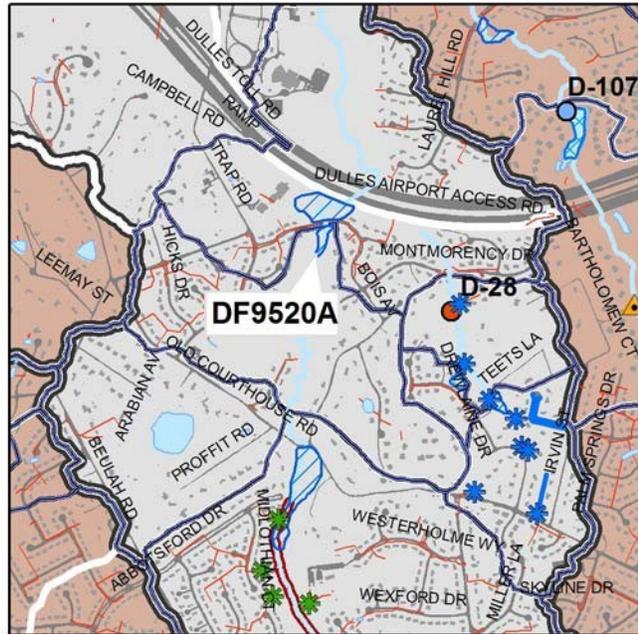


Project Number: DF9520A
Catchment Code: DFWC0009
Candidate Site: C20

Project Type: Culvert Retrofit
Project Size: 0.7 acres
Treated Area: 216 acres

Project Location: This project is located upstream of the culvert under Bois Avenue.

Project Description: The goal of this project is to use the wooded floodplain as storage to reduce peak flows, increase vegetative uptake, and settle solids out of the water column. This culvert retrofit would include improvements to enhance the water quality treatment at this site.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | This project would provide about 25% of the channel protection volume and could result in some reduction of the peak discharge. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with extended detention, along with vegetative uptake on the site. |

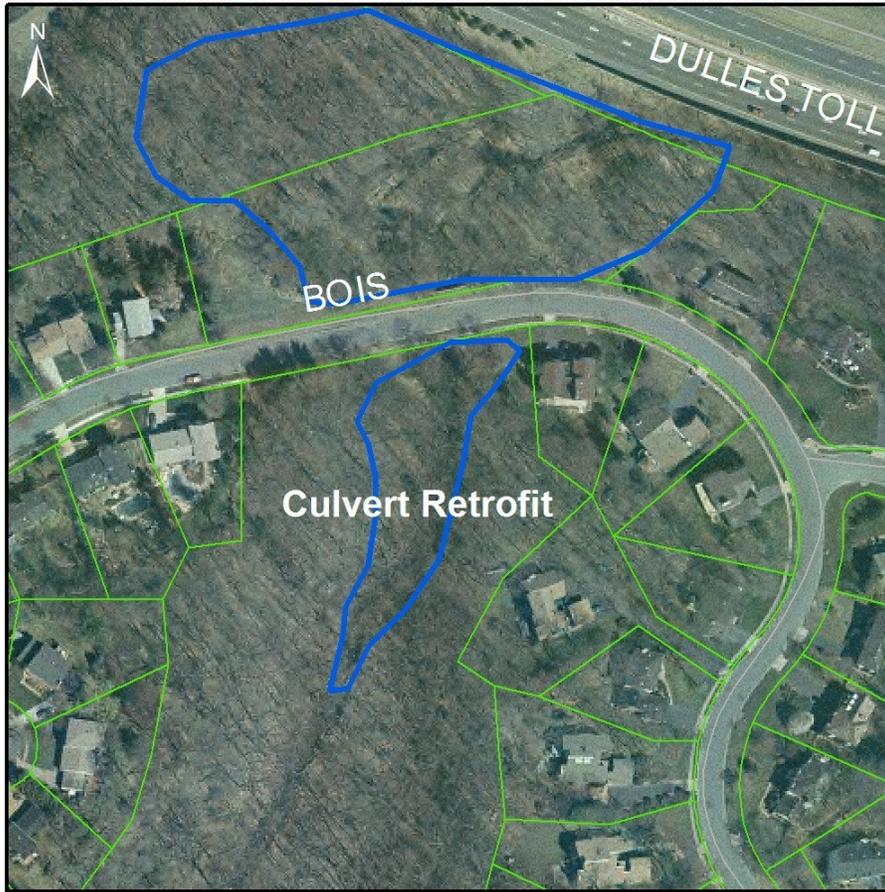
Potential Project Constraints:

| | |
|-----------------------|--|
| Environmental | There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain above this culvert. Some forest impacts would occur during construction. Projects in RPAs may require exceptions or waivers. |
| Facility Access | Access to this project is 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 | 1,080 | CY | \$35.00 | \$37,800 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 700 | SY | \$2.50 | \$1,750 |
| Wetland Planting | 240 | SY | \$2.00 | \$480 |
| Base Construction Cost | | | | \$46,030 |
| Mobilization (5%) | | | | \$2,302 |
| Subtotal 1 | | | | \$48,332 |
| Contingency (25%) | | | | \$12,083 |
| Subtotal 2 | | | | \$60,414 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$27,186 |
| Estimated Project Cost | | | | \$88,000 |

Concept Sketch

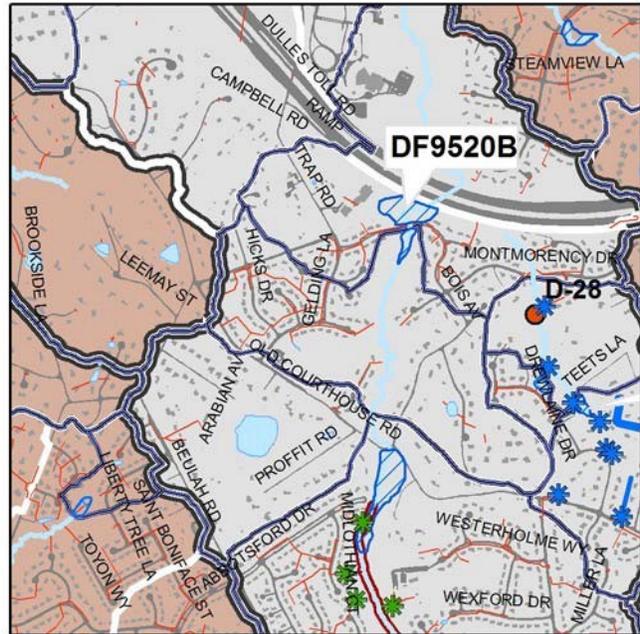


Project Number: DF9520B
Catchment Code: DFWC0009
Candidate Site: C20

Project Type: Culvert Retrofit
Project Size: 3.2 acres
Treated Area: 42.9 acres

Project Location: This project is located upstream of the culvert under the Dulles Toll Road north from Bois Avenue.

Project Description: The culvert retrofit is designed to store runoff on the floodplain during frequent, smaller events. Water quality improvements would not be part of the design, but some benefits would be provided through extended detention and settling. This project should be designed in conjunction with upstream project DF9520A as a series system.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | The project will provide approximately 60% of the channel protection volume. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with extended detention on the floodplain, along with vegetative uptake on the site. |

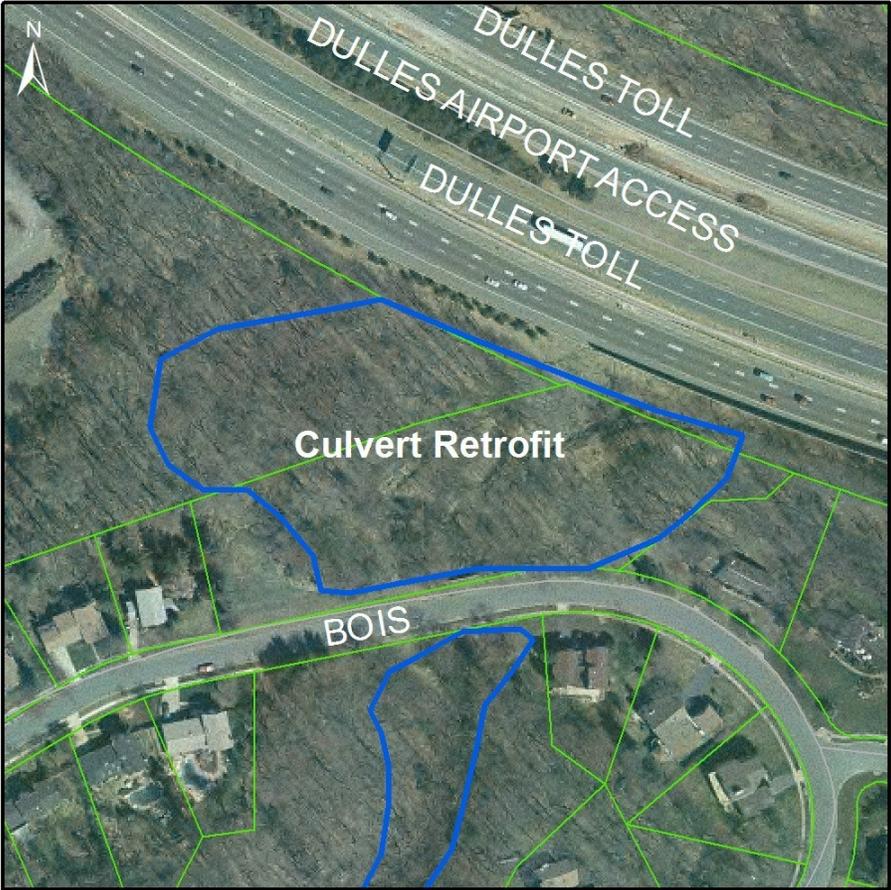
Potential Project Constraints:

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

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|------------------|
| Clear and Grub | 0.4 | AC | \$5,000.00 | \$2,000 |
| Excavation | 2,470 | CY | \$35.00 | \$86,450 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 1,600 | SY | \$2.50 | \$4,000 |
| Wetland Planting | 540 | SY | \$2.00 | \$1,080 |
| Base Construction Cost | | | | \$98,530 |
| Mobilization (5%) | | | | \$4,927 |
| Subtotal 1 | | | | \$103,457 |
| Contingency (25%) | | | | \$25,864 |
| Subtotal 2 | | | | \$129,321 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$58,194 |
| Estimated Project Cost | | | | \$188,000 |

Concept Sketch

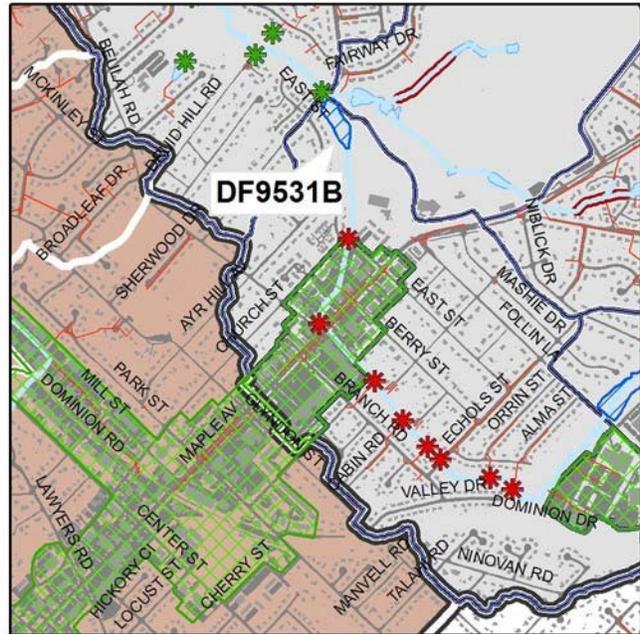


Project Number: DF9531B
Catchment Code: DFWC0004
Candidate Site: C31

Project Type: Culvert Retrofit
Project Size: 1.9 acres
Treated Area: 699.4 acres

Project Location: This site is located above Creek Crossing Road, at the Westwood Country Club.

Project Description: The goal of this project is to provide extended detention for channel protection and water quality improvements. The double culvert crossing can be used to develop the project and has the possibility of peak flow attenuation as well as detention of higher frequency storms



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | This project would result in some reduction of the peak discharge for small stormflows. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with increased detention. |

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 | 0.4 | AC | \$5,000.00 | \$2,000 |
| Excavation | 1,360 | CY | \$35.00 | \$47,600 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 1,760 | SY | \$2.50 | \$4,400 |
| Wetland Planting | 590 | SY | \$2.00 | \$1,180 |
| Base Construction Cost | | | | \$60,180 |
| Mobilization (5%) | | | | \$3,009 |
| Subtotal 1 | | | | \$63,189 |
| Contingency (25%) | | | | \$15,797 |
| Subtotal 2 | | | | \$78,986 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$35,544 |
| Estimated Project Cost | | | | \$115,000 |

Concept Sketch

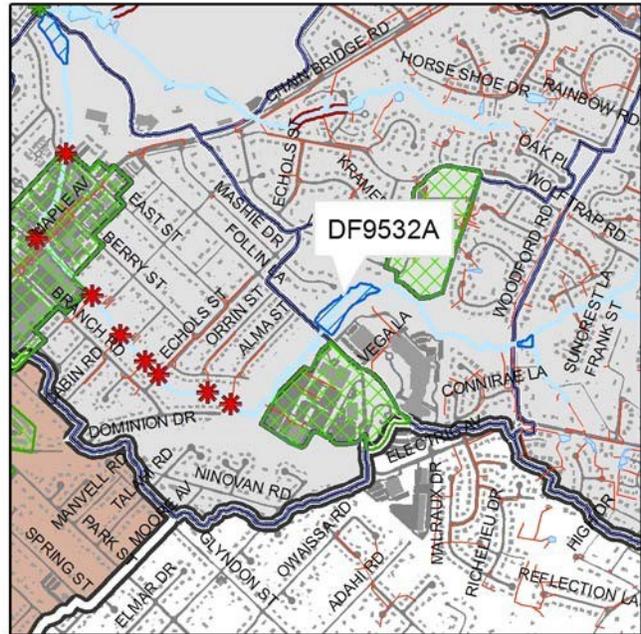


Project Number: DF9532A
Catchment Code: DFWC0003
Candidate Site: C32

Project Type: Culvert Retrofit
Project Size: 3.2 acres
Treated Area: 114.8 acres

Project Location: This site is located at the upstream side of the crossing at Follin Lane.

Project Description: The goal of this project is to place an impoundment structure to increase the detention time within this drainage area and protect channels downstream from high flow. This project would also provide some pollutant removal by means of vegetative uptake from the wooded floodplain.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | The project will provide 100% of the channel protection volume estimated for this location. |
| Water Quality | The pond will remain a dry facility and water quality improvements will be minor. There may be some improvements to water quality through the reduction in scour forming discharges, and sedimentation and vegetative uptake on the floodplain. |

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 | 0.7 | AC | \$5,000.00 | \$3,500 |
| Excavation | 960 | CY | \$35.00 | \$33,600 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 2,910 | SY | \$2.50 | \$7,275 |
| Wetland Planting | 970 | SY | \$2.00 | \$1,940 |
| Base Construction Cost | | | | \$51,315 |
| Mobilization (5%) | | | | \$2,566 |
| Subtotal 1 | | | | \$53,881 |
| Contingency (25%) | | | | \$13,470 |
| Subtotal 2 | | | | \$67,351 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$30,308 |
| Estimated Project Cost | | | | \$98,000 |

Concept Sketch

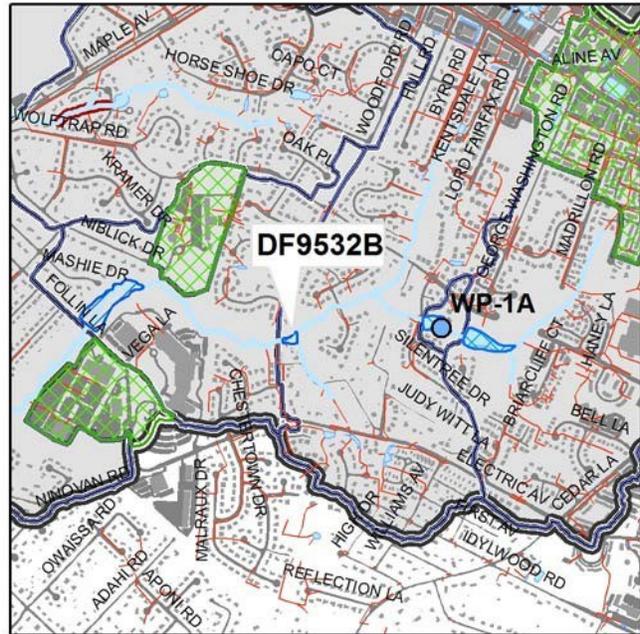


Project Number: DF9532B
Catchment Code: DFWC0003
Candidate Site: C32

Project Type: Culvert Retrofit
Project Size: 0.3 acres
Treated Area: 254 acres

Project Location: This site is located on the upstream side of Woodford Road.

Project Description: The goal is to create an extended detention structure that will use the wooded floodplain for storage to reduce erosion potential in the stream, increase the uptake of nutrients by plants, and allow sediment to settle.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | The project would result in minor reductions in peak discharge. |
| Water Quality | Reduction of pollutants would occur by vegetative uptake and the settling of solids. |

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 and may require a permit from the U.S. Army Corps of Engineers or VDEQ. 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 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 | 220 | CY | \$35.00 | \$7,700 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 290 | SY | \$2.50 | \$725 |
| Wetland Planting | 100 | SY | \$2.00 | \$200 |
| Base Construction Cost | | | | \$14,125 |
| Mobilization (5%) | | | | \$706 |
| Subtotal 1 | | | | \$14,831 |
| Contingency (25%) | | | | \$3,708 |
| Subtotal 2 | | | | \$18,539 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$8,343 |
| Estimated Project Cost | | | | \$27,000 |

Concept Sketch

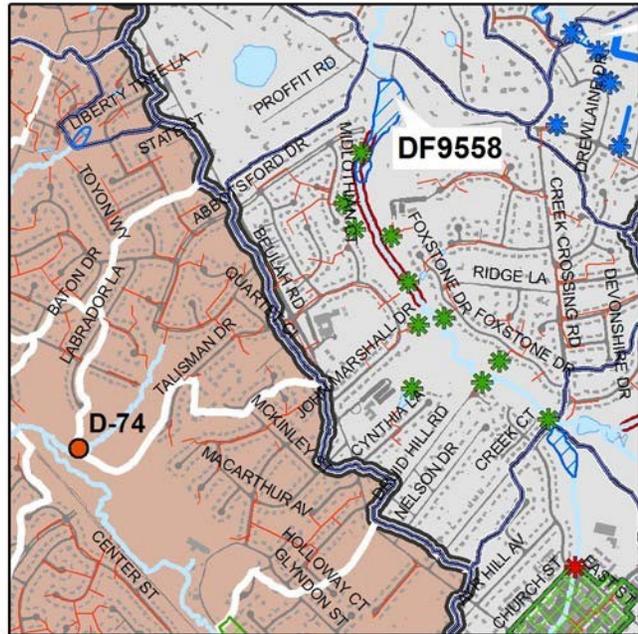


Project Number: DF9558
Catchment Code: DFWC0005
Candidate Site: C58

Project Type: Culvert Retrofit
Project Size: 5.0 acres
Treated Area: 354.9 acres

Project Location: This site is located at the upstream side of the crossing under Old Courthouse Road.

Project Description: The goal of this project is to provide water quality treatment through extended detention on to the floodplain in this area. This will be achieved as part of the several other projects in this catchment by improving the outfall of the culvert by reducing scour-inducing peak flows. This will decrease the scour at the crossing and reduce the amount of sediment carried downstream.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | The project is expected to result in minor reductions in peak flows. |
| Water Quality | The project has sufficient storage to treat 100% of the water quality volume. Sedimentation and nutrient uptake will also provide treatment. |

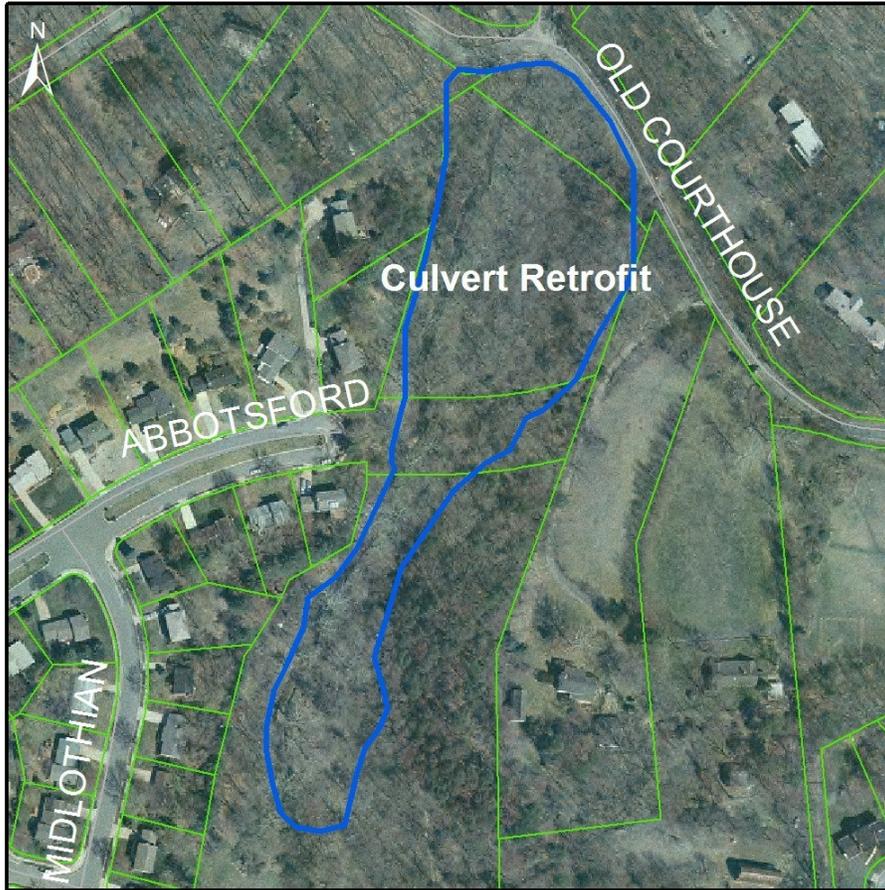
Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | Environmental permitting issues would be anticipated for any activity in and around a stream corridor. Forest and wetland impacts are anticipated during construction and may require a permit from the U.S. Army Corps of Engineers or VDEQ. 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 | 1.1 | AC | \$5,000.00 | \$5,500 |
| Excavation | 2,470 | CY | \$35.00 | \$86,450 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 4,550 | SY | \$2.50 | \$11,375 |
| Wetland Planting | 1,520 | SY | \$2.00 | \$3,040 |
| Base Construction Cost | | | | \$111,365 |
| Mobilization (5%) | | | | \$5,568 |
| Subtotal 1 | | | | \$116,933 |
| Contingency (25%) | | | | \$29,233 |
| Subtotal 2 | | | | \$146,167 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$65,775 |
| Estimated Project Cost | | | | \$212,000 |

Concept Sketch

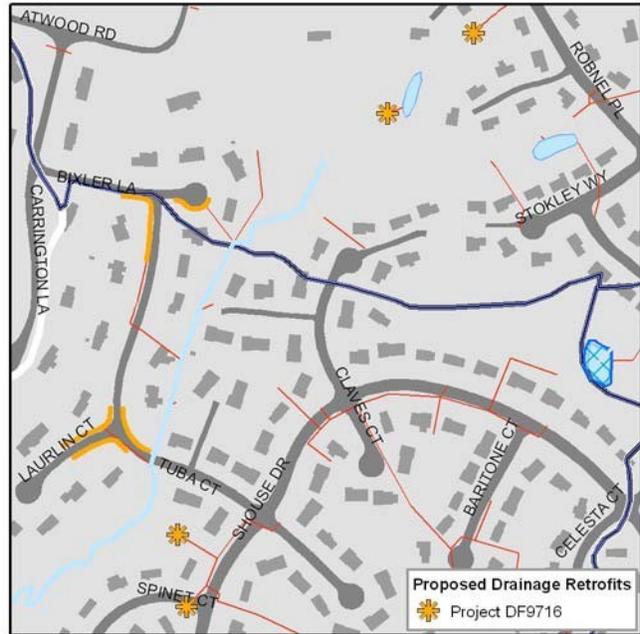


Project Number: DF9716
Catchment Code: DFWC9201
Candidate Site: C16

Project Type: Drainage Retrofit
Project Size: 944 feet of ditch

Project Location: Along Tuba and Laurlin Courts.

Project Description: This project involves replacing the concrete drainage ditches throughout the catchment, such as those along Tuba Court and Laurlin Court, with dry swales with an underdrain.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | Replacing the paved ditches with dry swales will reduce both volume and velocity. |
| Water Quality | Replacing ditches with swales will provide treatment before stormwater reaches the stream system. Water quality will also benefit from the reduction of sediment loads associated from scour 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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. Design should incorporate check dams or other features to ensure flow velocity is not erosive. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|------------------|
| Paved Ditch Demolition (Haul Away) | 944 | LF | \$18.00 | \$16,992 |
| Dry Swale w/ Underdrain | 944 | LF | \$50.00 | \$47,200 |
| Outfall Protection | 4 | EA | \$8,000.00 | \$32,000 |
| Base Construction Cost | | | | \$96,192 |
| Mobilization (5%) | | | | \$4,810 |
| Subtotal 1 | | | | \$101,002 |
| Contingency (25%) | | | | \$25,250 |
| Subtotal 2 | | | | \$126,252 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$56,813 |
| Estimated Project Cost | | | | \$183,000 |

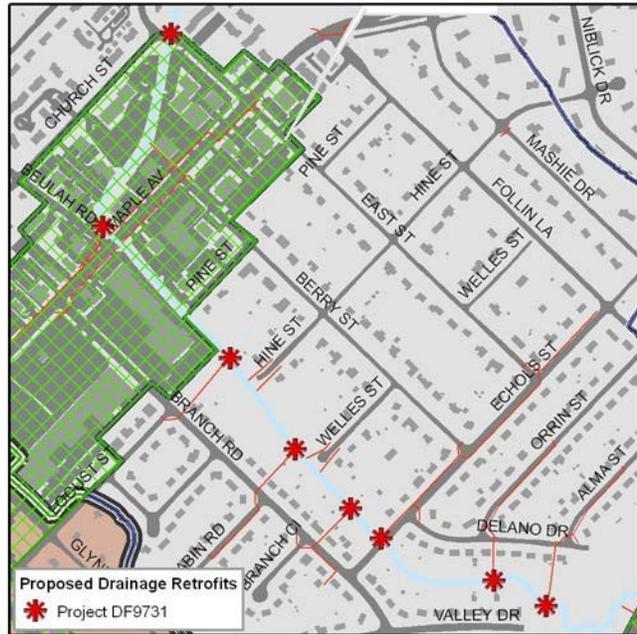
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Project Number: DF9731
Catchment Code: DFWC0004
Candidate Site: C31

Project Type: Drainage Retrofit.
Project Size: 8 Outfalls

Project Location:
 This project is distributed throughout the catchment where piped drainage systems discharge into natural channels.

Project Description:
 This project consists of reconfiguring outfalls or retrofitting energy dissipation structures to reduce scour and erosion where flows from the storm drainage 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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|------------------|
| Outfall Protection | 8 | EA | \$8,000.00 | \$64,000.00 |
| 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 |

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Project Number: DF9758
Catchment Code: DFWC0005
Candidate Site: C58

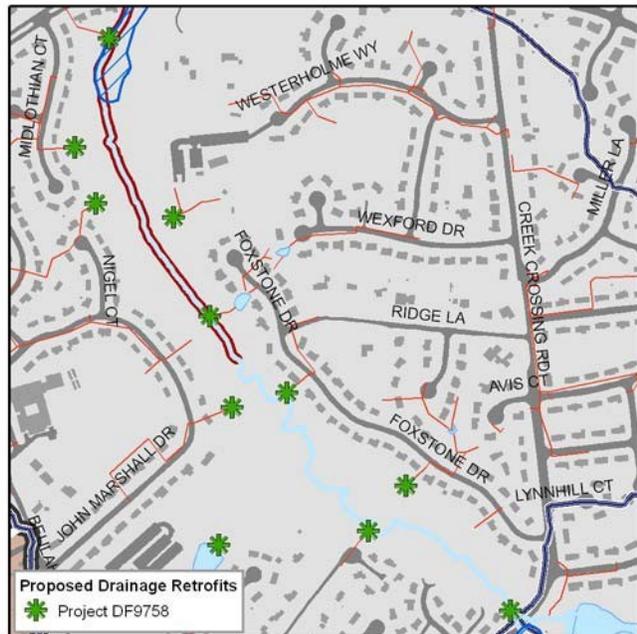
Project Type: Drainage Retrofit
Project Size: 11 Outfalls

Project Location:

This project is distributed throughout the catchment where piped drainage systems discharge into natural channels.

Project Description:

This project consists of reconfiguring outfalls or retrofitting energy dissipation structures to reduce scour and erosion where flows from the storm drainage 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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|------------------|
| Outfall Protection | 11 | EA | \$8,000.00 | \$88,000 |
| Base Construction Cost | | | | \$88,000 |
| Mobilization (5%) | | | | \$4,400 |
| Subtotal 1 | | | | \$92,400 |
| Contingency (25%) | | | | \$23,100 |
| Subtotal 2 | | | | \$115,500 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$51,975 |
| Estimated Project Cost | | | | \$167,000 |

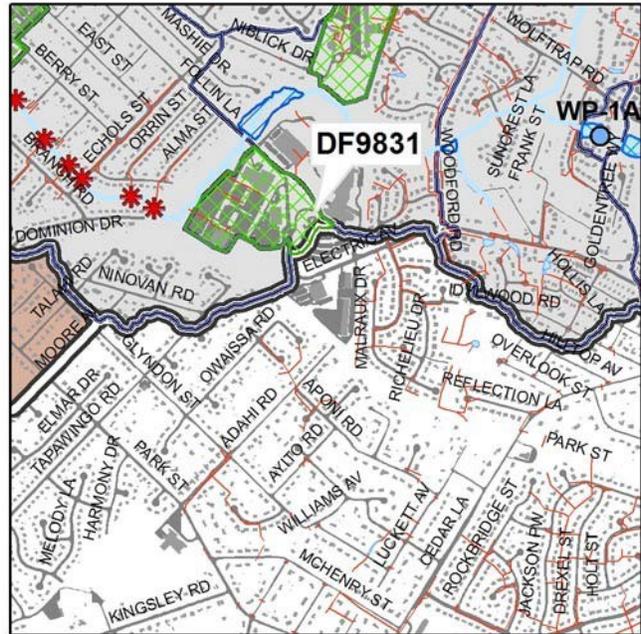
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Project Number: DF9831
Catchment Code: DFWC0004
Candidate Site: C31

Project Type: LID Retrofit
Project Size: 0.3 acres
Treated Area: 25.2 acres

Project Location: This project would retrofit the existing rear parking lot of the southwestern parcel associated with the Navy Federal Credit Union Complex on Follin Lane with LID porous pavers and/or structural controls.

Project Description: Replacing or renovating this parking lot would reduce the effects of imperviousness, with the benefit of lower velocities and volume of runoff into the stream.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | While designed primarily for water quality, this project would reduce the amount of runoff through infiltration and reduction of impervious area. |
| Water Quality | This project has been designed to treat 100% of the water quality volume for the site. |

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 | 1,352.0 | SY | \$120.00 | \$162,240 |
| Base Construction Cost | | | | \$162,240 |
| Mobilization (5%) | | | | \$8,112 |
| Subtotal 1 | | | | \$170,352 |
| Contingency (25%) | | | | \$42,588 |
| Subtotal 2 | | | | \$212,940 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$95,823 |
| Estimated Project Cost | | | | \$309,000 |

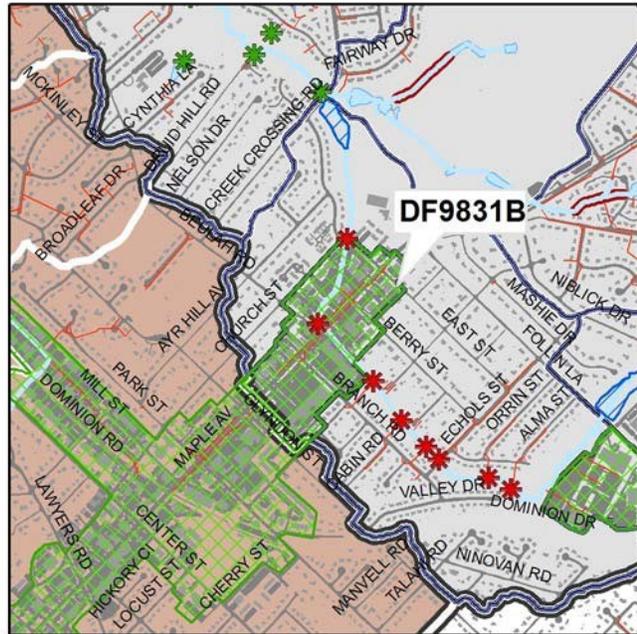
Concept Sketch



Project Number: DF9831B
Catchment Code: DFWC0004
Candidate Site: C31

Project Type: LID Retrofit
Project Size: 0.1 acres
Treated Area: 48.3 acres

Project Location: The area within 1 to 2 blocks on either side of Maple Avenue in Vienna and within 1 to 2 blocks of the W&OD Trail.



Project Description: This project requires a holistic LID approach to be retrofitted into the business corridor along Maple Street (Rte. 123), which is built out with commercial properties. The entire area is almost entirely impervious, and therefore results in high rates of runoff high concentrations of contaminants to the downstream waters. LID systems could include reduction of imperviousness, inlet filtration, bioretention, rooftop detention, or green roofs. Management practices could be implemented as a public project(s) or by individual sites as redevelopment occurs.

Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | The LID approach is expected to reduce runoff volume through infiltration. Minor reductions in peak flow rates could be expected. |
| Water Quality | The project would treat 100% of the water quality volume, which would provide significant improvements for this drainage area. |

Potential Project Constraints:

| | |
|-----------------------|--|
| Environmental | No environmental permitting issues or impacts are anticipated for this project. |
| Facility Access | For the most part, access in this area is excellent from roads and parking lots. |
| Design / Construction | This project would require detailed survey and mapping of all utilities, drainage appurtenances and structures. Coordination with private property owners would be necessary in some of the areas. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-----------|------------------|
| LID Structural Control | 3,165.0 | SY | \$120.00 | \$379,800 |
| Base Construction Cost | | | | \$379,800 |
| Mobilization (5%) | | | | \$18,990 |
| Subtotal 1 | | | | \$398,790 |
| Contingency (25%) | | | | \$99,698 |
| Subtotal 2 | | | | \$498,488 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$224,319 |
| Estimated Project Cost | | | | \$723,000 |

Concept Sketch:

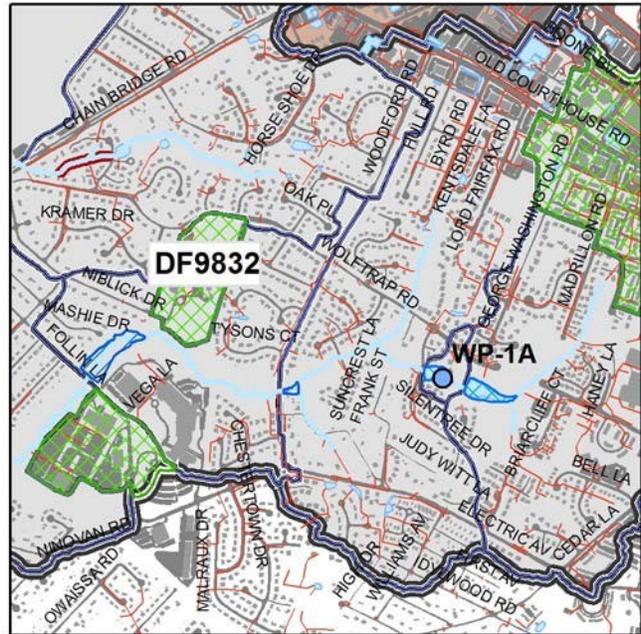


Project Number: DF9832
Catchment Code: DFWC0003
Candidate Site: C32

Project Type: LID Retrofit
Project Size: 0.1 acres
Treated Area: 21 acres

Project Location: This project would be located at the parcel occupied by Notre Dame and Our Lady of Good Counsel Catholic Church.

Project Description: The existing development results in a high impervious area. The goal is to reduce the imperviousness by strategically adding pervious areas across the site and by redirecting impervious runoff to the pervious sections. The LID retrofit would reduce the runoff volume and improve water quality from these properties.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | While designed primarily for water quality, this project would reduce the amount of runoff through reduction of impervious area, infiltration and evapotranspiration. |
| Water Quality | This project has been designed to treat 100% of the water quality volume for the site. |

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 | A holistic LID approach is recommended, rather than structural LID only. Conservation and disconnection would be significant part of this design. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-----------|------------------|
| LID Structural Control | 526.0 | SY | \$120.00 | \$63,120 |
| Base Construction Cost | | | | \$63,120 |
| Mobilization (5%) | | | | \$3,156 |
| Subtotal 1 | | | | \$66,276 |
| Contingency (25%) | | | | \$16,569 |
| Subtotal 2 | | | | \$82,845 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$37,280 |
| Estimated Project Cost | | | | \$120,000 |

Concept Sketch:

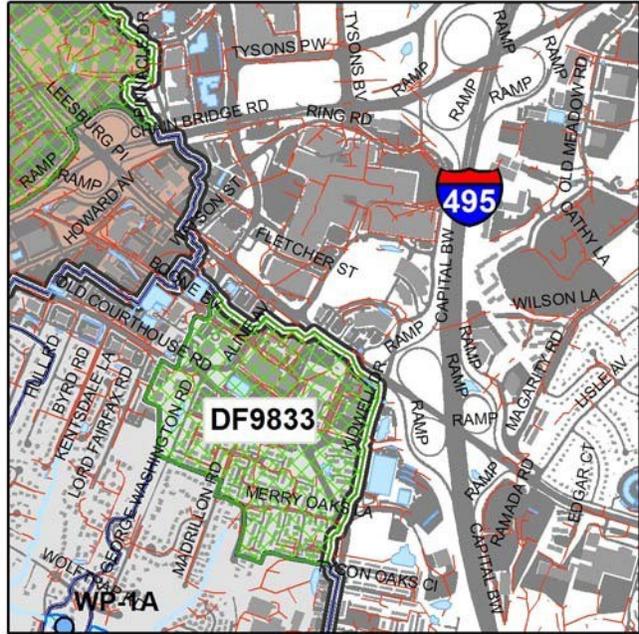


Project Number: DF9833
Catchment Code: DFWC0001
Candidate Site: C33

Project Type: LID Retrofit
Project Size: 1.1 acres
Treated Area: 109.9 acres

Project Location: This site is located in the upper third of the catchment.

Project Description: The goal is look for places where the impervious surface of this highly developed area could be broken and pervious areas created. The pervious areas will receive water from the impervious areas, reducing the water velocity and volume while increasing the infiltration rate.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | While designed primarily for water quality, this project would reduce the amount of runoff through reduction of impervious area and improve infiltration and evapotranspiration. |
| Water Quality | This project has been designed to treat 100% of the water quality volume for the site. |

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 | Minimization of runoff through use of pervious pavement and rooftop disconnection would be significant part of this design |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------------------------|--------------------|
| LID Structural Control | 5,500.0 | SY | \$120.00 | \$660,000 |
| | | | Base Construction Cost | \$660,000 |
| | | | Mobilization (5%) | \$33,000 |
| | | | Subtotal 1 | \$693,000 |
| | | | Contingency (25%) | \$173,250 |
| | | | Subtotal 2 | \$866,250 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$389,813 |
| | | | Estimated Project Cost | \$1,256,000 |

Concept Sketch:

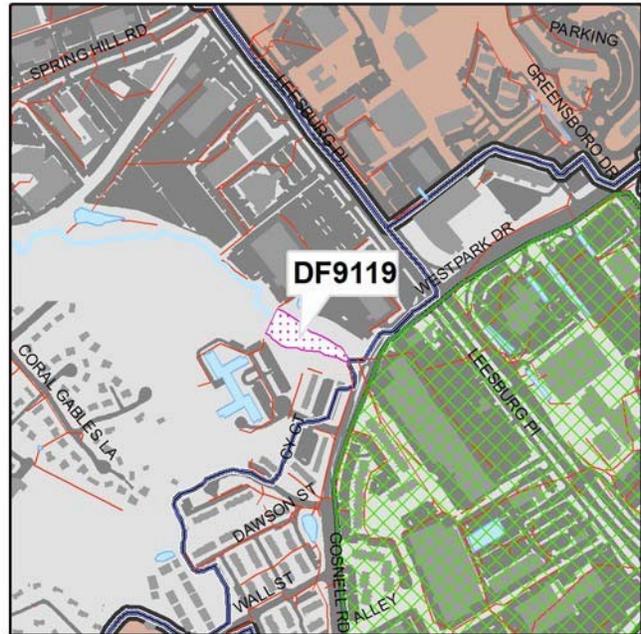


Project Number: DF9119
Catchment Code: DFOR0099
Candidate Site: C19

Project Type: New Pond
Project Size: 1.2 acres
Treated Area: 129 acres

Project Location: West of Gosnell Road and south of Leesburg Pike.

Project Description: This project is a new dry, in-stream facility at the outfall of this catchment. The size of the pond will depend on the design of the LID upstream. Assuming the LID is designed for water quality control of the whole drainage area, it would allow pond storage to be sized for channel protection only. Disconnection of upstream imperviousness would also reduce the volume required.



Potential Project Benefits:

| | |
|---------------|--|
| Peak Flow | The pond will provide approximately 20% of the channel protection volume calculated assuming no LID retrofits are installed. |
| Water Quality | The pond would be designed as a dry facility and water quality improvements would be derived from reduction of stream erosion. |

Potential Project Constraints:

| | |
|-----------------------|--|
| Environmental | There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain. Projects in RPAs may require exceptions or waivers. |
| Property Ownership | This area appears to be privately owned. |
| Facility Access | Access to this area is good by way of public roads. |
| Design / Construction | Coordination with private property owners would be necessary. No other design or construction issues were noted for this project. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|-------------|------------------|
| Clear and Grub | 0.3 | AC | \$5,000.00 | \$1,500 |
| Embankment | 1,620 | CY | \$60.00 | \$97,200 |
| Riser Structure | 1 | LS | \$10,000.00 | \$10,000 |
| Landscaping | 1,040 | SY | \$2.50 | \$2,600 |
| Base Construction Cost | | | | \$111,300 |
| Mobilization (5%) | | | | \$5,565 |
| Subtotal 1 | | | | \$116,865 |
| Contingency (25%) | | | | \$29,216 |
| Subtotal 2 | | | | \$146,081 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$65,737 |
| Estimated Project Cost | | | | \$212,000 |

Concept Sketch

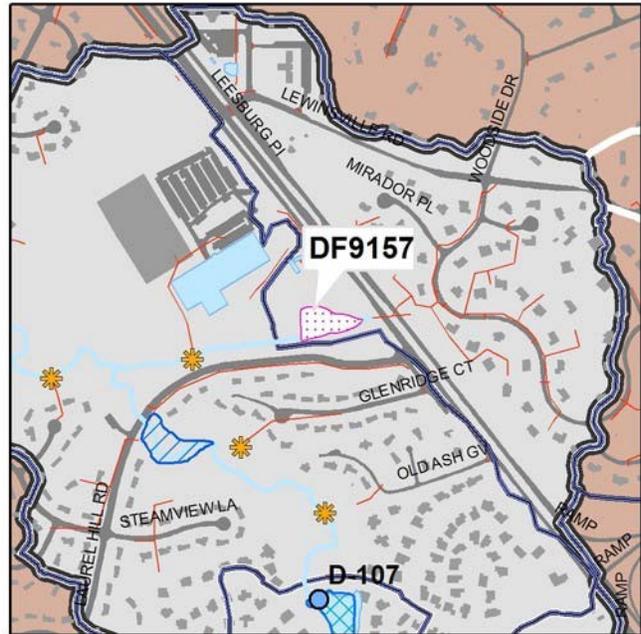


Project Number: DF9157
Catchment Code: DFOR0004
Candidate Site: C57

Project Type: New Pond
Project Size: 1.0 acres
Treated Area: 78.7 acres

Project Location: This project is located north of Laurel Hill Road, downstream of the intersection with Leesburg Pike.

Project Description: This project would construct a new dry pond to control the discharge into the stream by reducing the peak flows from the upstream area developed prior to stormwater management.



Potential Project Benefits:

| | |
|---------------|--|
| Streamflow | This facility would provide 100% of the channel storage volume and help to reduce erosive flows downstream. |
| Water Quality | Reduction in erosive flows will reduce sedimentation downstream. Some reduction of pollutants will occur at the site with increased settling associated with extended detention. |

Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain. 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 | 0.4 | AC | \$5,000.00 | \$2,000 |
| Embankment | 4,090 | CY | \$60.00 | \$245,400 |
| Riser Structure | 1 | LS | \$10,000.00 | \$10,000 |
| Landscaping | 1,830 | SY | \$2.50 | \$4,575 |
| Base Construction Cost | | | | \$261,975 |
| Mobilization (5%) | | | | \$13,099 |
| Subtotal 1 | | | | \$275,074 |
| Contingency (25%) | | | | \$68,768 |
| Subtotal 2 | | | | \$343,842 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$154,729 |
| Estimated Project Cost | | | | \$439,000 |

Concept Sketch:

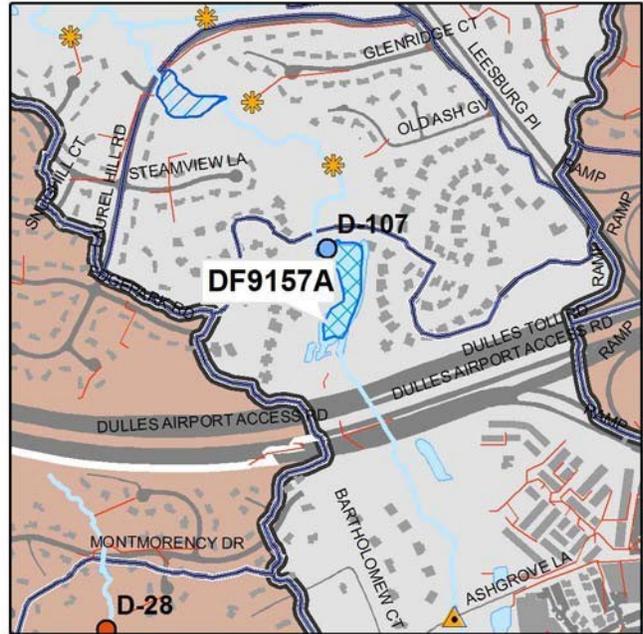


Project Number: DF9157A
Catchment Code: DFOR0004
Candidate Site: C57

Project Type: Pond Retrofit.
Project Size: 1.9 acres
Treated Area: 485 acres

Project Location: At the crossing of Jarrett Valley Drive.

Project Description: This project is a retrofit of regional pond D-107, designed to change outflow characteristics to provide channel protection as a dry extended detention pond for the large, drainage area upstream. Water quality features will enhance pollutant removal as a secondary goal.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | The project will provide approximately 40% of the channel protection volume. |
| Water Quality | Some reduction of pollutants will occur with increased settling associated with extended detention, along with vegetative uptake on the site. |

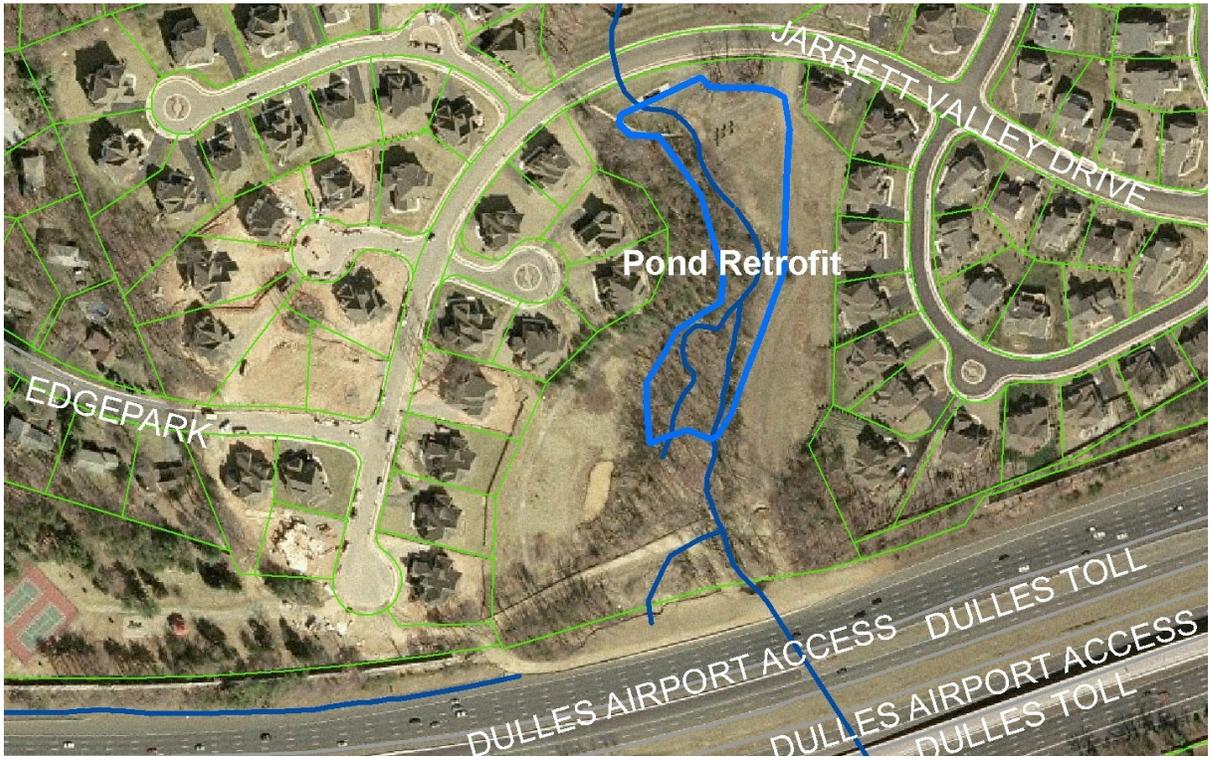
Potential Project Constraints:

| | |
|-----------------------|---|
| Environmental | Environmental permitting issues would not be anticipated for this retrofit project. 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 | 0.47 | AC | \$5,000.00 | \$2,342 |
| Grading and Excavation | 4,912 | CY | \$30.00 | \$147,350 |
| Outlet Protection | 1 | EA | \$8,000.00 | \$8,000 |
| Riser | 1 | LS | \$10,000.00 | \$10,000 |
| Wetland Planting | 1,133 | SY | \$2.00 | \$2,267 |
| Dry Landscaping | 1,700 | SY | \$2.50 | \$4,250 |
| Base Construction Cost | | | | \$174,209 |
| Mobilization (5%) | | | | \$8,710 |
| Subtotal 1 | | | | \$182,919 |
| Contingency (25%) | | | | \$45,730 |
| Subtotal 2 | | | | \$228,649 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$102,892 |
| Estimated Project Cost | | | | \$332,000 |

Concept Sketch

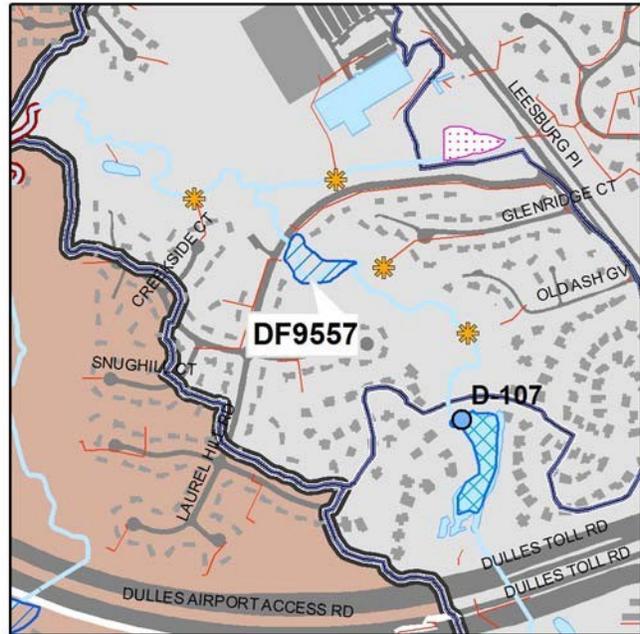


Project Number: DF9557
Catchment Code: DFOR0004
Candidate Site: C57

Project Type: Culvert Retrofit.
Project Size: 1.2 acres
Treated Area: 76 acres

Project Location: North of Streamview Lane, east of the crossing under Laurel Hill Road.

Project Description: This project should be designed to handle both water quality and channel protection. The retrofit will be designed as a dry extended detention facility, with water quality features such as wetland plantings and a micropool to enhance pollutant removal.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | This retrofit would provide approximately 75% of the channel protection storage volume and help to reduce erosive flows downstream. |
| Water Quality | Improvements to the water quality should be obtained through the reduction in scour forming discharges, sediment settlement, and vegetative uptake. |

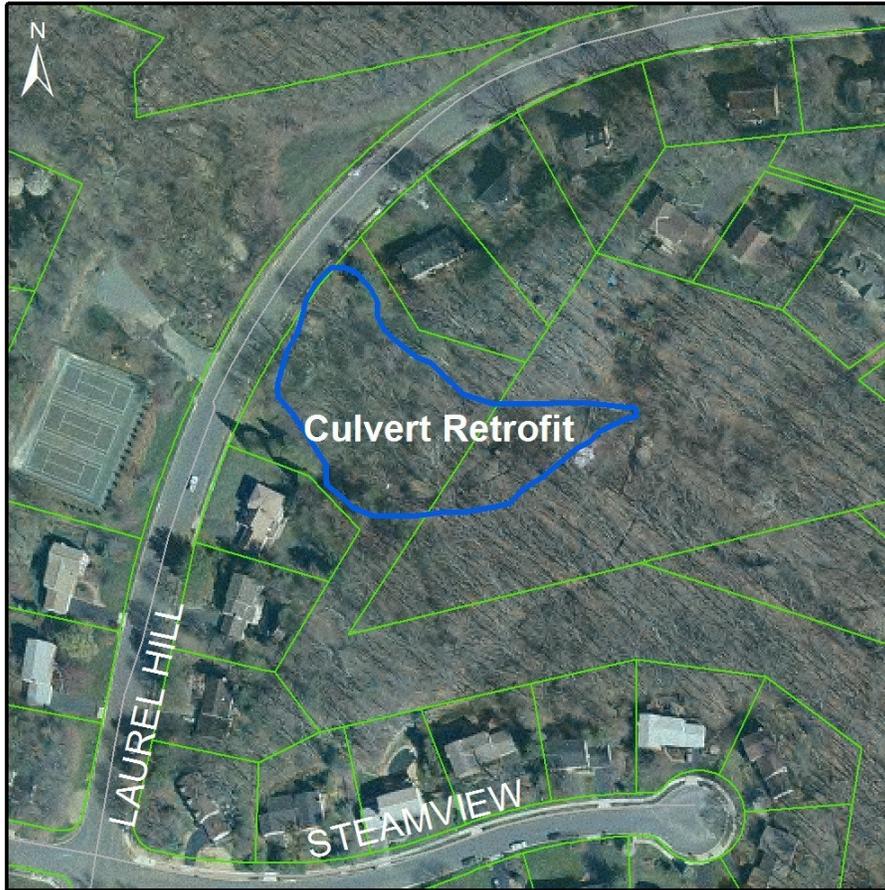
Potential Project Constraints:

| | |
|-----------------------|--|
| 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 | 0.3 | AC | \$5,000.00 | \$1,500 |
| Excavation | 1,170 | CY | \$35.00 | \$40,950 |
| Impoundment Structure | 1 | LS | \$5,000.00 | \$5,000 |
| Landscaping | 1,090 | SY | \$2.50 | \$2,725 |
| Wetland Planting | 370 | SY | \$2.00 | \$740 |
| Base Construction Cost | | | | \$50,915 |
| Mobilization (5%) | | | | \$2,546 |
| Subtotal 1 | | | | \$53,461 |
| Contingency (25%) | | | | \$13,365 |
| Subtotal 2 | | | | \$66,826 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$30,072 |
| Estimated Project Cost | | | | \$97,000 |

Concept Sketch

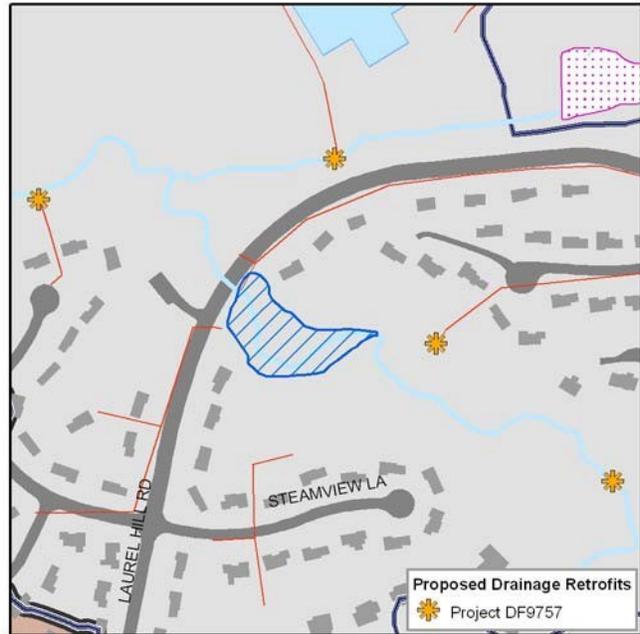


Project Number: DF9757
Catchment Code: DFOR0004
Candidate Site: C57

Project Type: Drainage Retrofit.
Project Size: 4 Outfalls

Project Location: Different locations throughout the catchment.

Project Description: Several outfalls in this area show evidence of scour and erosion. This project is designed to provide adequate energy dissipation, such as: riprap, plunge pools, or other structures at outfalls where the piped storm drain systems discharge into a natural channel.



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 | Access to these sites can usually be obtained from the roadway and driveways. |
| Design / Construction | No unusual design or construction issues were identified. |

Costs:

| ITEM | QUANTITY | UNITS | UNIT COST | TOTAL |
|--|----------|-------|------------|-----------------|
| Outfall Protection | 4 | EA | \$8,000.00 | \$32,000.00 |
| 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 |

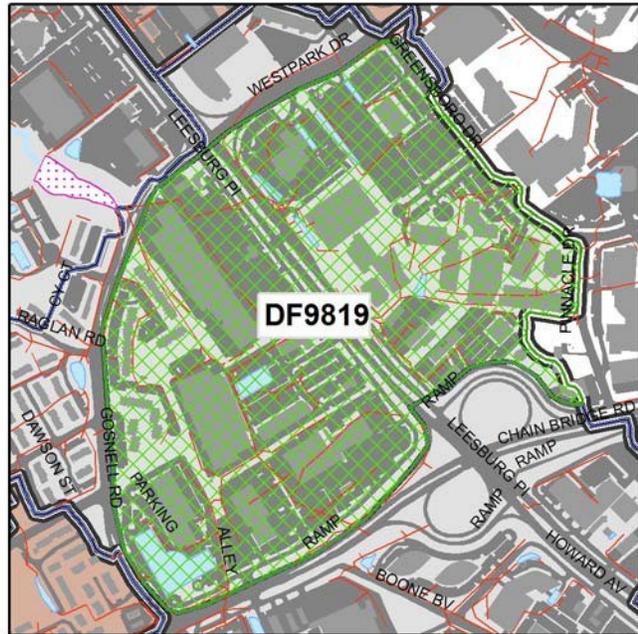
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Project Number: DF9819
Catchment Code: DFOR0099
Candidate Site: C19

Project Type: LID Retrofit
Project Size: 0.02 acres
Treated Area: 120.8 acres

Project Location: Intersection of Leesburg Pike and Chain Bridge Road

Project Description: The project is a retrofit of LID site design and structures to improve the quality of the discharge from this area, parts of which were developed without stormwater management facilities. Options include porous pavement on infrequently used parking areas, inlet filters for storm drains, or bioretention in the parking medians. It is anticipated that these practices may be implemented as part of redevelopment activities.



Potential Project Benefits:

| | |
|---------------|---|
| Streamflow | Improvement may occur in runoff volume from reduction of impervious area and the detention and infiltration components of the LID systems. |
| Water Quality | This project has been designed to treat 100% of the water quality volume for the site. Water quality will be improved from filtration and nutrient uptake in these 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 | 7,538 | SY | \$120.00 | \$904,560 |
| Base Construction Cost | | | | \$904,560 |
| Mobilization (5%) | | | | \$45,228 |
| Subtotal 1 | | | | \$949,788 |
| Contingency (25%) | | | | \$237,447 |
| Subtotal 2 | | | | \$1,187,235 |
| Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%) | | | | \$534,256 |
| Estimated Project Cost | | | | \$1,721,000 |

Concept Sketch:

