

Appendix B: Technical Documents

i. Subwatershed Strategies

Technical Memo 3.2 describes how initial strategies were developed for Sugarland Run and Horsepen Creek watersheds. The memo discusses the characterization of subwatershed improvement, stream restoration, and regional pond alternative strategies. The memo also describes how based on these strategies priority subwatersheds were identified and potential candidate restoration projects were selected.

ii. Prioritization

Technical Memo 3.4/3.5 describes how potential candidate projects were evaluated and the final list of projects incorporated in the watershed management plan was selected. The memo describes how candidate projects were investigated in the field to evaluate the scope, feasibility, and benefits of each candidate project. The memo also discusses the procedure by which candidate structural projects were evaluated and ranked.

iii. Modeling description

Technical Memo 3.6 describes the selection of projects to be further evaluated with hydrologic and hydraulic models. The memo discusses this assessment of potential impacts and discusses if objectives were met by implementing the modeled projects. The memo summarizes the setup, calibration and results of the hydrologic and hydraulic modeling performed. Results from the final STEPL pollution model were also summarized in this memo.

F. X. Browne, Inc.

Memorandum

To: Fairfax County
 From: F. X. Browne, Inc.
 Date: July 10, 2009
 RE: Task 3.2 Initial Subwatershed Strategies for Sugarland Run and Horsepen Creek Watersheds

Task 3.2 provides that initial strategies will be developed for Sugarland Run and Horsepen Creek watersheds. The initial subwatershed strategies consist of two main components, identifying priority subwatersheds and identifying candidate restoration projects.

Priority Subwatershed Identification

Priority subwatersheds/candidate restoration areas were identified based on the results of Final Subwatershed Ranking, priority restoration elements from SPA, problem areas identified during subwatershed characterization and field reconnaissance, and input from the WAG team. Potential alternatives were identified for the seven planned, un-built regional ponds within the watersheds.

F.X. Browne, Inc. used the following data sources and indicators to identify priority subwatersheds/candidate restoration areas.

Table 1 Candidate Restoration Area Selection Criteria

Data Source/ Indicator	Selection Process
Subwatershed Ranking	Lowest 40% of overall objective composite scores
SPA	Best professional judgment, numerous impairments for habitat, CEM (type 2 or 3), stream crossings, erosion, bank stability/headcuts, or insufficient riparian buffer
Regional Ponds	All subwatersheds draining to a planned/un-built regional pond
Flooding	All subwatersheds with non-zero scores for SW Ranking flooding indicators.
Field Reconnaissance	Best professional judgment, problem areas identified during field reconnaissance
Public Comments	Subwatersheds with problem areas identified by WAG members or during the Introduction and Initial Scoping Forum

There are also areas within Sugarland Run and Horsepen Creek watersheds that would benefit from preservation strategies rather than solely restorative strategies. Preservation strategies target the less impacted subwatersheds and key areas such as headwaters to prevent future degradation of the subwatershed and downstream areas.

F. X. Browne, Inc. used the following data sources and indicators to identify priority subwatersheds for preservation strategies.

Table 2 Candidate Preservation Area Selection Criteria

Data Source/ Indicator	Selection Process
Subwatershed Ranking	Highest 20% of overall objective composite scores to identify less impacted subwatersheds
STEPL	Greatest increase in modeled pollutant loadings to identify subwatersheds (top 20%) at greatest risk for future impairments
Total Impervious Area	Total impervious area of less than 10% to identify pristine subwatersheds & Greatest increase in impervious area to identify subwatersheds (top 20%) at greatest risk for future impairments

Identifying Impairments

Once priority subwatersheds have been identified, F. X. Browne, Inc. reviewed the following data in order to identify impairments for each subwatershed.

Table 3 Impairment Data Reviewed for Each Priority Subwatershed

Data Format	Data/Indicator	Impairment Type
Table	Overall composite score	All
Table	Objective composite scores	All
Table	Flooding Indicators	Flooding & Water Quantity
Table	STEPL pollutant loads	Pollutant Loading & Water Quality
Table	STEPL streambank erosion loads	Habitat & Stream Condition
Table	% Imperviousness	All
GIS	SPA CEM, Erosion, Headcuts	Habitat & Stream Condition
GIS	SPA Crossings, Ditch, Pipe	Habitat & Stream Condition
GIS	SPA Deficient Buffer, Habitat	Habitat & Stream Condition
GIS	SPS Fish IBI Score (Fish Community)	Habitat & Stream Condition
GIS	SPS IBI Score (Benthic Community)	Habitat & Stream Condition
GIS	E. coli	Pollutant Loading & Water Quality
GIS	303d Impaired Streams	Pollutant Loading & Water Quality
GIS	Subarea stormwater management controls	All

Reviewing the data directly removes the problems associated with relying on surrogate data used during SW Ranking. This is most notable with E. coli and SPS data that have limited data points.

Developing Strategies

General subwatershed characteristics and impairments were recorded for each priority subwatershed. Sources of subwatershed impairments were identified where evident and improvement goals/strategies were developed for each priority subwatershed. Improvement goals/strategies may include both structural and non-structural practices. The following table includes a summary of project types that may be included for the various improvement goals/strategies.

Table 4 Summary of Subwatershed Strategies & Project Types

Strategies:	Project Types:
Regional Pond Alternatives	Stormwater Pond Retrofits New Stormwater Ponds Low Impact Development Retrofits Culvert Retrofits Outfall Improvements Area-wide Drainage Improvements
Subwatershed Improvements	Stormwater Pond Retrofits New Stormwater Ponds Low Impact Development Retrofits Culvert Retrofits, including Road Crossing Improvements Outfall Improvements Area-wide Drainage Improvements
Stream Restoration	Streambank Stabilization Natural Channel Restoration
Non-Structural Measures & Preservation Strategies	Buffer restoration Rain barrel programs Dumpsite/Obstruction removal Community outreach/Public education Conservation acquisition/easements Street sweeping Storm drain stenciling

Regional ponds may be considered as a watershed management tool; however, the County has indicated that they are not a preferred tool. All subwatersheds containing a planned, un-built regional pond or draining to a planned, un-built regional pond will be evaluated for potential alternatives. **Regional Pond Alternative Strategies** may include retrofits to existing stormwater ponds, new stormwater ponds, low impact development projects, culvert retrofits, outfall improvements, area-wide drainage improvements, or a combination of the aforementioned project types. When more than one project is proposed for a regional pond drainage area, the project group will be considered as a single project in order to emphasize the necessity of implementing the entire group of projects.

Subwatershed Improvement Strategies are intended to reduce stormwater impacts for subwatersheds that do not drain to a planned, un-built regional pond. Project types for Subwatershed Improvement Strategies are the same types of projects recommended for the planned, un-built regional pond drainage areas. However, each individual project will be given its own project identification number and will not be considered as a combined group of projects.

Low impact development (LID) projects may be incorporated into Regional Pond Alternative Strategies and Subwatershed Improvement Strategies. LID projects are Best Management Practices (BMPs) designed to provide water quality and quantity benefits for stormwater management on the site where stormwater is generated. Possible LID projects include:

- Sand and Sand/Peat Filters
- Rain Gardens/Bioretenion
- Infiltration Basins/Trenches
- Vegetated Rooftops
- Porous/Permeable Paving
- Underground or Rooftop Storage

Stream Restoration Strategies are targeted at improving habitat, promoting stable stream geomorphology, and reducing in-stream pollutants due to erosion. Regional Pond Alternative and Subwatershed Improvement Strategies are critical to the success of Stream Restoration Strategies by improving drainage and reducing peak flows. A major component of Stream Restoration Strategies is identifying and addressing the source of the impairments.

Non-Structural Measures and Preservation Strategies are crucial to successful watershed management. Although it may be difficult to directly measure their benefits, Non-Structural Measures and Preservation Strategies can provide significant benefits to both the quality and quantity of stormwater runoff, improve habitat and stream quality, and help mitigate the potential impacts of future development. Because county-wide policy recommendations were adequately developed during the first round of Watershed Management Plans (WMPs), the Non-Structural Measures and Preservation Strategies developed for the Sugarland Run and Horsepen Creek WMP will focus on projects other than policy-related recommendations.

Priority Subwatersheds

Based on the data/indicators available as of the completion of this technical memorandum, the following subwatersheds have been identified as priorities for restorative or preservation strategies. Table 6 also indicates which selection criteria were used elevate the subwatershed to priority status.

Table 6 Priority Subwatersheds and Selection Criteria

Subwatershed ID	Preservation				Restoration						
	SW Ranking	Total Imperv. Area	% Increase Total Impervious	% Increase STEPL TSS	SW Ranking	SPA Data	Regional Ponds	Flooding	Public Comment/ Involvement	Field Recon	Field Recon/ ProRata
HC-CR-0001					X					X	X
HC-CR-0002					X		X		X		
HC-CR-0003					X						
HC-CR-0004					X		X			X	
HC-CR-0005					X		X			X	
HC-FP-0001			X	X	X			X			
HC-FP-0002											
HC-FP-0003									X		
HC-FP-0004											
HC-FP-0005					X						
HC-FP-0006			X								
HC-HC-0013					X						
HC-HC-0015					X						
HC-HC-0017					X						
HC-HC-0018											X
HC-HC-0019				X	X			X			X
HC-HC-0020					X	X		X	X		
HC-HC-0021					X						
HC-HC-0022											
HC-HC-0023		X			X						
HC-HC-0024					X						
HC-HC-0025					X						
HC-HC-0026				X	X						

Subwatershed ID	Preservation				Restoration						
	SW Ranking	Total Imperv. Area	% Increase Total Impervious	% Increase STEPL TSS	SW Ranking	SPA Data	Regional Ponds	Flooding	Public Comment/ Involvement	Field Recon	Field Recon/ ProRata
HC-HC-0027			X	X	X						
HC-HC-0028		X	X	X	X	X		X			X
HC-HC-0029			X	X			X				
HC-HC-0030				X	X			X			
HC-HC-0031				X	X	X					
HC-HC-0032					X						X
HC-HC-0033						X				X	
HC-HC-0034					X	X				X	
HC-HC-0035					X						
HC-HC-0036											
HC-HC-0037											
HC-HC-0038											
HC-HC-0039					X	X			X		
HC-HC-0040					X	X			X		
HC-IC-0007	X	X									
HC-IC-0008											
HC-MR-0001			X	X	X	X		X			
HC-MR-0002			X	X				X			
HC-MR-0003	X			X							
HC-MR-0004											
SU-FF-0001							X				
SU-FF-0002						X	X				
SU-FF-0003			X				X				X
SU-FF-0004							X				X
SU-FL-0001					X	X					
SU-FL-0002						X			X		
SU-FL-0003	X			X		X			X		
SU-FL-0004			X			X		X	X		

Subwatershed ID	Preservation				Restoration						
	SW Ranking	Total Imperv. Area	% Increase Total Impervious	% Increase STEPL TSS	SW Ranking	SPA Data	Regional Ponds	Flooding	Public Comment/ Involvement	Field Recon	Field Recon/ ProRata
SU-FL-0005											
SU-FL-0006					X						
SU-FL-0007					X			X			
SU-FL-0008			X	X				X			
SU-FL-0009			X								
SU-HB-0001	X										
SU-MB-0001	X		X								
SU-MB-0002											
SU-MB-0003	X	X									
SU-MB-0004	X	X									
SU-MB-0005	X	X									
SU-PO-0001	X	X									
SU-PO-0002	X	X									
SU-RI-0001					X						
SU-RI-0002											
SU-RI-0003							X		X	X	
SU-SU-0006	X										
SU-SU-0007	X										
SU-SU-0008											
SU-SU-0011	X	X						X			
SU-SU-0012											
SU-SU-0013	X	X	X								X
SU-SU-0018			X	X				X			
SU-SU-0019	X							X			
SU-SU-0020	X	X	X								
SU-SU-0021	X										
SU-SU-0022	X					X		X			
SU-SU-0023											

Subwatershed ID	Preservation				Restoration						
	SW Ranking	Total Imperv. Area	% Increase Total Impervious	% Increase STEPL TSS	SW Ranking	SPA Data	Regional Ponds	Flooding	Public Comment/ Involvement	Field Recon	Field Recon/ ProRata
SU-SU-0024		X							X		
SU-SU-0025											
SU-SU-0026							X			X	
SU-SU-0027	X						X				
SU-SU-0028			X	X		X					
SU-SU-0029	X										
SU-SU-0030						X					
SU-SU-0031						X					
SU-SU-0032						X			X		
SU-SU-0033											
SU-SU-0034			X	X		X					
SU-SU-0035								X			
SU-SU-0036									X	X	
SU-SU-0037				X						X	
SU-SU-0038									X		
SU-SU-0039					X						
SU-SU-0040					X			X	X		
SU-SU-0041			X	X	X						
SU-SU-0042				X	X			X	X		
SU-SU-0043			X	X	X				X		
SU-SU-0044			X		X						
SU-SU-0045					X			X	X		
SU-SU-0046					X			X			
SU-SU-0047					X			X			
SU-SU-0048					X			X			
SU-SU-0049					X			X			
SU-SU-0050					X						
SU-SU-0051											

Identifying Projects

A universe of potential projects was identified for the watersheds focusing on the Improvement Goals/Strategies and Preservation Strategies developed for each subwatershed. Temporary Project Identification Numbers and preliminary Project Type Codes were assigned to each project. All structural candidate projects were investigated in the field in order to determine viability and WAG members were allowed three weeks to review and provide comments on the initial universe of potential projects. The initial universe of candidate projects is provided in Appendix A. Preliminary Project Type Codes, used in the Candidate Projects table, are provided in Table 7

Table 7 Preliminary Project Type Codes

Code:	Project Type:
0	Regional Pond Alternatives
1	New Stormwater Ponds and Stormwater Pond Retrofits
2	Natural Channel Restoration
3	Streambank Stabilization
4	Road Crossing Improvements
7	Culvert Retrofits
8	Drainage Improvements
9	Low Impact Development Retrofits
No ID	Non-Structural & Preservation

Final Project Type Codes were developed by the County after the completion of the Candidate Projects table and will be used in final project numbering and in the Watershed Management Plan. These Project Type Codes are provided in Table 8, below.

Table 8 Final Project Type Codes

Code:	Project Type:
0	Regional Pond Alternatives
1	New Stormwater Ponds and Stormwater Pond Retrofits
2	Stream Restoration
3	Area-wide Drainage Improvements
4	Culvert Retrofits
5	New Best Management Practices/Low Impact Development Retrofits
6	Flood Protection/Mitigation
7	Outfall Improvements
No ID	Non-Structural & Preservation

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Appendix A

Candidate Projects Table

Index Map

Candidate Projects Map #1

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Candidate Projects Map #8

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Candidate Projects Report

Subwatershed HC-CR-0001 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Cedar

Description Primarily MDR, OS along stream corridor, 2 DP, much of MDR has no SWM controls **Impairments** Erosion downstream from dry ponds, poor water quality

Restoration Selection Criteria Field Recon/DC, Field Recon/ProRata, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve existing dry ponds, improve water quality

Percent Impervious 31.32%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
183	Subwatershed Improvement	1	Expand existing dry pond into field, replace existing paved ditch with naturalized drainage channel farther upstream, possible reduce size of low flow orifice to hold back smaller storm events	May compliment or replace projects 187 and/or 188; Should be completed prior to project 189 (stream restoration)	3029 JEANNIE ANNA CT
184	Subwatershed Improvement	1	Enlarge existing dry pond 0443DP and retrofit to naturalized basin, possible reduce size of low flow orifice to hold back smaller storm events	May compliment or replace project 185	2992 EMERALD CHASE DR
185	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond 0443DP, create low flow channel with vegetated swale	May compliment or replace project 184	2992 EMERALD CHASE DR
186	Subwatershed Improvement	8	Improve outfall below dry pond 0443DP to dissipate more energy	May compliment, but should not replace projects 184 and/or 185	2911 PLEASANT GLEN DR
187	Subwatershed Improvement	9	Replace drainage ditch with vegetated swale/infiltration trench, include check dams to slow flow/dissipate energy	May compliment, but should not replace project 183	2907 MOTHER WELL CT
188	Subwatershed Improvement	8	Improve outfall to dissipate more energy	May compliment, but should not replace projects 183 and/or 187	13239 PLEASANT GLEN CT
189	Stream Restoration	3	Repair eroding streambanks below outfall	Must control stormwater prior to stream restoration (projects 183, 187, 188)	13239 PLEASANT GLEN CT
190	Subwatershed Improvement	9	Disconnect drainage and re-route through vegetated swale/infiltration trench to expanded dry pond (project 183), additional drainage area to dry pond approx 5 acres	Must expand/enhance dry pond (project 183) prior to re-routing storm flow	13304 GLEN TAYLOR LA

191	Subwatershed Improvement	1	New naturalized basin or wetland to intercept flow before it reaches the stream, drainage area approx 6 acres - along trail, also Public Education		2961 MOTHER WELL CT
192	Subwatershed Improvement	9	Replace paved ditch with infiltration trench/basin or combination of LID retrofits, drainage area approx 3 acres		2940 MOTHER WELL CT
193	Subwatershed Improvement	9	Replace paved ditch with infiltration trench/basin or combination of LID retrofits, drainage area approx 2 acres		13313 SCOTSMORE WY
194	Subwatershed Improvement	9	New infiltration basin between homes and road, drainage area approx 10 acres	Possible alternative to project 195	3020 SUMMERSHADE CT
195	Subwatershed Improvement	1	New SWM facility (naturalized basin or constructed wetland to receive flow from road drainage and intercept flow from drainage channel in HC-CR-0003, drainage area approx 13 acres	Possible alternative to project 194	3022 SUMMERSHADE CT
196	Subwatershed Improvement	9	Replace paved ditch with infiltration trench		3018 EMERALD CHASE DR
197	Subwatershed Improvement	9	Disconnect drainage and re-route through infiltration basin/variety of LID retrofits, drainage approx 5 acres	Possible alternative to project 198	3020 EMERALD CHASE DR
198	Subwatershed Improvement	1	New naturalized basin or wetland to intercept flow before it reaches the stream, drainage area approx 5 acres	Possible alternative to project 197	3020 EMERALD CHASE DR
199	Subwatershed Improvement	1	New naturalized basin or wetland to intercept flow before it reaches the stream, drainage area approx 7 acres		3004 EMERALD CHASE DR

Subwatershed HC-CR-0002 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Cedar

Description Headwaters, MDR - culdesacs, OS along stream corridor but 50' or less forested buffer, no SWM **Impairments** Poor habitat and water quality, stream erosion impacts, high flows per acre

Restoration Selection Criteria Regional Pond and Public Involvement, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide alternatives to regional pond, improve habitat and water quality, capture impervious runoff

Percent Impervious 28.95%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M1a	Regional Pond Alternatives	0	LID retrofit - Replace existing concrete channel with new infiltration basin, drainage area approx 8 acres		3013 HUGHSMITH CT
M1b	Regional Pond Alternatives	0	Drainage improvement - Replace existing piped drainage with some type of natural channel along edge of field	may compliment or replace project M1c, possible alternative to project M1d	3021 HUGHSMITH CT
M1c	Regional Pond Alternatives	0	LID project - integrate Infiltration trench/basin with drainage improvement project (bringing drainage from pipe to surface), drainage area approx. 6 acres	may compliment or replace project M1b, possible alternative to project M1d	3021 HUGHSMITH CT
M1d	Regional Pond Alternatives	0	New constructed wetland to replace existing piped drainage, drainage area approx. 6 acres	possible alternative to projects M1b & M1c	3021 HUGHSMITH CT
M1e	Regional Pond Alternatives	0	Drainage improvement project to add meander to straightened stream channel		13239 STONE HEATHER DR
M1f	Regional Pond Alternatives	0	New SWM facility - wetland or wet pond to receive flow from portion of Chantilly Highlands, drainage area approx 12 acres		13131 LADYBANK LA
M1g	Regional Pond Alternatives	0	LID project - new bioretention or infiltration to intercept piped drainage before it reaches the stream, drainage area approx 1.5 acres		13145 LADYBANK LA
M2	Stream Restoration	3	Repair headcut and erosion		2973 MOTHER WELL CT

Subwatershed HC-CR-0003 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Cedar

Description Primarily MDR culdesaces, OS along stream corridor, some ESR along riparian zone slated for LDR, 6 DP **Impairments** Poor water quality, deficient riparian buffer, high channelized streams

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Improve water quality & riparian buffer, improve channelized streams

Percent Impervious 30.04%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
200	Stream Restoration	2	Daylight stream and return to natural channel - follow meander of OS	May compliment project 201 and 202	13104 WHEELER WY
201	Subwatershed Improvement	1	New naturalized basin or wetland	May compliment project 200 and 202	13106 WHEELER WY
202	Subwatershed Improvement	9	Replace paved ditch with vegetated swale/infiltration trench	May compliment project 200 and 201	3115 ASHBURTON AV
203	Subwatershed Improvement	9	Integrate infiltration basin into dry pond 1059DP, and replace paved ditch with vegetated swale/infiltration trench		3117 ASHBURTON AV
204	Subwatershed Improvement	9	Retrofit grass swale to vegetated swale/infiltration trench, include check dams to slow flow/dissipate energy and improve outfalls		13022 GREY FRIARS PL
205	Subwatershed Improvement	1	New naturalized basin or wetland, drainage area approx 13 acres		12903 HARRINGTON CT
206	Subwatershed Improvement	9	Integrate infiltration basin into dry pond 1072DP, replace paved ditches with vegetated swales/infiltration trenches		12900 HARRINGTON CT
207	Subwatershed Improvement	1	Retrofit dry pond 1001DP to naturalized basin		12807 SAFFRON DR
208	Subwatershed Improvement	9	Integrate infiltration basin into dry pond 1116DP, replace paved ditches with vegetated swales/infiltration trenches	Possible alternative to project 209	12901 HEDGETOP DR
209	Subwatershed Improvement	1	Retrofit dry pond 1116DP to naturalized basin	Possible alternative to project 208	12901 HEDGETOP DR
210	Preservation		Restore and improve riparian buffer		12902 HEDGETOP DR

Subwatershed HC-CR-0004 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Cedar

Description Headwaters, primarily MDR, culdesacs, OS along most of stream corridor, most of MDR has SWM control, 1 WP, 1 DP, 2 nonSWM ponds **Impairments** Flood complaints, poor habitat and water quality

Restoration Selection Criteria Regional Pond and Field Recon/DC, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide alternatives to regional pond, improve habitat and water quality, capture impervious runoff

Percent Impervious 20.75%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M4r	Regional Pond Alternatives	0	SWM retrofit - retrofit existing dry pond 0116DP to provide additional quantity and/or quality control		2956 TIMBER WOOD WY
M4s	Regional Pond Alternatives	0	LID retrofit - retrofit existing dry pond 0116DP to infiltration basin		2956 TIMBER WOOD WY
M4t	Regional Pond Alternatives	0	LID retrofit, bio retention to intercept piped drainage before it reaches stream drainage area approx 1 acre	would require homeowner consent	12811 AWBREY CT
M4u	Regional Pond Alternatives	0	New constructed wetland to replace existing channelized drainage, drainage area approx. 20 acres - also integrate public education (park)		12754 FLAT MEADOW LA
M4v	Regional Pond Alternatives	0	New constructed wetland to replace existing paved ditch, drainage area approx. 9 acres - also integrate public education (park/trail)	possible alternative to projects M4w or M4x	12712 TURBERVILLE CT
M4w	Regional Pond Alternatives	0	New infiltration basin to replace existing paved ditch, drainage area approx. 9 acres	possible alternative to projects M4v or M4x	12759 FLAT MEADOW LA
M4x	Regional Pond Alternatives	0	Drainage improvement project to add meander/natural channel to paved ditch	possible alternative to projects M4v or M4w	12712 TURBERVILLE CT

Subwatershed HC-CR-0005 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Cedar

Description Headwaters, primarily MDR, culdesacs, OS along most of stream corridor, most of MDR has SWM control, 5 DP, 1 WP, 3 nonSWM pond **Impairments** Flood complaints, fair habitat, poor water quality

Restoration Selection Criteria Drains to Regional Pond in HC-CR-0004 and Field Recon/DC, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide alternatives to regional pond, improve habitat and water quality, capture impervious runoff

Percent Impervious 23.01%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M3	Stream Restoration	2	Daylight streams between utility ROW and wet pond	May compliment projects M4m/M4n/M4o and M4p/M4q	12776 TURBERVILLE LA
M4a	Regional Pond Alternatives	0	LID retrofit - retrofit existing berm/open area to infiltration basin, drainage area approx 5 acres		12605 ASTURIAN CT
M4b	Regional Pond Alternatives	0	New constructed wetland/SWM pond to provide treatment to Franklin Corner sbdv, re-route pipe at edge of woodlands to intercept flows, drainage area approx 15 acres		12605 HERITAGE FARM LA
M4c	Regional Pond Alternatives	0	LID project - bioretention at rear corner of yard, drainage area approx. 1.5 acres	would require homeowner consent	3001 JONQUILLA CT
M4d	Regional Pond Alternatives	0	SWM retrofit - retrofit existing non-stormwater pond to provide additional quantity and/or quality control, may include pond draw-down		12710 FRANKLIN FARM RD
M4e	Regional Pond Alternatives	0	SWM retrofit - retrofit existing dry pond 0880DP to naturalized dry pond or wetland		3116 FRANKLINS WY
M4f	Regional Pond Alternatives	0	SWM retrofit - retrofit existing non-stormwater pond to provide additional quantity and/or quality control, may include pond draw-down		12741 FRANKLIN FARM RD
M4g	Regional Pond Alternatives	0	New constructed wetland/SWM pond at pipe outfall to provide treatment to portion of Franklin Farm sbdv, drainage area approx 12 acres		13123 ROUNDING RUN CI

M4h	Regional Pond Alternatives	0	New constructed wetland/SWM pond between two pipe outfalls to provide treatment to portion of Franklin Farm sbdv, drainage area approx 15 acres		13111 ROUNDING RUN CI
M4i	Regional Pond Alternatives	0	New LID project - infiltration basin to intercept piped drainage before it reaches the stream, drainage area approx. 5 acres		3124 HANNAH'S POND LA
M4j	Regional Pond Alternatives	0	Non-Structural - Targeted rain barrel program for homes on Cross Creek Ln & Cross Creek Ct		12810 CROSS CREEK LA
M4k	Regional Pond Alternatives	0	Drainage improvement - improve drainage channel between piped outfall and stream		13100 BRAMBLEWOOD LA
M4l	Regional Pond Alternatives	0	New LID project - infiltration basin to intercept piped drainage, drainage area approx. 7 acres		13126 THORNAPPLE PL
M4m	Regional Pond Alternatives	0	New LID project - 2 infiltration basins to replace existing paved ditches, drainage area approx. 14 acres total	possible alternative to projects M4n or M4o	12709 TURBERVILLE CT
M4n	Regional Pond Alternatives	0	New constructed wetlands to replace existing paved ditches, drainage area approx. 14 acres total	possible alternative to projects M4m or M4o	12709 TURBERVILLE CT
M4o	Regional Pond Alternatives	0	Drainage improvement project to replace existing paved ditches with meander/natural channel	possible alternative to projects M4m or M4n	3007 FLAT MEADOW CT
M4p	Regional Pond Alternatives	0	New LID project - infiltration basin replace existing paved ditch, drainage area approx. 2.5 acres	possible alternative to project M4q	3108 HANNAH'S POND LA
M4q	Regional Pond Alternatives	0	Drainage improvement project to replace existing paved ditch with meander/natural channel	possible alternative to project M4p	3108 HANNAH'S POND LA

Subwatershed HC-FP-0001 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Frying Pan

Description Primarily LDR, HDR, INT, OS, some non-riparian OS slated for HDR, 5 DP - most of dev has SWM **Impairments** Flooding, deficient buffer, poor habitat, severe headcut

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities** At risk for future development of OS

Preservation Selection Criteria % Increase IMP (7.44%), STEPL **Improvement Goals** capture impervious runoff, improve habitat and riparian buffers, repair headcut

Percent Impervious 23.27%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
60	Subwatershed Improvement	8	Improve outfall to dissipate more energy	Possible alternative to project 61	2714 COPPER CREEK RD
61	Subwatershed Improvement	1	New SWM facility - re-route drainage pipe to discharge into new dry pond/constructed wetland downstream of current outlet	Possible alternative to project 60	2718 COPPER CREEK RD
62	Stream Restoration	3	Repair headcut below SW outfall		2714 COPPER CREEK RD
63	Subwatershed Improvement	1	Retrofit existing dry pond 1288DP to provide additional storage/water quality - current outlet structure is 5' culvert, not functioning dry pond		2554 CENTREVILLE RD
64	Preservation		Conservation easement to preserve riparian buffer area and allow for enhanced dry pond		2554 CENTREVILLE RD
65	Subwatershed Improvement	9	LID retrofits including bioretention and infiltration around facility parking lots/landscaping to intercept SW runoff before it reaches the stream		13600 FRYING PAN RD
66	Subwatershed Improvement	9	LID retrofits including bioretention and infiltration around facility parking lots/landscaping to infiltrate SW runoff		2717 WEST OX RD
67	Subwatershed Improvement	1	SWM retrofit - enhance or replace TBD dry pond with functioning dry pond/naturalized basin, approx drainage area 20 acres		2625 CENTREVILLE RD
68	Subwatershed Improvement	9	LID retrofit/bioretention/infiltration to treat runoff from HIC and roadside drainage		13500 COPPER RIDGE DR

Subwatershed **HC-FP-0002** *Watershed:* **Horsepen Creek** *Management Area:* **Horsepen - Frying Pan**

Description Primarily HDR & INT, 3 DP, most dev area has SWM *Impairments*

Restoration Selection Criteria Non-Priority *Preservation Qualities*

Preservation Selection Criteria Non-Priority *Improvement Goals*

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
69	Subwatershed Improvement	1	Retrofit existing dry pond DP0406 to naturalized basin		2486 MASONS FERRY DR

Subwatershed HC-FP-0003 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Frying Pan

Description Primarily MDR & OS, 3 DP, most of res area is detention only SWM **Impairments** Invasive species, deficient buffer, fair habitat, channelized streams

Restoration Selection Criteria Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** buffer restoration, restore natural stream channels

Percent Impervious 20.74%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
70	Subwatershed Improvement	1	New SWM facility, wet pond/constructed wetland, drainage area approx 5 acres		13139 CURVED IRON RD
71	Subwatershed Improvement	1	New SWM facility, wet pond/constructed wetland, drainage area approx 8 acres	Possible alternative to project 72	2504 HALTERBREAK CT
72	Subwatershed Improvement	9	New infiltration basin, may or may not include swale, drainage area approx 8 acres	Possible alternative to project 71	2500 HALTERBREAK CT
73	Subwatershed Improvement	1	Retrofit existing dry pond 0919DP into naturalized dry pond		13115 FARMSTED CT
74	Stream Restoration	2	Remove concrete channel replace with natural channel design	will compliment project 73	13107 FARMSTED CT
75	Preservation		Riparian buffer restoration		13109 FARMSTED CT
76	Subwatershed Improvement	9	New infiltration basin integrated into dry pond 0563DP, drainage area approx 13 acres		13022 HENSON CT
77	Subwatershed Improvement	9	New infiltration basin integrated into dry pond 0631DP, drainage area approx 12 acres		13019 NEW AUSTIN CT

Subwatershed HC-FP-0004 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Frying Pan

Description Primarily MDR & HDR, 6 DP, 1 non-SWM pond, res not treated **Impairments**

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria Non-Priority **Improvement Goals**

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
78	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 6 acres		2469 IRON FORGE RD
79	Subwatershed Improvement	1	New bioretention basin(s)/infiltration LID, approx drainage area 2 acres		13108 WEATHERED OAK CT
80	Subwatershed Improvement	1	Retrofit dry pond 1224DP to naturalized basin		13029 MONROE MANOR DR
81	Subwatershed Improvement	1	Retrofit dry pond 1485DP to naturalized basin		13240 COPPER COVE WY
82	Subwatershed Improvement	1	Retrofit dry pond 0933DP to naturalized basin		13112 ASHNUT LA
83	Subwatershed Improvement	1	Retrofit dry pond 1416DP to naturalized basin		12962 PARK CRESCENT CI

Subwatershed HC-FP-0005 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Frying Pan

Description Primarily MDR, some OS - not planned for dev, 2 WP, 3 DP **Impairments** Poor habitat ds of WPs, deficient riparian buffer, fair water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Improve water quality, habitat and riparian buffers

Percent Impervious 32.78%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
84	Subwatershed Improvement	1	Retrofit lower portion of dry pond 1222DP to naturalized basin		12913 LOCKSLEY CT
85	Subwatershed Improvement	1	New naturalized basin in existing depression, drainage area approx 8 acres (not including drainage area to upstream dry pond)		2482 SYCAMORE LAKES CV
86	Subwatershed Improvement	1	Retrofit dry pond 0610DP to naturalized basin	Possible alternative to project 87	12839 TOURNAMENT DR
87	Subwatershed Improvement	9	Integrate infiltration basins into dry pond 0610DP, drainage area approx 35 acres	Possible alternative to project 86	12839 TOURNAMENT DR
88	Subwatershed Improvement	1	New naturalized basin/wet pond to intercept drainage from Oak Mill subv before it reaches stream, drainage area approx 11 acres		13005 PINEY GLADE RD

Subwatershed HC-FP-0006 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Frying Pan

Description Headwaters, primarily MDR, some OS - not planned for dev, no SWM **Impairments** Fair water quality downstream

Restoration Selection Criteria **Preservation Qualities** Future development in non-riparian areas

Preservation Selection Criteria % Increase IMP (2.24%) **Improvement Goals** Improve water quality, preserve habitat and riparian buffers, provide SWM controls

Percent Impervious 28.90%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
89	Subwatershed Improvement	1	Retrofit existing paved ditch into naturalized dry basin or constructed wetland		12715 FOX WOODS DR
90	Subwatershed Improvement	1	New naturalized basin/wet pond to intercept drainage from Monroe Manor subv before it reaches stream, drainage area approx 19 acres		2520 CAMBERWELL CT
91	Subwatershed Improvement	1	New naturalized basin to intercept drainage from Fox Mill Heights Sect. 1 subv before it reaches stream, drainage area approx 30 acres		12708 FOX WOODS DR

Subwatershed **HC-HC-0013** *Watershed:* **Horsepen Creek** *Management Area:* **Horsepen -Lower Middle**

Description Very small land area entirely within Dulles Int'l Airport *Impairments*

Restoration Selection Criteria SW Ranking *Preservation Qualities*

Preservation Selection Criteria *Improvement Goals* No improvement opportunities

Percent Impervious 33.97%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed **HC-HC-0015** **Watershed:** **Horsepen Creek** **Management Area:** **Horsepen -Lower Middle**

Description Very small land area (approx 8 acres) within Fairfax County, wooded with 1 LIC facility

Impairments

Restoration Selection Criteria SW Ranking

Preservation Qualities

Preservation Selection Criteria

Improvement Goals No improvement opportunities

Percent Impervious 18.03%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed HC-HC-0017 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Lower Middle

Description Bordering Loudoun, primarily MDR, 1 WP, 1 DP **Impairments** low water quality, higher impervious

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide water quality treatment, capture impervious runoff

Percent Impervious 33.55%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
1	Subwatershed Improvement	9	Retrofit dry pond to naturalized infiltration basin	if soils support infiltration, if not use project 2, Town of Herndon	914 SPRING KNOLL DR
2	Subwatershed Improvement	1	Retrofit dry pond to naturalized dry basin	if project 1 unsuitable, Town of Herndon	1540 SUMMERSET PL
3	Subwatershed Improvement	1	New stormwater facility - naturalized dry pond, drainage area approx. 30 ac.	Town of Herndon	1491 OAK TRAIL CT

Subwatershed HC-HC-0018 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Lower Middle

Description Bordering Loudoun, primarily HDR & MDR, 1 DP **Impairments** Culvert bottoms rusted out, channel eroding beneath and around culvert

Restoration Selection Criteria Field Recon/ ProRata **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Replace culvert, capture impervious runoff if possible

Percent Impervious 23.93%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
4	Subwatershed Improvement	7	Culvert retrofit upstream of Rock Hill Rd crossing (Pro Rata Project No. OAK-1)	if project 4 unsuitable, try project 5	2169 ASTORIA CI
5	Road Crossing Improvement	4	Raise road and replace culvert at Rock Hill Rd crossing (Pro Rata Project No. OAK-1)	if project 5 unsuitable, try project 4	2169 ASTORIA CI
6	Non-Structural		Rain Barrel Program Reflection Lake HOA & Four Season HOA (Herndon)		2021 MALEADY DR

Subwatershed HC-HC-0019 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Lower Middle

Description Bordering Loudoun, primarily HDR & MDR, some open space along stream, Dulles Toll Rd, 1 non-SW pond/marsh, no SWM **Impairments** Flooding (2yr)/ineffective control at road crossing, at risk for future development, poor water quality, high flows per acre

Restoration Selection Criteria Field Recon/ ProRata, SW Ranking, Flooding **Preservation Qualities**

Preservation Selection Criteria STEPL **Improvement Goals** Fix road crossing at Rock Hill Rd, improve water quality, capture impervious runoff. Address flows upstream.

Percent Impervious 29.95%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
7	Subwatershed Improvement	7	Culvert retrofit upstream of Rock Hill Rd crossing (Pro Rata Project No. OAK-2)		2152 ROCK HILL RD
8	Preservation		Preserve existing wetland/marsh/non-stormwater pond area from future development		2280 ASTORIA CI
9	Non-Structural		Rain Barrel Program Reflection Lake HOA		13417 POCONO CT

Subwatershed HC-HC-0020 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Lower Middle

Description Good riparian corridor, Primarily HDR, **Impairments** Flooding (Public inv & based on FEMA), Stream erosion
 some LIC/HIC, and an Elem School, DP & & ditch impacts from uncontrolled runoff, high SW
 BMP at school, 1 DP for LIC/HIC, 2 UG for outfalls, high impervious, poor water quality
 HIC, in-line pond, bulk of HDR has no SWM

Restoration Selection Criteria SPA Data, SW Ranking, Flooding, Public **Preservation Qualities**
 Involvement

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, stabilize/repair stream
 impacts, improve water quality

Percent Impervious 42.22%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
10	Subwatershed Improvement	9	Two infiltration basins on athletic fields in Four Seasons HOA park area, drainage area approx. 10 acres each. Additional LID around parking lot/rec. center - rain gardens, infiltration trenches, cisterns		1201 HERNDON PW
11	Subwatershed Improvement	9	New infiltration basin in HOA open corner, total drainage area approx 18 ac. Additional LID around parking lots, between buildings, along roadway - rain gardens, infiltration trenches	if infiltration not possible try project 12	2201 CHAMBLEE PL
12	Subwatershed Improvement	1	New dry pond in HOA open corner, total drainage area approx 18 ac.	if project 11 is unsuitable	2201 CHAMBLEE PL
13	Subwatershed Improvement	7	Culvert retrofit upstream of Parcher Ave to replace WP0219 (no outlet structure)		2102 MONAGHAN DR
14	Subwatershed Improvement	1	New SWM pond, intercept storm drains from Reflection Lake/Reflection Lake Sect. 10 , drainage area approx 18 ac.		13351 PARCHER AV
15	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream		13352 FONES PL
16	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream		13353 FELDMAN PL
17	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream		13359 HUNGERFORD PL
18	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream		13357 SHEA PL
19	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream	If project 21 not possible	13349 APGAR PL

20	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake Sect. 7 to stream		13317 AIKEN PL
21	Subwatershed Improvement	1	New SWM pond, intercept storm drains from eastern half of Reflection Lake Sect. 7, drainage area approx 10 acres	If new SWM pond possible, project 19 not necessary	13349 APGAR PL
22	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake to stream		2123 MALEADY DR
23	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake to stream		2117 MALEADY DR
24	Subwatershed Improvement	8	Improve drainage channels & outfalls from Reflection Lake to stream		13351 PARCHER AV
25	Stream Restoration	3	Repair eroding banks at SPA erosion points HCUT6-6-E4 & E5		13351 PARCHER AV
26	Non-Structural		Riparian buffer restoration upstream of Parcher Ave.		2138 MONAGHAN DR

Subwatershed HC-HC-0021 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Lower Middle

Description Headwaters, Primarily MDR & HDR, no SWM **Impairments** Poor habitat, high impervious, poor water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve water quality

Percent Impervious 44.12%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
27	Subwatershed Improvement	9	New infiltration basins/trenches on lawn in Four Seasons HOA, intercept drainage from development on N side of Herndon Pwy, drainage area approx. 35 acres total.	Infiltration is ideal, if not possible, try project 28	1338 SPRINGTIDE PL
28	Subwatershed Improvement	1	New dry pond on lawn in Four Seasons HOA, intercept drainage from development on N side of Herndon Pwy, drainage area approx. 35 acres total.	If project 27 not possible	1334 SPRINGTIDE PL
29	Subwatershed Improvement	9	New infiltration basin in park area of Four Seasons Regime HOA, drainage area approx 5 acres		624 CLEARWATER CT

Subwatershed HC-HC-0023 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Middle

Description Bordering Loudoun, primarily undeveloped woodlands between Sully Rd and Horsepen Creek - part of Dulles Int'l Airport property **Impairments** Poor habitat diversity and stream water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities** Undeveloped woodlands on bulk of Fairfax Co. portion of subwatershed

Preservation Selection Criteria IMP **Improvement Goals** Most likely upstream effects, address water quality upstream, preserve undeveloped woodlands

Percent Impervious 5.44%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed HC-HC-0024 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Middle

Description Bordering Loudoun, no buildings, primarily short grass land cover - part of Dulles Int'l Airport property **Impairments** No stream buffer, poor water quality, poor habitat, high stormwater flows

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Restore riparian buffers to the extent possible, improve water quality, drainage improvements, reduce stormwater flows

Percent Impervious 11.35%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
30	Subwatershed Improvement	1	Retrofit existing marsh area to high quality wetland		2550 DULLES VIEW DR
31	Non-Structural		Riparian buffer restoration to the extent possible on the airport property		2551 DULLES VIEW DR
32	Subwatershed Improvement	1	Drainage improvement project to add meander to straightened stream channel		2551 DULLES VIEW DR

Subwatershed HC-HC-0025 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Middle

Description Tank farm & power substation for Dulles Int'l Airport, and undeveloped woodlands to north, no SWM **Impairments** Deficient riparian buffer, poor water quality, high stormwater flows

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Restore riparian buffers, improve water quality, reduce stormwater flows

Percent Impervious 17.33%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
33	Subwatershed Improvement	1	Retrofit sediment basin into SWM facility and intercept drainage from ditch along Dulles Toll Road.		13801 FRYING PAN RD
34	Non-Structural		Riparian buffer restoration		2551 DULLES VIEW DR

Subwatershed HC-HC-0026 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Middle

Description Primarily LIC & HDR, all developed LU is treated by WP, LIC ds of WP is under development in 2007 aerial - burying stream, OS is slated for IND **Impairments** Poor habitat and water quality, high imperviousness, deficient buffers, and very high stormwater flows

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria STEPL **Improvement Goals** Improve stream habitat and water quality including riparian buffers, capture impervious runoff and reduce stormwater flows

Percent Impervious 44.72%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
35	Stream Restoration	2	Daylight stream and return to natural channel		2551 DULLES VIEW DR
36	Non-Structural		Riparian buffer restoration		2551 DULLES VIEW DR
37	Subwatershed Improvement	1	Retrofit existing dry pond to provide quality treatment for Wellesley HOA		13680 SAINT JOHNS WOOD PL
38	Subwatershed Improvement	1	New naturalized basin in existing drainage swale	in a very new development, may or may not have un-identified SWM facilities already	13648 LEGACY CI

Subwatershed HC-HC-0027 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Middle

Description	Primarily ESR & OS, slated for HIC & IND, 1 WP	Impairments	Poor habitat and deficient buffer (SPS sampling station for fish & benthic)
Restoration Selection Criteria	SW Ranking	Preservation Qualities	At risk for future development of ESR & OS including riparian buffer
Preservation Selection Criteria	% Increase IMP (9.51%), STEPL	Improvement Goals	Preserve & enhance riparian buffer & habitat
Percent Impervious	10.50%		

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
59	Preservation		Conservation easement to preserve riparian buffer area and Riparian Buffer restoration		13801 FRYING PAN RD

Subwatershed HC-HC-0028 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Middle

Description Primarily LDR, HDR, IND, HIC with some OS riparian buffers, 1 WP, 7 DP, 1 group of BMPs **Impairments** Poor habitat, numerous SPA impacts (erosion and tree obstructions), minor flooding

Restoration Selection Criteria Field Recon/ ProRata, SPA Data, SW Ranking, Flooding **Preservation Qualities** At risk for future development of OS to IND

Preservation Selection Criteria IMP, % Increase IMP (19.80%), STEPL **Improvement Goals** Restore stream impacts, preserve riparian buffers, improve water quality, reduce stormwater flows upstream

Percent Impervious 28.61%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
100	Non-Structural		Investigate and remove obstructions (possibly 4 moderate-severe obstructions)		13617 MOUNTAIN VIEW CT
101	Subwatershed Improvement	8	Improve outfall to dissipate more energy		13617 MOUNTAIN VIEW CT
102	Non-Structural		Investigate and remove obstructions (possibly 2 moderate-severe obstructions)		13616 MOUNTAIN VIEW CT
103	Stream Restoration	3	Repair eroding streambanks (erosion leading to fallen tree obstructions, creating more erosion)		13611 FLORIS ST
104	Stream Restoration	3	Repair eroding streambanks (erosion leading to fallen tree obstructions, creating more erosion)		13652 CEDAR RUN LA
105	Stream Restoration	3	Repair eroding streambanks (erosion leading to fallen tree obstructions, creating more erosion)		2748 COPPER CREEK RD
106	Subwatershed Improvement	9	New infiltration basin in empty field, drainage area approx 9 acres		13508 FLORIS ST
107	Preservation		Conservation easement to preserve riparian buffer		13611 FLORIS ST
92	Subwatershed Improvement	1	Retrofit dry pond 0495DP to naturalized basin		2816 MUSTANG DR
93	Subwatershed Improvement	1	Retrofit dry pond 0671DP to naturalized basin		2760 COPPER CREEK RD
94	Subwatershed Improvement	9	Retrofit dry pond 0426DP to infiltration basin, drainage area approx 9 acres	Possible alternative to project 95	2742 COPPER CREEK RD
95	Subwatershed Improvement	1	Retrofit dry pond 0426DP to naturalized basin	If project 94 (infiltration) not possible	2740 COPPER CREEK RD

96	Non-Structural		Riparian buffer restoration	2744 COPPER CREEK RD
97	Non-Structural		Investigate and remove obstructions (possibly three moderate-severe obstructions)	2818 MUSTANG DR
98	Non-Structural		Investigate and remove obstructions (possibly 2 moderate-severe obstructions)	13611 FLORIS ST
99	Subwatershed Improvement	8	Improve outfall to dissipate more energy	13611 FLORIS ST

Subwatershed HC-HC-0029 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Middle

Description Headwaters, primarily LIC & INT, large area of OS slated for IND, 1 WP treats most LIC/INT, Carson Middle Sch treated by DP (not in StormNet) **Impairments** Fair habitat, few obstruction/erosion impacts, high stormwater flows, 1 VPDES discharger (Boeing)

Restoration Selection Criteria Regional Pond **Preservation Qualities** At risk for future development of OS including riparian buffer

Preservation Selection Criteria % Increase IMP (95.15%), STEPL **Improvement Goals** Preserve stream buffer, reduce stormwater flows, improve water quality, restore stream impacts

Percent Impervious 29.37%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
108	Preservation		Conservation easement to preserve riparian buffer		13641 CEDAR RUN LA
109a	Regional Pond Alternatives	0	Retrofit existing dry pond to naturalized basin (dry pond not in StormNet)		13635 CEDAR RUN LA
109b	Regional Pond Alternatives	0	LID retrofits including bioretention, infiltration, green roofs around Boeing facility to infiltrate SW runoff		13651 MCLEAREN RD
110	Stream Restoration	3	Repair eroding streambanks, including investigation and removal of upstream obstruction		13618 MCLEAREN RD

Subwatershed HC-HC-0030 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description	Headwaters, primarily MDR, some INT, ESR, LDR, 7 DP, 1 lg nonSWM pond	Impairments	Minor flooding at Centreville Rd, erosion below nonSWM pond, high channelized streams, poor riparian buffers and water quality
Restoration Selection Criteria	SW Ranking, Flooding	Preservation Qualities	At risk for future development of ESR & LDR to MDR
Preservation Selection Criteria	STEPL	Improvement Goals	Reduce stormwater flows, identify and address source of erosion below nonSWM pond, improve stream and water quality
Percent Impervious	26.22%		

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
111	Subwatershed Improvement	1	Retrofit dry pond 0196DP to naturalized basin	Possible alternative to project 112	13348 POINT RIDER LA
112	Subwatershed Improvement	9	Integrate infiltration basins into dry pond 0196DP, drainage area approx 25 acres	Possible alternative to project 111	13346 POINT RIDER LA
113	Preservation		Conservation easement to preserve riparian buffer and SWM facility		2733 CENTREVILLE RD
114	Subwatershed Improvement	1	Retrofit dry pond 0803DP to naturalized basin	will compliment project 115	2707 MERRICOURT LA
115	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond (no StormNet ID), total drainage area approx 18 acres	will compliment project 114	2714 FLORIS LA
116	Subwatershed Improvement	9	Integrate infiltration basin into dry pond DP0382, total drainage area approx 3 acres, or replace with a combination of LID retrofits (bioretention in existing landscaping, infiltration trenches)		2727 CENTREVILLE RD
117	Subwatershed Improvement	9	Combination of LID retrofits including retrofitting dry pond DP0493 into bioretention or infiltration, land available for infiltration or other LID retrofits, total drainage area approx 2 acres.		2745 CENTREVILLE RD
118	Subwatershed Improvement	9	Integrate infiltration basin into dry pond DP0015, total drainage area approx 3 acres, or replace with a combination of LID retrofits (bioretention in existing landscaping, infiltration trenches)		2800 CENTREVILLE RD
119	Subwatershed Improvement	1	Retrofit dry pond VDOT29068 to naturalized basin		13574 CEDAR RUN LA

120	Subwatershed Improvement	1	Retrofit nonSWM pond FM0014 to wet pond		13492 LAKE SHORE DR
121	Subwatershed Improvement	8	Improve outfall to dissipate more energy	will compliment, but should not replace project 120	13496 LAKE SHORE DR

Subwatershed HC-HC-0031 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR & LIC, OS along streams, 4 DP, 2 groups of BMPs, some res dev untreated **Impairments** Numerous erosion and obstruction impacts, poor water quality

Restoration Selection Criteria SPA Data, SW Ranking **Preservation Qualities** Future development in non-riparian areas

Preservation Selection Criteria STEPL **Improvement Goals** Reduce stormwater flows, remove obstructions and repair eroding streambanks, improve water quality

Percent Impervious 28.73%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
122	Non-Structural		Investigate and remove obstructions at SPA reach 9-1 (may be up to 5 moderate-severe obstructions)		13592 COBRA DR
123	Stream Restoration	3	Stream restoration - repair erosion/headcuts on SPA reach 9-1 (5 moderate stream erosion areas)		13365 HORSEPEN WOODS LA
124	Subwatershed Improvement	1	New SWM facility, naturalized dry pond/constructed wetland, drainage area approx 8 acres	Possible alternative to project 125	2870 SPRING CHAPEL CT
125	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 8 acres	Possible alternative to project 124	2870 SPRING CHAPEL CT
126	Subwatershed Improvement	9	Bioretention or other LID retrofits in OS behind homes on both sides of Spring Chapel Ct to capture runoff before it discharges to stream		2863 SPRING CHAPEL CT
127	Stream Restoration	2	Daylight stream and return to natural channel		13446 LAKE SHORE DR
128	Non-Structural		Investigate and remove obstruction/repair outlet structure for dry pond DP0151 - outlet is clogged or damaged and not draining		2921H CENTREVILLE RD
129	Subwatershed Improvement	1	Retrofit existing dry pond to naturalized basin (dry pond not in StormNet)		3001 CENTREVILLE RD
159	Subwatershed Improvement	1	Retrofit dry pond 1349DP to naturalized basin		2882 HORSEPEN WOODS CT

Subwatershed HC-HC-0032 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, HDR, HIC, 2DP, MDR is mostly untreated **Impairments** Stream erosion upstream of McLearn Rd, impacts from SW outfalls, poor water quality

Restoration Selection Criteria Field Recon/ ProRata, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, improve stormwater drainage and water quality, repair eroded streambanks

Percent Impervious 37.76%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
130	Subwatershed Improvement	1	New constructed wetland/naturalized basin to intercept drainage before it reaches stream, drainage area approx 8 acres		13421 ELLIOTT AN CT
131	Subwatershed Improvement	9	Bioretention or other LID retrofits in OS behind homes to capture runoff before it discharges to stream, drainage area approx 2.5 acres		13415 GLEN TAYLOR LA
132	Subwatershed Improvement	1	New constructed wetland/naturalized basin to intercept drainage before it reaches stream, drainage area approx 10 acres		3138 KINROSS CI
133	Subwatershed Improvement	1	New constructed wetland/naturalized basin to intercept drainage before it reaches stream, drainage area approx 7 acres	Possible alternative to project 134	3142 KINROSS CI
134	Subwatershed Improvement	9	New infiltration basin to intercept drainage before it reaches stream, drainage area approx 7 acres	Possible alternative to project 133	13411 GLEN TAYLOR LA
135	Subwatershed Improvement	1	Retrofit dry pond 1055DP to naturalized basin		3029 MCMASTER CT
136	Subwatershed Improvement	1	Replace concrete channel with naturalized dry basin, drainage area approx 7 acres	Possible alternative to project 137	3003 TAYLOR MAKENZYE CT
137	Subwatershed Improvement	9	Replace concrete channel with infiltration basin, drainage area approx 7 acres	Possible alternative to project 136	3011 TAYLOR MAKENZYE CT
138	Stream Restoration	3	Repair stream erosion upstream of McLearn Rd		13591 COBRA DR

Subwatershed HC-HC-0033 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, some HDR, INT, HIC, 5 DP **Impairments** Several crossing, obstruction, and erosion impacts, deficient riparian buffers

Restoration Selection Criteria Field Recon/ SPA Data **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, remove obstructions and repair eroding streambanks, improve riparian buffers

Percent Impervious 32.24%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
139	Subwatershed Improvement	9	Integrate infiltration basins into regional dry pond H-19 (0747DP)		3151 KIRKWELL PL
140	Subwatershed Improvement	1	New constructed wetland/naturalized basin to intercept drainage before it reaches stream, drainage area approx 13 acres		3161 KIRKWELL PL
141	Non-Structural		Targeted rain barrel program for portion of Chantilly Highlands		13636 DORNOCK CT
142	Subwatershed Improvement	9	Infiltration basin to receive flow from two drainage channels, drainage area approx 7 acres	May compliment or replace project 143	13449 MUIRKIRK LA
143	Subwatershed Improvement	1	New naturalized basin to receive flow from two drainage channels and extend floodplain, drainage area approx 8 acres	May compliment or replace project 142	13459 MUIRKIRK LA
144	Subwatershed Improvement	9	Infiltration basin to intercept flow before it reaches stream, drainage area approx 3 acres	Possible alternative to project 145	13365 SCOTSMORE WY
145	Subwatershed Improvement	1	New constructed wetland/naturalized basin to intercept flow before it reaches stream, drainage area approx 3 acres	Possible alternative to project 144	13365 SCOTSMORE WY
146	Subwatershed Improvement	9	New Infiltration basin to intercept flow from two drain pipes before it reaches stream, drainage area approx 9 acres	Possible alternative to project 147	13226 CAROLINE CT
147	Subwatershed Improvement	1	New naturalized basin/constructed wetland to intercept flow from two drain pipes before it reaches stream, drainage area approx 9 acres	Possible alternative to project 146	13226 CAROLINE CT
148	Non-Structural		Targeted rain barrel program for portion of Chantilly Highlands		13344 SCOTSMORE WY

149	Non-Structural		Riparian buffer restoration (deficient buffer approx 2,500 ft in length)	3231 KINROSS CI
150	Subwatershed Improvement	9	Variety of LID retrofits around parking lots and athletic fields - rain gardens/bioretention, infiltration trenches/basins, cisterns	3210 KINROSS CI
151	Subwatershed Improvement	1	Retrofit dry pond 0606DP to naturalized basin	3254 TAYLOE CT

Subwatershed HC-HC-0034 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, some OS along riparian zone, 1 WP, 2 DP, most MDR is treated **Impairments** Moderate to severe erosion, poor water quality,

Restoration Selection Criteria Field Recon/ SPA Data, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, improve water quality, repair eroded streams

Percent Impervious 37.33%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
152	Stream Restoration	3	Repair stream erosion	Will compliment, but should not replace project 153	13132 BRADLEY FARM DR
153	Subwatershed Improvement	8	Improve outfall to dissipate more energy - SPA ID HCHC011.P003	May compliment or replace project 152	13130 BRADLEY FARM DR
154	Subwatershed Improvement	1	New naturalized dry basin or wetland, drainage area approx 7 acres (not including area upstream of 0562DP)		2780 MIDDLETON FARM CT
155	Preservation		Riparian buffer restoration		13231 MIDDLETON FARM LA
156	Non-Structural		Targeted rain barrel program for portion of Middleton Farm sbdv		13301 HORSEPEN WOODS LA
157	Subwatershed Improvement	1	Retrofit dry pond 0568DP to naturalized basin		2659 COCKERILL FARM LA
158	Subwatershed Improvement	1	Integrate infiltration basin into existing dry pond 0562DP, total drainage area approx 10 acres		13074 MONTEREY ESTATES DR

Subwatershed HC-HC-0035 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, OS along riparian zone, 3 DP, **Impairments** Flood complaints, poor water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, improve water quality, repair eroded streams

Percent Impervious 26.12%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
160	Subwatershed Improvement	9	Replace paved ditch with vegetated swale or infiltration trench and add bioretention at outlet, drainage area approx 3 acres		13158 LAZY GLEN LA
161	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond 0440DP and improve low flow channel with vegetated swale		2975 EMERALD CHASE DR
162	Subwatershed Improvement	1	Retrofit dry pond 1349DP to naturalized basin		13100 BRADLEY FARM DR

Subwatershed HC-HC-0036 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, 2 DP (including regional - West Ox Pond), 1 UG BMP **Impairments**

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria Non-Priority **Improvement Goals** Reduce stormwater flows, improve water quality

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
163	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond 0440DP and improve low flow channel with vegetated swale		2665 NEW ASPEN CT
164	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond (no StormNet ID) and improve low flow channel with vegetated swale		2875 FRANKLIN OAKS DR
165	Subwatershed Improvement	1	Retrofit dry pond (no StormNet ID) to naturalized basin		2802 GIBSON OAKS DR

Subwatershed HC-HC-0037 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, 2 DP

Impairments

Restoration Selection Criteria Non-Priority

Preservation Qualities

Preservation Selection Criteria Non-Priority

Improvement Goals Reduce stormwater flows, improve water quality

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
166	Stream Restoration	3	Repair streambank erosion		12724 BRADWELL RD
167	Subwatershed Improvement	9	Replace ditch with infiltration basin to intercept flow from pipe before it reaches stream, may include low flow vegetated swale total drainage area approx 18 acres	Possible alternative to project 168	12617 PINECREST RD
168	Subwatershed Improvement	1	New naturalized basin in place of existing swale	Possible alternative to project 167	12617 PINECREST RD
169	Subwatershed Improvement	7	Culvert retrofit		2587 VIKING DR
170	Subwatershed Improvement	9	Integrate infiltration basins into existing dry pond 0243DP, drainage area approx 120 acres	May compliment or replace project 171	2560 HUNTINGTON DR
171	Subwatershed Improvement	1	Retrofit dry pond 0243DP to naturalized basin, drainage area approx 120 acres	May compliment or replace project 170	2554 HUNTINGTON DR

Subwatershed HC-HC-0039 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, 2 DP **Impairments** Fair habitat, numerous erosion impacts, flooding complaints, poor water quality

Restoration Selection Criteria Public Involvement, SPA Data, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, improve water quality and habitat, repair eroded streams

Percent Impervious 21.82%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
172	Subwatershed Improvement	9	Vegetated swale with an infiltration trench, drainage area approx 5 acres	May compliment project 173	12810 KETTERING DR
173	Subwatershed Improvement	1	New naturalized basin to intercept drainage from pipe discharge and proposed vegetated swale (project 173), drainage area approx 24 acres including proposed vegetated swale (project 173)	May compliment project 172	12830 KETTERING DR
174	Subwatershed Improvement	1	New wetland or naturalized dry pond to intercepted piped drainage before it reaches stream, drainage area approx 20 acres		2632 VIKING DR
175	Subwatershed Improvement	1	Retrofit existing dry pond(s) to naturalized basins - outlet structure may be damaged/malfunctioning		2907 TIMBER WOOD WY
176	Stream Restoration	2	Repair erosion impacts on SPA reach 10-4, may be as many as 5 moderate to severe erosion areas		12827 KETTERING DR
177	Stream Restoration	2	Repair erosion impacts on SPA reach 10-3, may be as many as 5 moderate to severe erosion areas		12854 TEWKSBURY DR

Subwatershed HC-HC-0040 **Watershed:** Horsepen Creek **Management Area:** Horsepen -Upper

Description Primarily MDR, 2DP, 2 groups of BMPs, 1 nonSWM pond **Impairments** Poor habitat, numerous erosion impacts, flooding complaints, high channelized drainage

Restoration Selection Criteria Public Involvement, SPA Data, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Reduce stormwater flows, improve habitat and water quality, repair eroded streams

Percent Impervious 28.92%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
178	Stream Restoration	2	Repair erosion impacts on SPA reach 10-5, may be as many as 7 moderate to severe erosion areas	Must control stormwater prior to stream restoration (projects 179, 180, 181, 182)	2779 PRINCE HAROLD CT
179	Subwatershed Improvement	1	New naturalized basin to provide treatment to Fox Mill Estates stormwater before it reaches stream, drainage area approx 35 acres	Should be completed prior to project 178 (stream restoration)	12562 QUINCY ADAMS CT
180	Subwatershed Improvement	9	Replace paved ditch with vegetated swale or infiltration trench	Should be completed prior to project 178 (stream restoration)	12524 CHASBARB TE
181	Subwatershed Improvement	1	Expand existing dry pond into field, possibly reduce size of low flow orifice to hold back smaller storm events	Should be completed prior to project 178 (stream restoration)	2627 QUINCY ADAMS DR
182	Subwatershed Improvement	1	New naturalized basin/wetland to control stormwater before it reaches major erosion points, drainage area approx 97 acres	Should be completed prior to project 178 (stream restoration)	2785 PRINCE HAROLD CT

Subwatershed **HC-IC-0007** **Watershed:** **Horsepen Creek** **Management Area:** **Horsepen - Indian**

Description Nearly entirely in Loudoun County

Impairments

Restoration Selection Criteria

Preservation Qualities

Preservation Selection Criteria IMP, SW Ranking

Improvement Goals No improvement opportunities

Percent Impervious 9.85%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed HC-MR-0001 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Merrybrook

Description Bordering Loudoun, primarily LIC & HDR, some OS around stream, 2 WP, 1 DP, 2 nonSWM ponds, some LIC/HDR untreated **Impairments** Deficient riparian buffer, poor water quality & habitat, SPA erosion, obstruction & ditch impacts

Restoration Selection Criteria SPA Data, SW Ranking, Flooding **Preservation Qualities** At risk for future development of wooded OS

Preservation Selection Criteria % Increase IMP (2.75%), STEPL **Improvement Goals** Preserve riparian buffer, improve water quality & habitat, repair/improve SPA impacts

Percent Impervious 37.66%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
39	Subwatershed Improvement	1	Retrofit existing dry pond to naturalized basin		2424 LITTLE CURRENT DR
40	Preservation		Conservation easement to preserve riparian buffer		2436 LITTLE CURRENT DR
41	Subwatershed Improvement	1	Retrofit existing ornamental ponds in Dulles Corner commercial park to a constructed wetland with forebay	feasibility may be low, can also try project 42	2340 DULLES CORNER BV
42	Subwatershed Improvement	9	Variety of LID retrofits around parking lots and buildings - rain gardens, infiltration trenches, cisterns	May compliment or replace project 41	2325 DULLES CORNER BV
43	Stream Restoration	3	Repair eroding banks at SPA erosion point HCMR7-1-E1		13834 COPPERMINE RD
44	Non-Structural		Remove obstruction at SPA obstruction point HCMR7-2-O2		2436 LITTLE CURRENT DR

Subwatershed HC-MR-0002 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Merrybrook

Description Primarily LIC & HDR, very little SWM, 1 sm WP, 3 sm DP, several UG BMPs, lg ESR is slated for HIC **Impairments** Deficient riparian buffer, high impervious & SW outfalls, flooding of buildings (Coppermine Crossing Condos) and Centerville Rd north of Sunrise Valley Rd

Restoration Selection Criteria Flooding **Preservation Qualities** At risk for future development of ESR & OS

Preservation Selection Criteria % Increase IMP (18.24%), STEPL **Improvement Goals** Preserve riparian buffer, capture impervious runoff, improve drainage & outfalls, address high SW flows upstream to reduce flooding

Percent Impervious 35.95%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
45	Preservation		Conservation easement to preserve riparian buffer		13512 DAVINCI LA
46	Preservation		Conservation easement to preserve riparian buffer area and Riparian Buffer restoration		2475 CENTREVILLE RD
47	Subwatershed Improvement	1	New SWM facility - pair of wetlands or larger naturalized dry pond to intercept drainage from commercial park before it enters the stream, drainage area approx 40 acres		2475 CENTREVILLE RD
48	Subwatershed Improvement	1	New constructed wetland to intercept flow from drainage behind Coppermine Crossing Condominiums before it reaches the stream, drainage area approx 6 acres		13512 DAVINCI LA
49	Subwatershed Improvement	1	New constructed wetland to intercept flow from drainage behind Coppermine Crossing Condominiums before it reaches the stream, drainage area approx 8 acres		13644 SALK ST
50	Subwatershed Improvement	9	LID retrofits for urban commercial development (infiltration, bioretention, underground systems) for all commercial properties within Dulles Technology Drive	looks like newer development, may already be in place, but not visible	13600 DULLES TECHNOLOGY DR
51	Preservation		Conservation easement to preserve floodplain and riparian buffer area and Riparian Buffer restoration		2346 CENTREVILLE RD
52	Stream Restoration	2	Stream restoration - provide more buffer to road (this portion will flood in 100 yr storm event), possibly widen floodplain, natural channel design	would require homeowner consent	2346 CENTREVILLE RD

Subwatershed HC-MR-0003 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Merrybrook

Description Primarily LIC & HDR, some OS slated for LIC/HDR/IND, includes portion of Dulles Toll Rd, 3 WP in series, much of upper portion untreated **Impairments** High impervious

Restoration Selection Criteria **Preservation Qualities** At risk for future development of OS including riparian buffer

Preservation Selection Criteria SW Ranking, STEPL **Improvement Goals** Capture impervious runoff (especially important for downstream subbasin), preserve key OS areas

Percent Impervious 45.13%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
53	Subwatershed Improvement	9	Infiltration basin(s) on baseball diamond outfield. Additional LID retrofits throughout office complex (infiltration trenches, bioretention, underground systems)		2291 WOOD OAK DR
54	Preservation		Preserve and enhance buffer around series of wet ponds through conservation easement and buffer restoration projects		13200 WOODLAND PARK RD
55	Subwatershed Improvement	9	Infiltration basin(s) on baseball diamond outfield. Additional LID retrofits throughout office complex (infiltration trenches, bioretention, underground systems)		2121 COOPERATIVE WY
56	Subwatershed Improvement	9	Infiltration basin on large parking lot island, drainage area approx 10 acres. Additional LID retrofits throughout office complex (infiltration trenches, bioretention, underground systems)		13221 WOODLAND PARK RD

Subwatershed HC-MR-0004 **Watershed:** Horsepen Creek **Management Area:** Horsepen - Merrybrook

Description Primarily LIC & HDR, no SWM, 1 non-SW wetland/pond **Impairments**

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria Non-Priority **Improvement Goals** Capture impervious runoff (especially important for downstream subbasin)

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
57	Subwatershed Improvement	9	Infiltration basins and other LID on open space areas throughout Courts of Chandon subdv - 15+ locations available including athletic fields, total drainage area approx 75 acres		410 MAGNOLIA CT
58	Subwatershed Improvement	1	New SWM facility, naturalized dry pond or constructed wetland in common area of Courts of Chandon subdv, drainage area approx 15 acres		1249 ELDEN ST

Subwatershed SU-FF-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily highly developed LDR & MDR, good forested riparian buffer, 1 DP **Impairments** potential hot spot @ Metro Ready Mix Inc., multiple ditches and outfalls w/ moderate erosion impacts

Restoration Selection Criteria Regional Pond **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** provide alternatives to regional pond, capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 12.94%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
96a	Regional Pond Alternatives	0	LID: new infiltration basin to intercept storm drains from Sugar Creek Sec. 1, drainage area approx 4.2 acres	use project 96b if soils do not promote infiltration	12105 SNOW SHOE CT
96b	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from Sugar Creek Sec. 1, drainage area approx 4.2 acres	if project 96a is unsuitable	12105 SNOW SHOE CT
96c	Regional Pond Alternatives	0	LID: Add bioretention or filter strip to provide some water quality treatment to outfalls		12110 HEATHER WY
96d	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond VDOT29052 to naturalized dry basin	coordinate w/ VDOT	1120 SUGAR MAPLE LA
96e	Regional Pond Alternatives	0	LID: Add bioretention or filter strip to provide some water quality treatment to outfalls		1203 ROWLAND DR
96f	Regional Pond Alternatives	0	Drainage Improvement: improve drainage channel and outfalls from Rowland Dr		1200 ROWLAND DR
97	Non-Structural		Rain barrel program Shaker Woods HOA		1214 ROWLAND DR
98	Non-Structural		Rain barrel program Sugar Creek Sec. 1 HOA		12111 SNOW SHOE CT

Subwatershed SU-FF-0002 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily LDR with some ESR & MDR, portions of WWTP, good forested buffer along stream channels. 2 WP, 2 DP **Impairments** CEM Type 3 (widening), moderate erosion problems where obstructions were before, portions of Corbalis Treatment Plant with outfalls into stream

Restoration Selection Criteria Regional Pond, SPA Data **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** provide alternatives to regional pond, capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 14.65%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
100	Stream Restoration	2	Repair eroding banks at SPA erosion points SUSU2-2-E6, E7 & E8		1202 CRAYTON RD
101	Non-Structural		Conservation easement to preserve riparian buffer and forested open space		1165 SILVER BEECH RD
102	Non-Structural		Rain Barrel Program Sugar Creek 1st Addn, Sec. 2 HOA		11909 CRAYTON CT
103	Non-Structural		Rain Barrel Program Timber Knoll HOA		11862 TIMBER KNOLL CT
104	Non-Structural		Rain Barrel Program Stoney Creek Woods HOA		1177 TAJI CT
99a	Regional Pond Alternatives	0	LID: replace riprap outfall protection at end of driveway culvert with swale & bioretention		1202 CRAYTON RD
99b	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from southern part of Stoney Creek Woods, drainage area approx 27 acres	2 wet ponds in series located upstream on WWTP property	1207 CRAYTON RD
99c	Regional Pond Alternatives	0	LID: retrofit dry pond 0727DP to naturalized infiltration basin	if soils support infiltration, if not use project 99d	1176 SILVER BEECH RD
99d	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 0727DP to naturalized dry basin	if project 99cunsuitable	1176 SILVER BEECH RD
99e	Regional Pond Alternatives	0	Culvert retrofit: construct control structure w/ wetland or wet pond to intercept outfalls fr. Sugar Creek HOA		1176 SILVER BEECH RD

Subwatershed SU-FF-0003 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description LDR w/ large tracts of forested OS adjacent to streams, 1 DP **Impairments** undersized culverts w/ road flooding and minor erosion, poor habitat, moderate erosion downstream

Restoration Selection Criteria Drains to Regional Pond in SU-FF-0002, Field Recon/ProRata **Preservation Qualities** preserve open space to protect forested riparian buffers

Preservation Selection Criteria % Increase IMP (2.29%) **Improvement Goals** provide alternatives to regional pond, capture impervious runoff, stabilize/repair stream impacts, improve road crossings, improve water quality

Percent Impervious 10.87%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
105	Non-Structural		Rain Barrel Program Shaker Woods HOA		11666 GILMAN LA
106	Non-Structural		Rain Barrel Program Caris Glenne HOA & Blackstone at Shaker Woods HOA		1104 ARBOROAK PL
107	Non-Structural		Riparian buffer restoration downstream of Stuart Hills Way crossing		1126 STUART HILLS WY
99f	Regional Pond Alternatives	0	Road crossing improvement: Raise road and replace culvert at Shaker Woods Rd crossing (Pro Rata Project No. DR-6)		1225 SHAKER WOODS RD
99g	Regional Pond Alternatives	0	Road crossing improvement: Replace culvert at Shaker Woods Rd crossing and stabilize stream banks (Pro Rata Project DR-5)		1214 SHAKER WOODS RD
99h	Regional Pond Alternatives	0	LID: New infiltration basins to intercept storm drains from Shaker Woods HOA & Corbalis Water Treatment Plant, drainage area approx. 24 acres	if soils support infiltration otherwise use project 99i	1225 SHAKER WOODS RD
99i	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from southern part of Shaker Woods HOA & Corbalis Water Treatment Plant, drainage area approx. 24 acres	if project 99h is unsuitable	1225 SHAKER WOODS RD
99j	Regional Pond Alternatives	0	LID: retrofit dry pond 01064DP to naturalized infiltration basin	if soils support infiltration, if not use project 99k	1207 DANLEA CT
99k	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 1064DP to naturalized dry basin	if project 99j is unsuitable	1207 DANLEA CT

Subwatershed SU-FF-0004 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily LDR and MDR w/ some ESR, portions of WWTP, good forested buffer along streams, 2 farm ponds, 2DP **Impairments** undersized culverts w/ road flooding and minor erosion, poor habitat, poor water quality, moderate downstream erosion

Restoration Selection Criteria Drains to Regional Pond in SU-FF-0002, Field Recon/ProRata **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** provide alternatives to regional pond, capture impervious runoff, stabilize/repair stream impacts, improve road crossings, improve water quality

Percent Impervious 15.29%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
108	Stream Restoration	2	Repair eroding banks at SPA erosion points SUSU2-2-E10		1209 CRAYTON RD
109	Non-Structural		Rain Barrel Program Caris Glenne, Stuart Estates, & Stuart Hills HOA		1134 STUART HILLS WY
110	Non-Structural		Rain Barrel Program Forest Heights Estates & Stoney Creek Woods HOA		11808 FOREST HEIGHTS CT
111	Non-Structural		Rain Barrel Program Cedar Chase, Oak Creek Estates, Great Falls Woods, & D. J. Smithers HOAs		1074 CEDAR CHASE CT
99aa	Regional Pond Alternatives	0	LID: New infiltration basin to intercept storm drains from western part of Cedar Chase, drainage area approx. 6.5 acres	if soils support infiltration otherwise use project 99ab	11605 CEDAR CHASE RD
99ab	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains western part of Cedar Chase, drainage area approx. 6.5 acres	if project 99aa is unsuitable	1080 CEDAR CHASE CT
99l	Regional Pond Alternatives	0	LID: retrofit dry pond south of Forest Heights Ct to naturalized infiltration basin	if soils support infiltration, if not use project 99m	11811 FOREST HEIGHTS CT
99m	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond south of Forest Heights Ct to naturalized dry basin	if project 99l is unsuitable	11811 FOREST HEIGHTS CT
99n	Regional Pond Alternatives	0	SW Retrofit: Retrofit farm pond to constructed wetland or wet pond		1224 ADMIRAL ZUMWALT LA
99o	Regional Pond Alternatives	0	SW Retrofit: Retrofit farm pond to constructed wetland or wet pond		1121 CLINCH RD
99p	Regional Pond Alternatives	0	SW Retrofit: Retrofit farm pond to constructed wetland or wet pond		1108 SHAKER WOODS RD

99q	Regional Pond Alternatives	0	LID: retrofit dry pond DP0563 to naturalized infiltration basin	if soils support infiltration, if not use project 99k	1096 LIBERTY MEETING CT
99r	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond DP0564 to naturalized dry basin	if project 99j is unsuitable	1096 LIBERTY MEETING CT
99s	Regional Pond Alternatives	0	Road crossing improvement: Replace culvert at Shaker Woods Rd crossing and stabilize stream banks (Pro Rata Project DR-8)		1111 SHAKER WOODS RD
99t	Regional Pond Alternatives	0	Road crossing improvement: Replace culvert at Shaker Woods Rd crossing and stabilize stream banks (Pro Rata Project DR-7)		1134 STUART HILLS WY
99u	Regional Pond Alternatives	0	LID: New infiltration basin to intercept storm drains from Caris Glenne HOA, drainage area approx. 7 acres	if soils support infiltration otherwise use project 99v	11715 CARIS GLENNE DR
99v	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from Caris Glenne HOA, drainage area approx. 7 acres	if project 99u is unsuitable	11715 CARIS GLENNE DR
99w	Regional Pond Alternatives	0	LID: New infiltration basin to intercept storm drains from Oak Crest Estates, drainage area approx. 5.5 acres	if soils support infiltration otherwise use project 99x	11696 CARSON OVERLOOK CT
99x	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from Oak Crest Estates, drainage area approx. 5.5 acres	if project 99w is unsuitable	11696 CARSON OVERLOOK CT
99y	Regional Pond Alternatives	0	LID: New infiltration basin to intercept storm drains from eastern part of Cedar Chase, drainage area approx. 6 acres	if soils support infiltration otherwise use project 99z	11589 CEDAR CHASE RD
99z	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains eastern part of Cedar Chase, drainage area approx. 6 acres	if project 99y is unsuitable	11589 CEDAR CHASE RD

Subwatershed SU-FL-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Primarily MDR, OS along stream corridor, 4 DP, much of MDR has SWM control **Impairments** SPA Obstruction impacts, poor water quality, high channelized streams

Restoration Selection Criteria SPA Data, SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Remove obstructions, improve water quality, naturalize streams if possible

Percent Impervious 26.86%

Temporary Project ID	Strategy	Project Type	Description of Project	Comments	Nearest Address
M44	Non-Structural		Investigate and remove obstruction at SPA obstruction point SUFL3-2-O7		12300 VALLEY HIGH RD
M45	Non-Structural		Investigate and remove obstruction at SPA obstruction point SUFL3-2-O10		1425 VALLEY MILL CT
M46	Subwatershed Improvement	1	Retrofit dry pond 0573DP to naturalized basin	Will compliment project M47	12346 CLIVEDEN ST
M47	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench	Will compliment project M46	12348 CLIVEDEN ST
M48	Subwatershed Improvement	1	Retrofit dry pond 0785DP to naturalized basin	Will compliment project M49	12302 CLIVEDEN ST
M49	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench	Will compliment project M48	12302 CLIVEDEN ST
M50	Subwatershed Improvement	1	Retrofit dry pond 0227DP to naturalized basin	Will compliment project M51	12308 VALLEY HIGH RD
M51	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench	Will compliment project M50	12308 VALLEY HIGH RD
M52	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench		1302 CASSIA ST
M53	Stream Restoration	3	Replace paved ditch with naturalized channel	Will compliment project M52	1306 CASSIA ST
M54	Stream Restoration	3	Replace paved ditch with naturalized channel	Will compliment projects M48 & M49	12302 CLIVEDEN ST
M55	Subwatershed Improvement	1	New constructed wetland/naturalized dry pond to intercept drainage before it reaches stream, drainage area approx 6 acres, *project located along trail, also has a public education component		1423 VALLEY MILL CT

M56

Subwatershed Improvement

9

Suite of LID BMPs, vegetated swales, bioretention/infiltration, drainage area approx 3.5 acres, *project located along trail, also has public education component

1431 VALLEY MILL CT

Subwatershed SU-FL-0002 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Primarily MDR, OS along stream corridor, 5 DP, much of MDR has SWM control **Impairments** Poor water quality, high channelized streams

Restoration Selection Criteria SPA Data, Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Improve water quality, naturalize streams if possible

Percent Impervious 31.41%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M57	Subwatershed Improvement	9	Replace paved low flow channel and incoming pipes with naturalized vegetated swales/infiltration trenches (existing dry pond 0934DP)		12537 ROCK RIDGE RD
M58	Subwatershed Improvement	9	Enlarge existing dry pond 0637DP and retrofit with infiltration basin, replaced paved low flow channel with vegetated swale/infiltration trench		12537 MISTY WATER DR
M59	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond VDOT29049	May compliment or replace project M60	1401 DRANESVILLE RD
M60	Subwatershed Improvement	1	Retrofit existing dry pond VDOT29049 into naturalized basin	May compliment or replace project M59	1401 DRANESVILLE RD
M61	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond VDOT29048	May compliment or replace project M62	12333 EXBURY ST
M62	Subwatershed Improvement	1	Retrofit existing dry pond VDOT29048 into naturalized basin	May compliment or replace project M61	1502 THURBER ST
M63	Stream Restoration	3	Replace paved ditch with naturalized channel	Will compliment projects M61 & M62	12333 EXBURY ST
M64	Subwatershed Improvement	9	New infiltration basins, total drainage area approx 35 acres		12571 ROCK RIDGE RD
M65	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench and integrate infiltration basin into existing dry pond 0827DP	May compliment or replace project M66	12579 ROCK RIDGE RD
M66	Subwatershed Improvement	1	Retrofit existing dry pond 0827DP into naturalized basin	May compliment or replace project M65	12573 ROCK RIDGE RD
M67	Subwatershed Improvement	1	New naturalized dry basin or wetland to intercept drainage before it reaches stream, *along trail, also public education component		1501 HIDDENBROOK DR

M68	Subwatershed Improvement	1	New naturalized dry basin or wetland to intercept drainage before it reaches stream, drainage area approx 10 acres, *along trail, also public education component	12600 WESTLODGE CT
M69	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench and integrate infiltration basin into existing dry pond 0260DP	12603 MILLBANK WY
M70	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench and integrate infiltration basin into existing dry pond 0283DP	1551 COOMBER CT
M71	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench and integrate infiltration basin into existing dry pond 1343DP	1540 COOMBER CT
M72	Subwatershed Improvement	9	Replace paved low flow channel with vegetated swale/infiltration trench and integrate infiltration basin into existing dry pond 1441DP	12520 PHILMONT DR

Subwatershed SU-FL-0003 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Headwaters, primarily INT, mix of MDR, LDR, ESR - LDR & ESR slated for re-dev at higher densities, 1 (regional) dry pond **Impairments**

Restoration Selection Criteria SPA Data, Public Involvement **Preservation Qualities**

Preservation Selection Criteria SW Ranking, STEPL **Improvement Goals**

Percent Impervious 30.36%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M73	Subwatershed Improvement	1	New naturalized dry basin, drainage area approx 18 acres		1545 DRANESVILLE RD
M74	Preservation		Conservation easement to protect riparian zone and riparian buffer restoration		1546 DRANESVILLE RD
M75	Subwatershed Improvement	1	Retrofit existing regional dry pond 1440DP (Regional ID S-04) to naturalized basin		1503 JUDD CT

Subwatershed SU-FL-0004 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Primarily MDR, some INT, 1 DP, 1 BMP, 1 nonSWM pond, most of subwatershed has no SWM control **Impairments** Poor water quality, deficient riparian buffer, high channelized streams

Restoration Selection Criteria SPA Data, Public Involvement, Flooding **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (3.42%) **Improvement Goals** Improve water quality and riparian buffer, naturalize streams if possible

Percent Impervious 25.86%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M76	Subwatershed Improvement	8	Improve outfall at SPA point SUFL3-1-P5		12630 FANTASIA DR
M77	Stream Restoration	3	Repair erosion at SPA points SUFL3-1-E10 and SUFL3-1-E12		1291 MONROE ST
M78	Stream Restoration	3	Repair erosion at SPA points SUFL3-1-E9, SUFL3-1-E8 including removing obstruction at SPA point SUFL3-1-O5		1315 MONROE ST
M79	Subwatershed Improvement	1	New naturalized dry basin, drainage area approx 11 acres		12628 FANTASIA DR
M80	Subwatershed Improvement	9	Integrate infiltration basin and vegetated swale into existing dry pond	Possible alternative to project M81	1300 MONROE ST
M81	Subwatershed Improvement	1	Retrofit existing dry pond to naturalized basin	Possible alternative to project M80	1300 MONROE ST
M82	Subwatershed Improvement	9	Integrate infiltration basin and vegetated swale into existing dry pond (not in StormNet)	Possible alternative to project M83	1310 MONROE ST
M83	Subwatershed Improvement	1	Retrofit existing dry pond to naturalized basin (dry pond not in StormNet)	Possible alternative to project M82	1310 MONROE ST
M84	Subwatershed Improvement	1	New naturalized dry basin, drainage area approx 11 acres		12614 BUILDERS RD

Subwatershed SU-FL-0005 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Bordering Loudoun, primarily MDR, 1 WP - **Impairments** Deficient riparian buffer, high channelized streams
 treats most of subwatershed

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria Non-Priority **Improvement Goals** Improve riparian buffer, naturalize streams if possible

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M85	Subwatershed Improvement	9	New infiltration basin, drainage area approx 11 acres within Fairfax County	Possible alternative to project M86	1608 NATHAN LA
M86	Subwatershed Improvement	1	New naturalized dry basin, drainage area approx 11 acres within Fairfax County	Possible alternative to project M85	1608 NATHAN LA
M87	Stream Restoration	2	Restore grass channels to natural stream channels and improve riparian buffers		12707 NUREYEV LA

Subwatershed SU-FL-0006 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Primarily Golf Course & HDR, 1 nonSWM pond, no SWM control **Impairments** High stormwater flows, poor habitat diversity & water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve habitat and water quality

Percent Impervious 24.71%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M88	Stream Restoration	2	Restore grass channels to natural stream channels and improve riparian buffers to the extent possible on Golf Course		1270 OLD HEIGHTS RD
M89	Stream Restoration	2	Restore grass channels to natural stream channels and improve riparian buffers to the extent possible on Golf Course		1721 SADLERS WELLS DR
M90	Subwatershed Improvement	9	New infiltration basin to intercept drainage before it reaches stream, drainage area approx 6 acres	Possible alternative to project M91	1100 WATERFORD PL
M91	Subwatershed Improvement	1	New naturalized basin/constructed wetland to intercept drainage before it reaches stream, drainage area approx 6 acres	Possible alternative to project M90	1149 LISA CT
M92	Subwatershed Improvement	9	New infiltration basin to intercept drainage before it reaches stream, drainage area approx 6 acres	Possible alternative to project M93	1427 BLUEMONT CT
M93	Subwatershed Improvement	1	New naturalized basin/constructed wetland to intercept drainage before it reaches stream, drainage area approx 6 acres	Possible alternative to project M92	1427 BLUEMONT CT
M94	Subwatershed Improvement	9	Variety of LID retrofits (bioretention, infiltration, rain barrels, etc) throughout Tralee subdv	Will compliment, but should not replace projects M90/91 and M92/93	1131 WATERFORD PL
M95	Subwatershed Improvement	9	Replace pipe with vegetated swale/infiltration trench, also variety of LID retrofits (bioretention, infiltration) between buildings and throughout landscaping of Cavalier subdv		1027 QUEENS CT

M96	Subwatershed Improvement	9	New infiltration basin at point location and variety of LID retrofits (bioretention, infiltration) between buildings and throughout landscaping of Potomac Fairways Sect 1 and Sect 2	1109 LOPEZ LA
M97	Stream Restoration	2	Daylight stream and restore to natural channel, including buffer restoration	1106 TWAY LA
M98	Subwatershed Improvement	9	New infiltration basin in athletic field, replace paved ditch with vegetated swale/infiltration trench	1719 SADLERS WELLS DR

Subwatershed SU-FL-0007 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Headwaters, primarily Golf Course & MDR, 1 non-SWM pond, no SWM control **Impairments** High stormwater flows, poor habitat health & diversity, poor water quality

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve habitat and water quality

Percent Impervious 29.33%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M100	Subwatershed Improvement	1	New naturalized basin/constructed wetland, drainage area approx 20 acres	Possible alternative to project M99	1200 MAGNOLIA LA
M101	Subwatershed Improvement	9	Variety of LID retrofits (bioretention/rain gardens, infiltration basins/trenches, vegetated swales, etc) throughout sports complex		661 DULLES PARK CT
M102	Subwatershed Improvement	1	New naturalized dry pond or constructed wetland		800 MOSBY HOLLOW DR
M103	Stream Restoration	2	Restore grass channels to natural stream channels and improve riparian buffers to the extent possible on Golf Course		1090 STERLING RD
M104	Subwatershed Improvement	9	Retrofit grass channel to vegetated swale/infiltration trench and restore riparian buffer to the extent possible on Golf Course		816 MOSBY HOLLOW DR
M105	Subwatershed Improvement	1	Replace pipe/concrete channel with new constructed wetland and restore riparian buffer downstream		810 MOSBY HOLLOW DR
M106	Subwatershed Improvement	1	New naturalized dry pond or constructed wetland with naturalized/vegetated swales at outlet		995 CRESTVIEW DR
M107	Subwatershed Improvement	1	New naturalized dry pond or constructed wetland with naturalized/vegetated swales at outlet		1301 BAYSHIRE LA
M108	Non-Structural		Targeted rain barrel program at Westfield subdv		1357 ICY BROOK DR
M99	Subwatershed Improvement	9	New infiltration basins, drainage area approx 20 acres	Possible alternative to project M100	751 BARBARALYNN PL

Subwatershed SU-FL-0008 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Mix of LDR, MDR, HDR, LIC, HIC and INT, no SWM control **Impairments** Poor habitat health, poor water quality, deficient riparian buffer

Restoration Selection Criteria Flooding **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (4.24%), STEPL **Improvement Goals** Improve riparian buffer, habitat and water quality

Percent Impervious 31.53%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M109	Subwatershed Improvement	1	New SWM pond/constructed wetland, drainage area approx 3 acres		1001 STANTON PARK CT
M110	Non-Structural		Targeted rain barrel program at Haloyon of Herndon Sect 5, Van Vlecks subdv, Ballou subdv, Saubers subdv, Herndon Station, & Herndon Park Station		1001 MONROE ST
M111	Subwatershed Improvement	9	New infiltration basin/LID suite, drainage area approx 2 acres	Possible alternative (along with project M112) to project M113	1021 KINGS CT
M112	Subwatershed Improvement	9	Disconnect upstream outfall from Cavalier Park subdv and re-route through new vegetated swale/infiltration trench into new infiltration basin/bioretention	Possible alternative (along with project M111) to project M113	1056 KNIGHT LA
M113	Subwatershed Improvement	1	New SWM pond/constructed wetland to intercept flow from 3 drainage pipes from Cavalier Park subdv - use vegetated swale to re-route flow from pipes to pond	Possible alternative to projects M111 & M112	1037 KINGS CT
M114	Subwatershed Improvement	9	Daylight stream between property boundaries and replace pipe with vegetated swale/infiltration trench		913 MCDANIEL CT
M115	Subwatershed Improvement	9	New infiltration basin, drainage area approx 11 acres	Possible alternative to project M116	937 BRANCH DR
M116	Subwatershed Improvement	1	New naturalized basin/constructed wetland, drainage area approx 11 acres	Possible alternative to project M115	930 PARK AV
M117	Subwatershed Improvement	9	Variety of LID retrofits (bioretention/rain gardens, infiltration basins/trenches, vegetated swales, etc) throughout Fortnightly Square		121 FORTNIGHTLY BV
M118	Subwatershed Improvement	1	New naturalized dry pond in existing depression, drainage area approx 34 acres		800 VINE ST

M119	Subwatershed Improvement	9	Integrate infiltration basin/bioretention into existing dry pond (not in StormNet)	Possible alternative to projects M120 & M121	769 GRACE ST
M120	Subwatershed Improvement	1	Retrofit existing dry pond (not in StormNet) to naturalized dry pond	Possible alternative to project M119, will compliment project M121	769 GRACE ST
M121	Subwatershed Improvement	9	New infiltration basin in athletic field	Will compliment project M120 or M119	763 GRACE ST
M122	Subwatershed Improvement	9	New infiltration basin and/or LID suite in field/lawn, drainage area approx 25 acres	Possible alternative to project M123	782 ELDEN ST
M123	Subwatershed Improvement	1	New naturalized dry pond in field/lawn, drainage area approx 25 acres	Possible alternative to project M122	782 ELDEN ST
M124	Subwatershed Improvement	9	Replace grass channel with vegetated channel/infiltration trench	Will require homeowner consent	879 STATION ST

Subwatershed SU-FL-0009 **Watershed:** Sugarland **Management Area:** Sugarland - Folly Lick

Description Headwaters, primarily MDR & HDR, with mix of INT, OS & HIC, 1 DP, most dev has no SWM control **Impairments** Poor habitat health, poor water quality

Restoration Selection Criteria **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (2.80%) **Improvement Goals** Improve habitat and water quality

Percent Impervious 37.29%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M125	Subwatershed Improvement	9	Daylight drainage channel and replace with vegetated channel/infiltration trench, also, disconnect drainage from dry pond and re-route to new vegetated channel with a second vegetated channel along rear of HDR	OS containing drainage channel is slated for HDR, moving the stream pre-emptively will ensure the stream is preserved in a natural condition and not paved over	559 LEGACY PRIDE DR
M126	Subwatershed Improvement	9	Daylight drainage channel and replace with vegetated channel/infiltration trench along edge of parking lot and between buildings		615 CENTER ST
M127	Subwatershed Improvement	9	Replace paved ditch with vegetated swale/infiltration trench		541 FLORIDA AV
M128	Subwatershed Improvement	9	New infiltration basin, re-route additional drainage to new basin, total drainage area potentially 12 acres		901 LOCUST ST
M129	Subwatershed Improvement	1	New naturalized dry pond or constructed wetland, re-route additional drainage to new basin, total drainage area potentially 12 acres		901 LOCUST ST
M130	Subwatershed Improvement	9	Integrate various LID retrofits into landscaping areas, bioretention, infiltration, rain barrels, etc.		523 FLORIDA AV
M131	Subwatershed Improvement	1	Retrofit existing dry pond (no StormNet ID) into naturalized basin	Possible alternative to project M132	627 LEGACY PRIDE DR
M132	Subwatershed Improvement	9	Integrate infiltration basin into existing dry pond (no StormNet ID), and replace paved low flow channel with vegetated swale/infiltration trench	Possible alternative to project M131	627 LEGACY PRIDE DR

M133	Subwatershed Improvement	1	New naturalized dry pond or constructed wetland, re-route additional drainage to new basin, total drainage area potentially 37 acres	484 VIRGINIA AV
M134	Non-Structural		Targeted rain barrel program at Chandon subdv	712 ARCHER CT

Subwatershed SU-HB-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Mostly in Loudoun, drains to Fairfax, headwaters subwatershed, primarily LDR & MDR, HIC along Leesburg Pike corridor, RT SW treatment at HIC **Impairments** high impervious in Loudoun, poor habitat, high flows per acre

Restoration Selection Criteria **Preservation Qualities**

Preservation Selection Criteria SW Ranking **Improvement Goals** capture impervious runoff, improve water quality

Percent Impervious 10.69%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
63	Subwatershed Improvement	9	New LID treatments (bioretention, infiltration trenches, filter strips, swales, cisterns) around HIC corner of Dranesville Rd & Leesburg Pike		21800 TOWNCENTER PZ
64	Subwatershed Improvement	9	New LID treatments (bioretention, infiltration trenches, filter strips, swales, cisterns) around HIC along Dranesville Rd		1015 DRANESVILLE RD

Subwatershed SU-MB-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Partially in Loudoun Co, highly developed w/ LDR & MDR w/ extensive SW pipe network, some OS, 2 DP **Impairments**

Restoration Selection Criteria **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (4.74%), SW Ranking **Improvement Goals**

Percent Impervious 20.47%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
69	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space		1369 ROCK CHAPEL RD
70	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space		1379 ROCK CHAPEL RD
71	Subwatershed Improvement	9	New infiltration basin to capture runoff from Hastings Hunt Sec. 6 HOA, drainage area approx 12 ac.	if infiltration not possible try project 72	1290 BROWNS MILL CT
72	Subwatershed Improvement	1	New dry pond to capture runoff from Hastings Hunt Sec. 6 HOA, total drainage area approx 12 ac.	if project 71 is unsuitable	1258 MASON MILL CT
73	Subwatershed Improvement	9	Retrofit dry pond 0828DP I209	if infiltration not possible, try project 74	12596 CROSS HOLLOW CT

Subwatershed SU-MB-0003 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, Subwatershed completely w/in Loudoun, drains to Fairfax Co.

Impairments

Restoration Selection Criteria

Preservation Qualities Headwaters subwatershed

Preservation Selection Criteria IMP, SW Ranking

Improvement Goals Completely w/in Loudoun Co. - no projects proposed

Percent Impervious 3.62%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
75	Subwatershed Improvement	9	Retrofit dry pond 0308DP w/ infiltration trench in basin bottom for added infiltration benefit, 22 ac. total drainage area		12500 CLIFF EDGE DR
76	Non-Structural		Rain barrel program Hastings Hunt HOA		1462 POWELLS TAVERN PL

Subwatershed SU-MB-0004 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, Subwatershed completely w/in Loudoun, drains to Fairfax Co.

Impairments

Restoration Selection Criteria

Preservation Qualities Headwaters subwatershed

Preservation Selection Criteria IMP, SW Ranking

Improvement Goals Completely w/in Loudoun Co. - no projects proposed

Percent Impervious 6.85%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
77	Non-Structural		Rain barrel program Crestbrook HoA & Jenkins Ridge HOA		1318 BROWNS MILL CT

Subwatershed SU-MB-0005 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, Subwatershed completely w/in Loudoun, drains to Fairfax Co.

Impairments

Restoration Selection Criteria

Preservation Qualities Headwaters subwatershed

Preservation Selection Criteria IMP, SW Ranking

Improvement Goals Completely w/in Loudoun Co. - no projects proposed

Percent Impervious 7.67%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed SU-PO-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Potomac

Description Bordering Loudoun, primarily LDR & OS, some ESR, no SWM

Impairments

Restoration Selection Criteria

Preservation Qualities

Headwaters subwatershed, large lot sizes and large forested and undeveloped open space areas, not planned for development

Preservation Selection Criteria IMP, SW Ranking

Improvement Goals

Preserve open space areas and implement general watershed-wide preservation strategies.

Percent Impervious 2.91%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed SU-PO-0002 **Watershed:** Sugarland **Management Area:** Sugarland - Potomac

Description Bordering Loudoun, primarily LDR & ESR, 1 DP **Impairments**

Restoration Selection Criteria **Preservation Qualities** Headwaters subwatershed, large low density lots, fully developed-no further proposed development

Preservation Selection Criteria IMP, SW Ranking **Improvement Goals** Implement general watershed-wide preservations strategies (i.e. public education & outreach, street sweeping, etc.)

Percent Impervious 8.56%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed SU-RI-0001 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Mostly LDR & MDR, OS along riparian corridor, Fairfax County Parkway (Rte 7100), drains some of Corbalis Water Treatment Plant, 4 DP **Impairments** high impervious, poor water quality, upstream watershed impacts

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve water quality

Percent Impervious 20.31%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
147	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29046 to naturalized infiltration basin, direct outfall fr. Shaker Woods/Corbalis to basin, increase size if necessary	if soils support infiltration, if not use project 148, coordinate w/ VDOT	12024 SUGARLAND VALLEY DR
148	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29046 to naturalized dry basin, direct outfall fr. Shaker Woods/Corbalis to basin, increase size if necessary	if project 147 unsuitable, coordinate w/ VDOT	12022 SUGARLAND VALLEY DR
149	Subwatershed Improvement	9	LID: retrofit dry pond 1032DP to naturalized infiltration basin	if soils support infiltration, if not use project 150	12014 ROSIERS BRANCH DR
150	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 1032DP to naturalized dry basin	if project 149 unsuitable	12012 ROSIERS BRANCH DR
151	Subwatershed Improvement	9	LID: retrofit dry pond 0898DP to naturalized infiltration basin	if soils support infiltration, if not use project 152	12003 MEADOWVILLE CT
152	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0898DP to naturalized dry basin	if project 151 unsuitable	1314 SHAKER WOODS RD
153	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29046 to naturalized infiltration basin	if soils support infiltration, if not use project 154, coordinate w/ VDOT	12002 HEATHER DOWN DR
154	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29046 to naturalized dry basin	if project 153 unsuitable, coordinate w/ VDOT	1409 NORTHPOINT GLEN CT
155	Subwatershed Improvement	7	Retrofit culvert at Fairfax County Pkwy, install control structure w/ micro-pool/wetland for increased runoff storage	coordinate w/ VDOT	1403 NORTHPOINT GLEN CT
156	Non-Structural		Rain barrel program Union Mill, North Point Glen, Stuart Ridge HOAs		11999 HEATHER DOWN DR
157	Non-Structural		Rain barrel program Shaker Woods, Shaker Grove & Kingstream HOAs		1306 SHAKER WOODS RD

Subwatershed SU-RI-0002 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Headwaters, primarily LDR & MDR, with HIC & HDR adjacent to Reston Parkway, extensive SW pipe system, 2 DP, 1 WP **Impairments** moderate erosion fr crossing impacts, high impervious

Restoration Selection Criteria Non-Priority **Preservation Qualities** OS along riparian buffer at risk for future development, headwaters subwatershed

Preservation Selection Criteria **Improvement Goals** repair culvert impacts, capture impervious runoff

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
158	Subwatershed Improvement	9	LID: retrofit dry pond 0887DP to naturalized infiltration basin	if soils support infiltration, if not use project 159	11922 FAWN RIDGE LA
159	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0887DP to naturalized dry basin	if project 158 unsuitable	11870 FAWN RIDGE LA
160	Streambank Stabilization	3	Clear outlets at dry pond 0336DP, stabilize downstream impacts		11600 QUAIL RIDGE CT
161	Stream Restoration	2	Remove concrete channel and restore natural stream channel		11603 QUAIL RIDGE CT
162	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space in headwaters		11879 FAWN RIDGE LA
163	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11723 GREAT OWL CI
164	Subwatershed Improvement	9	LID: New LID treatments around parking lots, driveways & between buildings @ North Point Villas & Summer Ridge - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11719 SUMMERCHASE CI
165	Subwatershed Improvement	9	LID: New LID treatments around parking lots, driveways and between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs cisterns, porous paving, sand filters etc.		1456 NORTH POINT VILLAGE CE

Subwatershed SU-RI-0003 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Headwaters, primarily LDR & MDR, OS along riparian corridor, 3 DP **Impairments** Drainage impacts in residential areas, ineffective SW controls, increased flow per acre, poor water quality

Restoration Selection Criteria Regional Pond and Field Recon/DC, Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide alternatives to regional pond, capture impervious runoff, improve drainage, improve water quality

Percent Impervious 13.83%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
166a	Regional Pond Alternatives	0	Drainage improvement: remove concrete channel along Pellow Circle Ct, replace w/ grass or veg swale, improve outfall structures		11672 PELLOW CIRCLE CT
166b	Regional Pond Alternatives	0	Drainage improvement: improve drainage channel and outfall structures off Deer Forest Rd		11642 DEER FOREST RD
166c	Regional Pond Alternatives	0	LID: New infiltration basins to intercept storm drains from Shaker Woods HOA, drainage area approx. 20.5 acres	if soils support infiltration otherwise use project 166d, will need 2 infil. basins	11599 SOUTHINGTON LA
166d	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from Caris Glenne HOA, drainage area approx. 7 acres	if project 166c is unsuitable	11599 SOUTHINGTON LA
166e	Regional Pond Alternatives	0	LID: retrofit dry pond VDOT29050 to naturalized infiltration basin	if soils support infiltration, if not use project 166f, direct drainage from Southington Lane to basin, coordinate w/ VDOT	11597 SOUTHINGTON LA
166f	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond VDOT29050 to naturalized dry basin	if project 166e unsuitable, direct drainage from Southington Lane to basin, coordinate w/ VDOT	11597 SOUTHINGTON LA
166g	Regional Pond Alternatives	0	LID: retrofit dry pond 0353DP to naturalized infiltration basin	if soils support infiltration, if not use project 166h, direct drainage fr Deer Forest Rd to basin	11640 DEER FOREST RD
166h	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 0353DP to naturalized dry basin	if project 166g unsuitable, direct drainage fr Deer Forest Rd to basin	11640 DEER FOREST RD

166i	Regional Pond Alternatives	0	LID: retrofit drainage swale w/ infiltration trench and check dams for add'l storage and infiltration benefits	omit infiltration trench if infiltration not possible	11622 DEER FOREST RD
166j	Regional Pond Alternatives	0	LID: New infiltration basin to intercept storm drains from Shaker Dr & Southington La, drainage area approx. 7.4 acres	if soils support infiltration otherwise use project 166k	1219 SHAKER DR
166k	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from Shaker Dr & Southington La, drainage area approx. 7.4 acres	if project 166j is unsuitable	11550 SOUTHINGTON LA
166l	Regional Pond Alternatives	0	LID: retrofit dry pond 0337DP to naturalized infiltration basin, remove concrete low flow channel, deepen basin, protect residences from basin overtopping	if soils support infiltration, if not use project 166m	11601 AUBURN GROVE CT
166m	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 0337DP to naturalized dry basin, remove concrete low flow channel, deepen basin, protect residences from basin overtopping	if project 166l unsuitable	11602 AUBURN GROVE CT
166n	Regional Pond Alternatives	0	Drainage improvement: remove concrete channel between Auburn Grove Ct & Golden Eagle Dr, replace w/ grass or veg swale, improve outfall structures		11607 AUBURN GROVE CT
167	Non-Structural		Rain barrel program Shaker Woods HOA		11584 SOUTHINGTON LA

Subwatershed SU-SU-0006 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, 1 LDR & ESR

Impairments

Restoration Selection Criteria

Preservation Qualities

Headwaters subwatershed, large low density lots and estates, low development potential

Preservation Selection Criteria SW Ranking

Improvement Goals

Implement general watershed-wide preservations strategies (i.e. public education & outreach, street sweeping, etc.)

Percent Impervious 19.59%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
1	Subwatershed Improvement	8	Remove concrete channel & replace with veg. swales at cul-de-sac on Woolington Road		11443 WOOLINGTON RD

Subwatershed SU-SU-0007 *Watershed:* Sugarland *Management Area:* Sugarland - Lower

Description Mostly in Loudoun, one building w/in Fairfax *Impairments*

Restoration Selection Criteria *Preservation Qualities*

Preservation Selection Criteria SW Ranking *Improvement Goals*

Percent Impervious 18.30%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed SU-SU-0008 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, primarily LDR & ESR, **Impairments** Channelized drainage
 some OS, 1 DP

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Drainage Improvements

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
2	Subwatershed Improvement	8	Remove concrete channel & replace with veg. swales @ Seneca Green Way		515 SENECA GREEN WY
3	Subwatershed Improvement	9	LID Retrofit dry pond 1445DP to naturalized infiltration basin	if soils support infiltration, if not use project 5	501 JACKSON TAVERN WY
4	Subwatershed Improvement	1	Retrofit dry pond 1445DP to naturalized dry basin	if project 4 unsuitable	511 JACKSON TAVERN WY

Subwatershed SU-SU-0012 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, primarily LDR & ESR, with some pastures & horse farms, 2 DP **Impairments** Poor habitat downstream of 2 dry ponds

Restoration Selection Criteria Non-Priority **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Restore stream buffers, improve water quality

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
5	Non-Structural		Riparian buffer restoration upstream and downstream of Brockman Court.	Stream runs through 2 properties, one upstream and one downstream of Brockman Court	603 BROCKMAN CT
6	Subwatershed Improvement	9	LID Retrofit dry pond 1447DP to naturalized infiltration basin	if soils support infiltration, if not use project 7	11655 GREAT FALLS WY
7	Subwatershed Improvement	1	Retrofit dry pond 1447DP to naturalized dry basin	if project 6 unsuitable	11655 GREAT FALLS WY
8	Subwatershed Improvement	9	LID Retrofit dry pond 1446DP to naturalized infiltration basin	if soils support infiltration, if not use project 8	604 NALLS FARM WY
9	Subwatershed Improvement	1	Retrofit dry pond 1446DP to naturalized dry basin	if project 7 unsuitable	604 NALLS FARM WY

Subwatershed SU-SU-0013 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, primarily ESR & LDR with some OS, 3 farm ponds, no SWM **Impairments** At risk for future development, damaged and undersized culvert, CEM Type 3 - Widening

Restoration Selection Criteria Field Recon/ ProRata **Preservation Qualities**

Preservation Selection Criteria IMP, % Increase IMP (6.50%), SW Ranking **Improvement Goals** Repair culvert, capture impervious runoff if possible

Percent Impervious 6.19%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
10	Road Crossing Improvement	4	Repair and replace culvert @ Kentland Drive	may not be needed if upstream projects reduce flow volume/velocities	619 KENTLAND DR
11	Stream Restoration	2	Place j-hooks/cross vanes to reduce erosive flows to culvert at Kentland Drive		619 KENTLAND DR
12	Subwatershed Improvement	9	New infiltration basin in open space lot on Keithley Drive, drainage area approx 5 ac.	if infiltration not possible try project 13	770 KEITHLEY DR
13	Subwatershed Improvement	1	New dry pond in open space lot on Keithley Drive, total drainage area approx 5 ac.	if project 12 is unsuitable	770 KEITHLEY DR
14	Road Crossing Improvement	4	repair and replace culvert @ driveway off Plantation Drive	2003 SPA shows high bank erosion upstream and downstream of culvert, culvert may be undersized, new home and driveway shown on 2007 aerial, need to field verify to see if problem still exists	11820 PLANTATION DR
15	Subwatershed Improvement	1	Retrofit existing farm pond to wet pond or constructed wetland	land-locked parcel to south (currently undeveloped) of farm pond could be purchased and used to expand size of SWM pond.	11601 AIR VIEW LA

Subwatershed SU-SU-0018 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, primarily ESR & LDR with some parcels being dev. or planned for dev. **Impairments** Flooding in Loudoun County, at risk for future development

Restoration Selection Criteria Flooding **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (9.14%), STEPL **Improvement Goals**

Percent Impervious 11.68%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
16	Stream Restoration	2	Remove concrete channel and restore stream channel		804 THOMAS RUN DR
17	Subwatershed Improvement	1	Retrofit existing farm pond to wet pond or constructed wetland	will require homeowners consent	11901 PLANTATION DR

Subwatershed SU-SU-0019 *Watershed:* Sugarland *Management Area:* Sugarland - Lower

Description Bordering Loudoun, primarily LDR & MDR w/ some ESR, OS adjacent to streams, *Impairments* 1 res bldg in Loudoun at risk of flooding,
Restoration Selection Criteria Flooding *Preservation Qualities* forested riparian buffers, low density lots and estates
Preservation Selection Criteria SW Ranking *Improvement Goals*
Percent Impervious 14.19%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
18	Preservation		Conservation easement to preserve riparian buffer		12001 THOMAS AV
19	Preservation		Conservation easement to preserve riparian buffer		12031 THOMAS AV

Subwatershed SU-SU-0020 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, primarily ESR & LDR w/ some MDR, 1 DP, 3 farm ponds **Impairments** At risk for some future development

Restoration Selection Criteria **Preservation Qualities** Headwaters subwatershed, large low density lots and estates

Preservation Selection Criteria IMP, % Increase IMP (8.13%), SW Ranking **Improvement Goals** Implement general watershed-wide preservations strategies (i.e. public education & outreach, street sweeping, etc.), preserve undeveloped lots to protect stream buffers

Percent Impervious 8.37%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
20	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space in headwaters		748 KENTLAND DR
21	Preservation		Conservation easement to preserve riparian buffer		11639 BLUE RIDGE LA
22	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space in headwaters		11819 THOMAS AV
23	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space in headwaters		11925 THOMAS AV

Subwatershed SU-SU-0021 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, primarily LDR w/ some MDR & ESR, 2 DP **Impairments**

Restoration Selection Criteria **Preservation Qualities** Headwaters with good riparian buffers, good IBI ratings and fair habitat scores

Preservation Selection Criteria SW Ranking **Improvement Goals** Implement general watershed-wide preservations strategies (i.e. public education & outreach, street sweeping, etc.)

Percent Impervious 11.36%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
24	Preservation		Conservation easement from homes along Tralee Dr & Rolling Meadow Dr to preserve riparian buffer		11550 TRALEE DR
25	Subwatershed Improvement	9	LID: retrofit dry pond 1454DP to naturalized infiltration basin	if soils support infiltration, if not use project 26	11538 TRALEE DR
26	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 1454DP to naturalized dry basin	if project 25 unsuitable	11528 TRALEE DR
27	Subwatershed Improvement	9	LID: retrofit dry pond 1382DP to naturalized infiltration basin	if soils support infiltration, if not use project 28	11558 TRALEE DR
28	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 1382DP to naturalized dry basin	if project 27 unsuitable	11558 TRALEE DR

Subwatershed SU-SU-0022 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Bordering Loudoun, primarily LDR & MDR, large OS areas - conservation easements?, no SWM **Impairments** SPA SUSU1-2-D7 ditch moderate impacts w/moderate erosion

Restoration Selection Criteria SPA Data, Flooding **Preservation Qualities**

Preservation Selection Criteria SW Ranking **Improvement Goals**

Percent Impervious 10.60%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
29	Subwatershed Improvement	8	Improve drainage channel and outfalls from LIC parcel along Leesburg Pike	could complement project31	12218 LEESBURG PI
30	Non-Structural		Riparian buffer restoration along Leesburg Pike		12219 LEESBURG PI
31	Subwatershed Improvement	9	Implement LID treatments (bioretention, filter strips, infiltration trenches, etc.)	could complement project 29	12218 LEESBURG PI

Subwatershed SU-SU-0024 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily LDR & MDR, adjacent to Leesburg Pike (Rte 7), some large areas of OS, 1 VDOT SWM facility **Impairments**

Restoration Selection Criteria Public Involvement **Preservation Qualities**

Preservation Selection Criteria IMP **Improvement Goals**

Percent Impervious 8.99%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
32	Subwatershed Improvement	8	Improve drainage channels & outfalls		12188 HOLLY KNOLL CI
33	Non-Structural		Remove construction debris, cut/fill spoils, reforest or restore riparian buffer	coordinate w/ VDOT	12200 LEESBURG PI
34	Subwatershed Improvement	9	LID: retrofit dry pond 1382DP to naturalized infiltration basin	if soils support infiltration, if not use project 35, coordinate w/ VDOT	12201 LEESBURG PI
35	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 1382DP to naturalized dry basin	if project 34 unsuitable, coordinate w/ VDOT	12201 LEESBURG PI

Subwatershed SU-SU-0026 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily LDR & some ESR, large OS areas-parks & recreation facilities, some INT & HIC, pot. hotspot , 3 DP, 2 non-SWM ponds, Leesburg Pike (Rte. 7) **Impairments** Deficient riparian buffers, CEM Type 4 (stabilizing), potential hotspot (Dranesville Auto Service), channelized drainage

Restoration Selection Criteria Regional Pond and Field Recon/ Regional Ponds **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Provide alternatives to regional pond, Preserve open space areas, address potential water quality issues fr hotspot, improve drainage channels

Percent Impervious 21.12%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
36g	Regional Pond Alternatives	0	Drainage Improvement: Remove concrete channels & replace w/ veg. swales along Hollyview Dr.		11786 HOLLYVIEW DR
36h	Regional Pond Alternatives	0	LID: Provide water quality pretreatment for runoff from Dranesville Auto Service - LID treatments such as sand filters, water quality inlets, rain gardens etc.	adjacent open space lot could be used to create bioretention/infiltration trench to provide water quality treatment.	11800 LEESBURG PI
36i	Regional Pond Alternatives	0	LID: retrofit dry pond DP0562 to naturalized infiltration basin	if soils support infiltration, if not use project 36j	1090 LIBERTY MEETING CT
36j	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond DP0562 to naturalized dry basin	if project 36i unsuitable	1090 LIBERTY MEETING CT
36k	Regional Pond Alternatives	0	New LID treatments (bioretention, infiltration trenches, filter strips, swales, cisterns) around school at Sugarland Rd & Liberty Meeting Ct	Implement project 37 together with this project	1090 LIBERTY MEETING CT
36l	Regional Pond Alternatives	0	SW Retrofit: Retrofit farm pond into a high quality constructed wetland with appropriate wetland plantings		11800 LEESBURG PI
36m	Regional Pond Alternatives	0	LID: New LID treatments around parking lot and along driveway - infiltration trenches, bioretention, filter strips, swales.	Implement project 39 together with this project	11801 LEESBURG PI
36n	Regional Pond Alternatives	0	LID: Add bioretention or filter strip to provide some water quality treatment to outfalls		11903 LEESBURG PI
36o	Regional Pond Alternatives	0	New infiltration basin in athletic field in Grand Hamptons Sec. 1 off Safa St. drainage area approx 0.36 ac.		1081 SAFA ST

36p	Regional Pond Alternatives	0	New SW: new swm pond to intercept storm drains from eastern half of Holly Knoll Development, drainage area approx 19 acres		11903 LEESBURG PI
36q	Regional Pond Alternatives	0	LID: retrofit dry pond 0656DP to naturalized infiltration basin	if soils support infiltration, if not use project 36r	1085 SAFA ST
36r	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 0656DP to naturalized dry basin	if project 36qunsuitable	1085 SAFA ST
36s	Regional Pond Alternatives	0	Drainage Improvement: Remove concrete channels & replace w/ veg. swales in median of Leesburg Pike		11714 LEESBURG PI
37	Non-Structural		Non-structural: provide informational signs at LID treatments and create educational program for students, parents and community	Implement project 36ktogether with this project	1090 LIBERTY MEETING CT
38	Non-Structural		Non-structural - riparian buffer restoration along Leesburg Pike @ driving range, will also provide highway screening		11800 LEESBURG PI
39	Non-Structural		Non-structural - provide informational signs at LID treatments.	Implement project 36mtogether with this project	11801 LEESBURG PI

Subwatershed SU-SU-0027 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Headwaters, primarily LDR w/ some ESR & OS protecting rip. buffers, 2 DP, 1 farm pond **Impairments** some deficient riparian buffers ds end, channelized drainage

Restoration Selection Criteria Drains to Regional Pond in SU-SU-0026 **Preservation Qualities** Headwaters subwatershed, highly developed w/ low future dev. potential, fair to good riparian buffers

Preservation Selection Criteria SW Ranking **Improvement Goals** Provide alternatives to regional pond, restore stream buffers, protect riparian buffers, capture impervious runoff

Percent Impervious 13.72%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
36a	Regional Pond Alternatives	0	Drainage Improvement: Remove concrete channels & replace w/ veg. swales along Saunders Haven Ct.		11503 SAUNDERS HAVEN CT
36b	Regional Pond Alternatives	0	LID: retrofit dry pond 0570DP to naturalized infiltration basin	if soils support infiltration, if not use project 36c	11697 HOLLYVIEW DR
36c	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 0570DP to naturalized dry basin	if project 36b unsuitable	11695 HOLLYVIEW DR
36d	Regional Pond Alternatives	0	LID: retrofit dry pond 1332DP to naturalized infiltration basin	if soils support infiltration, if not use project 36e	11562 SENECA HILL CT
36e	Regional Pond Alternatives	0	SW Retrofit: Retrofit dry pond 1332DP to naturalized dry basin	if project 36d unsuitable	11525 SENECA WOODS CT
36f	Regional Pond Alternatives	0	SW Retrofit: Retrofit farm pond to constructed wetland or wet pond		11700 LEESBURG PI
40	Non-Structural		Riparian buffer restoration downstream of farm pond		11706 LEESBURG PI
41	Non-Structural		Rain barrel program Holly Knoll HOA		11697 HOLLYVIEW DR
42	Non-Structural		Rain barrel program Saunders Haven & D. J. Smithers HOAs		11509 SAUNDERS HAVEN CT
43	Non-Structural		Rain barrel program Great Falls Woods HOA		1004 PRESERVE CT

Subwatershed SU-SU-0028 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Bordering Loudoun, primarily LDR w/ some LIC & OS, 4 dp, 1 farm pond, Leesburg Pike (Rte 7) & Dranesville Rd (Rte 228) **Impairments** Severe erosion (5-6') on Sugarland Run along Dranesville Rd. - 15' headcut and undercut banks, high SW outfalls, multiple obstructions and ditch impacts

Restoration Selection Criteria SPA Data **Preservation Qualities** large forested riparian buffers, at risk for increased impervious and increased nutrient loading

Preservation Selection Criteria % Increase IMP (26.19%), STEPL **Improvement Goals** Capture impervious runoff and reduce erosive flows, stabilize and restore erosion impacts, preserve open space & riparian buffers

Percent Impervious 19.86%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
44	Stream Restoration	2	Repair eroded banks at SPA erosion point SUSU1-2-E4		1021 DRANESVILLE RD
45	Subwatershed Improvement	9	LID retrofit dry pond 0570DP to infiltration basin. Additional LID around building & parking lot - bioretention, infiltration trenches, filter strips, swales, cisterns	if infiltration not possible try project 46	1100 DRANESVILLE RD
46	Subwatershed Improvement	1	SW Retrofit dry pond 0570DP to naturalized dry pond	if project 45 is unsuitable	1100 DRANESVILLE RD
47	Subwatershed Improvement	9	LID retrofit potential dry pond to infiltration basin or bioretention. Additional LID around building & parking lot - infiltration trenches, filter strips, swales, cisterns, rain gardens.	if infiltration not possible try project 48	1108 DRANESVILLE RD
48	Subwatershed Improvement	9	SW Retrofit potential dry pond to naturalized dry pond	if project 47 is unsuitable	1108 DRANESVILLE RD
49	Subwatershed Improvement	9	New infiltration basin to capture runoff from Grand Hamptons II HOA, drainage area approx 6 ac.	if infiltration not possible try project 50	12213 WINDSOR HALL WY
50	Subwatershed Improvement	1	New dry pond to capture runoff from Grand Hamptons II HOA, total drainage area approx 6 ac.	if project 49 is unsuitable	12211 WINDSOR HALL WY
51	Subwatershed Improvement	9	SW retrofit dry pond 1034DP to constructed wetland or wet pond		12125 WINDSOR HALL WY
52	Subwatershed Improvement	8	Improve drainage channel and outfall at SPA ditch SUSU1-2-D9 and clear obstructions upstream and downstream of ditch		1048 PLATO LA

53	Subwatershed Improvement	9	Install veg. swale w/ check dams or bioretention to capture runoff from outfall		12150 WINDSOR HALL WY
54	Subwatershed Improvement	9	New infiltration basin to capture runoff from Laing at Sugarland HOA, drainage area approx 7.2 ac.	if infiltration not possible try project 55	1062 METHVEN CT
55	Subwatershed Improvement	1	New dry pond to capture runoff from Grand Laing at Sugarland HOA, total drainage area approx 7.2 ac.	if project 54 is unsuitable	1062 METHVEN CT
56	Subwatershed Improvement	9	Install veg. swale w/ check dams or bioretention to capture runoff from outfall		12146 WINDSOR HALL WY
57	Subwatershed Improvement	8	Improve drainage channel & outfall		12154 WINDSOR HALL WY
58	Subwatershed Improvement	8	Improve drainage channel and outfall at SPA ditch SUSU1-2-D10 and clear obstructions upstream and downstream of ditch		12282 MILLWOOD POND CT
59	Subwatershed Improvement	9	LID retrofit dry pond DP0501 to infiltration basin. Additional LID around building & parking lot - bioretention, infiltration trenches, filter strips, swales, cisterns	if infiltration not possible try project 60	1013 DRANESVILLE RD
60	Subwatershed Improvement	1	SW Retrofit dry pond DP0501 to naturalized dry pond	if project 59 is unsuitable	1013 DRANESVILLE RD
61	Non-Structural		Rain barrel program Grand Hamptons II HOA		12206 WINDSOR HALL WY
62	Non-Structural		Rain barrel program Laing at Sugarland		1066 METHVEN CT

Subwatershed SU-SU-0029 **Watershed:** Sugarland **Management Area:** Sugarland - Lower

Description Mostly in Loudoun drains to Fairfax, primarily MDR & LDR, Dranesville Rd, 1 DP, 1 farm pond **Impairments** high impervious in Loudoun

Restoration Selection Criteria **Preservation Qualities** Artificial wetlands created from Dranesville Rd relocation

Preservation Selection Criteria SW Ranking **Improvement Goals** Capture impervious runoff, preserve & enhance wetlands

Percent Impervious 17.84%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
65	Subwatershed Improvement	9	LID retrofit dry pond 1257DP to infiltration basin.	if infiltration not possible try project 66	1111 LANDERSET DR
66	Subwatershed Improvement	1	SW Retrofit dry pond 1257DP to naturalized dry pond	if project 65 is unsuitable	1109 LANDERSET DR
67	Subwatershed Improvement	1	SW retrofit artificial wetlands adjacent to Dranesville road to high quality constructed wetlands w/ sediment forebays		1103 LANDERSET DR
68	Non-Structural		Rain barrel program Colvin Hunt HOA		12418 WILLOW FALLS DR

Subwatershed SU-SU-0030 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily MDR & LDR, extensive forested riparian buffers, large SW pipe networks - most areas routed to SW facilities, 3 DP, 1 WP, 1 farm pond **Impairments** CEM Type 3 & Type 4, some large obstructions and multiple outfalls and ditches may be causing moderate erosion on outer bends

Restoration Selection Criteria SPA Data **Preservation Qualities** extensive forested riparian buffers

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and reduce erosive flows, stabilize and restore erosion impacts

Percent Impervious 21.04%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
78	Subwatershed Improvement	1	Retrofit dry pond 0074DP to naturalized dry pond, add sediment forebays or wq pretreatment, splitting into multiple naturalized dry ponds		1345 BUTTER CHURN DR
79	Subwatershed Improvement	8	Improve drainage channels & outfalls from dry pond 0074DP		1345 BUTTER CHURN DR
80	Subwatershed Improvement	8	Improve drainage channels & outfalls from dry pond 0074DP		1353 BUTTER CHURN DR
81	Non-Structural		Remove fallen tree and debris blocking flow of stream channel		12220 HEATHER WY
82	Subwatershed Improvement	8	Repair and improve drainage channel, provide additional flow dissipation		12214 HEATHER WY
83	Subwatershed Improvement	8	Improve drainage channels & outfalls from dry pond 0508DP		12217 SUGAR MAPLE DR
84	Subwatershed Improvement	9	LID: retrofit dry pond 0508DP to naturalized infiltration basin	if soils support infiltration, if not use project 85	12217 SUGAR MAPLE DR
85	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0508DP to naturalized dry basin	if project 84 unsuitable	12213 SUGAR MAPLE DR
86	Subwatershed Improvement	1	SW Retrofit: Retrofit farm pond to constructed wetland or wet pond		12214 SUGAR CREEK CT
87	Subwatershed Improvement	9	LID: retrofit dry pond 0508DP to naturalized infiltration basin	if soils support infiltration, if not use project 88	1141 BANDY RUN RD
88	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0508DP to naturalized dry basin	if project 87 unsuitable	1137 BANDY RUN RD
89	Subwatershed Improvement	9	LID: remove concrete channels and create naturalized infiltration basin	if soils support infiltration, if not use project 90	1072 METHVEN CT

90	Subwatershed Improvement	1	New SWM: remove concrete channels and install naturalized dry basin	if project 89unsuitable	1070 METHVEN CT
91	Non-Structural		Rain Barrel Program	Sugar Creek HOA	1150 BANDY RUN RD
92	Non-Structural		Rain Barrel Program	Crestwood HOA	1323 ROCK CHAPEL RD
93	Non-Structural		Rain Barrel Program	Millwood Pond HOA & Grand Hamptons II HOA	1159 MILLWOOD POND DR
94	Stream Restoration	2	Repair eroding banks at SPA erosion points	SUFF-2-1-E1	12218 HEATHER WY
95	Stream Restoration	2	Repair eroding banks at SPA erosion points	SUSU1-3-E5	1164 MILLWOOD POND DR

Subwatershed SU-SU-0031 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Primarily highly developed MDR w/ OS around riparian buffer, no SWM **Impairments** Stream erosion from uncontrolled runoff and large obstruction, high SW outfalls, high impervious, poor water quality

Restoration Selection Criteria SPA Data **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and reduce erosive flows, stabilize and restore erosion impacts

Percent Impervious 28.55%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
112	Subwatershed Improvement	9	LID: New infiltration basins to intercept storm drains from Crestbrook subdivision, drainage area approx. 24 acres	will need at least 2 basins, if soils support infiltration otherwise use project 113	1405 BAKERS CREEK CT
113	Subwatershed Improvement	1	New SW: new swm pond to intercept storm drains from Crestbrook subdivision, drainage area approx. 24 acres	if project 112 is unsuitable	12400 SHALLOW FORD CT
114	Subwatershed Improvement	9	LID: New infiltration basins to intercept storm drains from Crestbrook subdivision, drainage area approx. 2.5 acres	will need at least 2 basins, if soils support infiltration otherwise use project 115	1312 YELLOW TAVERN CT
115	Subwatershed Improvement	1	New SW: new swm pond to intercept storm drains from Crestbrook subdivision, drainage area approx. 2.5 acres	if project 114 is unsuitable	1375 BUTTER CHURN DR
116	Stream Restoration	2	Stabilize and repair eroded bank at SPA erosion point SUSU1-3-E6		1375 BUTTER CHURN DR
117	Non-Structural		Rain Barrel Program Crestbrook HOA		1334 SHALLOW FORD RD
118	Non-Structural		Remove obstruction at SPA obstruction point SUSU1-3-O8		12222 HEATHER WY

Subwatershed SU-SU-0032 **Watershed:** Sugarland **Management Area:** Sugarland - Lower Middle

Description Mostly MDR w/ some LDR, INT in the southeast part of subwatershed, OS along riparian corridor, extensive SW piping network, 9 DP, 1 WP **Impairments** Stream erosion and ditch impact from uncontrolled runoff, high SW outfalls, high impervious, poor water quality

Restoration Selection Criteria SPA Data, Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and reduce erosive flows, stabilize and restore erosion impacts, improve water quality

Percent Impervious 22.23%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
119	Subwatershed Improvement	9	LID: retrofit dry pond 0901DP to naturalized infiltration basin	if soils support infiltration, if not use project 120	12108 COURTNEY CT
120	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0901DP to naturalized dry basin	if project 119 unsuitable	12108 COURTNEY CT
121	Subwatershed Improvement	9	LID: retrofit dry pond 0899DP to naturalized infiltration basin	if soils support infiltration, if not use project 122	12109 COURTNEY CT
122	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0899DP to naturalized dry basin	if project 121 unsuitable	12118 SANDY CT
123	Subwatershed Improvement	9	LID: New infiltration basins to intercept storm drains from portion of Shaker Woods HOA, drainage area approx. 5 acres	if soils support infiltration otherwise use project 124	12111 SANDY CT
124	Subwatershed Improvement	1	New SW: new swm pond to intercept storm drains from Shaker Woods HOA, drainage area approx. 5 acres	if project 123 is unsuitable	12109 SANDY CT
125	Subwatershed Improvement	9	LID: retrofit dry pond DP0345 to naturalized infiltration basin	if soils support infiltration, if not use project 126	12024 MEADOWVILLE CT
126	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0345 to naturalized dry basin	if project 125 unsuitable	12024 MEADOWVILLE CT
127	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29054 to naturalized infiltration basin	if soils support infiltration, if not use project 128, coordinate w/ VDOT	12058 SUGARLAND VALLEY DR
128	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29054 to naturalized dry basin	if project 127 unsuitable, coordinate w/ VDOT	12054 SUGARLAND VALLEY DR
129	Subwatershed Improvement	9	LID: retrofit dry pond 0575DP to naturalized infiltration basin	if soils support infiltration, if not use project 130	12250 EXBURY ST

130	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0575DP to naturalized dry basin	if project 129 unsuitable	12250 EXBURY ST
131	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29053 to naturalized infiltration basin	if soils support infiltration, if not use project 132, coordinate w/ VDOT	12262 STREAMVALE CI
132	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29053 to naturalized dry basin	if project 131 unsuitable, coordinate w/ VDOT	12256 STREAMVALE CI
133	Non-Structural		Informational signage along trails for outreach	complements project 131 or 132	12256 STREAMVALE CI
134	Stream Restoration	2	Repair eroding banks at SPA erosion points SUSU1-1-E1		1404 VALEBROOK LA
135	Stream Restoration	2	Repair eroding banks at SPA erosion points SUSU1-1-E2		12035 SUGARLAND VALLEY DR
136	Subwatershed Improvement	9	LID: retrofit dry pond 0313DP to naturalized infiltration basin	if soils support infiltration, if not use project 137	12227 PARKSTREAM TE
137	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0313DP to naturalized dry basin	if project 136 unsuitable	1449 KINGSTREAM DR
138	Subwatershed Improvement	9	LID: retrofit dry pond 0434DP to naturalized infiltration basin	if soils support infiltration, if not use project 138	12122 EDDYSPARK DR
139	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0434DP to naturalized dry basin	if project 137 unsuitable	1407 VALEBROOK LA
140	Subwatershed Improvement	9	LID: retrofit dry pond 0845DP to naturalized infiltration basin	if soils support infiltration, if not use project 141	12149 EDDYSPARK DR
141	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0845DP to naturalized dry basin	if project 140 unsuitable	1570 KINGSTREAM CI
142	Subwatershed Improvement	9	New infiltration basin on athletic fields at school, drainage area approx. 2 acres each.	if soils support infiltration	12235 PARKSTREAM TE
143	Subwatershed Improvement	9	LID: New LID treatments around parking lot and along driveway - infiltration trenches, bioretention, filter strips, swales.	Implement project 144 together with this project	1464 KINGVALE CI
144	Non-Structural		Provide informational signs at LID treatments.	Implement project 143 together with this project	1470 KINGVALE CI
145	Non-Structural		Rain barrel program Shaker Woods HOA		12168 EDDYSPARK DR
146	Non-Structural		Rain barrel program Kingstream HOA		1236 ROWLAND DR

Subwatershed SU-SU-0034 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description MDR w/ some LDR, OS along small riparian corridor, no SWM, all SW pipes outfall to stream **Impairments** At risk for future development, some erosion and ditch impacts from uncontrolled runoff, major debris jams, high SW outfalls, high impervious, poor water quality

Restoration Selection Criteria SPA Data **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (5.99%), STEPL **Improvement Goals** clear debris jams, capture impervious runoff and reduce erosive flows, stabilize and restore erosion and ditch impacts, improve water quality

Percent Impervious 28.58%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
168	Subwatershed Improvement	9	LID: install vegetated swale with check dams & infiltration trench to promote detention and infiltration		714 JENNY ANN CT
169	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 170 together with this project	840 DRANESVILLE RD
170	Non-Structural		Non-structural - provide informational signs at LID treatments.	Implement project 169 together with this project	840 DRANESVILLE RD
171	Subwatershed Improvement	9	LID: New infiltration basin in INT lot, drainage area approx. 12 acres	if soils support infiltration otherwise use project 172	844 DRANESVILLE RD
172	Subwatershed Improvement	1	New SW: new swm pond in INT lot, drainage area approx. 12 acres	if project 171 is unsuitable	844 DRANESVILLE RD
173	Preservation		Conservation easement or lot purchase to preserve riparian buffer and forested open space		700 JENNY ANN CT
174	Subwatershed Improvement	9	LID: New infiltration basins in undeveloped OS lot, drainage area approx. 28 acres	if project 173 is implemented, if soils support infiltration otherwise use 174	702 JENNY ANN CT
175	Subwatershed Improvement	1	New SW: new swm pond in undeveloped OS lot, drainage area approx. 28 acres	if project 174 is unsuitable	702 JENNY ANN CT
176	Stream Restoration	3	Stabilize eroded bank at SPA erosion point SUSU018.E001		722 HUNTSMAN PL
177	Non-Structural		Remove obstruction at SPA obstruction point SUUT4-1-O2 & O3, and stabilize erosion impacts		12201 WOODVALE CT

178	Non-Structural	Rain barrel program Van Vecks Subdivision, Barker Hill Sec. 1, Graymoor & Chestnut Grove HOAs	788 3RD ST
179	Non-Structural	Rain barrel program Iron Ridge Sec. 2, Potomac Fairways, & Jeneba Woods HOAs	620 3RD ST
180	Non-Structural	Rain barrel program Old Dranesville Hunt Club HOA	718 OLD HUNT WY

Subwatershed SU-SU-0035 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Stream relocated by Fairfax Co. Pkwy, primarily HDR, w/ mixed LDR/MDR, HIC/LIC along Dulles Access Rd, some OS along riparian corridors, poor riparian buffer, 2 DP, 1 WP - regional pond

Impairments Straightened & relocated stream, immediately adjacent to Fairfax County Pkwy, potential for flooding, high impervious, deficient buffers, poor habitat, poor water quality

Restoration Selection Criteria Flooding

Preservation Qualities

Preservation Selection Criteria

Improvement Goals Improve crossings, restore naturalized stream condition, capture impervious runoff and reduce erosive flows, improve water quality

Percent Impervious 29.96%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
215	Subwatershed Improvement	8	Improve drainage channel and outfalls from Creekbend Dr		12016 CREEKBEND DR
216	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29041 to naturalized infiltration basin,	if soils support infiltration, if not use project 217, coordinate w/ VDOT	1606 POPLAR GROVE DR
217	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29041 to naturalized dry basin	if project 216 unsuitable, coordinate w/ VDOT	1610 POPLAR GROVE DR
218	Stream Restoration	2	Restore naturalized stream channel		11957 GREY SQUIRREL LA
219	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29040 to naturalized infiltration basin,	if soils support infiltration, if not use project 220, coordinate w/ VDOT	1707 SUNDANCE DR
220	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29040 to naturalized dry basin	if project 219 unsuitable, coordinate w/ VDOT	1707 SUNDANCE DR
221	Road Crossing Improvement	4	Remove/replace culvert, raise bed of access road off of Fairfax Co Pkwy, repair crossing impacts		1681 CEDAR HOLLOW WY
222	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11951 KILLINGSWORTH AV
223	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11790 BARON CAMERON AV

224	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		1651 RESTON PW
225	Subwatershed Improvement	9	New infiltration basin in athletic field off Reston Pkwy. drainage area approx 7 ac. Additional LID projects such as infiltration trenches, bioretention, filter strip, swales, green roofs etc. around parking lot and between buildings	Implement project 226 together with this project	1635 RESTON PW
226	Non-Structural		Non-structural: provide informational signs at LID treatments and create educational program for students, parents and community	Implement project 225 together with this project	1635 RESTON PW

Subwatershed SU-SU-0036 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Headwaters, mostly HDR/MDR, OS along riparian corridors, INT slated for OS in future, extensive SW pipe networks, 3 DP, 1 WP **Impairments** Riprap undermining channel, moderate to high erosion, blocked/clogged dry pond outlets, high impervious, high SW outfalls, fair habitat

Restoration Selection Criteria Field Recon/DC, Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and reduce erosive flows, remove riprap, stabilize and repair damaged channels

Percent Impervious 29.10%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
181	Subwatershed Improvement	9	LID: retrofit dry pond at Fairfax Co. Pkwy & Walnut Branch Rd to naturalized infiltration basin	if soils support infiltration, if not use project 182	12002 WALNUT BRANCH RD
182	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond at Fairfax Co Pkwy & Walnut Branch Rd to naturalized dry basin	if project 181 unsuitable	11967 GREY SQUIRREL LA
183	Subwatershed Improvement	9	LID: retrofit dry pond 0334DP to naturalized infiltration basin	if soils support infiltration, if not use project 184	1555 TRAILS EDGE LA
184	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0334DP to naturalized dry basin	if project 183 unsuitable	1557 TWISTED OAK DR
185	Subwatershed Improvement	9	LID: retrofit dry pond 0333DP to naturalized infiltration basin	if soils support infiltration, if not use project 185	11922 WINSTEAD LA
186	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 0333DP to naturalized dry basin	if project 184 unsuitable	11922 WINSTEAD LA
187	Subwatershed Improvement	9	LID: New infiltration basins in undeveloped OS lot, drainage area approx. 6 acres	if soils support infiltration otherwise use 188	1502 TWISTED OAK DR
188	Subwatershed Improvement	1	New SW: new swm pond in undeveloped OS lot, drainage area approx. 6 acres	if project 187 is unsuitable	1481 AUTUMN RIDGE CI
189	Stream Restoration	3	Remove riprap that is undermining channel, stabilize banks, restore riparian buffer		1550 RESTON PW
190	Subwatershed Improvement	9	LID: New infiltration basin in athletic field, intercept drainage fr western half of Reston Sec. 45, drainage area approx. 15 acres	if soils support infiltration	1550 RESTON PW
191	Subwatershed Improvement	9	LID: New infiltration basins in undeveloped OS lot, drainage area approx. 10 acres	if soils support infiltration otherwise use 192	1567 TRAILS EDGE LA

192	Subwatershed Improvement	1	New SW: new swm pond in undeveloped OS lot, drainage area approx. 10 acres	if project 191 is unsuitable	11723 OLD BAYBERRY LA
193	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		1668 HARVEST GREEN CT
194	Subwatershed Improvement	9	LID: new vegetated or grass swale w/ check dams and infiltration trench to promote detention storage & infiltration	omit infiltration trench if infiltration not possible	1560 TWISTED OAK DR
195	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	11758 ARBOR GLEN WY
196	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	1542 TWISTED OAK DR
197	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	1541 WOODCREST DR
198	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	1509 DEER POINT WY
199	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	1543 POPLAR GROVE DR
200	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	include signage & rain barrel program for education & outreach	1508 AUTUMN RIDGE CI
201	Subwatershed Improvement	9	LID: New infiltration basins in INT lot, drainage area approx. 13.5 acres	intercept outfalls from adjacent HDR area, if soils support infiltration otherwise use 202	1500 POPLAR GROVE DR
202	Subwatershed Improvement	1	New SW: new swm pond in INT lot, drainage area approx. 13.5 acres	intercept outfalls from adjacent HDR area, if project 201 is unsuitable	11875 LAKE NEWPORT RD

Subwatershed SU-SU-0037 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Headwaters, highly developed w/ HIC, HDR & LIC, some OS in parks & INT areas, extensive SW pipe networks 1 RT, 1 WP - regional pond **Impairments** Poor drainage at Library, high impervious, high SW outfalls, potential for future pollutant loading

Restoration Selection Criteria Field Recon/DC **Preservation Qualities**

Preservation Selection Criteria STEPL **Improvement Goals** Capture impervious runoff, and improve drainage

Percent Impervious 56.20%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
227	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11999 EDGEMERE CI
228	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 229 together with this project	1850 TOWN CENTER DR
229	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 228 together with this project	12062 EDGEMERE CI
230	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		1842 BOWMAN TOWNE CT
231	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 229 together with this project	11925 BOWMAN TOWNE DR
232	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 228 together with this project	11925 BOWMAN TOWNE DR
233	Subwatershed Improvement	9	LID: New infiltration basins in LIC lot along Bowman Towne Dr., drainage area approx. 6 acres	if soils support infiltration otherwise use 234	11925 BOWMAN TOWNE DR
234	Subwatershed Improvement	1	New SW: new swm pond in LIC lot along Bowman Towne Dr., drainage area approx. 6 acres	if project 233 is unsuitable	1778 FOUNTAIN DR

235	Subwatershed Improvement	9	LID: New infiltration basins in OS/INT lot along Bowman Towne Dr., drainage area approx. 13 acres	if soils support infiltration otherwise use 236, intercept drainage from HIC area @ New Dominion PW & Fountain Dr	1815 FOUNTAIN DR
236	Subwatershed Improvement	1	New SW: new swm pond in OS/INT lot along Bowman Towne Dr., drainage area approx. 13 acres	if project 233 is unsuitable, intercept drainage from HIC area @ New Dominion PW & Fountain Dr	1815 FOUNTAIN DR
237	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11810 FREEDOM DR
238	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		1857 FOUNTAIN DR
239	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11870 SPECTRUM CE
240	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		11816 SPECTRUM CE
241	Subwatershed Improvement	9	LID: New infiltration basins in OS lot along Fountain Dr., drainage area approx. 13 acres	if soils support infiltration otherwise use 242, intercept drainage from HIC area across Fountain Dr	1778 FOUNTAIN DR
242	Subwatershed Improvement	1	New SW: new swm pond in OS lot along Fountain Dr., drainage area approx. 13 acres	if project 241 is unsuitable, intercept drainage from HIC area across Fountain Dr	1778 FOUNTAIN DR
243	Subwatershed Improvement	9	LID: New infiltration basins in INT lot along Cameron Glen Dr., drainage area approx. 6 acres	if soils support infiltration otherwise use 244, intercept drainage from INT area along Cameron Glen Dr	12000 BOWMAN TOWNE DR
244	Subwatershed Improvement	1	New SW: new swm pond in OS lot along Cameron Glen Dr., drainage area approx. 6 acres	if project 243 is unsuitable, intercept drainage from HIC area along Cameron Glen Dr	12000 BOWMAN TOWNE DR

Subwatershed SU-SU-0038 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Primarily MDR w/ some LDR, large OS parcels protecting riparian corridor, extensive SW pipe network but no SWM treatment **Impairments** Public comments indicate flooding & inadequate SWM, uncontrolled runoff directed to streams, high impervious, poor water quality

Restoration Selection Criteria Public Involvement **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and improve water quality

Percent Impervious 24.39%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
203	Subwatershed Improvement	9	LID: New infiltration basins in OS lot, drainage area approx. 6 acres	intercept outfalls from adjacent MDR area, if soils support infiltration otherwise use 204	401 CAVENDISH ST
204	Subwatershed Improvement	1	New SW: new swm pond in OS lot, drainage area approx. 6 acres	intercept outfalls from adjacent MDR area, if project 203 is unsuitable	401 CAVENDISH ST
205	Subwatershed Improvement	1	New SW: new swm pond in OS lot, drainage area approx. 42 acres	intercept outfalls from adjacent MDR area	1108 CRITON ST
206	Subwatershed Improvement	9	LID: New infiltration basins in OS lot, drainage area approx. 6 acres	intercept outfalls from adjacent MDR area, if soils support infiltration otherwise use 208	400 QUEENS ROW ST
207	Subwatershed Improvement	1	New SW: new swm pond in OS lot, drainage area approx. 6 acres	intercept outfalls from adjacent MDR area, if project 207 is unsuitable	401 QUEENS ROW ST
208	Subwatershed Improvement	9	LID: New infiltration basins in OS lot, drainage area approx. 18 acres	intercept outfalls from adjacent MDR/LDR area, if soils support infiltration otherwise use 209, may need 2 basins	12024 CREEKBEND DR
209	Subwatershed Improvement	1	New SW: new swm pond in OS lot, drainage area approx. 18 acres	intercept outfalls from adjacent MDR area, if project 208 is unsuitable	12018 CREEKBEND DR
210	Subwatershed Improvement	9	LID: New infiltration basins in OS lot, drainage area approx. 18 acres	intercept outfalls from adjacent MDR/LDR area, if soils support infiltration otherwise use 209, may need 2 basins	12097 WALNUT BRANCH RD

211	Subwatershed Improvement	1	New SW: new swm pond in OS lot, drainage area approx. 18 acres	intercept outfalls from adjacent MDR area, if project 208 is unsuitable, potential for wet pond/wetland depending on base flow	12157 PURPLE SAGE CT
212	Non-Structural		Targeted rain barrel program @ Hunter's Creek Sec. 2		1104 CLARKE ST
213	Non-Structural		Targeted rain barrel program @ Reston Sec. 49		12039 CREEKBEND DR
214	Preservation		Conservation easement to preserve riparian buffer		12048 CREEKBEND DR

Subwatershed SU-SU-0039 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Mostly MDR, some LDR, HIC & HDR along southern part of watershed, INT in northwest part, ESR adjacent to stream on east side, 2 DP **Impairments** high impervious, high SW outfalls, poor water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff and improve water quality

Percent Impervious 31.93%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
245	Stream Restoration	2	Stabilize failing stream banks		409 QUEENS ROW ST
246	Subwatershed Improvement	9	LID: New infiltration basins in OS lot east of Herndon Pkwy, drainage area approx. 10 acres	if soils support infiltration otherwise use 247, intercept drainage from Hunters Creek HOA along Merlins Lane.	115 HERNDON PW
247	Subwatershed Improvement	1	New SW: new swm pond in OS lot east of Herndon Pkwy, drainage area approx. 10 acres	if project 246 is unsuitable, intercept drainage from Hunters Creek HOA along Merlins Lane.	115 HERNDON PW
248	Subwatershed Improvement	1	New SW: new swm pond in OS lot east of Herndon Pkwy, drainage area approx. 40 acres	depending on base flow, may be wet pond or constructed wetland	903 LEONA LA
249	Subwatershed Improvement	9	LID: retrofit dry pond adjacent to Leona Lane to naturalized infiltration basin	if soils support infiltration, if not use project 250	917 LEONA LA
250	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond adjacent to Leona Lane to naturalized dry basin	if project 249 unsuitable	917 LEONA LA
251	Subwatershed Improvement	8	Improve drainage channel and outfalls from Reneau Wy.		371 RENEAU WY
252	Subwatershed Improvement	9	LID: New infiltration basin in athletic field off Reston Pkwy. drainage area approx 6 ac.		504 WOODSHIRE LA
253	Subwatershed Improvement	9	LID: New infiltration basin in INT lot off Dranesville Rd, drainage area approx 13 ac.	if soils support infiltration, if not use project 254	529 MERLINS LA
254	Subwatershed Improvement	1	New SW: New SWM pond in INT lot off Dranesville Rd, drainage area approx 13 ac.	if project 253 unsuitable	529 MERLINS LA

255	Subwatershed Improvement	9	LID: retrofit dry pond in INT lot off Park Ave. to naturalized infiltration basin	if soils support infiltration, if not use project 256	902 GRANT ST
256	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond in INT lot off Park Ave. to naturalized dry basin	if project 255 unsuitable	603 DRANESVILLE RD
257	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 258 together with this project	651 DRANESVILLE RD
258	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 257 together with this project	651 DRANESVILLE RD
259	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 260 together with this project	670 DRANESVILLE RD
260	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 259 together with this project	630 DRANESVILLE RD
261	Non-Structural		Targeted rain barrel program @ Treeside Sec. 1, Sugar Land Heights & Yount Subdivision		815 GRANT ST
262	Non-Structural		Targeted rain barrel program @ Potomac Fairways, Ashburn, The Villages, Chelmstord, & Chasa Goettling Subdivision		905 N GUNNELL CT
263	Non-Structural		Targeted rain barrel program @ Hunters Creek HOA		503 PEMBROOK CT

Subwatershed SU-SU-0040 **Watershed:** Sugarland **Management Area:** Sugarland - Upper Middle

Description Highly developed subwatershed w/ MDR, HDR, LIC, & HIC, ESR slated for OS, OS along riparian corridor, some IND in south, 2 DP, Elden St (Rte 606), Fairfax County Pkwy. (Rte 7100) **Impairments** Flooding - non-residential bldg & road crossing, SW controls needed on VDOT property, blocked culverts fr field recon, high impervious, deficient stream buffers, poor water quality

Restoration Selection Criteria SW Ranking, Public Involvement, Flooding **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve drainage and improve water quality, remove culvert obstructions

Percent Impervious 38.55%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
264	Subwatershed Improvement	9	LID: New infiltration basin in OS lot west of Herndon Pkwy, drainage area approx. 5 acres	if soils support infiltration otherwise use 265	200 HERNDON PW
265	Subwatershed Improvement	1	New SW: new swm pond in OS lot west of Herndon Pkwy, drainage area approx. 5 acres	if project 265 is unsuitable	200 HERNDON PW
266	Subwatershed Improvement	9	LID: New infiltration basin in OS lot off of Laurel Way, drainage area approx. 6.25 acres	if soils support infiltration otherwise use 267, intercept outfalls from Laurel Way	192 LAUREL WY
267	Subwatershed Improvement	1	New SW: new swm pond in OS lot off of Laurel Way, drainage area approx. 6.25 acres	if project 266 is unsuitable, intercept outfalls from Laurel Way	188 LAUREL WY
268	Subwatershed Improvement	9	LID: New infiltration basin in OS lot east of Herndon Pkwy, drainage area approx. 10 acres	if soils support infiltration otherwise use 269, intercept outfall from Crestview Sec. 1	702 TAMARACK WY
269	Subwatershed Improvement	1	New SW: new swm pond in OS lot east of Herndon Pkwy, drainage area approx. 10 acres	if project 268 is unsuitable, intercept outfall from Crestview Sec. 1	700 TAMARACK WY
270	Subwatershed Improvement	8	Improve drainage channel and outfalls from Crestview Sec. 1 development		700 TAMARACK WY
271	Stream Restoration	2	Stabilize and repair eroding banks at SPA erosion points SUSU023-E001		126 LAUREL WY
272	Subwatershed Improvement	9	LID: retrofit dry pond 1456DP to naturalized infiltration basin	if soils support infiltration, if not use project 273	1748 STUART POINTE LA
273	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond 1456DP to naturalized dry basin	if project 272 unsuitable	1748 STUART POINTE LA

274	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		150 ELDEN ST
275	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		108 ELDEN ST
276	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		171 ELDEN ST
277	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29039 to naturalized infiltration basin	if soils support infiltration, if not use project 279	1704 LAKE SHORE CREST DR
278	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29039 to naturalized dry basin	if project 278 unsuitable	1704 LAKE SHORE CREST DR
279	Non-Structural		Targeted rain barrel program @ Crestview Sec. 1 & Runnymede Manor		762 CORDELL WY
280	Non-Structural		Targeted rain barrel program @ Stuart Woods, Reston Sec. 49 & Towns at Stuart Pointe		12113 WALNUT BRANCH RD

Subwatershed SU-SU-0041 **Watershed:** Sugarland **Management Area:** Sugarland - Upper

Description Mostly LIC, HIC & HDR along Elden St, MDR & INT in southwest part of subwatershed, OS areas at risk for development, 2 DP **Impairments** Very high impervious, poor water quality, poor habitat

Restoration Selection Criteria SW Ranking **Preservation Qualities** OS areas at risk for future development, potential for increase in pollutant loading

Preservation Selection Criteria % Increase IMP (3.17%), STEPL **Improvement Goals** preserve open space, capture impervious runoff, improve water quality

Percent Impervious 49.64%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
281	Subwatershed Improvement	8	Improve drainage channel and outfalls off of Laurel Way from Stuart Woods development		124 LAUREL WY
282	Subwatershed Improvement	9	LID: New infiltration basin in OS lot south of Elden St, drainage area approx. 7 acres	if soils support infiltration otherwise use 283	381 ELDEN ST
283	Subwatershed Improvement	1	New SW: new swm pond in OS lot south of Elden St, drainage area approx. 7 acres	if project 282 is unsuitable	381 ELDEN ST
284	Subwatershed Improvement	9	LID: retrofit dry pond @ northern end of IND lot off Spring St. to naturalized infiltration basin	if soils support infiltration, if not use project 285	347 ELDEN ST
285	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond @ northern end of IND lot off Spring St. to naturalized dry basin	if project 284 unsuitable	347 ELDEN ST
286	Subwatershed Improvement	9	LID: retrofit dry pond off Grove St. to naturalized infiltration basin	if soils support infiltration, if not use project 287	270 SPRING ST
287	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond off Grove St to naturalized dry basin	if project 286 unsuitable	270 SPRING ST
288	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		381 ELDEN ST
289	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		413 ELDEN ST

290	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		632 GRANT ST
291	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		501 ELDEN ST
292	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		460 ELDEN ST
293	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		652 ELDEN ST
294	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		605 ELDEN ST
295	Preservation		Conservation easement or lot purchase to preserve OS adjacent to IND along Van Buren St	OS area could be used for SWM implementation	101 PEARL ST
296	Subwatershed Improvement	9	LID: New infiltration basin in OS lot south of Elden St, drainage area approx. 5 acres	implement if project 295 proceeds and soils support infiltration otherwise use 297	601 NASH ST
297	Subwatershed Improvement	1	New SW: new swm pond in OS lot south of Elden St, drainage area approx. 5 acres	if project 296 is unsuitable and project 295 is implemented	601 NASH ST
298	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		585 GROVE ST
299	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		499 GROVE ST

300	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		601 NASH ST
301	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		505 HUNTMAR PARK DR
302	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		530 HUNTMAR PARK DR
303	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		475 SPRINGPARK PL
304	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, sand filters, filter strips, swales, green roofs, cisterns etc.		470 SPRINGPARK PL
305	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 306 together with this project	432 VAN BUREN ST
306	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 305 together with this project	432 VAN BUREN ST
307	Subwatershed Improvement	9	LID: New infiltration basin in OS lot @ corner of Spring St & Van Buren St drainage area approx. 10 acres	if soils support infiltration otherwise use 308	550 VAN BUREN ST
308	Subwatershed Improvement	1	New SW: new swm pond in OS lot @ corner of Spring St & Van Buren St, drainage area approx. 10 acres	if project 307 is unsuitable	550 VAN BUREN ST
309	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		347 ELDEN ST
310	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		500 CARLISLE DR

311	Subwatershed Improvement	9	LID: retrofit dry pond adjacent to Fairfax Co. Pkwy to naturalized infiltration basin	if soils support infiltration, if not use project 312	101 ELDEN ST
312	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond adjacent to Fairfax Co. Pkwy to naturalized dry basin	if project 311 unsuitable	101 ELDEN ST
313	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		1813 TOWN CENTER DR
314	Subwatershed Improvement	9	LID: retrofit dry pond DP0564 to naturalized infiltration basin	if soils support infiltration, if not use project 315	1800 TOWN CENTER DR
315	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0564 to naturalized dry basin	if project 314 unsuitable	12036 EDGEMERE CI
316	Subwatershed Improvement	9	LID: New infiltration basin in OS adjacent to IND & LIC along Fairfax Co. Pkwy, drainage area approx. 1 acres	if soils support infiltration otherwise use 317	491 CARLISLE DR
317	Subwatershed Improvement	1	New SW: new swm pond in OS adjacent to IND & LIC along Fairfax Co. Pkwy, drainage area approx. 8 acres	if project 282 is unsuitable	491 CARLISLE DR
318	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29038 to naturalized infiltration basin	if soils support infiltration, if not use project 319	12195 ABINGTON HALL PL
319	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29038 to naturalized dry basin	if project 318 unsuitable	461 CARLISLE DR
320	Stream Restoration	3	Stabilize eroded banks at SPA erosion point SUSU024.E001		453 CARLISLE DR
321	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		399 GROVE ST
322	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		380 HERNDON PW
323	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		360 HERNDON PW
324	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		365 HERNDON PW

325

Subwatershed Improvement

9

LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.

397 HERNDON PW

Subwatershed SU-SU-0042 **Watershed:** Sugarland **Management Area:** Sugarland - Upper

Description Primarily LIC w/ IND & HIC areas, some HDR & INT on eastern part of subwatershed, OS along riparian corridor - good forested riparian buffer, 3 DP, 2 UG **Impairments** Very high impervious, poor water quality, poor habitat, flooding - non-residential bldg in 100yr floodplain

Restoration Selection Criteria SW Ranking, Public Involvement, Flooding **Preservation Qualities**

Preservation Selection Criteria STEPL **Improvement Goals** Capture impervious runoff, improve drainage and improve water quality, remove culvert obstructions

Percent Impervious 51.93%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
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Subwatershed SU-SU-0043 **Watershed:** Sugarland **Management Area:** Sugarland - Upper

Description Highly developed w/ IND, HIC, MDR, some LIC & HDR, adjacent to Dulles Access Road, 2 DP, poor riparian buffers **Impairments** Very high impervious, at risk for increased impervious, poor water quality, deficient riparian buffers, poor habitat

Restoration Selection Criteria SW Ranking, Public Involvement **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (3.76%), STEPL **Improvement Goals** Capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 48.05%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
326	Preservation		Conservation easement or lot purchase to preserve OS adjacent to IND along Spring St & Fairfax Co. Pkwy	OS area could be used for SWM implementation	244 SUNSET PARK DR
327	Preservation		Conservation easement or lot purchase to preserve OS adjacent to HIC/HDR along Dulles Access Rd & Fairfax Co. Pkwy	OS area could be used for SWM implementation	230 FAIRBROOK DR
328	Subwatershed Improvement	9	LID: New infiltration basin in OS lot adjacent to HDR & IND lots off Sunset Park Dr drainage area approx. 7 acres	implement if project 326 proceeds and soils support infiltration otherwise use 329	230 FAIRBROOK DR
329	Subwatershed Improvement	1	New SW: new swm pond in OS lot adjacent to HDR & IND lots off Sunset Park Dr drainage area approx. 7 acres	implement if project 326 proceeds and project 328 is unsuitable	230 FAIRBROOK DR
330	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29076 to naturalized infiltration basin	if soils support infiltration, if not use project 331	533 HERNDON PW
331	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29076 to naturalized dry basin	if project 330 unsuitable	533 HERNDON PW
332	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		200 FAIRBROOK DR
333	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		467 HERNDON PW
334	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		151 SPRING ST

335	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		241 SPRING ST
336	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		220 SPRING ST
337	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond off Sugarland Meadow Dr to naturalized dry basin		352 SUGARLAND MEADOW DR
338	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		560 HERNDON PW
339	Subwatershed Improvement	9	LID: New infiltration basin in athletic field off Van Buren St w/ add'l LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, cisterns etc.	Implement project 340 together with this project	324 VAN BUREN ST
340	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 339 together with this project	320 VAN BUREN ST
341	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		290 MISSOURI AV
342	Subwatershed Improvement	9	LID: LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	Implement project 343 together with this project	320 SENATE CT
343	Non-Structural		Non-structural: provide informational signs at LID treatments and create education & outreach program	Implement project 342 together with this project	621 ALABAMA DR
344	Subwatershed Improvement	9	LID: New veg/grass swale w/ check dams & infiltration trench to bioretention	omit infiltration trench & bioretention if soils do not infiltrate	411 SUGARLAND MEADOW DR
345	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		575 HERNDON PW
346	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		607 HERNDON PW

Subwatershed SU-SU-0044 **Watershed:** Sugarland **Management Area:** Sugarland - Upper

Description Highly developed headwaters, Primarily HDR & HIC, some OS & LIC, no riparian buffers, 3 DP, 1 WP **Impairments** Very high impervious, at risk for increased impervious, poor water quality, deficient riparian buffers, poor habitat

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria % Increase IMP (6.48%) **Improvement Goals** Capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 38.32%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
347	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29036 to naturalized infiltration basin	if soils support infiltration, if not use project 348	429 CARLISLE DR
348	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29036 to naturalized dry basin	if project 347 unsuitable	427 CARLISLE DR
349	Subwatershed Improvement	9	LID: retrofit dry pond VDOT29037 to naturalized infiltration basin	if soils support infiltration, if not use project 350	441 CARLISLE DR
350	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond VDOT29037 to naturalized dry basin	if project 349 unsuitable	12195 ABINGTON HALL PL
351	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12199 CHANCERY STATION CI
352	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12157 TRYTON WY
353	Subwatershed Improvement	9	LID: New infiltration basin in wooded area between HDR buildings at corner of Crescent Park Dr & Town Center Pkwy, drainage area approx. 6 acres	if soils support infiltration otherwise use 354	12070 KINSLEY PL
354	Subwatershed Improvement	1	New SW: new swm pond in wooded area between HDR buildings at corner of Crescent Park Dr & Town Center Pkwy, drainage area approx. 6 acres	if project 353 is unsuitable	12070 KINSLEY PL
355	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12000 MARKET ST

356	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	12061 BLUEMONT WY
357	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.	11955 DEMOCRACY DR

Subwatershed SU-SU-0045 **Watershed:** Sugarland **Management Area:** Sugarland - Upper

Description Highly developed headwaters w/ mostly LIC and HIC, some OS & IND, include Dulles Access Road (Rte 267),extensive SW pipe network, 1 bioretention, 2 UG, 5 dP, 2 WP **Impairments** Flooding - non residential bldg in 100 yr floodplain with stream impairments, poor water quality, deficient riparian buffers and poor habitat

Restoration Selection Criteria SW Ranking, Public Involvement, Flooding **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, improve drainage and improve water quality, remove culvert obstructions

Percent Impervious 52.24%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
358	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12250 SUNSET HILLS RD
359	Subwatershed Improvement	9	LID: retrofit dry pond DP0421 to naturalized infiltration basin	if soils support infiltration, if not use project 360	12200 SUNSET HILLS RD
360	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0421 to naturalized dry basin	if project 359 unsuitable	12200 SUNSET HILLS RD
361	Subwatershed Improvement	9	LID: retrofit dry pond DP0350 to naturalized infiltration basin	if soils support infiltration, if not use project 362	12197 SUNSET HILLS RD
362	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0350 to naturalized dry basin	if project 361 unsuitable	12197 SUNSET HILLS RD
363	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12197 SUNSET HILLS RD
364	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12190 SUNSET HILLS RD
365	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12110 SUNSET HILLS RD
366	Subwatershed Improvement	9	LID: retrofit dry pond DP0289 to naturalized infiltration basin	if soils support infiltration, if not use project 367	12020 SUNSET HILLS RD
367	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0289 to naturalized dry basin	if project 366 unsuitable	12020 SUNSET HILLS RD

368	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12020 SUNSET HILLS RD
369	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12050 SUNSET HILLS RD
370	Subwatershed Improvement	9	LID: retrofit dry pond DP0440 to naturalized infiltration basin	if soils support infiltration, if not use project 371	12021 SUNSET HILLS RD
371	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0440 to naturalized dry basin	if project 370 unsuitable	12021 SUNSET HILLS RD
372	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12021 SUNSET HILLS RD
373	Subwatershed Improvement	9	LID: retrofit dry pond DP0547 to naturalized infiltration basin	if soils support infiltration, if not use project 374	12012 SUNSET HILLS RD
374	Subwatershed Improvement	1	SW Retrofit: Retrofit dry pond DP0647 to naturalized dry basin	if project 373 unsuitable	12012 SUNSET HILLS RD
375	Subwatershed Improvement	9	LID: New LID treatments around parking lot, driveways, between buildings - infiltration trenches, bioretention, filter strips, swales, green roofs, cisterns etc.		12011 SUNSET HILLS RD

Subwatershed SU-SU-0046 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Primarily LIC with some IND, HDR, HIC and GC, includes Dulles Access Rd (Rte 267). SW piping in most dev areas, 5DP, multiple WP **Impairments** Flooding with stream impairments, poor water quality and poor habitat

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities** Undeveloped wooded areas in LIC

Preservation Selection Criteria **Improvement Goals** Stabilize/repair stream impacts, improve water quality

Percent Impervious 54.18%

Temporary Project ID	Strategy	Project Type	Description of Project	Comments	Nearest Address
M35	Subwatershed Improvement	1	New infiltration basin, drainage area approx. 20 acres	If not suitable for infiltration, see project M36	12203 SUNRISE VALLEY DR
M36	Subwatershed Improvement	1	New naturalized dry pond, drainage area approx. 20 acres	Only if site is not suitable for infiltration project M35	12203 SUNRISE VALLEY DR
M37	Subwatershed Improvement	9	Retrofit dry pond DP0007 to naturalized dry pond		12018 SUNRISE VALLEY DR
M38	Subwatershed Improvement	9	Retrofit dry pond DP0202 to naturalized dry pond		11854 SUNRISE VALLEY DR
M39	Subwatershed Improvement	9	Retrofit dry pond DP0511 to naturalized dry pond		12010 SUNRISE VALLEY DR
M40	Subwatershed Improvement	9	Retrofit dry pond DP0372 to naturalized dry pond		2000 EDMUND HALLEY DR
M41	Subwatershed Improvement	9	Retrofit dry pond DP0389 to naturalized dry pond		2055 MERCATOR DR
M42	Subwatershed Improvement	1	New infiltration basin, drainage area approx. 20 acres	If not suitable for infiltration, see project M43	2055 MERCATOR DR
M43	Subwatershed Improvement	1	New naturalized dry pond, drainage area approx. 20 acres	Only if site is not suitable for infiltration project M42	2055 MERCATOR DR

Subwatershed SU-SU-0047 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Combination of MDR, LIC, IND and OS, includes Dulles Access Rd (Rte 267). Some SW piping, 1DP, 2WP, 1RT. **Impairments** Some flooding with stream impairments and poor habitat

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities** Undeveloped wooded areas in LIC and IND

Preservation Selection Criteria **Improvement Goals** Stabilize/repair stream impacts, improve water quality

Percent Impervious 33.61%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M26	Non-Structural Measures		Rain barrel campaign for Polo Fields HOA		2326 CLUB POND LA
M27	Stream Restoration	2	Remove paved ditch and restore naturalized stream	Good educational opportunity, signs	2326 CLUB POND LA
M28A	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 5 acres	If not suitable for infiltration, see project M28B	2328 CLUB POND LA
M28B	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 5 acres	Only if site is not suitable for infiltration project M28A	2439 FOX MILL RD
M28C	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 7 acres	If not suitable for infiltration, see project M28D	2439 FOX MILL RD
M28D	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 7 acres	Only if site is not suitable for infiltration project M28C	12707 HITCHCOCK CT
M28E	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 6 acres	If not suitable for infiltration, see project M28F	2323 DARIUS LA
M28F	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 6 acres	Only if site is not suitable for infiltration project M28E	2325 DARIUS LA
M28G	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 5 acres	If not suitable for infiltration, see project M28H	12701 THUNDER CHASE DR
M28H	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 5 acres	Only if site is not suitable for infiltration project M28G	12701 THUNDER CHASE DR
M28I	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 6 acres	If not suitable for infiltration, see project M28J	12617 BAYARD DR
M28J	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 6 acres	Only if site is not suitable for infiltration project M28I	12617 BAYARD DR
M28K	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 7 acres	If not suitable for infiltration, see project M28L	2214 STIRRUP IRON LA

M28L	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 7 acres	Only if site is not suitable for infiltration project M28K	2202 STIRRUP IRON LA
M28M	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 6 acres	If not suitable for infiltration, see project M28N	2202 STIRRUP IRON LA
M28N	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 6 acres	Only if site is not suitable for infiltration project M28M	12524 SUNRISE VALLEY DR
M28O	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 14 acres	If not suitable for infiltration, see project M28P	12707 HITCHCOCK CT
M28P	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 14 acres	Only if site is not suitable for infiltration project M28O	12703 THUNDER CHASE DR
M28Q	Low Impact Development Retrofits	0	New infiltration basin, drainage area approx. 14 acres	If not suitable for infiltration, see project M28R	2206 MILBURN LA
M28R	Low Impact Development Retrofits	0	New naturalized dry pond, drainage area approx. 14 acres	Only if site is not suitable for infiltration project M28Q	12703 ROARK CT
M28S	Stormwater Facility Retrofits	0	Retrofit dry pond DP1219 to naturalized dry pond		2311 ARCHDALE RD
M29	Stream Restoration	2	Remove paved ditch and restore naturalized stream	Good educational opportunity, signs	12707 HITCHCOCK CT
M30	Stream Restoration	2	Remove paved ditch and restore naturalized stream		2206 MILBURN LA
M31	Stream Restoration	2	Remove paved ditch and restore naturalized stream		2206 MILBURN LA
M32	Stream Restoration	2	Remove paved ditch and restore naturalized stream		2214 STIRRUP IRON LA
M33	Stream Restoration	2	Remove paved ditch and restore naturalized stream		12617 BAYARD DR

Subwatershed SU-SU-0048 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Combination of MDR, LIC and IND with some HDR. Extensive SW piping, 2DP, 1WP, 1BMP. **Impairments** Flooding with stream impairments, poor water quality and poor habitat, High Imperv.

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 57.66%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M20	Subwatershed Improvement	9	Porous pavers, infiltration and roof-top retrofit for Reston and Sunrise Professional Center		12502 SUNRISE VALLEY DR
M21	Subwatershed Improvement	9	Porous pavers, infiltration and roof-top retrofit		12502 SUNRISE VALLEY DR
M22	Subwatershed Improvement	9	Retrofit dry pond DP0164 to naturalized dry pond		12290 SUNRISE VALLEY DR
M23	Subwatershed Improvement	9	Retrofit dry pond DP0388 to naturalized dry pond, remove low-flow concrete channel		12307 TIGERS EYE CT
M25	Non-Structural Measures		Rain barrel campaign for Polo Fields HOA		12713 HITCHCOCK CT

Subwatershed SU-SU-0049 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Combination of MDR, HDR, LIC and OS. Dev areas have some SW piping. No SW management. **Impairments** Some flooding with stream impairments, poor water quality and poor habitat

Restoration Selection Criteria SW Ranking, Flooding **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Stabilize/repair stream impacts, improve water quality

Percent Impervious 33.22%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M14	Subwatershed Improvement	1	New infiltration trench or bio-retention basin.		12263 LAUREL GLADE CT
M15	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 3 acres		2251 SANIBEL DR
M16	Subwatershed Improvement	1	New infiltration basin, drainage area approx 8 acres		12274 ANGEL WING CT
M17	Subwatershed Improvement	1	New infiltration basin, drainage area approx 3 acres		2293 ARCHDALE RD
M18	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 5 acres		2287 COCQUINA DR
M19	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 4 acres		12300 SUNRISE VALLEY DR
M24	Stream Restoration	2	Remove paved ditch and restore naturalized stream	Good educational opportunity, signs	12500 CROSS COUNTRY LA

Subwatershed SU-SU-0050 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Primarily LDR & MDR with some HDR, OS, INT & LIC. Some OS slated for MDR. Dev areas have some SW piping, 2DP, 1BMP **Impairments** Some flooding with stream impairments and poor water quality

Restoration Selection Criteria SW Ranking **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Capture impervious runoff, stabilize/repair stream impacts, improve water quality

Percent Impervious 25.38%

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M1	Subwatershed Improvement	9	Retrofit dry pond DP0160 to naturalized dry pond	will compliment project M2	2501 FOX MILL RD
M2	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 8 acres	will compliment project M1	12515 KINGS LAKE DR
M3	Subwatershed Improvement	9	Retrofit dry pond 1448DP to infiltration basin or naturalized dry pond		12394 BROWN FOX WY
M34	Subwatershed Improvement		New naturalized dry pond, drainage area approx. 10 acres	Only if site is not suitable for infiltration project M34	12603 NOBLE VICTORY LA
M4	Stream Restoration	2	Drainage improvement - Replace existing concrete culvert with natural drainage channel		2351 BEDFORDSHIRE CI
M5	Subwatershed Improvement	1	New infiltration basin, drainage area approx 4 acres		2339 BEDFORDSHIRE CI
M6	Subwatershed Improvement	1	New infiltration basin, drainage area approx. 10 acres	If not suitable for infiltration, see project M28L	2311 ARCHDALE RD
M7	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 7 acres		12368 LIMA LA

Subwatershed SU-SU-0051 **Watershed:** Sugarland **Management Area:** Sugarland-Headwaters

Description Combination of LDR, MDR, HDR, LIC and OS. Dev areas have extensive SW piping. 1 DP, 1 WP. **Impairments** Poor habitat, poor water quality

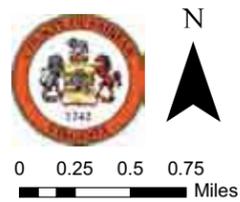
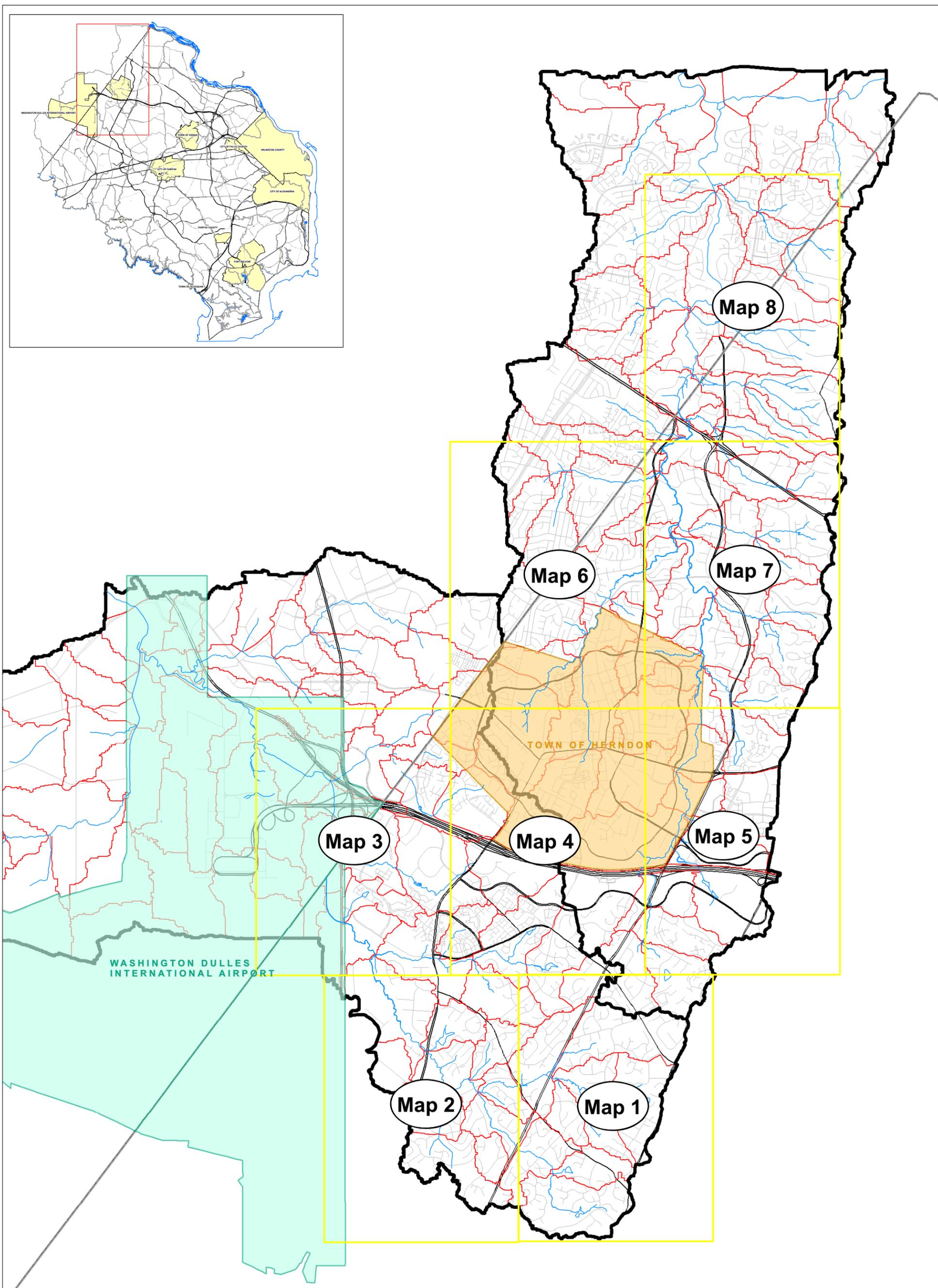
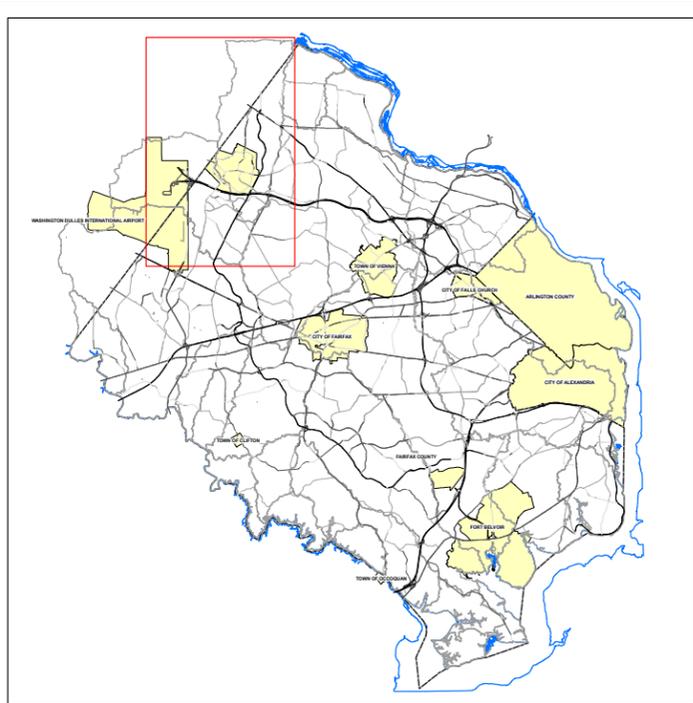
Restoration Selection Criteria **Preservation Qualities**

Preservation Selection Criteria **Improvement Goals** Improve water quality

Percent Impervious

<i>Temporary Project ID</i>	<i>Strategy</i>	<i>Project Type</i>	<i>Description of Project</i>	<i>Comments</i>	<i>Nearest Address</i>
M10	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 3 acres		2401 ANDORRA PL
M11	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 3 acres		2226 LOFTY HEIGHTS PL
M12	Stream Restoration	2	Drainage improvement - Replace existing concrete culvert with natural drainage channel		12331 COLERAINE CT
M13	Subwatershed Improvement	1	New constructed wetland or wet pond, drainage area approx 12 acres		12262 LAUREL GLADE CT
M8	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 6 acres		2529 FREETOWN DR
M9	Subwatershed Improvement	1	New infiltration basin, may or may not include swale, drainage area approx 2 acres		2402 FREETOWN DR

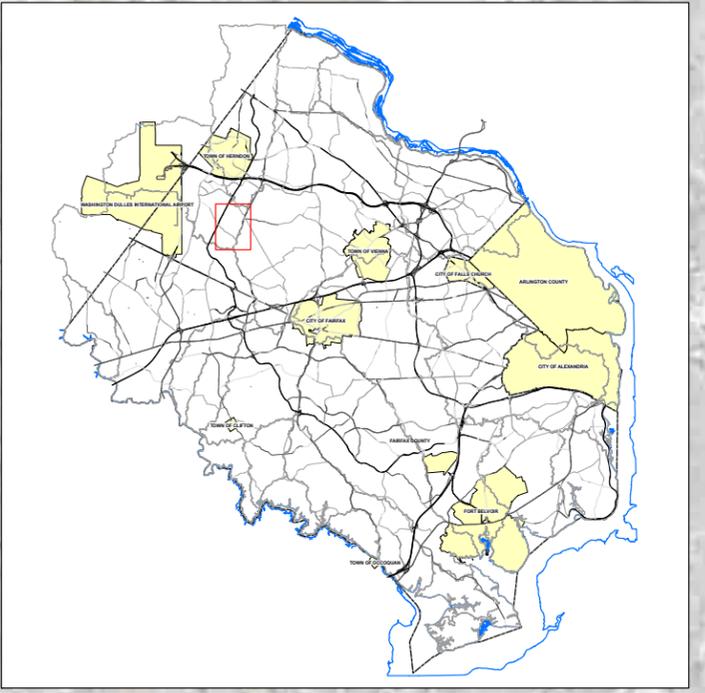
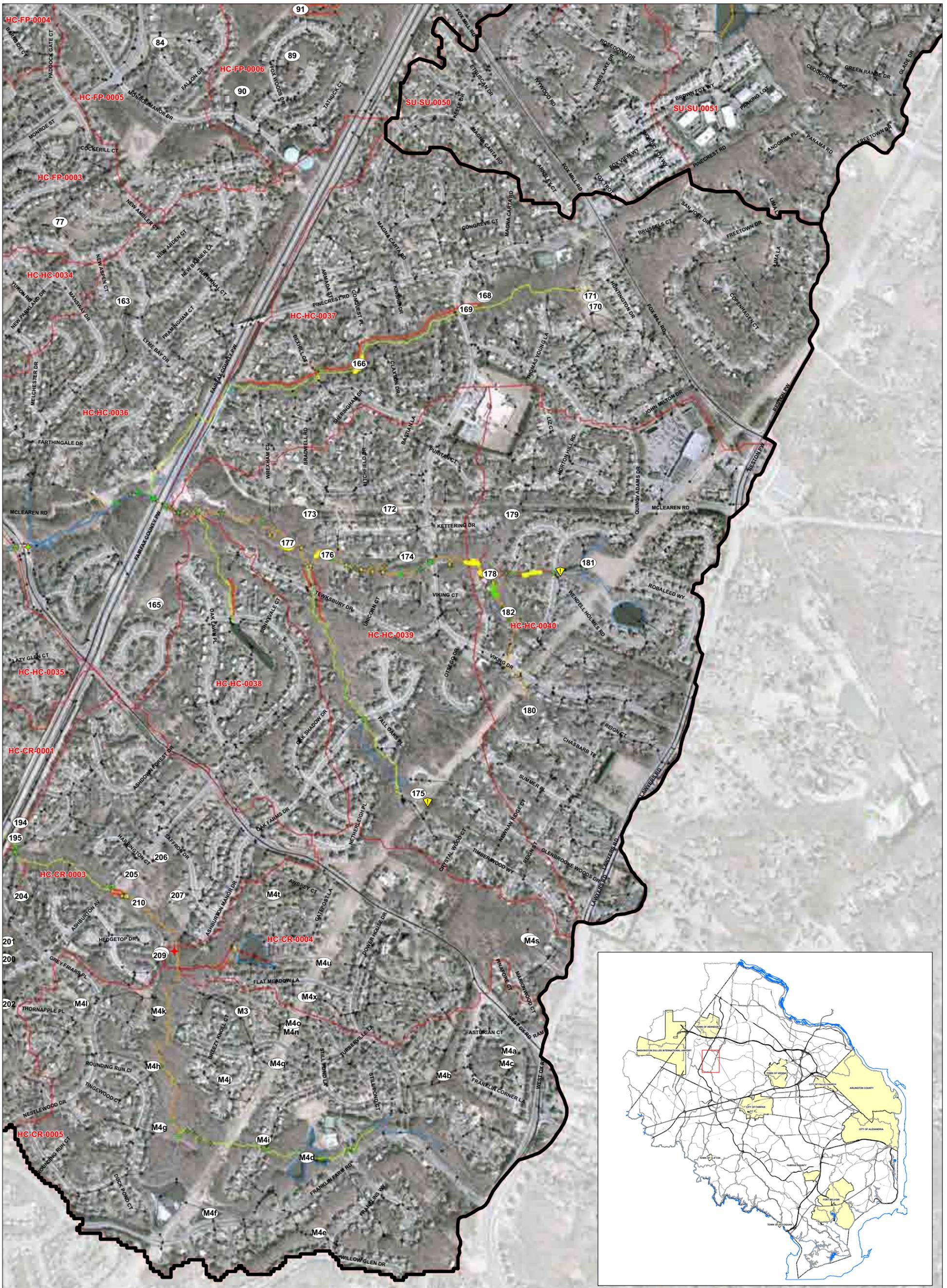
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Legend	
	Perennial Streams
	SH_Roads_major
	SH_Subbasins_061208
	Watersheds
	TOWN OF HERNDON
	WASHINGTON DULLES INTERNATIONAL AIRPORT
	County Bndry

**Index Map for Candidate
Projects Maps**

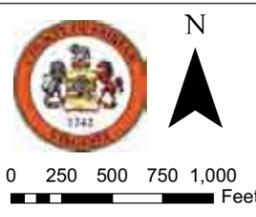
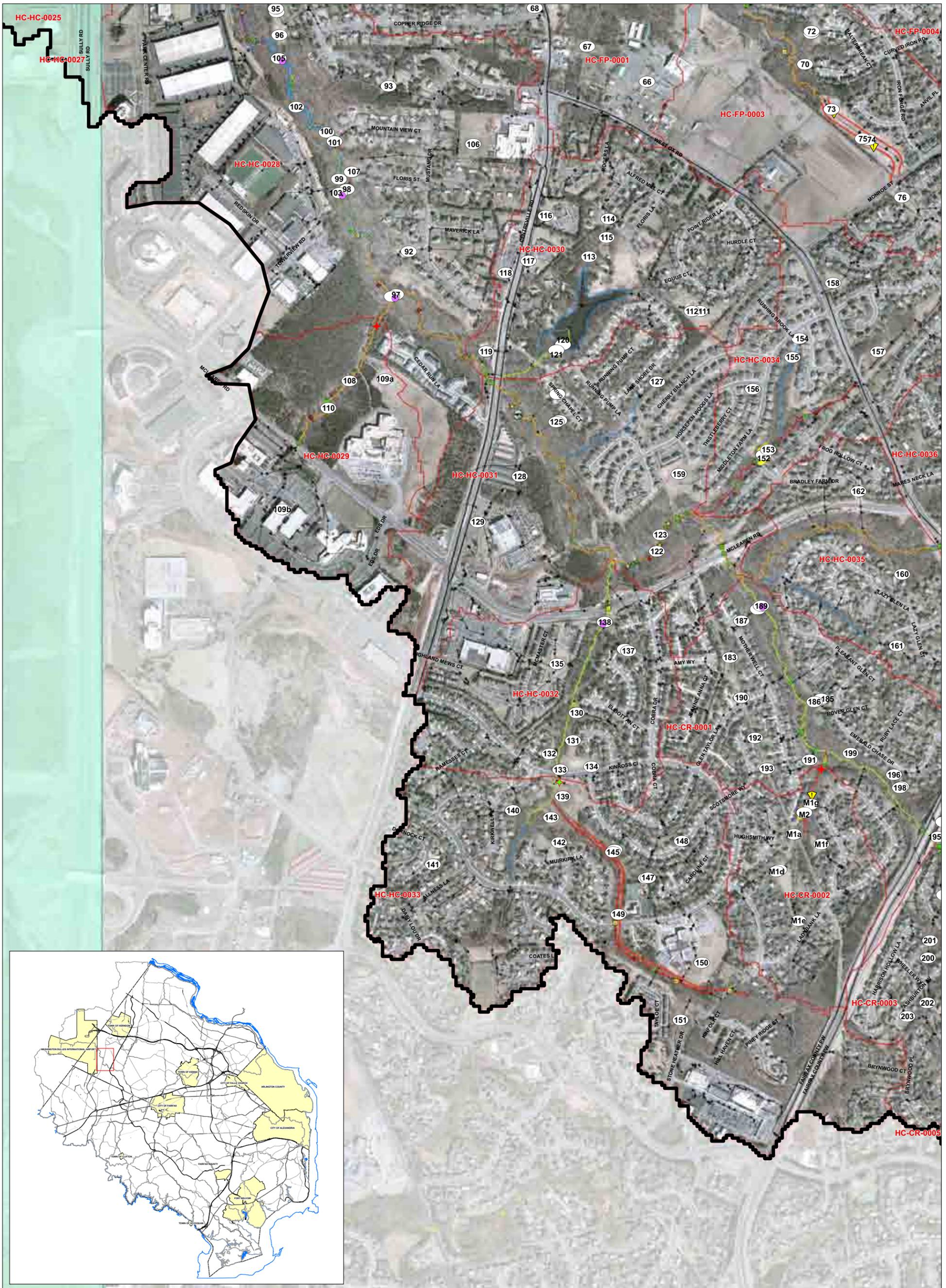
**Sugarland Run and
Horsepen Creek Watersheds**



	<ul style="list-style-type: none"> #### Candidate Projects ▼ Public Issues/Comments ● ProRata Projects Still Needed → StormNet Drainage Network ★ Regional Ponds ◆ Planned/Unbuilt ◆ Completed 	<ul style="list-style-type: none"> SPA Erosion Line <ul style="list-style-type: none"> Minor Moderate Severe SPA Erosion Points <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Head Cut Height <ul style="list-style-type: none"> < 1' 1'- 2' >2' SPA Crossing Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Ditch Impacts <ul style="list-style-type: none"> Minor Moderate Severe SPA Pipe Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Utility Impact <ul style="list-style-type: none"> Minor Moderate Severe SPA Obstruction Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Habitat <ul style="list-style-type: none"> Good Fair Poor Deficient Buffer
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**Candidate Projects for
Sugarland Run and
Horsepen Creek Watersheds**

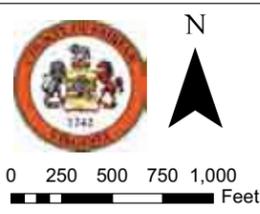
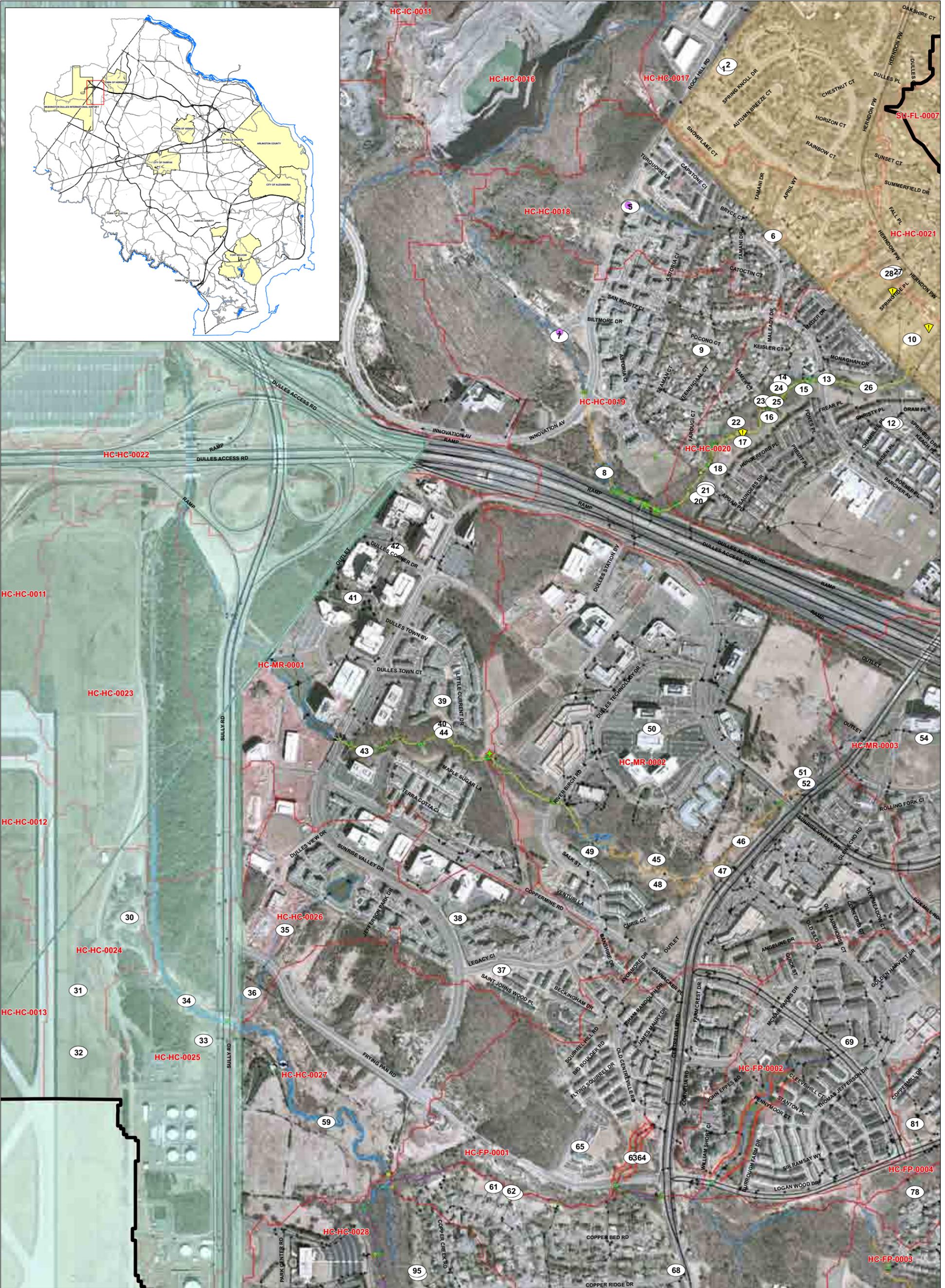
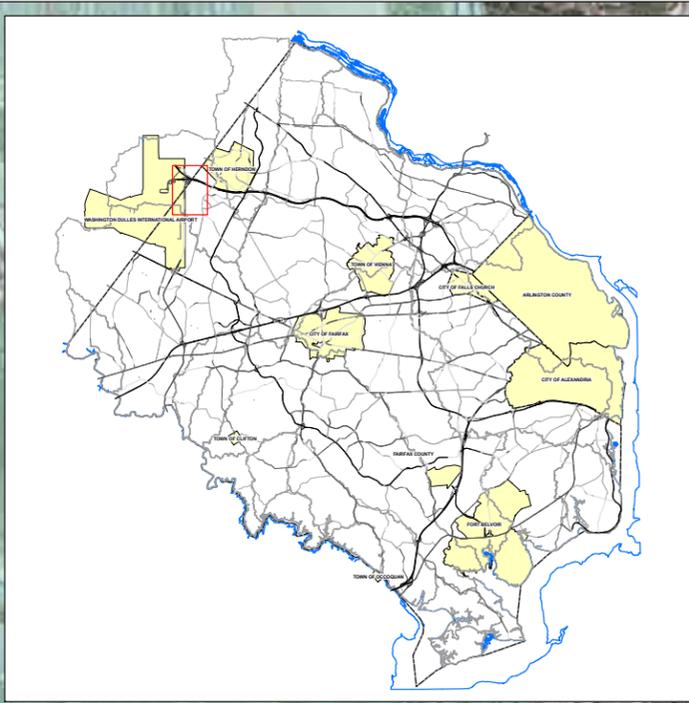
Map 1 of 8



###	Candidate Projects	SPA Erosion Line	SPA Head Cut Height	SPA Ditch Impacts	SPA Utility Impact	SPA Habitat
▼	Public Issues/Comments	Minor	< 1'	Minor	Minor	Good
●	ProRata Projects Still Needed	Moderate	1'- 2'	Moderate	Moderate	Fair
→	StormNet Drainage Network	Severe	>2'	Severe	Severe	Poor
◆	Regional Ponds	SPA Erosion Points	SPA Crossing Impact	SPA Pipe Impact	SPA Obstruction Impact	Deficient Buffer
◆	Planned/Unbuilt	Minor	Minor	Minor	Minor	
◆	Completed	Moderate	Moderate	Moderate	Moderate	
		Severe	Severe	Severe	Severe	

Candidate Projects for Sugarland Run and Horsepen Creek Watersheds

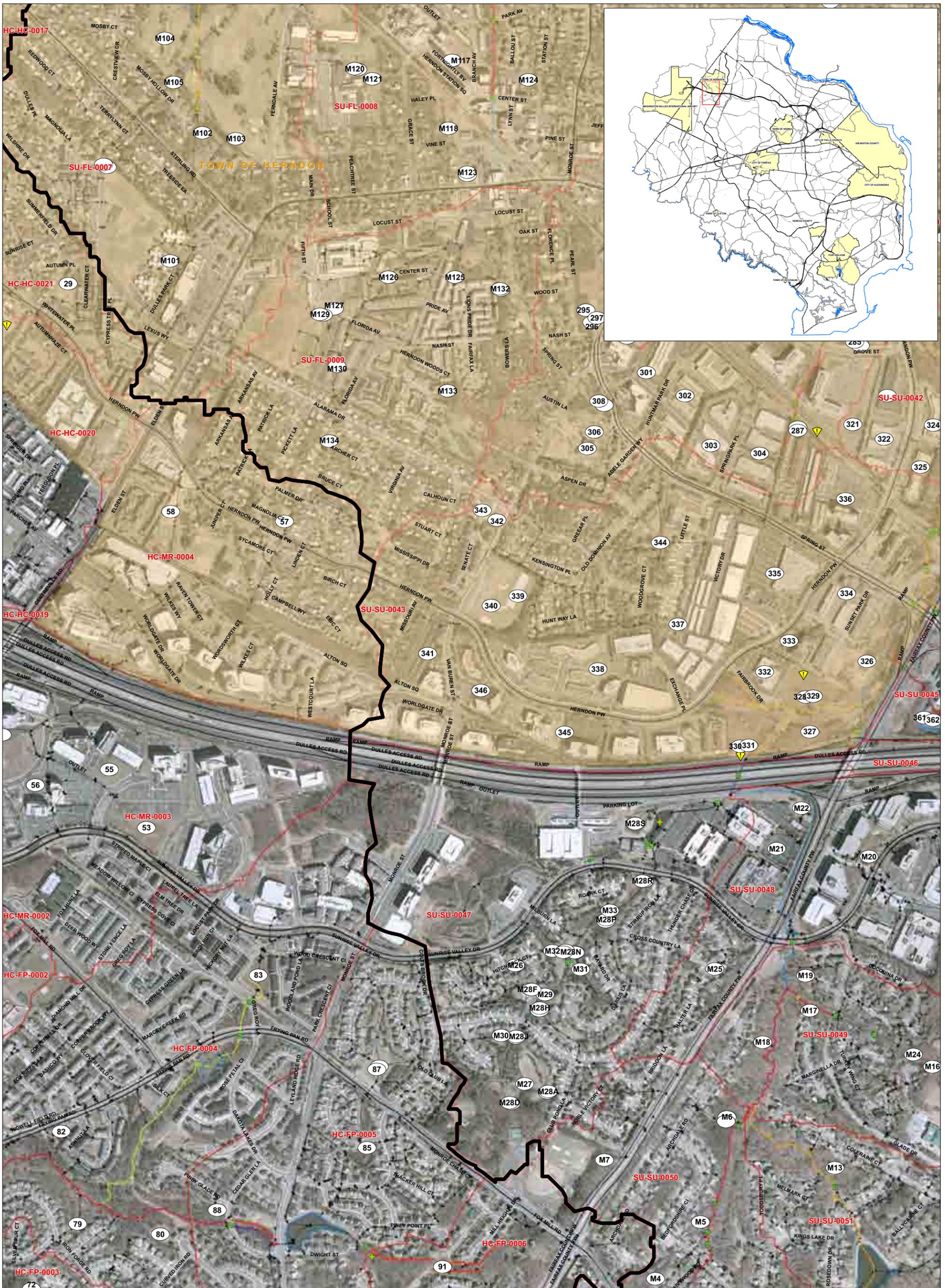
Map 2 of 8



<ul style="list-style-type: none"> #### Candidate Projects ▼ Public Issues/Comments ● ProRata Projects Still Needed → StormNet Drainage Network Regional Ponds <ul style="list-style-type: none"> ★ Planned/Unbuilt ★ Completed 	<ul style="list-style-type: none"> SPA Erosion Line <ul style="list-style-type: none"> Minor Moderate Severe SPA Erosion Points <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Head Cut Height <ul style="list-style-type: none"> < 1' 1'- 2' > 2' SPA Crossing Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Ditch Impacts <ul style="list-style-type: none"> Minor Moderate Severe SPA Pipe Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Utility Impact <ul style="list-style-type: none"> Minor Moderate Severe SPA Obstruction Impact <ul style="list-style-type: none"> Minor Moderate Severe 	<ul style="list-style-type: none"> SPA Habitat <ul style="list-style-type: none"> Good Fair Poor Deficient Buffer
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Candidate Projects for Sugarland Run and Horsepen Creek Watersheds

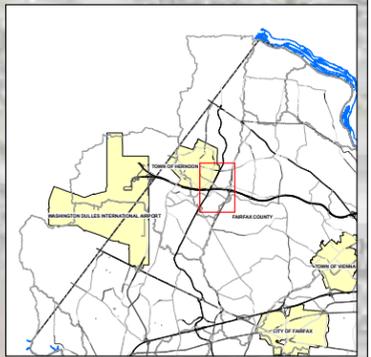
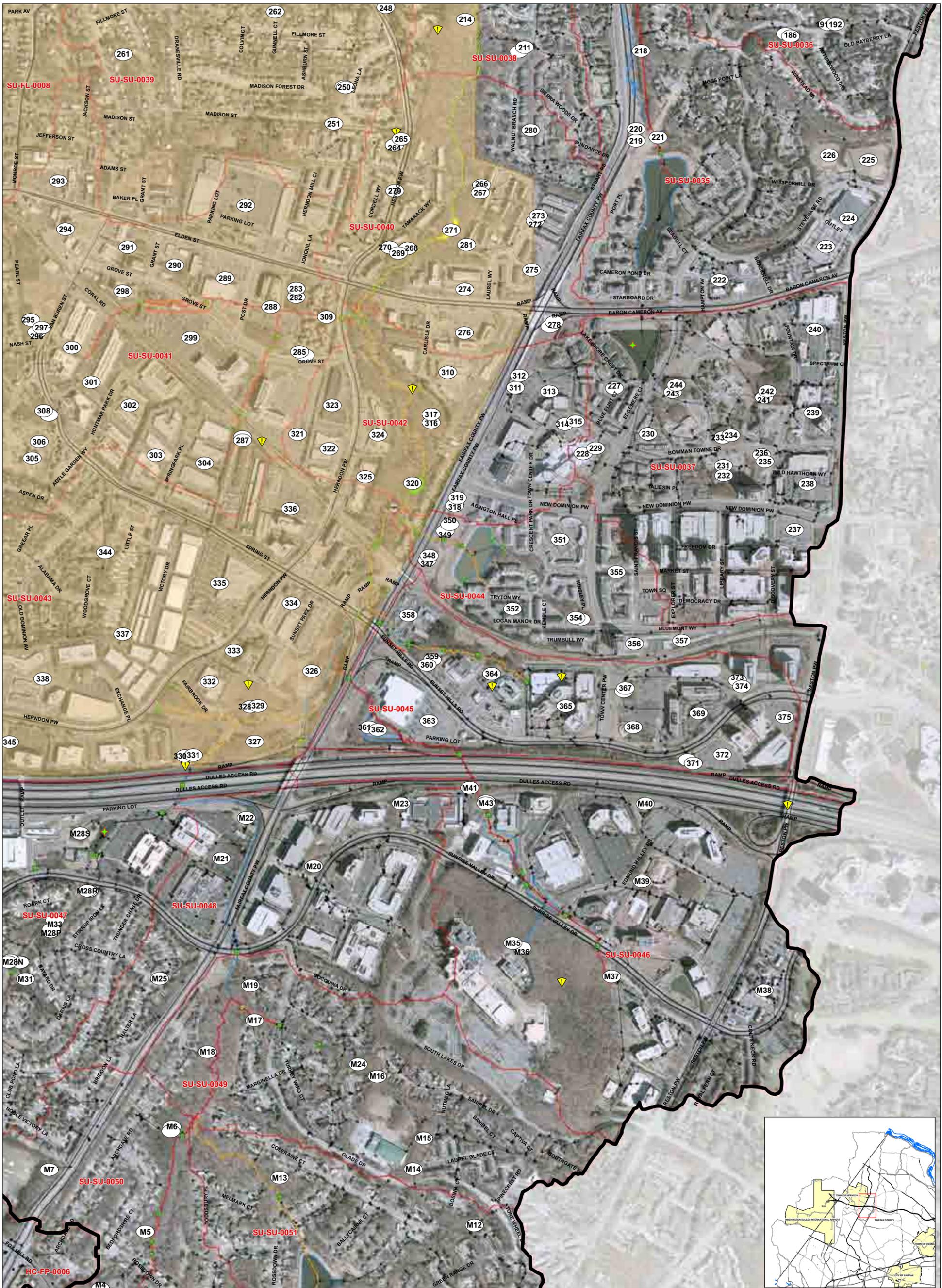
Map 3 of 8



		Candidate Projects	SPA Erosion Line Minor	SPA Head Cut Height < 1'	SPA Ditch Impacts Minor	SPA Utility Impact Minor	SPA Habitat Good
		Public Issues/Comments	SPA Erosion Line Moderate	SPA Head Cut Height 1' - 2'	SPA Ditch Impacts Moderate	SPA Utility Impact Moderate	SPA Habitat Fair
		ProRata Projects Still Needed	SPA Erosion Line Severe	SPA Head Cut Height > 2'	SPA Ditch Impacts Severe	SPA Utility Impact Severe	SPA Habitat Poor
		StormNet Drainage Network	SPA Erosion Points Minor	SPA Crossing Impact Minor	SPA Pipe Impact Minor	SPA Obstruction Impact Minor	Deficient Buffer
		Regional Ponds Planned/Unbuilt	SPA Erosion Points Moderate	SPA Crossing Impact Moderate	SPA Pipe Impact Moderate	SPA Obstruction Impact Moderate	
		Regional Ponds Completed	SPA Erosion Points Severe	SPA Crossing Impact Severe	SPA Pipe Impact Severe	SPA Obstruction Impact Severe	

**Candidate Projects for
Sugarland Run and
Horsepen Creek Watersheds**

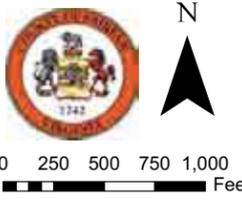
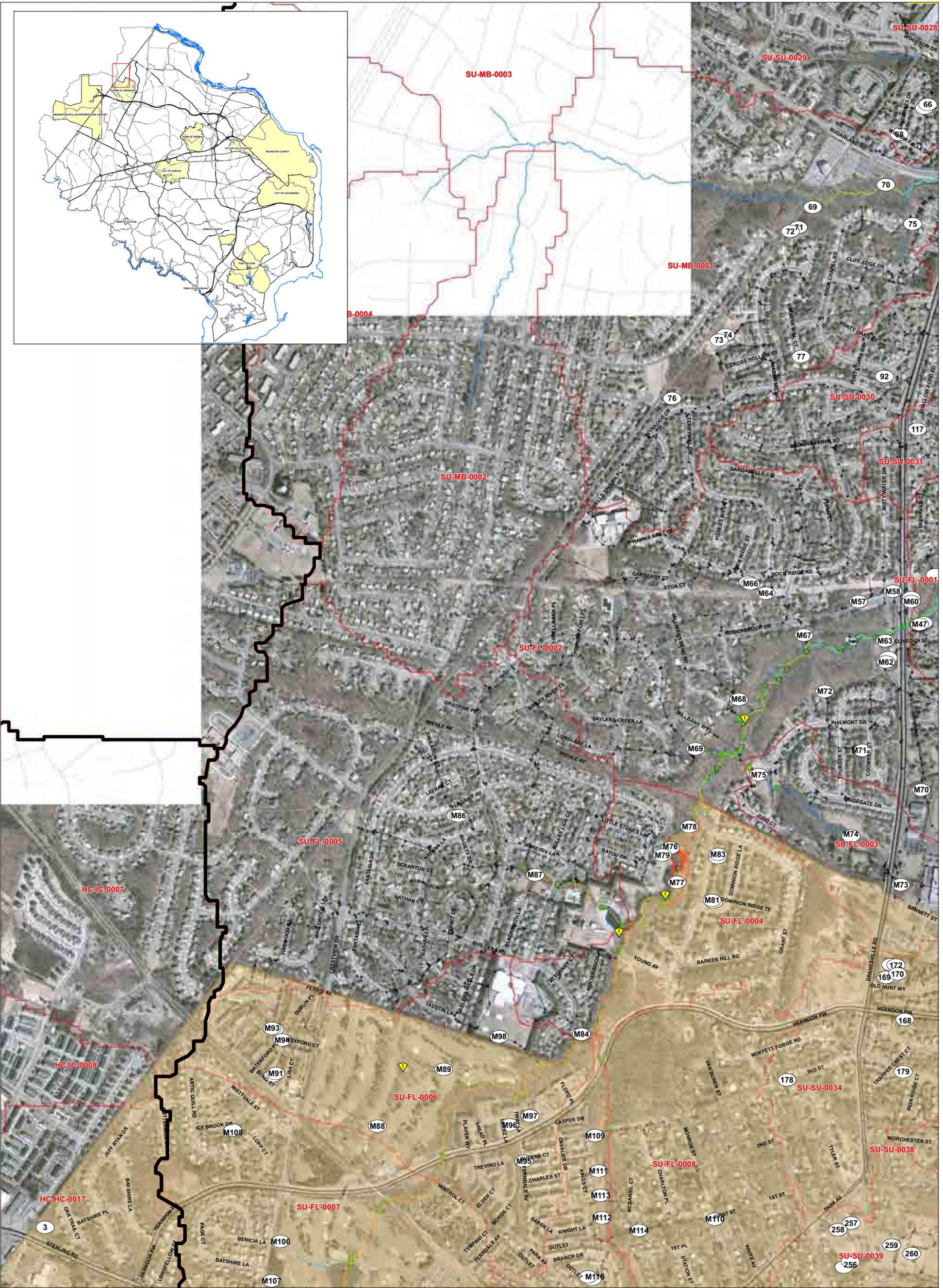
Map 4 of 8



 	<ul style="list-style-type: none"> Candidate Projects Public Issues/Comments ProRata Projects Still Needed StormNet Drainage Network Regional Ponds Planned/Unbuilt Completed 	<ul style="list-style-type: none"> SPA Erosion Line: Minor SPA Erosion Line: Moderate SPA Erosion Line: Severe SPA Erosion Points: Minor SPA Erosion Points: Moderate SPA Erosion Points: Severe 	<ul style="list-style-type: none"> SPA Head Cut Height: < 1' SPA Head Cut Height: 1'-2' SPA Head Cut Height: >2' SPA Crossing Impact: Minor SPA Crossing Impact: Moderate SPA Crossing Impact: Severe 	<ul style="list-style-type: none"> SPA Ditch Impacts: Minor SPA Ditch Impacts: Moderate SPA Ditch Impacts: Severe SPA Pipe Impact: Minor SPA Pipe Impact: Moderate SPA Pipe Impact: Severe 	<ul style="list-style-type: none"> SPA Utility Impact: Minor SPA Utility Impact: Moderate SPA Utility Impact: Severe SPA Obstruction Impact: Minor SPA Obstruction Impact: Moderate SPA Obstruction Impact: Severe 	<ul style="list-style-type: none"> SPA Habitat: Good SPA Habitat: Fair SPA Habitat: Poor Deficient Buffer
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Candidate Projects for Sugarland Run and Horsepen Creek Watersheds

Map 5 of 8

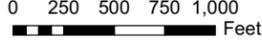


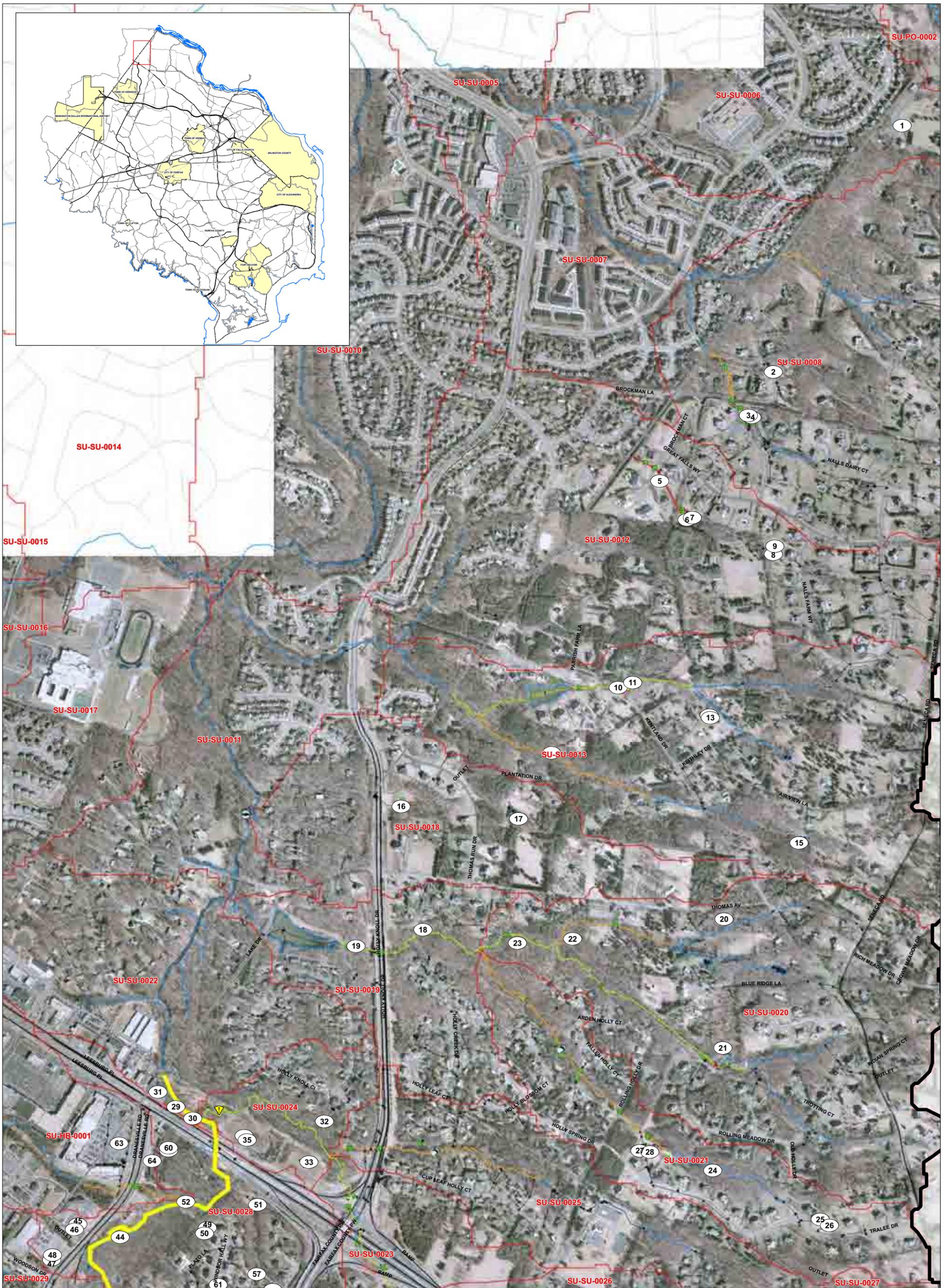
####	Candidate Projects	SPA Erosion Line	SPA Head Cut Height	SPA Ditch Impacts	SPA Utility Impact	SPA Habitat
▼	Public Issues/Comments	Minor	< 1'	Minor	Minor	Good
●	ProRata Projects Still Needed	Moderate	1'-2'	Moderate	Moderate	Fair
→	StormNet Drainage Network	Severe	>2'	Severe	Severe	Poor
○	Regional Ponds	SPA Erosion Points	SPA Crossing Impact	SPA Pipe Impact	SPA Obstruction Impact	Deficient Buffer
◆	Planned/Unbuilt	Minor	Minor	Minor	Minor	
◆	Completed	Moderate	Moderate	Moderate	Moderate	
		Severe	Severe	Severe	Severe	

Candidate Projects for Sugarland Run and Horsepen Creek Watersheds

Map 6 of 8



  	<ul style="list-style-type: none"> ### Candidate Projects ▼ Public Issues/Comments ● ProRata Projects Still Needed → StormNet Drainage Network ★ Regional Ponds ★ Planned/Unbuilt ★ Completed 	<ul style="list-style-type: none"> SPA Erosion Line Minor Moderate Severe ★ SPA Erosion Points ★ Minor ★ Moderate ★ Severe 	<ul style="list-style-type: none"> ▲ SPA Head Cut Height ▲ < 1' ▲ 1'- 2' ▲ > 2' ■ SPA Crossing Impact ■ Minor ■ Moderate ■ Severe 	<ul style="list-style-type: none"> ◆ SPA Ditch Impacts ◆ Minor ◆ Moderate ◆ Severe ● SPA Pipe Impact ● Minor ● Moderate ● Severe 	<ul style="list-style-type: none"> ◆ SPA Utility Impact ◆ Minor ◆ Moderate ◆ Severe + SPA Obstruction Impact + Minor + Moderate + Severe 	<ul style="list-style-type: none"> SPA Habitat Good Fair Poor Deficient Buffer
	<h3 style="margin: 0;">Candidate Projects for Sugarland Run and Horsepen Creek Watersheds</h3> <p style="margin: 0; font-weight: bold;">Map 7 of 8</p>					



		Candidate Projects	SPA Erosion Line Minor	SPA Head Cut Height < 1'	SPA Ditch Impacts Minor	SPA Utility Impact Minor	SPA Habitat Good
		Public Issues/Comments	SPA Erosion Line Moderate	SPA Head Cut Height 1'- 2'	SPA Ditch Impacts Moderate	SPA Utility Impact Moderate	SPA Habitat Fair
		ProRata Projects Still Needed	SPA Erosion Line Severe	SPA Head Cut Height >2'	SPA Ditch Impacts Severe	SPA Utility Impact Severe	SPA Habitat Poor
		StormNet Drainage Network	SPA Erosion Points Minor	SPA Crossing Impact Minor	SPA Pipe Impact Minor	SPA Obstruction Impact Minor	Deficient Buffer
		Regional Ponds Planned/Unbuilt	SPA Erosion Points Moderate	SPA Crossing Impact Moderate	SPA Pipe Impact Moderate	SPA Obstruction Impact Moderate	
		Completed	SPA Erosion Points Severe	SPA Crossing Impact Severe	SPA Pipe Impact Severe	SPA Obstruction Impact Severe	

Candidate Projects for Sugarland Run and Horsepen Creek Watersheds

Map 8 of 8

F. X. Browne, Inc.

Memorandum

To: Fairfax County
From: F. X. Browne, Inc.
Date: April 1, 2010
Revised: October 29, 2010
RE: Tasks 3.3, 3.4 and 3.5 Evaluation and Ranking of Candidate Structural and Non-Structural Projects for Sugarland Run and Horsepen Creek Watersheds

Task 3.3 requires that potential candidate sites be investigated in the field to evaluate the potential scope, feasibility, and benefits of each candidate project. Tasks 3.4 and 3.5 require candidate structural projects be evaluated and ranked following the guidelines described in Section 5.1-E of the WMP Standards version 3.2 and that non-structural candidate projects be evaluated and ranked using best professional judgment based on their overall benefit and feasibility in meeting watershed goals and objectives.

Task 3.3 Investigation of Candidate Projects

Watershed advisory group (WAG) members reviewed proposed candidate projects and discussed overall project selection methods and the location and scope of individual proposed projects at a WAG meeting on June 3rd, 2009. Comments from the WAG meeting were summarized and considered during field reconnaissance efforts.

Field visits to candidate sites were conducted for all potential candidate structural projects in the Sugarland Run and Horsepen Creek watersheds from June 8th through July 3rd. A field evaluation form, provided by the County, was completed for each candidate project site. Additional notes were taken on aerial photographs of candidate sites and photos were taken at each site. Data recorded on field forms were digitized into a County-provided database.

Field reconnaissance efforts helped to provide a basis for the initial reduction of candidate projects. Various constraints for new stormwater management facilities identified during field reconnaissance efforts that limited project feasibility included space, slope, utilities, a change in the development status, and existing, mature vegetation; all potential project constraints were recorded on field forms and digitized into the County-provided database. Some proposed projects were deemed low priority due to favorable existing conditions including properly functioning and appropriately sized outlet structures, naturalized basin bottoms and swales, adequate energy dissipation, and a general lack of visible impacts from high velocity and high volume stormwater flows.

Best professional judgment was used to reduce the initial list of candidate structural projects to 128 projects in Sugarland Run and Horsepen Creek watersheds. Factors considered during the initial feasibility analysis included constraints identified during field reconnaissance, the size and scale of the projects, the location and distribution of projects within a subwatershed, existing stormwater treatment in the subwatershed, project drainage area, and specific WAG member comments. Candidate projects deemed viable were those which had few, if any, site constraints, would provide significant additional stormwater treatment to a subwatershed, and were considered to be of significant size and scope.

Upon completion of the field reconnaissance efforts and initial feasibility analysis, candidate project sites that were deemed viable were digitized into GIS polygon shapefile format (*S_projects.shp*; *H_projects.shp*).

Project Cost Estimates

Costs were estimated for each project using unit costs provided by the County. The County considers a project to be of considerable size and scope if it is a minimum of \$80,000. Smaller projects of similar scope and close proximity were grouped together during the initial reduction of candidate projects under Task 3.3. Individual sub-projects in a suite of grouped subprojects may be estimated to cost less than the County-minimum of \$80,000; however, the total project group is greater than the threshold for project qualification.

Task 3.4 Evaluation and Ranking Candidate Structural Projects

Viable structural projects were given a six or seven digit project number according to the following numbering convention: XX9YZZ; where XX is the 2-digit watershed code, Y is the project type code, and ZZ is a 2-digit numbering code starting with 00 at the lowest point in the watershed. An additional seventh letter is used for any project with multiple subprojects. For regional pond alternatives, ZZ is the 2-digit regional pond number rather than a sequential numerical code.

Project type codes have been defined by the County in order to maintain consistency throughout the watershed management plans. Project type codes used in the Sugarland Run and Horsepen Creek watersheds include:

- 0 – Regional Pond Alternatives (may be any project type other than stream restoration that drains to a planned, unconstructed regional pond)
- 1 – New Stormwater Ponds and Stormwater Pond Retrofits
- 2 – Stream Restoration and Streambank Stabilization
- 4 – Road Crossing Improvements and Culvert Retrofits
- 5 – New Low Impact Development/Best Management Practices and LID/BMP Retrofits
- 9 – Non-Structural Projects

Planned, unconstructed regional ponds and the suite of regional pond alternatives proposed as an alternative group of projects for the regional pond are listed in Table 1.

Table 1 Planned, Unconstructed Regional Ponds and Regional Pond Alternatives

Regional Pond ID	Regional Pond Alternative Project IDs
S-01	SU9001A, SU9001B, SU9001C
S-02	SU9002A, SU9002B, SU9002C, SU9002D
S-05	SU9005A, SU9005B, SU9005C, SU9005D, SU9005E, SU9005F, SU9005G
S-07	SU9007A, SU9007B, SU9007C, SU9007D, SU9007E, SU9007F, SU9007G, SU9007H, SU9007I, SU9007J, SU9007K, SU9007L
H-02	HC9002A, HC9002B, HC9002C, HC9002D
H-07	HC9007A, HC9007B, HC9007C, HC9007D, HC9007E, HC9007F
H-13	HC9013A, HC9013B, HC9013C, HC9013D, HC9013E, HC9013F, HC9013G, HC9013H, HC9013I, HC9013J, HC9013K, HC9013L, HC9013M, HC9013N, HC9013O, HC9013P, HC9013Q, HC9013R

Viable structural projects were prioritized and ranked according to the guidance set forth in Section 5.1E of the Watershed Management Plan Standards 3.2. Structural projects were scored from 1 to 5 points, with 5 representing the highest priority and 1 representing the lowest priority.

The project scores were based on the following five factors:

1. Effect on Watershed Impact Indicators
2. Effect on Source Indicators
3. Location within Priority Subwatersheds
4. Sequencing
5. Implementability

Evaluation of structural projects based on each of these factors is discussed in further detail below. Prioritization tables for each factor are located in Appendices A, B, C, D, and E.

GIS Processing

Prior to prioritization and ranking outlined in Section 5.1E, a sequence of GIS processing was required in preparation for water quality modeling with STEPL. The projects were divided into five ‘runs’ for GIS processing and water quality modeling purposes. Each run contained no more than one project per subwatershed; projects with multiple subprojects and regional pond alternative scenarios were processed together in order to model the benefits of the entire group of projects.

Drainage areas to each project with water quality and/or water quantity benefits were delineated in GIS and a revised subarea treatment layer was calculated for each ‘run’ to show proposed stormwater management for the future with projects modeling scenario. During the GIS processing, output tables were created for each ‘run’ that contain the land use and soils data for the proposed stormwater management areas for use in water quality and water quantity modeling.

Water Quality Modeling with STEPL

The land use and soils output tables were loaded into the STEPL spreadsheets in order to show the water quality benefits for each proposed candidate project. Previous land use information was

cleared from the spreadsheets prior to loading the revised tables in order to ensure an accurate data transfer.

In some cases, the new project drainage areas caused a change in the majority soil type of the subareas within the subwatershed. Because of the changes in majority soil types, the total pollutant loadings before stormwater management facility reductions were applied varied from the future without projects condition to the future with projects condition by as much as 15 percent in either direction. This discrepancy in future pollutant loading resulted in a misrepresentation of the project benefits. In order to minimize the impact from this modeling flaw, the total pollutant loadings without BMP reductions (the total pollutant loading before stormwater management facility reductions were applied) for the future without projects and future with projects were averaged, the future with projects BMP reductions were applied, and an adjusted future with projects pollutant loading was calculated.

Two existing regional ponds are proposed for retrofit which will increase the sediment and nutrient removal efficiency of the ponds. Since regional ponds are not modeled using the subarea classifications like smaller stormwater facilities, these projects were modeled using the future without projects subarea land use and soils data and revising the regional pond pollutant removal efficiencies. Each of the regional ponds drains a single subwatershed and the proposed removal efficiencies were determined based on CDM's Stormwater Loading Factors & BMP Efficiencies for Countywide SWMM Model Applications report, prepared for Fairfax County DPWES Stormwater Planning Division (February 5, 2005).

Effect on Subwatershed Ranking Indicators

Select subwatershed ranking indicators were evaluated for various candidate project types to facilitate candidate project ranking. Total nitrogen, total phosphorus, and total suspended solids were calculated for the future with projects scenario using STEPL as indicated above. The hydrology indicator was also updated for projects where the future with projects scenario was modeled in SWMM. Other indicators could not be calculated for the future with projects condition and were evaluated based on existing condition and/or future without projects condition.

Generally, each indicator without future with projects data was evaluated in two ways. First, the existing and/or future without projects subwatershed ranking data was reviewed to establish the overall need and potential benefit for a project in that particular subwatershed. A project was assumed to have a greater potential benefit if it was located in a subwatershed that was in poor condition compared to a subwatershed that was in better condition. Also, if the subwatershed shows a worsening condition from the existing subwatershed ranking scenario to the future without project subwatershed ranking scenario, the subwatershed is in greater need of a proposed project. The second way each project was evaluated was based on the likely impact of the project on each subwatershed ranking indicator using our best professional judgment. This was dependent on the scale of the project and specific project details.

Project scores for each indicator were within a range from one to five, with five being the most beneficial and one providing the least benefit. Each project started with a score of 3 and was

adjusted up or down based on the existing and future without projects subwatershed ranking data and our best professional judgment as indicated above and depicted on Tables 2, 3, and 4.

Table 2 Project Scoring Methodology – Indicators with Existing Condition Only (1)

Project Score Adjustment	Subwatershed Ranking (SW) Indicators: Benthic Communities, Fish Communities, Aquatic Habitat, Channel Morphology, RPA Riparian Habitat, Headwater Riparian Habitat, Wetland Habitat
Start with “3”, then add or subtract:	
+1	Existing SW Ranking Score 2 or 4
0	Existing SW Ranking Score 6
-1	Existing SW Ranking Score 8 or 10
+1	Great Benefit
0	Some Potential Benefit
-1	Minimal/No Benefit

Table 3 Project Scoring Methodology – Indicators with Existing Condition Only (2)

Project Score Adjustment	Subwatershed Ranking (SW) Indicators: Instream Sediment, Channelized/Piped Streams, Stormwater Outfalls, Streambank Buffer Deficiency, Septic
Start with “3”, then add or subtract:	
+1	Existing SW Ranking Score 2.5
0	Existing SW Ranking Score 5
-1	Existing SW Ranking Score 7.5
-2	Existing SW Ranking Score 10
+1	Great Benefit
0	Some Potential Benefit
-1	Minimal/No Benefit

Table 4 Project Scoring Methodology – Indicators with Future w/out Projects Data

Project Score Adjustment	Subwatershed Ranking (SW) Indicators: Number of Road Hazards, Magnitude of Road Hazards, Residential and Non-Residential Building Hazards, Total Impervious Area, Directly Connected Impervious Area
Start with “3”, then add or subtract:	
+1	Worsening Condition from Existing to Future without Projects Scenario
+1	Future without Projects SW Ranking Score 2.5
0	Future without Projects SW Ranking Score 5
-1	Future without Projects SW Ranking Score 7.5
-2	Future without Projects SW Ranking Score 10
+1	Great Benefit
0	Some Potential Benefit
-1	Minimal/No Benefit

For the indicators with future without projects data, listed in Table 4, consideration of the expected change from existing condition to future without projects condition was included in the project score determination. Projects in subwatersheds that anticipate a worsening condition due

to anticipated development were given an additional point to reflect the greater need of projects in the subwatershed. No changes were noted in the number or magnitude of road hazards or the residential or non-residential building hazards indicators. The total impervious area indicator for a subwatershed was considered to have a worsening condition if the anticipated percentage of impervious area increased by one percent. The directly connected impervious area indicator for a subwatershed was considered to have a worsening condition if the anticipated percentage of impervious area increased by two percent.

The best professional judgment factor was applied according to Tables 2, 3, and 4 on a project by project basis depending on the anticipated benefit of the project. Some generalizations could be made based on the project type and specific project features. For the Instream Sediment indicator, a streambank stabilization project is anticipated to have a greater benefit than a stormwater pond retrofit so the streambank stabilization projects generally receive a +1 BPJ score, while a stormwater pond retrofit may receive a 0 or -1. The stormwater pond retrofit BPJ score is based on project specific factors such incorporation of outfall improvements or energy dissipation which will likely provide a greater benefit in terms of instream sediment than pond retrofits without these features.

For the indicators listed in Tables 3 and 4 above, it is possible to arrive at a project score of 0 or 6, which are outside of the required 1-5 range. These occurrences were very infrequent, but when encountered the project scores were capped at 1 and 5.

The hydrology indicator was first calculated using the same method as other indicators with only existing condition and future condition without projects data. Starting with a base score of 3, values were added or subtracted based on the future without projects score as shown in Table 4 above. Best professional judgment was then applied on a project by project basis depending on the anticipated benefit of the project. An additional factor was also applied to the hydrology indicator for those subwatersheds that exhibited worsening conditions. Subwatersheds were considered to have a worsening condition if the modeled flow per acre increased by six percent or greater.

Initial hydrology indicator values were incorporated with the other indicators to generate a preliminary prioritization ranking of proposed projects. The list of projects generated from the preliminary prioritization was used to determine which projects would be modeled in SWMM and HEC-RAS as discussed in Technical Memo 3.6. SWMM models of proposed projects allowed for the hydrology indicator to be scored based on the project's impact on the future with projects scenario for those projects which were modeled in SWMM. Quartiles were calculated based on the range of percent change in the Sugarland Run values from the future without projects scenario to the future with projects scenario. Table 5 below depicts the quartiles used for the projects where the hydrology indicator was updated. Quartiles were used in lieu of the recommended quintiles in order to allow an additional point of adjustment based on best professional judgment without exceeding the maximum five point score. Projects not modeled in SWMM maintain their initial hydrology indicator scores, as described above.

Table 5 Hydrology Indicator Quartiles

Percentile	% Change: Future w/out Project to Future with Project	Project Score
0%	-53.6% to -12.8%	4
33%	-12.8% to -3.6%	3
67%	-3.7% to -0.1%	2
100%	0.0% or greater	1

Several other indicators for which the future with projects scenario could be calculated were scored based on the project’s impact on the future with projects scenario. These indicators include Total Nitrogen, Total Phosphorus, and Total Suspended Solids. Preliminary quartiles were calculated based on the range of percent change in the Sugarland Run values from the future without projects scenario to the future with projects scenario. Final quartiles (or quintiles) will be calculated by the County based on the range of percent change in all of the county watersheds and revised scores may be applied.

Tables 6, 7, and 8, depict the quartiles used for each of the referenced indicators. Quartiles were used in lieu of the recommended quintiles in order to allow an additional point of adjustment based on best professional judgment without exceeding the maximum five point score.

Table 6 Preliminary Total Nitrogen (TN) Quartiles

Percentile	% Change: Future w/out Project to Future with Project	Project Score
0%	-55.2% to -3.1%	4
33%	-3.2% to -1.2%	3
67%	-1.3% to 2.7%	2
100%	2.8% or greater	1

Table 7 Preliminary Total Phosphorus (TP) Quartiles

Percentile	% Change: Future w/out Project to Future with Project	Project Score
0%	-53.2% to -3.4%	4
33%	-3.5% to -0.6%	3
67%	-0.7% to 2.0%	2
100%	2.1% or greater	1

Table 8 Preliminary Total Suspended Solids (TSS) Quartiles

Percentile	% Change: Future w/out Project to Future with Project	Project Score
0%	-87.5% to -6.8%	4
33%	-6.9% to -1.3%	3
67%	-1.4% to 2.2%	2
100%	2.3% or greater	1

In some cases, the existing and future condition without projects water quality scores (STEPL model) were modeled inaccurately. The treatment by some ponds was not included in the model because the pond was either not included in the County’s stormwater network and not identified until candidate project field reconnaissance, or the drainage area to the pond did not contain any

parcels included in the County's controlled parcels GIS layer. The treatment of some other areas was overestimated in the model either because the parcels were included in the County's controlled parcels GIS layer, but not located within the drainage area of an existing stormwater management facility, or because candidate project field reconnaissance indicated that an existing pond provided less treatment than was originally modeled. Best professional judgment was used to adjust the project scores for total nitrogen, total phosphorus, and total suspended solids based on whether the project benefit was accurately modeled or if the project benefits were over or under estimated due to inaccuracies in the future without projects condition STEPL model. Appendix F includes the STEPL output tables including pollutant loading for future without projects condition and future with projects condition, the percent reduction of pollutant loading, project score and best professional judgment score adjustment.

Regional pond alternative project groups were modeled in STEPL as a single group, but were evaluated individually in the project ranking spreadsheet so that subprojects could be eliminated, as necessary, if the overall benefit and cost of the regional pond alternative group far exceeded the benefit and cost of the proposed regional pond. Because the projects were modeled as a single project group, they all received the same modeled project benefit in the project ranking spreadsheet; however, some of the projects have a greater proportion of the benefit than others. Therefore, regional pond alternative project scores for total nitrogen, total phosphorus, and total suspended solids were adjusted using best professional judgment based on the project's likely proportion of the modeled benefit.

Projects which were not modeled in STEPL such as stream restoration projects and road crossing improvements were given a project score for total nitrogen, total phosphorus, and total suspended solids using best professional judgment based on the project's likely ability to affect each indicator.

Since every indicator is not likely to be impacted by some project types, a matrix was developed to show which project types are likely to affect which subwatershed ranking indicators. This way, the indicators evaluated for each project were targeted to those which the project was most likely to affect. This matrix is depicted in Tables 9 and 10, below.

While most projects conform to the matrix depicted in Tables 9 and 10, some projects consist of multi-faceted components that consist of a variety of project types, such as a stormwater pond retrofit that includes improvements to the pond's outfall and repairing streambank erosion below the outfall. For these situations, additional indicators may have been evaluated in order to more accurately represent the scale and variety of project benefits.

Table 9 Impact Indicator Scores Evaluated by Project Type

Individual Impact Indicator Scores	Stream Restoration (Type Code 2)	Outfall Improvement (Type Code 7)	Culvert Retrofit (Type Code 4)	Flood Protection/ Mitigation (Type 6)	New/Retrofit BMP/LID (Type Code 5)	New Stormwater Pond (Type Code 1)	Stormwater Pond Retrofit (Type Code 1)	Area-wide Drainage Improvement (Type 3)
Benthic Communities	X	X						X
Fish Communities	X	X						X
Aquatic Habitat	X	X	X					X
Channel Morphology (CEM)	X			X				X
Instream Sediment	X	X				X	X	X
Hydrology	X	X	X	X	X	X	X	X
Number of Road Hazards			X	X				
Magnitude of Road Hazards			X	X				
Residential Building Hazards			X	X				
Non-Residential Building Hazards			X	X				
Flood Complaints								
RPA Riparian Habitat	X							X
Headwater Riparian Habitat	X							X
Wetland Habitat	X				X	X	X	X
Terrestrial Forested Habitat								
E. coli								
TSS Concentration (STEPL)	X	X	X		X	X	X	X
TN Concentration (STEPL)		X	X		X	X	X	X
TP Concentration (STEPL)	X	X	X		X	X	X	X

X – Effects on these indicators were scored and evaluated

Table 10 Source Indicator Scores Evaluated by Project Type

Individual Impact Indicator Scores	Stream Restoration (Type Code 2)	Outfall Improvement (Type Code 7)	Culvert Retrofit (Type Code 4)	Flood Protection/ Mitigation (Type 6)	New/Retrofit BMP/LID (Type Code 5)	New Stormwater Pond (Type Code 1)	Stormwater Pond Retrofit (Type Code 1)	Area-wide Drainage Improvement (Type 3)
Channelized/Piped Streams	X	X	X	X		X		X
Directly Connected Impervious Area (DCIA)				X	X	X	X	X
Total Impervious Area				X	X			X
Stormwater Outfalls	X	X		X	X	X	X	X
Sanitary Sewer Crossings								
Streambank Buffer Deficiency	X							X
TSS Concentration (STEPL)	X	X	X		X	X	X	X
TN Concentration (STEPL)	X	X	X		X	X	X	X
TP Concentration (STEPL)	X	X	X		X	X	X	X
X – Effects on these indicators were scored and evaluated								

The RPA Riparian Habitat and Headwater Riparian Habitat indicators will only be impacted by a project if the project is located within the RPA area or headwater area, respectively. Therefore, a project was only evaluated for whichever riparian area it was located within, but not for both headwater and RPA riparian habitat indicators.

Flood complaints were not considered for any project type due to the inconsistency of this data. Terrestrial forested habitat and sanitary sewer crossings are unlikely to be significantly affected by any of the structural projects; therefore, these indicators were not considered in project ranking. The scarcity of E. coli data and the difficulty in determining likely project benefits eliminated this indicator from consideration in project ranking.

Project scores based on subwatershed ranking indicator scores were calculating by taking an average of all of the individual indicator scores which were evaluated for each project. Appendix A contains a summary of the project scores based on subwatershed ranking impact indicator scores. A summary of project scores based on subwatershed ranking source indicator scores are located in Appendix B.

Location within Priority Subwatersheds

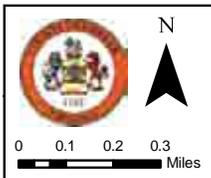
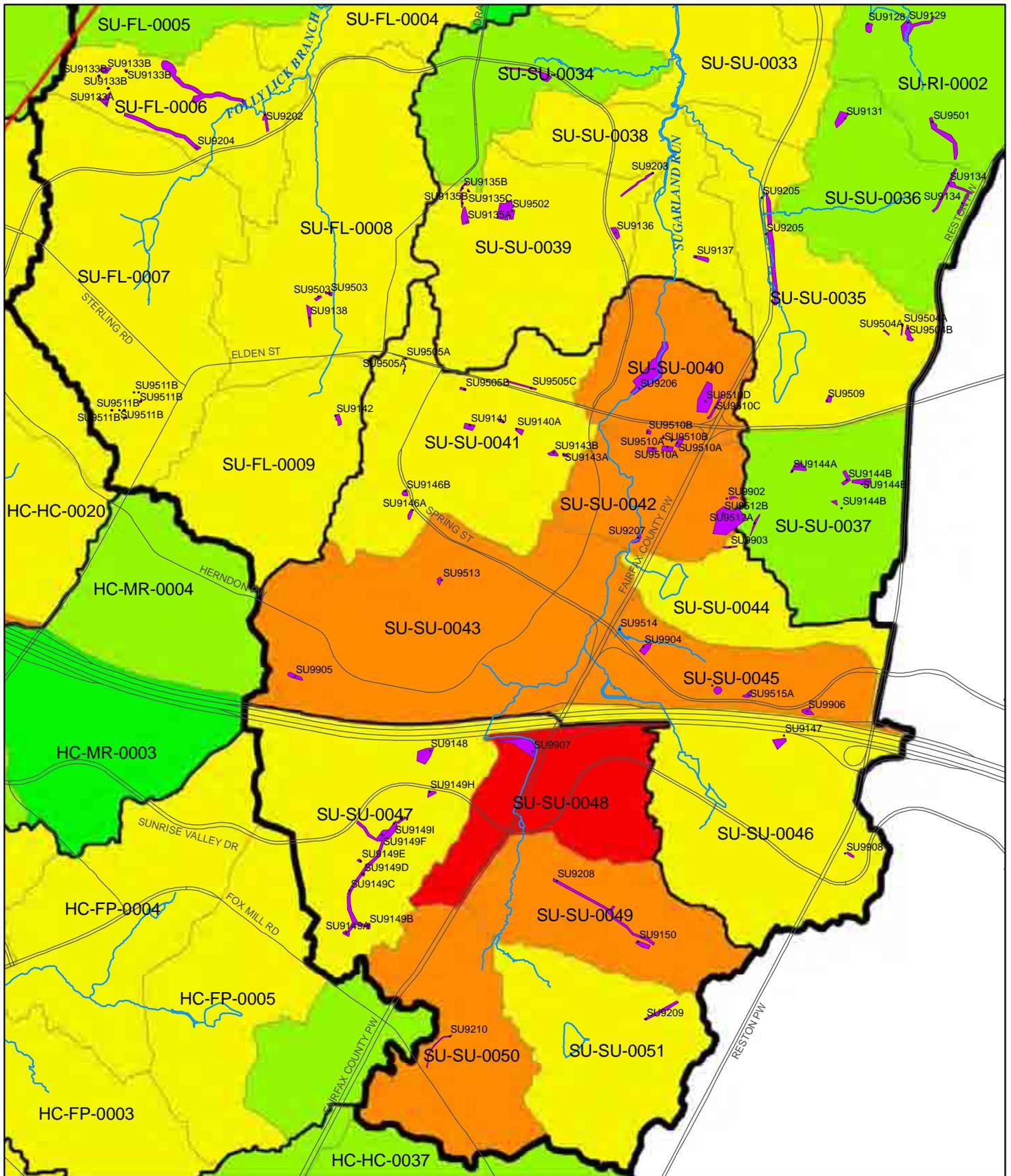
Results of the existing condition SW Ranking, updated in July 2009 (directory: Task2deliverables_Sugar-Horse/SW Ranking/Existing_073109/) were used to evaluate the “location within priority subwatersheds” project prioritization factor. Generally, candidate projects located within poor quality subwatersheds have the potential to provide a greater overall impact than a project located within a high quality subwatershed. In order to quantify this difference, preliminary quintiles were calculated based on existing condition watershed impact composite score for Sugarland Run and Horsepen Creek subwatersheds. Final quintiles will be calculated by the County based on the range of existing condition watershed impact composite scores in all of the county watersheds and revised scores may be applied. Table 11 depicts the quintiles used for Sugarland Run watershed. A complete list of project scores based on these priority subwatershed scores is located in Appendix C.

Table 11 Watershed Impact Composite Score Quintiles

Percentile	Watershed Impact Composite Scores	Project Score
80%	6.14 to 10	1
60%	5.36 to 6.13	2
40%	4.81 to 5.35	3
20%	4.32 to 4.81	4
0%	3.78 to 4.31	5

Figures 1 and 2 overlay the 0-25 year proposed candidate projects on the existing condition SW Ranking results.

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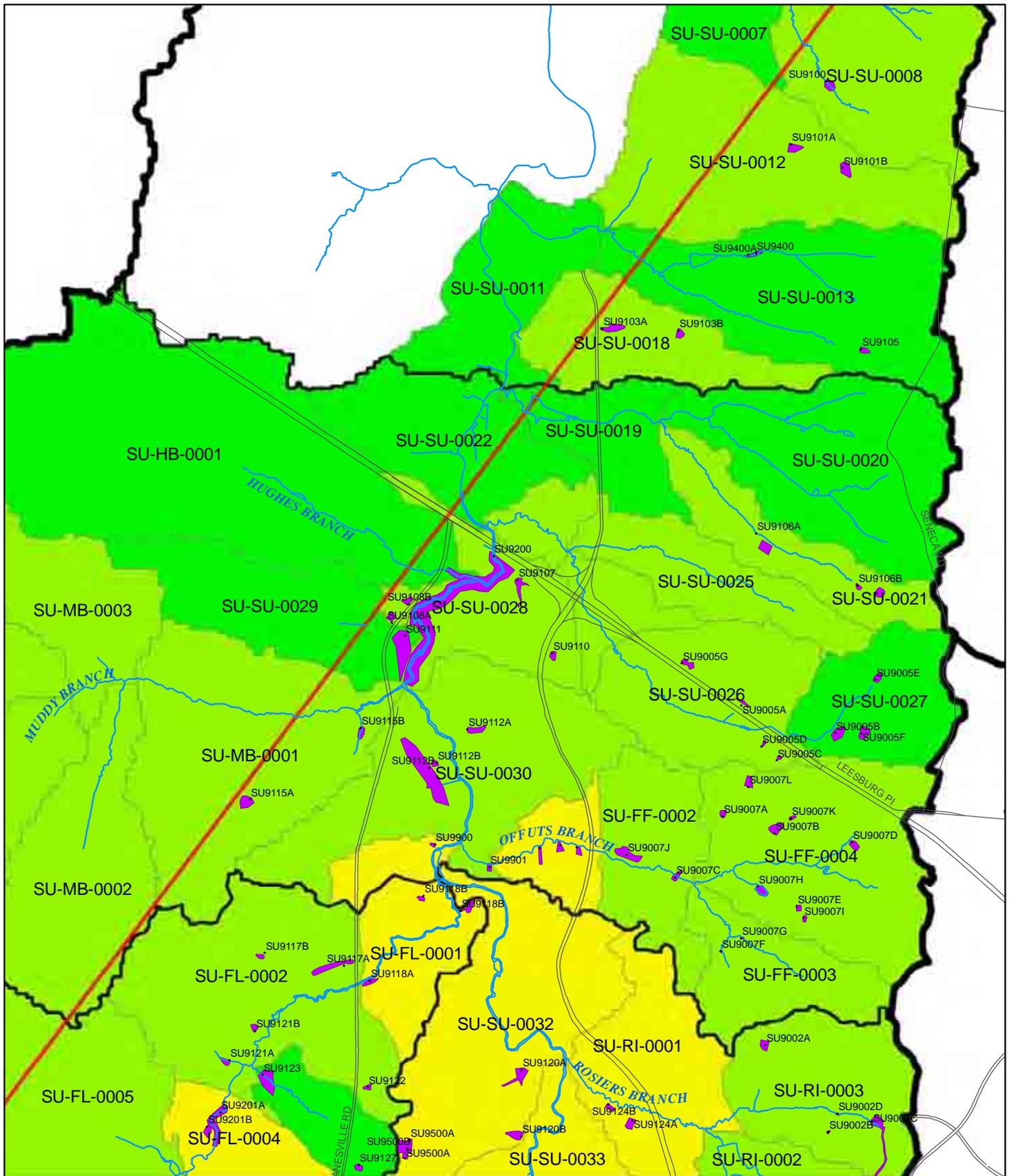


- Perennial Streams
- Major Roads
- S_Projects
- Fairfax County Boundary
- Watersheds

Objective Composite Score	
	1.0 - 4.0
	4.1 - 5.0
	5.1 - 6.0
	6.1 - 7.0
	7.1 - 8.0

FIGURE 1
Upper Sugarland Run
0-25 Year Projects

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 <p>N</p>  <p>0 0.1 0.2 0.3 Miles</p>	<ul style="list-style-type: none">  Perennial Streams  Major Roads  S_Projects  Fairfax County Boundary  Watersheds 	<p>Objective Composite Score</p> <ul style="list-style-type: none">  1.0 - 4.0  4.1 - 5.0  5.1 - 6.0  6.1 - 7.0 7.1 - 8.0 	<p>FIGURE 2</p> <p>Lower Sugarland Run</p> <p>0-25 Year Projects</p>

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Sequencing

Projects upstream relative to other projects should be completed prior to projects located downstream because upstream projects will provide protection for future downstream projects and also mitigate sources and stressors that cause cumulative impacts downstream. Therefore, projects in headwater areas should be considered the highest priority and receive a higher project score.

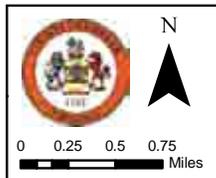
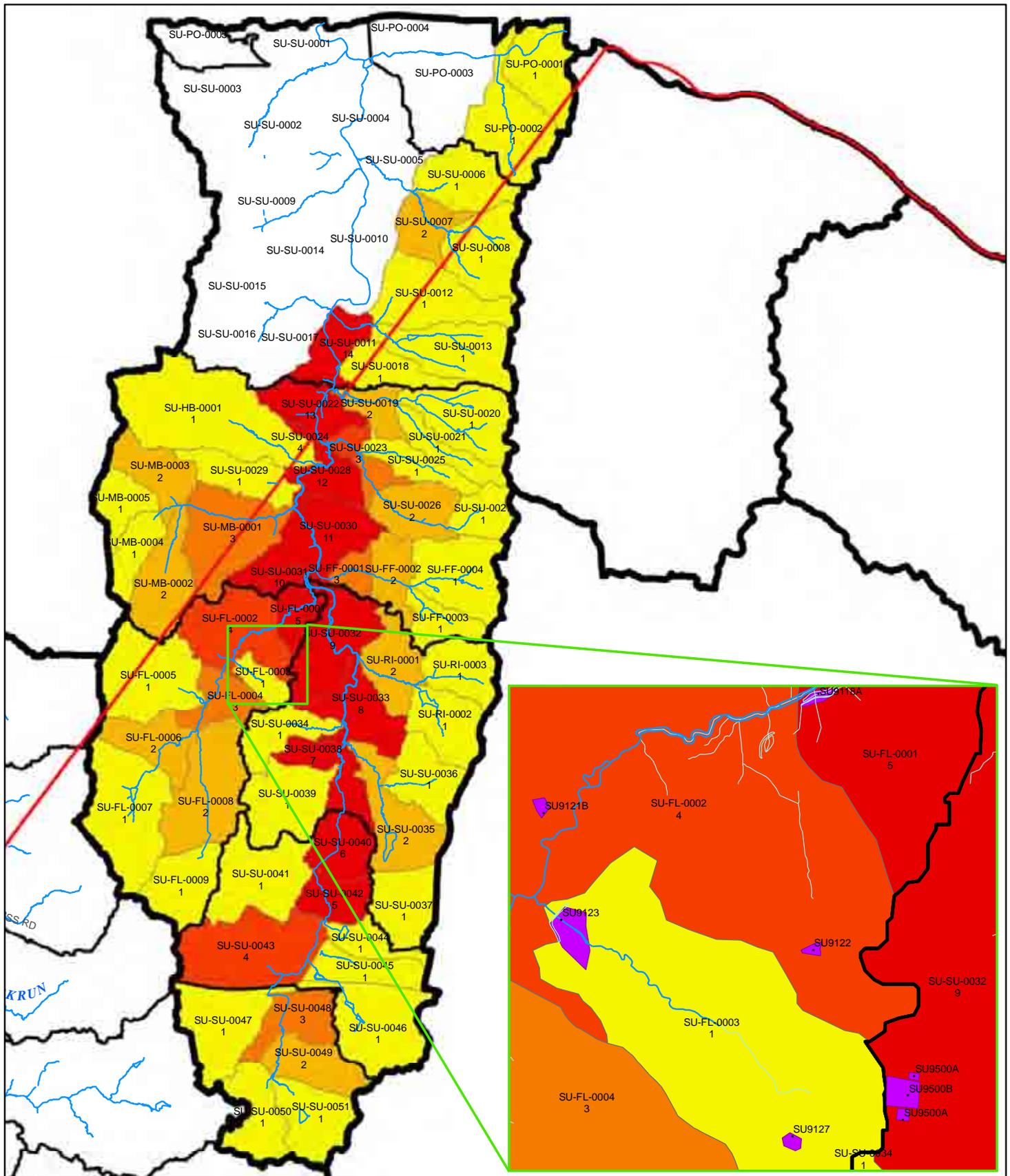
Subwatersheds were numbered according to relative stream order, see Figure 3. Headwater subwatersheds were given an order of one with higher numbered subwatersheds downstream. Once the subwatersheds were ordered, quintiles were calculated to determine project scores for each subwatershed. The subwatershed sequencing quintiles are depicted in Table 12, below.

Table 12 Subwatershed Sequencing Quintiles

Percentile	Subwatershed Order	Project Score
80%	4 to 12	1
60%	2 to 3	3
0% - 40%	1	5

A subwatershed may have headwater streams even if it receives flow from an upstream subwatershed. Candidate project SU9122 in Figure 3 Inset is an example of this; the project is located in SU-FL_0002 which was given a sequencing order of 4, however, SU9122 is located in a headwaters area so it should be scored accordingly. Project scores for projects located in these headwater areas, such as candidate project SU9122, were adjusted manually on a case by case basis. A complete listing of subwatershed order and project scores is provided in Appendix D.

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- FHD Streams
- Perennial Streams
- 0-25 Year Candidate Projects
- Watershed Management Areas
- Watersheds
- Fairfax County Boundary

- Sequencing Order
- 1
 - 2
 - 3
 - 4
 - 5 - 14

FIGURE 3
Sequencing Factor for
0-25 Year Project Prioritization

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Implementability

Less complex projects and projects without land acquisition requirements will be easier to implement and are given higher scores accordingly. Those projects which are located on County property or retrofits of County-maintained stormwater facilities were scored higher than projects on private parcels and those with multiple landowners. Implementability was determined in three steps:

- 1) Analysis of property owner – projects were assigned points based on property ownership. County-owned parcels were assigned a point value of 1; Homeowners Associations, 2; Churches and Commercial parcels, 3; and private parcels, 4. The total point value for each project area was summed so that a greater number of owners resulted in a greater point value and indicated a greater difficulty of implementation. This point value was divided by 2 if the project involved an existing County-maintained facility regardless of land owner, since existing County-maintained facilities have existing maintenance agreements in place. Table 13 shows some examples of this step in the Implementability analysis.

Table 13 Analysis of Property Ownership for Implementability

Property Owner(s)	Point Value	Existing County Facility?	Adjusted Point Value
1 County Parcel	1	Yes	0.5
1 County Parcel	1	No	1
1 HOA Parcel	2	Yes	1
1 Commercial or Church Parcel	3	Yes	1.5
1 HOA Parcel	2	No	2
1 Private Parcel	4	Yes	2
1 Commercial or Church Parcel	3	No	3
1 Commercial or Church Parcel	6	Yes	3
1 Private Parcel	4	No	4
3 Private Parcels	12	Yes	6
3 Private Parcels	12	No	12

- 2) Quintiles were established to produce a score based on parcel ownership. Quintiles for Implementability are depicted in Table 14. The quintiles were established so that County-maintained facilities on County-owned land were scored highest with the greatest ease of implementability, and private parcels without County-maintained facilities were scored lowest.

Table 14 Implementability Score Quintiles

Percentile	Adjusted Point Values Based on Ownership	Project Score
0%	0.5	5
20%	1 or 2	4
40%	3	3
60%	4 to 7	2
80%	8 or greater	1

- 3) Final adjustments were made using best professional judgment based on the overall complexity and implementability of the project. In some cases, County-maintained facilities are located on parcels with multiple owner records in the ownership database provided by the County, this resulted in inflated initial point values that were not adequately reduced by the County-maintained facility division factor. Several BPJ adjustments were made to adjust this anomaly.

Implementability scores for each project are located in Appendix E.

Initial Ranking Composite Score

An initial ranking composite score was calculated for each project based on the weighted average of the five project scores described above.

- 1) Effect on Subwatershed Ranking Watershed Impact Indicators (30%)
- 2) Effect on Subwatershed Ranking Watershed Source Indicators (30%)
- 3) Location within Priority Subwatersheds (10%)
- 4) Sequencing (20%)
- 5) Implementability (10%)

The initial ranking composite score, or prioritization score is used to determine the overall rank of each project. Projects are ranked from one to 123 for Sugarland Run Horsepen Creek according to the prioritization score. The least beneficial projects may drop from the 0-25 year implementation plan and the top 70 projects will be promoted to the 10-year implementation plan.

Unconstructed regional ponds and regional pond alternatives were all ranked initially in order to help identify the most beneficial disposition option for each regional pond. Although regional ponds are not the preferred stormwater management tool in Fairfax County, two of the seven unconstructed regional ponds are proposed for construction with a modified scope. The alternatives identified for regional pond S-01 cannot provide sufficient treatment for the currently untreated developed land within the subwatershed; regional pond S-01 was re-named SU9001 in order to maintain consistency in project numbering. Regional Pond H-07 has a small, 67-acre drainage area and provides the best treatment option for stormwater management in its subwatershed. Various drainage improvement and stream restoration projects were also needed in the subwatershed and regional pond H-07 was added to a suite of subprojects and re-named HC9007E.

Following the fourth Watershed Advisory Group (WAG) meeting, comments from WAG members were compiled and the initial ranking composite scores were adjusted based on the comments received. Project ranks were updated based on the revised composite scores and initial 10-year and 25-year implementation plans were organized using the revised project ranks.

Once approved by the County, each of the projects in the 10-year implementation plan will be further evaluated with additional hydrologic modeling and details for each project will be compiled onto a project fact sheet. The project fact sheets will contain geographical information, a description of the project, potential benefits, project design considerations, a map of the project area and an estimated project cost.

A summary of the five project scores and the initial ranking composite score for each candidate project is provided in Table 15.

Table 15 Summary of Individual Project Scores and Initial Ranking Composite Score

Subwatershed	Project No.	Watershed Impact Indicators	Watershed Source Indicators	Location within Priority Subwatersheds	Sequencing	Implementability	Initial Ranking Composite Score	Project Rank
HC-CR-0002	HC9007	3.73	3.71	3.00	5.00	1.00	3.63	34
HC-CR-0004/05	HC9013	3.90	4.57	2.00	5.00	1.00	3.84	15
HC-HC-0018	HC9100	2.83	2.60	2.00	5.00	4.00	3.23	85
HC-HC-0017	HC9101	2.67	2.40	3.00	5.00	4.00	3.22	86
HC-HC-0026	HC9102	3.33	3.17	5.00	5.00	2.00	3.65	33
HC-HC-0025	HC9103	3.67	3.33	2.00	1.00	4.00	2.90	116
HC-MR-0002	HC9104	3.43	3.33	2.00	3.00	3.00	3.13	99
HC-MR-0003	HC9105	3.17	3.33	1.00	3.00	3.00	2.95	112
HC-FP-0001	HC9106	4.00	4.00	4.00	3.00	2.00	3.60	37
HC-MR-0004	HC9107	3.86	4.83	1.00	5.00	4.00	4.11	4
HC-HC-0028	HC9108	3.00	3.67	1.00	4.00	5.00	3.40	59
HC-FP-0002	HC9109	3.17	3.60	2.00	5.00	4.00	3.63	35
HC-MR-0004	HC9110	3.20	3.33	1.00	5.00	4.00	3.46	52
HC-FP-0004	HC9111	3.17	3.67	3.00	3.00	3.00	3.25	80
HC-HC-0028	HC9113	3.67	4.20	1.00	1.00	3.00	2.96	111
HC-FP-0004	HC9114	4.17	4.80	3.00	1.00	4.00	3.59	40
HC-HC-0028	HC9115	3.00	3.83	1.00	2.00	4.00	2.95	113
HC-FP-0003	HC9116	3.50	4.00	2.00	5.00	4.00	3.85	13
HC-FP-0004	HC9117	3.17	3.60	3.00	1.00	4.00	2.93	114
HC-HC-0030	HC9118	3.17	3.80	4.00	5.00	3.00	3.79	20
HC-FP-0005	HC9119	3.83	3.60	3.00	1.00	4.00	3.13	98
HC-HC-0030	HC9121	3.33	3.80	4.00	5.00	2.00	3.74	24
HC-HC-0030	HC9122	4.00	4.60	4.00	5.00	2.00	4.18	3
HC-HC-0030	HC9123	3.17	3.83	4.00	5.00	4.00	3.90	10
HC-FP-0005	HC9124	4.17	4.33	3.00	1.00	1.00	3.15	95
HC-HC-0031	HC9125	2.67	3.17	3.00	3.00	4.00	3.05	104
HC-HC-0034	HC9126	2.83	3.50	3.00	5.00	4.00	3.60	37
HC-FP-0003	HC9127	3.17	3.50	2.00	5.00	4.00	3.60	37
HC-HC-0031	HC9128	3.33	4.00	3.00	3.00	3.00	3.40	57
HC-HC-0034	HC9129	3.67	4.33	3.00	5.00	5.00	4.20	2
HC-HC-0031	HC9130	3.17	3.80	3.00	2.00	5.00	3.29	76
HC-HC-0035	HC9131	3.50	4.33	1.00	2.00	3.00	3.15	96
HC-HC-0032	HC9132	2.83	3.60	5.00	3.00	4.00	3.43	56
HC-CR-0001	HC9133	3.67	4.33	4.00	1.00	4.00	3.40	59
HC-HC-0033	HC9134	3.17	4.33	1.00	5.00	4.00	3.75	23
HC-CR-0001	HC9135	3.17	3.67	4.00	2.00	4.00	3.25	82
HC-HC-0037	HC9136	2.83	3.50	1.00	5.00	4.00	3.40	58
HC-HC-0039	HC9137	3.33	4.17	2.00	3.00	4.00	3.45	54
HC-CR-0001	HC9138	3.17	3.83	4.00	2.00	4.00	3.30	75

Subwatershed	Project No.	Watershed Impact Indicators	Watershed Source Indicators	Location within Priority Subwatersheds	Sequencing	Implementability	Initial Ranking Composite Score	Project Rank
HC-HC-0039	HC9139	3.67	4.00	2.00	1.00	5.00	3.20	87
HC-HC-0037	HC9140	3.50	3.83	1.00	5.00	4.00	3.70	27
HC-HC-0040	HC9142	3.67	4.50	2.00	5.00	4.00	4.05	7
HC-CR-0003	HC9143	3.67	4.33	5.00	1.00	3.00	3.40	59
HC-CR-0003	HC9146	3.17	3.83	5.00	1.00	4.00	3.20	88
HC-HC-0039	HC9148	3.17	3.50	2.00	1.00	4.00	2.80	119
HC-HC-0040	HC9149	3.83	4.67	2.00	5.00	1.00	3.85	13
HC-HC-0020	HC9200	3.67	4.00	5.00	3.00	4.00	3.80	19
HC-HC-0037	HC9201	3.89	4.00	1.00	5.00	4.00	3.87	11
HC-HC-0039	HC9202	3.56	3.67	2.00	3.00	4.00	3.37	64
HC-CR-0001	HC9302	3.33	4.00	4.00	2.00	3.00	3.30	73
HC-HC-0019	HC9400	3.13	3.00	5.00	3.00	4.00	3.34	70
HC-HC-0018	HC9401	2.50	1.50	2.00	5.00	2.00	2.60	120
HC-HC-0026	HC9500	3.60	3.67	5.00	5.00	4.00	4.08	6
HC-HC-0028	HC9501	2.40	3.50	1.00	1.00	1.00	2.17	123
HC-HC-0028	HC9502	2.60	3.50	1.00	1.00	4.00	2.53	122
HC-FP-0001	HC9503	3.40	4.17	4.00	1.00	4.00	3.27	78
HC-HC-0035	HC9505	4.00	4.00	1.00	1.00	4.00	3.10	101
SU-FF-0001	SU9001	2.80	2.29	4.00	3.00	4.00	2.93	115
SU-RI-0003	SU9002	2.64	3.57	2.00	5.00	1.00	3.16	93
SU-SU-0026/27	SU9005	3.50	3.71	3.00	3.00	1.00	3.16	92
SU-FF-0002/03/04	SU9007	3.10	4.17	3.00	3.00	1.00	3.18	90
SU-SU-0008	SU9100	3.83	3.80	1.00	5.00	2.00	3.59	40
SU-SU-0012	SU9101	3.17	3.40	1.00	5.00	4.00	3.47	50
SU-SU-0018	SU9103	3.83	3.40	1.00	5.00	2.00	3.47	49
SU-SU-0013	SU9105	3.67	3.00	1.00	5.00	2.00	3.30	73
SU-SU-0021	SU9106	3.17	3.40	1.00	5.00	4.00	3.47	50
SU-SU-0028	SU9107	3.50	4.14	2.00	1.00	4.00	3.09	102
SU-SU-0028	SU9108	4.00	4.20	2.00	2.00	4.00	3.46	52
SU-SU-0028	SU9110	3.83	4.20	2.00	3.00	4.00	3.61	36
SU-SU-0029	SU9111	2.83	3.00	1.00	5.00	4.00	3.25	80
SU-SU-0030	SU9112	3.50	4.40	3.00	1.00	4.00	3.27	78
SU-MB-0001	SU9115	3.67	3.40	1.00	3.00	2.00	3.02	106
SU-FL-0002	SU9117	3.50	4.00	4.00	3.00	2.00	3.45	54
SU-FL-0001	SU9118	3.50	4.00	5.00	1.00	4.00	3.35	67
SU-SU-0032	SU9120	3.67	3.86	4.00	2.00	3.00	3.36	65
SU-FL-0002	SU9121	3.33	3.57	4.00	1.00	4.00	3.07	103
SU-FL-0002	SU9122	2.83	3.29	4.00	3.00	3.00	3.14	97
SU-FL-0003	SU9123	3.83	3.57	1.00	5.00	4.00	3.72	25
SU-RI-0001	SU9124	2.67	2.86	4.00	3.00	2.00	2.86	117

Subwatershed	Project No.	Watershed Impact Indicators	Watershed Source Indicators	Location within Priority Subwatersheds	Sequencing	Implementability	Initial Ranking Composite Score	Project Rank
SU-FL-0003	SU9127	2.50	2.71	1.00	5.00	3.00	2.96	110
SU-RI-0002	SU9128	2.67	2.86	1.00	5.00	4.00	3.16	94
SU-RI-0002	SU9129	3.50	3.80	1.00	5.00	2.00	3.49	46
SU-SU-0034	SU9130	3.83	3.57	5.00	5.00	1.00	3.82	17
SU-FL-0006	SU9133	3.17	3.00	3.00	4.00	4.00	3.35	67
SU-SU-0039	SU9135	3.17	3.43	4.00	5.00	3.00	3.68	31
SU-SU-0039	SU9136	3.33	3.29	4.00	5.00	4.00	3.79	21
SU-SU-0038	SU9137	4.00	3.60	3.00	1.00	4.00	3.18	89
SU-FL-0008	SU9138	3.00	2.40	4.00	3.00	4.00	3.02	107
SU-SU-0040	SU9139	3.50	3.29	5.00	3.00	4.00	3.54	44
SU-SU-0041	SU9140	3.67	3.71	5.00	5.00	3.00	4.01	9
SU-SU-0041	SU9141	2.83	2.60	5.00	5.00	2.00	3.33	71
SU-FL-0009	SU9142	3.00	2.40	4.00	5.00	3.00	3.32	72
SU-SU-0041	SU9143	3.00	2.60	5.00	5.00	3.00	3.48	48
SU-SU-0037	SU9144	3.83	4.20	2.00	5.00	1.00	3.71	26
SU-SU-0041	SU9146	3.83	3.60	5.00	5.00	3.00	4.03	8
SU-SU-0046	SU9147	2.67	2.60	5.00	5.00	3.00	3.38	62
SU-SU-0047	SU9149	4.00	4.40	2.00	5.00	1.00	3.82	18
SU-SU-0049	SU9150	3.50	3.60	4.00	3.00	4.00	3.53	45
SU-SU-0028	SU9200	3.09	3.83	2.00	1.00	1.00	2.58	121
SU-FL-0004	SU9201	3.45	3.33	5.00	3.00	1.00	3.24	84
SU-FL-0006	SU9202	3.36	3.00	3.00	3.00	3.00	3.11	100
SU-SU-0039	SU9203	3.64	4.00	4.00	5.00	4.00	4.09	5
SU-FL-0006	SU9204	3.36	3.25	3.00	4.00	4.00	3.48	47
SU-SU-0035	SU9205	3.36	3.88	3.00	3.00	2.00	3.27	77
SU-SU-0040	SU9206	4.00	4.13	5.00	1.00	2.00	3.34	69
SU-SU-0042	SU9207	3.73	3.38	5.00	1.00	2.00	3.03	105
SU-SU-0049	SU9208	3.73	4.25	4.00	4.00	1.00	3.69	28
SU-SU-0051	SU9209	3.82	4.13	2.00	5.00	2.00	3.78	22
SU-SU-0050	SU9210	3.45	3.75	4.00	5.00	1.00	3.66	32
SU-SU-0013	SU9400	2.60	2.86	1.00	5.00	1.00	2.84	118
SU-SU-0032	SU9500	3.60	3.57	4.00	3.00	4.00	3.55	43
SU-RI-0002	SU9501	3.20	3.29	1.00	5.00	2.00	3.25	83
SU-SU-0039	SU9502	3.20	3.57	4.00	5.00	4.00	3.83	16
SU-FL-0008	SU9503	3.00	3.00	4.00	3.00	2.00	3.00	108
SU-SU-0035	SU9504	2.80	3.43	3.00	4.00	4.00	3.37	63
SU-SU-0041	SU9505	3.40	3.57	5.00	5.00	1.00	3.69	29
SU-SU-0035	SU9509	3.60	4.00	3.00	4.00	3.00	3.68	30
SU-SU-0040	SU9510	3.00	3.00	5.00	3.00	1.00	3.00	108
SU-FL-0007	SU9511	2.80	2.71	4.00	5.00	3.00	3.35	66
SU-SU-0037	SU9512	3.40	4.14	2.00	5.00	1.00	3.56	42

Subwatershed	Project No.	Watershed Impact Indicators	Watershed Source Indicators	Location within Priority Subwatersheds	Sequencing	Implementability	Initial Ranking Composite Score	Project Rank
SU-SU-0043	SU9513	2.60	3.00	5.00	3.00	4.00	3.18	90
SU-SU-0045	SU9514	3.80	4.57	5.00	5.00	4.00	4.41	1
SU-SU-0045	SU9515	3.20	4.00	5.00	5.00	2.00	3.86	12

Task 3.5 Evaluation and Ranking Candidate Non-Structural Projects

Viable non-structural projects were given a six or seven digit project number according to the following numbering convention: XX9YZZ; where XX is the 2-digit watershed code, Y is the project type code, and ZZ is a 2-digit numbering code starting with 00 at the lowest point in the watershed. The project type code was not defined for non-structural projects; therefore, a code of ‘9’ was used for non-structural projects. An additional seventh letter is used for any project with multiple subprojects, such as buffer restoration in several disconnected locations.

Non-structural projects are likely to be implemented through existing Fairfax County program, such as the buffer program and policy/outreach mandates. Table 16 contains a description of each of the viable non-structural projects for Sugarland Run and Horsepen Creek watersheds.

Table 16 Non-Structural Projects

WMA	Project No.	Project Description
Horsepen - Cedar	HC9901	Restore riparian buffer along Cedar Branch (east of Ashburton Ave) and along a tributary stream within Chantilly Highlands (north of Grey Friars Pl). Targeted rain barrel program for homes on Cross Creek Ln & Cross Creek Ct. Remove invasives from existing dry pond 0603DP and replant with native vegetation.
Horsepen - Frying Pan	HC9902	Much of the riparian buffer in the Copper Crossing subdivision has been removed. Restore riparian buffer along Frying Pan Branch within the Copper Crossing Subdivision.
Horsepen - Lower Middle	HC9903	Targeted Rain Barrel Program at Reflection Lake Homeowners Association and Four Season Homeowners Association. Restore riparian buffer upstream of Parcher Avenue in Reflection Lake Sections 9 & 10.
Horsepen - Merrybrook	HC9907	Obtain conservation easement and restore buffer around a series of wet ponds at the intersection of Dulles Access Road and Centreville Road.
Horsepen - Middle	HC9904	Restore riparian buffers along three sections of Horsepen Run: west of Sully Road, within Rogers Farm Section 1, and within Mustand Crossing. Obtain conservation easement to protect riparian buffer and existing habitat below existing wet pond WP0342.
Horsepen - Upper	HC9905	Obtain conservation easement above existing pond (FM0014) to preserve riparian buffer and existing habitat. Remove obstructions in Horsepen Creek below McLearn Road (SPA reach 9-1) and restore riparian buffer. Restore riparian buffers above and below Kinross Circle. Stop mowing and existing dry pond in Franklin Woods subdivision and allow natural vegetation to mature. Vegetate existing dry pond (0440DP) in Monterey subdivision and break up concrete trickle ditch.
Horsepen - Upper	HC9906	Targeted rain barrel programs for portions of Chantilly Highlands without any existing or proposed stormwater controls.
Sugarland - Folly Lick	SU9900	Targeted rain barrel program at Westfile, Chandon, Fortnightly Square, Haloyon of Herndon Section 5, Van Vlecks, Ballou, Saubers, Herndon Station, and Herndon Park Station subdivisions.
Sugarland - Headwaters	SU9909	Targeted Rain Barrel Program at Polo Fields Home Owners Association.
Sugarland - Headwaters	SU9910	Naturalize existing County dry pond (DP0164) with native vegetation.
Sugarland - Headwaters	SU9911	Preserve Sunrise Valley Wetland Park as a natural wetland area and naturalize adjacent dry pond (No StormNet ID).
Sugarland - Lower Middle	SU9901	Restore riparian buffers in five locations: downstream of Stuart Hills Way crossing, northwest corner of Leesburg Pi and Holly Knoll Dr, along Leesburg Pike at the driving range, downstream across the street from the driving range, and south of Yellow Tavern Court in the Crestbrook Subdivision.

WMA	Project No.	Project Description
Sugarland - Lower Middle	SU9902	Targeted rain barrel program at Sugar Creek Sec. 1, Stuart Hills, Cedar Chase, Oak Creek Estates, Forest Heights, Stoney Creek Woods, Hastings Hunt Sec. 9, a portion of Jenkins Ridge, Holly Knoll, and Crestbrook subdivisions.
Sugarland - Lower Middle	SU9903	Obtain conservation easements to preserve riparian buffer and habitat along several headwater streams to Sugarland Run upstream of Holly Knoll Drive and the riparian buffer along a reach of Muddy Branch near the Fairfax County boundary.
Sugarland - Lower Middle	SU9904	Educate homeowners near the Heather Way cul-de-sac on erosion control BMPs and yard waste as an improper control measure.
Sugarland - Upper	SU9905	Targeted rain barrel program at Crestview Sec. 1, Runnymede Manor, Stuart Woods, Reston Sec 49, and Towns at Stuart Pointe subdivisions.
Sugarland - Upper	SU9906	Vegetate several existing County dry ponds throughout Sugarland Upper WMA DP0564, DP0421, DP0440, and DP0202. Vegetate the existing dry pond northwest of Van Buren St and Worldgate Dr and the existing swale northwest of Town Center PW and New Dominion PW.
Sugarland - Upper	SU9907	Obtain conservation easement and restore buffer to a minimum of 100-foot wide around the streams northwest of Fairfax County PW and Dulles Access Rd in order to provide nutrient removal, sediment control, flood control for this area slated for industrial development.
Sugarland - Upper Middle	SU9908	Targeted rain barrel program at Stuart Ridge, Shaker Woods, Shaker Grove, Kingstream, Hunters Creek, Potomac Fairways, Iron Ridge Sec. 2, Graymoor, Chestnut Grove, Old Drainsville Hunt Club, Jeneba Woods, Reston Sec. 49, and Sugar Land Heights subdivisions.

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Appendix A

Project Scores Based on Subwatershed Ranking Impact Indicator Scores

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IMPACT INDICATOR SCORES

Project Number	Subwatershed	Benthic	Fish Comm	Aquatic Habitat	Channel Morph	Instream Sediment	Hydrology	No Road Hazard	Magnitude Rd Hazard	Res. Bldg Haz	Non-Res Bldg Haz	Flood Complaints	Prot. RPA Riparian	Prot. Headwater Riparian	Prot. Wetl.	Prot. Nat Habitat	TSS	TN	TP	Ecoli	Sum	Score
HC9007	HC-CR-0002	4	4	3	1	3	5	-	-	-	-	-	4	-	5	-	4	4	4	-	41	3.73
HC9013	HC-CR-0004/05	4	4	3	1	3	4	-	-	-	-	-	-	-	5	-	5	5	5	-	39	3.90
HC9100	HC-HC-0018	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	2	2	-	17	2.83
HC9101	HC-HC-0017	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	2	2	2	-	16	2.67
HC9102	HC-HC-0026	-	-	-	-	3	4	-	-	-	-	-	-	-	5	-	2	4	2	-	20	3.33
HC9103	HC-HC-0025	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9104	HC-MR-0002	-	-	-	-	2	5	3	-	-	-	-	-	-	5	-	3	3	3	-	24	3.43
HC9105	HC-MR-0003	-	-	-	-	0	4	2	-	-	-	-	-	-	5	-	3	2	3	-	19	3.17
HC9106	HC-FP-0001	-	-	-	-	3	5	-	-	-	-	-	-	-	4	-	4	4	4	-	24	4.00
HC9107	HC-MR-0004	-	-	-	-	1	5	2	-	-	-	-	-	-	5	-	5	4	5	-	27	3.86
HC9108	HC-HC-0028	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	2	3	3	-	18	3.00
HC9109	HC-FP-0002	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9110	HC-MR-0004	-	-	-	-	0	4	-	-	-	-	-	-	-	5	-	2	2	3	-	16	3.20
HC9111	HC-FP-0004	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9113	HC-HC-0028	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9114	HC-FP-0004	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	5	5	5	-	25	4.17
HC9115	HC-HC-0028	-	-	-	-	2	2	-	-	-	-	-	-	-	5	-	3	3	3	-	18	3.00
HC9116	HC-FP-0003	-	-	-	-	2	3	-	-	-	-	-	-	-	5	-	3	4	4	-	21	3.50
HC9117	HC-FP-0004	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9118	HC-HC-0030	-	-	-	-	1	3	-	-	-	-	-	-	-	5	-	4	3	3	-	19	3.17
HC9119	HC-FP-0005	-	-	-	-	3	5	-	-	-	-	-	-	-	5	-	3	4	3	-	23	3.83
HC9121	HC-HC-0030	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	2	3	-	20	3.33
HC9122	HC-HC-0030	-	-	-	-	2	4	-	-	-	-	-	-	-	4	-	5	4	5	-	24	4.00
HC9123	HC-HC-0030	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9124	HC-FP-0005	-	-	-	-	3	4	-	-	-	-	-	-	-	5	-	4	5	4	-	25	4.17

IMPACT INDICATOR SCORES

Project Number	Subwatershed	Benthic	Fish Comm	Aquatic Habitat	Channel Morph	Instream Sediment	Hydrology	No Road Hazard	Magnitude Rd Hazard	Res. Bldg Haz	Non-Res Bldg Haz	Flood Complaints	Prot. RPA Riparian	Prot. Headwater Riparian	Prot. Wetl.	Prot. Nat Habitat	TSS	TN	TP	Ecoli	Sum	Score
HC9125	HC-HC-0031	-	-	-	-	2	1	-	-	-	-	-	-	-	5	-	3	2	3	-	16	2.67
HC9126	HC-HC-0034	-	-	-	-	2	2	-	-	-	-	-	-	-	5	-	3	2	3	-	17	2.83
HC9127	HC-FP-0003	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9128	HC-HC-0031	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	4	4	4	-	20	3.33
HC9129	HC-HC-0034	-	-	-	-	2	3	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9130	HC-HC-0031	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	4	4	3	-	19	3.17
HC9131	HC-HC-0035	-	-	-	-	3	1	-	-	-	-	-	-	-	5	-	4	4	4	-	21	3.50
HC9132	HC-HC-0032	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	3	3	3	-	17	2.83
HC9133	HC-CR-0001	-	-	-	-	2	4	-	-	-	-	-	-	-	4	-	4	4	4	-	22	3.67
HC9134	HC-HC-0033	-	-	-	-	1	1	-	-	-	-	-	-	-	5	-	4	4	4	-	19	3.17
HC9135	HC-CR-0001	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9136	HC-HC-0037	-	-	-	-	1	3	-	-	-	-	-	-	-	5	-	2	3	3	-	17	2.83
HC9137	HC-HC-0039	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	4	4	4	-	20	3.33
HC9138	HC-CR-0001	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9139	HC-HC-0039	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9140	HC-HC-0037	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	4	4	-	21	3.50
HC9142	HC-HC-0040	-	-	-	-	3	2	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9143	HC-CR-0003	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
HC9146	HC-CR-0003	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9148	HC-HC-0039	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
HC9149	HC-HC-0040	-	-	-	-	2	3	-	-	-	-	-	-	-	5	-	4	4	5	-	23	3.83
HC9200	HC-HC-0020	5	3	3	2	3	2	-	-	-	-	-	5	4	5	-	5	4	3	-	44	3.67
HC9201	HC-HC-0037	5	5	3	2	3	3	-	-	-	-	-	5	4	5	-	-	-	-	-	35	3.89
HC9202	HC-HC-0039	5	5	4	2	3	2	-	-	-	-	-	3	3	5	-	-	-	-	-	32	3.56
HC9302	HC-CR-0001	4	4	2	4	1	3	-	-	-	-	-	4	4	4	-	-	-	-	-	30	3.33

IMPACT INDICATOR SCORES

Project Number	Subwatershed	Benthic	Fish Comm	Aquatic Habitat	Channel Morph	Instream Sediment	Hydrology	No Road Hazard	Magnitude Rd Hazard	Res. Bldg Haz	Non-Res Bldg Haz	Flood Complaints	Prot. RPA Riparian	Prot. Headwater Riparian	Prot. Wetl.	Prot. Nat Habitat	TSS	TN	TP	Ecoli	Sum	Score
HC9400	HC-HC-0019	-	-	-	-	2	5	-	3	3	2	-	-	-	-	-	4	4	2	-	25	3.13
HC9401	HC-HC-0018	-	-	-	-	1	4	-	-	-	-	-	-	-	-	-	-	-	-	-	5	2.50
HC9500	HC-HC-0026	-	-	-	-	5	4	-	-	-	-	-	-	-	-	-	3	3	3	-	18	3.60
HC9501	HC-HC-0028	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	2	3	3	-	12	2.40
HC9502	HC-HC-0028	-	-	-	-	4	1	-	-	-	-	-	-	-	-	-	2	3	3	-	13	2.60
HC9503	HC-FP-0001	-	-	-	-	2	3	-	-	-	-	-	-	-	-	-	4	4	4	-	17	3.40
HC9505	HC-HC-0035	-	-	-	-	4	0	-	-	-	-	-	-	-	-	-	4	4	4	-	16	4.00
SU9001	SU-FF-0001	-	-	-	-	-	3	-	-	-	-	-	-	-	5	-	2	2	2	-	14	2.80
SU9002	SU-RI-0003	-	-	2	-	2	4	1	1	1	1	-	-	-	5	-	4	4	4	-	29	2.64
SU9005	SU-SU-0026/27	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	3	3	-	21	3.50
SU9007	SU-FF-0002/03/04	-	-	3	-	1	4	-	1	1	1	-	-	-	5	-	5	5	5	-	31	3.10
SU9100	SU-SU-0008	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	4	4	4	-	23	3.83
SU9101	SU-SU-0012	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	4	3	4	-	19	3.17
SU9103	SU-SU-0018	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	4	4	-	23	3.83
SU9105	SU-SU-0013	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	3	4	-	22	3.67
SU9106	SU-SU-0021	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
SU9107	SU-SU-0028	-	-	-	-	1	1	-	-	-	-	-	-	-	4	-	5	5	5	-	21	3.50
SU9108	SU-SU-0028	-	-	-	-	1	3	-	-	-	-	-	-	-	5	-	5	5	5	-	24	4.00
SU9110	SU-SU-0028	-	-	-	-	1	2	-	-	-	-	-	-	-	5	-	5	5	5	-	23	3.83
SU9111	SU-SU-0029	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	2	2	-	17	2.83
SU9112	SU-SU-0030	-	-	-	-	1	3	-	-	-	-	-	-	-	5	-	4	4	4	-	21	3.50
SU9115	SU-MB-0001	-	-	-	-	2	3	-	-	-	-	-	-	-	5	-	4	4	4	-	22	3.67
SU9117	SU-FL-0002	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	4	4	-	21	3.50
SU9118	SU-FL-0001	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	4	4	-	21	3.50
SU9120	SU-SU-0032	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	4	3	4	-	22	3.67

IMPACT INDICATOR SCORES

Project Number	Subwatershed	Benthic	Fish Comm	Aquatic Habitat	Channel Morph	Instream Sediment	Hydrology	No Road Hazard	Magnitude Rd Hazard	Res. Bldg Haz	Non-Res Bldg Haz	Flood Complaints	Prot. RPA Riparian	Prot. Headwater Riparian	Prot. Wetl.	Prot. Nat Habitat	TSS	TN	TP	Ecoli	Sum	Score
SU9121	SU-FL-0002	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	3	3	3	-	20	3.33
SU9122	SU-FL-0002	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	2	2	2	-	17	2.83
SU9123	SU-FL-0003	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	4	4	-	23	3.83
SU9124	SU-RI-0001	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	2	2	2	-	16	2.67
SU9127	SU-FL-0003	-	-	-	-	1	3	-	-	-	-	-	-	-	5	-	2	2	2	-	15	2.50
SU9128	SU-RI-0002	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	2	2	2	-	16	2.67
SU9129	SU-RI-0002	-	-	-	-	1	4	-	-	-	-	-	-	-	4	-	4	4	4	-	21	3.50
SU9130	SU-SU-0034	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	4	4	-	23	3.83
SU9133	SU-FL-0006	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	2	3	3	-	19	3.17
SU9135	SU-SU-0039	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	3	3	3	-	19	3.17
SU9136	SU-SU-0039	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	3	3	3	-	20	3.33
SU9137	SU-SU-0038	-	-	-	-	2	5	-	-	-	-	-	-	-	5	-	4	4	4	-	24	4.00
SU9138	SU-FL-0008	-	-	-	-	2	5	-	-	-	-	-	-	-	5	-	2	2	2	-	18	3.00
SU9139	SU-SU-0040	-	-	-	-	1	4	-	-	-	-	-	-	-	5	-	4	3	4	-	21	3.50
SU9140	SU-SU-0041	-	-	-	-	3	5	-	-	-	-	-	-	-	5	-	3	3	3	-	22	3.67
SU9141	SU-SU-0041	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	2	2	2	-	17	2.83
SU9142	SU-FL-0009	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	2	2	3	-	18	3.00
SU9143	SU-SU-0041	-	-	-	-	2	5	-	-	-	-	-	-	-	5	-	2	2	2	-	18	3.00
SU9144	SU-SU-0037	-	-	-	-	1	5	-	-	-	-	-	-	-	5	-	4	4	4	-	23	3.83
SU9146	SU-SU-0041	-	-	-	-	3	4	-	-	-	-	-	-	-	5	-	4	3	4	-	23	3.83
SU9147	SU-SU-0046	-	-	-	-	2	4	-	-	-	-	-	-	-	5	-	1	2	2	-	16	2.67
SU9149	SU-SU-0047	5	2	5	2	5	3	-	-	-	-	-	-	5	5	-	4	4	4	-	44	4.00
SU9150	SU-SU-0049	-	-	-	-	4	3	-	-	-	-	-	-	-	5	-	3	3	3	-	21	3.50
SU9200	SU-SU-0028	3	4	3	2	3	1	-	-	-	-	-	3	-	3	-	4	4	4	-	34	3.09
SU9201	SU-FL-0004	5	3	4	2	2	4	-	-	-	-	-	4	-	5	-	4	2	3	-	38	3.45

IMPACT INDICATOR SCORES

Project Number	Subwatershed	Benthic	Fish Comm	Aquatic Habitat	Channel Morph	Instream Sediment	Hydrology	No Road Hazard	Magnitude Rd Hazard	Res. Bldg Haz	Non-Res Bldg Haz	Flood Complaints	Prot. RPA Riparian	Prot. Headwater Riparian	Prot. Wetl.	Prot. Nat Habitat	TSS	TN	TP	Ecoli	Sum	Score
SU9202	SU-FL-0006	5	4	4	2	3	3	-	-	-	-	-	-	4	4	-	3	2	3	-	37	3.36
SU9203	SU-SU-0039	5	4	4	2	3	3	-	-	-	-	-	-	4	4	-	4	3	4	-	40	3.64
SU9204	SU-FL-0006	5	4	4	2	3	3	-	-	-	-	-	-	4	4	-	3	2	3	-	37	3.36
SU9205	SU-SU-0035	5	5	3	3	3	3	-	-	-	-	-	3	-	4	-	3	2	3	-	37	3.36
SU9206	SU-SU-0040	5	5	4	2	3	3	-	-	-	-	-	4	-	4	-	5	4	5	-	44	4.00
SU9207	SU-SU-0042	5	4	4	2	4	3	-	-	-	-	-	5	-	3	-	4	3	4	-	41	3.73
SU9208	SU-SU-0049	5	2	5	2	5	3	-	-	-	-	-	-	4	4	-	4	3	4	-	41	3.73
SU9209	SU-SU-0051	5	4	4	2	4	3	-	-	-	-	-	-	5	4	-	4	3	4	-	42	3.82
SU9210	SU-SU-0050	5	2	5	2	4	3	-	-	-	-	-	-	5	4	-	3	2	3	-	38	3.45
SU9400	SU-SU-0013	-	-	3	-	3	4	1	1	1	1	-	-	-	-	-	4	4	4	-	26	2.60
SU9500	SU-SU-0032	-	-	-	-	-	4	-	-	-	-	-	-	-	4	-	4	3	3	-	18	3.60
SU9501	SU-RI-0002	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	3	3	3	-	16	3.20
SU9502	SU-SU-0039	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	3	3	3	-	16	3.20
SU9503	SU-FL-0008	-	-	-	-	-	5	-	-	-	-	-	-	-	4	-	2	2	2	-	15	3.00
SU9504	SU-SU-0035	-	-	-	-	-	4	-	-	-	-	-	-	-	4	-	2	2	2	-	14	2.80
SU9505	SU-SU-0041	-	-	-	-	-	4	-	-	-	-	-	-	-	4	-	3	3	3	-	17	3.40
SU9509	SU-SU-0035	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	3	4	4	-	18	3.60
SU9510	SU-SU-0040	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	3	2	3	-	15	3.00
SU9511	SU-FL-0007	-	-	-	-	-	4	-	-	-	-	-	-	-	4	-	2	2	2	-	14	2.80
SU9512	SU-SU-0037	-	-	-	-	-	1	-	-	-	-	-	-	-	4	-	4	4	4	-	17	3.40
SU9513	SU-SU-0043	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	2	2	2	-	13	2.60
SU9514	SU-SU-0045	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	4	4	4	-	19	3.80
SU9515	SU-SU-0045	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	3	3	3	-	16	3.20

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Appendix B

Project Scores Based on Subwatershed Ranking Source Indicator Scores

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SOURCE INDICATOR SCORES

Project Number	Subwatershed	Total Imp	DCIA	Stream Bank Deficient	SW Outfalls	VPDES	Total Urban Area (%)	TSS	TN	TP	Septic	Channelized Pipes/Streams	Sum	Score
HC9007	HC-CR-0002	3	5	-	5	-	-	4	4	4	-	1	26	3.71
HC9013	HC-CR-0004/05	3	4	-	5	-	-	5	5	5	-	5	32	4.57
HC9100	HC-HC-0018	-	3	-	3	-	-	3	2	2	-	-	13	2.60
HC9101	HC-HC-0017	-	4	-	2	-	-	2	2	2	-	-	12	2.40
HC9102	HC-HC-0026	-	5	-	4	-	-	2	4	2	-	2	19	3.17
HC9103	HC-HC-0025	-	4	-	3	-	-	4	4	4	-	1	20	3.33
HC9104	HC-MR-0002	-	5	-	5	-	-	3	3	3	-	1	20	3.33
HC9105	HC-MR-0003	-	4	-	4	-	-	3	2	3	-	4	20	3.33
HC9106	HC-FP-0001	-	4	-	5	-	-	4	4	4	-	3	24	4.00
HC9107	HC-MR-0004	-	5	-	5	-	-	5	4	5	-	5	29	4.83
HC9108	HC-HC-0028	-	5	-	4	-	-	2	3	3	-	5	22	3.67
HC9109	HC-FP-0002	-	4	-	5	-	-	3	3	3	-	-	18	3.60
HC9110	HC-MR-0004	-	5	-	4	-	-	2	2	3	-	4	20	3.33
HC9111	HC-FP-0004	-	4	-	5	-	-	3	3	3	-	4	22	3.67
HC9113	HC-HC-0028	-	5	-	4	-	-	4	4	4	-	-	21	4.20
HC9114	HC-FP-0004	-	4	-	5	-	-	5	5	5	-	-	24	4.80
HC9115	HC-HC-0028	-	5	-	4	-	-	3	3	3	-	5	23	3.83
HC9116	HC-FP-0003	-	4	-	5	-	-	3	4	4	-	4	24	4.00
HC9117	HC-FP-0004	-	4	-	5	-	-	3	3	3	-	-	18	3.60
HC9118	HC-HC-0030	-	4	-	5	-	-	4	3	3	-	-	19	3.80
HC9119	HC-FP-0005	-	4	-	4	-	-	3	4	3	-	-	18	3.60
HC9121	HC-HC-0030	-	5	-	5	-	-	4	2	3	-	-	19	3.80
HC9122	HC-HC-0030	-	4	-	5	-	-	5	4	5	-	-	23	4.60
HC9123	HC-HC-0030	-	4	-	5	-	-	3	3	3	-	5	23	3.83
HC9124	HC-FP-0005	-	4	-	5	-	-	4	5	4	-	4	26	4.33

SOURCE INDICATOR SCORES

Project Number	Subwatershed	Total Imp	DCIA	Stream Bank Deficient	SW Outfalls	VPDES	Total Urban Area (%)	TSS	TN	TP	Septic	Channelized Pipes/Streams	Sum	Score
HC9125	HC-HC-0031	-	5	-	4	-	-	3	2	3	-	2	19	3.17
HC9126	HC-HC-0034	-	4	-	5	-	-	3	2	3	-	4	21	3.50
HC9127	HC-FP-0003	-	3	-	5	-	-	3	3	3	-	4	21	3.50
HC9128	HC-HC-0031	-	4	-	4	-	-	4	4	4	-	-	20	4.00
HC9129	HC-HC-0034	-	5	-	5	-	-	4	4	4	-	4	26	4.33
HC9130	HC-HC-0031	-	4	-	4	-	-	4	4	3	-	-	19	3.80
HC9131	HC-HC-0035	-	5	-	5	-	-	4	4	4	-	4	26	4.33
HC9132	HC-HC-0032	-	4	-	5	-	-	3	3	3	-	-	18	3.60
HC9133	HC-CR-0001	-	5	-	5	-	-	4	4	4	-	4	26	4.33
HC9134	HC-HC-0033	-	5	-	5	-	-	4	4	4	-	4	26	4.33
HC9135	HC-CR-0001	-	4	-	5	-	-	3	3	3	-	4	22	3.67
HC9136	HC-HC-0037	-	4	-	5	-	-	2	3	3	-	4	21	3.50
HC9137	HC-HC-0039	-	4	-	5	-	-	4	4	4	-	4	25	4.17
HC9138	HC-CR-0001	-	5	-	5	-	-	3	3	3	-	4	23	3.83
HC9139	HC-HC-0039	-	4	-	5	-	-	4	4	4	-	3	24	4.00
HC9140	HC-HC-0037	-	4	-	5	-	-	3	4	4	-	3	23	3.83
HC9142	HC-HC-0040	-	5	-	5	-	-	4	4	4	-	5	27	4.50
HC9143	HC-CR-0003	-	4	-	5	-	-	4	4	4	-	5	26	4.33
HC9146	HC-CR-0003	-	4	-	5	-	-	3	3	3	-	5	23	3.83
HC9148	HC-HC-0039	-	3	-	5	-	-	3	3	3	-	4	21	3.50
HC9149	HC-HC-0040	-	5	-	5	-	-	4	4	5	-	5	28	4.67
HC9200	HC-HC-0020	-	-	5	5	-	-	5	4	3	-	2	24	4.00
HC9201	HC-HC-0037	-	-	5	4	-	-	-	-	-	-	3	12	4.00
HC9202	HC-HC-0039	-	-	3	5	-	-	-	-	-	-	3	11	3.67
HC9302	HC-CR-0001	4	5	3	5	-	-	-	-	-	-	3	20	4.00

SOURCE INDICATOR SCORES

Project Number	Subwatershed	Total Imp	DCIA	Stream Bank Deficient	SW Outfalls	VPDES	Total Urban Area (%)	TSS	TN	TP	Septic	Channelized Pipes/Streams	Sum	Score
HC9400	HC-HC-0019	-	-	-	3	-	-	4	4	2	-	2	15	3.00
HC9401	HC-HC-0018	-	-	-	2	-	-	-	-	-	-	1	3	1.50
HC9500	HC-HC-0026	5	5	-	3	-	-	3	3	3	-	-	22	3.67
HC9501	HC-HC-0028	4	5	-	4	-	-	2	3	3	-	-	21	3.50
HC9502	HC-HC-0028	4	5	-	4	-	-	2	3	3	-	-	21	3.50
HC9503	HC-FP-0001	4	5	-	4	-	-	4	4	4	-	-	25	4.17
HC9505	HC-HC-0035	3	4	-	5	-	-	4	4	4	-	4	28	4.00
SU9001	SU-FF-0001	2	2	-	4	-	-	2	2	2	-	2	16	2.29
SU9002	SU-RI-0003	2	2	-	5	-	-	4	4	4	-	4	25	3.57
SU9005	SU-SU-0026/27	3	3	-	5	-	-	4	3	3	-	5	26	3.71
SU9007	SU-FF-0002/03/04	-	2	-	5	-	-	5	5	5	-	3	25	4.17
SU9100	SU-SU-0008	-	-	-	4	-	-	4	4	4	-	3	19	3.80
SU9101	SU-SU-0012	-	-	-	3	-	-	4	3	4	-	3	17	3.40
SU9103	SU-SU-0018	-	-	-	2	-	-	4	4	4	-	3	17	3.40
SU9105	SU-SU-0013	-	-	-	3	-	-	4	3	4	-	1	15	3.00
SU9106	SU-SU-0021	-	-	-	5	-	-	3	3	3	-	3	17	3.40
SU9107	SU-SU-0028	4	4	-	2	-	-	5	5	5	-	4	29	4.14
SU9108	SU-SU-0028	-	-	-	2	-	-	5	5	5	-	4	21	4.20
SU9110	SU-SU-0028	-	-	-	2	-	-	5	5	5	-	4	21	4.20
SU9111	SU-SU-0029	-	-	-	5	-	-	3	2	2	-	3	15	3.00
SU9112	SU-SU-0030	-	-	-	5	-	-	4	4	4	-	5	22	4.40
SU9115	SU-MB-0001	-	-	-	2	-	-	4	4	4	-	3	17	3.40
SU9117	SU-FL-0002	-	-	-	4	-	-	3	4	4	-	5	20	4.00
SU9118	SU-FL-0001	3	4	-	5	-	-	3	4	4	-	5	28	4.00
SU9120	SU-SU-0032	3	3	-	5	-	-	4	3	4	-	5	27	3.86

SOURCE INDICATOR SCORES

Project Number	Subwatershed	Total Imp	DCIA	Stream Bank Deficient	SW Outfalls	VPDES	Total Urban Area (%)	TSS	TN	TP	Septic	Channelized Pipes/Streams	Sum	Score
SU9121	SU-FL-0002	4	4	-	4	-	-	3	3	3	-	4	25	3.57
SU9122	SU-FL-0002	4	4	-	5	-	-	2	2	2	-	4	23	3.29
SU9123	SU-FL-0003	3	4	-	4	-	-	4	4	4	-	2	25	3.57
SU9124	SU-RI-0001	3	3	-	5	-	-	2	2	2	-	3	20	2.86
SU9127	SU-FL-0003	3	4	-	4	-	-	2	2	2	-	2	19	2.71
SU9128	SU-RI-0002	4	4	-	5	-	-	2	2	2	-	1	20	2.86
SU9129	SU-RI-0002	-	-	-	5	-	-	4	4	4	-	2	19	3.80
SU9130	SU-SU-0034	4	5	-	3	-	-	4	4	4	-	1	25	3.57
SU9133	SU-FL-0006	-	-	-	4	-	-	2	3	3	-	3	15	3.00
SU9135	SU-SU-0039	4	4	-	5	-	-	3	3	3	-	2	24	3.43
SU9136	SU-SU-0039	4	4	-	5	-	-	3	3	3	-	1	23	3.29
SU9137	SU-SU-0038	-	-	-	3	-	-	4	4	4	-	3	18	3.60
SU9138	SU-FL-0008	-	-	-	3	-	-	2	2	2	-	3	12	2.40
SU9139	SU-SU-0040	4	4	-	1	-	-	4	3	4	-	3	23	3.29
SU9140	SU-SU-0041	5	5	-	4	-	-	3	3	3	-	3	26	3.71
SU9141	SU-SU-0041	-	-	-	4	-	-	2	2	2	-	3	13	2.60
SU9142	SU-FL-0009	-	-	-	2	-	-	2	2	3	-	3	12	2.40
SU9143	SU-SU-0041	-	-	-	4	-	-	2	2	2	-	3	13	2.60
SU9144	SU-SU-0037	-	-	-	5	-	-	4	4	4	-	4	21	4.20
SU9146	SU-SU-0041	-	-	-	4	-	-	4	3	4	-	3	18	3.60
SU9147	SU-SU-0046	-	-	-	4	-	-	1	2	2	-	4	13	2.60
SU9149	SU-SU-0047	-	-	-	5	-	-	4	4	4	-	5	22	4.40
SU9150	SU-SU-0049	-	-	-	4	-	-	3	3	3	-	5	18	3.60
SU9200	SU-SU-0028	-	-	5	2	-	-	4	4	4	-	4	23	3.83
SU9201	SU-FL-0004	-	-	4	3	-	-	4	2	3	-	4	20	3.33

SOURCE INDICATOR SCORES

Project Number	Subwatershed	Total Imp	DCIA	Stream Bank Deficient	SW Outfalls	VPDES	Total Urban Area (%)	TSS	TN	TP	Septic	Channelized Pipes/Streams	Sum	Score
SU9202	SU-FL-0006	-	-	4	3	-	-	3	2	3	-	3	18	3.00
SU9203	SU-SU-0039	5	5	4	5	-	-	4	3	4	-	2	32	4.00
SU9204	SU-FL-0006	3	3	4	4	-	-	3	2	3	-	4	26	3.25
SU9205	SU-SU-0035	4	5	5	5	-	-	3	2	3	-	4	31	3.88
SU9206	SU-SU-0040	4	4	5	2	-	-	5	4	5	-	4	33	4.13
SU9207	SU-SU-0042	4	4	2	2	-	-	4	3	4	-	4	27	3.38
SU9208	SU-SU-0049	5	5	4	4	-	-	4	3	4	-	5	34	4.25
SU9209	SU-SU-0051	4	4	5	5	-	-	4	3	4	-	4	33	4.13
SU9210	SU-SU-0050	4	5	5	3	-	-	3	2	3	-	5	30	3.75
SU9400	SU-SU-0013	2	3	-	2	-	-	4	4	4	-	1	20	2.86
SU9500	SU-SU-0032	3	3	-	5	-	-	4	3	3	-	4	25	3.57
SU9501	SU-RI-0002	4	4	-	5	-	-	3	3	3	-	1	23	3.29
SU9502	SU-SU-0039	5	5	-	5	-	-	3	3	3	-	1	25	3.57
SU9503	SU-FL-0008	5	5	-	2	-	-	2	2	2	-	3	21	3.00
SU9504	SU-SU-0035	3	5	-	5	-	-	2	2	2	-	5	24	3.43
SU9505	SU-SU-0041	5	5	-	3	-	-	3	3	3	-	3	25	3.57
SU9509	SU-SU-0035	3	5	-	5	-	-	3	4	4	-	4	28	4.00
SU9510	SU-SU-0040	4	5	-	1	-	-	3	2	3	-	3	21	3.00
SU9511	SU-FL-0007	3	5	-	4	-	-	2	2	2	-	1	19	2.71
SU9512	SU-SU-0037	4	5	-	4	-	-	4	4	4	-	4	29	4.14
SU9513	SU-SU-0043	5	5	-	3	-	-	2	2	2	-	2	21	3.00
SU9514	SU-SU-0045	5	5	-	5	-	-	4	4	4	-	5	32	4.57
SU9515	SU-SU-0045	5	5	-	4	-	-	3	3	3	-	5	28	4.00

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Appendix C

Project Scores Based on Location within Priority Subwatersheds

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<i>Priority Subwatersheds</i>		Future w/o Project Composite Score	Preliminary Project Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project Number	Subwatershed				
HC9007	HC-CR-0002	4.83	3		3
HC9013	HC-CR-0004/05	6.00	2		2
HC9100	HC-HC-0018	5.73	2		2
HC9101	HC-HC-0017	4.83	3		3
HC9102	HC-HC-0026	4.24	5		5
HC9103	HC-HC-0025	5.68	2		2
HC9104	HC-MR-0002	6.13	2		2
HC9105	HC-MR-0003	6.43	1		1
HC9106	HC-FP-0001	4.74	4		4
HC9107	HC-MR-0004	6.43	1		1
HC9108	HC-HC-0028	6.14	1		1
HC9109	HC-FP-0002	5.49	2		2
HC9110	HC-MR-0004	6.43	1		1
HC9111	HC-FP-0004	4.99	3		3
HC9113	HC-HC-0028	6.14	1		1
HC9114	HC-FP-0004	4.99	3		3
HC9115	HC-HC-0028	6.14	1		1
HC9116	HC-FP-0003	5.76	2		2
HC9117	HC-FP-0004	4.99	3		3
HC9118	HC-HC-0030	4.74	4		4
HC9119	HC-FP-0005	4.83	3		3
HC9121	HC-HC-0030	4.74	4		4
HC9122	HC-HC-0030	4.74	4		4
HC9123	HC-HC-0030	4.74	4		4
HC9124	HC-FP-0005	4.83	3		3
HC9125	HC-HC-0031	5.20	3		3
HC9126	HC-HC-0034	5.15	3		3
HC9127	HC-FP-0003	5.76	2		2
HC9128	HC-HC-0031	5.20	3		3
HC9129	HC-HC-0034	5.15	3		3
HC9130	HC-HC-0031	5.20	3		3
HC9131	HC-HC-0035	6.19	1		1
HC9132	HC-HC-0032	4.24	5		5
HC9133	HC-CR-0001	4.72	4		4
HC9134	HC-HC-0033	7.97	1		1
HC9135	HC-CR-0001	4.72	4		4
HC9136	HC-HC-0037	6.51	1		1
HC9137	HC-HC-0039	5.65	2		2
HC9138	HC-CR-0001	4.72	4		4
HC9139	HC-HC-0039	5.65	2		2
HC9140	HC-HC-0037	6.51	1		1
HC9142	HC-HC-0040	6.03	2		2
HC9143	HC-CR-0003	4.24	5		5

<i>Priority Subwatersheds</i>		Future w/o Project Composite Score	Preliminary Project Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project Number	Subwatershed				
HC9146	HC-CR-0003	4.24	5		5
HC9148	HC-HC-0039	5.65	2		2
HC9149	HC-HC-0040	6.03	2		2
HC9200	HC-HC-0020	3.78	5		5
HC9201	HC-HC-0037	6.51	1		1
HC9202	HC-HC-0039	5.65	2		2
HC9302	HC-CR-0001	4.72	4		4
HC9400	HC-HC-0019	4.27	5		5
HC9401	HC-HC-0018	5.73	2		2
HC9500	HC-HC-0026	4.24	5		5
HC9501	HC-HC-0028	6.14	1		1
HC9502	HC-HC-0028	6.14	1		1
HC9503	HC-FP-0001	4.74	4		4
HC9505	HC-HC-0035	6.19	1		1
SU9001	SU-FF-0001	4.32	4		4
SU9002	SU-RI-0003	6.08	2		2
SU9005	SU-SU-0026/27	4.91	3		3
SU9007	SU-FF-0002/03/04	4.83	3		3
SU9100	SU-SU-0008	7.17	1		1
SU9101	SU-SU-0012	7.17	1		1
SU9103	SU-SU-0018	6.34	1		1
SU9105	SU-SU-0013	7.09	1		1
SU9106	SU-SU-0021	6.51	1		1
SU9107	SU-SU-0028	5.36	2		2
SU9108	SU-SU-0028	5.36	2		2
SU9110	SU-SU-0028	5.36	2		2
SU9111	SU-SU-0029	6.43	1		1
SU9112	SU-SU-0030	5.23	3		3
SU9115	SU-MB-0001	7.23	1		1
SU9117	SU-FL-0002	4.48	4		4
SU9118	SU-FL-0001	4.24	5		5
SU9120	SU-SU-0032	4.56	4		4
SU9121	SU-FL-0002	4.48	4		4
SU9122	SU-FL-0002	4.48	4		4
SU9123	SU-FL-0003	7.57	1		1
SU9124	SU-RI-0001	4.32	4		4
SU9127	SU-FL-0003	7.57	1		1
SU9128	SU-RI-0002	6.59	1		1
SU9129	SU-RI-0002	6.59	1		1
SU9130	SU-SU-0034	3.92	5		5
SU9133	SU-FL-0006	5.07	3		3
SU9135	SU-SU-0039	4.32	4		4
SU9136	SU-SU-0039	4.32	4		4
SU9137	SU-SU-0038	5.15	3		3

<i>Priority Subwatersheds</i>		Future w/o Project Composite Score	Preliminary Project Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project Number	Subwatershed				
SU9138	SU-FL-0008	4.78	4		4
SU9139	SU-SU-0040	3.94	5		5
SU9140	SU-SU-0041	4.16	5		5
SU9141	SU-SU-0041	4.16	5		5
SU9142	SU-FL-0009	4.75	4		4
SU9143	SU-SU-0041	4.16	5		5
SU9144	SU-SU-0037	5.44	2		2
SU9146	SU-SU-0041	4.16	5		5
SU9147	SU-SU-0046	4.11	5		5
SU9149	SU-SU-0047	6.03	2		2
SU9150	SU-SU-0049	4.66	4		4
SU9200	SU-SU-0028	5.36	2		2
SU9201	SU-FL-0004	4.07	5		5
SU9202	SU-FL-0006	5.07	3		3
SU9203	SU-SU-0039	4.32	4		4
SU9204	SU-FL-0006	5.07	3		3
SU9205	SU-SU-0035	5.26	3		3
SU9206	SU-SU-0040	3.94	5		5
SU9207	SU-SU-0042	4.03	5		5
SU9208	SU-SU-0049	4.66	4		4
SU9209	SU-SU-0051	5.57	2		2
SU9210	SU-SU-0050	4.32	4		4
SU9400	SU-SU-0013	7.09	1		1
SU9500	SU-SU-0032	4.56	4		4
SU9501	SU-RI-0002	6.59	1		1
SU9502	SU-SU-0039	4.32	4		4
SU9503	SU-FL-0008	4.78	4		4
SU9504	SU-SU-0035	5.26	3		3
SU9505	SU-SU-0041	4.16	5		5
SU9509	SU-SU-0035	5.26	3		3
SU9510	SU-SU-0040	3.94	5		5
SU9511	SU-FL-0007	4.70	4		4
SU9512	SU-SU-0037	5.44	2		2
SU9513	SU-SU-0043	4.16	5		5
SU9514	SU-SU-0045	3.79	5		5
SU9515	SU-SU-0045	3.79	5		5

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Appendix D

Project Scores Based on Sequencing

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<i>Sequencing</i>		Sequence Number	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed				
HC9007	HC-CR-0002	1	5		5
HC9013	HC-CR-0004/05	1	5		5
HC9100	HC-HC-0018	1	5		5
HC9101	HC-HC-0017	1	5		5
HC9102	HC-HC-0026	1	5		5
HC9103	HC-HC-0025	8	1		1
HC9104	HC-MR-0002	3	3		3
HC9105	HC-MR-0003	2	3		3
HC9106	HC-FP-0001	4	1	3	3
HC9107	HC-MR-0004	1	5		5
HC9108	HC-HC-0028	6	1	4	4
HC9109	HC-FP-0002	1	5		5
HC9110	HC-MR-0004	1	5		5
HC9111	HC-FP-0004	3	3		3
HC9113	HC-HC-0028	6	1		1
HC9114	HC-FP-0004	3	3	1	1
HC9115	HC-HC-0028	6	1	2	2
HC9116	HC-FP-0003	1	5		5
HC9117	HC-FP-0004	3	3	1	1
HC9118	HC-HC-0030	1	5		5
HC9119	HC-FP-0005	2	3	1	1
HC9121	HC-HC-0030	1	5		5
HC9122	HC-HC-0030	1	5		5
HC9123	HC-HC-0030	1	5		5
HC9124	HC-FP-0005	2	3	1	1
HC9125	HC-HC-0031	5	1	3	3
HC9126	HC-HC-0034	1	5		5
HC9127	HC-FP-0003	1	5		5
HC9128	HC-HC-0031	5	1	3	3
HC9129	HC-HC-0034	1	5		5
HC9130	HC-HC-0031	5	1	2	2
HC9131	HC-HC-0035	4	1	2	2
HC9132	HC-HC-0032	2	3		3
HC9133	HC-CR-0001	3	3	1	1
HC9134	HC-HC-0033	1	5		5
HC9135	HC-CR-0001	3	3	2	2
HC9136	HC-HC-0037	1	5		5
HC9137	HC-HC-0039	2	3		3
HC9138	HC-CR-0001	3	3	2	2
HC9139	HC-HC-0039	2	3	1	1
HC9140	HC-HC-0037	1	5		5
HC9142	HC-HC-0040	1	5		5
HC9143	HC-CR-0003	2	3	1	1
HC9146	HC-CR-0003	2	3	1	1
HC9148	HC-HC-0039	2	3	1	1

<i>Sequencing</i>		Sequence Number	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed				
HC9149	HC-HC-0040	1	5		5
HC9200	HC-HC-0020	2	3		3
HC9201	HC-HC-0037	1	5		5
HC9202	HC-HC-0039	2	3		3
HC9302	HC-CR-0001	3	3	2	2
HC9400	HC-HC-0019	3	3		3
HC9401	HC-HC-0018	1	5		5
HC9500	HC-HC-0026	1	5		5
HC9501	HC-HC-0028	6	1		1
HC9502	HC-HC-0028	6	1	1	1
HC9503	HC-FP-0001	4	1	1	1
HC9505	HC-HC-0035	4	1	1	1
SU9001	SU-FF-0001	3	3		3
SU9002	SU-RI-0003	1	5		5
SU9005	SU-SU-0026/27	2	3		3
SU9007	SU-FF-0002/03/04	2	3		3
SU9100	SU-SU-0008	1	5		5
SU9101	SU-SU-0012	1	5		5
SU9103	SU-SU-0018	1	5		5
SU9105	SU-SU-0013	1	5		5
SU9106	SU-SU-0021	1	5		5
SU9107	SU-SU-0028	12	1		1
SU9108	SU-SU-0028	12	1	2	2
SU9110	SU-SU-0028	12	1	3	3
SU9111	SU-SU-0029	1	5		5
SU9112	SU-SU-0030	11	1		1
SU9115	SU-MB-0001	3	3	3	3
SU9117	SU-FL-0002	4	1	3	3
SU9118	SU-FL-0001	5	1		1
SU9120	SU-SU-0032	9	1	2	2
SU9121	SU-FL-0002	4	1		1
SU9122	SU-FL-0002	4	1	3	3
SU9123	SU-FL-0003	1	5		5
SU9124	SU-RI-0001	2	3		3
SU9127	SU-FL-0003	1	5		5
SU9128	SU-RI-0002	1	5		5
SU9129	SU-RI-0002	1	5		5
SU9130	SU-SU-0034	1	5		5
SU9133	SU-FL-0006	2	3	4	4
SU9135	SU-SU-0039	1	5		5
SU9136	SU-SU-0039	1	5		5
SU9137	SU-SU-0038	7	1		1
SU9138	SU-FL-0008	2	3		3
SU9139	SU-SU-0040	6	1	3	3
SU9140	SU-SU-0041	1	5		5

<i>Sequencing</i>		Sequence Number	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed				
SU9141	SU-SU-0041	1	5		5
SU9142	SU-FL-0009	1	5		5
SU9143	SU-SU-0041	1	5		5
SU9144	SU-SU-0037	1	5		5
SU9146	SU-SU-0041	1	5		5
SU9147	SU-SU-0046	1	5		5
SU9149	SU-SU-0047	1	5		5
SU9150	SU-SU-0049	2	3	3	3
SU9200	SU-SU-0028	12	1		1
SU9201	SU-FL-0004	3	3		3
SU9202	SU-FL-0006	2	3		3
SU9203	SU-SU-0039	1	5		5
SU9204	SU-FL-0006	2	3	4	4
SU9205	SU-SU-0035	2	3		3
SU9206	SU-SU-0040	6	1		1
SU9207	SU-SU-0042	5	1		1
SU9208	SU-SU-0049	2	3	4	4
SU9209	SU-SU-0051	1	5		5
SU9210	SU-SU-0050	1	5		5
SU9400	SU-SU-0013	1	5		5
SU9500	SU-SU-0032	9	1	3	3
SU9501	SU-RI-0002	1	5		5
SU9502	SU-SU-0039	1	5		5
SU9503	SU-FL-0008	2	3		3
SU9504	SU-SU-0035	2	3	4	4
SU9505	SU-SU-0041	1	5		5
SU9509	SU-SU-0035	2	3	4	4
SU9510	SU-SU-0040	6	1	3	3
SU9511	SU-FL-0007	1	5		5
SU9512	SU-SU-0037	1	5		5
SU9513	SU-SU-0043	4	1	3	3
SU9514	SU-SU-0045	1	5		5
SU9515	SU-SU-0045	1	5		5

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Appendix E

Project Scores Based on Implementability

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<i>Implementability</i>		Initial Score based on Ownership	Are there Existing DPs / WPs? (Yes = +1)	Adjusted Score for County Maintained WP or DP (Initial Score / 2)	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed						
HC9007	HC-CR-0002	14	0	14.0	1		1
HC9013	HC-CR-0004/05	51	1	25.5	1		1
HC9100	HC-HC-0018	2	0	2.0	4		4
HC9101	HC-HC-0017	1	0	1.0	4		4
HC9102	HC-HC-0026	6	0	6.0	2	2	2
HC9103	HC-HC-0025	1	0	1.0	4		4
HC9104	HC-MR-0002	3	0	3.0	3		3
HC9105	HC-MR-0003	3	0	3.0	3		3
HC9106	HC-FP-0001	11	1	5.5	2		2
HC9107	HC-MR-0004	1	0	1.0	4		4
HC9108	HC-HC-0028	1	1	0.5	5		5
HC9109	HC-FP-0002	3	1	1.5	4		4
HC9110	HC-MR-0004	2	0	2.0	4		4
HC9111	HC-FP-0004	7	1	3.5	3		3
HC9113	HC-HC-0028	3	0	3.0	3		3
HC9114	HC-FP-0004	6	1	3.0	3	4	4
HC9115	HC-HC-0028	6	1	3.0	3	4	4
HC9116	HC-FP-0003	2	0	2.0	4		4
HC9117	HC-FP-0004	2	1	1.0	4		4
HC9118	HC-HC-0030	6	1	3.0	3		3
HC9119	HC-FP-0005	2	1	1.0	4		4
HC9121	HC-HC-0030	13	1	6.5	2		2
HC9122	HC-HC-0030	8	0	8.0	1	2	2
HC9123	HC-HC-0030	2	1	1.0	4		4
HC9124	HC-FP-0005	18	1	9.0	1		1
HC9125	HC-HC-0031	1	0	1.0	4		4
HC9126	HC-HC-0034	2	1	1.0	4		4
HC9127	HC-FP-0003	4	1	2.0	4		4
HC9128	HC-HC-0031	3	0	3.0	3		3

<i>Implementability</i>		Initial Score based on Ownership	Are there Existing DPs / WPs? (Yes = +1)	Adjusted Score for County Maintained WP or DP (Initial Score / 2)	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed						
HC9129	HC-HC-0034	1	1	0.5	5		5
HC9130	HC-HC-0031	1	1	0.5	5		5
HC9131	HC-HC-0035	6	1	3.0	3	3	3
HC9132	HC-HC-0032	2	1	1.0	4		4
HC9133	HC-CR-0001	7	0	7.0	2	4	4
HC9134	HC-HC-0033	6	1	3.0	3	4	4
HC9135	HC-CR-0001	3	1	1.5	4		4
HC9136	HC-HC-0037	2	0	2.0	4		4
HC9137	HC-HC-0039	6	0	6.0	2	4	4
HC9138	HC-CR-0001	3	0	3.0	3	4	4
HC9139	HC-HC-0039	2	0	2.0	4	5	5
HC9140	HC-HC-0037	2	1	1.0	4		4
HC9142	HC-HC-0040	4	0	4.0	2	4	4
HC9143	HC-CR-0003	4	1	2.0	4	3	3
HC9146	HC-CR-0003	9	1	4.5	2	4	4
HC9148	HC-HC-0039	4	0	4.0	2	4	4
HC9149	HC-HC-0040	10	0	10.0	1		1
HC9200	HC-HC-0020	7	1	3.5	3	4	4
HC9201	HC-HC-0037	2	0	2.0	4		4
HC9202	HC-HC-0039	4	1	2.0	4		4
HC9302	HC-CR-0001	3	0	3.0	3		3
HC9400	HC-HC-0019	3	1	1.5	4		4
HC9401	HC-HC-0018	4	0	4.0	2		2
HC9500	HC-HC-0026	4	0	4.0	2	4	4
HC9501	HC-HC-0028	12	0	12.0	1		1
HC9502	HC-HC-0028	1	0	1.0	4		4
HC9503	HC-FP-0001	1	0	1.0	4		4
HC9505	HC-HC-0035	2	1	1.0	4		4
SU9001	SU-FF-0001	1	0	1.0	4		4

<i>Implementability</i>		Initial Score based on Ownership	Are there Existing DPs / WPs? (Yes = +1)	Adjusted Score for County Maintained WP or DP (Initial Score / 2)	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed						
SU9002	SU-RI-0003	10	0	10.0	1		1
SU9005	SU-SU-0026/27	17	0	17.0	1		1
SU9007	SU-FF-0002/03/04	28	0	28.0	1		1
SU9100	SU-SU-0008	4	0	4.0	2		2
SU9101	SU-SU-0012	8	0	8.0	1	4	4
SU9103	SU-SU-0018	6	0	6.0	2		2
SU9105	SU-SU-0013	4	0	4.0	2		2
SU9106	SU-SU-0021	8	0	8.0	1	4	4
SU9107	SU-SU-0028	2	0	2.0	4		4
SU9108	SU-SU-0028	6	0	6.0	2	4	4
SU9110	SU-SU-0028	2	0	2.0	4		4
SU9111	SU-SU-0029	1	0	1.0	4		4
SU9112	SU-SU-0030	1	0	1.0	4		4
SU9115	SU-MB-0001	4	0	4.0	2		2
SU9117	SU-FL-0002	4	0	4.0	2		2
SU9118	SU-FL-0001	1	0	1.0	4		4
SU9120	SU-SU-0032	3	0	3.0	3		3
SU9121	SU-FL-0002	1	0	1.0	4		4
SU9122	SU-FL-0002	3	0	3.0	3		3
SU9123	SU-FL-0003	2	0	2.0	4		4
SU9124	SU-RI-0001	4	0	4.0	2		2
SU9127	SU-FL-0003	3	0	3.0	3		3
SU9128	SU-RI-0002	12	0	12.0	1	4	4
SU9129	SU-RI-0002	5	0	5.0	2		2
SU9130	SU-SU-0034	28	0	28.0	1		1
SU9133	SU-FL-0006	2	0	2.0	4		4
SU9135	SU-SU-0039	3	0	3.0	3		3
SU9136	SU-SU-0039	1	0	1.0	4		4

<i>Implementability</i>		Initial Score based on Ownership	Are there Existing DPs / WPs? (Yes = +1)	Adjusted Score for County Maintained WP or DP (Initial Score / 2)	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed						
SU9137	SU-SU-0038	2	0	2.0	4		4
SU9138	SU-FL-0008	1	0	1.0	4		4
SU9139	SU-SU-0040	2	0	2.0	4		4
SU9140	SU-SU-0041	3	0	3.0	3		3
SU9141	SU-SU-0041	4	0	4.0	2		2
SU9142	SU-FL-0009	3	0	3.0	3		3
SU9143	SU-SU-0041	3	0	3.0	3		3
SU9144	SU-SU-0037	9	0	9.0	1		1
SU9146	SU-SU-0041	3	0	3.0	3		3
SU9147	SU-SU-0046	3	0	3.0	3		3
SU9149	SU-SU-0047	8	0	8.0	1		1
SU9150	SU-SU-0049	1	0	1.0	4		4
SU9200	SU-SU-0028	40	0	40.0	1		1
SU9201	SU-FL-0004	25	0	25.0	1		1
SU9202	SU-FL-0006	3	0	3.0	3		3
SU9203	SU-SU-0039	2	0	2.0	4		4
SU9204	SU-FL-0006	1	0	1.0	4		4
SU9205	SU-SU-0035	5	0	5.0	2		2
SU9206	SU-SU-0040	4	0	4.0	2		2
SU9207	SU-SU-0042	4	0	4.0	2		2
SU9208	SU-SU-0049	11	0	11.0	1		1
SU9209	SU-SU-0051	4	0	4.0	2		2
SU9210	SU-SU-0050	34	0	34.0	1		1
SU9400	SU-SU-0013	8	0	8.0	1		1
SU9500	SU-SU-0032	1	0	1.0	4		4
SU9501	SU-RI-0002	6	0	6.0	2		2
SU9502	SU-SU-0039	1	0	1.0	4		4
SU9503	SU-FL-0008	4	0	4.0	2		2
SU9504	SU-SU-0035	1	0	1.0	4		4

<i>Implementability</i>		Initial Score based on Ownership	Are there Existing DPs / WPs? (Yes = +1)	Adjusted Score for County Maintained WP or DP (Initial Score / 2)	Preliminary Project Score	FXB Adjustment	Applied Score
Project Number	Subwatershed						
SU9505	SU-SU-0041	13	0	13.0	1		1
SU9509	SU-SU-0035	3	0	3.0	3		3
SU9510	SU-SU-0040	175	0	175.0	1		1
SU9511	SU-FL-0007	3	0	3.0	3		3
SU9512	SU-SU-0037	36	0	36.0	1		1
SU9513	SU-SU-0043	2	0	2.0	4		4
SU9514	SU-SU-0045	2	0	2.0	4		4
SU9515	SU-SU-0045	7	0	7.0	2		2

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Appendix F

STEPL

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<i>Total Suspended Solids (TSS)</i>		Existing Condition ton/ac/yr	Future w/o Project Condition ton/ac/yr	Future w/Project Condition ton/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9007	HC-CR-0002	0.15	0.15	0.02	-85.8%	4	0	4
HC9013	HC-CR-0004/05	0.21	0.22	0.17	-20.2%	4	1	5
HC9100	HC-HC-0018	0.11	0.11	0.11	-2.4%	3	0	3
HC9101	HC-HC-0017	0.15	0.15	0.14	-6.3%	3	-1	2
HC9102	HC-HC-0026	0.13	0.15	0.16	2.3%	1	1	2
HC9103	HC-HC-0025	0.25	0.25	0.16	-37.6%	4	0	4
HC9104	HC-MR-0002	0.02	0.03	0.03	-2.9%	3	0	3
HC9105	HC-MR-0003	0.03	0.04	0.04	-1.4%	3	0	3
HC9106	HC-FP-0001	0.12	0.14	0.14	-4.3%	3	1	4
HC9107	HC-MR-0004	0.02	0.02	0.02	-7.3%	4	1	5
HC9108	HC-HC-0028	0.12	0.14	0.14	0.5%	2	0	2
HC9109	HC-FP-0002	0.11	0.11	0.11	0.1%	2	1	3
HC9110	HC-MR-0004	0.02	0.02	0.02	-0.8%	2	0	2
HC9111	HC-FP-0004	0.14	0.14	0.14	-0.3%	2	1	3
HC9113	HC-HC-0028	0.12	0.14	0.13	-8.3%	4	0	4
HC9114	HC-FP-0004	0.14	0.14	0.12	-11.8%	4	1	5
HC9115	HC-HC-0028	0.12	0.14	0.14	1.5%	2	1	3
HC9116	HC-FP-0003	0.12	0.12	0.11	-5.8%	3	0	3
HC9117	HC-FP-0004	0.14	0.14	0.14	-0.1%	2	1	3
HC9118	HC-HC-0030	0.12	0.13	0.12	-7.5%	4	0	4
HC9119	HC-FP-0005	0.13	0.13	0.14	1.6%	2	1	3
HC9121	HC-HC-0030	0.12	0.13	0.13	-1.5%	3	1	4
HC9122	HC-HC-0030	0.12	0.13	0.12	-7.0%	4	1	5
HC9123	HC-HC-0030	0.12	0.13	0.13	-0.4%	2	1	3
HC9124	HC-FP-0005	0.13	0.13	0.14	0.9%	2	2	4
HC9125	HC-HC-0031	0.16	0.18	0.17	-2.0%	3	0	3
HC9126	HC-HC-0034	0.14	0.14	0.14	-2.0%	3	0	3
HC9127	HC-FP-0003	0.12	0.12	0.11	-4.7%	3	0	3
HC9128	HC-HC-0031	0.16	0.18	0.16	-7.5%	4	0	4
HC9129	HC-HC-0034	0.14	0.14	0.12	-11.0%	4	0	4

<i>Total Suspended Solids (TSS)</i>		Existing Condition ton/ac/yr	Future w/o Project Condition ton/ac/yr	Future w/Project Condition ton/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9130	HC-HC-0031	0.16	0.18	0.18	-0.3%	2	2	4
HC9131	HC-HC-0035	0.14	0.14	0.13	-7.8%	4	0	4
HC9132	HC-HC-0032	0.17	0.17	0.17	-2.9%	3	0	3
HC9133	HC-CR-0001	0.16	0.16	0.15	-10.9%	4	0	4
HC9134	HC-HC-0033	0.03	0.03	0.02	-38.9%	4	0	4
HC9135	HC-CR-0001	0.16	0.16	0.16	-4.2%	3	0	3
HC9136	HC-HC-0037	0.03	0.03	0.03	-1.2%	2	0	2
HC9137	HC-HC-0039	0.15	0.15	0.02	-87.5%	4	0	4
HC9138	HC-CR-0001	0.16	0.16	0.16	-4.8%	3	0	3
HC9139	HC-HC-0039	0.15	0.15	0.15	-0.9%	2	2	4
HC9140	HC-HC-0037	0.03	0.03	0.03	-1.5%	3	0	3
HC9142	HC-HC-0040	0.09	0.09	0.02	-75.1%	4	0	4
HC9143	HC-CR-0003	0.15	0.15	0.14	-9.7%	4	0	4
HC9146	HC-CR-0003	0.15	0.15	0.15	-3.8%	3	0	3
HC9148	HC-HC-0039	0.15	0.15	0.15	-1.8%	3	0	3
HC9149	HC-HC-0040	0.09	0.09	0.09	-4.0%	3	1	4
HC9200	HC-HC-0020	0.19	0.19	0.17	-8.5%	4	1	5
HC9201	HC-HC-0037	0.03	0.03	0.03	0.0%	2		-
HC9202	HC-HC-0039	0.15	0.15	0.15	0.0%	2		-
HC9302	HC-CR-0001	0.16	0.16	0.14	-11.9%	4		-
HC9400	HC-HC-0019	0.21	0.22	0.20	-10.0%	4	0	4
HC9401	HC-HC-0018	0.11	0.11	0.11	0.0%	2		-
HC9500	HC-HC-0026	0.13	0.15	0.15	-0.3%	2	1	3
HC9501	HC-HC-0028	0.12	0.14	0.14	-0.9%	2	0	2
HC9502	HC-HC-0028	0.12	0.14	0.14	-0.2%	2	0	2
HC9503	HC-FP-0001	0.12	0.14	0.14	-3.9%	3	1	4
HC9505	HC-HC-0035	0.14	0.14	0.13	-9.2%	4	0	4
SU9001	SU-FF-0001	0.18	0.18	0.18	-0.3%	2	0	2
SU9002	SU-RI-0003	0.10	0.10	0.09	-14.0%	4	0	4
SU9005	SU-SU-0026/27	0.21	0.21	0.18	-13.8%	4	0	4

<i>Total Suspended Solids (TSS)</i>		Existing Condition ton/ac/yr	Future w/o Project Condition ton/ac/yr	Future w/Project Condition ton/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9007	SU-FF-0002/03/04	0.41	0.41	0.38	-6.85%	3	2	5
SU9100	SU-SU-0008	0.07	0.07	0.07	-9.03%	4	0	4
SU9101	SU-SU-0012	0.06	0.06	0.06	-6.38%	3	1	4
SU9103	SU-SU-0018	0.08	0.08	0.06	-22.24%	4	0	4
SU9105	SU-SU-0013	0.06	0.07	0.05	-28.56%	4	0	4
SU9106	SU-SU-0021	0.08	0.08	0.08	-0.21%	2	1	3
SU9107	SU-SU-0028	0.36	0.37	0.37	-0.12%	2	3	5
SU9108	SU-SU-0028	0.36	0.37	0.37	-0.68%	2	3	5
SU9110	SU-SU-0028	0.36	0.37	0.37	0.00%	2	3	5
SU9111	SU-SU-0029	0.08	0.08	0.08	-1.88%	3	0	3
SU9112	SU-SU-0030	0.14	0.14	0.12	-16.66%	4	0	4
SU9115	SU-MB-0001	0.08	0.08	0.07	-14.15%	4	0	4
SU9117	SU-FL-0002	0.15	0.15	0.14	-5.32%	3	0	3
SU9118	SU-FL-0001	0.15	0.15	0.14	-6.10%	3	0	3
SU9120	SU-SU-0032	0.21	0.21	0.20	-5.04%	3	1	4
SU9121	SU-FL-0002	0.15	0.15	0.14	-6.81%	3	0	3
SU9122	SU-FL-0002	0.15	0.15	0.15	-0.72%	2	0	2
SU9123	SU-FL-0003	0.03	0.03	0.02	-45.45%	4	0	4
SU9124	SU-RI-0001	0.21	0.21	0.21	-0.91%	2	0	2
SU9127	SU-FL-0003	0.03	0.03	0.03	-4.96%	3	-1	2
SU9128	SU-RI-0002	0.08	0.08	0.08	-4.60%	3	-1	2
SU9129	SU-RI-0002	0.08	0.08	0.08	-4.46%	3	1	4
SU9130	SU-SU-0034	0.19	0.20	0.15	-22.25%	4	0	4
SU9133	SU-FL-0006	0.13	0.13	0.13	0.45%	2	0	2
SU9135	SU-SU-0039	0.17	0.18	0.17	-2.92%	3	0	3
SU9136	SU-SU-0039	0.17	0.18	0.16	-6.40%	3	0	3
SU9137	SU-SU-0038	0.13	0.13	0.12	-11.69%	4	0	4
SU9138	SU-FL-0008	0.14	0.15	0.15	-0.07%	2	0	2
SU9139	SU-SU-0040	0.20	0.20	0.19	-2.97%	3	1	4

<i>Total Suspended Solids (TSS)</i>		Existing Condition ton/ac/yr	Future w/o Project Condition ton/ac/yr	Future w/Project Condition ton/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9140	SU-SU-0041	0.19	0.20	0.16	-18.17%	4	-1	3
SU9141	SU-SU-0041	0.19	0.20	0.19	-4.26%	3	-1	2
SU9142	SU-FL-0009	0.13	0.14	0.14	-0.51%	2	0	2
SU9143	SU-SU-0041	0.19	0.20	0.20	-0.23%	2	0	2
SU9144	SU-SU-0037	0.03	0.16	0.03	-82.48%	4	0	4
SU9146	SU-SU-0041	0.19	0.20	0.20	-2.47%	3	1	4
SU9147	SU-SU-0046	0.18	0.18	0.18	-1.15%	2	-1	1
SU9149	SU-SU-0047	0.04	0.04	0.03	-10.83%	4	0	4
SU9150	SU-SU-0049	0.14	0.14	0.13	-3.83%	3	0	3
SU9200	SU-SU-0028	0.36	0.37	0.15	-58.24%	4	0	4
SU9201	SU-FL-0004	0.17	0.17	0.14	-21.64%	4	0	4
SU9202	SU-FL-0006	0.13	0.13	NA	-	-	3	3
SU9203	SU-SU-0039	0.17	0.18	NA	-	-	4	4
SU9204	SU-FL-0006	0.13	0.13	NA	-	-	3	3
SU9205	SU-SU-0035	0.13	0.13	NA	-	-	3	3
SU9206	SU-SU-0040	0.20	0.20	NA	-	-	5	5
SU9207	SU-SU-0042	0.19	0.20	NA	-	-	4	4
SU9208	SU-SU-0049	0.14	0.14	NA	-	-	4	4
SU9209	SU-SU-0051	0.11	0.11	NA	-	-	4	4
SU9210	SU-SU-0050	0.17	0.17	NA	-	-	3	3
SU9400	SU-SU-0013	0.06	0.07	0.05	-36.51%	4	0	4
SU9500	SU-SU-0032	0.21	0.21	0.21	-1.45%	3	1	4
SU9501	SU-RI-0002	0.08	0.08	0.08	-1.15%	2	1	3
SU9502	SU-SU-0039	0.17	0.18	0.17	-0.76%	2	1	3
SU9503	SU-FL-0008	0.14	0.15	0.15	-0.46%	2	0	2
SU9504	SU-SU-0035	0.13	0.13	0.14	1.63%	2	0	2
SU9505	SU-SU-0041	0.19	0.20	0.19	-3.75%	3	0	3
SU9509	SU-SU-0035	0.13	0.13	0.13	-1.31%	2	1	3
SU9510	SU-SU-0040	0.20	0.20	0.19	-2.32%	3	0	3
SU9511	SU-FL-0007	0.14	0.14	0.14	2.17%	2	0	2

Total Suspended Solids (TSS)		Existing Condition ton/ac/yr	Future w/o Project Condition ton/ac/yr	Future w/Project Condition ton/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9512	SU-SU-0037	0.03	0.16	0.03	-82.23%	4	0	4
SU9513	SU-SU-0043	0.20	0.23	0.23	-0.67%	2	0	2
SU9514	SU-SU-0045	0.22	0.23	0.18	-21.77%	4	0	4
SU9515	SU-SU-0045	0.22	0.23	0.22	-3.56%	3	0	3

<i>Total Nitrogen (TN)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9007	HC-CR-0002	6.36	6.36	2.85	-55.2%	4	0	4
HC9013	HC-CR-0004/05	10.35	10.47	9.56	-8.8%	4	1	5
HC9100	HC-HC-0018	6.02	6.19	6.16	-0.3%	2	0	2
HC9101	HC-HC-0017	7.24	7.24	7.03	-2.9%	3	-1	2
HC9102	HC-HC-0026	7.80	8.71	8.49	-2.5%	3	1	4
HC9103	HC-HC-0025	8.81	8.81	7.58	-14.0%	4	0	4
HC9104	HC-MR-0002	3.32	4.30	4.24	-1.4%	3	0	3
HC9105	HC-MR-0003	4.42	5.13	5.06	-1.2%	2	0	2
HC9106	HC-FP-0001	6.04	7.18	7.06	-1.6%	3	1	4
HC9107	HC-MR-0004	3.91	4.01	3.90	-2.7%	3	1	4
HC9108	HC-HC-0028	5.75	6.49	6.40	-1.3%	3	0	3
HC9109	HC-FP-0002	7.85	7.85	7.85	0.0%	2	1	3
HC9110	HC-MR-0004	3.91	4.01	3.97	-0.9%	2	0	2
HC9111	HC-FP-0004	7.55	7.59	7.59	-0.1%	2	1	3
HC9113	HC-HC-0028	5.75	6.49	6.24	-3.9%	4	0	4
HC9114	HC-FP-0004	7.55	7.59	7.32	-3.6%	4	1	5
HC9115	HC-HC-0028	5.75	6.49	6.44	-0.8%	2	1	3
HC9116	HC-FP-0003	5.29	5.29	5.11	-3.3%	4	0	4
HC9117	HC-FP-0004	7.55	7.59	7.59	-0.1%	2	1	3
HC9118	HC-HC-0030	5.70	6.03	5.88	-2.5%	3	0	3
HC9119	HC-FP-0005	7.52	7.52	7.42	-1.4%	3	1	4
HC9121	HC-HC-0030	5.70	6.03	6.20	2.8%	1	1	2
HC9122	HC-HC-0030	5.70	6.03	5.86	-2.9%	3	1	4
HC9123	HC-HC-0030	5.70	6.03	6.16	2.2%	2	1	3
HC9124	HC-FP-0005	7.52	7.52	7.40	-1.6%	3	2	5
HC9125	HC-HC-0031	5.89	6.36	6.28	-1.2%	2	0	2
HC9126	HC-HC-0034	6.46	6.49	6.46	-0.6%	2	0	2
HC9127	HC-FP-0003	5.29	5.29	5.15	-2.6%	3	0	3
HC9128	HC-HC-0031	5.89	6.36	6.14	-3.4%	4	0	4

<i>Total Nitrogen (TN)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9129	HC-HC-0034	6.46	6.49	6.17	-5.0%	4	0	4
HC9130	HC-HC-0031	5.89	6.36	6.35	-0.1%	2	2	4
HC9131	HC-HC-0035	6.30	6.30	6.09	-3.2%	4	0	4
HC9132	HC-HC-0032	8.41	8.45	8.21	-2.8%	3	0	3
HC9133	HC-CR-0001	7.30	7.30	6.97	-4.5%	4	0	4
HC9134	HC-HC-0033	3.91	3.91	3.23	-17.4%	4	0	4
HC9135	HC-CR-0001	7.30	7.30	7.14	-2.2%	3	0	3
HC9136	HC-HC-0037	4.28	4.30	4.18	-2.8%	3	0	3
HC9137	HC-HC-0039	3.27	3.27	2.92	-10.8%	4	0	4
HC9138	HC-CR-0001	7.30	7.30	7.09	-2.8%	3	0	3
HC9139	HC-HC-0039	3.27	3.27	3.16	-3.3%	4	0	4
HC9140	HC-HC-0037	4.28	4.30	4.13	-3.9%	4	0	4
HC9142	HC-HC-0040	3.73	3.75	3.51	-6.4%	4	0	4
HC9143	HC-CR-0003	7.04	7.06	6.73	-4.6%	4	0	4
HC9146	HC-CR-0003	7.04	7.06	6.90	-2.2%	3	0	3
HC9148	HC-HC-0039	3.27	3.27	3.18	-2.7%	3	0	3
HC9149	HC-HC-0040	3.73	3.75	3.67	-2.3%	3	1	4
HC9200	HC-HC-0020	8.53	8.70	8.49	-2.5%	3	1	4
HC9201	HC-HC-0037	4.28	4.30	4.30	0.0%	2		-
HC9202	HC-HC-0039	3.27	3.27	3.27	-0.1%	2		-
HC9302	HC-CR-0001	7.30	7.30	6.94	-4.9%	4		-
HC9400	HC-HC-0019	9.09	10.10	9.73	-3.7%	4	0	4
HC9401	HC-HC-0018	6.02	6.19	6.19	0.0%	2		-
HC9500	HC-HC-0026	7.80	8.71	8.70	-0.1%	2	1	3
HC9501	HC-HC-0028	5.75	6.49	6.34	-2.2%	3	0	3
HC9502	HC-HC-0028	5.75	6.49	6.38	-1.7%	3	0	3
HC9503	HC-FP-0001	6.04	7.18	7.00	-2.4%	3	1	4
HC9505	HC-HC-0035	6.30	6.30	6.03	-4.2%	4	0	4
SU9001	SU-FF-0001	7.57	7.57	7.57	0.0%	2	0	2
SU9002	SU-RI-0003	4.61	4.61	4.27	-7.2%	4	0	4

<i>Total Nitrogen (TN)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9005	SU-SU-0026/27	9.71	9.72	9.03	-7.1%	4	-1	3
SU9007	SU-FF-0002/03/04	16.00	16.21	15.61	-3.71%	4	1	5
SU9100	SU-SU-0008	3.54	3.56	3.42	-4.17%	4	0	4
SU9101	SU-SU-0012	3.15	3.17	3.14	-0.73%	2	1	3
SU9103	SU-SU-0018	3.61	4.03	3.45	-14.24%	4	0	4
SU9105	SU-SU-0013	2.75	2.87	2.78	-3.15%	3	0	3
SU9106	SU-SU-0021	4.10	4.14	4.13	-0.21%	2	1	3
SU9107	SU-SU-0028	6.75	7.49	7.47	-0.22%	2	3	5
SU9108	SU-SU-0028	6.75	7.49	7.44	-0.74%	2	3	5
SU9110	SU-SU-0028	6.75	7.49	7.49	0.00%	2	3	5
SU9111	SU-SU-0029	4.18	4.18	4.18	-0.05%	2	0	2
SU9112	SU-SU-0030	6.42	6.43	5.90	-8.23%	4	0	4
SU9115	SU-MB-0001	4.01	4.19	3.93	-6.17%	4	0	4
SU9117	SU-FL-0002	6.42	6.42	6.18	-3.72%	4	0	4
SU9118	SU-FL-0001	6.91	6.91	6.57	-4.88%	4	0	4
SU9120	SU-SU-0032	7.81	7.81	7.60	-2.76%	3	0	3
SU9121	SU-FL-0002	6.42	6.42	6.28	-2.15%	3	0	3
SU9122	SU-FL-0002	6.42	6.42	6.39	-0.51%	2	0	2
SU9123	SU-FL-0003	3.91	4.11	2.92	-28.91%	4	0	4
SU9124	SU-RI-0001	9.22	9.22	9.20	-0.26%	2	0	2
SU9127	SU-FL-0003	3.91	4.11	4.01	-2.29%	3	-1	2
SU9128	SU-RI-0002	4.67	4.82	4.73	-1.72%	3	-1	2
SU9129	SU-RI-0002	4.67	4.82	4.75	-1.46%	3	1	4
SU9130	SU-SU-0034	8.86	9.38	8.46	-9.89%	4	0	4
SU9133	SU-FL-0006	5.82	5.82	5.67	-2.59%	3	0	3
SU9135	SU-SU-0039	8.53	8.72	8.60	-1.28%	3	0	3
SU9136	SU-SU-0039	8.53	8.72	8.49	-2.62%	3	0	3
SU9137	SU-SU-0038	6.61	6.21	5.92	-4.75%	4	0	4
SU9138	SU-FL-0008	6.45	6.87	6.85	-0.34%	2	0	2

<i>Total Nitrogen (TN)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9139	SU-SU-0040	9.40	9.31	9.20	-1.19%	2	1	3
SU9140	SU-SU-0041	9.21	10.07	9.36	-7.06%	4	-1	3
SU9141	SU-SU-0041	9.21	10.07	9.88	-1.88%	3	-1	2
SU9142	SU-FL-0009	6.16	6.38	6.32	-0.93%	2	0	2
SU9143	SU-SU-0041	9.21	10.07	10.07	-0.04%	2	0	2
SU9144	SU-SU-0037	5.69	8.28	5.49	-33.67%	4	0	4
SU9146	SU-SU-0041	9.21	10.07	9.95	-1.17%	2	1	3
SU9147	SU-SU-0046	9.01	9.11	8.89	-2.44%	3	-1	2
SU9149	SU-SU-0047	6.17	6.17	5.85	-5.19%	4	0	4
SU9150	SU-SU-0049	6.36	6.36	6.25	-1.62%	3	0	3
SU9200	SU-SU-0028	6.75	7.49	7.15	-4.57%	4	0	4
SU9201	SU-FL-0004	6.44	6.54	6.48	-0.92%	2	0	2
SU9202	SU-FL-0006	5.82	5.82	NA	-	-	2	2
SU9203	SU-SU-0039	8.53	8.72	NA	-	-	3	3
SU9204	SU-FL-0006	5.82	5.82	NA	-	-	2	2
SU9205	SU-SU-0035	6.98	7.02	NA	-	-	2	2
SU9206	SU-SU-0040	9.40	9.31	NA	-	-	4	4
SU9207	SU-SU-0042	8.35	8.60	NA	-	-	3	3
SU9208	SU-SU-0049	6.36	6.36	NA	-	-	3	3
SU9209	SU-SU-0051	5.48	5.48	NA	-	-	3	3
SU9210	SU-SU-0050	8.01	8.08	NA	-	-	2	2
SU9400	SU-SU-0013	2.75	2.87	2.64	-7.84%	4	0	4
SU9500	SU-SU-0032	7.81	7.81	7.72	-1.27%	3	0	3
SU9501	SU-RI-0002	4.67	4.82	4.80	-0.33%	2	1	3
SU9502	SU-SU-0039	8.53	8.72	8.69	-0.33%	2	1	3
SU9503	SU-FL-0008	6.45	6.87	6.86	-0.23%	2	0	2
SU9504	SU-SU-0035	6.98	7.02	6.98	-0.57%	2	0	2
SU9505	SU-SU-0041	9.21	10.07	9.88	-1.91%	3	0	3
SU9509	SU-SU-0035	6.98	7.02	6.87	-2.11%	3	1	4
SU9510	SU-SU-0040	9.40	9.31	9.20	-1.17%	2	0	2

<i>Total Nitrogen (TN)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9511	SU-FL-0007	6.31	6.44	6.39	-0.81%	2	0	2
SU9512	SU-SU-0037	5.69	8.28	5.49	-33.65%	4	0	4
SU9513	SU-SU-0043	9.14	10.44	10.40	-0.39%	2	0	2
SU9514	SU-SU-0045	10.53	10.59	9.74	-7.95%	4	0	4
SU9515	SU-SU-0045	10.53	10.59	10.41	-1.63%	3	0	3

<i>Total Phosphorus (TP)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9007	HC-CR-0002	0.96	0.96	0.47	-50.6%	4	0	4
HC9013	HC-CR-0004/05	1.54	1.56	1.36	-12.6%	4	1	5
HC9100	HC-HC-0018	0.85	0.85	0.87	1.7%	2	0	2
HC9101	HC-HC-0017	1.08	1.08	1.04	-3.4%	3	-1	2
HC9102	HC-HC-0026	1.00	1.09	1.11	2.1%	1	1	2
HC9103	HC-HC-0025	0.95	0.95	0.77	-18.6%	4	0	4
HC9104	HC-MR-0002	0.50	0.61	0.60	-1.5%	3	0	3
HC9105	HC-MR-0003	0.72	0.81	0.80	-1.5%	3	0	3
HC9106	HC-FP-0001	0.92	1.07	1.05	-2.0%	3	1	4
HC9107	HC-MR-0004	0.60	0.60	0.58	-3.5%	4	1	5
HC9108	HC-HC-0028	0.73	0.80	0.79	-1.2%	3	0	3
HC9109	HC-FP-0002	1.07	1.07	1.07	0.1%	2	1	3
HC9110	HC-MR-0004	0.60	0.60	0.59	-1.4%	3	0	3
HC9111	HC-FP-0004	1.08	1.09	1.09	-0.1%	2	1	3
HC9113	HC-HC-0028	0.73	0.80	0.77	-4.2%	4	0	4
HC9114	HC-FP-0004	1.08	1.09	1.04	-4.9%	4	1	5
HC9115	HC-HC-0028	0.73	0.80	0.80	-0.4%	2	1	3
HC9116	HC-FP-0003	0.80	0.80	0.77	-4.1%	4	0	4
HC9117	HC-FP-0004	1.08	1.09	1.09	-0.1%	2	1	3
HC9118	HC-HC-0030	0.89	0.93	0.90	-3.4%	3	0	3
HC9119	HC-FP-0005	1.08	1.08	1.08	-0.1%	2	1	3
HC9121	HC-HC-0030	0.89	0.93	0.94	1.3%	2	1	3
HC9122	HC-HC-0030	0.89	0.93	0.88	-4.7%	4	1	5
HC9123	HC-HC-0030	0.89	0.93	0.94	1.6%	2	1	3
HC9124	HC-FP-0005	1.08	1.08	1.08	-0.4%	2	2	4
HC9125	HC-HC-0031	0.86	0.91	0.90	-1.4%	3	0	3
HC9126	HC-HC-0034	0.98	0.99	0.98	-0.8%	3	0	3
HC9127	HC-FP-0003	0.80	0.80	0.78	-2.9%	3	0	3
HC9128	HC-HC-0031	0.86	0.91	0.88	-3.6%	4	0	4

<i>Total Phosphorus (TP)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
HC9129	HC-HC-0034	0.98	0.99	0.92	-6.7%	4	0	4
HC9130	HC-HC-0031	0.86	0.91	0.91	-0.2%	2	1	3
HC9131	HC-HC-0035	0.95	0.95	0.91	-4.4%	4	0	4
HC9132	HC-HC-0032	1.21	1.21	1.18	-2.8%	3	0	3
HC9133	HC-CR-0001	1.12	1.12	1.05	-6.0%	4	0	4
HC9134	HC-HC-0033	0.53	0.53	0.42	-20.3%	4	0	4
HC9135	HC-CR-0001	1.12	1.12	1.09	-2.6%	3	0	3
HC9136	HC-HC-0037	0.59	0.59	0.57	-3.0%	3	0	3
HC9137	HC-HC-0039	0.49	0.49	0.39	-21.5%	4	0	4
HC9138	HC-CR-0001	1.12	1.12	1.08	-3.4%	3	0	3
HC9139	HC-HC-0039	0.49	0.49	0.48	-3.7%	4	0	4
HC9140	HC-HC-0037	0.59	0.59	0.57	-4.1%	4	0	4
HC9142	HC-HC-0040	0.54	0.54	0.48	-11.7%	4	0	4
HC9143	HC-CR-0003	1.07	1.08	1.02	-5.5%	4	0	4
HC9146	HC-CR-0003	1.07	1.08	1.05	-2.4%	3	0	3
HC9148	HC-HC-0039	0.49	0.49	0.48	-3.3%	3	0	3
HC9149	HC-HC-0040	0.54	0.54	0.52	-3.5%	4	1	5
HC9200	HC-HC-0020	1.20	1.20	1.20	0.2%	2	1	3
HC9201	HC-HC-0037	0.59	0.59	0.59	0.0%	2		-
HC9202	HC-HC-0039	0.49	0.49	0.49	-0.1%	2		-
HC9302	HC-CR-0001	1.12	1.12	1.04	-7.4%	4		-
HC9400	HC-HC-0019	1.43	1.43	1.46	2.1%	2	0	2
HC9401	HC-HC-0018	0.85	0.85	0.87	1.8%	2		-
HC9500	HC-HC-0026	1.00	1.09	1.10	0.6%	2	1	3
HC9501	HC-HC-0028	0.73	0.80	0.78	-2.7%	3	0	3
HC9502	HC-HC-0028	0.73	0.80	0.79	-1.5%	3	0	3
HC9503	HC-FP-0001	0.92	1.07	1.03	-3.3%	3	1	4
HC9505	HC-HC-0035	0.95	0.95	0.90	-5.1%	4	0	4
SU9001	SU-FF-0001	1.18	1.18	1.18	0.0%	2	0	2
SU9002	SU-RI-0003	0.72	0.72	0.66	-9.0%	4	0	4

<i>Total Phosphorus (TP)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9005	SU-SU-0026/27	1.52	1.52	1.38	-8.7%	4	-1	3
SU9007	SU-FF-0002/03/04	2.32	2.34	2.23	-5%	4	1	5
SU9100	SU-SU-0008	0.55	0.55	0.52	-5%	4	0	4
SU9101	SU-SU-0012	0.47	0.47	0.47	-1%	3	1	4
SU9103	SU-SU-0018	0.56	0.61	0.50	-18%	4	0	4
SU9105	SU-SU-0013	0.42	0.44	0.42	-5%	4	0	4
SU9106	SU-SU-0021	0.61	0.62	0.62	0%	2	1	3
SU9107	SU-SU-0028	1.13	1.22	1.21	0%	2	3	5
SU9108	SU-SU-0028	1.13	1.22	1.21	-1%	3	2	5
SU9110	SU-SU-0028	1.13	1.22	1.22	0%	2	3	5
SU9111	SU-SU-0029	0.59	0.59	0.59	-1%	2	0	2
SU9112	SU-SU-0030	0.99	0.99	0.89	-10%	4	0	4
SU9115	SU-MB-0001	0.60	0.62	0.57	-7%	4	0	4
SU9117	SU-FL-0002	1.00	1.00	0.96	-4%	4	0	4
SU9118	SU-FL-0001	1.05	1.05	0.99	-5%	4	0	4
SU9120	SU-SU-0032	1.16	1.16	1.12	-3%	3	1	4
SU9121	SU-FL-0002	1.00	1.00	0.97	-3%	3	0	3
SU9122	SU-FL-0002	1.00	1.00	0.99	-1%	2	0	2
SU9123	SU-FL-0003	0.54	0.56	0.40	-27%	4	0	4
SU9124	SU-RI-0001	1.35	1.35	1.35	0%	2	0	2
SU9127	SU-FL-0003	0.54	0.56	0.54	-3%	3	-1	2
SU9128	SU-RI-0002	0.65	0.67	0.66	-2%	3	-1	2
SU9129	SU-RI-0002	0.65	0.67	0.66	-2%	3	1	4
SU9130	SU-SU-0034	1.35	1.42	1.25	-12%	4	0	4
SU9133	SU-FL-0006	0.93	0.93	0.91	-3%	3	0	3
SU9135	SU-SU-0039	1.25	1.27	1.25	-2%	3	0	3
SU9136	SU-SU-0039	1.25	1.27	1.23	-3%	3	0	3
SU9137	SU-SU-0038	0.98	0.92	0.87	-6%	4	0	4
SU9138	SU-FL-0008	0.98	1.04	1.04	0%	2	0	2

<i>Total Phosphorus (TP)</i>		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9139	SU-SU-0040	1.34	1.32	1.30	-2%	3	1	4
SU9140	SU-SU-0041	1.21	1.32	1.21	-9%	4	-1	3
SU9141	SU-SU-0041	1.21	1.32	1.29	-2%	3	-1	2
SU9142	SU-FL-0009	0.93	0.96	0.95	-1%	3	0	3
SU9143	SU-SU-0041	1.21	1.32	1.32	0%	2	0	2
SU9144	SU-SU-0037	0.57	1.16	0.54	-53%	4	0	4
SU9146	SU-SU-0041	1.21	1.32	1.30	-2%	3	1	4
SU9147	SU-SU-0046	1.24	1.25	1.22	-2%	3	-1	2
SU9149	SU-SU-0047	0.64	0.64	0.60	-7%	4	0	4
SU9150	SU-SU-0049	0.95	0.95	0.93	-2%	3	0	3
SU9200	SU-SU-0028	1.13	1.22	1.08	-11%	4	0	4
SU9201	SU-FL-0004	1.00	1.01	0.99	-2%	3	0	3
SU9202	SU-FL-0006	0.93	0.93	NA	0%	-	3	3
SU9203	SU-SU-0039	1.25	1.27	NA	0%	-	4	4
SU9204	SU-FL-0006	0.93	0.93	NA	0%	-	3	3
SU9205	SU-SU-0035	1.00	1.00	NA	0%	-	3	3
SU9206	SU-SU-0040	1.34	1.32	NA	0%	-	5	5
SU9207	SU-SU-0042	1.12	1.13	NA	0%	-	4	4
SU9208	SU-SU-0049	0.95	0.95	NA	0%	-	4	4
SU9209	SU-SU-0051	0.80	0.80	NA	0%	-	4	4
SU9210	SU-SU-0050	1.20	1.21	NA	0%	-	3	3
SU9400	SU-SU-0013	0.42	0.44	0.38	-12%	4	0	4
SU9500	SU-SU-0032	1.16	1.16	1.14	-2%	3	0	3
SU9501	SU-RI-0002	0.65	0.67	0.67	-1%	2	1	3
SU9502	SU-SU-0039	1.25	1.27	1.26	0%	2	1	3
SU9503	SU-FL-0008	0.98	1.04	1.04	0%	2	0	2
SU9504	SU-SU-0035	1.00	1.00	1.00	0%	2	0	2
SU9505	SU-SU-0041	1.21	1.32	1.29	-2%	3	0	3
SU9509	SU-SU-0035	1.00	1.00	0.99	-1%	3	1	4
SU9510	SU-SU-0040	1.34	1.32	1.31	-1%	3	0	3

Total Phosphorus (TP)		Existing Condition lb/ac/yr	Future w/o Project Condition lb/ac/yr	Future w/Project Condition lb/ac/yr	% Change Future w/o to Future w/project	Adjusted Existing Score	FXB Adjustment (+1, 0, -1)	Applied Score
Project No.	Subwatershed							
SU9511	SU-FL-0007	0.97	0.99	0.98	-1%	2	0	2
SU9512	SU-SU-0037	0.57	1.16	0.55	-53%	4	0	4
SU9513	SU-SU-0043	1.25	1.39	1.38	-1%	2	0	2
SU9514	SU-SU-0045	1.44	1.45	1.29	-11%	4	0	4
SU9515	SU-SU-0045	1.44	1.45	1.42	-2%	3	0	3

F. X. Browne, Inc.

Memorandum

To: Fairfax County
From: F. X. Browne, Inc.
Date: July 8, 2010
Revised: October 21, 2010
RE: Task 3.6 Model Analysis and Evaluation of Alternative Scenarios for
Sugarland Run and Horsepen Creek Watersheds

1.0 Introduction

Task 3.6 requires that proposed 10-yr implementation projects be further analyzed using SWMM and HEC-RAS to evaluate hydrologic and hydraulic (H&H) benefits. The H&H analyses allows for an assessment of potential impacts as well as evaluation of the objectives met by implementing the projects.

The following represents occasions where modeled output is essential:

- Water quality retrofits that have strong potential to create or exacerbate upstream or downstream flooding conditions
- Projects where the objective is to reduce/mitigate erosive downstream velocities
- Projects where the objective is to reduce/mitigate downstream flooding

In these cases, modeled SWMM and HEC-RAS analysis have been performed to quantify whether adverse impacts were avoided or that objectives were met. This memo summarizes the setup, calibration and results of the hydrologic and hydraulic modeling performed in Task 3.6. A costs and benefits analysis was performed as part of Task 3.6 and is summarized below as well. Results from the final STEPL pollution model from Task 3.4 are also summarized in this memo.

1.1 Design Storms

Storm events are classified by the amount of rainfall, in inches, that occurs over the duration of a storm. The amount of rainfall depends on how frequently the storm will statistically occur and how long the storm lasts. In general, smaller storms occur more frequently than larger storms of equal duration. Hence, a 2-year, 24hr storm (having a 50 percent chance of happening in a given year) has less rainfall than a 10-year, 24hr storm (having a 10 percent chance of happening in a given year).

Modeling is a way to mathematically predict and spatially represent what will occur with a given rainfall event. Hydrologic and hydraulic models were used to achieve this goal and are briefly described below:

- *Hydrologic models* take into account several factors including the particular rainfall event of interest, the physical nature of the land area where the rainfall occurs, and how quickly the resulting stormwater runoff drains this given land area. Hydrologic models can describe both the quantity of stormwater runoff and resulting pollution, such as nutrients (nitrogen and phosphorus) and sediment that are transported by the runoff.
- *Hydraulic models* represent the effect the stormwater runoff from a particular rainfall event has on both man-made and natural systems. These models can predict both the ability man-made culverts/channels have in conveying stormwater runoff and the spatial extent of potential flooding.

Table 1 provides modeling rationale for the three storm events that were modeled for this project.

Table 1 Modeling Rationale	
Storm Event	Modeling Rationale
2-year, 24hr	Represents the amount of runoff that defines the shape of the receiving streams.
10-year, 24hr	Used to determine which road culverts will have adequate capacity to convey this storm without overtopping the road.
100-year, 24hr	Used to define the limits of flood inundation zones

1.2 Selection of Projects

As shown in Table 2, thirty-six (36) projects from the ten year implementation plan were selected for SWMM and/or HEC-RAS modeling, and two (2) additional stream restoration and culvert retrofit projects were selected for changes to be modeled only in HEC-RAS through the subtask 3.6 modeling effort. Subprojects within a project group such as in the case of regional pond alternatives were analyzed individually but were assessed together per the guidance document entitled, Clarification of language from March 2009 WMP Standards Version 3.2 (Subtasks 3.4 & 3.6). A list of selected projects is attached with this memo.

1.2.1 Justification for selection of projects

Projects were selected based on the criteria established at the Technical Team Meeting #6 and in accordance with the guidance document entitled, Clarification of language from March 2009 WMP Standards Version 3.2 (Subtasks 3.4 & 3.6). Based on these criteria, projects that were capable of providing meaningful increased quantity control, decreased downstream flow velocities or reduced flooding were selected for additional modeling in subtask 3.6.

All culvert retrofits that proposed increased conveyance capacities and/or the addition of micropool systems or additional storage capacity were included to be modeled within HEC-RAS. Stream restoration projects that significantly changed the morphology of the stream channel or proposed changes that would have significant impact to downstream flow velocities were also included in the list of projects to be modeled within HEC-RAS.

1.2.2 Justification for projects not modeled in SWMM

The TM-3 Guidance Update dated February 13, 2008, specifies that double-counting of treatment types is not considered due to wide variation in how treatment would be assigned in nested areas, due to limited availability of information and the number of assumptions that would need to be made.

To be consistent with this guidance, the modeling effort in subtask 3.6 did not include modeling subarea type C facilities in the SWMM model. Projects of this type include rain gardens, green roofs, infiltration trenches, water quality filters, infiltration basins and constructed wetlands. Projects of this class were generally smaller scale improvements to the local area, such as rain gardens, water quality filters, and infiltration trenches. Inherent in their limited scope, these low impact projects have high water quality benefits, but provide no meaningful quantity control and have little to no impact on reducing flooding conditions. Large scale projects that fall into this subtype such as infiltration basins, green roofs and constructed wetlands also were not selected for modeling. Constructed wetlands, green roofs and infiltration basins present modeling difficulties with limited availability of information which would lead to inaccurate assumptions without further detailed study. The current set up of SWMM models does not have mechanisms or capabilities to incorporate these large-scale type C projects without being inconsistent with previous guidance documentation. Although large in scale, these projects would not provide significantly higher water quantity control as standard design practice would have these projects control only the 2-year recurrence interval runoff volumes. In terms of water quantity, type C facilities, particularly those that incorporate bioretention or infiltration, generally reduce runoff volumes and will therefore not increase flooding downstream.

Ten additional projects that did not fall into subarea type C were not selected. These ten projects were all retrofits of existing stormwater facilities. In these cases, the existing SWMM model already indicated the proposed subtype that the proposed project would result in. Therefore, changes to these subareas would have minimal impacts on the water quantity capability already incorporated in the existing model.

1.2.3 Justification for projects not modeled in HEC-RAS

The HEC-RAS model for Sugarland Run and Horsepen Creek contains only the main stem and major tributaries of the two watersheds. Culvert retrofits, in-line ponds, and stream restoration projects that are not located on a modeled channel cannot be incorporated into the model and were excluded from the selected projects list.

Culvert retrofit projects that did not expand the conveyance capability of the channel or increased storage capacity through a micropool or designed outlet structure were also excluded

from the selected projects list. In these cases, modeling the culvert retrofit would not result in a change to the velocities within the stream channel.

Likewise, stream restoration projects that did not propose alterations to the channel cross sections or significant changes to the morphology and planform of the stream were also excluded from the modeling effort. These minor stream restoration projects, such as stream bank stabilization, do not significantly change the conveyance capability of the stream channel nor do they generally have a significant impact on channel velocities.

Table 2 below shows the final list of projects modeled in the hydrologic and hydraulic models.

Table 2					
List of Modeled Projects					
Subwatershed	Project ID	Modeled in			SWMM RUN
		STEPL	SWMM	HEC-RAS	
HC-CR-0002	HC9007E	X	X		1
HC-CR-0004	HC9013F	X	X		1
HC-CR-0005	HC9013G	X	X		1
HC-CR-0005	HC9013K	X	X		1
HC-CR-0005	HC9013J	X	X		1
HC-FP-0003	HC9127A	X	X		1 & 2
HC-FP-0003	HC9127B	X	X		1
HC-FP-0003	HC9127A	X	X		1 & 2
HC-FP-0004	HC9114	X	X		1
HC-HC-0020	HC9200B	X	X		1
HC-HC-0026	HC9102	X	X		1
HC-HC-0030	HC9118A	X	X		1
HC-HC-0030	HC9118B	X	X		1
HC-HC-0030	HC9122	X	X		2
HC-HC-0031	HC9128	X	X		1
HC-HC-0031	HC9130	X	X		2
HC-HC-0032	HC9132	X	X		1
HC-HC-0033	HC9134A	X	X		1
HC-HC-0034	HC9126	X	X		1
HC-HC-0034	HC9129A	X	X		2
HC-HC-0037	HC9140	X	X		1
HC-HC-0040	HC9142B	X	X		1
HC-MR-0004	HC9107	X	X		1
HC-MR-0004	HC9110	X	X		2
SU-FF-0002	SU9007J	X	X		2 & 3
SU-FF-0002	SU9007J	X	X		2 & 3
SU-FF-0004	SU9007B	X			1 & 3
SU-FF-0004	SU9007B	X			1 & 3

**Table 2
List of Modeled Projects**

Subwatershed	Project ID	Modeled in			SWMM RUN
		STEPL	SWMM	HEC-RAS	
SU-FF-0004	SU9007D	X	X		3
SU-FF-0004	SU9007I	X	X		3
SU-FF-0004	SU9007L	X	X		3
SU-FL-0002	SU9117A	X	X		1
SU-FL-0002	SU9117B	X	X		1
SU-FL-0003	SU9123	X	X		1
SU-FL-0004	SU9201B	X	X		1
SU-FL-0004	SU9201A			X	
SU-RI-0003	SU9002A	X	X		1
SU-RI-0003	SU9002C	X	X		1
SU-RI-0003	SU9002D	X			
SU-SU-0008	SU9100	X	X		1
SU-SU-0012	SU9101A	X	X		1
SU-SU-0012	SU9101B	X	X		1
SU-SU-0018	SU9103A	X	X		1
SU-SU-0028	SU9108A	X	X		1
SU-SU-0028	SU9108B	X	X		1
SU-SU-0032	SU9120A	X	X		1
SU-SU-0032	SU9120B	X	X		1
SU-SU-0034	SU9130	X	X		1
SU-SU-0035	SU9205			X	
SU-SU-0037	SU9144A	X	X		1
SU-SU-0037	SU9144B	X	X		1
SU-SU-0037	SU9144C	X	X		1
SU-SU-0037	SU9144D	X	X		1
SU-SU-0039	SU9135A	X	X		1
SU-SU-0039	SU9136	X	X		2
SU-SU-0041	SU9141	X	X		1
SU-SU-0041	SU9146B	X	X		2
SU-SU-0046	SU9147	X	X		1
SU-SU-0047	SU9149A	X	X		1
SU-SU-0047	SU9149B	X	X		1
SU-SU-0047	SU9149D	X	X		1
SU-SU-0047	SU9149E	X	X		1
SU-SU-0047	SU9149F	X	X		1
SU-SU-0047	SU9149G	X	X		1
SU-SU-0049	SU9150	X	X		1

2.0 Setup and Calibration of Stormwater Models

As discussed in the previous section, modeling is a way to mathematically predict and spatially represent what will occur during a given rainfall event. Hydrologic and hydraulic models are the two types of models that are used to achieve this.

Hydrologic and hydraulic models were created for three distinct scenarios as listed below:

- Existing conditions
- Future conditions without projects
- Future conditions with projects

For *Existing Conditions*, the models simulated the condition of the watersheds at the time the models were created by incorporating information on land use, soils, existing stormwater management and best management practice facilities, previous stream and watershed assessments, and actual field reconnaissance and site visits. The *Future Conditions without Projects* scenario simulated future conditions based on countywide future land use and development, derived from the county's comprehensive plan and build-out predictions. As the name implies, the *Future Conditions without Projects* models do not contain any of the watershed restoration strategies or projects identified in this plan. The *Future Conditions with Projects* scenario simulates the implementation of the projects discussed in the previous sections. The *Future Conditions with Projects* scenario uses the *Future Conditions without Projects* models as a base on which proposed restoration strategies are added and evaluated.

Comparison of modeling results from these three scenarios yielded pollutant loading and stormwater runoff reductions discussed below.

2.1 GIS Processing

A sequence of Geographical Information System (GIS) processing was required in preparation for pollution modeling with STEPL and hydrologic modeling with SWMM. The *Future Conditions with Projects* scenario was evaluated in two ways. First, each project was evaluated individually, in order to assess the benefits of each individual project. In order to isolate project benefits, the projects were divided into multiple 'runs' for modeling purposes. Each run contained no more than one project per subwatershed; projects with multiple subprojects and regional pond alternative scenarios were processed together in order to model the benefits of the entire group of projects. A final 'run' was also processed for each model in order to evaluate the benefits of the implementation plans as a whole.

For each run, drainage areas to each modeled project were delineated in GIS. Processing was conducted in GIS to break each subwatershed into subareas based on the existing and/or proposed stormwater controls. There are five distinct subareas, each representing a type of stormwater facility:

- Peak-shaving only (subarea A)
- Peak-shaving and water quality, wet pond (subarea B1)
- Peak-shaving and water quality, dry pond (subarea B2)
- Peak-shaving only (subarea C)
- No stormwater treatment (subarea D)

Subareas were delineated from subwatersheds to adequately characterize all of the stormwater treatment that was occurring in the subwatershed. In some cases, the *Existing Conditions* and *Future Conditions without Projects* subareas were calculated incorrectly. The treatment by some ponds was not included in the appropriate subarea because the pond was not included in the County's stormwater network and not identified until candidate project field reconnaissance, or the drainage area to the pond did not contain any parcels included in the County's controlled parcels GIS layer. The treatment of some other areas was overestimated either because the parcels were included in the County's controlled parcels GIS layer, but not located within the drainage area of an existing stormwater management facility, or because candidate project field reconnaissance indicated that an existing pond provided less treatment than was originally modeled. These inaccuracies inherent in the GIS processing methodology are minimal at the watershed scale; however, they are problematic at an individual project scale. Best professional judgment was used to determine whether individual project benefits were over or under estimated in pollution modeling. Some projects were excluded from hydrologic modeling due to these inconsistencies.

During the GIS processing, output tables were created for each 'run' that contain the land use and soils data for the proposed stormwater management areas for use in water quality and water quantity modeling.

2.2 Pollution Model

The Spreadsheet Tool for the Estimation of Pollutant Load (STEPL) model developed for the U. S. EPA was used to quantify the nutrient and sediment loads generated by stormwater runoff. The STEPL model calculates nutrient and sediment loads using simple algorithms based on the runoff volume and the pollutant concentrations in the runoff water as influenced by factors such as the land use distribution and management practices. The annual sediment load is calculated based on the Universal soil Loss Equation (USLE) and the sediment delivery ratio. Sediment and pollutant load reductions that result from the implementation of existing and/or proposed stormwater management facilities or best management practices (BMPs) are computed using known pollutant removal efficiencies.

2.2.1 Pollutant Model Setup

A STEPL model was developed for each of three conditions as described above. The model for each scenario was generally set up in the same manner. Local data such as state name, county name, precipitation information, universal soil loss equation (USLE) parameters and nutrient concentration in runoff were entered into the model.

Land use and soils tables were developed and imported into the STEPL model based on the distribution of each land use type or soil hydrologic group within each subarea. Pollutant loads and load reductions were automatically calculated for total nitrogen, total phosphorus, and sediment.

Because pollutant loads and load reductions were calculated at a subwatershed scale, each proposed project was modeled individually in order to show the water quality benefits for each specific project, and as a group to show the water quality benefits of watershed management plan as a whole.

Regional ponds were not modeled using the subarea classifications like smaller stormwater facilities because these facilities often drain larger areas that may include several subareas with additional stormwater controls. Therefore, regional facilities that were proposed for retrofit or construction were modeled by revising the regional pond pollutant removal efficiencies.

2.2.2 Streambank Erosion

Only locations where SPA data was available were used to calculate streambank erosion. All SPA erosion data (previous SPA assessments and the SPA conducted by F. X. Browne, Inc as part of subtask 2.3) that had an impact score of 5 or greater were included in the calculations. Bank length and height were obtained from the SPA layers and reflect actual measurements performed in the field during the SPA analysis. For the areas where this data was not measured, the height was estimated based on the severity ranking and nearby field investigations.

Per the guidance document “Guidance for Representing Streambank Erosion and Regional Pond Efficiencies,” dated 2/5/2009, the empirical equation provided in the document was used to characterize the streambank erosion.

The following equation and parameters were used to calculate streambank erosion:

$$\text{Annual Sediment Load from Streambank, ton} = L * H * RR * DW * NCF$$

Where:

L = Streambank Length, ft

H = Streambank Height, ft

RR = Lateral Recession Rate, ft/year

DW = Soil Dry Weight, ton/ft³, based on the soil texture

NCF = Nutrient correction fraction, based on the soil texture (optional)

$$\text{Load Reduction} = \text{Load} * \text{BMP Efficiency}$$

$$\text{Nutrient Load, lbs} = \text{Sediment Load} * \text{NC}/100$$

Where NC = Nutrient concentration %

The locations where streambank erosion was calculated were compared with the Soils_complete_w_HSG shapefile that had been clipped to our watershed boundaries. With this, the soil textural class was obtained and used to identify the soil dry weight based on the table provided in the guidance document “Guidance for Representing Streambank Erosion and Regional Pond Efficiencies,” dated 2/5/2009 as replicated in Table 2 below.

Table 2: Dry Density and Nutrient Correction Factors for Various Soil Textures

Soil Textural Class	Dry Density (tons/ft3)	Nutrient Correction Factor
Clay	0.035	1.15
Clay loam	0.0375	1.15
Fine Sandy loam	0.05	0.85
Loams, sandy clay loams	0.045	0.85
Organic	0.011	1.5
Sands, Loamy sands	0.055	0.85
Sandy clay	0.045	0.85
Sandy loam	0.0525	0.85
Silt Loam	0.0425	1
Silty clay loam, silty clay	0.04	1

As shown in Table 3 below, default values for lateral recession rates were determined based on the qualitative assessment of lateral erosion as assessed through the SPA habitat assessments. Lateral recession rates were obtained from the 'Gully&Streambank Erosion' tab in the STEPL template and posted on the WMP forum on February 6, 2009.

Table 3: Lateral Recession Rates based on SPA Impact Scores

Impact Score	Lateral Recession	Rate (ft/yr)
5	Moderate	0.13
6	Moderate	0.13
7	Severe	0.4
8	Severe	0.4
9	Severe	0.4
10	Very Severe	0.5

A Microsoft Excel spreadsheet was used to calculate stream loadings in lieu of creating a separate STEPL model. The calculated loads were aggregated to the subwatershed level and incorporated with the land-based loadings generated in the previously loaded STEPL models to determine total loadings used in the project prioritization task as discussed in the Task 3.4/3.5 technical memo.

2.3 Hydrologic Model

The SWMM model was developed by the U. S. EPA and was used to model rainfall runoff relationships in the Sugarland Run and Horsepen Creek watersheds. Peak rate of runoff and total runoff volume values were generated from the SWMM models and describe the magnitude of stormwater runoff that results from each of the design storms.

2.3.1 Hydrologic Model Setup

SWMM models were generally created in the same manner for all three scenarios. Delineated subwatersheds were imported into the model and subareas were added depending on the type of stormwater facility/restoration strategy. Subwatershed and subarea parameters were input into the model from existing data, updated with field reconnaissance data and calibrated against real world flow and runoff information.

Subareas were delineated from subwatersheds to adequately characterize all of the stormwater treatment that was occurring in the subwatershed. Subareas were representative of all stormwater facilities or restoration strategies of a single type within a subwatershed. Therefore, the area draining to the facilities of each type were summed up and modeled as a single subarea (i.e. sum of all areas draining to C type facilities are represented by a single C type subarea within the model).

Regional ponds listed in the 1989 County Regional Stormwater Management Plan have both the stage-area relationship and the orifice elevation and size available. These regional ponds were represented within the model separately from the subarea delineation described above. The stage-area table from the report was specified for the storage unit, and the sizes and crest heights were specified for the orifices.

SWMM models for the *Existing Conditions* and the *Future Conditions without Projects* scenarios were prepared by the County's Technical Consultant, updated with field reconnaissance data and calibrated using discharge relationships developed in D. G. Anderson's 1970 Water Supply Paper and/or flood frequency methods detailed in U.S.G.S. Fact Sheet 023-01. Detailed information on SWMM model calibration can be found in Appendix B.

The SWMM models for the *Future Conditions with Projects* scenario were developed using the *Future Conditions without Projects* as the base models into which the proposed 10-year structural projects would be added. The SWMM Updating Tool developed by the County's Technical Consultant and the methodology outlined in the "Tutorial for using the SWMM Updating Tool" provided by the Technical Consultant were used to build these SWMM models. Subareas delineated in the GIS processing described above were manually entered into the SWMM models and subarea parameters such as subarea width and storage unit surface areas were calculated and adjusted in the models. Orifice sizes for the various stormwater facilities were calculated per the "Tutorial for Orifice Sizing" provided by the Technical Consultant. During quality control checking of the SWMM models, it was determined that the SWMM Updating Tool replaced previously calibrated infiltration values in subareas that had no change

in area. Infiltration values and routing parameters from the *Future Conditions without Projects* models were copied into the *Future Conditions with Projects* models and finalized.

2.4 Hydraulic Model

The Hydrologic Engineering Centers River Analysis System (HEC-RAS) hydraulic model was initially developed by the U.S. Army Corps of Engineers (USACE) in the early 1990s as a tool to manage the rivers and harbors in their jurisdiction. HEC-RAS has found wide acceptance as the standard for simulating the hydraulics of water flow through natural and/or manmade channels and rivers. HEC-RAS is commonly used for modeling water flowing through a system of open channels with the objective of computing water surface elevations.

2.4.1 Hydraulic Model Setup

The geographic input data for the HEC-RAS model was extracted using HEC-GeoRAS. HEC-GeoRAS is a tool that processes the geospatial data within the County's Geographic Information System, specifically as it pertains to physical features such as stream geometry and flow path so that these features can be represented in the model. The HEC-RAS models were limited to the major tributaries and the main stem of Horsepen Creek and Sugarland Run and do not include intermittent streams in headwater areas. Low flows and undefined channels prevent the models from providing beneficial output in these areas. However, the flow contributions from these areas were considered in downstream areas within the model.

Using available County or Virginia Department of Transportation (VDOT) engineering data, bridge and culvert crossings were coded into the model to simulate the effect these facilities have on the water surface elevations or profile. Where data were not available, field reconnaissance was performed to obtain the crossing elevation data. This crossing data was determined relative to a point where the elevation could be estimated accurately from the County's topographic data. Manning's 'n' values, which represent surface roughness, were assigned to the channel and overbank portions of the studied streams based on field visits and aerial photographs.

The hydrologic flow input data and the locations where the flows change were extracted from SWMM. The 2-yr, 10-yr and 100-yr storm flow outputs were determined at several locations in order to provide a detailed flow profile for input into the HEC-RAS hydraulic model.

As stated previously, the 2-year storm discharge is regarded as the channel-forming or dominant discharge that transports the majority of a stream's sediment load and therefore actively forms and maintains the channel. A comparison of stream dynamics and channel geometry for the 2-year discharge provides insight regarding the relative stability of the system and helps to identify areas in need of restoration.

The 10-year storm discharge was included to analyze the level of service of bridge and culvert stream crossings. Occurring less frequently than the 2-year storm, the flood stage associated with this storm can result in more significant safety hazards to residents. All stream crossings (bridges and culverts) were analyzed against this storm to see if they performed at safe levels.

The 100-year storm discharge is used by the Federal Emergency Management Agency (FEMA) to delineate floodplain inundation zones in order to establish a Flood Insurance Rate Map (FIRM) for a given area. The 100-yr HEC-RAS models were built in compliance with FEMA standards and were included to map the limits of these floodplain inundation zones. This mapping provided a means to assess which properties are at risk to flooding by the 100-yr storm event.

3.0 Analysis of Stormwater Modeling Results

Results of the modeling efforts were compiled and analyzed to determine the magnitude and extent of flooding and flow changes caused by implementation of the modeled projects. Pollutant load reductions were evaluated for all projects in the watershed management plan.

3.1 STEPL Model Results

STEPL model results for the overall 10-year implementation plan are presented in Table 4. Overall, the 10-year implementation plan will reduce total nitrogen, phosphorus and suspended solids by 3,551 pounds per year, 625 pounds per year and 210 tons per year, respectively. Implementing all projects in the plan would reduce total nitrogen, total phosphorus and total suspended solids by 4,747 pounds per year, 850 pounds per year and 275 tons per year, respectively.

Watershed/Watershed Management Area	Modeling Scenario	Total Nitrogen (lb/yr)	Total Phosphorus (lb/yr)	Total Suspended Solids (ton/yr)	Total Suspended Solids (lb/yr)
Sugarland Watershed, Folly Lick Branch WMA	Future Condition without Projects	11,252	1,715	245.6	491,192
	Future Condition with 10-yr Projects	11,092	1,686	234.2	468,467
	Reduction	160	28	11.4	22,725
	Future Condition with 0-25 yr Projects	10,939	1,658	227.0	453,998
	Reduction	313	57	18.6	37,193
Sugarland Watershed, Headwaters WMA	Future Condition without Projects	6,733	906	120.4	240,759
	Future Condition with 10-yr Projects	6,574	887	118.1	236,291
	Reduction	159	19	2.2	4,468
	Future Condition with 0-25 yr Projects	6,574	887	118.1	236,291
	Reduction	159	19	2.2	4,468
Sugarland Watershed, Lower WMA	Future Condition without Projects	9,072	1,331	183.4	366,788
	Future Condition with 10-yr Projects	8,909	1,302	177.9	355,770
	Reduction	163	29	5.5	11,018
	Future Condition with 0-25 yr Projects	8,831	1,283	174.5	349,076
	Reduction	241	48	8.9	17,712
Sugarland Watershed, Lower Middle WMA	Future Condition without Projects	16,130	2,401	375.4	750,878
	Future Condition with 10-yr Projects	15,839	2,334	325.7	651,322
	Reduction	290	66	49.8	99,555
	Future Condition with 0-25 yr Projects	15,611	2,290	314.6	629,238
	Reduction	518	110	60.8	121,640

Table 4
STEPL Model Results for 10-year Implementation Plan

Watershed/Watershed Management Area	Modeling Scenario	Total Nitrogen (lb/yr)	Total Phosphorus (lb/yr)	Total Suspended Solids (ton/yr)	Total Suspended Solids (lb/yr)
Sugarland Watershed, Potomac WMA	Future Condition without Projects	1,552	238	39.3	78,616
	Future Condition with 10-yr Projects	1,551	238	39.3	78,616
	Reduction	0	0	0.0	0
	Future Condition with 0-25 yr Projects	1,551	238	39.3	78,616
	Reduction	0	0	0.0	0
Sugarland Watershed, Upper WMA	Future Condition without Projects	13,360	1,803	284.3	568,616
	Future Condition with 10-yr Projects	12,993	1,748	270.6	541,261
	Reduction	367	55	13.7	27,355
	Future Condition with 0-25 yr Projects	12,760	1,711	258.9	517,801
	Reduction	600	92	25.4	50,815
Sugarland Watershed, Upper Middle WMA	Future Condition without Projects	13,330	1,924	267.4	534,823
	Future Condition with 10-yr Projects	12,698	1,813	232.9	465,883
	Reduction	631	111	34.5	68,940
	Future Condition with 0-25 yr Projects	12,563	1,788	226.4	452,882
	Reduction	767	137	41.0	81,941
<i>Sugarland Watershed, Total</i>	<i>Future Condition without Projects</i>	<i>71,429</i>	<i>10,318</i>	<i>1,515.8</i>	<i>3,031,672</i>
	<i>Future Condition with 10-yr Projects</i>	<i>69,657</i>	<i>10,009</i>	<i>1,398.8</i>	<i>2,797,593</i>
	<i>Reduction</i>	<i>1,771</i>	<i>310</i>	<i>117.0</i>	<i>234,080</i>
	<i>Future Condition with 0-25 yr Projects</i>	<i>68,829</i>	<i>9,855</i>	<i>1,358.9</i>	<i>2,717,884</i>
	<i>Reduction</i>	<i>2,599</i>	<i>463</i>	<i>156.9</i>	<i>313,788</i>
Horsepen Watershed, Cedar Run WMA	Future Condition without Projects	4,802	726	104.0	207,959
	Future Condition with 10-yr Projects	4,511	664	88.1	176,241
	Reduction	291	62	15.9	31,718
	Future Condition with 0-25 yr Projects	4,430	645	83.2	166,408
	Reduction	373	81	20.8	41,552
Horsepen Watershed, Frying Pan Branch WMA	Future Condition without Projects	7,863	1,119	137.5	274,947
	Future Condition with 10-yr Projects	7,610	1,077	127.3	254,697
	Reduction	253	42	10.1	20,249
	Future Condition with 0-25 yr Projects	7,602	1,075	127.1	254,291
	Reduction	261	44	10.3	20,655

Table 4
STEPL Model Results for 10-year Implementation Plan

Watershed/Watershed Management Area	Modeling Scenario	Total Nitrogen (lb/yr)	Total Phosphorus (lb/yr)	Total Suspended Solids (ton/yr)	Total Suspended Solids (lb/yr)
Horsepen Watershed, Indian Creek WMA	Future Condition without Projects	7,200	1,023	143.9	287,712
	Future Condition with 10-yr Projects	7,200	1,023	143.9	287,712
	Reduction	0	0	0.0	0
	Future Condition with 0-25 yr Projects	7,200	1,023	143.9	287,712
	Reduction	0	0	0.0	0
Horsepen Watershed, Lower WMA	Future Condition without Projects	15,944	1,937	445.0	890,017
	Future Condition with 10-yr Projects	15,944	1,937	445.0	890,017
	Reduction	0	0	0.0	0
	Future Condition with 0-25 yr Projects	15,944	1,937	445.0	890,017
	Reduction	0	0	0.0	0
Horsepen Watershed, Lower Middle WMA	Future Condition without Projects	10,013	1,515	222.7	445,366
	Future Condition with 10-yr Projects	9,583	1,448	207.1	414,167
	Reduction	430	67	15.6	31,199
	Future Condition with 0-25 yr Projects	9,570	1,439	204.1	408,241
	Reduction	442	75	18.6	37,125
Horsepen Watershed, Merrybrook Run WMA	Future Condition without Projects	5,236	756	63.1	126,170
	Future Condition with 10-yr Projects	5,218	750	62.6	125,211
	Reduction	18	6	0.5	959
	Future Condition with 0-25 yr Projects	5,176	745	62.1	124,118
	Reduction	60	11	1.0	2,052
Horsepen Watershed, Middle WMA	Future Condition without Projects	6,909	819	157.0	314,019
	Future Condition with 10-yr Projects	6,702	797	153.9	307,727
	Reduction	207	22	3.1	6,292
	Future Condition with 0-25 yr Projects	6,469	761	138.1	276,133
	Reduction	440	58	18.9	37,886
Horsepen Watershed, Stallion WMA	Future Condition without Projects	5,517	700	158.6	317,136
	Future Condition with 10-yr Projects	5,517	700	158.6	317,136
	Reduction	0	0	0.0	0
	Future Condition with 0-25 yr Projects	5,517	700	158.6	317,136
	Reduction	0	0	0.0	0
Horsepen Watershed, Upper WMA	Future Condition without Projects	9,406	1,355	176.5	352,903
	Future Condition with 10-yr Projects	8,826	1,238	128.5	257,022
	Reduction	581	117	47.9	95,881
	Future Condition with 0-25 yr Projects	8,834	1,236	127.6	255,115
	Reduction	572	119	48.9	97,788
<i>Horsepen Watershed, Total</i>	<i>Future Condition without Projects</i>	<i>72,892</i>	<i>9,949</i>	<i>1,608.1</i>	<i>3,216,229</i>
	<i>Future Condition with 10-yr Projects</i>	<i>71,112</i>	<i>9,634</i>	<i>1,514.9</i>	<i>3,029,889</i>
	<i>Reduction</i>	<i>1,780</i>	<i>315</i>	<i>93.2</i>	<i>186,340</i>
	<i>Future Condition with 0-25 yr Projects</i>	<i>70,744</i>	<i>9,562</i>	<i>1,489.6</i>	<i>2,979,130</i>
	<i>Reduction</i>	<i>2,148</i>	<i>387</i>	<i>118.5</i>	<i>237,099</i>

Table 4
STEPL Model Results for 10-year Implementation Plan

Watershed/Watershed Management Area	Modeling Scenario	Total Nitrogen (lb/yr)	Total Phosphorus (lb/yr)	Total Suspended Solids (ton/yr)	Total Suspended Solids (lb/yr)
<i>Total Watershed Management Plan</i>	<i>Future Condition without Projects</i>	<i>144,321</i>	<i>20,267</i>	<i>3,124.0</i>	<i>6,247,902</i>
	<i>Future Condition with 10-yr Projects</i>	<i>140,769</i>	<i>19,643</i>	<i>2,913.7</i>	<i>5,827,482</i>
	<i>Reduction</i>	<i>3,551</i>	<i>625</i>	<i>210.2</i>	<i>420,419</i>
	<i>Future Condition with 0-25 yr Projects</i>	<i>139,573</i>	<i>19,417</i>	<i>2,848.5</i>	<i>5,697,014</i>
	<i>Reduction</i>	<i>4,747</i>	<i>850</i>	<i>275.4</i>	<i>550,887</i>

3.2 SWMM Model Results

Tables 5 and 6 below presents the 2-Year and 10-Year peak rate of runoff flows from the SWMM model runs for Sugarland Run and Horsepen Creek. The tables below show the effects of the modeled projects individually and bundled in cases of subprojects or regional pond alternatives.

Table 5
SWMM Model Results for Horsepen Creek

Subbasin	Project ID	2-YR Total Flow (cfs)			10-YR Total Flow (cfs)		
		Future without Projects	Future with Projects	Difference	Future without Projects	Future with Projects	Difference
HC-CR-0002	HC9007E	67.22	31.21	-54%	140.25	64.80	-54%
	Overall		31.21	-54%		64.80	-54%
HC-CR-0004	HC9013F	147.05	129.53	-12%	306.27	262.06	-14%
	Overall		130.07	-12%		262.82	-14%
HC-CR-0005	HC9013G, HC9013K, HC9013J	102.78	89.10	-13%	213.66	181.59	-15%
	Overall		89.15	-13%		181.62	-15%
HC-FP-0003	HC9127A & HC9127B	65.41	64.63	-1%	130.35	129.08	-1%
	HC9127A		64.68	-1%		130.90	0%
	Overall		64.65	-1%		129.12	-1%
HC-FP-0004	HC9114	183.11	141.2	-23%	371.71	297.49	-20%
	Overall		141.20	-23%		297.49	-20%
HC-HC-0020	HC9200B	154.68	154.21	0%	334.95	330.38	-1%
	Overall		154.31	0%		330.55	-1%
HC-HC-0026	HC9102	65.42	58.44	-11%	126.72	113.84	-10%
	Overall		58.47	-11%		113.89	-10%

**Table 5
SWMM Model Results for Horsepen Creek**

Subbasin	Project ID	2-YR Total Flow (cfs)			10-YR Total Flow (cfs)		
		Future without Projects	Future with Projects	Difference	Future without Projects	Future with Projects	Difference
HC-HC-0030	HC9118A & HC9118B	61.78	55.51	-10%	123.19	111.38	-10%
	HC9122		51.14	-17%		102.81	-17%
	Overall		44.96	-27%		90.57	-26%
HC-HC-0031	HC9128	327.87	325.98	-1%	913.68	917.37	0%
	HC9130		325.96	-1%		912.75	0%
	Overall		315.61	-4%		910.06	0%
HC-HC-0032	HC9132	99.00	97.08	-2%	201.71	198.92	-1%
	Overall		95.02	-4%		197.87	-2%
HC-HC-0033	HC9134A	3.83	3.83	0%	3.88	3.88	0%
	Overall		3.83	0%		3.88	0%
HC-HC-0034	HC9126	56.92	56.71	0%	116.69	116.35	0%
	HC9129A		50.25	-12%		105.97	-9%
	Overall		50.94	-11%		107.85	-8%
HC-HC-0037	HC9140	121.27	104.90	-13%	242.36	213.42	-12%
	Overall		104.89	-14%		213.38	-12%
HC-HC-0040	HC9142B	92.55	91.21	-1%	188.23	188.14	0%
	Overall		91.22	-1%		188.14	0%
HC-MR-0004	HC9107	126.11	106.62	-15%	254.96	208.58	-18%
	HC9110		119.98	-5%		240.41	-6%
	Overall		104.86	-17%		206.55	-19%

In the Horsepen Creek watershed, HC9007E, a regional pond alternative project that consisted of a new in-line extended detention pond at the location of a proposed but never constructed regional pond, showed the greatest reduction in flows with a 54% reduction in flows from both the 2-year and 10-year storm events. Several projects such as HC9128 and HC9130 in subwatershed HC-HC-0031 and HC9134A in subwatershed HC-HC-0034 resulted in no net change between the *Future Conditions without Projects* and *Future Conditions with Projects* scenarios. The results for these projects are indicative of their relatively small size and drainage area. The scope and design of these projects was reevaluated and their ranking in the priority list was affected

**Table 6
SWMM Model Results for Sugarland Run**

Subbasin	Project ID	2-YR Total Flow (cfs)			10-YR Total Flow (cfs)		
		Future without Projects	Future with Projects	Difference	Future without Projects	Future with Projects	Difference
SU-FF-0002	SU9007J	207.38	198.21	-4%	454.03	433.83	-4%
	SU9007J		187.49	-10%		394.65	-13%
	Overall		186.15	-10%		400.16	-12%
SU-FF-0004	SU9007B	126.17	119.34	-5%	280.32	250.44	-11%
	SU9007B, SU9007D, SU9007I, SU9007L		116.81	-7%		244.43	-13%
	Overall		115.26	-9%		243.93	-13%
SU-FL-0002	SU9117A & SU9117B	756.05	748.74	-1%	1538.91	1522.70	-1%
	Overall		749.03	-1%		1523.14	-1%
SU-FL-0003	SU9123	10.51	5.48	-48%	12.41	12.41	0%
	Overall		5.47	-48%		12.41	0%
SU-FL-0004	SU9201B	702.38	701.67	0%	1403.83	1408.42	0%
	Overall		701.60	0%		1408.30	0%
SU-RI-0003	SU9002A & SU9002C	58.69	52.43	-11%	122.24	107.74	-12%
	Overall		52.49	-11%		107.69	-12%
SU-SU-0008	SU9100	128.97	97.79	-24%	249.37	201.48	-19%
	Overall		97.81	-24%		201.55	-19%
SU-SU-0012	SU9101A & SU9101B	85.39	83.38	-2%	173.17	168.60	-3%
	Overall		83.36	-2%		168.55	-3%
SU-SU-0018	SU9103A	58.24	49.14	-16%	119.37	99.49	-17%
	Overall		49.19	-16%		99.61	-17%
SU-SU-0028	SU9108A & SU9108B	149.88	140.84	-6%	263.51	246.20	-7%
	Overall		140.88	-6%		246.29	-7%
SU-SU-0032	SU9120A & SU9120B	1192.26	1141.09	-4%	2540.36	2424.46	-5%
	Overall		1129.37	-5%		2397.92	-6%

**Table 6
SWMM Model Results for Sugarland Run**

Subbasin	Project ID	2-YR Total Flow (cfs)			10-YR Total Flow (cfs)		
		Future without Projects	Future with Projects	Difference	Future without Projects	Future with Projects	Difference
SU-SU-0034	SU9130	110.23	69.73	-37%	225.79	141.92	-37%
	Overall		70.04	-36%		142.49	-37%
SU-SU-0037	SU9144A, SU9144B, SU9144C, SU9144D	3.57	3.57	0%	3.58	3.57	0%
	Overall		3.57	0%		3.57	0%
SU-SU-0039	SU9135A	173.48	128.71	-26%	357.89	262.63	-27%
	SU9136		109.94	-37%		224.72	-37%
	Overall		105.07	-39%		214.43	-40%
SU-SU-0041	SU9141	298.78	266.67	-11%	588.21	526.55	-10%
	SU9146B		271.19	-9%		531.91	-10%
	Overall		259.38	-13%		508.88	-13%
SU-SU-0046	SU9147	200.74	187.13	-7%	387.33	361.28	-7%
	Overall		187.20	-7%		361.42	-7%
SU-SU-0047	SU9149A, SU9149B, SU9149D, SU9149E, SU9149F, SU9149G	401.21	378.75	-6%	769.91	728.36	-5%
	Overall		379.13	-6%		728.93	-5%
SU-SU-0049	SU9150	266.68	253.15	-5%	502.56	476.46	-5%
	Overall		253.57	-5%		477.08	-5%

The SWMM model results show that projects SU9130 and SU9136 yielded the greatest reduction in flows of projects in the Sugarland Run watershed that were modeled. Both projects are new enhanced extended detention basins where no stormwater treatment currently exists and the SWMM model indicates that implementation of both projects would result in a 37% reduction in flows from both the 2-year and 10-year storm events. Project SU9201B and project suite SU9144A-D resulted in no net change between the *Future Conditions without Projects* and *Future Conditions with Projects* scenarios. The results for project SU9201B is indicative of its relatively small size and drainage area. Project suite SU9144A-C is a series of small extended detention basins with small drainage areas. The scope and design of these projects was reevaluated and their ranking in the priority list was affected.

3.3 HEC-RAS Model Results

Peak flow values from the SWMM models were used as inputs for HEC-RAS models. In general, *Future Conditions without Projects* models showed increased water surface elevations compared to *Existing Conditions* models, although the extent of flooding was generally the same. Peak flow values for *Future Conditions with Projects* models were generally lower and resulted in water surface elevations that were lower. In some cases where projects were targeted to alleviate flooding or to prevent roadway overtopping, water surface elevations were significantly lower and the goal of preventing damage to property from flooding was achieved. Figure 1 below depicts the magnitude of the difference in water surface elevations between the *Future Conditions with Projects* and *Future Conditions without Projects* scenarios in some sections.

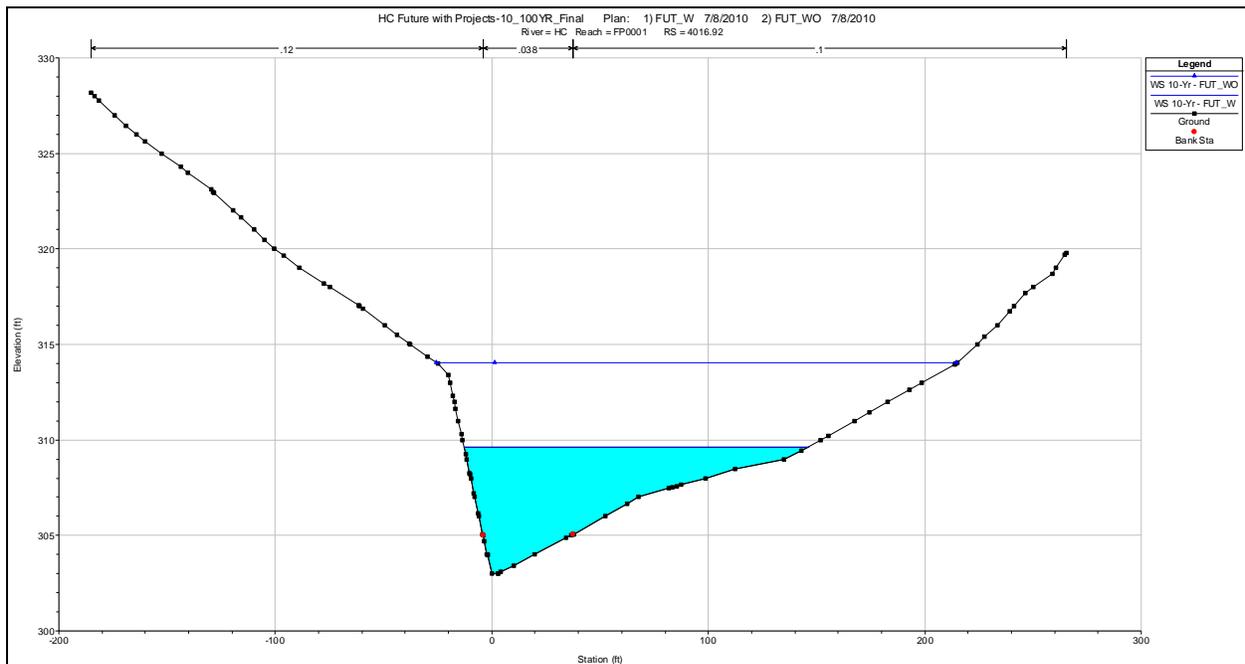


Figure 1: Plot of HEC-RAS cross-section located on Frying Pan Branch of the Horsepen Creek watershed showing reduction in flow from *Future Conditions without Projects* to *Future Conditions with Projects* scenario for the 10-year storm event.

4.0 Cost Benefits Analysis

An integral element to evaluating the benefits of restoration strategies and projects is associated costs. Cost estimates were calculated for all structural projects. Detailed cost estimates were determined for structural projects in the 0-10 year implementation phase. The total costs of implementing projects in this phase were calculated to be approximately \$18 million and \$13 million for the Sugarland Run and Horsepen Creek watersheds, respectively. Associated costs for structural projects in the 11-25 year phase were roughly approximated based on the overall costs associated with similar projects in the 10 year implementation plan and estimated to total about \$13 million. Cost estimates were not calculated for non-structural projects, because non-

structural projects do not require traditional construction measures to be implemented and may be programmatic in nature.

In addition to the calculation of cost estimates for projects listed in the implementation plan, a cost benefit analysis was also performed. The project cost distribution for all projects listed in the 10-year implementation plan was evaluated. The evaluation of the project cost distribution allowed for a determination of outliers within the lists of projects. A chart detailing the project cost distribution is attached in Appendix B. These outliers could be projects that were significantly more or less expensive than other projects in the lists. These projects were further scrutinized and evaluated to determine if they should remain in the 10-year list. Outliers determined to be kept in the list were evaluated separately from the other projects in the 10-year list. A cost to benefit ratio was calculated based on the subwatershed ranking composite score and the projects' associated costs.

Using the cost to benefit ratio, all structural projects in the 10-year implementation plan were reordered based on this analysis. Best professional judgment will be used to determine the appropriateness of the ranking adjustments for each 10-year project. A table detailing the results of the cost benefits analysis is attached in Appendix B. The composite scores from the prioritization process were adjusted to reflect the cost benefits analysis. Quintiles were established based on the difference in project rank from the prioritization process and the cost benefits analysis. Score adjustments to the composite scores were scaled based on the magnitude of the change as shown in Table 7 below to reflect the impact of the cost benefits analysis. Projects were reordered based on these adjusted scores and reviewed using best professional judgment to determine the final list of 10-year implementation projects.

Table 7		
Quintiles for Cost Benefit Analysis Adjustments		
Percentile	Change in Rank (Cost Benefits Analysis Score – Composite Score)	Score Adjustment
0%	-39	0.10
20%	-17	0.05
40%	-6	0.00
60%	3	-0.05
80%	15	-0.10

5.0 Conclusions & Ranking Modifications

Based on the results presented in this memo, the overall impact of implementing the projects identified in the 10-year priority list is generally beneficial to reducing pollutant loads and stormwater runoff flows. These results were used to adjust the overall ranking of structural projects for the final watershed management plan. Projects showing significant reductions were weighted favorably whereas projects showing increased flows or potential for downstream flooding were further evaluated to determine viability in the 10-year priority list.

Appendix A: Determination of SWMM Input Parameters

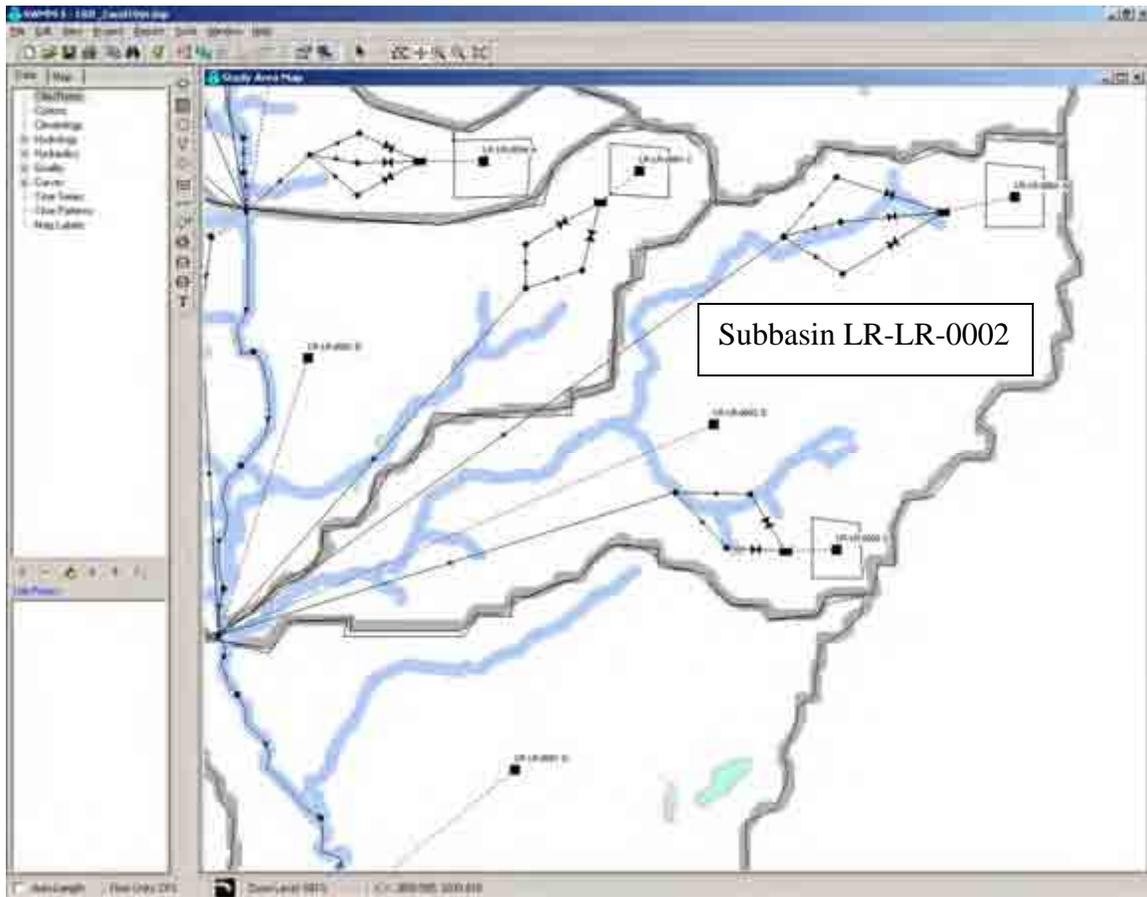
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Determination of SWMM input parameters

This short write-up explains how input parameters for the County SWMM models are developed. The LRR-SWMM model is used as an example in the following discussions.

1. General model setup

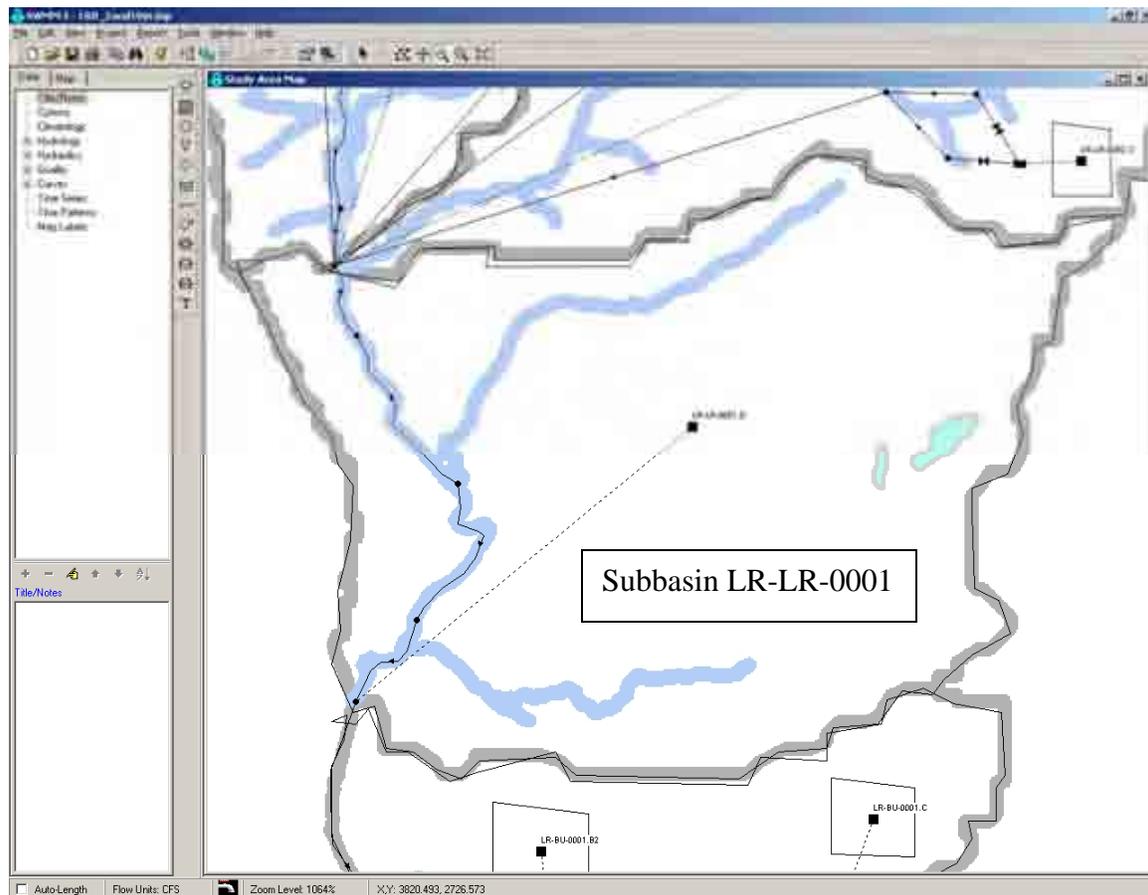
When setting up SWMM, the subbasins and subareas are delineated. Since most subbasins always have subarea D (no-treatment) and may have one or more other subareas (i.e., A, B1, B2, and C), by default the delineation along the subbasin boundary is named as subarea “D.” Other subareas, if any, are delineated as rectangular boxes within subarea “D.” This delineation scheme only illustrates the subarea composition within a subbasin, and does not reflect the real location of subareas or influence the routing of surface runoff. The input parameters for each subarea is entered separately (discussed in Section 2) and flow is routed to downstream components, independent of the size or location of the delineation.



The screenshot above shows the delineation for several Little Rocky Run subbasins/subareas. As shown, in subbasin LR-LR-0002, there are three subareas of A, C, and D. By default the delineation along the subbasin boundary is named as subarea D, and subareas A and C are delineated as rectangles within. Surface runoff from each

subarea is either routed to the subbasin outlet or the downstream stormwater facility (discussed in Section 3).

A subbasin may also contain only one subarea, as shown below for subbasin LR-LR-0001. The only subarea here, Subarea D, is delineated along the subbasin boundary and routed to subbasin outlet. Natural stream channel (discussed in Section 4) carries upstream runoff to downstream through the subbasin.



2. Input parameters for subarea

As shown in the SWMM input parameter window above for subarea LR-LR-0002.D, input parameters for a subarea include area, width, slope, percentage of impervious, Manning's n for both pervious and impervious surfaces, depression storage for both impervious and pervious surfaces, percentage of impervious surfaces with zero depression storage, subarea internal routing method and percentage, and the Horton infiltration parameters. The generation of each input parameter is discussed below.

Area – In a given subbasin, the aggregated area for one particular subarea type (i.e. sum all C subareas within LR-LR-0002) is the value to input for that subarea in SWMM.

Width – The width of a subbasin, as specified in SWMM User's manual, is calculated by dividing the subbasin area by the longest flow path. The longest flow path is

automatically generated using ArcHydro. In subbasins consisting of more than one subareas, TM3 specifies that the width of the subbasin is divided among the subareas in proportion to the area percentage of each subarea in the subbasin. For example, the LR-LR-0002 subbasin has a total area of 145.66 acres and a longest flow path of 6792.02 ft. Thus, the width for the subbasin is 934.18 ft. Since the area of subarea D is 125.35 acre, or 86%, the width for subarea D is $934.18 \times 86\% = 803.91$ ft.

Slope – Slope for a subbasin is calculated as “rise over run,” in which the “run” represents the longest flow path, and the “rise” is the elevation difference between the starting and ending points of the longest flow path. As is specified in TM3, slope is calculated for subbasins only, and all the subareas within a subbasin use the same slope.

Percentage of imperviousness – The percentage of imperviousness of a subarea is calculated as dividing the total planimetric impervious area (i.e. building, roadway, parking lot, and sidewalk) by the total area of the subarea.

Manning’s *n* – The Manning’s *n* for both impervious and pervious surfaces are calculated based on land use information following TM3 specifications (pp. 4-29). The area of each type of land use within a subarea is first tabulated and the percentage calculated. By referring to the Manning’s *n* for each type of land use in TM3, an area-weighted Manning’s *n* is calculated for the whole subarea.

Depression storage – The depression storage for pervious and impervious surfaces follows the TM3 recommendations, in which the depression storage for pervious surface is 0.2 in and impervious 0.1 in.

Percentage of impervious surface with zero depression storage – A default value of 25% suggested by TM3 is used in the initial model setup.

Internal routing method and percentage – This is a SWMM5 capability of allowing for internal routing of flow among pervious and impervious surfaces (SWMM has three categories of surfaces: DCIA, NDCIA, and pervious), which makes it possible to reflect runoff from NDCIA surfaces (by routing NDCIA runoff to neighboring pervious surfaces). When specifying the internal routing method, flow is routed to pervious surfaces, and the percentage routed is calculated as the NDCIA area divided by the total impervious area (DCIA+NDCIA).

Horton infiltration parameters (WLMIN, WLMAX, and DECAY) – The Horton infiltration parameters are generated based on the soils information within each subarea, following TM3 specifications (pp. 4-13). The area of each hydraulic soils group within a subarea is first tabulated, and area-weighted WLMAX, WLMIN, and DECAY are then calculated for the soils in the subarea.

3. Input parameters for stormwater facilities

There are four types of stormwater facilities: peak-shaving only (subarea A); peak-shaving and water quality, wet pond (subarea B1); peak-shaving and water quality, dry pond (subarea B2); and peak-shaving only (subarea C).

3.1 Peak-shaving facilities

The peak-shaving facilities serve the purpose of maintaining the pre-development peak flow for both 2-year and 10-year design storms. In the model representation, a storage unit with three orifices is used to represent the facility. Facing downstream, the three orifices are the 2-year orifice, 10-year orifice, and overflow orifice from left to right. The elevation of the orifices also increase as they change from 2-year to overflow. For example, the 2-year orifice is always located at the bottom of the storage unit (Crest Height=0). Dummy channels carries flow from the three orifices to a downstream converging point, before discharging the combined outflow to subbasin outlet.

The storage unit is initialized to have a surface area of 1/8 acre with uniform depth, and the maximum depth is set to be 20 ft. The surface area of the storage unit might change during the sizing process. The sizing process follows the procedures in Virginia Stormwater Management Handbook.

At the end of sizing process, the 2-year orifice has a maximum outflow rate that equals the pre-development subarea (Impervious percentage=0) peak runoff rate during the 2-year design storm. No flow occurs in the 10-year and overflow orifices during the 2-year event. During a 10-year design event, the combined flow from the 10-year and 2-year orifices equal the pre-development subarea peak flow rate, and no flow occurs in the overflow orifice. The overflow orifice is located at the maximum water depth in the storage unit during a 10-year storm, and the overflow orifice diameter is uniformly set to be 5 ft.

3.2 Peak-shaving and water quality facilities, wet pond

The wet pond facilities provide water quality benefits through the permanent pool of water. Except for the permanent pool, all other features are the same as the peak-shaving facilities.

Following the Virginia Stormwater Management Handbook guidelines, the volume of the permanent pool of water is four times the water quality volume. The water quality volume is defined as the first inch of runoff from the impervious surfaces of a subarea. After calculating the volume of permanent pool, the initial depth of water in the SWMM storage unit is calculated by dividing the volume with the storage unit surface area. The initial depth of water in the storage unit is the elevation for the 2-year outflow orifice. The sizing procedures followed for 2-year, 10-year, and overflow orifices are the same as those in the peak-shaving facilities case.

3.3 Water quality only facilities

The sizing for water quality only facilities observes the County regulations on water quality facilities, in which an imperviousness-based water quality volume has to be detained and released in 48 hours. The relationship between subarea imperviousness and the volume required for storage is specified in Plate No. 2-6 of the County Public Facilities Manual.

For water quality only facilities, one storage unit and two orifices (water quality orifice and overflow orifice) are used for the representation. Initial settings for the storage unit (surface area and maximum depth) are the same as in the peak-shaving only facilities. Similar to peak-shaving only facilities and wet pond type facilities, the two orifices are water quality orifice and overflow orifice from left to right when facing downstream.

Sizing of water quality orifice follows the Virginia Stormwater Management Handbook procedures. The final water quality orifice sizing ensures that the release time for the storage volume is 48 hours. The overflow orifice is uniformly set to be 5 ft in diameter.

3.4 Peak-shaving and water quality facilities, dry pond

The peak-shaving and water quality facilities functions like a combination of the peak-shaving only facility and the water quality only facility. In SWMM, the representation is one storage unit with four outflow orifices: water quality orifice, 2-year outflow orifice, 10-year outflow orifice, and overflow orifice. When facing downstream, the four orifices are arranged as water quality orifice, 2-year orifice, 10-year orifice, and overflow orifice from left to right.

During the sizing process, the water quality orifice is first sized following the same steps as those in the water quality only facilities. Then the 2-year, 10-year, and overflow orifices are sized as for the peak-shaving only facilities. The only difference here is that during a 2-year event, the peak rate of the combined flow from the water quality and 2-year orifices matches the pre-development subarea peak runoff rate. And in a 10-year design event, the combined flow from the water quality orifice, 2-year orifice, and 10-year orifice matches the pre-development subarea peak runoff rate. The overflow orifice diameter is uniformly set to 5 ft.

4. Input parameters for natural channels

Cross-sections are cut along the main channel stem following TM3 guidelines (pp. 6-5). The ArcGIS 3D Analyst is used to derive the cross-section channel profile based on the County TIN data. The cross-section data are then exported in Excel files, which are then loaded into SWMM.

All the natural channel cross-sections have the “irregular” shape, which has the cross-section from the TIN data. The channel lengths are measured from the County FHD layer. A SWMM5 default Manning’s n of 0.01 is used for all channels.

5. Input parameters for regional ponds

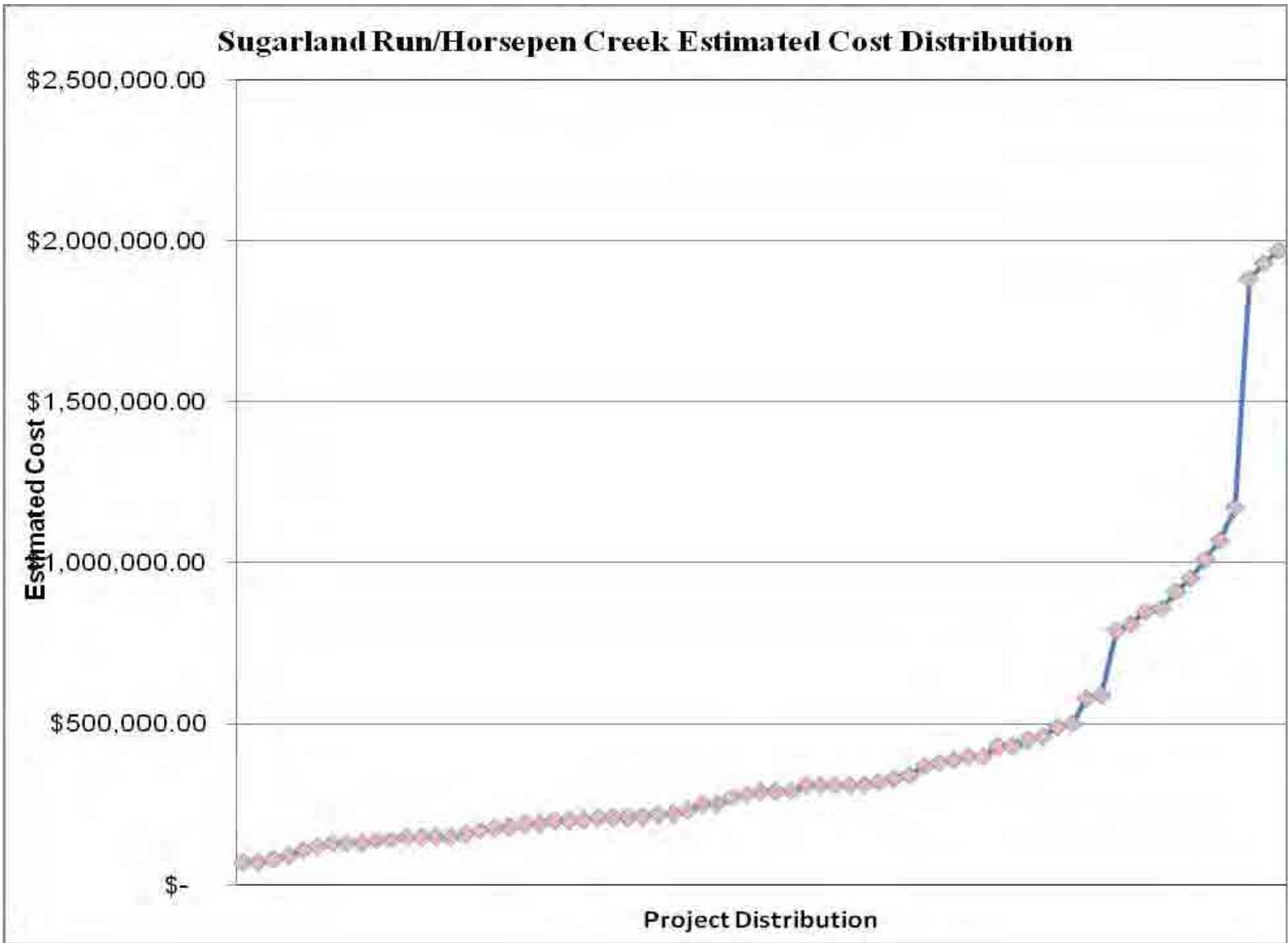
Regional ponds listed in the 1989 County Regional Stormwater Management Plan have both the stage-area relationship and the orifice elevation and size available. These regional ponds are represented within the model using one storage unit and two or three orifices depending on the design. The stage-area table from the report is specified for the storage unit, and the sizes and crest heights are specified for the orifices.

As for regional ponds that are not listed in the 1989 County Regional Stormwater Management Plan, some have as-built information available (i.e., Keene Mill Village regional pond in Pohick Creek) and some does not have any information (i.e. Lake Accotink in Accotink Creek, Burke Lake in Pohick). As for the ones that have the as-built information, the data are in the forms of elevation-outflow tables or curves for 2-year or 10-year design events (instead of stage-area for storage unit, and crest height and size for 2-year and 10-year orifices). That means that a separate representation needs to be created for both 2-year and 10-year design storms for these regional ponds (a total number of 10). Currently these ten regional ponds are not represented.

All regional ponds in the County are marked with text notation in the model, and the regional ponds that need addition information are noted in the “Description” of the pond.

Appendix B: Cost Benefit Analysis Results

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Project Number	Estimated Costs	Composite Score	Comp. Score Rank	CBA Score	CBA Scaled Score	CBA Rank	Change in Rank (CBA - Comp)	CBA Score Adjustment	CBA Adjusted Prioritization Score	Final Rank
HC9007	\$ 790,000.00	3.63	34	5.29	0.69	60	25	-0.1	3.53	48
HC9013	\$ 1,970,000.00	3.84	15	8.17	0.50	70	64	-0.1	3.99	10
HC9102	\$ 150,000.00	3.65	33	3.73	0.98	19	-15	0.05	3.70	26
HC9106	\$ 310,000.00	3.60	37	4.12	0.87	43	4	-0.05	3.55	45
HC9107	\$ 210,000.00	4.11	4	3.87	1.06	4	-1	0	4.11	4
HC9108	\$ 190,000.00	3.40	59	3.82	0.89	38	-27	0.1	3.50	54
HC9109	\$ 400,000.00	3.63	35	4.34	0.84	49	13	-0.05	3.58	41
HC9110	\$ 160,000.00	3.46	52	3.75	0.92	28	-26	0.1	3.56	44
HC9114	\$ 340,000.00	3.59	40	4.19	0.86	46	4	-0.05	3.54	46
HC9116	\$ 220,000.00	3.85	13	3.90	0.99	16	1	0	3.85	14
HC9118	\$ 120,000.00	3.79	21	3.65	1.04	9	-12	0.05	3.84	16
HC9119	\$ 450,000.00	3.13	98	4.46	0.81	51	15	-0.1	3.53	49
HC9121	\$ 590,000.00	3.74	24	4.80	0.78	56	31	-0.1	3.64	33
HC9122	\$ 70,000.00	4.18	3	3.53	1.18	1	-3	0	4.18	3
HC9123	\$ 150,000.00	3.90	10	3.73	1.05	6	-6	0	3.90	11
HC9126	\$ 180,000.00	3.60	37	3.80	0.95	23	-16	0.05	3.65	31
HC9127	\$ 180,000.00	3.60	37	3.80	0.95	23	-16	0.05	3.65	31
HC9128	\$ 430,000.00	3.40	57	4.41	0.77	57	-6	0	3.40	65
HC9129	\$ 490,000.00	4.20	2	4.56	0.92	29	26	-0.1	4.10	5
HC9132	\$ 210,000.00	3.43	56	3.87	0.89	41	-18	0.1	3.53	49
HC9133	\$ 310,000.00	3.40	59	4.12	0.83	50	-15	0.05	3.45	63
HC9134	\$ 310,000.00	3.80	19	4.12	0.91	34	15	-0.1	3.70	27
HC9136	\$ 150,000.00	3.40	58	3.73	0.91	33	-31	0.1	3.50	53
HC9137	\$ 430,000.00	3.45	54	4.41	0.78	55	-1	0	3.45	61
HC9140	\$ 370,000.00	3.70	27	4.26	0.87	44	15	-0.1	3.60	39
HC9142	\$ 220,000.00	4.05	7	3.90	1.04	8	-1	0	4.05	7
HC9143	\$ 310,000.00	3.40	59	4.12	0.84	48	-17	0.05	3.45	63
HC9149	\$ 270,000.00	3.85	13	4.02	0.96	21	6	-0.05	3.80	20
HC9200	\$ 1,070,000.00	3.80	19	5.97	0.64	64	45	-0.1	3.70	27
HC9201	\$ 230,000.00	3.87	11	3.92	0.99	17	4	-0.05	3.82	19
HC9202	\$ 950,000.00	3.37	64	5.68	0.59	67	-3	0	3.37	69
HC9500	\$ 250,000.00	4.08	6	3.97	1.03	11	3	-0.05	4.03	9
HC9503	\$ 90,000.00	3.27	77	3.58	1.05	5	-19	0.1	3.87	12
SU9002	\$ 860,000.00	3.16	93	5.46	0.62	66	4	-0.05	3.36	70
SU9005	\$ 280,000.00	3.16	92	4.04	0.84	47	-14	0.05	3.46	59
SU9007	\$ 1,010,000.00	3.18	90	5.83	0.59	68	10	-0.05	3.38	67

Project Number	Estimated Costs	Composite Score	Comp. Score Rank	CBA Score	CBA Scaled Score	CBA Rank	Change in Rank (CBA - Comp)	CBA Score Adjustment	CBA Adjusted Prioritization Score	Final Rank
SU9100	\$ 170,000.00	3.59	40	3.78	0.95	22	-20	0.1	3.69	29
SU9101	\$ 390,000.00	3.47	50	4.31	0.80	52	0	0	3.47	56
SU9103	\$ 210,000.00	3.47	49	3.87	0.91	35	-16	0.05	3.52	51
SU9106	\$ 400,000.00	3.47	50	4.34	0.80	54	2	0	3.47	56
SU9108	\$ 210,000.00	3.46	52	3.87	0.89	37	-17	0.05	3.51	52
SU9110	\$ 130,000.00	3.61	36	3.68	0.98	18	-20	0.1	3.71	25
SU9117	\$ 500,000.00	3.45	54	4.58	0.75	58	2	0	3.45	61
SU9123	\$ 310,000.00	3.72	25	4.12	0.90	36	9	-0.05	3.67	30
SU9129	\$ 190,000.00	3.49	46	3.82	0.91	32	-16	0.05	3.54	47
SU9130	\$ 150,000.00	3.82	17	3.73	1.03	12	-6	0	3.82	18
SU9135	\$ 320,000.00	3.68	31	4.14	0.89	40	8	-0.05	3.63	37
SU9136	\$ 110,000.00	3.79	22	3.63	1.04	7	-15	0.05	3.84	17
SU9139	\$ 70,000.00	3.54	44	3.53	1.00	15	-31	0.1	3.64	35
SU9143	\$ 140,000.00	3.48	48	3.70	0.94	25	-25	0.1	3.58	42
SU9144	\$ 200,000.00	3.71	26	3.85	0.96	20	-8	0.05	3.76	22
SU9146	\$ 130,000.00	4.03	8	3.68	1.10	2	-8	0.05	4.08	6
SU9147	\$ 140,000.00	3.38	62	3.70	0.91	31	-37	0.1	3.48	55
SU9149	\$ 1,930,000.00	3.82	18	8.07	0.54	69	67	-0.1	4.22	2
SU9150	\$ 250,000.00	3.53	45	3.97	0.89	39	-8	0.05	3.58	42
SU9201	\$ 910,000.00	3.24	84	5.58	0.67	61	35	-0.1	3.64	34
SU9203	\$ 290,000.00	4.09	5	4.07	1.01	13	6	-0.05	4.04	8
SU9204	\$ 1,880,000.00	3.48	47	7.95	0.44	71	22	-0.1	3.38	66
SU9205	\$ 810,000.00	3.27	76	5.34	0.64	63	3	-0.05	3.37	68
SU9208	\$ 1,170,000.00	3.69	28	6.22	0.63	65	54	-0.1	3.84	15
SU9209	\$ 290,000.00	3.78	23	4.07	0.93	26	3	-0.05	3.73	23
SU9210	\$ 80,000.00	3.66	32	3.56	1.03	10	-23	0.1	3.76	21
SU9500	\$ 850,000.00	3.55	43	5.44	0.65	62	17	-0.1	3.45	60
SU9502	\$ 580,000.00	3.83	16	4.78	0.80	53	36	-0.1	3.73	24
SU9504	\$ 130,000.00	3.37	63	3.68	0.92	30	-39	0.1	3.47	58
SU9505	\$ 380,000.00	3.69	29	4.29	0.86	45	15	-0.1	3.59	40
SU9509	\$ 330,000.00	3.68	30	4.17	0.88	42	11	-0.05	3.63	36
SU9512	\$ 200,000.00	3.56	42	3.85	0.93	27	-17	0.05	3.61	38
SU9514	\$ 290,000.00	4.41	1	4.07	1.08	3	2	0	4.41	1
SU9515	\$ 200,000.00	3.86	12	3.85	1.00	14	0	0	3.86	13

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