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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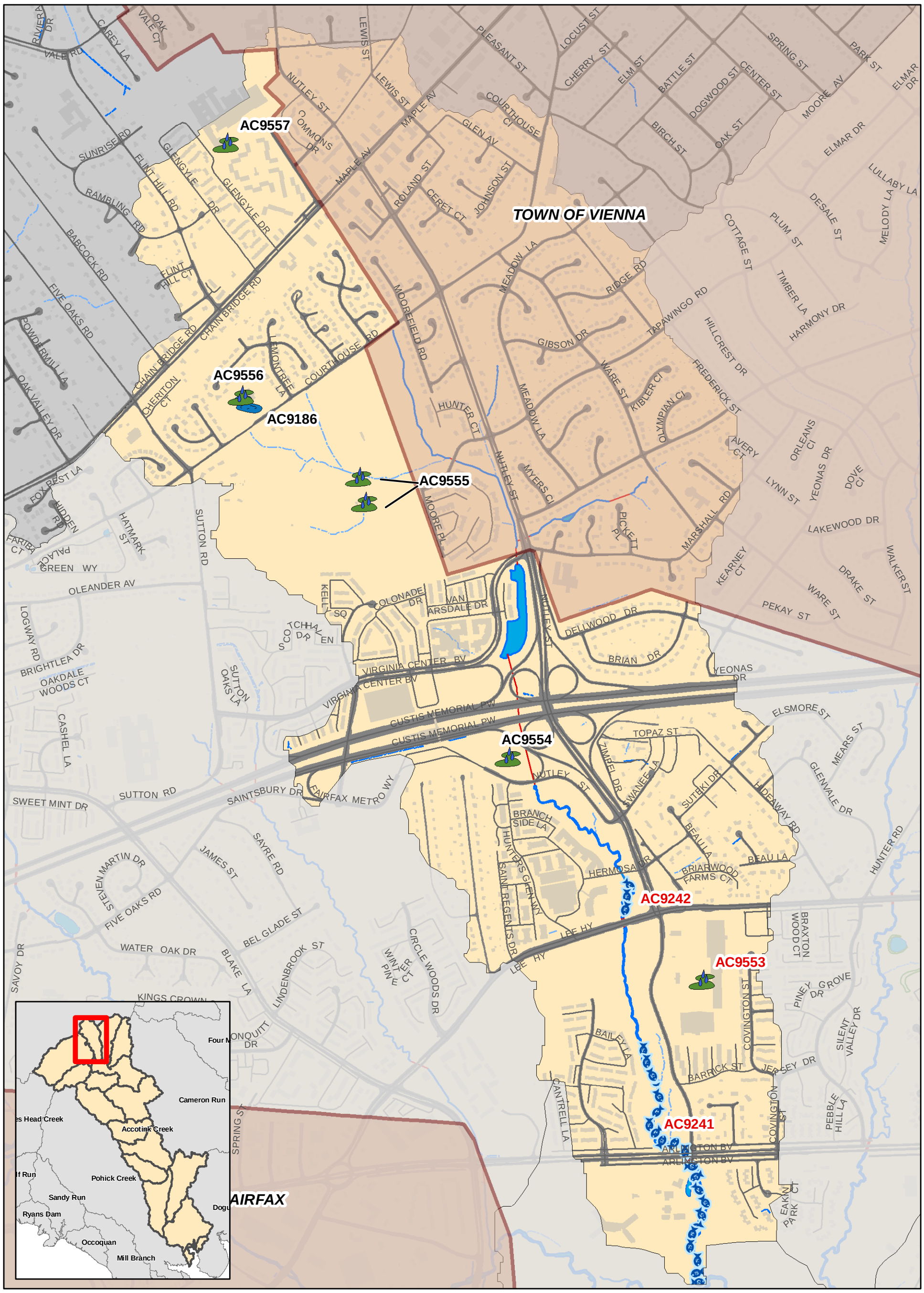

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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Community Outreach/Public Education
- Area-wide Drainage Improvement
- 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 5.3

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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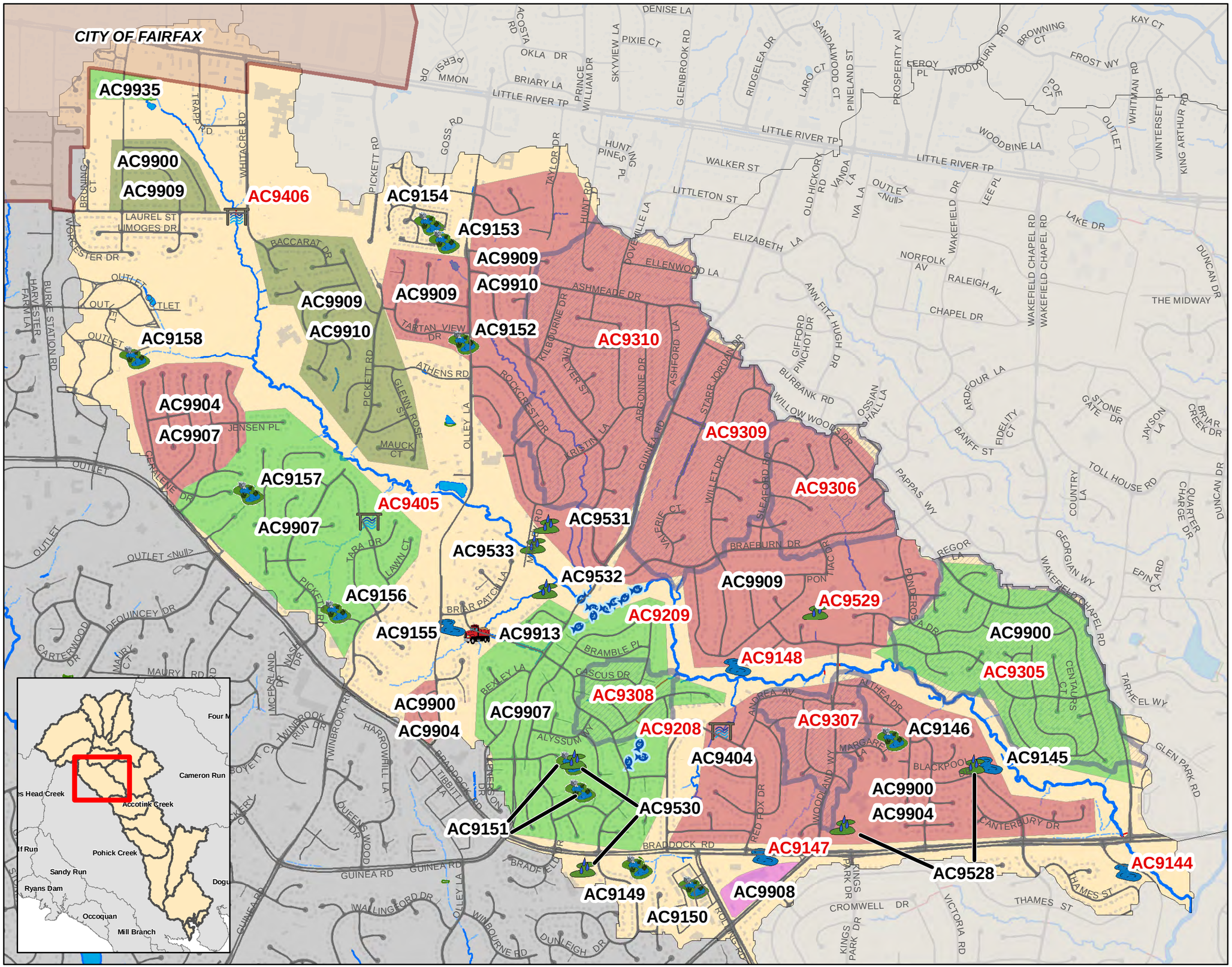

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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Community Outreach/ Public Education
- Area-wide Drainage Improvements
- 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 5.4

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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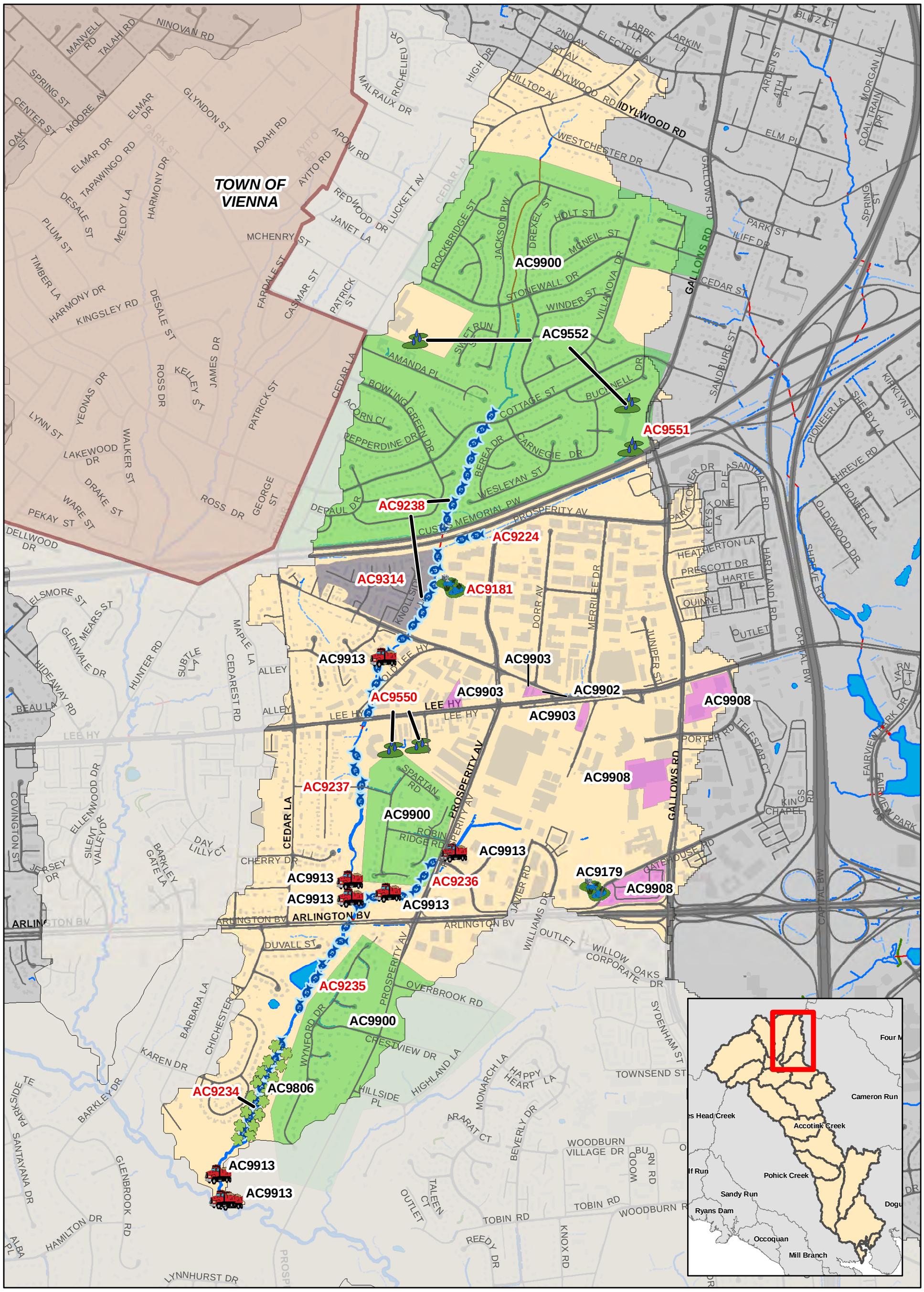

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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Community Outreach/Public Education
Area-wide Drainage Improvement
Land Conservation 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 5.5

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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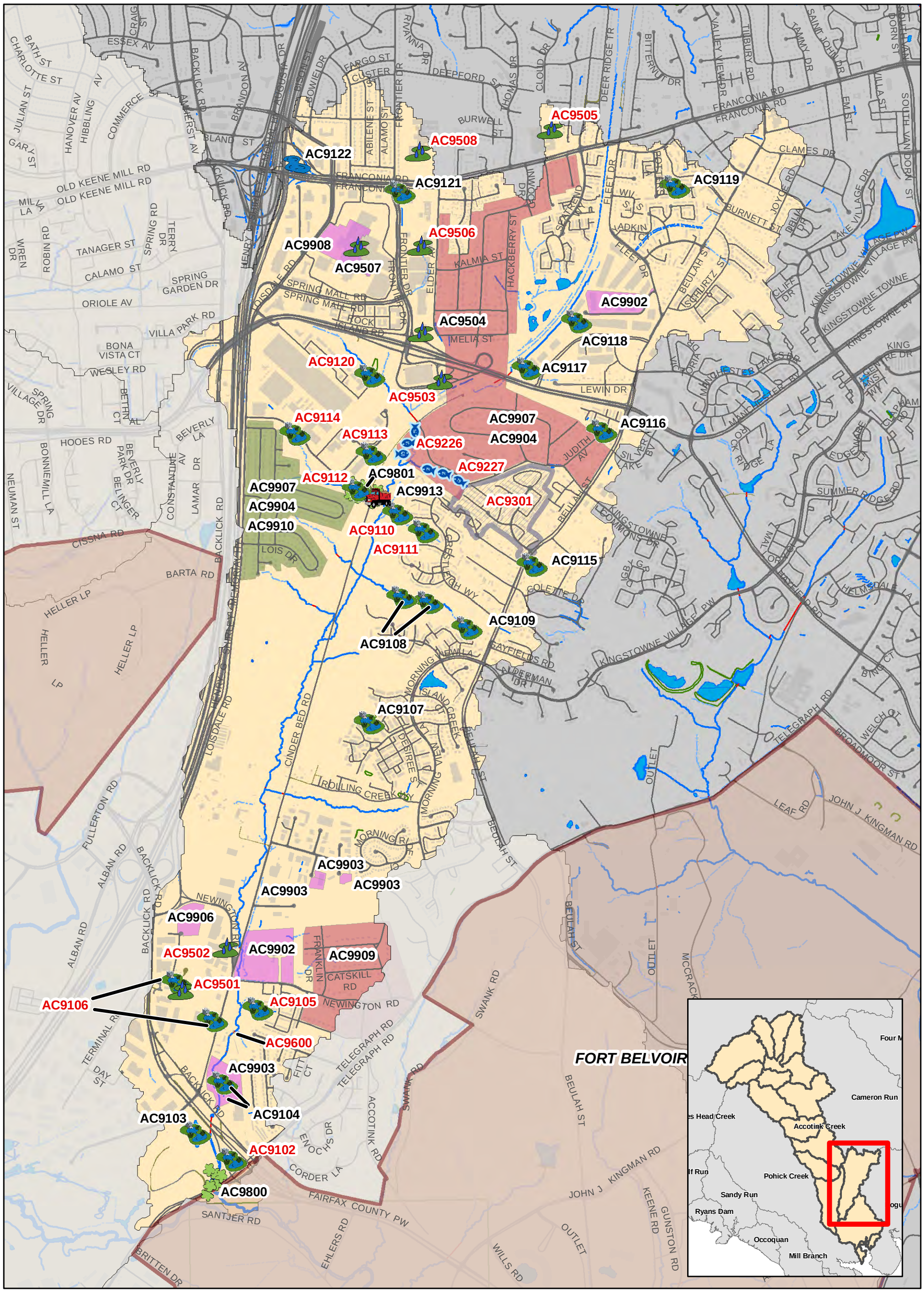

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Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.6

WMA: Long Branch South
Proposed Projects

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