5 WMA Restoration Strategies

In an area as built-out and diverse as Fairfax County, it is important to understand the specific issues in a watershed in order to determine the best strategy to restore and protect it. To facilitate data management and promote local awareness of the streams, the watershed was subdivided into 16 Watershed Management Areas (WMAs) each approximately four square miles in size. These include seven major tributaries: Bear Branch, Crook Branch, Daniels Run, Hunters Branch, Long Branch Central, Long Branch North and Long Branch South. Because of long, narrow shape of the watershed, the remaining areas that drain directly to Accotink Creek mainstem were subdivided into eight WMAs: Mainstem 1 through 8. Finally, the area of land draining to tidewater was designated as the Potomac WMA.

Approximately 11.7 square miles (23 percent) of the watershed are located in areas outside of the County jurisdiction and are not included in this plan. Because of this, the planning effort focused on only 14 of the 16 WMAs identified since the Potomac WMA is entirely within Fort Belvoir Military Reservation and the Daniels Run WMA is within the City of Fairfax.

The following section provides a discussion of the impairments affecting each WMA in the plan and the proposed solutions to those impairments. Impairments were identified through field assessment, modeling and the results of subwatershed ranking analysis. Additional information may be found in Appendix B, Technical Documents.

5.1 Bear Branch

Roughly half of the Bear Branch WMA is within the boundaries of the Town of Vienna, which still falls under the jurisdiction of Fairfax County. Two subwatersheds were identified among the highest priority areas in need for restoration in the entire Accotink Creek watershed.

5.1.1 Structural Projects

5.1.1.1 10-Year Projects

AC9182 Stormwater Pond Retrofit

A retrofit is proposed for the existing pond 0043DP in Mantua Park that treats the stormwater runoff from a high-density residential area in Chesterfield Meadows Section 1 neighborhood. Recommendations include a new control structure, extending the flow path and creating a new outfall, which would be reconnected to the wetland.

AC9183 New Stormwater Pond

This is a proposed new pond to treat runoff from the parking lot at Kena Shriners Temple. The facility would be located in the grassy area on the southwest portion of the site. The existing storm drain pipe will be cut so that it discharges into the pond for treatment and a riser structure will be designed to provide detention for water quality.

Bear Branch Stream Restoration Projects -- Three stream restoration projects and a series of culvert retrofits have been proposed to restore a substantial length of Bear Branch and its tributaries. Ideally, they would be implemented from upstream to downstream, in the following order: AC9225 and AC9240 first, with design of the confluence coordinated, followed by AC9239 downstream. If the 25-year culvert retrofit project, AC9408, is included, it should be designed simultaneously with AC9240.

AC9225 Stream Restoration

This project would retrofit the stream channel on the upstream side of I-66 at South Side Park in the Town of Vienna. The channel is over-widened with moderate to severe erosion along the stream banks. Restoration would include reducing the channel dimensions, raising the bed elevation and installing grade controls.

AC9239 Stream Restoration

This project would restore an eroded section of Bear Branch that originates north of Hunter Road and extends approximately 600 feet downstream of Route 50. Restoration would include stabilizing the stormwater outfall structures, regrading and stabilizing eroded stream banks with armor-in-place and bioengineering techniques, installing grade controls and removing the metal beams currently in the stream.

AC9240 Stream Restoration

This project is located at the downstream end of a road culvert under Yeonas Drive and extends through South Side Park approximately 2,500 feet downstream to a road culvert under Route 66. Restoration would include repairing broken stormwater outfall structures, regrading and stabilizing the eroded banks with armor-in-place and bioengineering techniques, installing grade controls and removing invasive plant species.

AC9315 Area-Wide Drainage Improvements

Some medium and low-density residential areas in the Hideaway Park subdivision between Elsmore Street and Glenvale Drive that lack stormwater management controls would be retrofitted to treat stormwater runoff by installing tree box filters at existing stormwater inlets and rain gardens at yard inlets.

5.1.1.2 25-Year Projects

AC9184 Stormwater Pond Retrofit

This project involves the retrofit of two existing ponds. The first (1204DP) is located along Barkley Gate Lane and Royal Doulton Lane. The second pond treats stormwater runoff from the Armistead Park neighborhood. Both projects would include some excavation of the existing ponds for additional storage. Tree removal along the embankment and riparian plantings downstream are also recommended with this project.

AC9185 New Stormwater Pond

This is a potential site for new pond behind Silent Valley Drive that would treat the stormwater runoff from high-density residential homes in the Covington neighborhood. A riser structure and embankment will be used to provide the water quality and water quantity treatment.

AC9408 Culvert Retrofit

This project is proposed at three different road crossings within the Town of Vienna's South Side Park: Kingsley Road, Yeonas Drive and Cottage Street. Recommendations include creating a micropool followed by a pool with wetland plantings upstream of each road crossing to provide water quality control.

5.1.2 Non Structural Projects

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drain inlets within the Armistead Park neighborhood. The program can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

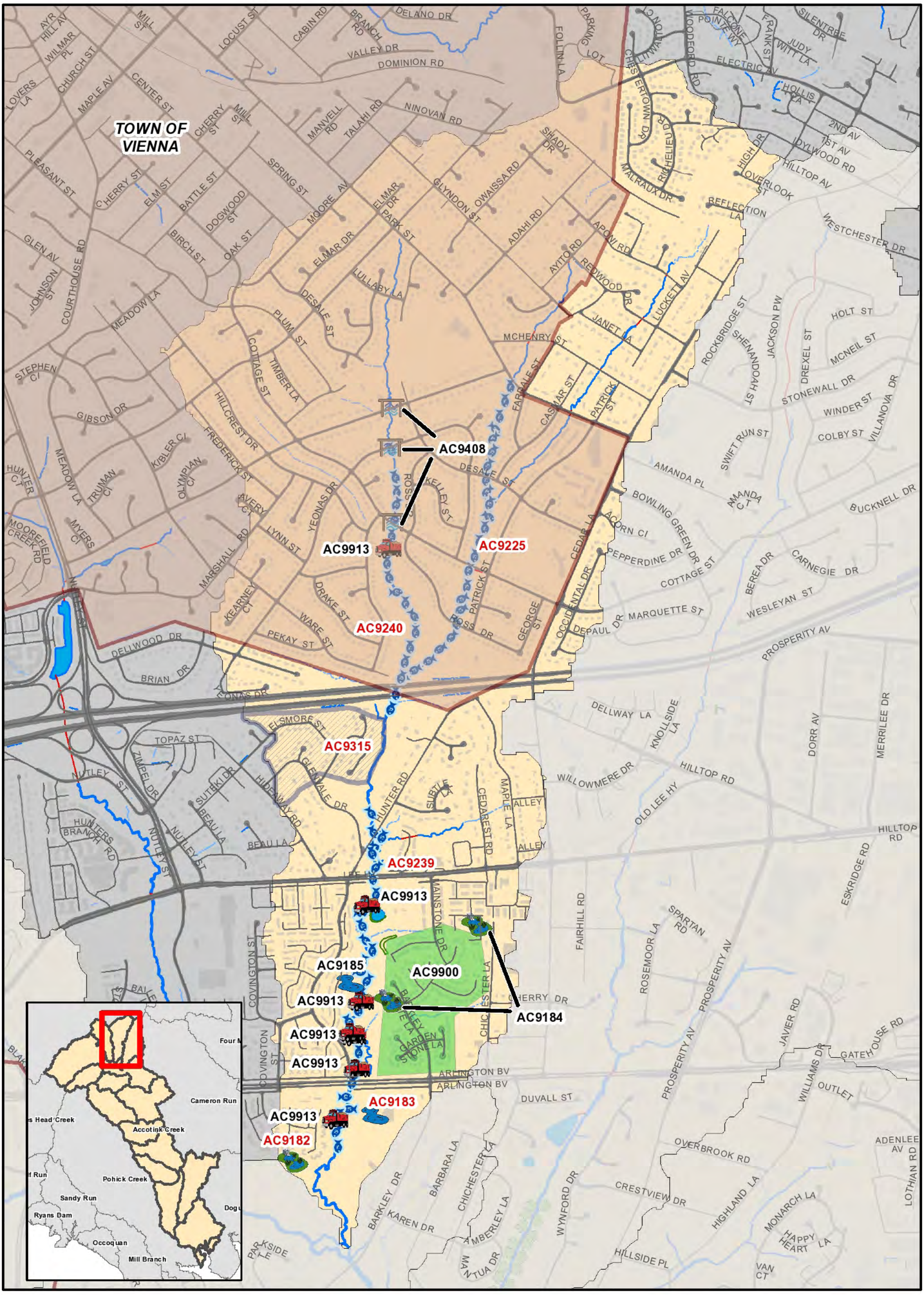
AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Six sites were identified as areas of significant obstructions during the physical stream assessment. This project would be a community-wide program to remove trees and debris blocking fish passage, trees and yard waste within the stream.

Table 5-1: Bear Branch Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9182	Stormwater Pond Retrofit	AC-BB-0000	Mantua Park	Water Quality	County - FCPA	1 - 10
AC9183	New Stormwater Pond	AC-BB-0000	Kena Shriners Temple	Water Quality and Quantity	Private	1 - 10
AC9225	Stream Restoration	AC-BB-0030	South Side Park	Water Quality	Private / Town of Vienna	1 - 10
AC9239	Stream Restoration	AC-BB-0000, -0005, -0010	Covington / Villa Lee Park, Arrowhead Park	Water Quality	Private / County - FCPA	1 - 10
AC9240	Stream Restoration	AC-BB-0015, -0020	South Side Park Neighborhood	Water Quality	Town of Vienna	1 - 10
AC9315	Area-Wide Drainage Improvements	AC-BB-0010	Hideaway Park neighborhood	Water Quality	Private	1 - 10
AC9184	Stormwater Pond Retrofit	AC-BB-0005	Behind Barkley Gate Ln and Armistead Park neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9185	New Stormwater Pond	AC-BB-0005	Covington neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9408	Culvert Retrofit	AC-BB-0020	South Side Park	Water Quality	Town of Vienna	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Armistead Park	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple



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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Community Outreach/Public Education
- Area-wide Drainage Improvement
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement
- Rain Barrel Program
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.1

WMA: Bear Branch
Proposed Projects

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5.2 Crook Branch

The results of the subwatershed ranking analysis showed that all except one subwatershed in Crook Branch WMA appeared to be impaired in one form or another. One subwatershed located in the eastern portion of the WMA was in good condition primarily due to the influence of good forest and wetland coverage. In terms of overall ranking, the Crook Branch WMA had five of the highest priority subwatersheds in the entire Accotink Creek watershed.

5.2.1 Structural Projects

5.2.1.1 10-Year Projects

AC9175 Stormwater Pond Retrofit

Three local pond retrofits are proposed for this project. The first pond (0137DP) treats stormwater runoff from Hunters Glen neighborhood. The second pond (0045DP) treats stormwater runoff from the Ridgelea Hills neighborhood. The third pond (DP0133) treats the Bethlehem Lutheran Church. Proposed project recommendations include a new riser/control structure, excavating for additional storage and adding a plunge pool at each inflow point where stormwater enters the pond.

AC9220 Stream Restoration

There is severe erosion for approximately 100 feet in the stream channel behind Glade Hill Road. The project will include stabilizing the eroded stream through raising the bed elevation to meet the confluence elevation with Project AC9221, and installing grade controls or step pools to dissipate energy and prevent further bed incision.

AC9221 Stream Restoration

This project is a stream restoration of an incised and over-widened stream behind Colesbury Place in the Ridgelea Hills neighborhood. Restoration of this channel will focus on creating a nested channel, in which the floodplain and banks of the current channel will be regraded to allow for a new floodplain at an elevation lower than the original floodplain, and restoring the riparian buffer.

AC9222 Stream Restoration

There are areas of significant erosion along the length of the stream bank along Tovito Drive. This stream restoration project would involve regrading and stabilizing the eroded stream banks, grade controls to dissipate energy and installation of stone toe protection to ensure future bank stability.

AC9312 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended for the low and medium-density residential areas of the Westchester and Briars of Westchester neighborhoods to provide water quality control. Tree box filters will be installed at curb inlets, rain gardens will be installed at yard inlets and vegetated swales will be installed in place of paved ditches.

AC9313 Area-Wide Drainage Improvements

The Langhorne Acres neighborhood has no stormwater management facilities and would benefit by implementing area wide drainage improvements. Proposed treatment systems include tree box filters installed at various street inlets and rain gardens installed at yard inlets.

AC9546 New BMP/LID

There are four existing bioretention filters on the Mantua Elementary School property which are not functioning as optimally as they could due to a lack of vegetative cover. These sites are candidates for additional amendments to bring them to demonstration quality in this public location. As part of the overall project, one additional location for a bioretention filter was identified at an outfall on the southeast portion of the property.

AC9547 New BMP/LID

Two bioretention projects would treat the rooftop runoff from the Providence Presbyterian Church and the roadway runoff from Pixie Court. The downspouts at the rear of the church could be disconnected and routed to one of the bioretention facilities, while curb extensions on Pixie Court could route the roadway runoff into the other bioretention facility for treatment before it enters Crook Branch.

AC9548 New BMP/LID

Because of the large drainage area, this proposed project will use a flow splitter to direct the first flush of stormwater to a proposed bioretention filter, which is sited in open space adjacent to the intersection of Little River Turnpike and Ridgelea Drive in the Ridgelea Hills neighborhood. This will provide water quality treatment for a combination of residential, commercial and roadway runoff.

5.2.1.2 25-Year Projects

AC9174 Stormwater Pond Retrofit

This project is a retrofit of the existing dry pond (DP0378) at the Greater Washington Jewish Community Foundation. The retrofit would modify the riser structure, remove the concrete low-flow channels and replace them with meandering natural channels.

AC9176 Stormwater Pond Retrofit

This project is a proposed dry pond retrofit (0200DP) to treat stormwater runoff from the Briars at Westchester neighborhood. Recommendations include excavating to increase storage volume, removing the concrete channel and modifying the riser.

5.2.2 Non Structural Projects

AC9803 Buffer Restoration

This project, located downstream of Prosperity Avenue, involves the restoration of the impaired stream buffer.

AC9804 Buffer Restoration

This project, located upstream of Prosperity Avenue, involves the restoration of the impaired stream buffer.

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Mantua Hills, Brian Acres, Skybrook, Sunnyhill Hill and Westchester communities. The stencil marking can educate

the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9907 Community Outreach/Public Education - Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. The upland reconnaissance identified one neighborhood, Ridgelea Hills, which could be targeted with this effort.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Two sites were identified as areas of significant obstructions or dumpsites during the physical stream assessment. This project would be a community-wide program to remove debris blocking fish passage and trees within the stream.

Table 5-2: Crook Branch Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9175	Stormwater Pond Retrofit	AC-CR-0010	Hunters Glen and Ridgelea Hills neighborhoods and Bethlehem Lutheran Church	Water Quality	Private	1 - 10
AC9220	Stream Restoration	AC-CR-0010	Ridgelea Hills neighborhood	Water Quality	Private	1 - 10
AC9221	Stream Restoration	AC-CR-0015	Mantua and Ridgelea Hills neighborhoods	Water Quality	Private	1 - 10
AC9222	Stream Restoration	AC-CR-0025	Mantua Hills and Stockbridge neighborhoods	Water Quality	Private - Residential	1 - 10
AC9312	Area-Wide Drainage Improvements	AC-CR-0020	Westchester and Briars of Westchester neighborhoods	Water Quality	Private - Residential	1 - 10
AC9313	Area-Wide Drainage Improvements	AC-CR-0030	Langhorne Acres neighborhood	Water Quality	Private - Residential	1 - 10
AC9546	BMP/LID	AC-CR-0015	Mantua Elementary School	Water Quality	County - FCPS	1 - 10
AC9547	BMP/LID	AC-CR-0010	Providence Presbyterian Church and Pixie Ct	Water Quality	Private / State - VDOT	1 - 10
AC9548	BMP/LID	AC-CR-0010	Ridgelea Hills neighborhood	Water Quality	Private	1 - 10
AC9174	Stormwater Pond Retrofit	AC-CR-0005	Greater Washington Jewish Community Foundation	Water Quality and Quantity	Private - Church	11 - 25
AC9176	Stormwater Pond Retrofit	AC-CR-0020	Briars at Westchester neighborhood	Water Quality and Quantity	Private - Residential	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9803	Buffer Restoration	AC-CR-0000	Upstream of Prosperity Ave	Water Quality	Private, County
AC9804	Buffer Restoration	AC-CR-0005	Downstream of Prosperity Ave	Water Quality	Private
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9907	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple

CITY OF FAIRFAX

AC9313
AC9222
AC9546
AC9221
AC9803
AC9913
AC9804
AC9913
AC9900
AC9220
AC9312
AC9907
AC9547
AC9176
AC9548
AC9174
AC9175

SAINT MARKS PL
ALBA PL
HAMILTON DR
GLENBROOK RD
BARKLEY DR
LYNNHURST DR
TOBIN RD
REEDY DR
CORONADO TE
CONVENTO TE
TOWITO DR
PRADO PL
EL DORADO CT
PONCE PL
PRINCE WILLIAM DR
HORNER CT
STONELEIGH CT
LAUREL LEAF LA
COLESBURY PL
MORNINGSIDE DR
ACOSTA RD
PERSIMMON CT
MATHY DR
LYNN REGIS
PERSIMMON DR
OKLA DR
BRIARY LA
BRIARY WY
BELL RIVER TR
DENISE LA
SKYVIEW LA
PIXIE CT
GLENBROOK RD
GLADE HILL RD
RIDGELEA DR
BENTWOOD CT
SANDALWOOD CT
LARO CT
PINELAND ST
LEROY PL
MORNINGSIDE WOODS PL
WOODBURN RD
SPICEWOOD DR
BROWNING CT
FROST WY
SHELLEY LA
VARSITY CT
KLOMAN ST
WOODBINE LA
LITTLE RIVER TP
WALKER ST
LITTLETON
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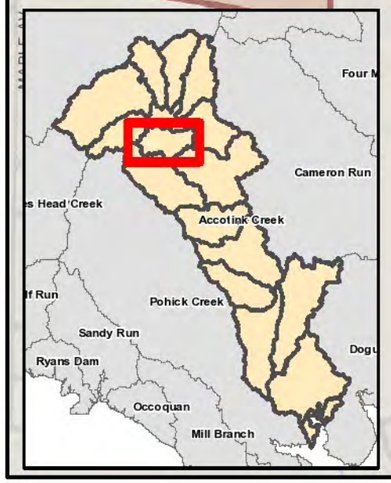
LEE PL
WAKEFIELD CHAPEL RD
LAKE DR
FOREST ST
NORFOLK AV
ELIZABETH LA
OLD HICKORY RD
VANDA LA
GUINEA RD
YERKES PL
DOVEVILLE LA
HUNTING PL
PINES
HUNT RD
JOYCE ST
ELLENWOOD LA
TAYLOR DR
NESTER RD
WEIRICH RD
MIRROR POND DR
HALL DR
WROUGHT IRON CT
SHARI DR
BACCARAT DR
SPODE CT
PICKETT RD
STARLIT PONDS DR
GOSS RD
OLLEY LA
BARKER CT



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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Community Outreach/Public Education
- Area-wide Drainage Improvements
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement Project
- Rain Barrel Programs
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.2

WMA: Crook Branch
Proposed Projects

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5.3 Hunters Branch

The results of subwatershed ranking analysis showed that most of the subwatersheds in the Hunters Branch WMA were in good condition primarily due to influence of forested or undeveloped parcels in Eakin, Towers and Nottoway Parks. Part of this WMA lies within the boundary of the Town of Vienna, which is still within the jurisdiction of Fairfax County. Only one subwatershed was among the highest priority in the watershed.

5.3.1 Structural Projects

5.3.1.1 10-Year Projects

AC9241 Stream Restoration

This project will restore a section of Hunters Branch approximately 3,700 feet upstream of the confluence of Hunters Branch and Accotink Creek mainstem. Restoration would include removing the riprap, creating stable stream crossings, repairing scour pools, regrading and stabilizing eroded stream banks, installing grade controls and removing invasive plant species.

AC9242 Stream Restoration

This project will restore an eroded section of Hunters Branch immediately upstream and downstream of a pedestrian bridge between Hermosa Drive and Lee Highway. Restoration will include regrading and stabilizing eroded stream banks with armor-in-place and bioengineering techniques and repairing the pedestrian bridge.

AC9553 BMP/LID Retrofit

This project is a parking lot retrofit at the Pan Am Shopping Center off of Nutley Street. Tree box filters and bioretention basins will be installed adjacent to storm drain inlets at existing parking medians and along the vegetated area on the west side of the lot.

5.3.1.2 25-Year Projects

AC9186 New Stormwater Pond

This project is a new pond behind Vienna Moose Lodge on Court House Road. This pond will provide water quantity control and improve the water quality in the downstream channel.

AC9554 New BMP/LID

This proposed project is a parking lot retrofit at the Vienna Metro Station near Stansbury Way. Bioretention or dry swales along the green space between parking rows is proposed to treat the runoff from the parking lot.

AC9555 New BMP/LID

Two bioretention facilities are proposed at Nottoway Park; one in the parking lots and one near the tennis courts. This will improve the water quality of stormwater runoff as well as provide an educational opportunity.

AC9556 New BMP/LID

A parking lot retrofit is recommended at the Vienna Moose Lodge by adding tree box filters at storm drain inlets to provide water quality control.

AC9557 New BMP/LID

This is a proposed project at Madison High School. Tree box filters are proposed at storm drain inlets draining the parking lot to provide water quality treatment.

Table 5-3: Hunters Branch Projects

Structural Projects						
Project #	Project Type	Subshed	Location	Watershed Benefit	Land Owner	Phase
AC9241	Stream Restoration	AC-HB-0000, -0005	Stonehurst / Eakin Community Park	Water Quality	Private / County - FCPA	1 - 10
AC9242	Stream Restoration	AC-HB-0010	Lee Hwy and Hermosa Dr	Water Quality	Private	1 - 10
AC9553	BMP/LID	AC-HB-0005	Pan Am Shopping Center	Water Quality	Private	1 - 10
AC9186	New Stormwater Pond	AC-HB-0025	Vienna Moose Lodge	Water Quality and Quantity	Private	11 - 25
AC9554	BMP/LID	AC-HB-0010	Vienna Metro Station parking lot	Water Quality	Public - Metro	11 - 25
AC9555	BMP/LID	AC-HB-0025	Nottoway Park	Water Quality	County - FCPA	11 - 25
AC9556	BMP/LID	AC-HB-0025	Vienna Moose Lodge	Water Quality	Private	11 - 25
AC9557	BMP/LID	AC-HB-0035	Madison High School	Water Quality	County - FCPS	11 - 25

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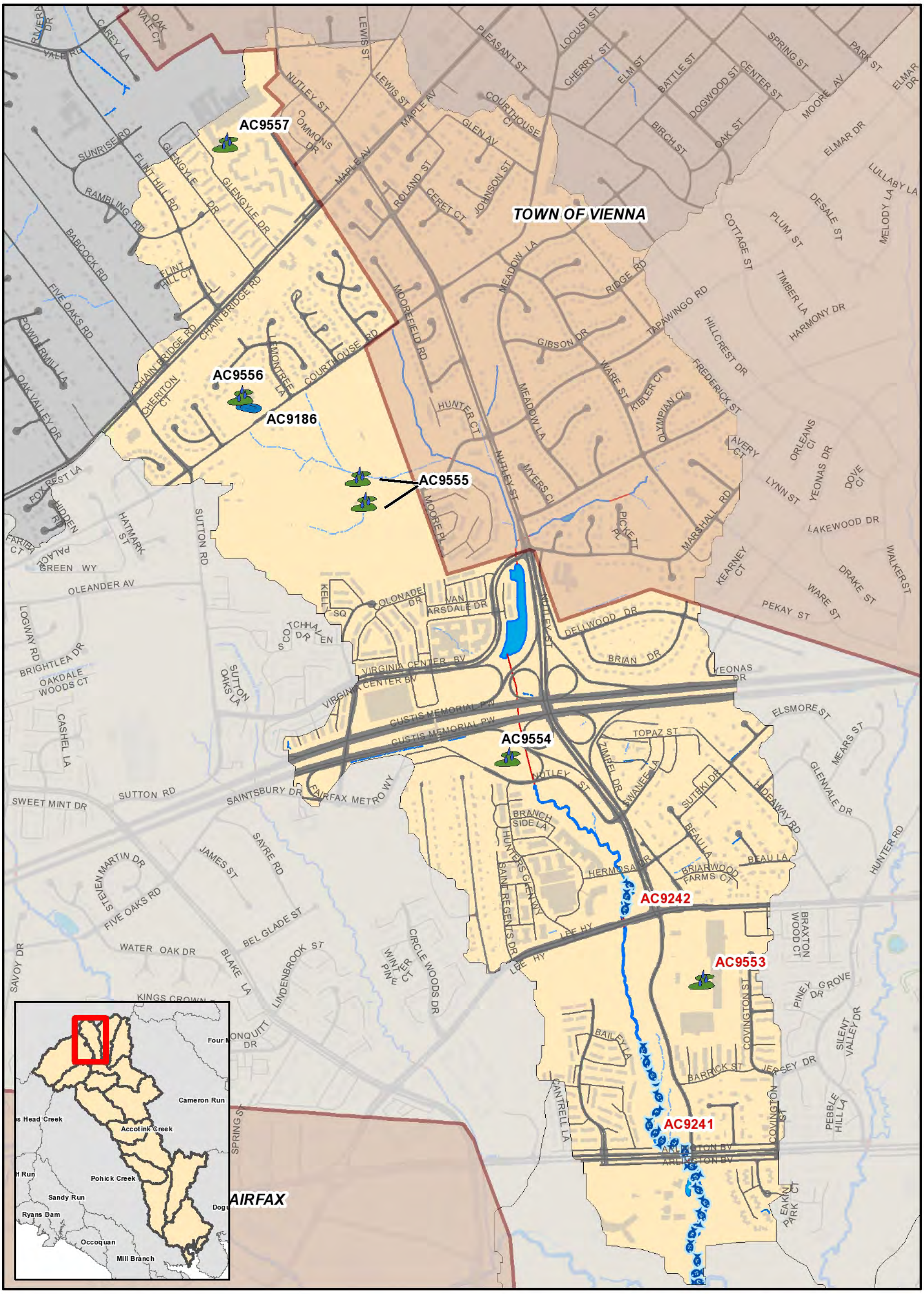

Map 5.3

WMA: Hunters Branch
Proposed Projects

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5.4 Long Branch Central

Conditions in the Long Branch Central WMA were highly variable. A significant number of subwatersheds in the WMA were in good condition primarily due to the influence of undeveloped areas of Lake Accotink, Rutherford, Olde Forge and Long Branch Parks that have good forest and wetland coverage. However, in terms of overall ranking, Long Branch Central had seven of the highest priority subwatersheds in the watershed, generally influenced by the amount of residential land use runoff that is not controlled by stormwater management facilities.

5.4.1 Structural Projects

5.4.1.1 10-Year Projects

AC9144 New Stormwater Pond

This proposed facility between Danbury Forest Drive and Thames Street would be a new extended detention dry pond which would provide water quality and water quantity treatment at the outfall of the existing storm drainage system. The new riser structure would discharge to the existing culvert under Danbury Forest Drive.

AC9147 New Stormwater Pond

A new stormwater pond is proposed in the Kings Park Shopping Center to provide storage and capture runoff. The existing storm drains would be used for inflow and the new riser would connect to the existing storm drain under Braddock Road.

AC9148 New Stormwater Pond

An extended detention pond is proposed in the Long Branch Stream Valley Park adjacent to the stormwater outfall to provide water quality and water volume storage for the runoff from the Springbrook Forest neighborhood. The new pond would involve excavation, construction of an embankment, installation of a riser structure, and internal pond features including a plungepool, a micropool and a meandering low-flow channel.

AC9208 Stream Restoration

This stream restoration project is located behind King David Boulevard. Field crews noted isolated pockets of moderate to severe bank erosion on outside meanders, some of which are encroaching on private property. Restoration efforts would include reducing the channel dimensions, installing grade controls and stabilization techniques.

AC9209 Stream Restoration

This project in Long Branch Stream Valley Park involves the restoration of moderate to severe bank erosion within the stream channel and at a storm drain outfall. As part of this restoration, the storm drain outfall will be corrected, the stream banks will be stabilized with armor-in-place techniques and the stream bed elevation will be raised to encourage fish passage.

AC9305 Area-Wide drainage improvements

Area-wide drainage improvements are recommended for the Canterbury Woods neighborhood, a medium-density residential area, by implementing a hybrid project that includes installing tree box filters and rain gardens.

AC9306 Area-Wide Drainage Improvements

There are no existing stormwater management facilities in the subwatershed. An area-wide drainage improvement is recommended to treat the runoff from the medium-density residential area in the Willow Woods neighborhood. Rain gardens and tree box filters would be installed at storm drain inlets.

AC9307 Area-Wide Drainage Improvements

This project recommends treating the runoff for the Woodland Forest neighborhood, downstream of dry pond 1022DP, by implementing tree box filters and rain gardens to improve water quality.

AC9308 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Canterbury Woods and Long Branch neighborhoods by implementing a hybrid project that includes installing tree box filters and rain gardens.

AC9309 Area-Wide Drainage Improvements

There are no existing stormwater management facilities in the Springbrook Forest, Willow Woods and Woods of Ilda neighborhoods so area-wide drainage improvements are recommended to treat the runoff through installing tree box filters and rain gardens at stormwater inlets.

AC9310 Area-Wide Drainage Improvements

The medium density residential neighborhoods of Springbrook Forest and Rutherford were developed with no existing stormwater management facilities. The project is distributed throughout most of the subwatershed and involves treating runoff before it reaches the storm drain system by installing tree box filters at curb inlets and rain gardens adjacent to yard inlets.

AC9405 Culvert Retrofit

A retrofit is proposed for a road culvert under Twinbrook Road in Old Forge Park to add a weir wall control structure and stabilized micropool to regulate discharge of the smaller, high frequency storm events.

AC9406 Culvert Retrofit

This project is located in Long Branch Park on the upstream side of Laurel Street between Lenox Drive and Whitacre Road. This culvert retrofit would add a weir wall control structure on the upstream side of the culvert and creating a micropool followed by a pool with wetland plantings.

AC9529 New BMP/LID

A parking lot retrofit is recommended at the Canterbury Woods Elementary School by adding tree box filters at storm drain inlets to provide water quality control.

5.4.1.2 25-Year Projects

AC9145 New Stormwater Pond

A new pond is proposed to treat the runoff from the Canterbury Woods Swim Club on Blackpool Drive. This project would create a shallow wetland area to improve the water quality of the runoff.

AC9146 Stormwater Pond Retrofit

This site is an existing deep, dry pond (0943DP) with a small footprint behind Althea Drive in the Woodland Forest neighborhood. The proposed project is to retrofit the pond by adding a micropool, expanding the footprint and modifying the outlet to obtain channel erosion control through volume storage.

AC9149 Stormwater Pond Retrofit

This project proposes to retrofit an existing wet pond (WP0238) between Braddock Road and Dunleigh Drive that treats runoff from the Dunleigh neighborhood. Recommendations include retrofitting the existing pond by modifying the outlet structure, clearing out the inlet, adding an aquatic shelf and clearing trees from the embankment.

AC9150 Stormwater Pond Retrofit

This is a proposed retrofit of an existing dry pond (DP0362) behind Fern Park Drive in Burke Professional Center to treat the runoff from Dunleigh neighborhood. The retrofit would provide water quality improvements to the receiving waters.

AC9151 Stormwater Pond Retrofit

This project proposed the retrofit of two dry ponds (0207DP and 0055DP) located near the Long Branch Swim and Racquet Club to reduce downstream channel erosion. Recommendations include installing a forebay and micropool, adding new control structures and replacing the concrete channel with a wet swale. The downstream channels should also be stabilized through this project.

AC9152 Stormwater Pond Retrofit

This project proposes to retrofit an existing dry pond (0054DP) behind Tartan View Drive in the Chestnut Hills West neighborhood for water quality by creating forebays or micropools, lengthening the flow path and modifying the outlet structure.

AC9153 Stormwater Pond Retrofit

This project proposes to convert the existing downstream wet pond (WP0179) behind Wrought Iron Court that treats runoff from the Lee Meadows neighborhood to a large wetland facility. Proposed recommendations include excavating the pond to increase storage, adding pools and modifying the outlet.

AC9154 Stormwater Pond Retrofit

This is a retrofit of the existing wet pond (WP0178) that treats runoff from the Lee Meadows neighborhood. Field assessment indicated erosion in the low flow channel, sediment buildup in

pond bottom and a clogged outlet. Proposed recommendations include modifying the outlet structure and adding forebays at the inlet.

AC9155 New Stormwater Pond

A large area of the Sweet Briar Forest residential neighborhood is draining to a concrete channel behind Olley Lane. The project proposes to convert this channel to a linear wetland to provide water quality benefits.

AC9156 Stormwater Pond Retrofit

This project is proposed to retrofit existing dry pond DP0123 which treats the runoff from the Korean Presbyterian Church by adding a forebay for additional water quality volume storage, modifying the outlet and lengthening the flow path.

AC9157 Stormwater Pond Retrofit

An existing dry pond (0197DP) behind Ceralene Court in George Mason Park that treats the runoff from a residential area is proposed to be converted to a wet pond by removing concrete channels, installing a sediment forebay and modifying the outlet to provide extended detention.

AC9158 Stormwater Pond Retrofit

The existing dry pond (0057DP) treating runoff from a section of the Somerset South neighborhood seems to be functioning as a shallow wetland at the lower end of pond. The proposed project recommendations include installing a plunge pool and micropool, installing a new riser and creating a meandering low flow channel.

AC9404 Culvert Retrofit

A road culvert retrofit is proposed under Red Fox Drive to provide storage upstream of the embankment and control the discharge of the small, high frequency events to provide water quality treatment and help reduce downstream channel erosion.

AC9528 New BMP/LID

This project consists of two separate sites to treat parking lot runoff through bioretention or rain gardens. The first site is Holy Spirit Catholic Church, which also presents the opportunity to disconnect rooftop drains. Bioretention is also proposed to treat the upper parking lot runoff at the second site, Canterbury Woods Swim Club, on Blackpool Drive.

AC9530 New BMP/LID

This project consists of two separate sites to treat stormwater runoff through bioretention or rain gardens. The first site is the downslope edge of the parking lot at Longbranch Swim and Racquet Club on Bradfield Drive. A bioretention filter is also proposed to capture rooftop and driveway runoff at Saint Stephen's United Methodist Church.

AC9531 New BMP/LID

This project recommends installation of a bioretention filter to capture and treat parking lot runoff from the Rutherford Area Swim Club parking lot.

AC9532 New BMP/LID

This is a proposed bioretention filter at the outlet behind Bayard Road in Rutherford Park to capture runoff from the Rutherford neighborhood.

AC9533 New BMP/LID

This is a potential site for water quality swales and detention storage behind Marley Road at Rutherford Park.

5.4.2 Non Structural Projects

AC9900 Community Outreach/Public Education – Stenciling

This community-wide project involves marking the storm drains within the Red Fox Forest, Stone Haven, Woodland Forest, Canterbury Woods, Olley Lane, Somerset and Oak Hill community. The stencil marking can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9904 Rain Barrel Programs – Rain Barrels

Rain barrels provide the first step for residents to disconnect their downspout from draining to an impervious surface. This project would be a community-wide outreach program to encourage their use. Several neighborhoods, Somerset South, Olley Lane, and Stone Haven, Red Fox Forest and Canterbury Woods, were identified during the upland reconnaissance with roof drainage that would be suitable for this approach.

AC9907 Community Outreach/Public Education – Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. The upland reconnaissance identified several neighborhoods, Canterbury Woods, Long Branch, Ashford, Bradfield, Olde Forge, Surrey Square, Braddock Green and Somerset South, that could be targeted with this effort.

AC9908 Inspection/Enforcement Enhancement Project – Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. Dumpsters in this WMA were flagged as hotspots with evidence of having no cover.

AC9909 Rain Barrel Programs – Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows by turning downspouts away from driveways and impervious surfaces and letting the water flow onto lawns. In this WMA, they included the area around Chestnut Knolls, Somerset, Old Creek Estates, Rutherford, Sussex, Springbrook Forest, and Willow Woods.

AC9910 Street Sweeping Program

The Somerset, Old Creek Estates, Rutherford, Sussex and Springbrook Forest neighborhoods were found to have trash, litter or organic debris in the curb and gutter which could negatively

impact the local waterways through introduction into the stream system via the storm drain inlets. This project consists of developing or extending a street sweeping program to remove potential pollutants from the street before they can wash into a storm drain or a stream.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

One site was identified with a significant obstruction or dumpsite during the stream assessment. This project would be a community-wide program to remove the debris blocking fish passage.

AC9935 Community Outreach/Public Education – Tree Planting

One community, Holly Park, was assessed during the upland reconnaissance and identified for a watershed-wide outreach program to encourage tree planting and urban reforestation.

Table 5-4: Long Branch Central Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9144	New Stormwater Pond	AC-LB-0000	Lake Accotink Park	Water Quality and Quantity	County - FCPA	1 - 10
AC9147	New Stormwater Pond	AC-LB-0015	Kings Park Shopping Ctr	Water Quality and Quantity	Private - Commercial	1 - 10
AC9148	New Stormwater Pond	AC-LB-0015	Long Branch Stream Valley Park	Water Quality and Quantity	County - FCPA	1 - 10
AC9208	Stream Restoration	AC-LB-0025	Longbranch Falls Park	Water Quality	County - FCPA	1 - 10
AC9209	Stream Restoration	AC-LB-0030	Long Branch Stream Valley Park	Water Quality	County - FCPA	1 - 10
AC9305	Area-Wide Drainage Improvements	AC-LB-0005	Canterbury Woods neighborhood	Water Quality	Private - Residential	1 - 10
AC9306	Area-Wide Drainage Improvements	AC-LB-0010	Willow Woods neighborhood	Water Quality	Private - Residential	1 - 10
AC9307	Area-Wide Drainage Improvements	AC-LB-0015	Woodland Forest neighborhood	Water Quality	Private - Residential	1 - 10
AC9308	Area-Wide Drainage Improvements	AC-LB-0025	Canterbury Woods and Long Branch neighborhoods	Water Quality	Private - Residential	1 - 10
AC9309	Area-Wide Drainage Improvements	AC-LB-0030	Springbrook Forest, Willow Woods and Woods of Ilda neighborhoods	Water Quality	Private	1 - 10
AC9310	Area-Wide Drainage Improvements	AC-LB-0035	Springbrook Forest and Rutherford neighborhoods	Water Quality	Private	1 - 10
AC9405	Culvert Retrofit	AC-LB-0060	Old Forge Park	Water Quality	State - VDOT	1 - 10
AC9406	Culvert Retrofit	AC-LB-0075	Long Branch Park	Water Quality	State - VDOT	1 - 10
AC9529	BMP/LID	AC-LB-0015	Canterbury Woods Elementary School	Water Quality	County - FCPS	1 - 10
AC9145	New Stormwater Pond	AC-LB-0005	Canterbury Woods Swim Club	Water Quality	Private	11 - 25
AC9146	Stormwater Pond Retrofit	AC-LB-0005	Woodland Forest neighborhood	Water Quality	Private - Residential	11 - 25
AC9149	Stormwater Pond Retrofit	AC-LB-0020	Dunleigh neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9150	Stormwater Pond Retrofit	AC-LB-0020	Burke Professional Center	Water Quality	Private - Commercial	11 - 25

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9151	Stormwater Pond Retrofit	AC-LB-0025	Long Branch Swim and Racquet Club	Water Quality	Private	11 - 25
AC9152	Stormwater Pond Retrofit	AC-LB-0040	Chestnut Hills West neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9153	Stormwater Pond Retrofit	AC-LB-0040	Behind Wrought Iron Ct	Water Quality and Quantity	Private - Residential	11 - 25
AC9154	Stormwater Pond Retrofit	AC-LB-0040	Lee Meadows neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9155	New Stormwater Pond	AC-LB-0045	Sweet Briar Forest neighborhood	Water Quality	Private - Residential	11 - 25
AC9156	Stormwater Pond Retrofit	AC-LB-0060	Korean Presbyterian Church	Water Quality and Quantity	Private - Church	11 - 25
AC9157	Stormwater Pond Retrofit	AC-LB-0060	George Mason Park	Water Quality and Quantity	County - FCPA	11 - 25
AC9158	Stormwater Pond Retrofit	AC-LB-0065	Somerset South neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9404	Culvert Retrofit	AC-LB-0020	Red Fox Dr	Water Quality and Quantity	State - VDOT	11 - 25
AC9528	BMP/LID	AC-LB-0005	Holy Spirit Catholic Church and Canterbury Woods Swim Club	Water Quality	Private	11 - 25
AC9530	BMP/LID	AC-LB-0025	Longbranch Swim and Racquet Club Parking Lot and St. Stephens United Methodist Church	Water Quality	Private	11 - 25
AC9531	BMP/LID	AC-LB-0035	Rutherford Area Swim Club	Water Quality	Private	11 - 25
AC9532	BMP/LID	AC-LB-0045	Rutherford Park	Water Quality	County - FCPA	11 - 25
AC9533	BMP/LID	AC-LB-0055	Rutherford Park	Water Quality	County - FCPA	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9904	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9907	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9910	Street Sweeping Program	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple
AC9935	Community Outreach/Public Education	Multiple	Multiple	Water Quality and Quantity	Multiple

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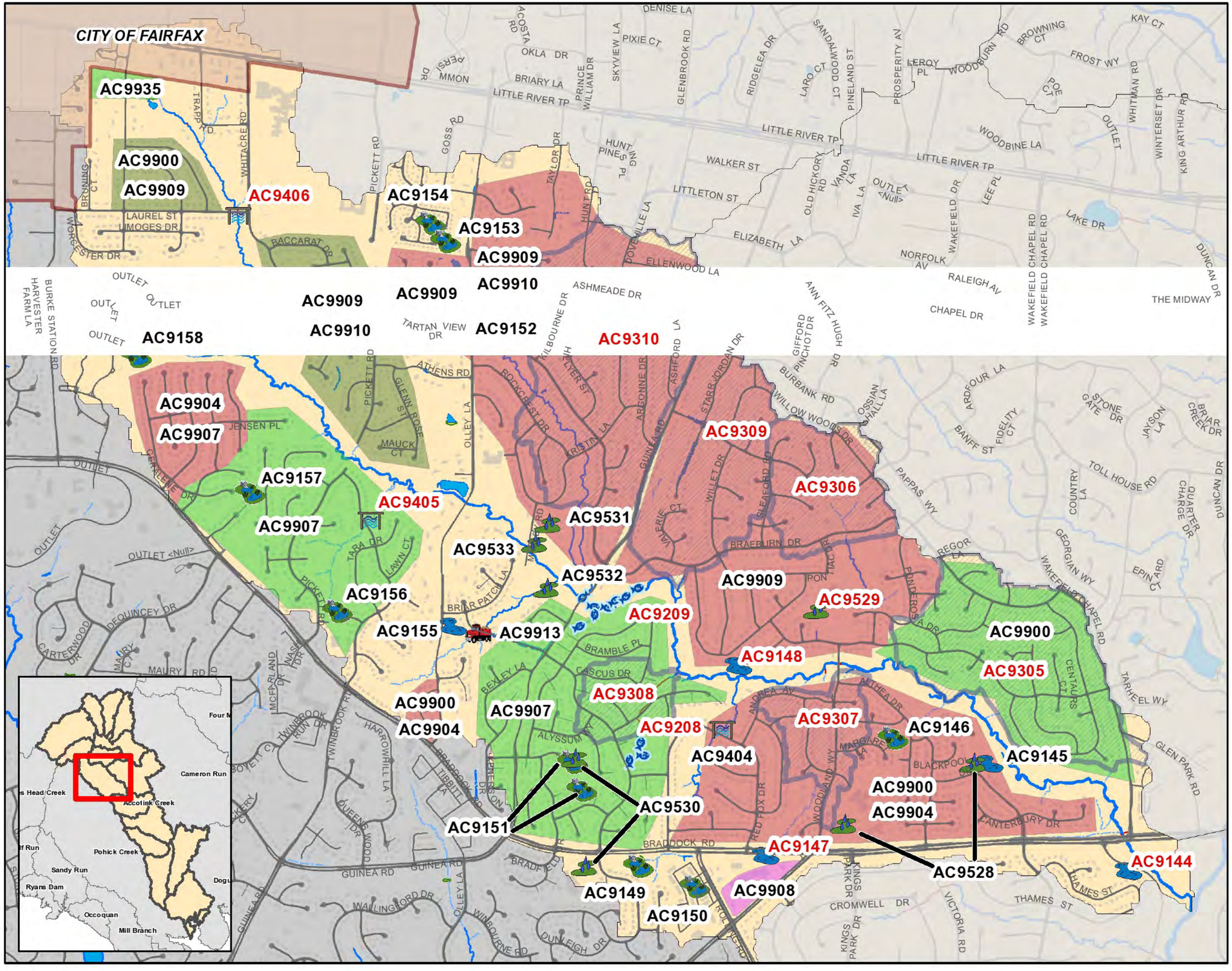

Map 5.4

WMA: Long Branch Central
Proposed Projects

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5.5 Long Branch North

The results of the subwatershed ranking analysis showed that all except two subwatersheds in Long Branch North are impaired in some form. A subwatershed in the southwestern corner of the WMA was among the lowest ranked in the Accotink Creek watershed for composite score of impacts and sources because it is completely built out with low forest cover.

5.5.1 Structural Projects

5.5.1.1 10-Year Projects

AC9181 Stormwater Pond Retrofit

A retrofit is proposed for dry pond DP0146 that drains Prosperity Business Campus. Project recommendations include removing the existing concrete channels, excavating to create a permanent wet storage element and replacing the existing riser to convert the pond to a shallow wetland.

Long Branch North Stream Restoration Projects -- A series of stream restoration projects have been proposed to restore a substantial length of Long Branch North and its tributaries. Ideally, they would be implemented from upstream to downstream, in the following order: AC9238, AC9224 (a short tributary) and AC9237 on the main channel. AC9236 could be completed simultaneously, followed by AC9235 and AC9234.

AC9224 Stream Restoration

This is a short stream restoration project between I-66 and Prosperity Avenue in the I-66 right of way. Severe stream bank erosion was observed throughout the stream length. Proposed project recommendations are to raise the bed elevation using step pools and stabilize the stream bank.

AC9234 Stream Restoration

This project would restore an eroded section of stream in the Sutton Place and Mantua Woods neighborhoods near the confluence with the Accotink Creek mainstem. Restoration would include installing bank protection, reshaping the channel and removing invasive plant species.

AC9235 Stream Restoration

This project proposes to restore an eroded and previously stabilized section of Long Branch North in the Sutton Place and Copeland Pond neighborhoods. The proposed restoration starts downstream of the culvert under Arlington Boulevard to approximately the end of Copeland Pond Court. Restoration would include reshaping the channel, protecting the banks and replacing existing old engineering techniques with natural channel design structures.

AC9236 Stream Restoration

This stream restoration project is located downstream of Prosperity Avenue in the Merrifield View neighborhood. Restoration will include removing the existing concrete channel and restoring it to a more natural channel, retrofitting storm drain structures, installing grade control structures, regrading and stabilizing stream banks and buffer restoration.

AC9237 Stream Restoration

This stream restoration would extend north from Cherry Drive to south of Dogwood Lane and would include regrading and stabilizing eroded stream banks, adjusting the channel to protect

the sanitary sewer manhole and removing riprap around the pedestrian bridge and replacing with bioengineering techniques.

AC9238 Stream Restoration

This project is intended to restore an eroded section of Long Branch North that originates north of Cottage Street and extends downstream to Lee Highway. Restoration efforts would include raising the stream bed elevation, installing grade control structures and stabilizing eroded stream banks. Additionally, buffer restoration is recommended to promote additional stability and to restore ecological function where extensive amounts of invasive vegetation are present.

AC9314 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Dunn Loring Village neighborhood by implementing a hybrid project that includes installing tree box filters and rain gardens.

AC9550 New BMP/LID

Multiple practices are proposed for industrial properties on Industrial Lane adjacent to Lee Highway. Installation of two tree box filters and a sand filter is proposed while a vegetated swale would replace an existing concrete swale.

AC9551 New BMP/LID

Two bioretention filters are proposed to treat the runoff from rooftops and parking areas in the southern section of Stenwood Elementary School. Disconnection and routing to the bioretention facilities would allow for water quality treatment before the runoff enters the stream system.

5.5.1.2 25-Year Projects

AC9179 Stormwater Pond Retrofit

This project would retrofit dry pond DP0138, which drains a part of Luther Jackson Middle School and the Gatehouse shopping complex, to an extended detention pond by excavating the bottom to add water quality treatment.

AC9552 New BMP/LID

This project consists of two separate school sites, Thoreau Middle School and the northern section of Stenwood Elementary School, to install bioretention facilities to treat stormwater runoff from the parking lot and rooftop for water quality. Curb cuts are recommended to divert the parking lot runoff to proposed bioretention areas.

5.5.2 Non Structural Projects

AC9806 Buffer Restoration

This project, located between Amberley Lane and Wynford Drive, involves the restoration of the degraded stream buffer.

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the North Pine, North Pine Ridge, Stonewall Manor, Dunn Loring Woods, Oak Forrest, Pine Ridge, Sutton Place and

Amanda Place communities. The stencil marking can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9902 Inspection/Enforcement Enhancement Project - Vehicle Maintenance

This project would provide community-wide targeted enforcement of spill prevention and pollution prevention regulations for sites where vehicles are maintained. The upland reconnaissance identified an uncovered fueling area that should be targeted.

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. Three sites in this WMA had improper storage of mulch, uncovered fueling islands, oil-stained drum storage or uncovered storage of topsoil and sand. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9908 Inspection/Enforcement Enhancement Project - Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. Dumpsters in this WMA were flagged as hotspots with evidence of garbage and grease flowing from overfull grease traps and dumpsters to a storm drain.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Seven sites were identified with significant obstructions or dumpsites during the stream assessment. This project would be a community-wide program to remove carpet and padding in the stream, trees blocking fish passage and debris within the stream.

Table 5-5: Long Branch North Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9181	Stormwater Pond Retrofit	AC-LC-0025	Prosperity Business Campus	Water Quality	Private - Commercial	1 - 10
AC9224	Stream Restoration	AC-LC-0025	I-66 and Prosperity Ave	Water Quality	State - VDOT	1 - 10
AC9234	Stream Restoration	AC-LC-0000	Sutton Place and Mantua Woods neighborhoods	Water Quality	Private - Residential	1 - 10
AC9235	Stream Restoration	AC-LC-0000	Sutton Place and Copeland Pond neighborhoods	Water Quality	Private - Residential	1 - 10
AC9236	Stream Restoration	AC-LC-0005	Merrifield View neighborhood	Water Quality	Private - Residential	1 - 10
AC9237	Stream Restoration	AC-LC-0015	Fairhill on the Boulevard neighborhood	Water Quality	Private - Residential	1 - 10
AC9238	Stream Restoration	AC-LC-0020, -0025, -0030	Dunn Loring Woods neighborhood and Prosperity Business Campus	Water Quality	Private	1 - 10
AC9314	Area-Wide Drainage Improvements	AC-LC-0025	Dunn Loring Village neighborhood	Water Quality	Private	1 - 10
AC9550	BMP/LID	AC-LC-0015	Industry Lane and Lee Hwy	Water Quality	Private - Industrial	1 - 10
AC9551	BMP/LID	AC-LC-0025	Stenwood Elementary School	Water Quality	County - FCPS	1 - 10
AC9179	Stormwater Pond Retrofit	AC-LC-0005	Luther Jackson Middle School	Water Quality and Quantity	County - FCPS	11 - 25
AC9552	BMP/LID	AC-LC-0030	Thoreau Middle School and Stenwood Elementary School	Water Quality	County - FCPS	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9806	Buffer Restoration	AC-LC-0000	Behind Amberley Ln	Water Quality	Private
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9902	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple

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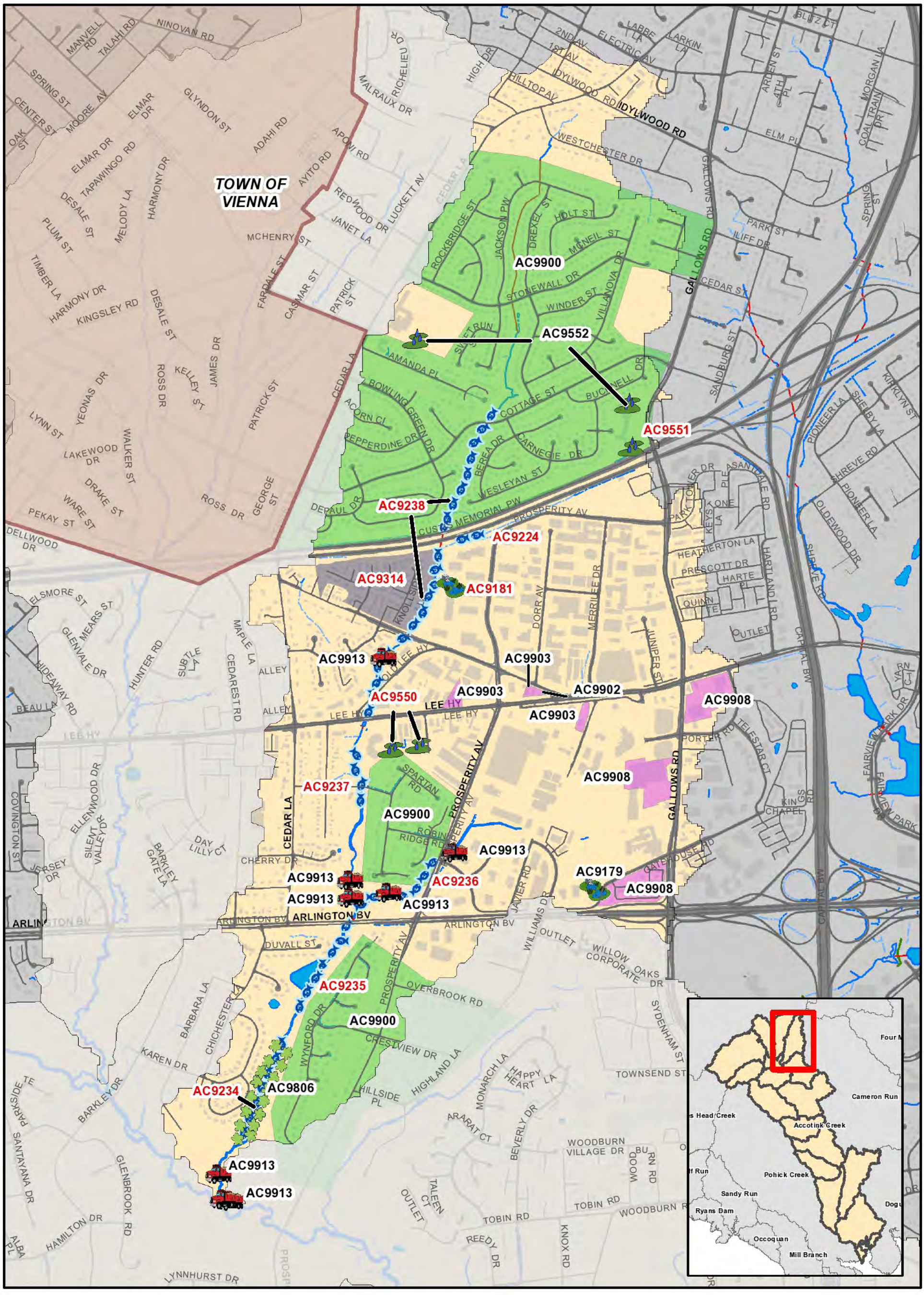

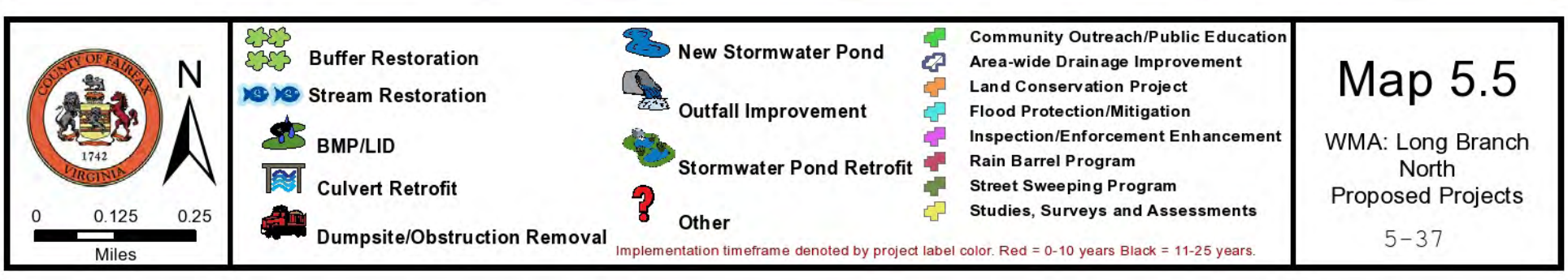

Map 5.5

WMA: Long Branch North
Proposed Projects

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5.6 Long Branch South

The results of the subwatershed ranking analysis showed a significant number of subwatersheds in Long Branch South impaired in some form. Six subwatersheds were in good conditions, three of which include large undeveloped and forested areas and the remaining three are undeveloped parcels in Fort Belvoir, Loisdale Estates and Amberleigh Park.

5.6.1 Structural Projects

5.6.1.1 10-Year Projects

AC9102 Stormwater Pond Retrofit

This project is at an existing VDOT dry pond that treats runoff from the Fairfax County Parkway and a part of an industrial area. The proposed project is to convert this existing dry pond to a shallow wetland facility by excavating for additional storage, adding plunge pools at the inflows along with wetland and dry plantings.

AC9105 Stormwater Pond Retrofit

This project is a retrofit of an existing dry pond (0095DP) that provides water quantity control for the multifamily residential homes in Pinewood Station. The dry pond could be converted to an extended detention facility through removing the existing headwalls and the concrete low-flow channels and adding and a riser structure and plunge pool at each inflow for energy dissipation into the facility.

AC9106 Stormwater Pond Retrofit

This project is a retrofit of two neighboring dry ponds that treat runoff from Newington Industrial along Backlick Road and Cinder Bed Road. The proposed project recommends excavating the bottom of dry pond DP0474 for water quality volume storage and removing the concrete channel and converting the existing pond behind Terminal Drive to a wet pond by installing a new riser and excavating for a forebay and micropool.

AC9110 Stormwater Pond Retrofit

This project is a proposed retrofit of dry pond 0700DP at the end of Briarleigh Way in the Amberleigh neighborhood. The dry pond would be retrofitted to an extended detention pond by adding a riser, excavating and creating berms to lengthen the flow path.

AC9111 Stormwater Pond Retrofit

This proposed project is to retrofit dry pond 0180DP behind Birchleigh Way in the Amberleigh neighborhood. Project recommendations include adding a riser structure, removing the headwall, tree removal and riprap stabilization.

AC9112 Stormwater Pond Retrofit

A retrofit of dry pond DP0366 in the Springfield Industrial Center is recommended. The pond could be converted to a shallow wetland facility through excavating and redesigning the outlet to reduce clogging. This would allow this pond to achieve water quality and water quantity goals for habitat improvement and reduce downstream channel erosion.

AC9113 Stormwater Pond Retrofit

This project retrofit will convert the dry pond DP0367 at the Springfield Industrial Center to a shallow wetland to improve water quality and habitat. The existing pond could be retrofitted by modifying the outlet structure along with adding wetland plantings and plunge pools. Field observations indicated that a part of the riser has failed.

AC9114 Stormwater Pond Retrofit

This is an existing pond (VDOT29028) in the Springfield Industrial Park with a large drainage area to be converted to a shallow wetland to improve water quality by reforesting and adjusting the outlet for storage.

AC9120 Stormwater Pond Retrofit

This project is a retrofit of an existing pond (DP0296) treating multifamily residential area near Springfield Metro Center along Metropolitan Center Drive. This project is a quantity control pond that will be converted to a shallow wetland by modifying the spillway characteristics of the existing riser, installing a new dewatering system and excavating to create permanent wet storage for water quality treatment. Trash removal is also recommended.

AC9226 Stream Restoration

This project on Long Branch South is located near Barry Road in the Windsor Estates neighborhood and would restore the channel near an instream sanitary sewer manhole and remove the debris jam. Additionally, the channel would be regraded and eroded stream banks would be stabilized with armor-in-place and/or bioengineering techniques.

AC9227 Stream Restoration

This stream restoration project would remove a concrete-lined channel south of Route 644 along Barry Road in the Windsor Estates neighborhood. The restoration would include removing the concrete channel, regrading and stabilizing the stream channel. Creating a riparian buffer is also proposed.

AC9301 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the Windsor Park neighborhood by installing tree box filters at curb inlets and rain gardens adjacent to yard inlets.

AC9501 New BMP/LID

This project proposes to build a vegetated swale alongside an existing pond to provide water quality treatment for the runoff from a section of Newington Industrial Park along Terminal Drive.

AC9502 New BMP/LID

This project proposes to build a vegetated swale at the downstream outfall from a commercial area on Newington Road to provide water quality treatment.

AC9503 New BMP/LID

This project proposes adding a bioretention facility to treat parking lot runoff at the Franconia-Springfield Metro Station.

AC9505 New BMP/LID

This project proposes to install tree box filters at storm drain inlets to treat the runoff from the parking lot at Francis Scott Key Middle School. There is no existing stormwater management on site.

AC9506 BMP/LID Retrofit

The installation of multiple bioretention filters and basins is proposed to treat the runoff from a large commercial parking lot located along Frontier Drive. There is an existing underground facilities that provides quantity control for large storm events, but field assessment indicates small bioretention systems within the parking lot medians could treat the runoff for water quality.

AC9508 New BMP/LID

This project includes retrofitting existing storm drain inlets with tree box filters to treat runoff for water quality from the western portion of the parking lot at Robert E. Lee High School.

AC9600 Flood Protection/Mitigation

This project, located at the culvert under the railroad tracks near Cinder Bed Road, would reduce flooding during the 10-year and 100-year storms.

5.6.1.2 25-Year Projects

AC9103 Stormwater Pond Retrofit

This is a potential pond retrofit which currently treats the stormwater runoff from part of the Gateway 95 Business Park. Recommendations include adding a riser at the outlet to provide channel erosion control downstream and a plunge pool at the inlet.

AC9104 Stormwater Pond Retrofit

This project consists of two existing neighboring small dry ponds (DP0300 and DP0301) that provide detention for stormwater runoff at the Shirley Industrial Complex. The proposed project would add water quality treatment by converting the ponds to bioretention facilities.

AC9107 Stormwater Pond Retrofit

The existing dry pond (0179DP) that treats the stormwater runoff from the Landsdowne neighborhood is proposed to be converted to an extended detention facility by removing concrete channels and excavating the area. Quantity control would be expanded by regrading embankments. A micropool and forebay would be created to promote water quality control.

AC9108 Stormwater Pond Retrofit

This project recommends converting two existing neighboring small dry ponds (0129DP and 0179DP) in Amberleigh Park by excavating for water quality volume storage, installing a restrictor on the riser and lengthening the flow path.

AC9109 Stormwater Pond Retrofit

The existing dry pond (1267DP) treats stormwater runoff from residential homes between Brockett Crossing and Venture Drive is proposed to be converted to an extended detention pond. This retrofit would add a new riser structure, remove the concrete low-flow channels and

replace them with a meandering low flow channel, excavate for additional storage and add plantings.

AC9115 Stormwater Pond Retrofit

This project would retrofit an existing VDOT dry pond (VDOT29029) next to Assembly of God Church. Recommendations include a new riser structure, restricting the outlet for storage and installing a low berm to lengthen the flow path.

AC9116 Stormwater Pond Retrofit

This project would retrofit dry pond 0780DP, which treats stormwater runoff Devonshire Townhomes, to an extended detention facility. Concrete channels would be removed and a meandering low flow channel created.

AC9117 Stormwater Pond Retrofit

This project proposes converting the existing dry pond (DP0400), which treats stormwater runoff from the Walker Lane Condominiums, to a wet pond by raising the restrictor to create a permanent pool to improve water quality treatment.

AC9118 Stormwater Pond Retrofit

This project proposes to convert the dry pond (DP0308) behind Gravel Road at Fleet Industrial Park to a wet pond by raising the restrictor to increase the wet area and thus improve water quality in the receiving waters. Reforestation is also recommended.

AC9119 Stormwater Pond Retrofit

This project would retrofit the existing dry pond (0886DP) behind Gildar Street, which treats stormwater runoff from Springfield North Condominiums, to a wet pond by excavating and removing concrete channels or raising the restrictor and overflow.

AC9121 Stormwater Pond Retrofit

There is an existing dry pond (DP0450) at Sunrise Assisted Living that provides detention for runoff from the site. The proposed project would retrofit the dry pond by removing the concrete channel and raising the overflow. A micropool and forebay would be added for water quality management.

AC9122 New Stormwater Ponds

There are three potential areas for improvement in the ramp connecting I-95 and Franconia Road. Two are at existing inlets in low spots where a riser could be designed to create storage without the need for an embankment. One eroding ditch could be converted to a vegetated swale for water quality treatment.

AC9504 New BMP/LID

This project is located at a series of strip malls opposite Springfield Mall on Frontier Drive. The parking island and the area between the stores and the street could be retrofitted with bioretention facilities to treat the runoff from the parking lots.

AC9507 BMP/LID Retrofit

This project recommends the installation of bioretention and tree box filters in parking medians and around the perimeter to treat parking lot runoff for water quality at Springfield Mall, currently approved for redevelopment.

5.6.2 Non Structural Projects

AC9800 Buffer Restoration

This project, located off of Telegraph Road, involves the restoration of the degraded stream buffer.

AC9801 Buffer Restoration

This project, located near Cinder Bed Road, involves the restoration of the degraded stream buffer.

AC9902 Inspection/Enforcement Enhancement Project - Vehicle Maintenance

This project would provide community-wide targeted enforcement of spill prevention and pollution prevention regulations for sites where vehicles are maintained. The upland reconnaissance identified an outdoor vehicle repair/maintenance/storage facility and a van wash discharging directly to a storm drain.

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. Four sites in this WMA had construction equipment stored outdoors, outdoor equipment fueling or outdoor drum storage without cover. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9904 Rain Barrel Programs - Rain Barrels

Rain barrels provide the first step for residents to disconnect their downspout. This project would be a community-wide outreach program to encourage their use. Three neighborhoods, Windsor Estates, Loisdale Estates and Springfield Forest, were identified during the upland reconnaissance with roof drainage that would be suitable for this approach.

AC9906 Inspection/Enforcement Enhancement Project - Litter/Trash Enforcement

Litter and trash enforcement is done through the enforcement of regulations for illegal dumping, litter laws, or unsecure truck loads. Community outreach programs for beautifying neighborhoods, including health and safety information, can be used effectively in the implementation of the programs. The area flagged for enforcement includes a cul-de-sac at the north end of Terminal Road.

AC9907 Community Outreach/Public Education - Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. The upland reconnaissance identified several neighborhoods: Loisdale Estates, Springfield Forest and Windsor Estates, that could be targeted with this effort.

AC9908 Inspection/Enforcement Enhancement Project - Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. Dumpsters in this WMA were flagged as hotspots with evidence of unknown leakage.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, they included the area around Hunter Estates and Newberry Station.

AC9910 Street Sweeping Program - street sweeping

Loisdale Estates were found to have trash, litter or organic debris in the curb and gutter, flowing to storm drain inlets. This project consists of developing or extending a street sweeping program to remove potential pollutants from the street before they can wash into a storm drain or a stream.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

One site was identified with significant obstructions or dumpsites during the stream assessment. This project would be a community-wide program to remove appliances, trash and yard waste on the stream bank.

Table 5-6: Long Branch South Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9102	Stormwater Pond Retrofit	AC-LA-0003	Intersection of Telegraph Rd and Fairfax County Pkwy	Water Quality and Quantity	State - VDOT	1 - 10
AC9105	Stormwater Pond Retrofit	AC-LA-0010	Pinewood Station neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9106	Stormwater Pond Retrofit	AC-LA-0010	Backlick Rd and Cinder Bed Rd	Water Quality and Quantity	State - VDOT, Private - Commercial	1 - 10
AC9110	Stormwater Pond Retrofit	AC-LA-0050	Amberleigh neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9111	Stormwater Pond Retrofit	AC-LA-0050	Amberleigh neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9112	Stormwater Pond Retrofit	AC-LA-0060	Springfield Industrial Park	Water Quality and Quantity	Private - Commercial	1 - 10
AC9113	Stormwater Pond Retrofit	AC-LA-0060	Springfield Industrial Park	Water Quality	Private - Commercial	1 - 10
AC9114	Stormwater Pond Retrofit	AC-LA-0060	Springfield Industrial Park	Water Quality and Quantity	State - VDOT	1 - 10
AC9120	Stormwater Pond Retrofit	AC-LA-0065	Franconia/Springfield Metro	Water Quality and Quantity	Public - Metro	1 - 10
AC9226	Stream Restoration	AC-LA-0050	Windsor Estates	Water Quality	Private - Residential	1 - 10
AC9227	Stream Restoration	AC-LA-0055	Windsor Estates	Water Quality	Private - Residential	1 - 10
AC9301	Area-Wide Drainage Improvements	AC-LA-0055	Windsor Park	Water Quality	Private	1 - 10
AC9501	BMP/LID	AC-LA-0010	Newington Industrial Park	Water Quality	Private - Industrial	1 - 10
AC9502	BMP/LID	AC-LA-0015	Newington Rd	Water Quality	Private	1 - 10
AC9503	BMP/LID	AC-LA-0050	Franconia/Springfield Metro	Water Quality	Public - Metro	1 - 10
AC9505	BMP/LID	AC-LA-0080	Francis Scott Key Middle School	Water Quality	County - FCPS	1 - 10
AC9506	BMP/LID	AC-LA-0070	Commercial Parking Lot	Water Quality	Private - Commercial	1 - 10
AC9508	BMP/LID	AC-LA-0075	Robert E. Lee High School	Water Quality	County - FCPS	1 - 10
AC9600	Flood Protection/Mitigation	AC-LA-0010	Culvert under railroad behind Industrial Park	Water Quantity	Federal	1 - 10

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9103	Stormwater Pond Retrofit	AC-LA-0003	Gateway 95 Business Park	Water Quality and Quantity	Private - Commercial	11 - 25
AC9104	Stormwater Pond Retrofit	AC-LA-0005	Shirley Industrial Complex	Water Quality	Private - Industrial	11 - 25
AC9107	Stormwater Pond Retrofit	AC-LA-0030	Landsdowne neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9108	Stormwater Pond Retrofit	AC-LA-0045	Amberleigh Park	Water Quality and Quantity	County - FCPA	11 - 25
AC9109	Stormwater Pond Retrofit	AC-LA-0045	Island Creek Park	Water Quality and Quantity	County - FCPA	11 - 25
AC9115	Stormwater Pond Retrofit	AC-LA-0055	Next to Assembly of God Church	Water Quality and Quantity	State - VDOT	11 - 25
AC9116	Stormwater Pond Retrofit	AC-LA-0055	Devonshire Townhomes	Water Quality and Quantity	Private - Residential	11 - 25
AC9117	Stormwater Pond Retrofit	AC-LA-0085	Walker Lane Condo	Water Quality	Private - Residential	11 - 25
AC9118	Stormwater Pond Retrofit	AC-LA-0085	Fleet Industrial Park	Water Quality	Private - Industrial	11 - 25
AC9119	Stormwater Pond Retrofit	AC-LA-0090	Behind Gilders St	Water Quality and Quantity	Private - Residential	11 - 25
AC9121	Stormwater Pond Retrofit	AC-LA-0075	Sunrise Assisted Living	Water Quality and Quantity	Private - Residential	11 - 25
AC9122	New Stormwater Pond	AC-LA-0075	I-95 and Franconia Rd Interchange	Water Quality	Federal	11 - 25
AC9504	BMP/LID	AC-LA-0050	Shopping area opposite Springfield Mall	Water Quality	Private - Commercial	11 - 25
AC9507	BMP/LID	AC-LA-0075	Springfield Mall	Water Quality	Private	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9800	Buffer Restoration	AC-LA-0003	Intersection of Telegraph Rd and Fairfax County Pkwy	Water Quality	Private
AC9801	Buffer Restoration	AC-LA-0050	Springfield Industrial Center and Cinder Bed Rd	Water Quality	Private

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9902	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9904	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9906	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9907	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9910	Street Sweeping Program	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	AC-LA-0010	Multiple	Water Quality	Multiple

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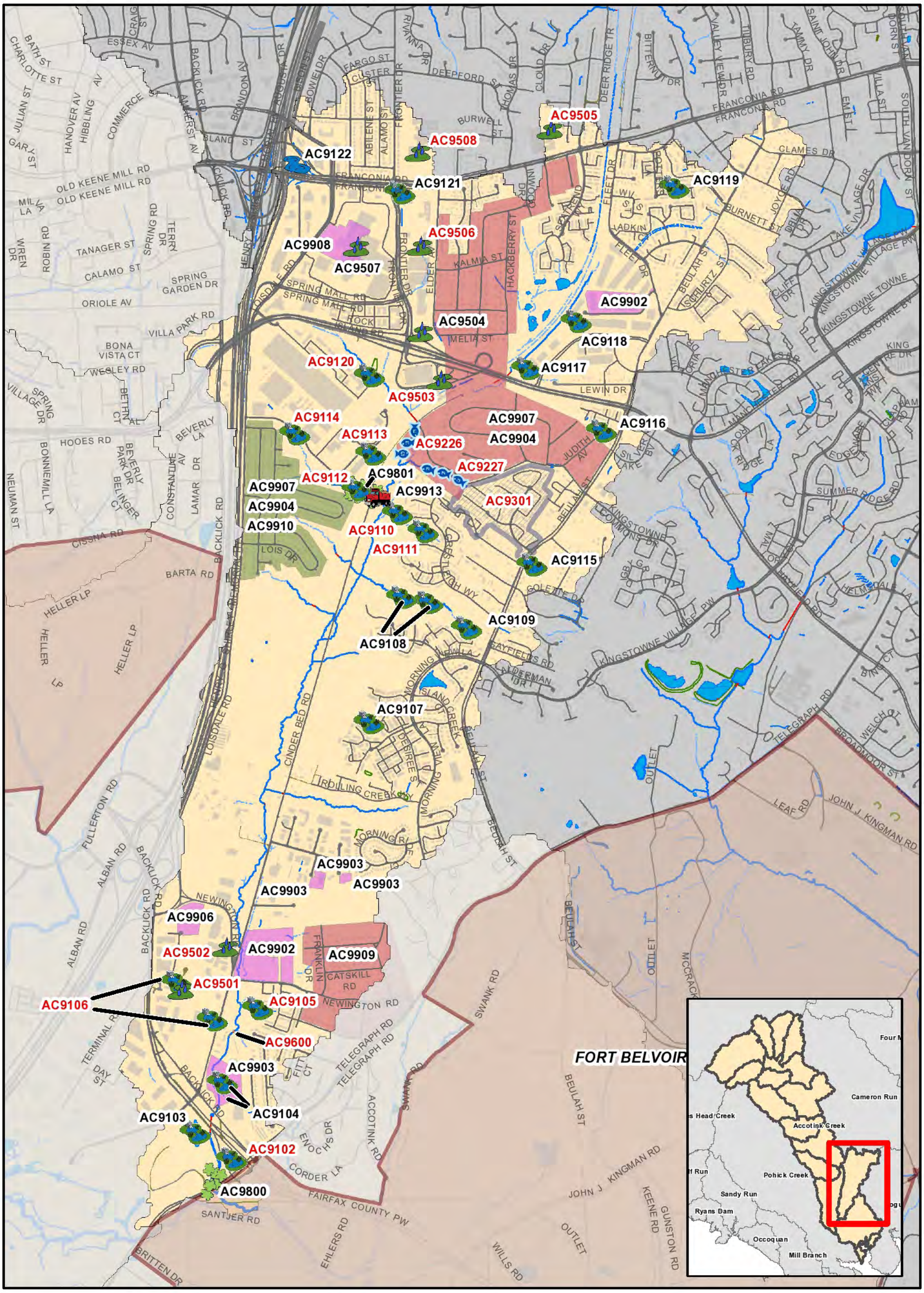

Map 5.6

WMA: Long Branch South
Proposed Projects

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5.7 Accotink Mainstem 1

The results of the subwatershed ranking analysis showed a significant number of subwatersheds in Mainstem 1 that were impaired in some form. Three subwatersheds were in good condition, primarily due to good forest cover and the undeveloped parcels of Towers Park and Ranger Road Park. Thirteen of the 23 subwatersheds in the Mainstem 1 WMA are within the boundaries of Fairfax City and were not assessed for retrofits or improvements.

5.7.1 Structural Projects

5.7.1.1 10-Year Projects

AC9195 Stormwater Pond Retrofit

This project proposes to convert an existing dry pond (0100DP), which treats stormwater runoff from Oakton Village neighborhood, to an extended detention facility. A new riser structure, removal of the concrete channels and the addition of a plunge pool will improve the water quality treatment of this facility.

AC9196 Stormwater Pond Retrofit

This project proposes to retrofit existing wet pond WP0271 into a wetland facility at Four Winds at Oakton Condominium. Recommendations include stabilizing the outfall, adding a new riser structure, excavating for additional storage, tree removal and adding a micropool and plunge pool at the riser and inflow.

AC9199 Stormwater Pond Retrofit

An existing dry pond (1235DP) along Buckley Street in Rosehaven Estates is proposed to be retrofitted to provide greater water quality volume and peak flow reduction. Recommendations include modifying the existing riser structure, installing a plunge pool and a micropool and plantings.

AC9316 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the Hawthorne Village Apartments, Five Oaks Place and Cedar Grove Park neighborhoods by installing tree box filters at curb and street inlets and rain gardens adjacent to yard inlets.

AC9409 Culvert Retrofit

Runoff from Oakton High School is proposed to be treated by retrofitting the road culvert under Sutton Road. This would involve adding a control structure upstream of the culvert to regulate the discharge from small, frequent storms.

AC9558 New BMP/LID

Parking lot runoff at Mosby Woods Elementary School is proposed to be treated by implementation of two bioretention facilities. These facilities would be located in the parking and bus loop medians.

AC9562 New BMP/LID

A series of bioretention filters and basins is proposed to treat runoff from the AT&T building and parking lot on Chain Bridge Road. Currently, the parking area drains through three outfalls to a

dry pond with a concrete channel located in an open grass field at the south end of the parking lot. There is sufficient space at the inflows to the pond to create bioretention facilities to pre-treat runoff for water quality and maintain the existing detention characteristics of the pond.

5.7.1.2 25-Year Projects

AC9187 Stormwater Pond Retrofit

Field assessment indicated the existing dry pond (0714DP) behind Blake Park Court is not functioning well due to a shortened flow path through the facility. The proposed project is to retrofit the existing dry pond with bioretention facilities to improve water quality and quantity control.

AC9188 Stormwater Pond Retrofit

Dry pond 0527DP treats the stormwater runoff from a multi-family residential area in the Country Creek neighborhood is proposed to be converted to bioretention to improve water quality before it enters the downstream channel.

AC9189 New Stormwater Pond

There is potential to create a wetland in a riparian area of East Blake Lane Park to treat high storm surges from the stream. This project would treat runoff from the Randall Valley and Five Oaks neighborhoods.

AC9190 Stormwater Pond Retrofit

The existing pond behind Oakton Pond Court could be retrofitted for increased water quality control by installing a forebay and a riser structure.

AC9191 Stormwater Pond Retrofit

Excavation of an existing dry pond behind Cyrandall Place is proposed to provide a permanent pool and aquatic bench for improved water quality treatment.

AC9192 Stormwater Pond Retrofit

Existing dry pond 0908DP behind Lochalsh Lane in the Edgemoore neighborhood is proposed to be retrofitted by removing the existing headwall and replacing it with a new riser, removing the concrete channels and replacing them with a meandering low flow channel and excavating for extended detention for to add water quality treatment to the existing quantity control.

AC9193 Stormwater Pond Retrofit

The project proposes to convert an existing dry pond that treats stormwater runoff from Oakdale Woods Court to a bioretention facility for increased water quality treatment by replacing the outlet structure, repairing inflow concrete flumes or replacing it with a natural channel within the facility.

AC9194 Stormwater Pond Retrofit

Two pond retrofits (1313DP and 0041DP) are proposed behind Miles Stone Court and along Courthouse Road. Recommendations include replacing the risers and adding storage volume for water quality treatment.

AC9197 Stormwater Pond Retrofit

This project recommends two neighboring ponds to be retrofitted to provide maximum water quality benefits. Pond 0147DP behind Borge Street treating neighborhood runoff is proposed to be retrofitted to include bioretention facilities. The pond retrofit behind Oakton Meadows Court (0173DP) would include excavating near the riser to create a small micropool, raising the embankment to reduce channel erosion and modifying the riser.

AC9198 Stormwater Pond Retrofit

The proposed project recommends retrofitting the existing pond behind Silver Stone Court (DP0505) and the existing dry pond behind White Flint Court (0073DP) by removing the concrete channel, adding forebays and increasing storage.

AC9559 New BMP/LID

Implementation of a bioretention facility at the outfall behind Bickley Court is recommended to improve the water quality of the roadway runoff before it enters the stream.

AC9560 New BMP/LID

Proposed recommendations are to retrofit dry pond 0015DP behind Courthouse Wood Court by converting it to a bioretention filter for water quality treatment.

AC9561 New BMP/LID

A bioretention facility is proposed to treat the Vistas Condominium parking lot runoff at Valentine Street. This would involve installing a curb cut and retrofitting a storm drain inlet to improve water quality control.

5.7.2 Non Structural Projects

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Hawthorne Village, Beech Park, Fairfax Acres, Dudley Heights and Rosehaven Estates communities. The stencil marking can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, it includes the area around Hawthorne Village Apartments.

Table 5-7: Mainstem 1 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9195	Stormwater Pond Retrofit	AC-AC-0465	Oakton Village neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9196	Stormwater Pond Retrofit	AC-AC-0475	Four Winds at Oakton Condominium	Water Quality and Quantity	Private - Residential	1 - 10
AC9199	Stormwater Pond Retrofit	AC-AC-0510	Rosehaven Estates	Water Quality and Quantity	Private - Residential	1 - 10
AC9316	Area-Wide Drainage Improvements	AC-AC-0425	Hawthorne Village Apts, Five Oaks Place and Cedar Grove Park neighborhoods	Water Quality	Private	1 - 10
AC9409	Culvert Retrofit	AC-AC-0415	Oakton High School	Water Quality	State - VDOT	1 - 10
AC9558	BMP/LID	AC-AC-0425	Mosby Woods Elementary School	Water Quality	County - FCPS	1 - 10
AC9562	BMP/LID	AC-AC-0500	AT&T office building	Water Quality	Private - Commercial	1 - 10
AC9187	Stormwater Pond Retrofit	AC-AC-0410	Behind Blake Park Ct	Water Quality	Private - Residential	11 - 25
AC9188	Stormwater Pond Retrofit	AC-AC-0415	Country Creek neighborhood	Water Quality	Private - Residential	11 - 25
AC9189	New Stormwater Pond	AC-AC-0425	East Blake Lane Park	Water Quality	County - FCPA	11 - 25
AC9190	Stormwater Pond Retrofit	AC-AC-0425	Behind Oakton Pond Ct	Water Quality and Quantity	Private - Residential	11 - 25
AC9191	Stormwater Pond Retrofit	AC-AC-0430	Behind Cyrandall Pl	Water Quality and Quantity	Private - Residential	11 - 25
AC9192	Stormwater Pond Retrofit	AC-AC-0430	Edgemoore neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9193	Stormwater Pond Retrofit	AC-AC-0430	Oakdale Woods Ct	Water Quality	Private - Residential	11 - 25
AC9194	Stormwater Pond Retrofit	AC-AC-0430	Behind Miles Stone Ct	Water Quality	Private - Residential	11 - 25
AC9197	Stormwater Pond Retrofit	AC-AC-0475	Borge St and Oakton Meadows	Water Quality	Private - Residential	11 - 25
AC9198	Stormwater Pond Retrofit	AC-AC-0500	Silver Stone Ct and While Flint Ct	Water Quality and Quantity	Private - Residential	11 - 25

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9559	BMP/LID	AC-AC-0430	End of Bickley Ct	Water Quality	Private	11 - 25
AC9560	BMP/LID	AC-AC-0430	Behind Courthouse Wood Ct	Water Quality	Private	11 - 25
AC9561	BMP/LID	AC-AC-0465	Vistas Condominiums	Water Quality	Private - Residential	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple

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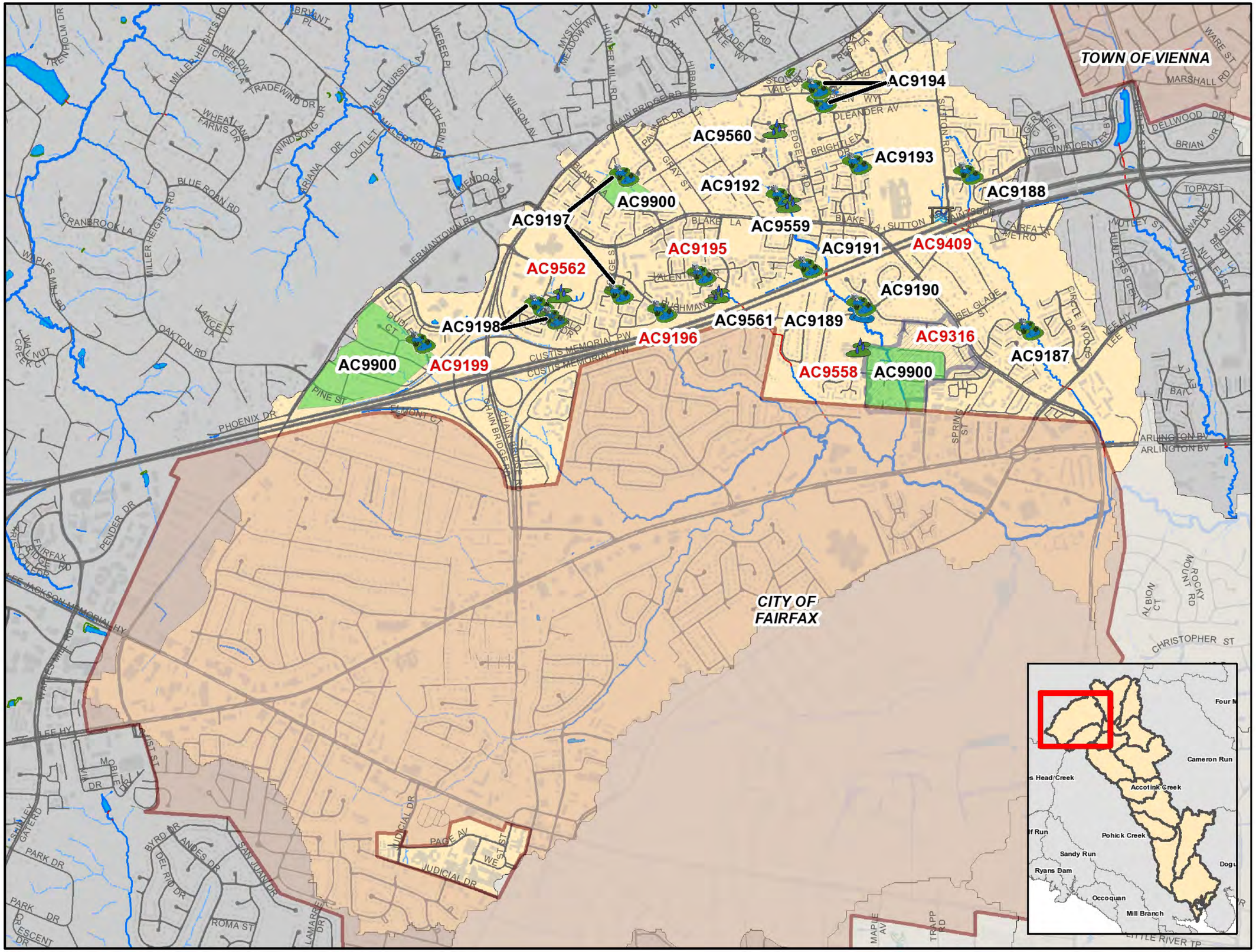

Map 5.7

WMA: Mainstem 1
Proposed Projects

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5.8 Accotink Mainstem 2

The results of the subwatershed ranking analysis showed four subwatersheds in the Mainstem 2 WMA to be in good condition due to the influence of undeveloped parcels in Mill Creek Park, Accotink Stream Valley Park and Eakin Park. The remaining 10 subwatersheds are impaired in some form. In terms of overall ranking, Mainstem 2 had 10 of the highest priority subwatersheds for the overall Accotink Creek watershed.

5.8.1 Structural Projects

5.8.1.1 10-Year Projects

AC9172 New Stormwater Pond

An extended detention facility is proposed to provide water quality and water quantity treatment for the runoff from the residential area along Wheatwheel Lane and Libeau Lane.

AC9178 Stormwater Pond Retrofit

An existing dry pond (0169DP), that treats the runoff from a residential area in the Prosperity Heights neighborhood, is proposed to be retrofitted into a wetland facility to provide additional water quality and quantity control by removing the headwall and putting in a riser and channel stabilization.

AC9219 Stream Restoration

This project would restore two existing stream channels and a ditch located within Pine Ridge Park as well as a third stream channel within Accotink Stream Valley Park. There is also a potential sewer utility being exposed at the Collins Street road culvert. Restoration efforts will include reducing channel dimensions and raising bed elevations to reconnect each channel to its original floodplain, as well as stabilization of severe erosion.

AC9223 Stream Restoration

A large restoration project is recommended for the stream between Monarch Lane and Highland Lane. Currently this channel is mostly straight, incised, over-widened and is lacking a riparian buffer in several areas along the right bank facing downstream. Restoration of this channel will include regrading and stabilizing eroded stream banks. Buffer restoration on the right bank facing downstream in various locations will be necessary to further improve restored areas and to restore ecological function.

AC9545 New BMP/LID

This project proposed two separate bioretention facilities to treat the parking lot runoff at Eakin Park and from the Byzantine Church parking lot located along Woodburn Road.

5.8.1.2 25-Year Projects

AC9171 Stormwater Pond Retrofit

Dry pond 0106DP treating runoff from the Holmes Run neighborhood is proposed to be converted to a wetland by adding a micropool, a forebay, raising the embankment for water quality volume storage and reduce downstream channel erosion and lengthening the flow path to a meandering channel.

AC9173 Stormwater Pond Retrofit

The existing dry pond (DP0204), which treats the stormwater runoff from the Silk Vision and Surgery Center, is proposed to be retrofitted by removing the concrete channel, adding forebays at inlets and modifying the outlet for water quality volume storage.

AC9543 New BMP/LID

This project proposes two separate facilities to control water quality from parking lots. Installation of bioretention or infiltration at parking islands is proposed to treat the parking lot runoff at Camelot Elementary School while installation of a bioretention basin to treat the runoff from a gravel parking lot is proposed in Pine Ridge Park.

AC9544 New BMP/LID

The parking lot runoff at the Silk Vision and Surgery Center is proposed to be treated by retrofitting the storm drain inlets with tree box filters for water quality control.

AC9549 New BMP/LID

Installation of two sand filters is proposed to improve the water quality of the parking lot runoff at commercial business along Arlington Boulevard and Williams Drive.

5.8.2 Non Structural Projects

AC9802 Buffer Restoration

This project, located along Launcelot Way in the Accotink Stream Valley Park, involves the restoration of the degraded stream riparian buffer.

AC9805 Buffer Restoration

This project, located near Prosperity Avenue and Highland Lane in Eakin Community Park, involves the restoration of the degraded stream riparian buffer.

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Camelot, Winterset Section 4, Camelot Heights, Mill Creek Park, Woodburn Village, Mantua, Langhorne Acres, Pine Ridge, Sutton Place and Strathmeade Square communities. The stencil marking can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Ten sites were identified with significant obstructions or dumpsites during the stream assessment. This project would be a community-wide program to remove trees and debris blocking fish passage and trees and yard waste within the stream.

AC9935 Community Outreach/Public Education - Tree Planting

Four communities assessed during the upland reconnaissance could be sites for a watershed-wide outreach program to encourage tree planting and urban reforestation. These include Holmes Run Heights, Shamrock Heights, Chaconas Estates and Gallows Estates.

Table 5-8: Mainstem 2 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9172	New Stormwater Pond	AC-AC-0335	End of Libeau Ln	Water Quality and Quantity	Private - Residential	1 - 10
AC9178	Stormwater Pond Retrofit	AC-AC-0370	Prosperity Heights neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9219	Stream Restoration	AC-AC-0350	Pine Ridge Park	Water Quality	County - FCPA	1 - 10
AC9223	Stream Restoration	AC-AC-0370	Pine Ridge neighborhood	Water Quality	Private - Residential	1 - 10
AC9545	BMP/LID	AC-AC-0360	Eakin Park and Byzantine Church parking lot	Water Quality	County - FCPA / Private	1 - 10
AC9171	Stormwater Pond Retrofit	AC-AC-0335	Holmes Run Village neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9173	Stormwater Pond Retrofit	AC-AC-0350	Silk Vision and Surgery Center	Water Quality	Private - Commercial	11 - 25
AC9543	BMP/LID	AC-AC-0350	Camelot Elementary School / Pine Ridge Park	Water Quality	County - FCPS / County - FCPA	11 - 25
AC9544	BMP/LID	AC-AC-0350	Silk Vision and Surgery Center	Water Quality	Private - Commercial	11 - 25
AC9549	BMP/LID	AC-AC-0375	Arlington Blvd & Williams Dr	Water Quality	Private - Commercial	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	
AC9802	Buffer Restoration	AC-AC-0350	Accotink Stream Valley Park	Water Quality	County - FCPA	
AC9805	Buffer Restoration	AC-AC-0370	Eakin Community Park	Water Quality	County - FCPA	
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple	
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple	
AC9935	Community Outreach/Public Education	Multiple	Multiple	Water Quality and Quantity	Multiple	

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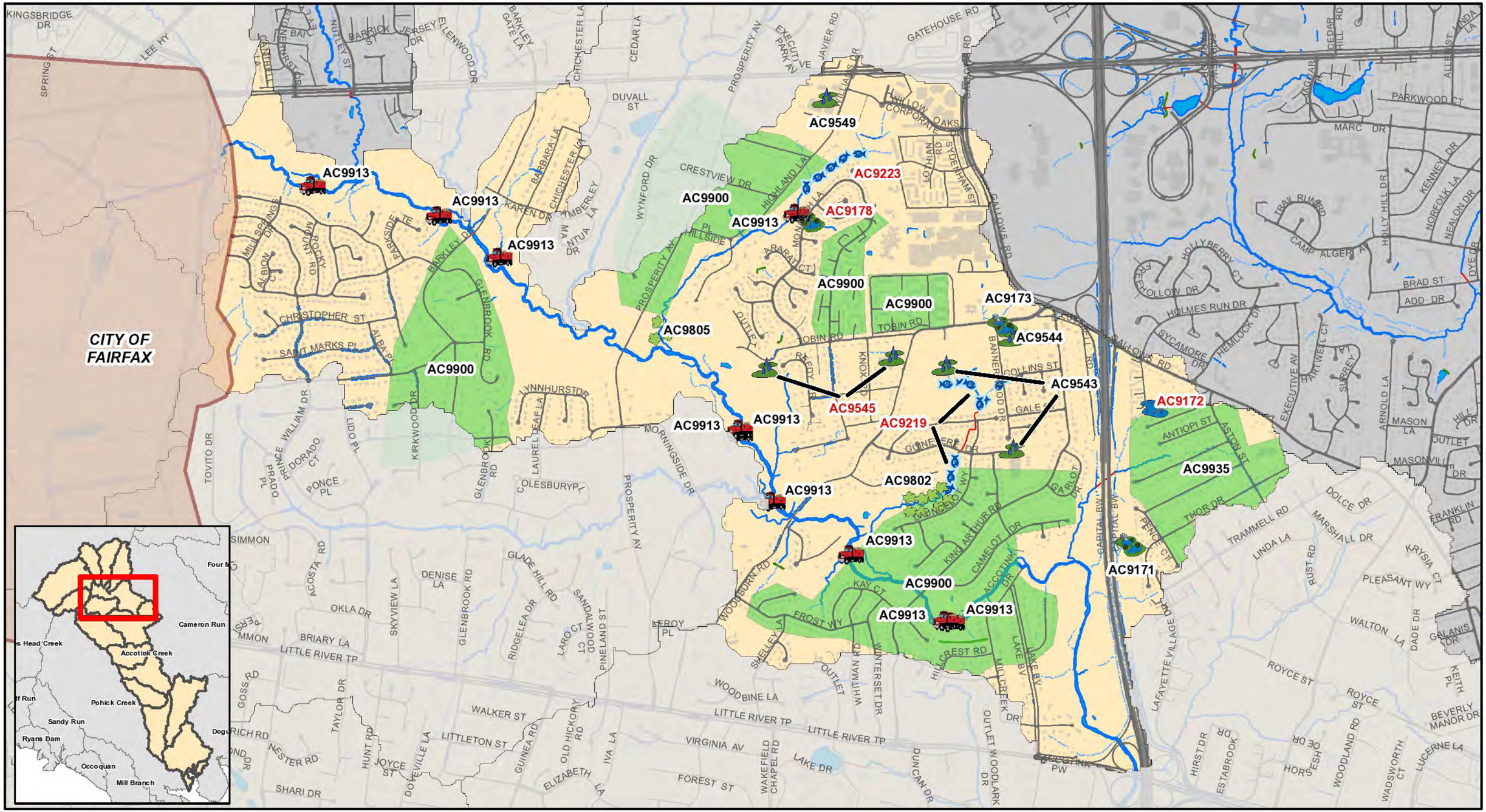
CITY OF FAIRFAX
AC9913
AC9900
AC9805
AC9549
AC9223
AC9178
AC9173
AC9544
AC9543
AC9545
AC9219
AC9172
AC9935
AC9802
AC9171
KINGSBRIDGE DR
SPRING ST
LEE HY
NUTLEY ST
BARRICK ST
JERSEY DR
ELLENWOOD DR
BARKLEY GATE LA
CHICHESTER LA
CEDAR LA
DUVALL ST
PROSPERITY AV
EXECUTIVE PARK AV
JAVIER RD
GATEHOUSE RD
WILLIAMS DR
WILLOW OAKS CORPORATE
LOTHIAN RD
SYDENHAM ST
GALLOWS RD
CRESTVIEW DR
HIGHLAND LA
WYNFORD DR
BARBARA LA
KAREN DR
AMBERLEY LA
MANTUA DR
PARKSIDE TE
BARKLEY DR
GLENBROOK RD
MILL SPRINGS DR
ALBION CT
MOUNT ROCKY RD
CHRISTOPHER ST
SAINT MARKS PL
ALBA PL
PROSPERITY AV
HILLSIDE PL
ARARAT CT
MONTREAL LA
OUTLET
TOBIN RD
KNOX RD
BANNERWOOD DR
COLLINS ST
GALE
GUINEVERE DR
LYNNHURST DR
LAUREL LEAF LA
MORNINGSIDE DR
COLESBURY PL
KIRKWOOD DR
GLENBROOK RD
TOVITO DR
PRINCE WILLIAM DR
EL DORADO CT
PRADO PL
PONCE PL
LIDO PL
ANTIOPI ST
ASTON ST
THOR DR
PENCE CT
CAPITAL BLVD
KING ARTHUR RD
CAMELOT DR
GARLOT DR
ACCOTINK DR
WOODBURN RD
KAY CT
FROST WY
SHELLEY LA
HILLCREST RD
MILL CREEK DR
LAKE BV
OUTLET WOODLARK DR
ACCOTINK PW
LAFAYETTE VILLAGE DR
TRAMMELL RD
LINDA LA
RUST RD
MARSHALL DR
DOLCE DR
KRYSIA CT
PLEASANT WY
WALTON LA
DADE DR
GALANIS DR
ROYCE ST
KEITH PL
BEVERLY MANOR DR
WOODLAND RD
WADSWORTH CT
LUCERNE LA
HIRST DR
ESTABROOK DR
HORSESHOE DR
PARKWOOD CT
MARC DR
TRAIL RUN RD
CAMP ALGER AV
HOLLY HILL DR
KENNEY DR
NORFOLK LA
NEALON DR
HOLLYBERRY CT
FIREHOLLOW DR
HOLMES RUN DR
SYCAMORE DR
HEMLOCK DR
EXECUTIVE AV
HARTWELL CT
SURREY LA
BRAD ST
ADD DR
DYE DR
ARNOLD LA
MASON LA
MASONVILLE DR
HILL DR
OUTLET
FRANKLIN RD
SIMMON
ACOSTA RD
DENISE LA
GLADE HILL RD
SKYVIEW LA
GLENBROOK RD
RIDGELEA DR
LARO CT
SANDALWOOD CT
PINELAND ST
LEROY PL
OKLA DR
BRIARY LA
LITTLE RIVER TP
GOSS RD
TAYLOR DR
HUNT RD
JOYCE ST
DOVEVILLE LA
NESTER RD
SHARI DR
RICH RD
WALKER ST
LITTLETON ST
GUINEA RD
OLD HICKORY RD
ELIZABETH LA
IVA LA
WOODBINE LA
VIRGINIA AV
FOREST ST
WAKEFIELD CHAPEL RD
LAKE DR
DUNCAN DR
WHITMAN RD
WINTERSET DR
OUTLET
Four M
Cameron Run
Accotink Creek
Pohick Creek
Sandy Run
Ryans Dam
Occoquan
Mill Branch
Dog
0
0.125
0.25
Miles
N
Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Community Outreach/Public Education
Area-wide Drainage Improvements
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement Project
Rain Barrel Programs
Street Sweeping Program
Studies, Surveys and Assessments
Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.
Map 5.8
WMA: Mainstem 2
Proposed Projects
5-63

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5.9 Accotink Mainstem 3

The results of the subwatershed ranking analysis showed seven subwatersheds in Mainstem 3 WMA to be in good condition; four of these were due to the influence of undeveloped parcels in Wakefield Park. Three additional subwatersheds have good forest and wetland cover. The remaining 11 subwatersheds were impaired in some form. In terms of overall ranking, Mainstem 3 had 11 of the highest priority subwatersheds for the overall project.

5.9.1 Structural Projects

5.9.1.1 10-Year Projects

AC9161 Stormwater Pond Retrofit

This existing dry pond (0294DP) near the intersection of Americana Drive and Commons Drive in the Patriot Village neighborhood is recommended to be retrofitted by modifying the outlet structure to provide storage, creating a micropool at the outlet, installing sediment forebays at inlets, excavating the pond outlet to provide better storage and stabilizing the existing stream channel.

AC9162 Stormwater Pond Retrofit

This project is a retrofit of an existing dry pond (0293DP) at Patriot Drive and American Drive in the Patriot Village neighborhood. Recommendations include adding forebays at all inlets, modifying the outlet to provide storage and excavating the pond to provide additional storage. The receiving stream on the downstream side of the culvert will also be stabilized to prevent further erosion.

AC9210 Stream Restoration

This project involves restoring three stream channels located within Wakefield Park draining commercial areas located along Braddock Road and the Capital Beltway. These channels are currently incised and over-widened with moderate to severe erosion occurring on meander bends and along straight sections. Restoration of these channels will focus on reducing the channel dimensions and raising the stream bed elevations to reconnect each channel to the floodplain.

Truro Neighborhood Stream Restoration Projects -- Three stream restoration projects through the Truro neighborhood have been proposed to restore a substantial length of Turkey Run, a tributary to Mainstem 3. Ideally, they would be implemented from upstream to downstream, in the following order: AC9213, AC9212 and AC9211.

AC9211 Stream Restoration

This project is located between Kenwyn Court and Wakefield Drive and involves the restoration of a short section of existing stream channel that starts at a large storm drain outfall and extends southwest to the mainstem of Turkey Run. Currently, this channel is incised with moderate erosion on both banks. Regrading and stabilizing are recommended. Stone toe protection may be needed near the storm drain outfall and under the foot bridge to prevent future erosion. Raising the bed elevation of this channel and installing grade controls will prevent further incision.

AC9212 Stream Restoration

This project involves a stream channel located between Elizabeth Lane, Aunt Lilly Lane, Kenwen Court and Ossian Hall Lane. This sinuous channel is currently incised, and over-widened. It has eroded primarily on outside meander bends and along some straight sections. The severity of erosion and incision increases downstream. Reconnecting the stream to the floodplain and grade controls are recommended.

AC9213 Stream Restoration

This project is located between Ann Fitzhugh Drive, Aunt Lilly Lane, Turkey Creek Court and Mary Lee Lane. Currently, there is an exposed sanitary sewer concrete casing acting as grade control for an active headcut in the stream channel near the end of Mary Lee Lane. on either side of the sewer utility the stream channel is beginning to over-widen. Reducing the existing channel dimensions, raising the bed elevation of the channel, and correcting the slope of the channel at the sewer casing will all help to reconnect flows to the floodplain.

AC9214 Stream Restoration

This is a stream restoration project for an eroded and incised channel behind Woodlark Drive in Wakefield Park. Recommendations include regrading and stabilizing eroded stream banks, raising the current bed elevation and installing stone toe protection and armoring techniques where sanitary sewer lines are exposed in the stream channel.

AC9215 Stream Restoration

This project is a stream restoration in Mill Creek Park just upstream of the road culvert under Little River Turnpike that receives stormwater runoff from the Turnpike and the Calvary Church of the Nazarene. The stream channel is incised and over-widened with moderate to severe erosion occurring on the outside of meanders. Recommendations include regrading and stabilizing eroded stream banks, altering the current stream alignment and installing stone toe protection.

AC9216 Stream Restoration

This is a stream restoration project for two channels behind Americana Drive in the Lafayette Forest neighborhood. Both channels are currently incised and over-widened and eroding on meander bends and straight sections. Recommendations include reducing the stream channel dimensions, raising the bed elevation to reconnect each channel to the floodplain and installing grade controls to prevent future incision and over-widening of the channel.

AC9217 Stream Restoration

This is a stream restoration project behind Donnybrook Court. Field assessment indicated an absence of riparian buffer and moderate erosion along the stream banks. Restoration will focus on reconnecting higher flows to the original floodplain to dissipate energy and encourage deposition of sediment on the floodplain. Other restoration components include reducing the existing channel dimensions, installing grade controls in the stream channel restoring areas of deficient riparian buffers.

AC9218 Stream Restoration

The stream channel between Hummer Road and Pleasant Ridge Road in the Pleasant Ridge neighborhood is incised with areas of active erosion and presents an opportunity for stream restoration. Recommendations include constructing nested benches throughout the reach and restore riparian buffer where applicable.

AC9230 Stream Restoration

This project entails restoring the existing stream channel located in Wakefield Park between I-495 and Queen Elizabeth Boulevard that is deeply incised and experiencing severe bank and bed erosion. Restoring the channel will include regrading and stabilizing eroded stream banks with armor-in-place and bioengineering techniques and installing grade controls to dissipate energy.

AC9231 Stream Restoration

This project entails restoring overflow stream channels located within the eastern floodplain of Accotink Creek between I-495 and Toll House Road in Wakefield Park. Currently, these channels are deeply incised with bank and bed erosion. Restoration would include repairing bank erosion with armor-in-place and bioengineering techniques and installing grade controls.

AC9232 Stream Restoration

This project entails restoring the existing stream channel located within Wakefield Park that is located between I-495 and Toll House Road which extends from the culvert under I-495 downstream to the confluence with Accotink Creek. Currently, this channel is experiencing severe bank and bed erosion and is deeply incised. This restoration would regrade and stabilize the eroded banks and install grade controls to dissipate energy.

AC9233 Stream Restoration

This project entails restoring an existing stream channel that is experiencing severe bank and bed erosion and is deeply incised located within Wakefield Park between I-495 and Briar Creek Drive. The channel extends from the downstream side of the culvert under I-495 downstream to the confluence with Accotink Creek. Restoration would include regrading and stabilizing eroded stream banks and installing grade controls.

AC9304 Area-Wide Drainage Improvements

There are no existing stormwater management facilities in the subwatershed. Area-wide drainage improvements are recommended to treat the runoff from the medium-density Ravensworth Park and Bristow residential areas through the installation of tree box filters, swales and bioretention filters.

AC9311 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the untreated medium-density areas of the Ramblewood subdivision are recommended here. Projects include installing tree box filters, disconnecting downspouts and installing rain gardens.

AC9535 New BMP/LID

This site, in Wakefield Chapel Estates, experiences concentrated flows across a yard to an outlet. Recommendations include adding a vegetated swale and check dams. Outreach and education is proposed for this neighborhood as part of project AC9935.

AC9538 New BMP/LID

Project recommendations include converting three existing dry ponds in the parking lot at Northern Virginia Community College dry ponds to bioretention cells or extended detention through modifying outlets and excavating the ponds to increase storage. The bottom of the existing ponds would be excavated and the outlets modified to provide additional water quality treatment.

AC9539 New BMP/LID

This project is a potential parking lot retrofit at Annandale Terrace Elementary School. Currently, there are no stormwater management facilities on this site. Recommendations include adding bioretention facilities in the parking lot medians to provide water quality control and installing tree box filters at the existing storm drain inlets.

AC9541 New BMP/LID

This is a potential parking lot retrofit at Little River Shopping Center on Little River Turnpike. Recommendations include the addition of bioretention cells in parking lot islands along Little River Turnpike to provide water quality control.

5.9.1.2 25-Year Projects

AC9159 New Stormwater Pond

There is an existing grass swale receiving runoff from the Townes of Wakefield development along Braddock Road at the south end of Howery Field Park. The project proposes converting the swale to a stormwater pond by using a berm and creating wetlands to provide water quality treatment.

AC9160 Stormwater Pond Retrofit

This project is a retrofit of wet pond WP0195 which treats stormwater runoff from the medium-density residential area of Chapel Lake, along Chapel Lake Court. Recommendations include removing trees from the embankment, modifying the riser to provide storage, excavating the pond bottom for storage and create an aquatic bench around the pond perimeter. There are wetland elements around pond edge but the existing pond banks are beginning to erode. There are no modifications necessary for the existing inlets.

AC9165 Stormwater Pond Retrofit

This is a potential retrofit of dry pond 0102DP behind Whitman Road in Camelot Greens to be converted to a shallow wetland facility. This project will install a new riser structure in place of the existing headwall, remove trees impacting the facility and excavating for additional storage.

AC9166 Stormwater Pond Retrofit

A retrofit is proposed for the dry pond (0627DP) behind Donnybrook Court in the Lafayette Forest neighborhood. Proposed project recommendations include adding a forebay, lengthening the channel flow path, excavating for additional volume and modifying the riser to maximize the volume available for wet storage.

AC9167 Stormwater Pond Retrofit

This is a potential retrofit of dry pond 0128DP that treats multifamily residential homes in the Lafayette Park West neighborhood. The project recommendations include excavating the pond bottom for additional volume storage, replanting vegetation on side slopes and bottom, adding a forebay and lengthening the flow path.

AC9168 Stormwater Pond Retrofit

This project is a retrofit of dry pond 0178DP that treats stormwater runoff from high and medium-density residential areas in the Adams Walk neighborhood. Recommendations include modifying the riser, excavation and installing micropools or plunge pools at inlets for increased settlement of sediment and energy dissipation.

AC9169 Stormwater Pond Retrofit

This project is a retrofit of a long narrow dry pond (DP0373) located in the parking lot at the Wachovia building between Hummer Road and Woodland Road. The project includes converting the pond to a bioretention facility to provide water quality treatment.

AC9170 Stormwater Pond Retrofit

This proposed project is to retrofit existing dry pond 0314DP to an extended detention facility to treat a part of the Lafayette Village neighborhood. Field assessment indicated badly eroded inlet channels and an eroded downstream channel. Recommendations include modifying the riser, adding a forebay at the inlet and a micropool at the outlet.

AC9407 Culvert Retrofit

A retrofit is proposed at the upstream end of the road culvert under Private Lane. The area is flat and would provide some storage as well as water quality benefits through a micropool and plantings.

AC9534 New BMP/LID

This site is a former school converted into the Annandale District Government Center. A bioretention facility is proposed to treat the runoff from the parking lots.

AC9536 New BMP/LID

This project identifies potential areas for a downspout disconnection and installation of bioretention facilities at Wakefield Forest Elementary School. Rain gardens may also be possible here.

AC9537 New BMP/LID

This project proposes to convert an existing swale in Wakefield Chapel Park to a step-pool bioretention facility to provide additional water quality control. The swale now drains single-family residential homes in the Wakefield Chapel Estates neighborhood.

AC9700 Outfall Improvement

This project will reconstruct the storm drain outfall in Wakefield Park to a step pool wetland to provide additional water quality control through removal of an existing concrete channel and excavation of the area. The channel now drains single-family residential homes on Mockingbird Drive and a part of Duncan Drive.

AC9701 Outfall Improvement

This proposed project is located at the upstream edge of Wakefield Park where drainage from a single-family residential area in the Chestnut Hill neighborhood flows into the park. Project recommendations include removing the concrete channel below the outfall and constructing a step pool wetland system to provide additional water quality control.

5.9.2 Non Structural Projects

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Ravensworth Grove, Ravensworth Park, Bristow, Cedar Crest, Heritage Hill, Wakefield Chapel Estates, Chestnut Hill, Fairfax Hill, Tollhouse Woods and Monroe Knolls communities. The stencil marking can educate the public, reduce dumping and reduce the amount of litter and pollutants that enter the storm drain system.

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. One site in this WMA had improper storage of materials. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9904 Rain Barrel Programs - Rain Barrels

Rain barrels provide the first step for residents to disconnect their downspout. This project would be a community-wide outreach program to encourage their use. Several neighborhoods were identified during the upland reconnaissance with roof drainage that would be suitable for this approach. These included Ravensworth Grove, Ravensworth Park, Bristow, Cedar Crest, Heritage Hill, Wakefield Chapel Estates, Chestnut Hill, Fairfax Hill, Tollhouse Woods and Monroe Knolls Truro, Wakefield Chapel Woods, and Wakefield Forest, Woods of Ilda, and Oak Hill.

AC9906 Inspection/Enforcement Enhancement Project - Litter/Trash Enforcement

Litter and trash enforcement is done through the enforcement of regulations for illegal dumping, litter laws, or unsecure truck loads. Community outreach programs for beautifying neighborhoods, including health and safety information, can be used effectively in the implementation of the programs. The areas flagged for enforcement include Parliament Apartments and Fairmont Garden Apartments.

AC9908 Inspection/Enforcement Enhancement Project - Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. Dumpsters in this WMA were flagged as hotspots with grease stains and little to no evidence of appropriate management.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, it includes the area around Willow Woods and Bristow Village.

AC9910 Street Sweeping Program - Street Sweeping

The Truro and Oak Hill neighborhoods were found to have trash, litter, or organic debris in the curb and gutter, flowing to storm drain inlets. This project consists of developing or extending a street sweeping program to remove potential pollutants from the street before they can wash into a storm drain or a stream.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Eleven sites were identified with significant obstructions or dumpsites during the stream assessment. This project would be a community-wide program to remove trees and debris blocking fish passage, and trees and yard waste within the stream.

AC9935 Community Outreach/Public Education - Tree Planting

Four communities assessed during the upland reconnaissance could be sites for a watershed-wide outreach program to encourage tree planting and urban reforestation. These include Truro, Wakefield Chapel Woods, Park Glen Heights and Oak Hill.

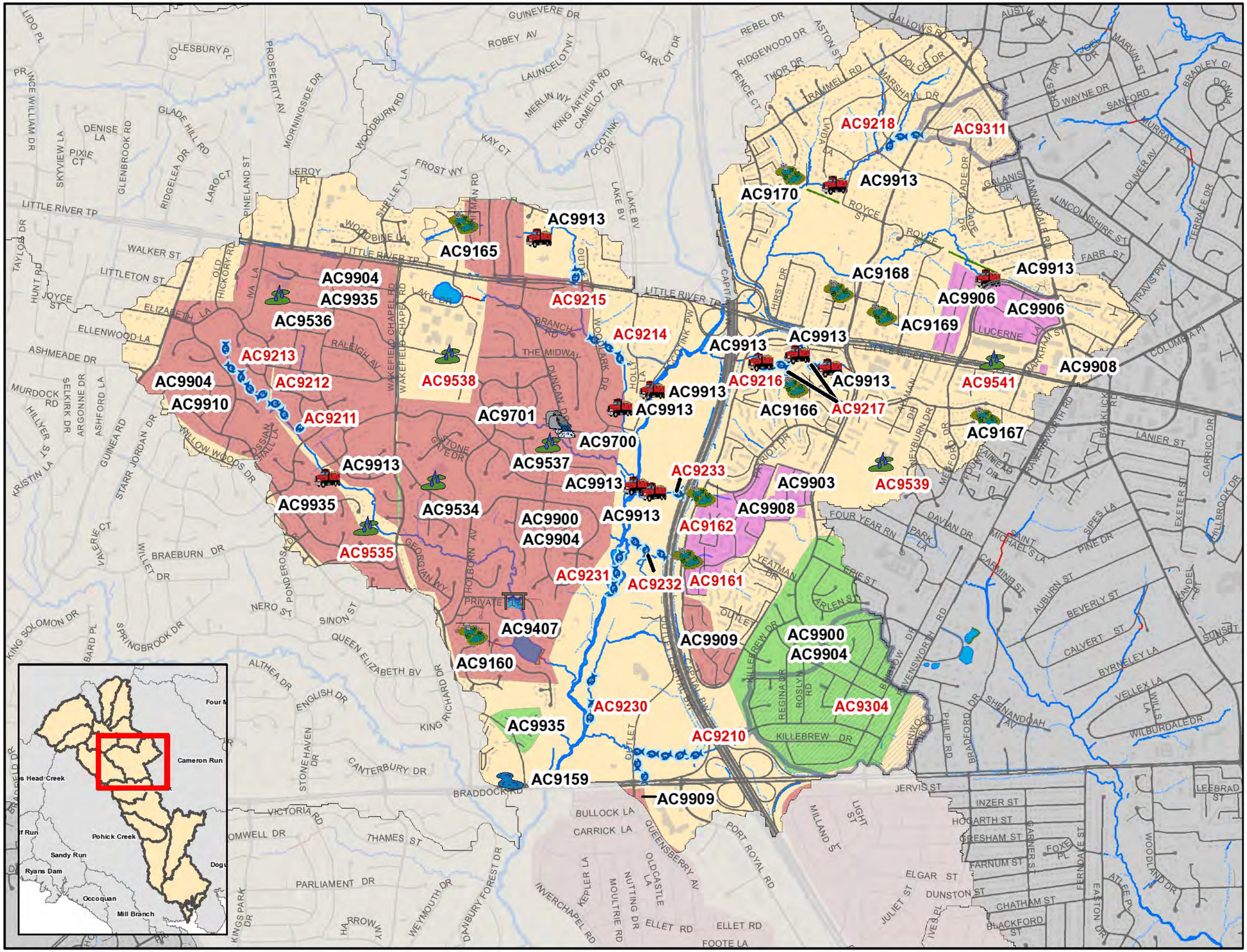
Table 5-9: Mainstem 3 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9161	Stormwater Pond Retrofit	AC-AC-0295	Patriot Village neighborhood	Water Quality	Private - Residential	1 - 10
AC9162	Stormwater Pond Retrofit	AC-AC-0300	Patriot Village neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9210	Stream Restoration	AC-AC-0280	Wakefield Park neighborhood	Water Quality	County - FCPA	1 - 10
AC9211	Stream Restoration	AC-TR-0010	Truro neighborhood	Water Quality	Private - Residential	1 - 10
AC9212	Stream Restoration	AC-TR-0010	Truro neighborhood	Water Quality	Private - Residential	1 - 10
AC9213	Stream Restoration	AC-TR-0010	Truro neighborhood	Water Quality	Private - Residential	1 - 10
AC9214	Stream Restoration	AC-AC-0320	Wakefield Park	Water Quality	County - FCPA	1 - 10
AC9215	Stream Restoration	AC-AC-0320	Mill Creek Park neighborhood	Water Quality	Private / State - VDOT	1 - 10
AC9216	Stream Restoration	AC-AC-0315	Lafayette Forest neighborhood	Water Quality	Private - Residential	1 - 10
AC9217	Stream Restoration	AC-AC-0315	Lafayette Forest neighborhood	Water Quality	Private - Residential	1 - 10
AC9218	Stream Restoration	AC-CO-0020	Pleasant Ridge neighborhood	Water Quality	Private - Residential	1 - 10
AC9230	Stream Restoration	AC-AC-0280	Wakefield Park	Water Quality	County - FCPA	1 - 10
AC9231	Stream Restoration	AC-AC-0285	Wakefield Park	Water Quality	County - FCPA	1 - 10
AC9232	Stream Restoration	AC-AC-0285	Wakefield Park	Water Quality	County - FCPA	1 - 10
AC9233	Stream Restoration	AC-AC-0285	Wakefield Park	Water Quality	County - FCPA	1 - 10
AC9304	Area-Wide Drainage Improvements	AC-AC-0290	Ravensworth Park and Bristow neighborhoods	Water Quality	Private	1 - 10
AC9311	Area-Wide Drainage Improvements	AC-CO-0020	Ramblewood neighborhood	Water Quality	Private	1 - 10
AC9535	BMP/LID	AC-TR-0005	Wakefield Chapel Estates	Water Quality	Private - Residential	1 - 10
AC9538	BMP/LID	AC-AC-0310	Northern Virginia Community College parking lot	Water Quality	State	1 - 10

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9539	BMP/LID	AC-AC-0315	Annandale Terrace Elementary School	Water Quality	County - FCPS	1 - 10
AC9541	BMP/LID	AC-AC-0315	Little River Shopping Center	Water Quality	Private - Commercial	1 - 10
AC9159	New Stormwater Pond	AC-AC-0280	Howery Field Park	Water Quality and Quantity	County - FCPA	11 - 25
AC9160	Stormwater Pond Retrofit	AC-TR-0000	Chapel Lake	Water Quality and Quantity	Private - Residential	11 - 25
AC9165	Stormwater Pond Retrofit	AC-AC-0320	Camelot Greens	Water Quality and Quantity	Private - Residential	11 - 25
AC9166	Stormwater Pond Retrofit	AC-AC-0315	Lafayette Forest	Water Quality	Private - Residential	11 - 25
AC9167	Stormwater Pond Retrofit	AC-AC-0315	Lafayette Park West	Water Quality and Quantity	Private - Residential	11 - 25
AC9168	Stormwater Pond Retrofit	AC-CO-0000	Adams Walk	Water Quality	Private - Residential	11 - 25
AC9169	Stormwater Pond Retrofit	AC-CO-0005	Wachovia Building on Woodland Rd	Water Quality	Private - Commercial	11 - 25
AC9170	Stormwater Pond Retrofit	AC-CO-0015	Lafayette Village	Water Quality	Private - Residential	11 - 25
AC9407	Culvert Retrofit	AC-TR-0000	Between Private Ln and Queen Elizabeth Blvd	Water Quality	State - VDOT	11 - 25
AC9534	BMP/LID	AC-TR-0000	Annandale District Govt Center	Water Quality	County	11 - 25
AC9536	BMP/LID	AC-TR-0010	Wakefield Forest Elementary School	Water Quality	County - FCPS	11 - 25
AC9537	BMP/LID	AC-AC-0310	Wakefield Park	Water Quality	County - FCPA	11 - 25
AC9700	Outfall Improvement	AC-AC-0310	Wakefield Park	Water Quality	County - FCPA	11 - 25
AC9701	Outfall Improvement	AC-AC-0310	Wakefield Park	Water Quality	County - FCPA	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9904	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9906	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9910	Street Sweeping Program	Multiple	Multiple	Water Quality	Multiple
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple
AC9935	Community Outreach/Public Education	Multiple	Multiple	Water Quality and Quantity	Multiple



Map 5.9

WMA: Mainstem 3
Proposed Projects

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5.10 Accotink Mainstem 4

The results of the subwatershed ranking analysis showed a significant number of subwatersheds in Mainstem 4 WMA to be in good condition primarily due to the influence of undeveloped parcels of Lake Accotink Park. In terms of overall ranking, Mainstem 4 had four highest priority subwatersheds in the watershed.

5.10.1 Structural Projects

5.10.1.1 10-Year Projects

Accotink Mainstem 4 Stream Restoration Projects -- Three stream restoration projects and two culvert retrofits have been proposed on the tributary draining Kings Park and continuing into Lake Accotink Park. These projects should be constructed starting at the upstream end with AC9207 in Kings Park, followed by AC9206 downstream. Culvert retrofit AC9408 may provide some attenuation in flows which should be accounted for before designing stream restoration project AC9205. The final project in the series is culvert retrofit AC9402.

AC9205 Stream Restoration

This is a potential stream restoration site behind Thames Street in Lake Accotink Park in the Kings Park subdivision. Field investigation indicated moderate stream bank erosion and parts of the stream was widened to over 100 feet in many areas. The recommendation is to reconnect the channel to the floodplain by reducing channel dimensions and raising the bed elevation.

AC9206 Stream Restoration

This is a potential stream restoration site in the Kings Park subdivision between Thames Street, Victoria Street and Perth Court. Field investigations found the stream with moderate incision and stream bank erosion and over-widened stream conditions. An existing sanitary sewer crossing encased in concrete as well as an exposed sewer manhole standpipe are present in the stream channel. Recommendations include reconnecting this channel to the floodplain, possible channel relocation to redirect flows away from existing infrastructure, regrading and stabilization.

AC9207 Stream Restoration

This project is located entirely within Kings Park and extends from the end of Trafalgar Court to a culvert under Cromwell Drive. The current sinuous, incised, and over-widened stream channel is eroding on the outside of meander bends as well as along straight segments of the steam. Recommendations include creating a nested channel, reducing the existing channel dimensions and installing grade controls as well as armor-in-place stabilization techniques or stone toe protection.

AC9229 Stream Restoration

This project is intended to restore an eroded section of Flag Run located between the north side of the Capital beltway (I-495) and the south side of Queensberry Avenue. Currently, this channel is experiencing severe bank and bed erosion. The project would include regrading and stabilizing the eroded stream banks, protecting the outfall and potentially replacing the existing culvert with a bottomless arch culvert.

AC9302 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the large medium-density residential area in the Ravensworth neighborhood by installing tree box filters at various inlets throughout the neighborhood.

AC9303 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the untreated medium-density residential area in the Kings Park subdivision by installing tree box filters at inlets, disconnecting downspouts and installing rain gardens.

AC9400 Culvert Retrofit

This project, located at the road culvert under Queensbury Avenue in Lake Accotink Park, would modify the control structure to manage the high frequency storm events, reduce stream channel erosion and improve water quality. The project is located downstream of stream restoration project AC9229 and culvert retrofit AC9401. Design of all three projects should be performed concurrently.

AC9401 Culvert Retrofit

A culvert retrofit is proposed under the Capital Beltway in North Springfield. This project would add a control structure on the upstream side of the road culvert to control small, high frequency storms, primarily for water quality control. The project is located in the middle of two segments of stream restoration project AC9229 and upstream of culvert retrofit AC9400. Design of all three projects should be performed concurrently.

5.10.1.2 25-Year Projects

AC9142 New Stormwater Pond

This site is located at an industrial area on Morrissette Drive. Proposed recommendations include adding a new wetland to provide storage and a forebay at the outfall to provide water quantity and quality control. The project may be constrained by an electric line overhead.

AC9402 Culvert Retrofit

This project proposes to retrofit the upstream side of the road culvert under Danbury Forest Drive in Lake Accotink Park. This would add a control structure on the upstream side of the culvert to regulate discharge of the small, high frequency storms.

AC9403 Culvert Retrofit

This is a potential retrofit of a road culvert under Southampton Drive in the Kings Park neighborhood. Recommendations include adding a control structure on the upstream side of the road culvert to control the storm surge from rain events.

AC9523 New BMP/LID

Several bioretention facility options are proposed at the North Springfield Elementary School. Recommendations include adding a bioretention facility at the end of the main parking area, bioretention or rain gardens at the downspouts, disconnecting downspouts and adding stormwater planters on the side near the secondary parking area.

AC9524 New BMP/LID

This project is located at the Church of Jesus Christ on Inver Chapel Road. Proposed project recommendations include disconnecting downspouts, directing the runoff to rain gardens at the back of the church and treating the parking lot runoff by implementing bioretention at both ends of the parking lot. There is also potential to disconnect downspouts on apartment buildings on Rexford Court and route the flow toward a new bioretention in an open grassy area.

AC9525 New BMP/LID

A series of bioretention filters are proposed at yard inlets draining Tivoli Condominiums behind Torington Drive to treat the impervious runoff. Recommendations include modifying the existing storm drain structure to allow minimal ponding and adding plantings around the structures for uptake.

AC9526 BMP/LID Retrofit

This project recommends a bioretention facility at the rear of the West Springfield Business Center parking lot at the industrial area on Morrissette Drive. The proposed bioretention would treat the runoff from the parking lot used for fleet storage and the fueling area.

AC9527 New BMP/LID

This is a potential parking lot retrofit at Kings Park Elementary School. Three bioretention facilities are proposed at yard inlets on the site to capture and treat stormwater runoff.

5.10.2 Non Structural Projects

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. Three sites in this WMA had an uncovered fueling area, large dirt mounds without cover, or building materials stored outside. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, it includes the areas around Ravensworth, Springfield and Kings Park.

AC9913 Dumpsite/Obstruction Removal - Dumpsite/Obstruction

Four sites were identified with significant obstructions or dumpsites during the stream assessment. This project would be a community-wide program to remove trees and concrete within the stream blocking fish passage.

Table 5-10: Mainstem 4 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9205	Stream Restoration	AC-AC-0270	Lake Accotink Park	Water Quality	County - FCPA	1 - 10
AC9206	Stream Restoration	AC-AC-0270	Kings Park neighborhood	Water Quality	Private - Residential	1 - 10
AC9207	Stream Restoration	AC-AC-0275	Kings Park	Water Quality	County - FCPA	1 - 10
AC9229	Stream Restoration	AC-FR-0000, -0005	Flag Run Park, Lake Accotink Park / I-495	Water Quality	County - FCPA / State - VDOT	1 - 10
AC9302	Area-Wide Drainage Improvements	AC-AC-0240	Ravensworth neighborhood	Water Quality	Private - Residential	1 - 10
AC9303	Area-Wide Drainage Improvements	AC-AC-0260	Kings Park neighborhood	Water Quality	Private	1 - 10
AC9400	Culvert Retrofit	AC-FR-0000	Queensberry Ave	Water Quality	State - VDOT	1 - 10
AC9401	Culvert Retrofit	AC-FR-0005	I-495	Water Quality	State - VDOT	1 - 10
AC9142	New Stormwater Pond	AC-AC-0260	Behind Morrissette Dr	Water Quality and Quantity	Private - Utility	11 - 25
AC9402	Culvert Retrofit	AC-AC-0270	Lake Accotink Park	Water Quality and Quantity	State - VDOT	11 - 25
AC9403	Culvert Retrofit	AC-AC-0270	Lake Accotink Park	Water Quality	State - VDOT	11 - 25
AC9523	BMP/LID	AC-FR-0005	North Springfield Elementary School	Water Quality	County - FCPS	11 - 25
AC9524	BMP/LID	AC-AC-0235	Church of Jesus Christ and behind Rexford Ct	Water Quality	Private	11 - 25
AC9525	BMP/LID	AC-AC-0248	Tivoli Condominiums	Water Quality	Private	11 - 25
AC9526	BMP/LID	AC-AC-0260	West Springfield Business Center	Water Quality	Private - Commercial	11 - 25
AC9527	BMP/LID	AC-AC-0270	Kings Park Elementary School	Water Quality	County - FCPS	11 - 25
AC9703	Outfall Improvement	AC-AC-0270	Lake Accotink Park	Water Quality	County - FCPA	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9913	Dumpsite/Obstruction Removal	Multiple	Multiple	Water Quality	Multiple

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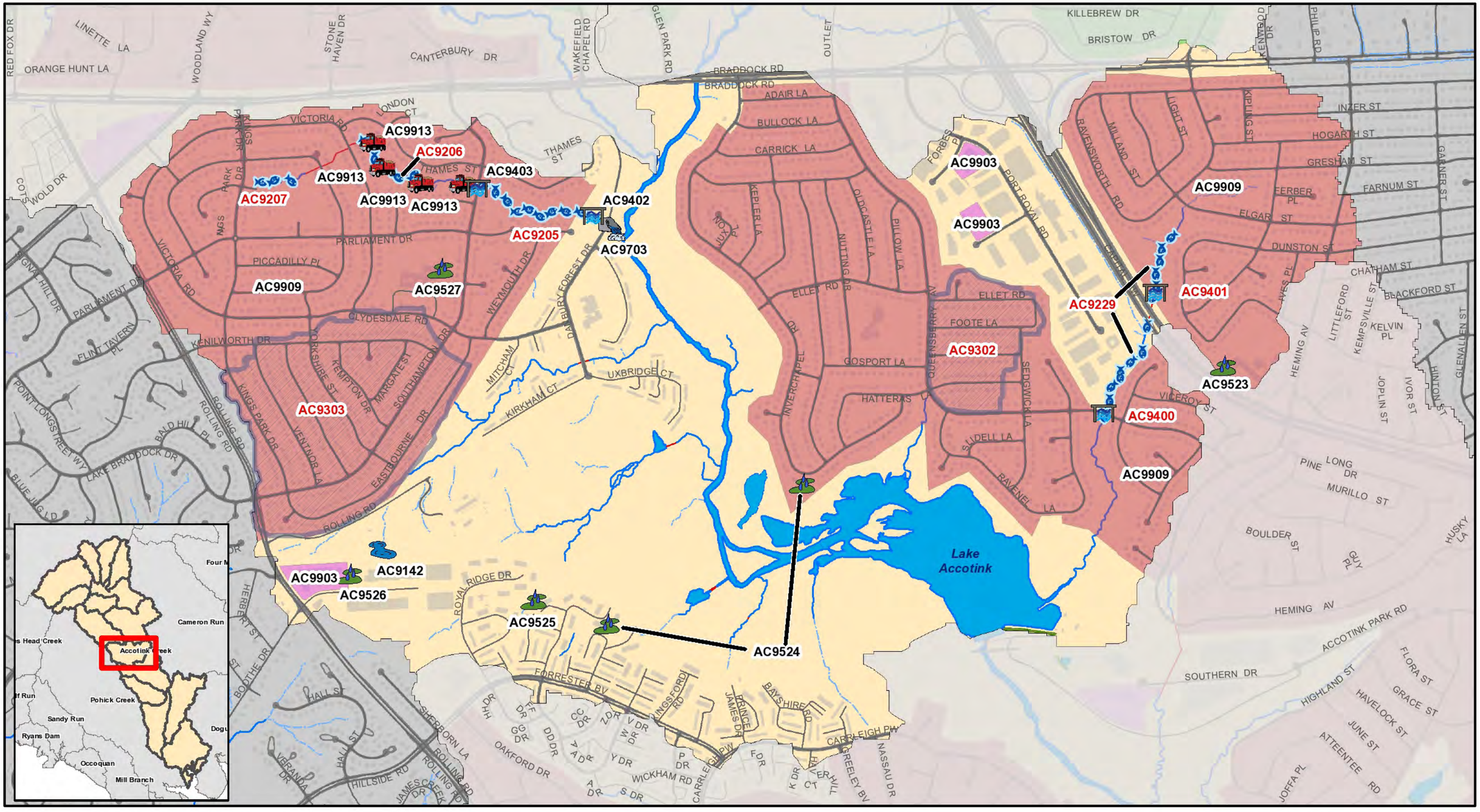

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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Community Outreach/Public Education
- Area-wide Drainage Improvements
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement Project
- Rain Barrel Programs
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.10

WMA: Mainstem 4
Proposed Projects

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5.11 Accotink Mainstem 5

The results of the subwatershed ranking analysis showed all except three subwatersheds in Mainstem 5 WMA to be in good condition, primarily due to the influence of undeveloped parcels of Accotink Stream Valley Park. Only two subwatersheds were ranked as highest priority in the watershed.

5.11.1 Structural Projects

5.11.1.1 10-Year Projects

AC9139 Stormwater Pond Retrofit

This is a retrofit of existing dry pond 0935DP which will be converted to an extended detention facility through removing the concrete channel in the pond and replacing it with a meandering channel and modifying the riser to reduce stream channel erosion downstream.

AC9201 Stream Restoration

This stream restoration parallels Bardu Avenue in the Accotink Stream Valley Park. The upstream portion of the channel is relatively stable except for minor to moderate erosion occurring in isolated areas, and the downstream portion is very sinuous with moderate to severe erosion and over-widening evident. A partially exposed sanitary sewer crossing is present in the downstream portion of the project site. Recommendations include reducing the current channel dimensions, redirecting flows away from eroded meanders and installing grade controls to dissipate stream energy and prevent further widening. Armor-in-place or bioengineering stabilization techniques and stone toe protection may be needed on outer meander bends and at the sanitary sewer line crossing.

AC9202 Stream Restoration

The upstream portion of the channel is relatively stable except for minor to moderate erosion occurring in isolated areas, and the downstream portion is very sinuous with moderate to severe erosion and over-widening evident. A partially exposed sanitary sewer crossing is present in the downstream portion of the project site. The upstream section of the reach is severely eroded near the outfall; the downstream portion of this project is incised and experiencing moderate stream bank erosion. Restoration of the upstream portion of this project will focus on raising the bed elevation of the channel as well as regrading and stabilizing stream banks with armor-in-place or bioengineering techniques. The downstream portion of this project will focus on reconnecting this channel to the floodplain by reducing channel dimensions and raising the bed elevation.

AC9203 Stream Restoration

This proposed project is a stream restoration in Lake Accotink Park. Field investigation indicated areas of high stream bank erosion near Highland Street that require stabilization and an area under the sanitary sewer line that is actively eroding. Project recommendations include stream bank stabilization and installing flow deflectors upstream to direct the stream away from the stream bank.

AC9204 Stream Restoration

This is a potential stream restoration site along Heming Avenue in Lake Accotink Park. Field investigation indicated stream bank erosion on meanders and straight sections, including at a

storm drain outfall. Recommendations include reconnecting this channel to the original floodplain by reducing channel dimensions and raising the bed elevation. Grade controls should also be installed and the storm drain outfall corrected.

5.11.1.2 25-Year Projects

AC9137 Stormwater Pond Retrofit

This is a proposed retrofit of existing dry pond 0013DP behind Villa Park Road. Recommendations include removing the concrete channels and adding a riser for the outlet and a forebay micropool. Raising the outlet could provide water quality control and channel erosion control without sacrificing large storm detention.

AC9138 Stormwater Pond Retrofit

This project proposes to retrofit the existing dry pond (DP0049), which treats the stormwater runoff from the Toyota Dealership on Amherst Avenue, by widening and excavating the pond for water quality volume storage. No changes are recommended for the riser.

AC9140 Stormwater Pond Retrofit

This project recommends to retrofit wet pond WP0257 between Attendee Road and Floyd Avenue in Brookfield Park. Field assessment indicated that the only outlet for the pond is the spillway and that the pond receives stormwater but does not provide storage. Proposed recommendations include adding an aquatic bench and modifying the outlet and excavating the pond to provide storage.

AC9141 Stormwater Pond Retrofit

This project proposes a retrofit of dry pond DP0415 along Highland Street in the Highland Business Park. Recommendations include modifying the riser, removing concrete channels and lengthening the flow path. The bottom of the pond is swampy and could potentially be converted to a wetland or a pond with wetland elements.

AC9516 New BMP/LID

This project recommends the installation of a bioretention facility or tree box filters to treat runoff at each storm drain inlet in Lee Valley Apartments.

AC9517 New BMP/LID

This project recommends installing a bioretention facility in the courtyard at Garfield Elementary School to treat parking lot runoff and a grass swale to be constructed between the parking lot and fence.

AC9518 New BMP/LID

There are numerous downspouts that can be disconnected at Springfield United Methodist Church to improve water quality treatment. Additional recommendations include removing a concrete swale and converting the area to a vegetated swale and adding curb cuts at the edge of the parking lot to avoid concentrated flow to the swale.

AC9519 New BMP/LID

This project would treat the southern section of the parking lot of Springfield Shopping Plaza for water quality by creating rain gardens at depressed curb islands and adding bioretention at inlets.

AC9520 BMP/LID Retrofit

The northern section of Springfield Shopping Plaza is treated for water quantity control by existing underground facilities. Recommendations include installing rain gardens at depressed curb islands and providing bioretention at inlets to treat parking lot runoff for water quality.

AC9521 New BMP/LID

This parking lot retrofit is located at Saint Bernadette Church and School. Recommendations include adding a bioretention area in the back of the school and disconnecting downspouts to direct flow to the proposed bioretention facility.

AC9522 New BMP/LID

This proposed retrofit is located at Grace Presbyterian Church on Bath Street. The recommendation is to install a bioretention area along the parking lot to capture uncontrolled runoff. Some runoff is currently bypassing storm drains and causing stream bank erosion downstream of the site.

5.11.2 Non Structural Projects

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. Two sites in this WMA had oil tanks stored outdoors or roofing material stored outdoors. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9908 Inspection/Enforcement Enhancement Project - Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. Dumpsters at one location in this WMA were flagged as a hotspot with evidence of being too full and overflowing grease barrels.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, they included the area around Keene Mill Manor, Cardinal Forest, Springfield and Monticello Forest.

AC9914 Community Outreach/Public Education - Turf Management

Outreach to turf managers is similar to that of lawn care; however, it is intended more for data gathering to assess current practices and education about runoff pollution. In this WMA, West Springfield, Hunter Village, Keene Mill Manor and Cardinal Forest were identified as a potential outreach sites.

Table 5-11: Mainstem 5 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9139	Stormwater Pond Retrofit	AC-AC-0185	Westhaven neighborhood	Water Quality	Private - Residential	1 - 10
AC9201	Stream Restoration	AC-AC-0195	Accotink Stream Valley Park	Water Quality	County - FCPA	1 - 10
AC9202	Stream Restoration	AC-AC-0200	Charlestown neighborhood	Water Quality	Private - Residential	1 - 10
AC9203	Stream Restoration	AC-AC-0215	Lake Accotink Park	Water Quality	County - FCPA	1 - 10
AC9204	Stream Restoration	AC-AC-0220	Lake Accotink Park	Water Quality	County - FCPA	1 - 10
AC9137	Stormwater Pond Retrofit	AC-CA-0005	Behind Villa Park Rd	Water Quality and Quantity	Private - Residential	11 - 25
AC9138	Stormwater Pond Retrofit	AC-CA-0010	Toyota Dealership on Amherst Ave	Water Quality and Quantity	Private - Commercial	11 - 25
AC9140	Stormwater Pond Retrofit	AC-AC-0205	Brookfield Park	Water Quality and Quantity	County - FCPA	11 - 25
AC9141	Stormwater Pond Retrofit	AC-AC-0215	Highland Business Park	Water Quality and Quantity	Private - Commercial	11 - 25
AC9516	BMP/LID	AC-CA-0000	Lee Valley Apts	Water Quality	Private	11 - 25
AC9517	BMP/LID	AC-CA-0010	Garfield Elementary School	Water Quality	County - FCPS	11 - 25
AC9518	BMP/LID	AC-CA-0010	Springfield United Methodist Church	Water Quality	Private - Church	11 - 25
AC9519	BMP/LID	AC-CA-0010	Springfield Plaza	Water Quality	Private	11 - 25
AC9520	BMP/LID	AC-CA-0010	Springfield Plaza	Water Quality	Private	11 - 25
AC9521	BMP/LID	AC-AC-0185	Saint Bernadette Church and School	Water Quality	Private - Church	11 - 25
AC9522	BMP/LID	AC-AC-0205	Grace Presbyterian Church	Water Quality	Private - Church	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9914	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple

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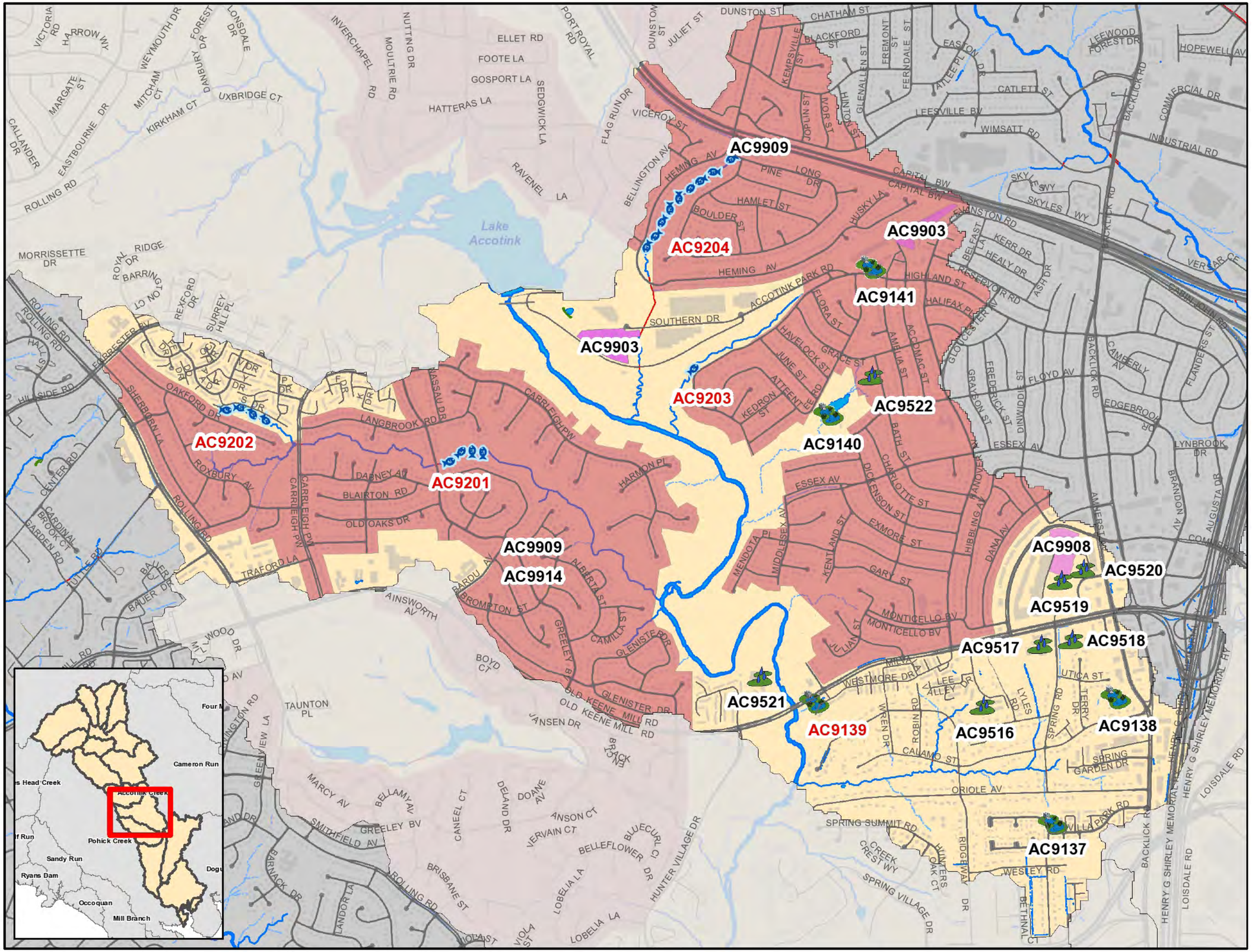

Map 5.11

WMA: Mainstem 5
Proposed Projects

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5.12 Accotink Mainstem 6

The results of the subwatershed ranking analysis showed all except three subwatersheds in Mainstem 6 WMA to be in good condition primarily due to the influence of undeveloped parcels of Ft. Belvoir, West Springfield Park, Accotink Stream Valley Park and Springfield Golf Course. Only two subwatersheds were ranked as highest priority for overall project.

5.12.1 Structural Projects

5.12.1.1 10-Year Projects

AC9133 Stormwater Pond Retrofit

This project is a retrofit of existing dry pond 0462DP located on the upstream side of Hunter Village Drive, which treats a high-density residential area in the Hunter Village neighborhood. To improve the treatment provided at this site, the project recommendation is to install a new riser structure and stabilize the existing stream channel into the facility.

AC9136 Stormwater Pond Retrofit

This project is a retrofit of a dry pond on Kenwood Avenue in the Kenwood Oaks neighborhood. Recommendations include excavating the bottom of the pond to create a shallow wetland and to provide additional storage by adjusting the outlet to maximize detention to improve water quality treatment.

AC9200 Stream Restoration

This project proposes to restore an eroded section of stream channel located in both private and public areas downstream of Greeley Boulevard. Restoration of this channel will focus on regrading and stabilizing eroded stream banks through the use of armor-in-place techniques on outer meander bends and bioengineering techniques on the inside meander bends and any straight portions of the channel.

AC9514 New BMP/LID

This project proposes to treat the parking lot runoff of the Cardinal Forest Plaza for water quality by constructing bioretention cells in the parking lot along Old Keene Mill Road.

AC9515 New BMP/LID

This project proposes to treat the parking lot runoff of the Old Keene Hills Shopping Center by implementing bioretention areas in parking islands or on the periphery of the lot.

5.12.1.2 25-Year Projects

AC9131 Stormwater Pond Retrofit

This project proposes to retrofit existing dry pond 0170DP, which treats the stormwater runoff from a medium-density residential area in the Shirley Springs neighborhood, by removing the concrete channel and excavating a micropool at the inlet to add water quality control.

AC9132 Stormwater Pond Retrofit

This proposed project is to retrofit the existing dry pond (0169DP), which treats the stormwater runoff from the low and medium-density residential areas in the Shirley Springs neighborhood

by removing the concrete channel, excavating the bottom for water quality volume storage and adjusting the outlet size. Curb cuts are also recommended to treat runoff from the road.

AC9134 Stormwater Pond Retrofit

This proposed project includes converting the existing pond in the Rolling Forest neighborhood to a detention pond by removing concrete channels, adding plunge pools, modifying the riser and increasing the flow path. This will provide water quality treatment through extended detention.

AC9135 Stormwater Pond Retrofit

This is a project which groups retrofits of two small dry ponds: 0144DP behind Bethnal Place and a pond behind Caton Woods Court. The recommendation is to excavate both ponds for additional capacity to provide water quality along with the original detention control.

AC9513 New BMP/LID

The proposed project is to treat the rooftop runoff of the West Springfield Elementary School with a bioretention facility to improve the water quality onsite.

5.12.2 Non Structural Projects

AC9907 Community Outreach/Public Education - Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. In this WMA, West Springfield and Hunter Village were identified as a potential outreach sites.

AC9908 Inspection/Enforcement Enhancement Project - Dumpster Maintenance

One source of litter and pollutants in stormwater runoff is poorly maintained dumpsters and other waste management practices. This project is a community-wide enforcement and outreach approach to properties where problems were identified during the upland reconnaissance. One area in this WMA was flagged with evidence of overflowing grease barrels.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, they included the area around Keene Mill Manor, West Springfield and Hunter Village.

Table 5-12: Mainstem 6 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9133	Stormwater Pond Retrofit	AC-AC-0145	Hunter Village neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9136	Stormwater Pond Retrofit	AC-AC-0175	Kenwood Oaks neighborhood	Water Quality and Quantity	Private - Residential	1 - 10
AC9200	Stream Restoration	AC-AC-0160	Downstream from Greeley Blvd / Hunter Village Park	Water Quality	Private / County - FCPA	1 - 10
AC9514	BMP/LID	AC-AC-0170	Cardinal Forest Plaza	Water Quality	Private - Commercial	1 - 10
AC9515	BMP/LID	AC-AC-0175	Old Keene Mill Shopping Center	Water Quality	Private - Commercial	1 - 10
AC9131	Stormwater Pond Retrofit	AC-AC-0135	Bonniemill Acres neighborhood	Water Quality	Private - Residential	11 - 25
AC9132	Stormwater Pond Retrofit	AC-AC-0140	Shirley Springs neighborhood	Water Quality	Private - Residential	11 - 25
AC9134	Stormwater Pond Retrofit	AC-AC-0145	Rolling Forest neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9135	Stormwater Pond Retrofit	AC-AC-0180	Bethnal Pl and Caton Woods Ct	Water Quality and Quantity	Private - Residential	11 - 25
AC9513	BMP/LID	AC-AC-0160	West Springfield Elementary School	Water Quality	County - FCPS	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9908	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9914	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple

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AC9908
AC9514
AC9515
AC9136
AC9907
AC9909
AC9200
AC9513
AC9135
AC9133
AC9134
AC9132
AC9131
FORT BELVOIR NORTH AREA
Cameron Run
Accotink Creek
Pohick Creek
Sandy Run
Ryans Dam
Occoquan
Mill Branch
Dogue
N
0 0.125 0.25
Miles
Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Community Outreach/Public Education
Area-wide Drainage Improvements
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement Project
Rain Barrel Programs
Street Sweeping Program
Studies, Surveys and Assessments
Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.12

WMA: Mainstem 6
Proposed Projects

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5.13 Accotink Mainstem 7

The results of the subwatershed ranking analysis showed six of the 16 subwatersheds in Mainstem 7 have low scores in water quality only; this is primarily due to the influence of industrial areas. Three subwatersheds in the northern portion of the WMA are in good condition because they are within the boundaries of the Fort Belvoir North Area. Four additional subwatersheds in the southern portion of the WMA are in good condition due to the influence of undeveloped park land. Only one subwatershed in the WMA scored among the lowest 40 percent of all the subwatersheds in Accotink Creek.

5.13.1 Structural Projects

5.13.1.1 10-Year Projects

AC9123 Stormwater Pond Retrofit

This project would retrofit the existing dry pond (DP0411) on Cinder Bed Road at Gateway 95 Business Park to provide increased water quality control. Recommendations include modifying the riser, adding plunge pools at the inflows and removing the concrete channels.

AC9126 Stormwater Pond Retrofit

The proposed project consists of retrofitting the existing dry pond (DP0338) at Alban Industrial Center off of Alban Road. The pond has almost no detention as the outlet structure is oversized. Recommendations include modifying the riser with a smaller outlet, removing concrete channels, excavating the bottom and lengthening the flow path.

AC9300 Area-Wide Drainage Improvements

Area-wide drainage improvements are recommended to treat the runoff from the medium-density residential area in the Pohick Estates neighborhood by installing tree box filters at curb inlets and rain gardens at yard inlets.

AC9509 New BMP/LID

The parking lot in Lockport Industrial Park off of Telegraph Square Drive currently drains to the floodplain with no stormwater management. This project recommends a installing a bioretention facility along the edge of the parking lot to treat runoff for water quality.

AC9510 BMP/LID Retrofit

The entire Lockport Industrial park is lacking water quality treatment. Recommend installing tree box filters at storm drain inlets to treat runoff for water quality.

AC9511 New BMP/LID

This project proposes to convert the existing grass swale at the Deer Park parking lot of Lockport Industrial Park to a bioretention facility to treat the parking lot runoff for water quality.

AC9512 New BMP/LID

This project proposes to construct a vegetated swale to provide water quality control in the area adjacent to the HRM Automotive parking lot off of Alban Road. Because of the slope of the site, the best approach is to construct it as a step pool system with check dams.

5.13.1.2 25-Year Projects

AC9124 Stormwater Pond Retrofit

This project proposes to convert existing dry pond DP0299 at Newington Commerce Center to a wet pond by installing a riser. This would promote additional water quality benefits through pollutant removal.

AC9125 Stormwater Pond Retrofit

Field assessment indicated that dry pond 0660DP in the Terra Grande neighborhood is functioning well but is accumulating sediment. Project recommendations include removing sediment and modifying the control structure to provide extended detention.

AC9127 Stormwater Pond Retrofit

This existing pond at the Alban Industrial Center is currently functioning as dry pond. Project recommendations include excavation of accumulated sediment and debris and installation of a new riser structure to provide extended detention for water quality treatment.

AC9128 Stormwater Pond Retrofit

Possible retrofits at dry pond 0582DP, between Springfield Hills Drive and Woodstown Drive in the Terra Grande neighborhood, include removing accumulated debris, modifying the riser and stabilizing the low flow channel to add water quality treatment to the existing quantity control.

AC9129 Stormwater Pond Retrofit

The existing pond at the VA 95 Industrial Park is proposed to be retrofitted to a wet pond by raising the outlet structure to provide additional water quality treatment.

AC9130 New Stormwater Pond

A car dealership on Alban Road has a large amount of untreated impervious surface. Recommendations include excavating for a new wet pond, using the existing storm drains as inflows and installing a riser to provide water quality and quantity treatment.

5.13.2 Non Structural Projects

AC9902 Inspection/Enforcement Enhancement Project - Vehicle Maintenance

This project would provide community-wide targeted enforcement of spill prevention and pollution prevention regulations for sites where vehicles are maintained. The upland reconnaissance identified two car washing areas discharging directly to a tree box filter device and a fleet washing facility discharging through a dry pond without treatment.

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. Three sites in this WMA had an uncovered fueling area or gravel berms around gas storage tanks. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9904 Rain Barrel Programs - Rain Barrels

Rain barrels provide the first step for residents to disconnect their downspout. This project would be a community-wide outreach program to encourage their use. One neighborhood, Springfield Oaks, was identified during the upland reconnaissance with roof drainage that would be suitable for this approach.

AC9907 Community Outreach/Public Education - Lawn Care

This project would provide community-wide education and guidance to homeowners on lawn care practices that would potentially reduce pollutants in stormwater runoff. In this WMA, Pohick Estates, Terra Grande and Springfield Oaks were identified as a potential outreach sites.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, they included Pohick Estates and Terra Estates.

Table 5-13: Mainstem 7 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9123	Stormwater Pond Retrofit	AC-AC-0075	Gateway 95 Business Park	Water Quality	Private - Commercial	1 - 10
AC9126	Stormwater Pond Retrofit	AC-AC-0095	Alban Industrial Center	Water Quality and Quantity	Private - Commercial	1 - 10
AC9300	Area-Wide Drainage Improvements	AC-AC-0080	Pohick Estates neighborhood	Water Quality	Private	1 - 10
AC9509	BMP/LID	AC-AC-0070	Lockport Industrial Park	Water Quality	Private - Industrial	1 - 10
AC9510	BMP/LID	AC-AC-0070	Lockport Industrial Park	Water Quality	Private - Industrial	1 - 10
AC9511	BMP/LID	AC-AC-0080	Deer Park parking lot	Water Quality	Private - Industrial	1 - 10
AC9512	BMP/LID	AC-AC-0105	HRM Automotive	Water Quality	Private - Industrial	1 - 10
AC9124	Stormwater Pond Retrofit	AC-AC-0085	Newington Commerce Center	Water Quality	Private - Industrial	11 - 25
AC9125	Stormwater Pond Retrofit	AC-AC-0090	Terra Grande neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9127	Stormwater Pond Retrofit	AC-AC-0095	Alban Industrial Center	Water Quality and Quantity	Private - Commercial	11 - 25
AC9128	Stormwater Pond Retrofit	AC-AC-0095	Terra Grande	Water Quality and Quantity	Private - Residential	11 - 25
AC9129	Stormwater Pond Retrofit	AC-AC-0105	VA 95 Industrial Park	Water Quality	Private - Industrial	11 - 25
AC9130	New Stormwater Pond	AC-FL-0005	Alban Road	Water Quality and Quantity	Private - Commercial	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9902	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9904	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9914	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple

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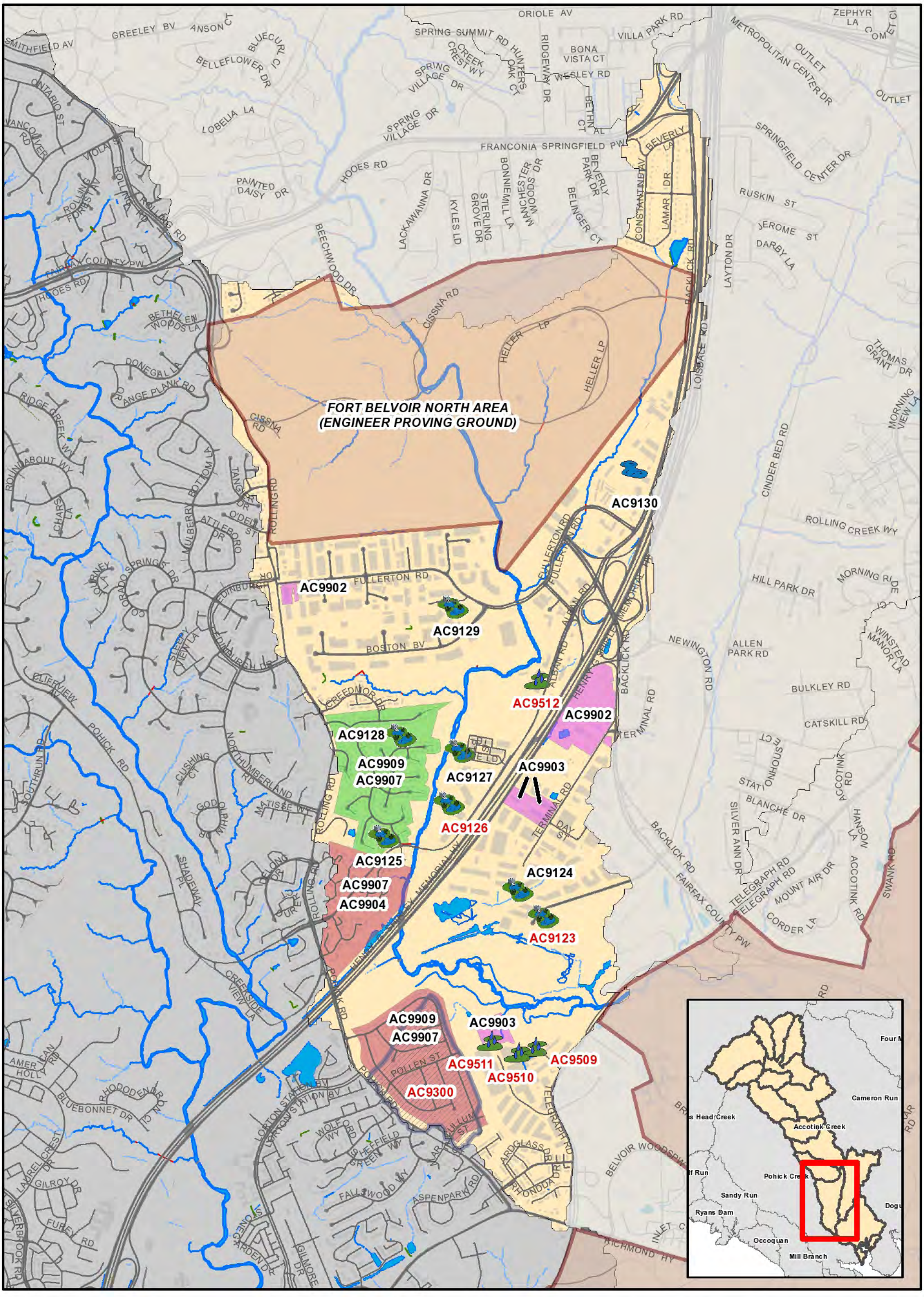

Buffer Restoration	New Stormwater Pond	Community Outreach/Public Education	
Stream Restoration	Outfall Improvement	Area-wide Drainage Improvement	
BMP/LID	Stormwater Pond Retrofit	Land Conservation Project	
Culvert Retrofit	Other	Flood Protection/Mitigation	
Dumpsite/Obstruction Removal		Inspection/Enforcement Enhancement	
		Rain Barrel Program	
		Street Sweeping Program	
		Studies, Surveys and Assessments	

0 0.125 0.25 Miles

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.13

WMA: Mainstem 7
Proposed Projects

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5.14 Accotink Mainstem 8

Almost all the subwatersheds of Mainstem 8 are either completely or partially within the boundaries of Fort Belvoir. Retrofits or improvement projects were assessed at sites which were outside of the fort and under the jurisdiction of Fairfax County.

5.14.1 Structural Projects

5.14.1.1 10-Year Projects

AC9101 Stormwater Pond Retrofit

This existing dry pond, 0629DP, is on the upstream side of the road culvert underneath Mount Air Drive near Telegraph Road in the Village of Mount Air neighborhood. The pond is located within a forested area where a perennial stream channel flows through the road culvert. There is significant erosion on the downstream side of this culvert. The proposed retrofit consists of installing a weir wall control structure to modify the outflow characteristics to provide water quality treatment. The receiving stream on the downstream side of the road culvert will be stabilized to prevent further erosion.

5.14.1.2 25-Year Projects

AC9100 Stormwater Pond Retrofit

This project proposes converting dry pond DP0401 along Morning Meadow Drive in the Landsdowne neighborhood to a wet pond by removing the low flow outlet to provide additional water quality treatment and stabilizing the downstream channel with step pools or check dams.

AC9500 New BMP/LID

The project recommends converting the unused portions of the parking lot in Pohick Industrial Park to bioretention facilities to increase stormwater treatment and to remove some impervious surface. Reconfiguration of the storm drains may be required for implementation.

5.14.2 Non Structural Projects

AC9900 Community Outreach/Public Education - Stenciling

This community-wide project involves marking the storm drains within the Cook Inlet community. The stencil marking can educate the public, reduce dumping, and reduce the amount of litter and pollutants that enter the storm drain system.

AC9902 Inspection/Enforcement Enhancement Project - Vehicle Maintenance

This project would provide community-wide targeted enforcement of spill prevention and pollution prevention regulations for sites where vehicles are maintained. The upland reconnaissance identified a car wash discharging directly to a storm drain and two outdoor truck repair/maintenance/storage facilities.

AC9903 Inspection/Enforcement Enhancement Project - Outdoor Materials

Materials that are stored outdoors are subjected to precipitation, making them a possible source of stormwater runoff pollution. One site in this WMA had construction rubble stored without cover. This project would be a community-wide enforcement and outreach approach to check for stormwater pollution prevention plans and to educate property owners.

AC9904 Rain Barrel Programs - Rain Barrels

Rain barrels provide the first step for residents to disconnect their downspout. This project would be a community-wide outreach program to encourage their use. A retirement community (The Fairfax) was identified during the upland reconnaissance with roof drainage that would be suitable for this approach.

AC9909 Rain Barrel Programs - Downspout Disconnect

The upland reconnaissance identified several sites where downspouts were directly connected to storm drains. A watershed-wide outreach program could be beneficial in reducing runoff volume or peak flows. In this WMA, they included the area around Hunter Estates and Newberry Station.

Table 5-14: Mainstem 8 Projects

Structural Projects						
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
AC9101	Stormwater Pond Retrofit	AC-AC-0065	Village of Mount Air neighborhood	Water Quality	Private - Residential	1 - 10
AC9100	Stormwater Pond Retrofit	AC-KR-0005	Landsdowne neighborhood	Water Quality and Quantity	Private - Residential	11 - 25
AC9500	BMP/LID	AC-AC-0050	Pohick Industrial Park	Water Quality	Private	11 - 25

Non-Structural Projects					
Project #	**Project Type**	**Subshed**	**Location**	**Watershed Benefit**	**Land Owner**
AC9900	Community Outreach/Public Education	Multiple	Multiple	Water Quality	Multiple
AC9902	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9903	Inspection/Enforcement Enhancement Project	Multiple	Multiple	Water Quality	Multiple
AC9904	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple
AC9909	Rain Barrels	Multiple	Multiple	Water Quality and Quantity	Multiple

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AC9100
AC9101
AC9903
AC9500
AC9902
AC9901
AC9904
AC9900
AC9909
AC9902
FORT BELVOIR
Four M
Cameron Run
s Head Creek
Accotink Creek
f Run
Pohick Creek
Sandy Run
Ryans Dam
Occoquan
Mill Branch
0 0.125 0.25
Miles
N
Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Community Outreach/Public Education
Area-wide Drainage Improvement
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments
Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.
Map 5.14
WMA: Mainstem 8
Proposed Projects

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5.15 Project Fact Sheets

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