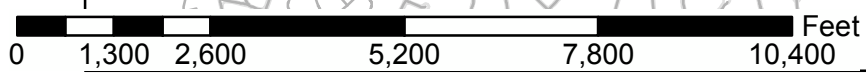


**Marumsco Creek and Farm
Creek Watershed Stream
Corridor Improvement Projects**



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 905-SCIP-01

Stream: Marumsko Creek

Subshed: 905

Type: Stream Stabilization, Trash Removal.

Size/Length: 2000 LF

Location: Tributary of Marumsko Creek east of Telegraph Rd. near intersection with Minnieville Rd.

Land Ownership:

Twiford, Gordon M & Billie

12847 Minnieville Rd.

GPIN: 8392-09-5849

Armstrong, Gordon Tr. & Mamie E. Tr.

12847 Minnieville Rd.

GPIN: 8392-19-4155

Finney, Annie Mae & Juanita

13105 Telegraph Rd.

GPIN: 8392-08-6872

Belno LLC

13191 Telegraph Rd.

GPIN: 8392-18-9619

Problem Description:

Trash (2B-905-34TR and 2B-905-35TR)

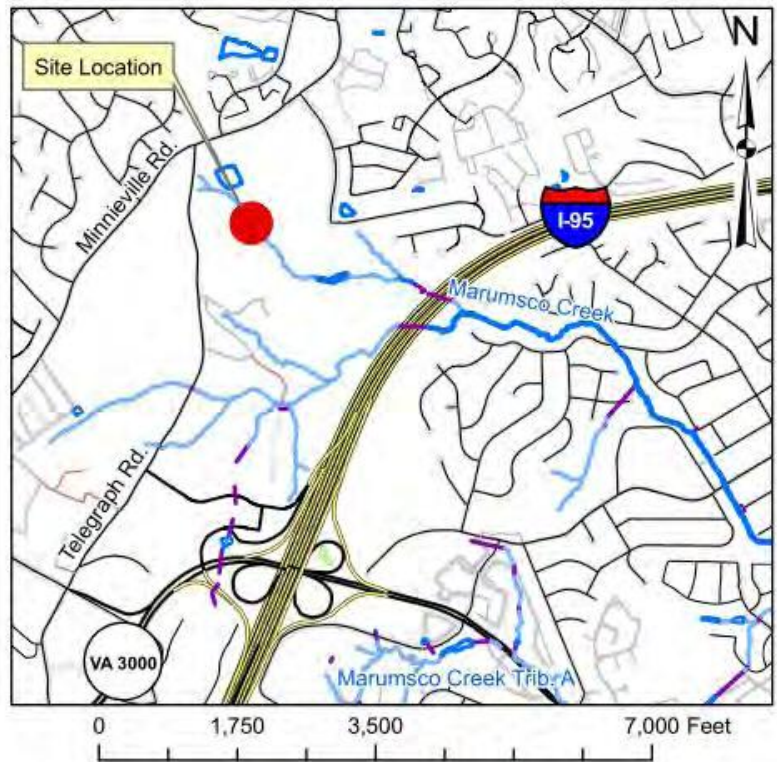
Trash and debris dumping areas observed along the upper portion of the project reach. Observed trash includes tires, metal tanks, and yard waste. Total volume of trash is estimated to be less than 5 truck loads.

Impacted Stream Buffer (2B-905-36IB)

Lack of vegetation on both left and right streambank is affecting the stream buffer along a reach length of 1,000 feet. Lack of buffer is impacting the bank stability and water quality within the stream.

Channel Erosion (2B-905-37, 2B-905-38MI, and 2B-905-39ER)

Severely degraded reach of stream is experiencing head cutting, widening, and bank failure with erosion attacking both banks. An ATV crossing in the middle of the reach



PROJECT VICINITY MAP

has also destroyed both the bed and the banks of the stream. Current erosion has affected 550 linear feet of right streambank and 750 linear feet of the left streambank with bank erosion heights in excess of 3-feet.

Project Concept

Stream Stabilization and Stream Buffer Restoration

The project concept for stabilization of this reach of stream involves stabilization of the channel bed and channel banks through use of constructed in-stream structures , bank grading and bank plantings. The reach upstream of the ATV crossing will be stabilized using bank grading, bank plantings, and log structures to stabilize the headcutting. The reach downstream of the ATV crossing including the ATV crossing will be restored using bioengineering and larger in-stream structures. Associated channel bank grading and floodplain creation / re-connection will decrease the erosional stresses created by concentrated flows in the main channel.

Trash Removal / Prevention

The project concept also incorporates trash and debris clean up and removal in the vicinity of the stabilization site and at the dumping sites. Properties owners should be notified of the dumping and advised to develop prevention measures for their property.

Project Benefits

Stream Stabilization / Stream Buffer Restoration

The stabilization of this reach of stream will provide water quality, and natural resource conservation benefits for the lower portion of the Marumsco Creek watershed. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and impacting the downstream stream reaches. Removal of the trash and prevention of illegal dumping will also mitigate the current adverse conditions being created.

Natural Resource Conservation – Bank plantings in the upper reach of the project will provide adequate stream buffer that is required for growth and sustainment of various natural resources in the area.

Project Cost:

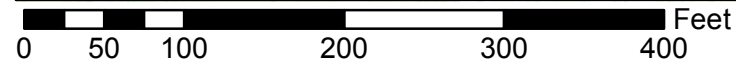
Design Cost: \$150,000

Construction Cost: \$300,000

Total Cost: \$450,000

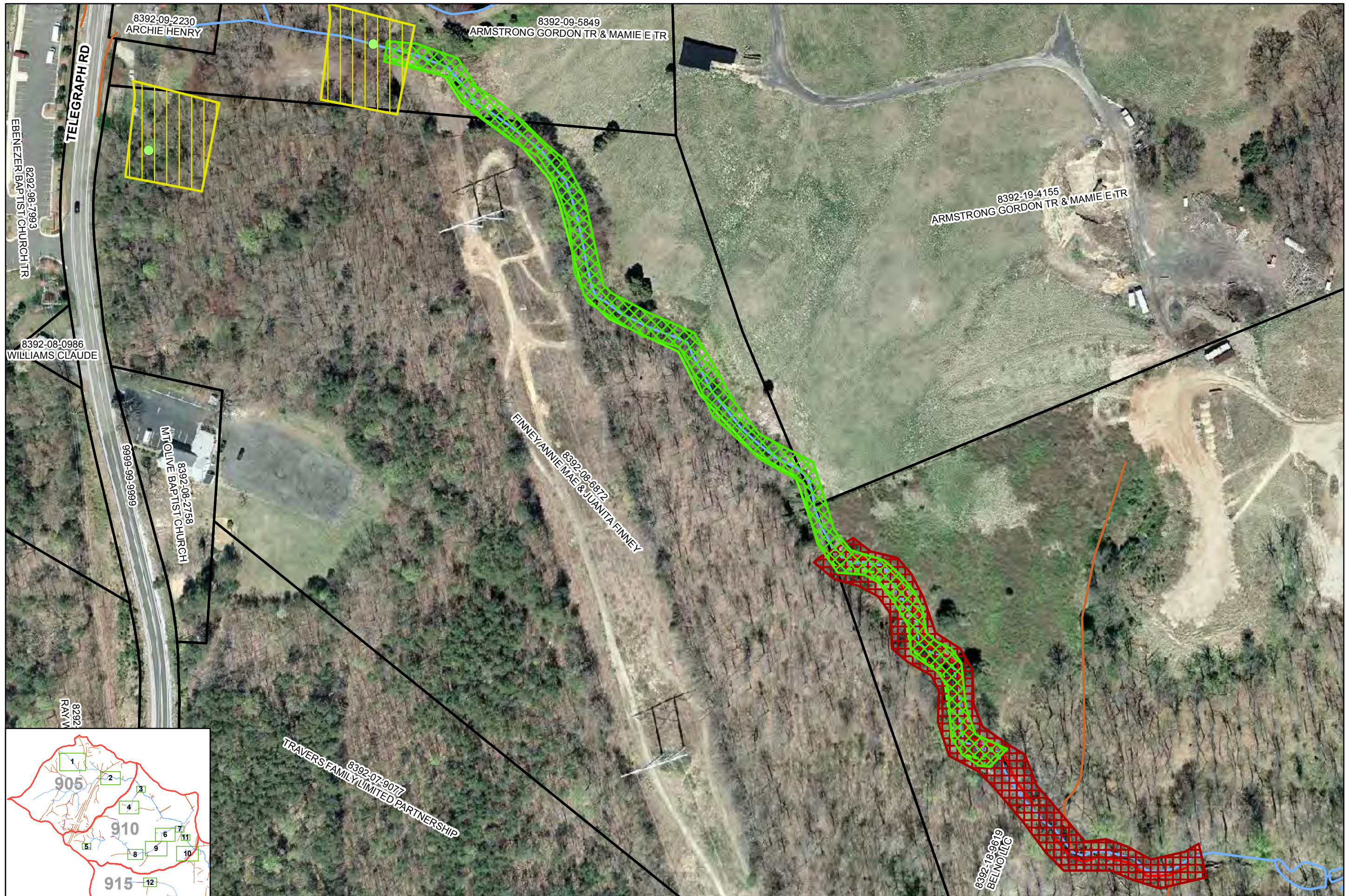


- Legend**
- Parcels
 - Storm Water Management BMP
 - Wetlands
 - Subsheds
 - Stream
 - Culvert
 - Ditch
 - Erosion
 - Impacted Buffer
 - Channel Modification
 - Coastal Zone
 - Trash
 - Stream Crossing
 - Utility
 - ⊕ SD Outfall
 - ⊗ Coastal Zone Characterization
 - ⊗ Miscellaneous Concerns
 - ⊕ Reach Characterization



1 inch equals 120 feet

**Marumso Creek and
Farm Creek Watershed
Stream Corridor
Improvement Project**



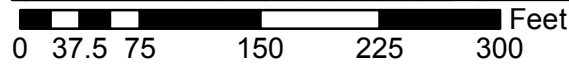
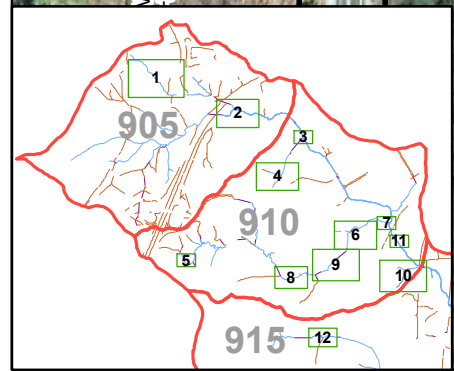
905-SCIP-01



Legend

- Outfall Stabilization
- Stream Stabilization
- Bank Planting
- Trash Removal
- Prevention of Illegal Dumping
- Parcels
- Storm Water Management BMP
- Wetlands
- Stream
- Culvert
- Ditch
- Erosion
- Impacted Buffer
- Channel Modification
- Coastal Zone
- Trash
- Stream Crossing
- Utility
- SD Outfall
- Coastal Zone Characterization
- Miscellaneous Concerns
- Reach Characterization

Marumso Creek and Farm Creek Watershed Stream Corridor Improvement Project



1 inch equals 120 feet

2B-905-34TR & 2B-905-35-TR

Illegal Dumping. Tires, tanks and yard waste found in the stream and on the right bank.



2B-905-36IB

Lack of vegetation on both banks.



2B-905-37ER

Multiple small headcuts developing into channel widening and large bank mass wasting. 3-foot high bank erosion on left and right banks along a total reach length of 500 ft.



2B-905-38MI

ATV crossing destroying bed and banks.



2B-905-39ER

Tortuous meander bends with bank failure along a total reach length of 250 ft.



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 905-SCIP-02

Stream: Marumsko Creek

Subshed: 905

Type: Stream Stabilization, Outfall Stabilization, Trash Removal/Prevention of Illegal Dumping.

Size/Length: 750 LF

Location: Tributary of Marumsko Creek east of I-95 between Carter Ln. and Hylton Ave.

Land Ownership:

PWC Park Authority,
Hammill Mill Park
13396 Pinetree Dr.
GPIN: 8392-37-0216

PWC Park Authority,
Hammill Mill Park
1723 Carter Ln
GPIN: 8392-47-0558

Allen Natalie *et al.*
2012 Horner Rd
GPIN: 8392-26-6542

Virginia Department of Transportation
I-95 Right-of-Way
GPIN: N/A

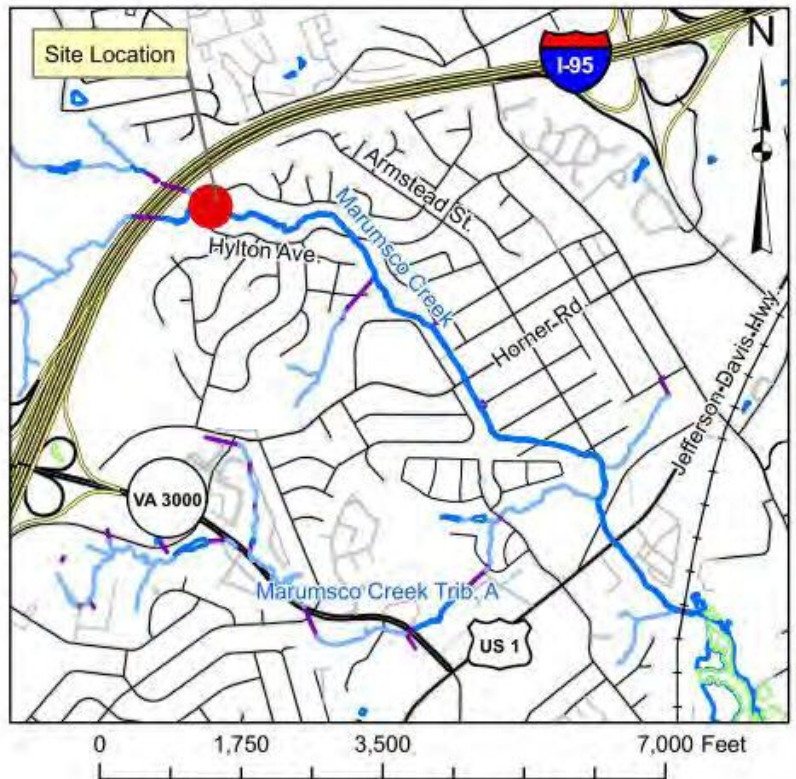
Problem Description:

Trash (2C-905-54TR and 2C-905-59TR)

Trash and debris observed along the tributary to the main stream and the lower portion of the project reach on the main stream. Observed trash is mostly residential in nature, including appliances and yard waste. Total volume of trash is estimated to be less than 3 truck loads.

Channel Erosion (2C-905-52ER)

The upper reach of stream is experiencing bank failure with erosion attacking both banks. Current erosion has affected 180 feet of right streambank and 100 feet of the left



PROJECT VICINITY MAP

streambank with average bank heights of 3-feet. An ATV crossing on the tributary to the main reach has is destroying portions of the stream bed and banks.

Impacted Open Channel Outfall (2C-905-600T)

Concrete channel outfall from the Lancaster Park pool parking lot is undermined and breaking apart. Continued undermining will result in a complete failure of the concrete channel and encroachment of erosion on the tributary parking area.

Project Concept

Stream Stabilization

The project concept for this reach of stream involves stabilization of the channel bed and channel banks through use of bank grading, bioengineering and in-stream structures.

Outfall Stabilization

Stabilization of the open channel outfall will involve removal of the failing concrete apron and replacement with a stable rock and log channel.

Trash Removal

The project concept also incorporates trash and debris clean up and removal in the vicinity of the stabilization site.

Prevention of Dumping

An illegal dumping prevention program should be developed for this area to prevent further dumping of scrap metal and appliances and to prevent ATV's from damaging the natural resources (stream banks) in the area. Additionally, the ATV's in this area appear to be traveling through the I-95 culvert system, the prevention program can also be tailored towards creating safety upgrades and preventing access of ATV's to the culverts..

Project Benefits

Stream Stabilization / Outfall Stabilization

The stabilization of this reach of stream will provide water quality for the lower portion of the Marumsko Creek watershed. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and adversely impacting the downstream stream reaches. Presence of trash and debris in the stream channel has many adverse impacts on water quality including introduction of heavy metals, oils, and inorganic compounds into the aquatic habitat.

Safety Improvements – ATV's are currently using the I-95 culvert system to access PWC park lands on either side of the I-95 corridor. Traversing these culverts can be a dangerous activity, as they are both a confined space and subject to rapidly rising flood waters. Prevention of access to the culverts would be in the best interests of Prince William County and VDOT.

Project Cost:

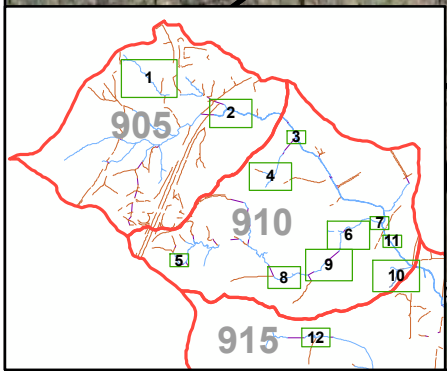
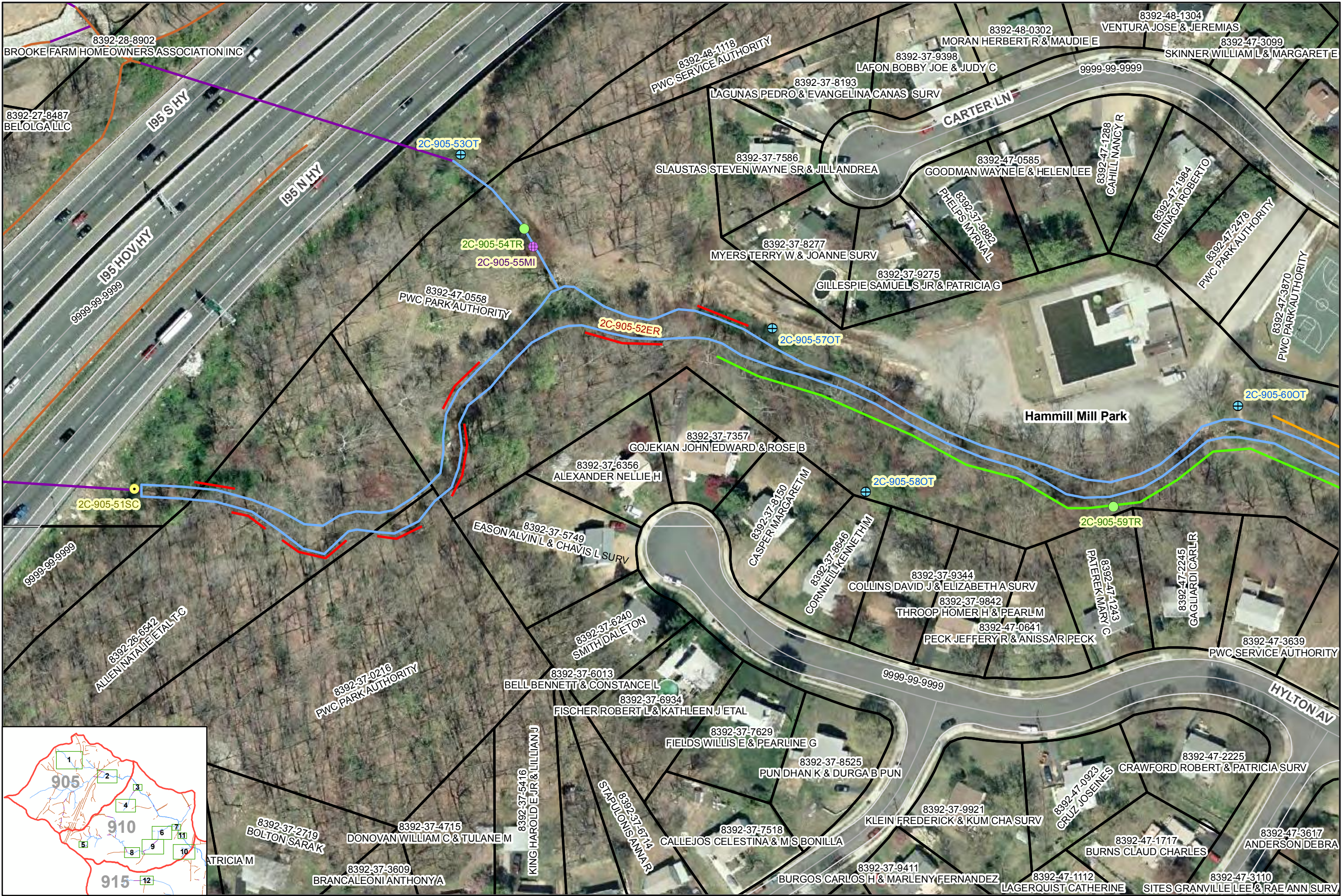
Design Cost: \$140,000

Construction Cost: \$225,000

Total Cost: \$365,000



- Legend**
- Parcels
 - Storm Water Management BMP
 - Wetlands
 - Subsheds
 - Stream
 - Culvert
 - Ditch
 - Erosion
 - Impacted Buffer
 - Channel Modification
 - Coastal Zone
 - Trash
 - Stream Crossing
 - Utility
 - SD Outfall
 - Coastal Zone Characterization
 - Miscellaneous Concerns
 - Reach Characterization



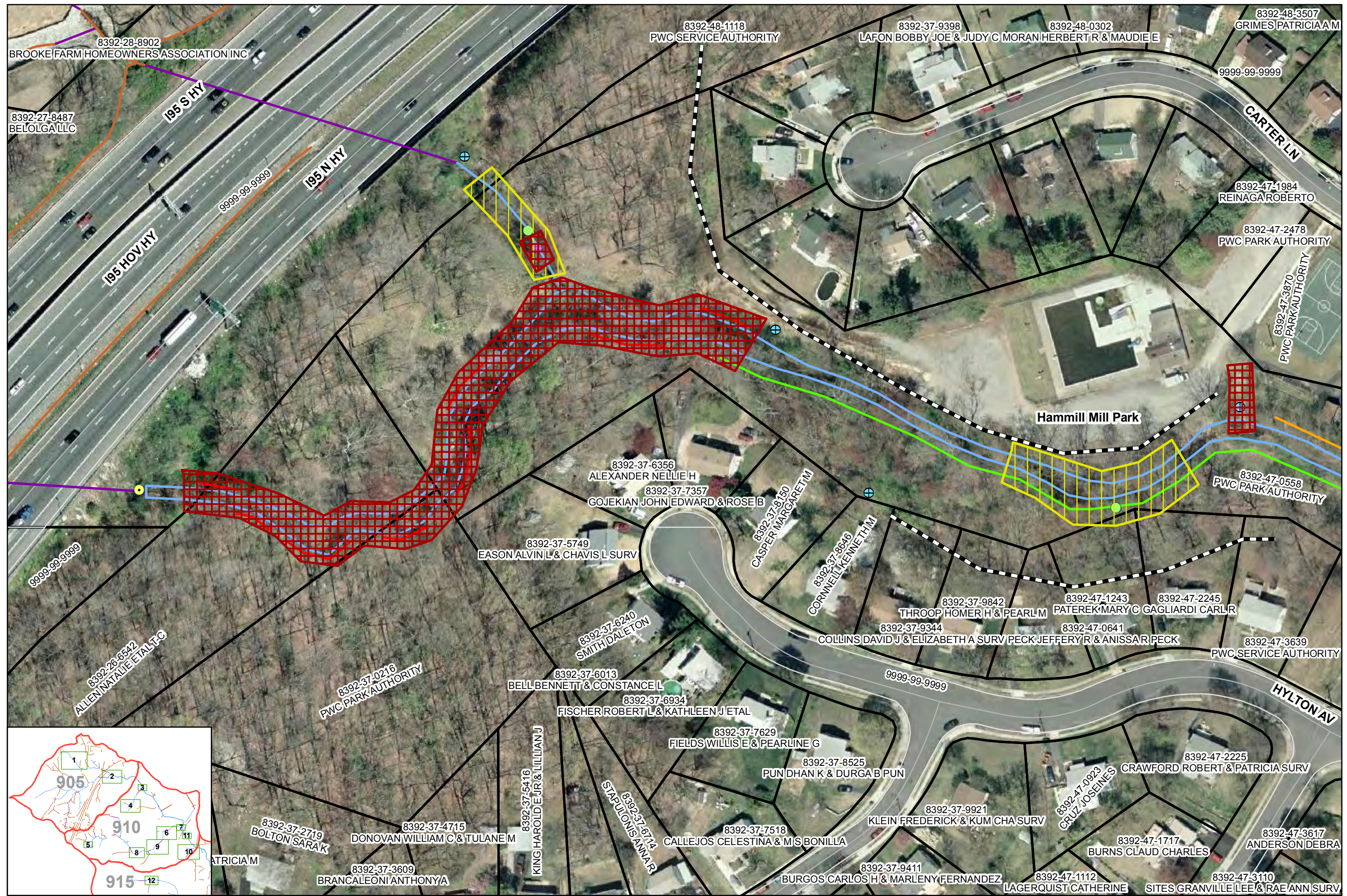
0 35 70 140 210 280 Feet
1 inch equals 90 feet

Marumso Creek and Farm Creek Watershed Stream Corridor Improvement Project

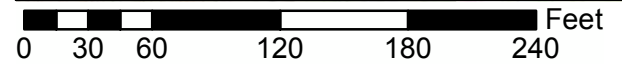


Legend

- Outfall Stabilization
- Stream Stabilization
- Bank Planting
- Trash Removal
- Prevention of Illegal Dumping
- Parcels
- Storm Water Management BMP
- Wetlands
- Stream
- Culvert
- Ditch
- Erosion
- Impacted Buffer
- Channel Modification
- Coastal Zone
- Trash
- Stream Crossing
- Utility
- SD Outfall
- Coastal Zone Characterization
- Miscellaneous Concerns
- Reach Characterization



**Marumsko Creek and
Farm Creek Watershed
Stream Corridor
Improvement Project**



1 inch equals 90 feet

2C-905-52ER

Bank erosion. 3-foot high erosion observed on the left bank along a total reach length of 100 ft. 3-foot high erosion observed on the right bank along a total reach length of 180 ft.



2C-905-54TR

Illegal dumping. Appliances found in the stream.



2C-905-59TR

Illegal dumping. Yard waste found in the stream and on the riparian area on the left bank.



2C-905-600T

Grouted riprap apron of the open channel broken and failing. Headcuttings found underneath the broken apron.



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 910-SCIP-03

Stream: MarumSCO Creek

Subshed: 910

Type:

Outfall Stabilization.

Size/Length: 24" Outfall

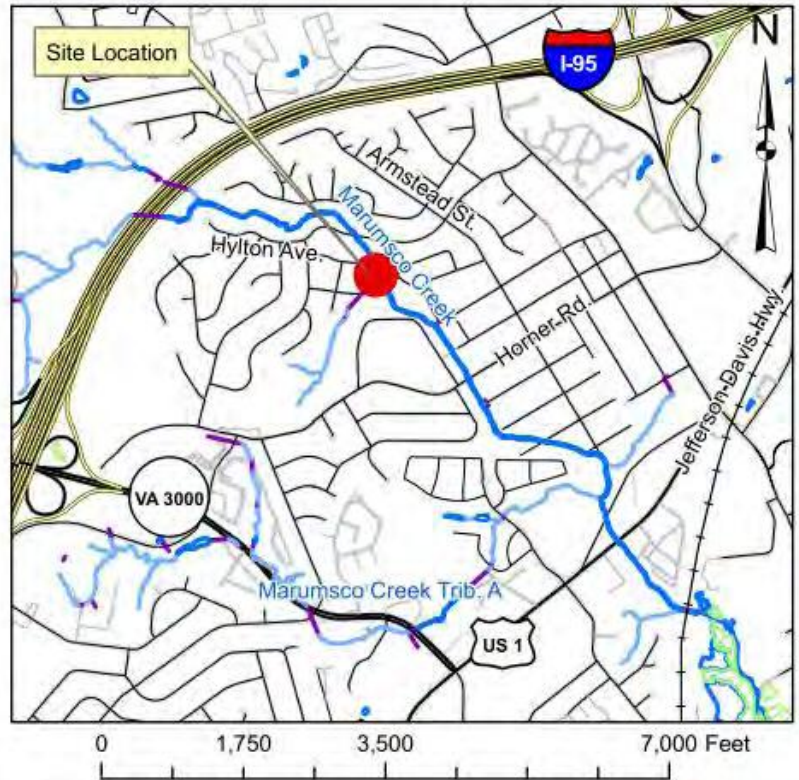
Location: MarumSCO Creek east of
Jefferson Davis Hwy. near
Jefferson Plaza

Land Ownership:

PWC

1633 Hylton Ave.

GPIN: 8392-57-5918



PROJECT VICINITY MAP

Problem Description:

Channel Erosion (3C-910-116ER)

This reach of stream is experiencing bank erosion with erosion attacking the right bank. Current erosion has affected 40 feet of the right streambank with average bank heights of 4-feet.

Impacted Storm Drain Outfall (3C-910-117OT)

Storm drain outfall foundation is undermined and is slumping into the channel bed. The joint between the RCP stormdrain pipe and endwall is broken. There is also erosion around and behind the endwall. Continued undermining of endwall foundation will result in complete failure of the endwall structure adversely impacting the stream and progressively deteriorating the storm drain system through formation of sinkholes and further pipe related failures..

Project Concept

Stream Stabilization

The project concept for stabilization of this reach of stream involves stabilization of the right channel bank through use of constructed in-stream structures, bioengineering and bank grading.

Outfall Stabilization

Stabilization of the storm drain outfall will be incorporated into the stream stabilization design. The existing endwall will require replacement and resetting of broken pipe segments. Localized grading and stabilization around the reset endwall will be required to complete the repair.

Project Benefits

Stream Stabilization / Outfall Stabilization

The stabilization of this reach of stream will provide water quality, and infrastructure maintenance and protection benefits for the lower portion of the Marumsco Creek watershed. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and impacting the downstream stream reaches.

Infrastructure Maintenance – The storm drain outfall is currently undermined and in need of maintenance to prevent failure. Failure of the endwall can potentially lead to a chain reaction destabilization of the storm drain pipe system with pipes breaking, joints separating and sinkholes forming.

Project Cost:

Design Cost: \$30,000

Construction Cost: \$61,000

Total Cost: \$91,000



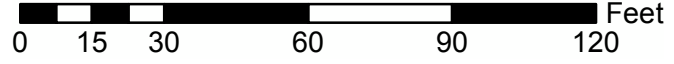
910-SCIP-03



Legend

-  Parcels
-  Storm Water Management BMP
-  Wetlands
-  Subsheds
-  Stream
-  Culvert
-  Ditch
-  Erosion
-  Impacted Buffer
-  Channel Modification
-  Coastal Zone
-  Trash
-  Stream Crossing
-  Utility
-  SD Outfall
-  Coastal Zone Characterization
-  Miscellaneous Concerns
-  Reach Characterization

Marumsko Creek and Farm Creek Watershed Stream Corridor Improvement Project



1 inch equals 40 feet



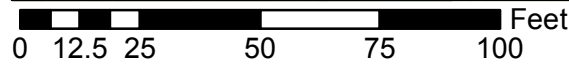
910-SCIP-03



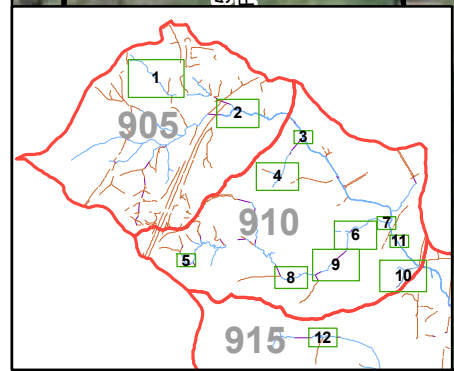
Legend

- Outfall Stabilization
- Stream Stabilization
- Bank Planting
- Trash Removal
- Prevention of Illegal Dumping
- Parcels
- Storm Water Management BMP
- Wetlands
- Stream
- Culvert
- Ditch
- Erosion
- Impacted Buffer
- Channel Modification
- Coastal Zone
- Trash
- Stream Crossing
- Utility
- SD Outfall
- Coastal Zone Characterization
- Miscellaneous Concerns
- Reach Characterization

Marumso Creek and Farm Creek Watershed Stream Corridor Improvement Project



1 inch equals 40 feet



3C-910-117OT

Outfall foundation undermined and failing.
Bank erosion around the outfall.



3C-910-116ER

Bank failure. 4-foot high erosion observed
along a reach length of 40 ft on the right
bank.



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 910-SCIP-04

Stream: Marumsko Creek

Subshed: 910

Type:

Stream Stabilization

Trash Removal/

Prevention of Illegal Dumping.

Size/Length: 800 LF

Location: Tributary of
Marumsko Creek east of I-95
and north of Horner Rd.
between Orchard Dr. and
Millwood Dr.

Land Ownership:

Dale, Danny E Sr & Diana P

1714 Horner Rd.

GPIN: 8392-45-8822

Pahlavani, Hossein & Mehdi

1710 & 1712 Horner Rd.

GPIN: 8392-45-9634 & 8392-45-9124

Dike, Basil P & Lewis

1708 Horner Rd.

GPIN: 8392-45-9941

Dunivan, James H & Mary P

1706 Horner Rd.

8392-55-0646

Kantrovich Harry J & Corinne

1704 Horner Rd.

GPIN: 8392-55-1150

Mallow, Donald R & Sandra L

1702 Horner Rd

GPIN: 8392-55-1963

Mallow, Eric Lee & Jennifer Lynn

13301 Millwood Dr.

GPIN: 8392-55-2278

Rietz, James Michael

13321 Millwood Dr.

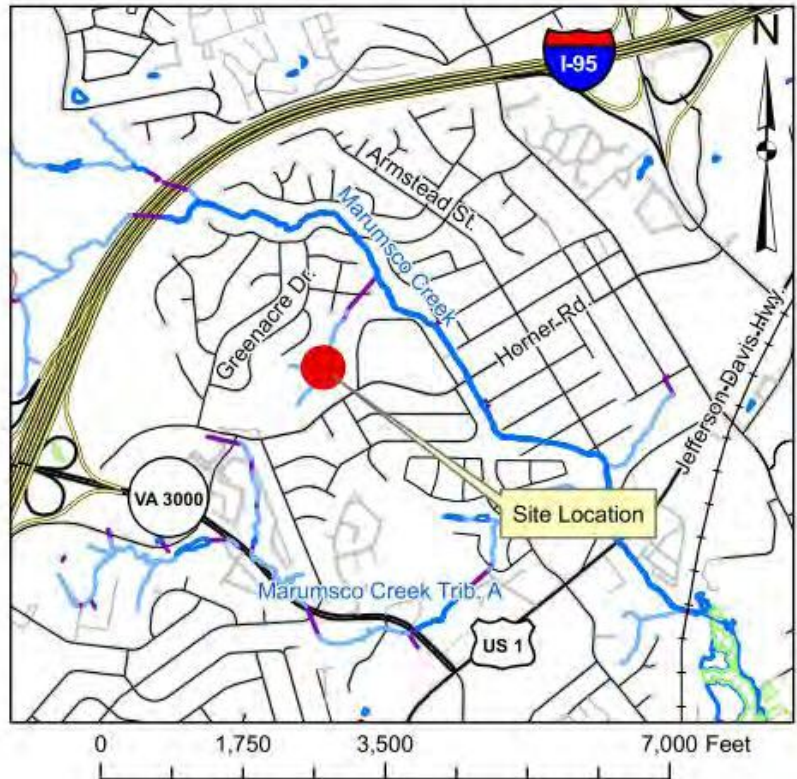
GPIN: 8392-55-2790

Kilby Elementary School

PWC School Board.

1800 Horner Rd.

GPIN: 8392-45-3007



PROJECT VICINITY MAP

Problem Description:

Trash (3C-910-102TR, 3C-910-104TR, and 3C-910-106TR)

A large dump site for construction related waste was observed along the upper reaches of the tributary. Dump site was observed on the property at 1710 Horner Road. In other areas, significant amounts of trash and debris were observed. Observed trash is residential and industrial in nature, including floatables, plastic waste, tires, appliances, automotive waste, construction waste, scrap metal and yard waste. Total volume of trash is estimated to be more than 24 truck loads.

Channel Erosion (3C-910-103ER, 3C-910-107ER, and 3C-910-108ER)

The upper reach of stream is experiencing bank erosion and widening with erosion attacking both banks. Current erosion has affected 240 feet of the right streambank and 230 feet of the left streambank with bank heights in excess of 4-feet. The lower reach of stream is also severely degraded. It is experiencing headcutting and widening with erosion on both banks. Current erosion has affected 380 feet of right streambank and 320 ft of the left streambank with bank heights in excess of 8-feet.

The northern tributary is experiencing headcutting and progressive bed degradation. Current the headcut produces a 1-foot drop and shows evidence that it is a long term / progressive headcut.

Project Concept

Stream Stabilization

The project concept for the stream involves stabilization of the channel bed and channel banks through use of bank grading and constructed in-stream structures. The stabilization will involve grade control measures to stabilize and eliminate headcutting.

Trash Removal Prevention

The project concept also incorporates trash and debris clean up and removal in the vicinity of the stabilization site.

Prevention of Illegal Dumping

In conjunction with the trash clean-up, a community involvement / education program should be considered for this neighborhood to help protect the natural resources and property value. The severe dumping behind 1710 Horner Road will require investigation and possible intervention on the part of Prince William County personnel.

Project Benefits

Stream Stabilization

The stabilization of this reach of stream will provide water quality benefits for the lower portion of the Marumsco Creek watershed. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and adversely impacting the downstream stream reaches. Presence of trash and debris in the stream channel has many adverse impacts on water quality including introduction of heavy metals, oils, and inorganic

compounds into the aquatic habitat. Removal of the trash and prevention of illegal dumping will mitigate the current adverse conditions being created.

Project Cost:

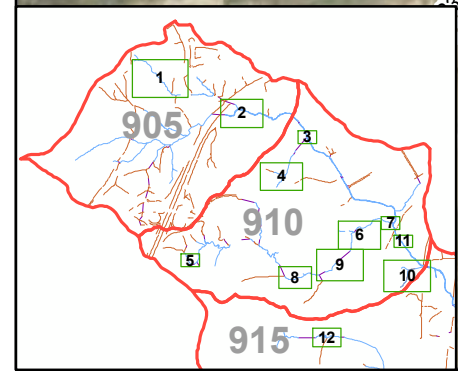
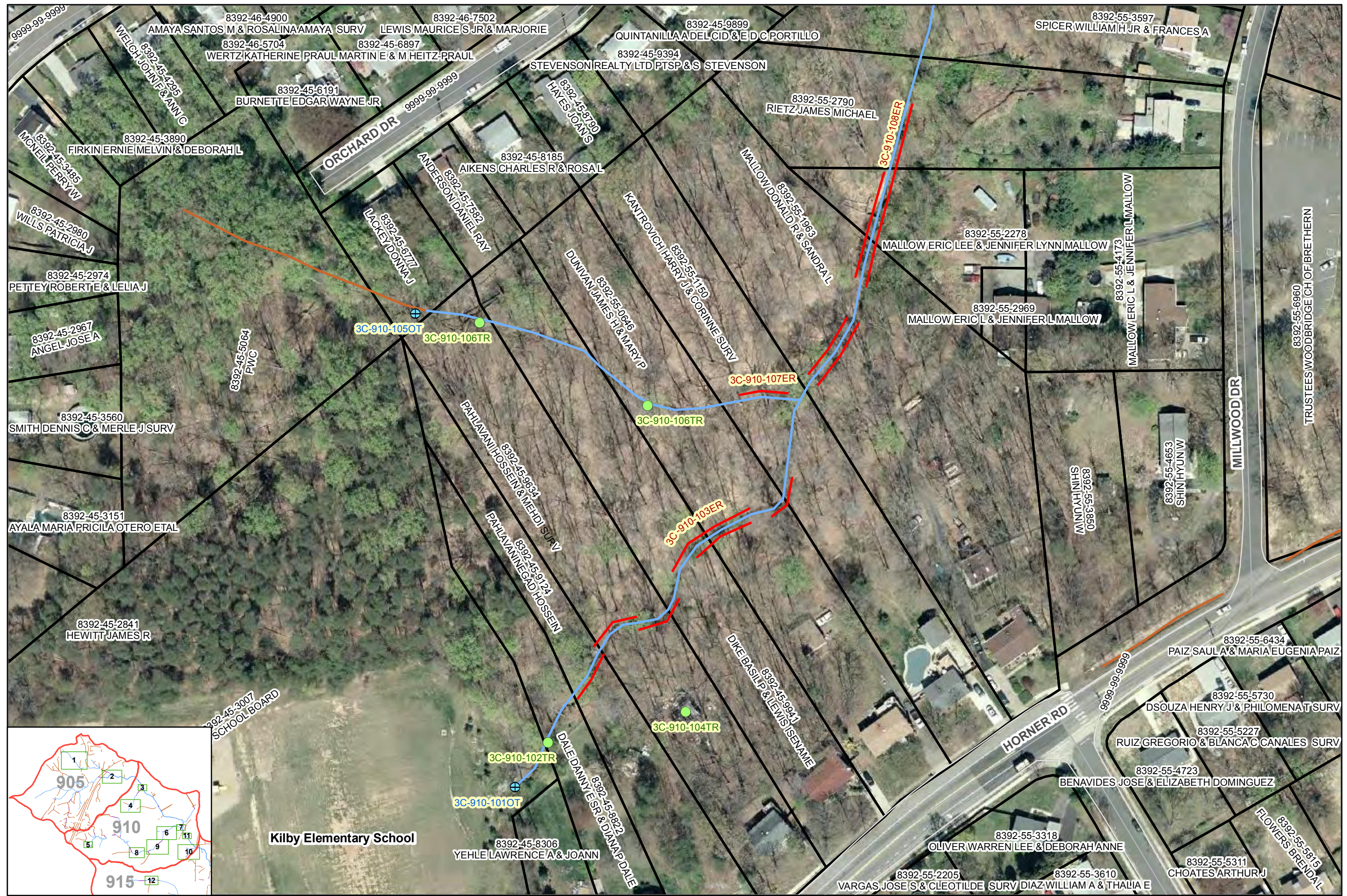
Design Cost: \$150,000

Construction Cost: \$400,000

Total Cost: \$550,000



- Legend**
- Parcels
 - Storm Water Management BMP
 - Wetlands
 - Subsheds
 - Stream
 - Culvert
 - Ditch
 - Erosion
 - Impacted Buffer
 - Channel Modification
 - Coastal Zone
 - Trash
 - Stream Crossing
 - Utility
 - SD Outfall
 - Coastal Zone Characterization
 - Miscellaneous Concerns
 - Reach Characterization























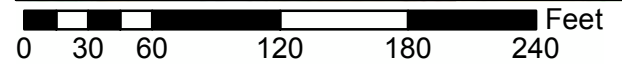
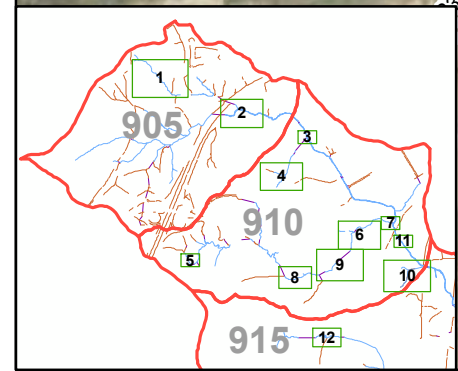
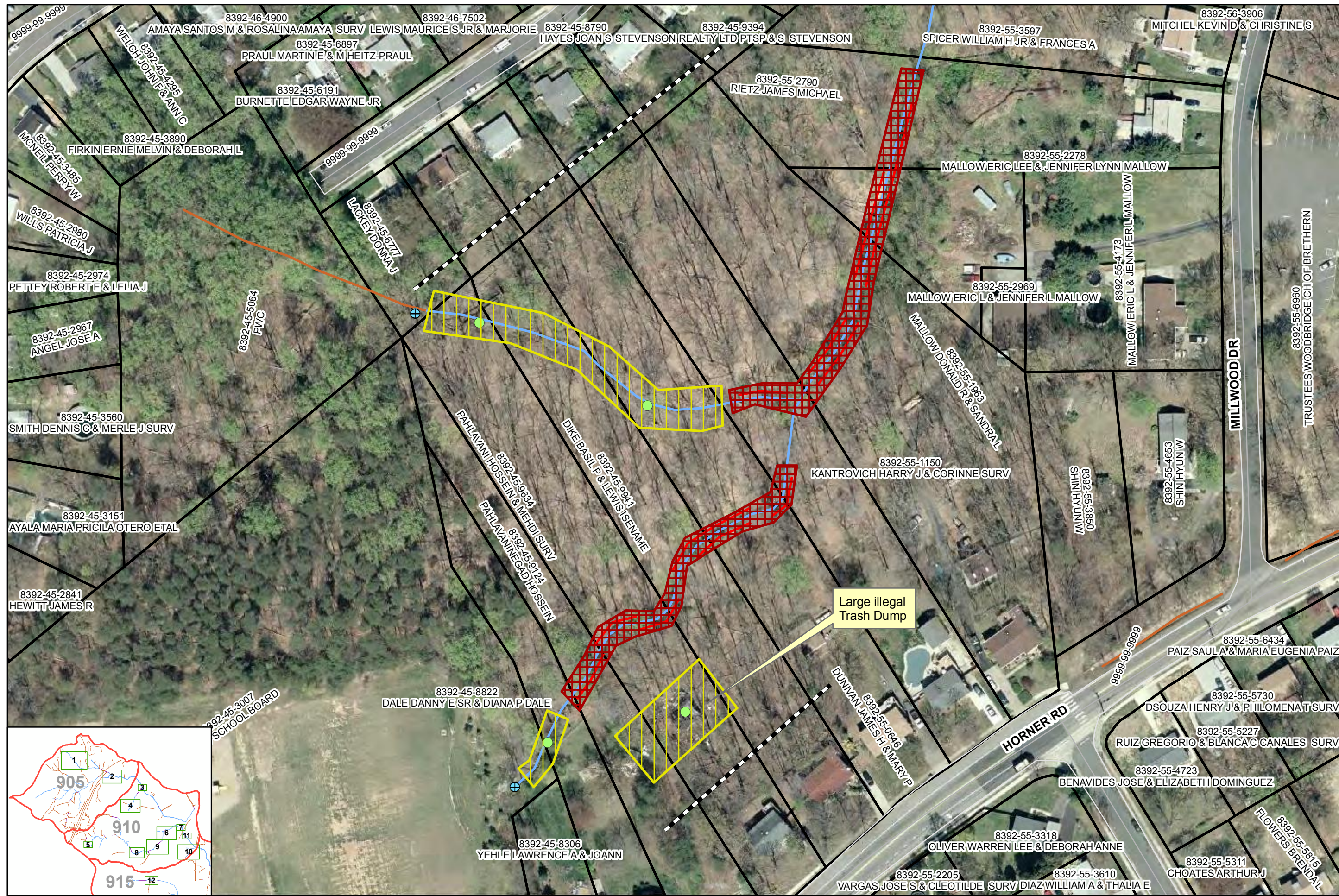
0 35 70 140 210 280 Feet
1 inch equals 90 feet

Marumso Creek and Farm Creek Watershed Stream Corridor Improvement Project



Legend

-  Outfall Stabilization
-  Stream Stabilization
-  Bank Planting
-  Trash Removal
-  Prevention of Illegal Dumping
-  Parcels
-  Storm Water Management BMP
-  Wetlands
-  Stream
-  Culvert
-  Ditch
-  Erosion
-  Impacted Buffer
-  Channel Modification
-  Coastal Zone
-  Trash
-  Stream Crossing
-  Utility
-  SD Outfall
-  Coastal Zone Characterization
-  Miscellaneous Concerns
-  Reach Characterization

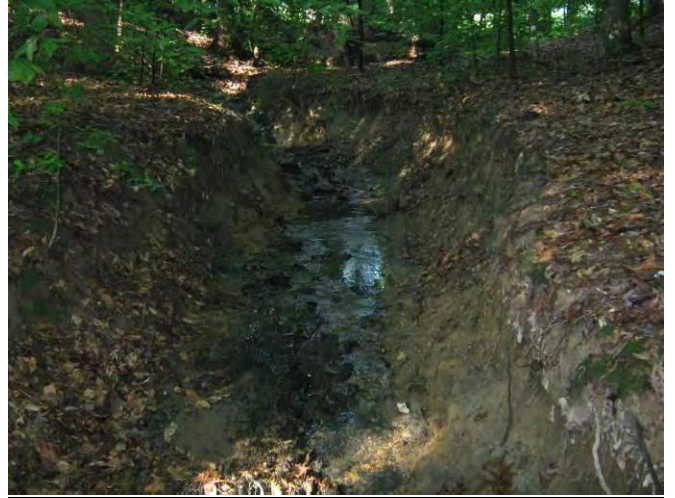


1 inch equals 90 feet

**Marumso Creek and
Farm Creek Watershed
Stream Corridor
Improvement Project**

3C-910-103ER

Bank erosion and widening observed. 4-foot high erosion observed on the left bank along a length of 230 ft. 4-foot high erosion observed on the right bank along a total reach length of 240 ft.



3C-910-102TR & 3C-910-104TR

Illegal dumping. Tires, appliances, automotive waste, construction waste, metal, plastic waste found in the stream and on the right bank. Dump Site is behind 1710 Horner Road.



3C-910-107ER

Headcutting in the tributary. Potential long-term excessive sediment source for the stream.



3C-910-106TR

Illegal dumping. Tires and metals found in the stream and on the riparian area.



3C-910-108ER

Headcutting and bank widening observed. 5.5-foot high erosion observed on the left bank along a total reach length of 320 ft. 5.5-foot high erosion observed on the right bank along a total reach length of 380 ft.



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 910-SCIP-05

Stream: MarumSCO Creek

Tributary A

Subshed: 910

Type:

Stream Stabilization.

Size/Length: 250 LF

Location: Tributary A to MarumSCO Creek east of I-95, south of York Dr. near Pop Moubry Pl. in Lancaster Park

Land Ownership:

PWC Park Authority

Lancaster Park

13800 Pop Moubry Pl.

GPIN: 8392-23-7776

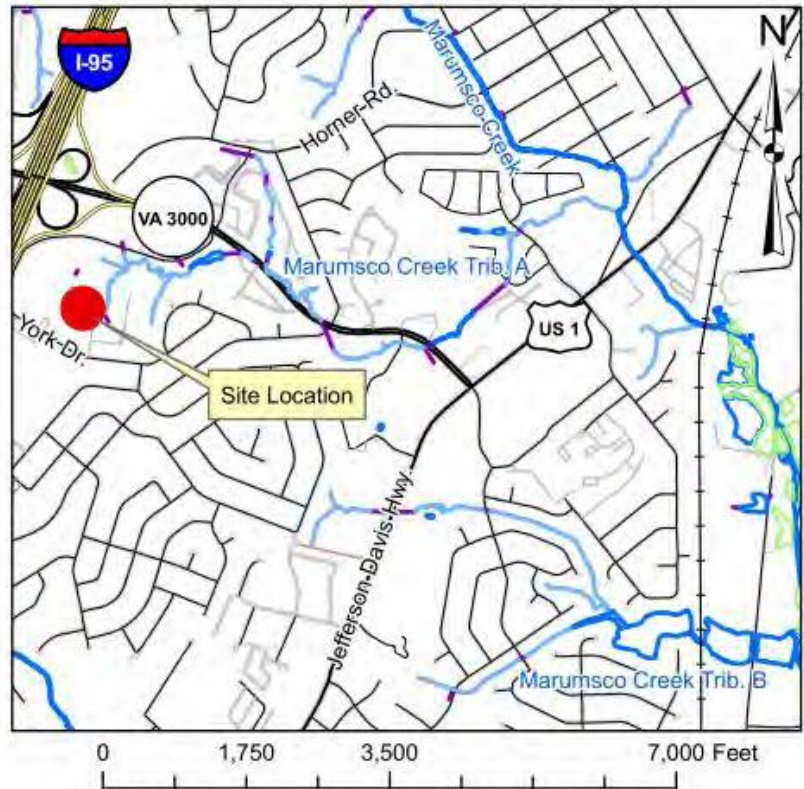
Vaughan Elementary School

PWC Board of County

Supervisors

2200 York Dr.

GPIN: 8392-12-5494



PROJECT VICINITY MAP

Problem Description:

Channel Erosion (4B-910-03ER)

Moderately degraded reach of stream is experiencing both head cutting and widening with erosion attacking both banks. Current erosion has affected a 100 feet of both the right and left streambanks with bank heights in excess of 1-foot.

Impacted Stream Buffer (4B-910-01IB)

Lack of woody vegetation has impacted the stream buffer along the entire reach of the project area. Currently turf/lawn occupies the left and right stream buffer zones.

Project Concept

Stream Stabilization / Stream Buffer Restoration

The project concept for stabilization of this reach of stream involves stabilization of the channel bed and channel banks through use of bank grading and log grade controls. Associated channel bank grading and floodplain creation / re-connection will decrease the erosional stresses created by concentrated flows in the main channel.

The project concept for restoration of stream buffer involves active reforestation along both banks on the entire reach of the stream in the project area.

Project Benefits

Stream Stabilization / Stream Buffer Restoration

The stabilization of this reach of stream will provide water quality, and natural resource conservation benefits for the lower portion of the Marumsco Creek watershed. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and impacting the downstream stream reaches.

Natural Resource Conservation – Active reforestation along the stream will provide a natural habitat for various natural resources.

Project Cost:

Design Cost: \$50,000






Construction Cost: \$87,500

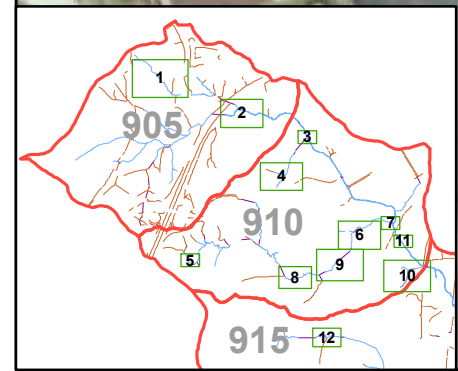
Total Cost: \$137,500

910-SCIP-05



Legend

-  Parcels
-  Storm Water Management BMP
-  Wetlands
-  Subsheds
-  Stream
-  Culvert
-  Ditch
-  Erosion
-  Impacted Buffer
-  Channel Modification
-  Coastal Zone
-  Trash
-  Stream Crossing
-  Utility
-  SD Outfall
-  Coastal Zone Characterization
-  Miscellaneous Concerns
-  Reach Characterization



0 15 30 60 90 120 Feet

1 inch equals 40 feet

**Marumso Creek and
Farm Creek Watershed
Stream Corridor
Improvement Project**

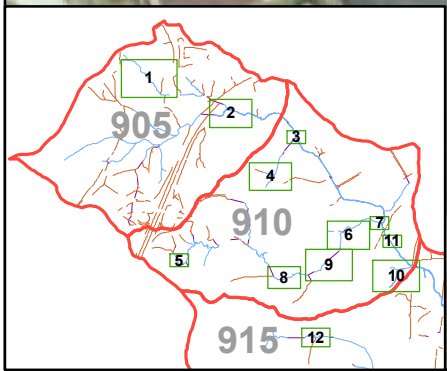
910-SCIP-05



Legend

-  Outfall Stabilization
-  Stream Stabilization
-  Bank Planting
-  Trash Removal
-  Prevention of Illegal Dumping
-  Parcels
-  Storm Water Management BMP
-  Wetlands
-  Stream
-  Culvert
-  Ditch
-  Erosion
-  Impacted Buffer
-  Channel Modification
-  Coastal Zone
-  Trash
-  Stream Crossing
-  Utility
-  SD Outfall
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-  Reach Characterization

**Marumso Creek and
Farm Creek Watershed
Stream Corridor
Improvement Project**



0 12.5 25 50 75 100 Feet

1 inch equals 40 feet

4B-910-03ER

Bank widening and headcutting. 1-foot high erosion observed on the left bank and right banks along a total reach length of 100 ft.



4B-910-01IB

Lack of vegetated buffer. Absence of woody vegetation is impacting the stability of the streambanks and water quality within the stream.

