

October 2016

Annual Stormwater Management Report

VSMP Permit No. 0088595 – FY 2016



Submitted by:
Prince William County
Department of Public Works

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Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Marc Aveni
Chief, Environmental Services Division

September 30th, 2016

Date

I. Program Implementation

1. MS-4 Program Review and Updates

The Prince William County MS-4 Program plan describes all programs and actions taken by the County to ensure compliance with Virginia Stormwater Management Program (VSMP) MS-4 Permit # VA0088595. Prince William County was issued its latest permit on December 17th, 2014. Prince William County submitted its program plan document to the DEQ Northern Virginia Regional Office (NVRO) on December 17th, 2015 as required in section I.a.6 of its MS-4 Permit. The following updates have been made to the Program Plan document during the FY16 reporting period:

- Methods for obtaining public comment on watershed management plans (Section III)
- Updated links to applicable governing policy (BMP a.1)
- Added information on the County's new site inspection application (BMP a.1)
- Clarified accounting for prior land cover condition offsets (BMP a.2)
- Clarified the County's prohibition of Urea based de-icing products (BMP c.3)
- Updated responsible parties involved in pesticide, herbicide, and fertilizer storage, transport, and disposal (BMP d.3)
- Updated language to better reflect the County's IMP program (BMP d.4)
- Updated responsible parties involved in County's Illicit Discharge Program (BMP e.1)
- Updated road maintenance governing policy (BMP c.2)
- Updated snow removal governing policy (BMP c.3)
- Added information on the County's Floatables Monitoring Program (BMP e.3)
- Updated responsible party information for litter control programs (BMP e.3)
- Removed redundant guiding policy – No policy was removed/replaced (BMP e.3)
- Updated to provide clarity between the County's definitions of "High Risk", "VPDES", and "non-VPDES" high risk facilities (BMP g.1)
- Updates to publically maintained facility maintenance requirements (BMP h.1)
- Language updated to reflect current state of MS-4 service area modeling efforts (BMP h.4)
- Language updated to reflect current municipal training practices (BMP i.1)
- Added detail to High Priority Municipal Facility selection process (BMP i.2)
- Updated list of High Priority Municipal Facilities (BMP i.3)
- Added and updated information on Local water quality improvement programs (j.2)
- Added details to the County's Voluntary Retrofit Program (j.5)
- Added protocols to Wet Weather Monitoring program developed during reporting period (l.2)
- Added protocols and updated information related to the County's Biological Monitoring Program (V.1)
- Updated language related to the County's In-stream Monitoring Protocols (V.2)
- Added protocols related to the County's Floatables Monitoring Program (V.3)

All changes comply with requirements set forth by permit section I.B.7.a). Modifications are consistent with conditions of the state permit and the County ensures public notice and participation requirements are followed. All changes are documented in this Annual Report.

2. Planning

On December 17th 2015 the County submitted to the Department a cost benefit analysis of pollutant reduction priority projects as part of its Program Plan. These projects are selected from completed watershed studies and are prioritized according to a number of metrics determined by County. This prioritized list will be presented along with information on the number of BMP acres treated, impervious area draining to the BMP, condition of downstream channel, amount of pollutant reduction, feasibility for implementation, unit cost of reductions and other benefits the County determines for the retrofit.

In addition to its cost benefit analysis, the County submitted its Watershed Management plan as part of its Program plan on December 17th 2015. This document was placed on the County's website within 30 days after being submitted to the Department. The County will continue to seek public comment in the development of its Watershed Management Plan as subsequent watershed studies are performed.

3. MS4 Program Implementation

a. Construction Site Runoff and Post Construction Runoff

BMP 1 – Continue to implement an Erosion and Sediment Control Program

Prince William County continues to implement the erosion and sediment control program consistent with the Virginia Erosion and Sediment Control Law §62.1-44.15:51 of the Code of Virginia and Virginia Erosion and Sediment Control Regulations 9VAC25-840 et seq. Our E&S regulations are not more stringent than the State regulations. Since the entire County is designated as the Chesapeake Bay Preservation & Management Area, the minimum threshold for requiring E&S permit is 2,500 square feet.

Our stormwater management program is consistent with the Virginia Stormwater Management Act §62.1-44.15:24 of the Code of Virginia and Virginia Stormwater Management Program Regulations 9VAC25-870 et seq. The Virginia Stormwater Management Program (VSMP) regulations became effective on July 1, 2014. These regulations are contained in Section 700 of the County's Design & Construction Standards Manual (DCSM), and Chapter 23.2, Article IV – Storm Water Management in Prince William County Code. The SWM requirements for Development on Prior Developed Lands are consistent with the State regulations. The County's SWM regulations are more stringent than the State regulations only in certain areas as described below.

VSMP regulations allowed the localities to adopt criteria more stringent than VSMP with proper justification based on specific watershed studies. Alternatively, more stringent regulations that pre-existed prior to January 1, 2013 were exempt. Based on this exemption, Prince William County retained more stringent regulations on flood control in critical watersheds to control the 25-year storm to prevent localized flooding events. In addition, the County retained its authority to require the control of the 100-year flood, for proposed developments located upstream of existing residential developments with required minimum lot sizes less than one acre and adjoining

special flood hazard areas. These requirements are in addition to the required control of 2- and 10-year frequency storms per state regulations.

Prince William County employs 12 full-time site inspectors. In addition, the County has five full-time engineers to review the land development plans for E&S and SWM requirements. All inspectors comply with E&S, SWM, and Plan Review DEQ certifications, either holding current certifications or are covered under provisional certifications. In Prince William County, maintaining these certifications is a condition for the continued employment. Prince William County is committed to providing continuing education and training to its employees on E&S and SWM.

The land development plan review, inspection and enforcement of E&S and SWM regulations are performed by a single agency in Prince William County. The Environmental Services Division of the Department of Public Works is directly responsible for administering the program. Having a streamlined program under one agency is very helpful in ensuring the consistent interpretation and enforcement of applicable ordinances. The County continues to require the Responsible Land Disturbance (RLD) certifications prior to issuing the land disturbance permits. The County’s E&S Administrator conducts periodic joint meetings with the plan reviewers and the site inspectors for the continued improvement of the programs.

To work in concert with the County’s EnerGov system and generate additional efficiency and effectiveness of E&S inspections, Prince William County is currently in development of a mobile application to aid in E&S and land disturbance inspections. This system run on tablet devices provided to each site inspector. Follow up inspections, violation notices, and inspection checklists are all managed through the application. The County expects to see an increase in both inspection efficiency and accuracy, as well as greater effectiveness in communicating issues to County Citizens.

For the period July 1, 2015 thru June 30, 2016, Prince William County approved a total of 133 land development plans with a cumulative land disturbance of 1,048.983 acres.

Table 1, presented below, summarizes the number of land disturbing activity inspections conducted and the number and type of each enforcement action taken for Erosion & Sediment Control.

Table 1 – Erosion and Sediment Control Program Summary

Month	Erosion Inspections	Site Inspections	Violations	Notice to Comply	Inspection Notice	Inspection Report	Stop Work
Jul-15	296	195	6	0	38	0	0
Aug-15	274	171	4	0	13	0	0
Sep-15	397	277	4	0	20	2	0
Oct-15	406	319	4	0	15	0	0
Nov-15	478	377	1	0	11	0	0
Dec-15	510	428	0	0	9	1	0
Jan-16	402	373	1	0	6	1	0

Feb-16	665	569	2	0	28	13	0
Mar-16	760	658	8	0	25	2	0
Apr-16	653	643	7	0	5	1	0
May-16	727	557	2	0	10	11	0
Jun-16	778	637	3	0	3	6	0
Total	6346	5204	42	0	183	37	0

Our stormwater management program is consistent with the Virginia Stormwater Management Act §62.1-44.15:24 of the Code of Virginia and Virginia Stormwater Management Program Regulations 9VAC25-870 et seq. The Virginia Stormwater Management Program (VSMP) regulations became effective on July 1, 2014.

Prince William County continues to implement a robust program to address the post-construction discharges from new developments and redevelopments by ensuring the long-term operation and maintenance of these SWM controls. We have a dedicated team for the inspection and maintenance of all the county-maintained SWM facilities. All the county-maintained and the county-owned facilities are inspected annually. The County inspects all the privately-maintained SWM facilities once within the 5-year permit cycle. The owners of these facilities receive the County’s inspection reports along with the identification of deficiencies to be corrected within the specified deadline. Our staff follows-up to ensure maintenance and seek the County Attorney’s assistance as necessary.

Prince William County’s strategies to address the stormwater controls that are designed to treat the stormwater runoff solely from individual residential lot are summarized in BMP Table 7-6, included in Appendix A. The Table summarizes the party responsible for the maintenance and the applicable deed restrictions and agreements. For the individual infill lots outside the common plan of development, the County allows the use of the “Agreement in lieu of a SWM Plan”.

b. Retrofitting on Prior Developed Lands

BMP 1 – Implementation of TMDL priority Projects

The County is in the process of selecting and developing priority projects. Seven projects will be selected from the list of prioritized projects described in section III.3. These projects will be completed no later than 54 months from permit issuance and will be implemented to meet the requirements set forth in Part I.D of the County’s MS-4 permit (permit # VA0088595).

One project had been previously approved by DEQ and completed by the County as part of its seven conceptual projects.

- SWM Facility No. 99 – Water Quality Retrofit

During this reporting period, the County has completed an additional two priority TMDL project, as well as began construction on a third.

Hylbrook Park

The purpose of this project is to stabilize the stream channel and improve water quality and habitat along a degraded reach of an unnamed tributary to Marumsco Creek along Jefferson Davis Highway between West Longview Drive and Church Hill Drive. Approximately, 14,897 square feet of stream channel, stream banks, and floodplain will be disturbed during construction.

The total disturbed area is estimated to be 2.3 acres. The restoration of the reach, known as Hylbrook Park, involves the stabilization of 987 linear feet of channel, improving sediment transport, and protecting sanitary sewer infrastructure. This work will require significant in-channel construction.

The project reach begins at the outlet of a 72-inch culvert southeast of West Longview Drive and flows for approximately 1,000 feet over gravel-cobble bed and marine clay before it passes through culverts below Church Hill Drive. Much of the upper portion of the project reach has severe erosion with 5-7 foot vertical banks that lack vegetation cover. Approximately 300 feet from the culvert, the Senior Center building is situated on a terrace beyond the right bank. A nearly vertical 15-foot high eroding slope separates the stream channel from the concrete pad behind the Senior Center. Further downstream, approximately 500-600 feet from the culvert, the stream channel is about 15-20 feet from the outfield fence of a baseball field. A sanitary sewer line approaches the right bank about 600 feet below the culvert outlet and continues along the channel until it crosses beneath it 850 feet below the culvert, or 50 feet upstream from the Church Hill Drive culvert.



The project design incorporates bankfull floodplain benches, limited meander pattern, and structural measures to stabilize the existing eroding stream channel.

The existing topography is representative of a wider valley through which the stream has cut a deeper channel. The reach-wide channel slope is 1.0%, which is not considered to be steep for the geographic setting. The riparian vegetation is very minimal on the streambanks, which are eroding and often close to vertical. Beyond the streambanks, mature hardwood trees, including poplar, maple and oak, are relatively abundant.

The Hylbrook Park Project was completed on June 30th, 2016, with plantings planned for Oct 2016.



SWM Facility 28 Water Quality Retrofit

Stormwater Management Facility 28 is a privately maintained facility within Subshed 448 of the Occoquan Watershed in Woodbridge, Virginia. The facility is located 700 feet east of Clipper Drive surrounded by Mariner and Macrina Drives to the north and Mayflower Drive to the southwest in the Lake Ridge Section 8C subdivision. This retrofit design was developed from the conceptual design initially presented in the Occoquan Watershed - Study of Four Subwatersheds dated March 5, 2015 as prepared for the County by Wetland Studies and Solutions, Inc. (WSSI). As stated in the study, the goals of this retrofit is to (1) improve water quality treatment by storing the Water Quality Treatment Volume (Tv) and detaining it for a minimum of 24 hours, (2) protect the downstream channel, (3) maintain the 10- and 100-year outflows at existing levels, and (4) provide a minimum of 1-foot freeboard for the dam during the 100-year storm event. This approximately 0.9 acre facility is situated on the edge of a moderately steep terrain that is well-forested. The watershed is approximately 90 acres and predominately piped with two streams feeding directly into the facility. The stream from Clipper Drive shows signs of erosion, but is largely protected by riprap. The downstream receiving channel is stable. See Appendix B for additional details including TMDL credit calculations. The SWM facility 28 retrofit was completed in August 21st 2016.

East Longview

The purpose of this project is to stabilize the stream channel and improve water quality and habitat along a degraded reach of an unnamed tributary to Marumsco Creek between Jefferson Davis Highway and East Longview Drive. Approximately, 11,381 square feet of stream channel, stream banks, and floodplain will be disturbed during construction. The total disturbed area is estimated to be 2.9 acres. The restoration of the reach, known as East Longview, involves the stabilization of 924 linear feet of channel, improving sediment transport, and protecting sanitary sewer infrastructure. This work will require significant in-channel construction.

The project reach begins at the outlet of a 54-inch culvert east of Jefferson Davis Highway and flows for approximately 60 feet over concrete-grouted rip rap before it drops approximately 3 feet

at a head cut to native gravel-cobble bed material. At this point, for approximately 300 feet, work has been recently completed to stabilize the left bank. The stabilization work included installation of jersey barriers and rip rap, as well as grading and planting the bank slopes. The right bank, however, is approximately 5-7 feet high, nearly vertical, and actively eroding.

After 300 feet, the channel makes several tight meander bends that have considerably widened the channel. Within this reach is an outlet from a stormwater control facility on the right bank. The stormwater BMP collects runoff from the neighboring Hendricks Automotive Group site to the south. The BMP is slated to be retrofitted in the coming year and the outlet structure will be replaced to discharge overflow on the bankfull bench. Eighty feet past the stormwater outlet, a ten inch sanitary sewer line crosses the channel seven feet above the streambed. The earth surrounding and foundation for the sewer line creates a pinch point in the channel.

Below the sewer line crossing, the left bank slope has been stabilized with filter fabric and large rip rap. The rip rap has slid downslope to some degree. Immediately downstream from the rip rap slope, the stream channel enters a deep, narrow reach where widening is still to come. This reach extends for more than two hundred feet before the channel discharge empties into a 54-inch concrete culvert below East Longview Road.

The existing topography is representative of a narrow valley through which the stream has cut a deeper channel. The reach-wide channel slope is 2.2%, which is considered to be fairly steep for the geographic setting. The riparian vegetation is very minimal on the streambanks, which are eroding and often close to vertical. Beyond the streambanks, mature hardwood trees, including poplar and oak, are relatively abundant.

This project began in FY16 with expected completion during Q2 2016.



BMP 2 – Implementation of Non-Priority Projects

No additional non-priority restoration or retrofit projects were completed during FY16; however, two reforestation projects were completed during the reporting period.

Hunters Ridge

The Hunters Ridge Reforestation project encompassed 5.65 acres with the objective to improve the quality of water entering Prince William County's streams, and ultimately the Chesapeake Bay, to restore a permanent, natural forest canopy cover with all the associated benefits to people and wildlife, and to educate local citizens to the value and benefit of native trees and forests.

This project has achieved these objectives by planting acres of trees indigenous to Prince William County in the permanent open space of Hunter Ridge Estates. This open space (Parcel C-1) is protected by proffer conditions and deed restrictions limiting disturbance to the open space.

Prior to development, the project site was a horse farm. During development, Richmond American Homes, the developer of Hunter Ridge Estates, removed a barn and gravel parking area from the open space converting impervious surfaces to pervious soils seeded with grass. A portion of this converted area and additional areas of former pasture became the site for the grant's reforestation. The County has now completed the restoration by installing a total of 2778 tree seedlings.

This reforestation project is in addition to two prior reforestation projects in the Powells Creek watershed, all within a 2 mile stretch of the creek. Hunter Ridge is an upland site and effectively returns forest cover to the headwaters of two side tributaries to Powells Creek.

The planting will create an initial forest composed of deciduous overstory and understory species. Planting density is sufficient to close the forest canopy within 6 to 10 years under normal rainfall conditions. The resulting leaf drop will convert the existing grass dominated ground cover to a healthy leaf layered forest floor which is significantly better at infiltrating storm water, preventing erosion, and will result in improved water quality. The project results in a 134.89 lb/yr removal of Nitrogen, 7.16 lb/yr reduction in phosphorous, and a 2,504 lb/yr reduction in sediment loadings to the bay according to Chesapeake Bay TMDL action Plan protocols.

Of the 5.85 acres, 5.65 acres was planted by the County's contractor in mid-April. On May 7, 2016, 0.2 acres was planted by community volunteers on adjacent public (vacant) right-of-way. A total of approximately 27 volunteers planted 100 trees, thus completing the planting project begun by the contractor. Volunteer Hours were not recorded and so are not reported for reimbursement.

Public awareness of the project has been achieved through the public/private partnership with the Hunter Ridge Home Owners Association (HOA), through the volunteers that attended the planting and through announcement on the County's web site which was picked up and promoted via an on-line community news feed.

Garner Drive

The Garner Drive Reforestation Project encompassed 0.40 acres. A vacant County property was converted from open space to forest. Sixty percent of the plantings were done by the contractor and forty percent were done by Master Gardener volunteers from the PWC VA Coop Extension. Native shrub species planted near the road include: Redtwig Dogwood, Northern Bayberry, Silky Dogwood and Red Chokeberry. Native understory trees planted in the middle area include: River Birch, Redbud and Downy Serviceberry. Native overstory trees planted in the back area include: Red Maple, Tulip Poplar and Northern Red Oak.

c. Roadways

BMP 1 – Maintain Accurate List of Prince William County Owned Roadways

Although the Virginia Department of Transportation (VDOT) maintains a majority of the roadways and right of way areas within Prince William County, the County is responsible for the maintenance of some roadways and parking lots. VDOT operates under its own phase II stormwater permit, and coordination regarding issues with MS-4 physical-interconnectivity is required as part of both permittee's MS-4 requirements (see section II.m). The County currently operates and maintains parking lots associated with County facilities.

As part of its permit responsibilities PWC has generated a list of all County maintained parking lots, streets, and roadways and the acres treated/not treated by BMPs. This list will be updated yearly as changes to County Maintained roadways may change over the lifespan of the permit. The County has 75 total parcels with impervious parking lots or roads. There are 48 parcels containing County maintained impervious roadways totaling 12.4 miles or 41.9 acres, in addition, there are 69 parcels with impervious parking lots totaling 121.8 acres. Some parcels may contain both sections of impervious roadway and parking lot space.

Table 2 – County Maintained Roadways, Streets, and Parking lots

ST NO	ST NAME	ST TYPE	DEED ACRES	DESCRIPTION	Imp. Parking Lot? (Yes=1; No=0)	Area of Imp. Parking Lot (Acres)	Imp. Road? (Yes=1; No=0)	Imp. Road (Linear Ft)	Imp. Road (Acres)	Site BMPs (Yes=1; No=0)	Parking Lots Treated by BMPs (Acres)	Imp. Roads Treated by BMPs (Acres)	Imp. Roads Treated by BMPs (Miles)	Imp. Roads Not Treated by BMPs (Miles)
4925	CATHARPIN	RD	1.216	LAWNVALE ESTATES SEC 2 R/W PRIVATE ROAD	0		1	880	0.38	0	0	0	0.00	0.17
13001	CHINN PARK	DR	77.003	CHINN PARK	0		1	97	0.05	1	0	0.05	0.02	0.00
13131	PUBLIC SAFETY	DR	12.081	PUBLIC SAFETY FACILITY - ACREAGE	0		1	585	0.15	1	0	0.15	0.11	0.00
5049	WATERWAY	DR	8.210	MONTCLAIR LIBRARY (UNDER CONSTRUCTION)	0		1	716	0.801	1	0	0.801	0.14	0.00
8636	WELLINGTON	RD	0.857	PWC JUVENILE CTR	0		1	284	0.16	1	0	0.16	0.05	0.00
1040	EXPRESS	DR	2.538	VRE TRAIN STATION WOODBRIDGE	0		1	483	0.65	1	0	0.65	0.09	0.00
7625	AARON	LN	15.264	ELLIS L BARRON PARK	1	0.29	0			1	0.29	0	0.00	0.00
12560	ADEN	RD	97.074	NOKESVILLE COMMUNITY PARK	1	1.87	1	4393	1.4	1	1.87	1.4	0.83	0.00
5901	ANTIOCH	RD	3.800	FIRE STATION ANTIOCH ROAD/ DOMINION VALLEY	1	1.17	1	897	0.62	1	1.17	0.62	0.17	0.00
8051	ASHTON	AV	4.177	BULL RUN LIBRARY	1	1.94	1	231	0.15	1	1.94	0.15	0.04	0.00
7500	BEN LOMOND PARK	DR	240.607	BEN LOMOND PARK	1	1.92	1	1010	0.86	1	1.92	0.86	0.19	0.00
14730	BIRCHDALE	AV	8.656	BIRCHDALE PARK	1	0.77	0			0	0	0	0.00	0.00
14998	BIRCHDALE	AV	0.836	VFD FIRE STATION	1	0.33	1	58	0.038	0	0	0	0.00	0.01
15520	BLACKBURN	RD	42.452	RIPPON LODGE	1	0.48	1	1050	0.58	1	0.48	0.58	0.20	0.00
12401	BRAEMAR	PY	15.172	BRAEMAR PARK	1	0.55	0			1	0.55	0	0.00	0.00
14418	BRISTOW	RD	132.734	HELWIG PARK & LIBRARY	1	6.5	1	3,800	2.18	1	6.5	2.18	0.72	0.00
13065	CHINN PARK	DR	14.647	CHINN PARK COMPLEX (Library, Aquatic Center)	1	4.86	1	509	0.29	1	4.86	0.29	0.10	0.00
13850	CHURCH HILL	DR	5.086	COMMUNITY CENTER	1	0.49	1	547	0.25	0	0	0	0.00	0.10
15150	CLOVERDALE	RD	30.190	CLOVERDALE PARK	1	1.57	1	1122	0.49	0	0	0	0.00	0.21
10501	COPELAND	DR	2.974	SUDLEY MANOR COMMUNITY CENTER	1	0.74	0			0	0	0	0.00	0.00
12380	COTTON MILL	DR	4.770	LAKE RIDGE MARINA	1	1.02	1	1163	0.65	1	1.02	0.65	0.22	0.00
12371	COTTON MILL	DR	67.064	LAKE RIDGE PARK, GOLF COURSE	1	2.01	1	1179	0.66	1	2.01	0.66	0.22	0.00
7	COUNTY COMPLEX	CT	65.547	STADIUM COMPLEX	1	4.88	1	950	0.54	1	4.88	0.54	0.18	0.00
1	COUNTY COMPLEX	CT	40.676	McCOURT & DEVELOPMENT SERVICES BUILDINGS	1	7.03	1	5085	4.8	1	7.03	4.8	0.96	0.00
5180	DALE	BL	7.161	PARKS SKATE NATION	1	1.48	0			1	1.48	0	0.00	0.00
5070	DALE	BL	6.179	BOYS AND GIRLS CLUB	1	0.38	0			1	0.38	0	0.00	0.00

5100	DALE	BL	3.500	BOYS/ GIRLS CLUB/COMMUTER PARKING LOT	1	2.61	1	338	0.24	1	2.61	0.24	0.06	0.00
5301	DALE	BL	218.234	ANDREW LEITCH PARK	1	1.95	1	933	0.46	1	1.95	0.46	0.18	0.00
4249	DALE	BL	0.478	DALE CITY LIBRARY	1	0.1	0			0	0	0	0.00	0.00
14012	DAWSON BEACH	RD	6.230	COMMUNITY CENTER	1	0.16	1	1444	0.47	0	0	0	0.00	0.27
15941	DONALD CURTIS	DR	17.091	FERLAZZO BLDG	1	4.9	1	600	0.5	1	4.9	0.5	0.11	0.00
4100	EXETER	DR	5.688	BRITTANY PARK	1	0.96	1	334	0.16	1	0.96	0.16	0.06	0.00
15611	FARM CREEK	DR	2.427	FARM CREEK VRE COMMUTER LOT	1	1.22	0			1	1.22	0	0.00	0.00
15601	FARM CREEK	DR	4.413	FARM CREEK VRE COMMUTER LOT	1	2.65	1	762	0.88	1	2.65	0.88	0.14	0.00
12993	FITZWATER	DR	0.287	NOKESVILLE LIBRARY - PCL 1	1	0.09	0			1	0.09	0	0.00	0.00
12997	FITZWATER	DR	0.287	NOKESVILLE LIBRARY - PCL 2	1	0.05	0			1	0.05	0	0.00	0.00
8900	FREEDOM CENTER	BL	15.398	WESTERN POLICE STATION	1	4.15	1	1453	1.03	1	4.15	1.03	0.28	0.00
13030	HARBOR	DR	2.293	COMMUTER LOT - TACKETTS MILL	1	1.47	0			1	1.47	0	0.00	0.00
13509	HILLENDALE	DR	3.426	COMMUTER LOT - HILLENDALE RD	1	2.23	0			1	2.23	0	0.00	0.00
13499	HILLENDALE	DR	21.901	JOHN JENKINS PARK	1	0.16	1	413	0.26	1	0.16	0.26	0.08	0.00
4603	JAMES MADISON	HY	163.633	JAMES LONG PARK	1	3.55	1	3025	2.02	1	3.55	2.02	0.57	0.00
15904	JEFFERSON DAVIS	HY	0.960	EASTERN FUELING STATION	1	0.74	0			1	0.74	0	0.00	0.00
14945	JEFFERSON DAVIS	HY	5.065	HILDA BARG HOMELESS CENTER	1	0.3	1	468	0.25	1	0.3	0.25	0.09	0.00
14450	JOHN MARSHALL	HY	3.847	FIRE STATION	1	0.86	1	435	0.26	1	0.86	0.26	0.08	0.00
4701	LOCUST SHADE	DR	642.151	LOCUST SHADE PARK AND FOREST GREEN GOLF	1	3.9	1	7170	3.95	1	3.9	3.95	1.36	0.00
8460	MAPLEWOOD	DR	27.478	JOSEPH READING PARK	1	0.4	1	1162	0.62	1	0.4	0.62	0.22	0.00
8601	MATHIS	AV	2.748	CENTRAL LIBRARY MANASSAS	1	1.25	0			0	0	0	0.00	0.00
14716	MINNIEVILLE	RD	26.333	HOWISON HOMESTEAD PARK	1	1.3	1	899	0.53	1	1.3	0.53	0.17	0.00
14400	MINNIEVILLE	RD	0.367	DALE CITY RECREATION CENTER PARKING LOT	1	0.23	0			1	0.23	0	0.00	0.00
14300	MINNIEVILLE	RD	30.862	DALE CITY RECREATION CENTER	1	1.4	1	164	0.31	1	1.4	0.31	0.03	0.00
2081	OLD BRIDGE	RD	0.700	OLD BRIDGE COMMUTER LOT	1	0.39	0			1	0.39	0	0.00	0.00
2095	OLD BRIDGE	RD	1.138	OLD BRIDGE COMMUTER LOT	1	1.12	0			1	1.12	0	0.00	0.00
2201	OPITZ	BL	3.778	POTOMAC REGIONAL LIBRARY	1	0.93	1	53	0.038	0	0	0	0.00	0.01
10699	PIPER	LN	40.330	AIRPORT VRE STATION & COMMUTER LOT	1	4.44	1	1902	1.3	1	4.44	1.3	0.36	0.00

13800	POP MOUBRY	PL	20.880	LANCASTER PARK	1	0.17	1	258	0.13	1	0.17	0.13	0.05	0.00
14700	POTOMAC MILLS	RD	3.580	PRTC POTOMAC MILLS	1	1.78	1	419	0.34	1	1.78	0.34	0.08	0.00
14730	POTOMAC MILLS	RD	0.787	PRTC - HOMELESS SHELTER	1	0.35	0			1	0.35	0	0.00	0.00
14716	POTOMAC MILLS	RD	5.507	PRTC POTOMAC MILLS	1	1.9	0			1	1.9	0	0.00	0.00
13161	PUBLIC SAFETY	DR	8.276	PUBLIC SAFETY TRAINING FACILITY - PCL B	1	0.4	0			1	0.4	0	0.00	0.00
13101	PUBLIC SAFETY	DR	25.052	PUBLIC SAFETY TRAINING FACILITY - PCL A	1	2.29	1	2581	1.8	1	2.29	1.8	0.49	0.00
12731	RIDGEFIELD VILLAGE	DR	4.400	EARL CUNARD PARK	1	0.18	0			1	0.18	0	0.00	0.00
17301	RIVER RIDGE	BL	6.262	LACEY COMPTON PARK - WAYSIDE VILLAGE	1	0.35	0			1	0.35	0	0.00	0.00
16530	RIVER RIDGE	BL	5.656	RIVER OAKS FIRE STATION	1	1.03	1	854	0.57	1	1.03	0.57	0.16	0.00
16198	SILVER LAKE	RD	43.753	SILVER LAKE - EQUESTRIAN CENTER	1	0.8	0			1	0.8	0	0.00	0.00
15960	SINDLINGER	WY	4.400	FERLAZZO CENTER	1	1.42	0			1	1.42	0	0.00	0.00
13455	TELEGRAPH	RD	24.609	HORNER RD COMMUTER PARKING LOT	1	10.9	1	1531	2.3	1	10.9	2.3	0.29	0.00
12051	TYGART LAKE	DR	42.074	BROAD RUN LINEAR PARK - PUMP STATION	1	0.38	0			1	0.38	0	0.00	0.00
10801	UNIVERSITY	BL	26.403	INNOVATION - ATCC SITE	1	2.78	1	1825	1.04	1	2.78	1.04	0.35	0.00
11930	VALLEY VIEW	DR	125.626	VALLEY VIEW PARK	1	5.4	1	3644	2.8	1	5.4	2.8	0.69	0.00
14300	VETERANS	DR	78.114	VETERANS MEMORIAL PARK	1	3.21	1	4221	2.3	1	3.21	2.3	0.80	0.00
14631	VINT HILL	RD	165.000	PRINCE WILLIAM GOLF COURSE	1	0.8	1	1736	0.804	1	0.8	0.804	0.33	0.00
4450	WATERWAY	DR	13.802	ANN MONCURE WALL PARK	1	1	1	1373	0.66	1	1	0.66	0.26	0.00
8642	WELLINGTON	RD	1.263	PWC JUVENILE CENTER	1	0.17	1	357	0.204	1	0.17	0.204	0.07	0.00
2430	WEST LONGVIEW	DR	4.156	HYLBROOK PARK	1	0.59	0			0	0	0	0.00	0.00
14811	DUMFRIES	RD	1061.984	FLEET BUILDING PARKING LOT ONLY	1	2.09	0			0	0	0	0.00	0.00
				TOTALS	69	121.8	48	65,393	41.9		112.8	40.3	11.6	0.8

BMP 2 – Good Housekeeping Practices on County Maintained Roadways

Prince William County contracts out maintenance activities for County maintained parking lots, streets, and roadways. These activities include sweeping, line painting, and asphaltting. No aggregate materials are stored as part of B&G roadway maintenance activities at this time.

Asphalt maintenance to parking lots and roadways are scheduled to be performed cyclically, with the average asphalt lifespan of 17 years. Each lot and roadway is listed for evaluation every fiscal year. Paint maintenance to parking lots is performed every 4 years. Street sweeping to parking lots is scheduled to be performed every 2 years. All maintenance activities are designed to conform to good housekeeping and pollution prevention practices in a manner to minimize the discharge of pollutants.

Buildings and Grounds maintenance vehicles are stored in a manner to reduce the discharge of pollutants. Vehicles are serviced and repaired by PWC Fleet Management Division and are tracked by GPS to provide feedback on fuel usage and routing. This is designed to improve efficiency and minimize pollutant discharge.

A more in depth description of good housekeeping practices on County maintained roadways will be presented in the FY17 Annual Report as specified in the permit (36 months after permit issuance). This will include all SOPs and written protocols.

BMP 3 – Good Housekeeping Practices for Winter Weather Maintenance

Prince William County Buildings and Grounds are responsible for snow removal at all county facilities maintained by Buildings and grounds along with a snow removal contractor. Snow removal activities are not performed on any other County maintained roads, streets, or parking lots. Salt, sand, and calcium chloride are the specified materials used in snow removal activities. Any materials used for deicing and sanding activities are stored and maintained in a manner to prevent runoff from precipitation.

As an update to winter weather maintenance practices is ongoing, a more in depth description of snow removal practices on County maintained roadways will be presented in the FY17 Annual Report as specified in the permit (36 months after permit issuance)..

d. Pesticide, Herbicide, and Fertilizer Application

In addition to two certified staff, Prince William County is in the process of expanding its partnership with the agencies responsible for turf management on County-owned lands. The County has established a self-directed optimistic goal for nutrient management and plans to comply with all required regulations and requirements set forth in its MS-4 permit. The management program for the applicators of pesticides, herbicides and fertilizers within Prince William County focuses on compliance with the state laws and on public education programs.

BMP 1 – Identify Nutrient Applied County Lands

Prince William County is dedicated to minimizing the effects of pesticides, herbicides, and fertilizer use on the Chesapeake Bay. The County has identified all lands of which nutrients are applied to a contiguous area of more than one acre. The latitude and longitude of these lands will be reported to DEQ as requested. This data will be used to determine where Nutrient Management plans need to be developed. This list is displayed in the following section, along with the current status of implementation for each site.

BMP 2 – Develop and Implement Turf and Landscape Management Plans

The County is in the process of developing and implementing Turf and Landscape nutrient management plans for County lands where nutrients are applied to greater than one contiguous acre. Currently just over 40% of lands owned by the County are covered under nutrient management plans. Table 3 below provides a summary of lands of which nutrients are applied to greater than one contiguous acre and the progress of the County’s NMP.

Table 3 – Nutrient Management Plan Implementation

Name	Acres	Longitude (W)	Latitude (N)	Acres with plans (field measured)	Plan Start Date	Plan End Date
Barg Homeless	1.72	77*16'32"	38*37'36"			
Boys Home /Winter Shelter	1.92	77*17'43"	38*37'50"	1.92	10/30/2015	10/29/2018
Bull Run Library	1.56	77*31'14"	38*47'12"	1.56	10/30/2015	10/29/2018
Central Library	1.48	77*27'19"	38*46'7"	1.48	4/11/2016	4/10/2019
Dawson Beach	4.08	77*14'42"	38*38'53"	4.08	2/24/2016	2/24/2019
Fire 20	2.19	77*18'23"	38*38'51"			
Fire 23	3.10	77*18'19"	38*35'11"			
Fire 3F	2.18	77*19'53"	38*33'12"			
Fire 4	1.77	77*37'10"	38*48'14"	1.77	2/2/2016	2/1/2019
Garfield Ferlazzo	8.41	77*17'40"	38*36'29"			
Juvenile Detent	1.33	77*25'6"	38*37'57"			
Juvenile Emergency Shelter	1.12	77*31'8"	38*45'48"			
Manassas Court	8.10	77*28'44"	38*45'9"	8.1	6/24/2015	6/23/2018
McCoart	13.97	77*21'8"	38*40'49"	13.97	3/14/2015	3/14/2018
PWC Safety Training Center	6.27	77*35'7"	38*39'52"			
Western PD	7.27	77*31'2"	38*45'45"	7.27	4/1/2015	3/31/2018
Anne Wall	11.32	77*20'39"	38*36'14"			
Ben Lomond	49.09	77*29'37"	38*47'51"			
Ben Lomond Community	1.84	77*30'22"	38*47'22"			
Birchdale Rec	2.98	77*18'40"	38*37'48"			
Braemar	3.42	77*34'9"	38*44'2"			

Catharpin	19.75	77*33'56"	38*51'16"			
Chinn	16.84	77*19'49"	38*40'14"			
Cloverdale	13.45	77*19'10"	38*37'20"			
Dale City Rec	7.37	77*20'42"	38*38'35"			
Fairmont	13.23	77*29'27"	38*46'54"			
Forest Greens	105.42	77*21'14"	38*32'35"	105.42	11/1/14	11/1/17
Graham Park Pool	0.62	77*19'11"	38*33'16"			
Hellwig	58.98	77*27'0"	38*38'20"			
Howison	15.49	77*22'57"	38*38'2"			
James Long	62.64	77*38'5"	38*51'13"			
Lake Ridge	16.00	77*19'15"	38*41'31"	16		
Leitch	2.80	77*22'16"	38*39'26"			
Leitch/VEPCO	16.21	77*22'6"	38*39'13"			
Locust Shade	7.01	77*21'4"	38*32'0"			
Mayhew	7.17	77*29'29"	38*48'24"			
Nokesville	42.94	77*34'39"	38*41'8"			
Prince William Golf	200.00	77*37'50"	38*44'51"	200		
Stadium	22.78	77*21'5"	38*41'1"			
Turley	2.47	77*18'34"	38*37'40"			
Valley View	69.88	77*32'22"	38*42'4"			
VEPCO	3.91	77*21'49"	38*38'53"			
Veterans	48.58	77*14'59"	38*38'32"			
H.L. Mooney Plant	4.90	77*26'84"	38*61'46"		7/12/2016	7/12/2019
Spittle Building	2.40	77*34'92"	38*68'11"		7/12/2016	7/12/2019
Total	895.97			361.57		
				40.36%		

BMP 3 – Develop and Employ Good Housekeeping Practices for storage transport and disposal of pesticides, herbicides, and fertilizers.

The County currently works with its municipal facilities to ensure good housekeeping practices are followed. This includes the storage, transport, and disposal of pesticides, herbicides, and fertilizers. All County staff working with pesticides, herbicides, insecticides, and fertilizers are trained and maintain required certifications.

In addition, the County works with various volunteer organizations to ensure the proper use and storage of pesticides, herbicides, and fertilizers. For instance, the Environment and Natural Resources program of Virginia Cooperative Extension Prince William provides research based information to help citizens improve their lawns and landscapes without negatively impacting the environment. Services include:

- Horticulture Help Line and Plant Clinics at local Garden Centers and farmer's market to answer questions about insect, disease or gardening problems
- BEST Lawns is a lawn education program that provides lime and fertilizer recommendations based on a soil test and lawn measurements, as well as best practices for lawn care
- Free lectures to the public
- Education for businesses and non-profit organizations in the management of storm water runoff
- Training for interested citizens who wish to become Master Gardener volunteers
- Low maintenance gardening techniques demonstrated at the Teaching Garden
- Plant a Row for the Hungry collections at local Farmer's Markets
- Cooperative Extension agent is on the board of the Prince William Soil & Water Conservation District
- Emergency management assistance to local agricultural producers
- Pesticide Safety training and best management educational workshops for the Green Industry

VCE conducts a post survey gauging awareness and behavior changes made through educational programming. It tracks program effectiveness and reach by evaluating the number of people educated and the number of people that implement the practices they learn.

The County will continue to define and promote good housekeeping practices for storage transport and disposal of pesticides, herbicides, and fertilizers.

BMP 4 – Develop and Employ Integrated Pest Management Plans

The County will track and employ Integrated Pest Management Plans where applicable. Currently the county maintains all lands under IPM with the mission of the program to survey, reduce, and control populations when possible, of mosquitoes and forest pests. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. The data gathered in the process is analyzed and used to track population trends, determine appropriate control measures and evaluate effectiveness of the control efforts. Reduction and response consists of implementing IPM pest control measures to suppress populations of mosquitoes, gypsy moths and fall cankerworms. Selective application of environmentally-compatible, EPA-registered products are utilized to control these pests. Several factors from our surveillance program and other environmental factors help in determining treatment options.

During the reporting period, the County applied larvicide to a total of 27.90 acres including 10.41 acres of stormwater management facilities and 17.49 acres of lands not designated as stormwater management facilities. In addition, the Mosquito and Forest Pest Management Branch applied adulticide to a total of 9,684.12 acres, bringing the total County lands treated by IPM to 9,712.02 acres.

e. Illicit Discharge and Improper Disposal

BMP 1 – Elimination of Illicit Discharges and Improper Disposal

The Prince William County Illicit Discharge Detection and Elimination Program consists of elements designed to identify, mitigate, and prevent the release of non-stormwater discharges into its storm sewer system, and thus into State and Federal waters. Through development of County Fire Protection, Zoning, Building Development, and Stormwater Management Ordinances; Prince William County has prohibited the discharge of any non-stormwater element determined to be contributing significant amounts of pollutants to its stormsewer system. This includes the dumping or improper disposal of motor vehicle fluids, household hazardous wastes, sanitary sewage, grass clippings, leaf litter, and animal wastes. The County defines all discharges categorized as non-stormwater discharges, as well as those discharges not addressed as illicit discharges in accordance with part I.A.1.b) in permit #VA0088595 in Article II sec. 23.2-4.1 of Prince William County’s Code of Ordinances. By issuance of a Notice of Violation, discharges are required per IDDE program procedure to be eliminated within 30 days of discovery, unless removal is not possible within that timeframe. In these instances, reasonable and prudent measures to minimize discharge will be taken and an action plan for mitigation/removal will be required.

Table 4 below summarizes the results of the Illicit Discharge Program. The program is broken into 3 elements; Dry weather outfall inspections (see section II.1 for more details); reported and observed discharges; and shopping center surveys. Shopping surveys are quantitative assessments of the state of shopping centers throughout the County as it pertains to stormwater pollution prevention. Items such as the number, location, and maintenance of dumpsters, compactors, and grease traps are evaluated during this assessment.

Table 4 – Illicit Discharge Program Overview

Type	No.	Percentage	
1201			
Dry Weather Outfall Inspections	Non-flowing	929	77%
	Flowing	272	22.7%
	Groundwater	99	8.2%
	Surface Water	85	7.1%
	Other	80	6.7%
Illicit Discharges	8	0.7%	
26			
Reported and Observed Discharges	Non-founded/minor	15	58%
	Illicit Discharges	11	42%
24			
Shopping Center Surveys	Deficiencies	4	36.4%
	Illicit Discharges	1	9.1%
	Average Score	3.67	

		21	
Total Discharges	NOV Closed	13	62%
	Minor Discharges	7	33%
	NOV's Active	1	5%

During the reporting period Prince William County responded to 30 complaints of illicit discharge, a significant increase from the 9 reported discharges from the previous reporting period. All but three instances have been resolved; two are ongoing investigations, where no NOV was issued. These sites are complying with mitigation requests, but are being monitored for continued compliance; the final site was issued an NOV, but also has outstanding violations from the Fire Marshalls Office, and Building Development. This site has sense been permanently closed, which has ceased the actions that were responsible for the NOV being issued. This case has been closed in FY17. See Table 5 below for more detail on reported Illicit Discharge cases handled by the County in FY16.

Table 5 – Reported Illicit Discharges for FY16

Illicit Discharge - Reported/Observed Discharges - FY2016										
Complainant Information		Discharge Information								
Citizen/County Staff	Date	Discharge Description	Discharge Location	Land use Type	Date of initial inspection	NOV Issued	Date of last Inspection	Comments/Notes	Status	Date of Closure
Citizen	6/29/15	Washing of sediment laden vehicles. Discharging hydrocarbon and salt into storm sewer system	9220 Mike Garcia Drive	Wholesale warehousing	6/29/15	2015-01	7/28/2015, Periodic	RAM Hauling ceased washing activities at the Mike Garcia Drive Location	Case Closed	7/28/2015
Citizen	7/1/15	Algae growth due to discharge getting from property 13901 to 14005 Telegraph Road	14005 Telegraph Road	New developing site	7/1/2015	No	8/3/2015, Periodic	Meeting was made with business owner of 13901 concerning discharge generating from their business. The discharge was removed before follow up inspection.	Case Closed	8/3/2015
Citizen	7/6/15	Dumping of paint and cleaning painting supplies into a drop inlet	7501 Nyack Court	Residential	7/6/2015	No	7/7/2015	Due to lack of strong evidence linking the suspected discharger to the violation, an NOV was not issued. Educational materials and a warning letter were sent to Patriot Painting.	Case Closed	7/7/2015
Staff	7/15/15	Overflow of pool water	3605 Graham Park Road	Public Pool	7/15/2015	No	7/18/2015	Discharge was reported to DEQ according to regulation. Protocols and technologies were put into place to prevent future discharges.	Case Closed	7/15/2015
Citizen	7/29/15	illicit discharge due to leaking compactor	7174 Fortuna Center Plaza	Shopping Center	7/30/2016	2015-05	9/9/2015	Deficiency corrected within 30 days.	Case Closed	9/9/2015

Staff	7/31/15	grease and oil discharging/spilling into underground SWM Facility	SWM Facility: 5347	Gas Station	7/31/2015	No	7/31/2015	There was no sign of spilling and dumping oil & grease except for some localized spots at fueling and parking areas. Conditions were found to be typical of this type of facility. Some trash and litter were found inside the vaults.	Case Closed	7/31/2015
Staff	7/31/15	Washing of commercial vehicles, allowing runoff to enter a nearby storm sewer.	9268 Mike Garcia Drive	Wholesale warehousing	7/31/2015	2015-05	9/1/15, Periodic	Mosquito Squad ceased the washing of its vehicles in a manner that violates county ordinance. Periodic inspections continue	Case Closed	9/1/2015
Staff	8/17/15	Discharge residue due to leaking dumpster	7174 Fortuna Center Plaza	Shopping Center	8/17/2015	2015-04	9/9/2015	Deficiencies were corrected within 30 days.	Case Closed	9/9/2015
Citizen	8/17/15	Dumping of grass clippings into storm drain	12850 Island House LP	Residential	8/17/2015	No	8/17/2015	Reported discharge could not be identified	Case Closed	8/17/2015
Staff	9/3/15	washing of commercial generators and vehicles	8664 Virginia Meadows Dr.	Industrial Park	9/3/2015	2015-06	10/5/2015	Temp Power ceased washing activities and cleaned all visible staining/debris from pavement.	Case Closed	10/5/2015
Staff	9/17/15	Dumping of food waste on parking lot. Leaking of waste liquid from compactor into storm sewer system.	2090 Daniel Stuart SQ	Shopping Center	9/17/2015	2015-07	10/20/2015	Successive inspections were made on 09/24, 10/20 and 12/4 respectively. Deficiencies were corrected on 9/24. Follow up inspections confirmed completion.	Case Closed	12/4/2015
Staff	10/8/15	Dumpster leaking grease and waste liquid into drop inlet.	17247 Wayside Drive	Shopping Center	10/8/2015	2015-08	11/9/2015	The leaky dumpster was replaced and waste food stain was cleaned within 30 days.	Case Closed	10/20/2015

Staff	11/3/15	Grease/Oil discharge	5301 Waterway Drive Montclair	Restaurant	11/3/2015	2015-09	12/3/15, Periodic	SOPs put in place to prevent further discharge, relocated the grease and oil collection tank away from storm water drop inlet.	Case Closed	12/14/2015
Citizen	11/4/15	Dumping of grease down drop inlet	11722 Robert E Lee	Residential	11/5/2015	No	12/15/2015	Grease residue was found on drop inlet grate as well as inside the storm drain pipe. No obvious violators were identified. Continued Monitoring shows no additional grease discharge	Case Closed	12/15/2015
Citizen	12/17/15	Odor from manhole	8006 Rocky Run	Residential	12/17/2015	No	12/17/2015	VDOT staff and PWC storm drain crew conducted inspections of the pipes using CCTV. No illicit discharge was found to be present.	Case Closed	1/13/2016
Citizen	12/28/15	Discharging pool water to the neighboring property	1642 Hylton Ave	Residential	12/28/2015	No	12/28/2015	The case was handled by district court, court date on 1/5/2016. NOV was not issued due to ongoing litigation.	Case Closed	12/28/2015
Staff	1/10/16	Discharge of home heating oil	1524 James Street	Residential	1/10/2016	No	1/10/2016	HAZMAT and Fire personnel were on scene due to discharge of home heating oil (Approx. 250 gal). Discharge was contained to drop inlet due to sediment clogging storm sewer system. DEQ tank inspector Michael Clark was took point on enforcement efforts.	Case Closed	1/26/2016
Citizen	2/11/16	Salt stockpile uncovered	13720 Smoketown Rd	Shopping Center	2/11/2016	No	2/16/2016	Salt stock pile was removed and salt stain cleaned.	Case Closed	2/16/2016
Staff	2/12/16	General Illicit discharge generating activities	9450 Hawkins Drive	Industrial Park	2/12/2016	No	Periodic 2/12/2016; 2/24/2016	The property found to be rented by various companies. The property found to maintain poor good housekeeping practices; however, no illicit discharges were found to be present. Candidate to Refer to DEQ for compliance review	Case Closed	2/12/2016

Citizen	2/16/16	Salt stockpile uncovered	3171 Golansky Blvd	Shopping Center	2/16/2016	No	2/16/2016	Salt stock pile was properly covered and salt stain cleaned.	Case Closed	2/16/2016
Staff	2/29/16	Dumping of Pink crystal material	Joplin Rd at chainage 19.5	VDOT Easement	2/29/2016	No	3/1/2016	Dumping pink crystal material confirmed to be snow melting salt. Violator could not be identified and case was forwarded to VDOT for further action.	Case Closed	3/2/2016
Staff	3/21/16	Released dust and litter into storm sewer system	7911 Notes Rd	Industrial	3/24/2016	2016-1	4/25/2016	The deficiencies found to be corrected by improving dust discharge funnel, extending fence to the ground, limiting product loading to inside the property, and sweeping regularly with vacuum truck. Deficiencies were corrected within 30 days.	Case Closed	4/25/2016
Staff	3/31/16	Uncovered salt pile, grease and debris stain on pavement directed towards storm drain.	11900 Livingston Rd	Industrial Park	3/31/2016	2016-02	5/6/2014	Open salt pile was removed, grease and debris stains cleaned within 30 days.	Case Closed	5/6/2016
Citizen	4/4/16	Dumping grass clippings into storm sewer system	13816 Meadowbrook Rd	Residential	4/8/2016	No	6/28/2016	Insignificant amount of grass clippings observed in storm drain system. Due to lack of sufficient evidence, NOV was not issued. Follow up inspection was made [6/28], no further discharges were observed.	Case Closed	6/28/2016
Citizen	4/6/2016	Dumping of parking lot sweeping material	14328 Jefferson Davis HWY	Shopping Center	4/6/2016	No	6/28/2016, Periodic	Upon arriving on site, no sweeping residue was found in the reported storm drain. The site was re-inspected [6/28] and found clean without reported discharge.	Case Closed	6/28/2016
Citizen	4/25/16	Sludge discharge into creek	8660 Virginia Meadow Dr.	Industrial Park	4/26/2016	No	6/13/2016	Discharge of sludge was ceased; mud bag, silt fence, and straw bale barrier were installed for immediate control. Long term control of discharge is being monitored.	Case Ongoing	

Citizen	5/13/2016	Dumping of paint into storm sewer	13719 Bluefin Drive	Residential	5/13/2016	No	5/16/2016, Periodic	The source of contamination was identified as the discharge of paint into the storm sewer drop inlet located beside 13712 Bluefin Drive. The violator could not be identified at the time of initial inspection. Follow up inspections will be continued.	Case closed	5/16/2016
Citizen	5/18/16	Green paint discharge	SWM Facility: 5091	Residential	5/24/2016	No	5/24/2016	The source of green stain observed at outfall and downstream riprap could not be identified. Follow up inspections will continue.	Case Ongoing	
Staff	5/18/16	Sludge and grease discharge into creek	14980 Farm Creek Dr.	Industrial Park	5/18/2016	2016-4	6/17/2016	Sludge, grease and oil debris were developed and discharged into the creek. Follow up inspection made (6/17); An enforcement action found to be undertaken by Neighborhood Services as well. The business found to be closed for corrective actions.	Case Ongoing	
Citizen	5/26/16	Discharge due to leaking compactor	13813 Foulger Square	Shopping Center	5/27/2016	2016-04	6/8/2016	The compactor was maintained to prevent discharging waste food fluid. Stain and debris were found to be removed as instructed. Deficiencies were corrected within 30 days.	Case Closed	6/8/2016
Citizen	5/27/16	Discharge of automotive fluids into storm drain.	3907 Forge Drive	Residential	6/1/2016	No	Periodic 6/1/2016; 6/30/2016	The complaint property was suspected to be used for vehicle repair. Automotive fluids were found to be spilled onto open ground and fence; however, no discharge was observed in storm drain system.	Case Closed	6/30/2016

Reports for the Illicit Discharge cases above are presented in Appendix E. The County expects reported discharges to continue to increase over the next fiscal year. An increase in reported discharges are expected due to a combination of an updated IDDE program, increased citizen awareness of illicit discharge issues through public outreach initiatives, and County Employee training.

Four discharges were discovered as a result of the shopping center survey program. One NOV was issued, and all issues were resolved satisfactorily .Table 6 below describes discharges discovered under shopping center inspections

Table 6 – Discharges Discovered Through Shopping Center Surveys

Illicit Discharge - Shopping Center Surveys - FY2016							
Discharge Location	Facility	Date of initial inspection	Characteristics of discharge	NOV Issued	Date of last inspection	comments	Status
13301 Gateway Center Gainesville VA	Super Target	12/31/2015	Discharge Waste food fluid through leaky dumpster into storm sewer	2015-10	2/2/2016	The deficiencies were found to be corrected.	Case Closed
10040 Sowder Village Sq. Manassas, VA 20109	Various Restaurants & Others	4/8/2016	Spilling waste oil & grease into pavements for flowing into storm sewer system	No	4/18/2016	The deficiencies were found to be corrected.	Case Closed
10900 Bulloch Dr Manassas, VA 20109	Partridge Center Shopping center	3/16/2016	Salt stockpile uncovered	No	3/31/2016	Sand stock pile found to be removed and salt stain cleaned.	Case Closed
14645 Jefferson Davis Hwy Woodbridge, VA 22191	McDonald Restaurant	5/25/2016	Discharging wash water to the parking lot	No	6/7/2016	Wash water pipe found to be closed.	Case Closed

BMP 2 – Sanitary Sewer Exfiltration Abatement Program

Prince William County contains a mix of sanitary sewer systems and septic fields within its jurisdiction. The sanitary sewer system is maintained, and operated by the Prince William County Sanitary Sewer Service Authority (PWCSA) and Virginia American Water (formally Dale Services Corporation), both which operate under their own VPDES permit. Prince William County is not responsible for the inspection and maintenance of the sanitary sewer system; however, PWC works closely with the PWCSA to identify and correct deficiencies within the sanitary sewer network. Prince William County Service Authority has an ongoing program, the infiltration and inflow check program, for identifying and correcting defects in the County’s sanitary sewer systems, such as:

- Performing detailed engineering studies to locate defects in the gravity sewer system and recommend corrective action.
- Preparing construction documents for repair of the identified defects.
- Constructing necessary improvements.

The identification and correction of deficiencies is aided by Prince William County through its Dry Weather Monitoring, Stormsewer Maintenance, General Stormwater Discharge, and Stream Restoration Programs. Cross connections, leaks, and other maintenance issues are discovered as non-stormwater discharges within the stormsewer network through the County's Dry Weather Monitoring and Stormsewer Maintenance Programs. Citizens can report leaks and cross connections discovered discharging through the stormsewer system through the County's General Discharge program. Sanitary sewer infrastructure exposed to potential damage as a result of degrading streams and waterways are protected through projects associated with the County's Stream Restoration Program. Prince William County continues to identify and report concerns to the PWCSA when sanitary sewer system maintenance and repairs are needed. The County maintains communication with the PWCSA to document follow-up actions taken on maintenance issues reported to the Service Authority. The PWCSA oversees all new construction on sanitary sewer system components and is responsible for the proper installation and operation of the system.

Prince William County is actively working on establishing working relationships with Virginia American Water with regards to their Infiltration and Inflow Program as well as with all Phase II MS-4 systems within the County's Jurisdictional area includes establishing regularly scheduled meetings between all relevant parties.

The Prince William Health District is responsible for the oversight and regulation of certain sewage and water environmental health issues within Prince William County. The Health department oversees the permitting and inspection of septic systems. The Health District inspects and permits septic systems and requires onsite sewage disposal systems not requiring a Virginia Pollution Discharge Elimination System (VPDES) permit shall have pump-out accomplished at least once every five years. The Health District also provides valuable public outreach to septic system owners, including information on septic system maintenance.

The following summarizes actions taken by the PWCSA for the reporting period:

To: Madan Mohan, P.E., CFM
 Chief, Watershed Management Branch
 Environmental Services Branch
 Prince William County Public Works

From: Don Pannell, P.E., Director of Operations & Maintenance *DP*

Date: July 25, 2016

Subject: MS4 Permit

Please find the following data as requested for the MS4 Permit regarding the Service Authority sanitary sewer system. The period covers July 1, 2015 to June 30, 2016.

NEW ASSET ACTIONS

Action Item	Results
New sanitary sewers constructed and inspected (miles):	10.96
New sanitary sewer manholes constructed and inspected:	241
New sanitary sewer laterals constructed and inspected:	601

EXISTING ASSET ACTIONS

Action Item	Results
Existing sanitary sewers inspected via closed circuit television inspection (CCTV) (Miles):	141.4 Miles
Existing sanitary sewers repaired via cured-in-place rehabilitation (Feet):	49,267'
Existing sanitary sewer manholes inspected and repaired:	Inspected: 37 Repaired: 17 Total: 54
Existing sanitary sewer lateral inspected via CCTV:	28
Existing cleanouts repaired:	15

SANITARY SEWER OVERFLOW

Date	Cause	Discharge Vol. (Gal.)	Comment
07/23/2015	Sanitary sewer overflow occurred at 3458 Canal Road, at the Dumfries Lift Station force main. Leak caused by a 2" hole due to external corrosion.	21,000 gallons	Repairs made to the 16" ductile iron force main; no paper, grit or solids were observed in surrounding area. Staff cleaned spill and placed lime on site.
8/24/2015	Sanitary sewer overflow occurred at 11559 Nokesville Road. The LPFM leak was caused by a crack in the 2" PVC pipe of approximately 6 inches in length.	50 gallons	Staff surrounded the area with sand bags and made repairs to the LPFM. A vactor truck was deployed to pump approx. 50 gallons from the containment area. Based on field crew observation, no paper, grit, or solids were observed in the area or outside the area of construction.
10/7/2015	Sanitary sewer overflow occurred near 1304 Congress Street. Crew found sewer intermittently bubbling from the manhole cover pick hole.	200 gallons	Area around manhole was sandbagged to contain flow, no paper, grit or solids were present on the ground. SA staff flushed line.
12/19/2015	Sanitary sewer overflow occurred at 12751 Gazebo Court. Sewer intermittently discharging from the manhole cover pick hole. Crews observed a buildup of grease inside the manhole at the invert of the two incoming mains and a lateral that serves the address above – it was observed that the flow line is obstructed by the CIPP liner. All three sewer mains (2 incoming and 1 outgoing) are CIPP lined, grease buildup was in the manhole, mains were fine.	800 gallons	The area around the manhole was sandbagged to contain the flow. No physical evidence (paper, grit, grease, solids, etc.) of sewage was present on the ground. Part of the flow was absorbed by the ground; the rest was recovered using the flush truck. The field crew observed that no flow reached a nearby ephemeral stream. The area around the manhole was cleaned up and limed.
1/5/2015	Sanitary sewer overflow occurred at 15217 Postillion Court. Sewer intermittently discharging from the manhole cover, pick hole was plugged. The cause of backup was due to a grease and debris build up in the main.	3200 gallons	Sandbags were placed around the manhole to contain the flow. The field crew observed that the sewer discharged and ran overland approximately 25 feet into an unnamed ditch that eventually leads to a storm water detention pond approximately 1350 feet downstream. Field crews did not observe any evidence of grey water in the pond. No paper, grit, or solids were observed near the manhole or the unnamed ditch. SA personnel cleared the main stoppage, using a flush truck. The area around the manhole was limed.

2/16/2016	Sewer intermittently discharging from the manhole cover on Payne Lane.	0	SA Personnel responded to the site and sandbagged the area. Two flush trucks: one to jet the head section and one to vacuum out the downstream manhole. Crew retrieved an I&I bowl from manhole invert, which was the cause of the stoppage. Based on field crew observation, no paper, grit, or solids were observed near the manhole and no overflow condition occurred.
4/16/2016	Sanitary sewer overflow occurred at 9260 Weathersfield Drive. Cause of blockage was rock and gravel due to drilling which had occurred in the easement.	700	SA personnel responded to the site and sandbagged the area. Sewage discharge ran overland approx. 40 yards, but did not reach Broad Run. SA personnel cleared the main stoppage using a flush truck. Based on field crew observations, paper and grit were found near the manhole.

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Figure 1 – Summary of PWCSA Sewer Abatement Program

BMP 3 – Reduce the Discharge of Floatables

Public Works has eight crew teams whose primary responsibility is to clean up litter and removal of illegal signs and dumps in the state right-of-way. In addition, the Adopt-A-Spot program is a litter cleanup and recycling program sponsored by the Virginia Department of Waste Management. The Prince William County Soil & Water Conservation District (SWCD) undertakes stream cleanups under their Adopt-A-Stream program. Some stream clean-ups are done on an individual occasion basis rather than an on-going project, and these sites are often done for specific programs or purposes (Alice Ferguson Foundation, Earth Day, etc.). Adoptable areas under this program include parks, schools, vacant land and neglected public areas. Stream sites are located in the various sub-watersheds in Prince William County and some of cleaned up more than once per year.

The locations selected for the Adopt-A-Stream (AAS) clean-ups are selected from mainly public or park riparian properties, which have experienced historical problems with trash accumulation or have had specific problems in the past. Some private sites are also found in the areas. A list of potential sites is also maintained for future clean-up sites. This program not only identifies locations where floatables and trash are a concern in the County. It follows that assessment with a volunteer cleanup, which temporarily removes the trash and debris. The County’s Litter Control and landfill personnel also provide assistance with picking and weighing of the trash after a cleanup to document the amount of trash removed from the site. If the cleanup is included in the AAS program, periodic clean-ups on a biannual or annual basis are conducted, thereby revisiting sites to see if the floatables condition has improved over time. Currently, the floatables survey program is not set up according to Prince William County’s new MS-4 permit; however, this program will be amended to ensure future compliance.

PWSWCD also administers the County's Floatables Monitoring Program. This program is designed to assess refuse loading to 6 selected stream sites throughout the County. More information on this program can be found in section II.3.

Prince William County, in coordination with the Keep Prince William Beautiful (KPWB) Organization, Developed a program dedicated to the labeling of storm drains throughout the County. These labels identify a storm drain as discharging to the Chesapeake Bay, as well as remind citizens not to dump items, fluids, etc., down the storm drain. Included in this program will be public outreach initiatives focused on eliminating illicit discharge and litter. KPWB partners with local volunteers to complete program objectives, involving local citizens and providing educational services. KPWB partnered with volunteers to label 897 storm drains in FY16, and reached 1066 citizens through public outreach events.

During the reporting period Prince William County's litter crew collected 67.87 tons of trash and removed over 9897.36 illegal roadway signs encompassing over 1959 miles of roadway. This is on track to be a slight decrease in tons of trash collected then last year's numbers; however a marked increase to the number of road signs collected. This could be a result of increased awareness and public outreach regarding litter issues, and an increase in road signs due to upcoming elections.

BMP 4 – Proper Disposal of Wastes

Public Works continues to coordinate a variety of recycling and solid waste management programs in the community through its solid waste division. Some of those are:

- Composting yard debris at two facilities
- Hosting the Too Good to Waste Place for citizens to drop off or pick up useful items
- Provide two weekly collection sites for citizens to drop off trash and recyclables in the rural section of our county
- Public Works provides twice a week collection of household hazardous waste at the County Landfill and once a month collection at the County Compost Facility.
- Public Works provides recycling containers at 18 locations throughout the community and a weekly trash and recyclable collection in the rural section of the county.
- Staff conducts regular inspections of refuse hauling equipment to reduce incidents of spills and leaks from trucks, as well as trash blowing from trucks that could make its way to local waterways.
- Public Works captures methane gas produced at the County Landfill. We are able to generate enough electricity to serve 5000 homes. This practice reduces the potential for methane gas escaping into the air and water.

The following summarizes the County's solid waste, household hazardous waste, and recycling programs for FY15:

**PRINCE WILLIAM COUNTY
SANITARY LANDFILL
MONTHLY OPERATIONS REPORT**

9/7/2016

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FY16	OTHER REFUSE							TOTAL REFUSE TO LANDFILL	TIRES		TOTAL MONTHLY REVENUE
	KEEP PW B'FUL	"Overs" B.F.	INCIN. ASH	SPECIAL PICK-UPS	CONTAM. SOIL	REFUSE FROM B.F.	COUNTY ROAD CL-UP		TONS	REVENUE	
	TONS	TONS	TONS	TONS	TONS	TONS	TONS				
Jul-15	13.46	229.46	380.39	-	-	489.98	-	42,116.17	92.98	\$ 11,622.00	\$ 186,020.10
Aug-15	-	630.14	321.95	-	-	482.67	-	35,935.58	209.12	\$ 14,340.85	\$ 160,306.05
Sep-15	0.93	332.59	180.46	-	-	416.67	-	39,522.76	116.88	\$ 12,484.75	\$ 163,910.53
Oct-15	12.96	520.71	144.53	-	-	403.36	-	39,053.13	141.03	\$ 11,763.85	\$ 164,539.32
Nov-15	-	525.36	284.43	-	-	374.56	-	33,737.84	122.07	\$ 12,561.25	\$ 146,305.88
Dec-15	2.60	156.20	245.18	-	-	366.25	-	35,298.35	155.96	\$ 12,319.44	\$ 169,330.02
Jan-16	2.77	145.27	229.15	-	-	299.88	-	26,639.84	97.92	\$ 8,148.40	\$ 138,799.73
Feb-16	3.34	248.57	36.16	-	-	327.22	-	27,805.79	92.71	\$ 7,591.00	\$ 144,598.85
Mar-16	3.13	328.78	171.25	-	-	456.98	-	38,408.71	138.34	\$ 13,586.00	\$ 167,223.08
Apr-16	26.44	793.68	36.07	-	-	527.06	-	35,421.66	138.67	\$ 12,441.00	\$ 158,595.53
May-16	45.77	885.88	-	-	-	503.73	-	41,024.26	138.41	\$ 16,785.00	\$ 168,447.30
Jun-16	25.66	722.23	88.30	-	-	537.66	-	40,658.76	177.86	\$ 13,026.00	\$ 185,631.53
TOTAL	137.06	5,518.87	2,117.87	-	-	5,186.02	-	435,622.85	1,621.95	\$ 146,669.54	\$ 1,953,707.92

Figure 2 – PWC Landfill Refuse Reduction Statistics for FY16

**PRINCE WILLIAM COUNTY
RECYCLING
MONTHLY OPERATIONS REPORT
PRINCE WILLIAM COUNTY - ONLY**

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FY16	CO-MINGLED	TEXTILES		DONATION PLACE OUT	USED OIL			CAR BATTERIES			ANTIFREEZE		NPR REC. REVENUE	RECYCLE AMERICA REVENUE	RENT From NPR	Residue from Recycling Building
		OUT	REVENUE		L.F. OUT	B.F. OUT	REVENUE	L.F. OUT	B.F. OUT	REVENUE	GALLONS	GALLONS				
Jul-15	0.00	0.62	\$0.00	23.54	3,775	300	\$ -	169	36	\$ 799.33	325	30	\$ 1,252.70	\$ 17.05	\$ 7,894.30	18.76
Aug-15	0.00	0.00	\$0.00	23.93	4,700	700	\$ -	146	20	\$ 1,021.70	100	120	\$ 1,319.70	\$ -	\$ 7,894.30	18.59
Sep-15	0.00	0.58	\$0.00	16.65	1,750	1,075	\$ -	117	21	\$ 997.66	-	-	\$ 3,535.02	\$ -	\$ 7,894.30	33.90
Oct-15	0.00	0.93	\$0.00	16.57	1,750	400	\$ -	106	12	\$ 829.38	625	60	\$ 1,786.35	\$ -	\$ 7,894.30	38.36
Nov-15	0.00	0.10	\$0.00	17.11	1,000	815	\$ -	70	13	\$ 709.18	890	-	\$ 2,182.50	\$ -	\$ 7,894.30	40.02
Dec-15	0.00	0.54	\$0.00	27.14	1,850	500	\$ -	105	3	\$ 498.83	485	-	\$ 1,736.05	\$ -	\$ 7,894.30	27.59
Jan-16	0.00	0.46	\$0.00	20.17	1,500	600	\$ -	64	18	\$ 691.15	235	30	\$ 1,904.10	\$ -	\$ 7,894.30	18.46
Feb-16	0.00	0.49	\$0.00	11.21	1,500	600	\$ -	73	14	\$ 450.75	230	55	\$ -	\$ -	\$ 7,894.30	16.04
Mar-16	0.00	0.65	\$0.00	28.74	1,500	750	\$ -	134	21	\$ 516.86	290	125	\$ 3,732.35	\$ -	\$ 7,894.30	23.56
Apr-16	0.00	0.00	\$0.00	28.34	7,239	1,115	\$ (1,615.80)	154	35	\$ 931.55	850	50	\$ -	\$ -	\$ 7,894.30	19.53
May-16	0.00	0.87	\$0.00	10.45	3,460	943	\$ (947.80)	112	45	\$ 1,135.89	500	100	\$ 2,172.05	\$ -	\$ 7,894.30	8.65
Jun-16	0.00	0.78	\$0.00	21.72	4,922	690	\$ (1,122.40)	233	37	\$ 964.24	400	40	\$ 2,067.25	\$ -	\$ 7,894.30	22.77
TOTAL	0.00	6.02	\$0.00	245.61	34,946	8,488	\$ (3,686.00)	1,483	275	\$ 9,546.52	4,930	610	\$ 21,688.07	\$ 17.05	\$ 94,731.60	286.23

Figure 3 – PWC Landfill Recycling Statistics for FY16

**PRINCE WILLIAM COUNTY
RECYCLING
ALL RECYCLING**

9/7/2016

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FY16	NEWSPAPER TO NPR FROM		CARDBOARD TO NPR FROM		(incl. paper rolls) MIXED PAPER TO NPR FROM		CO-MINGLED TO NPR FROM		NEWS-PAPER TO Republic & American	CARD-BOARD TO Republic & American	MIXED PAPER TO Republic & American	CO-MINGLED TO Republic & American	TOTAL TONS	DATE & SIGNATURE
	PWC Facilities	All Others	PWC Facilities	All Others	PWC Facilities	All Others	PWC Facilities	All Others						
	Jul-15	7.88	-	27.55	280.35	13.88	508.54	-	-	2.84	8.75	9.99	59.84	919.62
Aug-15	6.16	3.97	23.79	242.88	16.72	432.07	-	-	-	10.45	5.69	57.62	799.35	
Sep-15	6.92	-	18.42	187.99	11.14	563.39	-	-	-	9.14	9.37	49.10	855.47	
Oct-15	4.72	-	16.89	293.97	13.26	538.34	-	-	2.84	11.02	8.66	49.16	938.86	
Nov-15	8.16	-	21.24	248.76	17.16	364.66	-	-	2.88	10.31	7.21	42.13	722.51	
Dec-15	5.86	2.08	36.86	276.86	18.86	433.60	-	-	-	7.10	7.22	73.59	862.03	
Jan-16	0.89	-	25.16	250.22	14.62	349.10	-	-	-	9.20	12.35	48.25	709.79	
Feb-16	5.94	-	29.85	230.06	15.55	493.86	-	-	-	9.69	13.88	63.01	861.84	
Mar-16	5.47	-	27.88	229.63	16.38	532.94	-	-	2.75	9.57	10.56	50.21	885.39	
Apr-16	5.96	-	27.36	180.27	14.73	447.77	-	-	2.16	8.10	7.55	44.19	738.09	
May-16	6.25	2.77	24.42	124.15	14.05	486.31	-	-	3.26	8.23	7.42	56.03	732.89	*
Jun-16	9.07	-	27.30	151.69	10.68	456.30	-	-	-	5.73	3.45	50.61	714.83	
TOTAL	73.28	8.82	306.72	2,696.83	177.03	5,606.88	-	-	16.73	107.29	103.35	643.74	9,740.67	

*7.34 tons of mixed paper collected at shred event but not sent to any of these destinations

Figure 4 – PWC Recycling Statistics for FY16 (cont.)

BMP 5 - Discharge Elimination Programs

Prince William County hosts several programs under its Illicit Discharge Detection and Elimination (IDDE) program dedicated to the detection, identification, and elimination of unauthorized discharges to its MS-4 system. These programs include the Dry Weather Monitoring, General Discharge, Wet Weather Monitoring, and Industrial and High Risk Monitoring Programs. For more information on these programs, including program background and reporting, see section II.i water quality screening programs.

f. Spill Prevention and Response

BMP 1 – Coordination with FMO

The County's Department of Fire and Rescue is the lead County agency responsible for all aspects of spill response. Accordingly, the County has designated a full-time Hazardous Materials Officer. Prince William County participates in the Commonwealth Department of Emergency Management Services' regional Hazardous Materials response programs and maintains a National Incident Management System Type 1 HAZMAT Team for emergency response.

The County's Department of Fire & Rescue (DFR) responds to all complaints of hazardous spills and hazardous illicit discharge. If the complaints relate to sewage, the appropriate agency, such as, Prince William County Service Authority or the Virginia American Water will be contacted. The complaints on the malfunctioning septic systems and drain fields are referred to the County's Health Department. The County staff makes every effort to direct complaints to the appropriate agency as expeditiously as possible.

For this reporting period there were 42 instances of discharges impacting the MS-4 that were responded to by Prince William County's Department of Fire and Rescue. This included 12 discharges of diesel fuel, 9 discharges of gasoline, 7 discharges of general oils, 3 unknown spills, 2 hydraulic oil spills, 2 chemical spills, 2 battery acid spills, 1 home heating oil spill, 1 paint spill, and 1 propane spill. All events were addressed and remediated, and follow-up inspections were conducted to confirm mitigation of events. Discharge Reports for these incidents will be included in Appendix F.

g. Industrial and High Risk Runoff

BMP 1 – Identify all Industrial and High Risk Dischargers

The monitoring Industrial, High Risk and non-VPDES High Risk areas of Prince William County is accomplished as part of the County's IDDE program. On a semi-annual basis, PWC examines lists provide by DEQ to assess new permitted facilities discharging to the County's stormsewer system along with their permit, and registration form. These facilities are then added to a GIS layer, and their outfalls identified for use in monitoring efforts. Outfalls are identified using a combination of facility registration statements, DMR reports, and GIS desktop analysis. During FY16 the County further defined the VPDES permitted facilities discharging into its MS-4. Having identified its MS-4 service area, a GIS desktop analysis was completed and Permittees that

discharge into the County's MS-4 service area were identified. Maps of these facilities can be seen in Appendix G.

High risk facilities are those covered under Individual VPDES permits. These facilities include municipal landfills; other treatment, storage, or disposal facilities for municipal waste; hazardous waste treatment, storage, disposal and recovery facilities; facilities that are subject to EPCRA Title III, Section 313. There are four of these facilities that discharge to the County's MS-4:

- Prince William County - Balls Ford Yard Waste
- Prince William County Yard Waste Compost Facility
- Virginia Concrete Company Inc. – Gainesville
- Chase David D Residence

The Prince William County Balls Ford Yard Waste and Yard Waste Compost Facilities are monitored by the Solid Waste Division. Results are shared with the Watershed Management branch upon request. DMRs from these facilities are provided to Watershed Management when sent to DEQ as part of reporting requirements.

High Risk and Industrial VPDES permitted facilities are found to be contributing significant pollutants to the stormsewer system will be referred to DEQ for compliance review. Table 7 below shows the VPDES facilities discharging into the County's MS-4 area.

Table 7 – VPDES Permitted Facilities that Discharge into the County’s MS-4

	Permit No	Facility	Location Address 1	Type	Location City	Location Zip5	County Name	DMRs
1	VAR052243	234 Auto and Truck Salvage Limited Liability Co.	14843 Dumfries Rd	SWGP	Manassas	20112	Prince William County	TBD
2	VAR051949	Chemung Contracting Corporation - Gainesville	7201 Rail Line Ct	SWGP	Gainesville	22013	Prince William County	Semi-Annual
3	VAR051117	US Foods Incorporated	11994 Livingston Rd	SWGP	Manassas	20109	Prince William County	Semi-Annual
4	VAG830458	Chase David D Residence	13734 Joyce Rd	Petrol	Woodbridge	22191	Prince William County	TBD
5	VAR052014	Double T Automotive Incorporated	15009A Jefferson Davis Hwy	SWGP	Woodbridge	22194	Prince William County	TBD
6	VAR051477	First Transit Incorporated	14700 Potomac Mills Rd	SWGP	Woodbridge	22192	Prince William County	Semi-Annual
7	VAR052115	Penny's Used Auto Parts	13059 Minnieville Rd	SWGP	Woodbridge	22192	Prince William County	TBD
8	VAR051639	Potomac Disposal Services of Virginia, LLC	9650 Hawkins Dr	SWGP	Manassas	20109	Prince William County	Semi-Annual
9	VA0088510	Prince William County - Balls Ford Yard Waste	13000 Balls Ford Rd	Individual	Manassas	22111	Prince William County	TBD
10	VAR051078	Prince William County Sanitary Landfill	14811 Dumfries Rd	SWGP	Manassas	20112	Prince William County	TBD
11	VA0086797	Prince William County Yard Waste Compost Facility	14811 Dumfries Rd	Individual	Manassas	22111	Prince William County	TBD
12	VAG110100	Virginia Concrete Company Inc - Gainesville	7300 Rail Line Ct	Concrete	Gainesville	20156	Prince William County	TBD
13	VAR051298	Vistas at Lake Manassas Limited Liability Company	14505 Lee Hwy	SWGP	Gainesville	20155	Prince William County	TBD

BMP 2 – Develop Prioritized Schedule for Monitoring VPDES and High Risk Outfalls

Outfalls identified as VPDES, High Risk non-VPDES and High Risk as described above are inspected according to specific protocols outlined in the Prince William County’s IDDE Program. Outfalls are prioritized and inspected according to a probability of pollutant discharge. This probability takes in account an assumed potential for a discharge to occur, possible pollutant discharge effect according to the type of facility and its operations, and the potential for environmental damage according to the facilities proximity to environmentally sensitive areas. This analysis is performed using GIS, and is updated on an annual basis. Outfall prioritization follows an iterative process that incorporates in-field observations. During outfall/facility analysis if a greater amount of pollutant discharges are found coming from a specific High Risk land use or VPDES facility, values will be adjusted to reflect the increase in pollutant discharge probability. As outfalls are monitored under the County’s Dry Weather Monitoring Program, those which are determined to have a high potential for pollutant discharge are identified as High Risk and added to the prioritized schedule the next time it is updated.

BMP 3 – Develop Program to Monitor VPDES and High Risk Outfalls

VPDES and High Risk outfalls are scheduled for inspection according to the methods described in BMP 2. Outfalls are monitored in accordance with the County’s Dry Weather Monitoring Protocols. Facilities whose outfalls are found to discharge significant pollutant flows within 3 consecutive inspections (follow-up inspections are scheduled according to IDDE protocols) are referred to DEQ for compliance review (see BMP 6). Outfalls of VPDES permitted facilities are inspected once a year, while High Risk outfalls are inspected once a permit cycle (due to high volume).

During the reporting period PWC conducted required industrial VPDES and high risk outfall inspections on County facilities holding VPDES or individual industrial stormwater permits as well as at two other VPDES permitted locations, Double T Automotive, and Potomac Disposal Services. No deficiencies were found as a result of these inspections. The number of Industrial and high risk outfalls was low due to the reconfiguring of the County’s VPDES and High Risk facility identification process as a result of completing the identification its official MS-4 Service area. The County expects a renewed emphasis on these inspections in the upcoming fiscal year and expects to complete inspections on all VPDES and high Risk outfalls during the next reporting period. Outfalls associated with VPDES and High Risk facilities are identified as below, outfalls represented by a letter are not identified in the County’s GIS system with a current outfall ID and are therefore identified in a separate GIS shapefile maintained by Watershed Management:

Table 8 – VPDES and High risk Outfalls

Outfall	Outfall ID	Facility	Notes
1	4407	234 Auto and Truck Salvage Limited Liability Company	Not monitored by Parcel - receives drainage from Permitted facility
2	49124	Chemung Contracting Corporation - Gainesville	
3	49121	Chemung Contracting Corporation - Gainesville	Not monitored by Parcel - receives drainage from Permitted facility

4	46229	Chase David D Residence	Not monitored by Parcel - receives drainage from Permitted facility
5	19594	Double T Automotive Incorporated	Not monitored by Parcel - receives drainage from Permitted facility
6	47292	First Transit Incorporated	
7	47274	First Transit Incorporated	Not monitored by Parcel - receives drainage from Permitted facility
8	47279	First Transit Incorporated	Not monitored by Parcel - receives drainage from Permitted facility
9	A	Penny's Used Auto Parts	Outfall is overland flow to rear part of property, no actual stormsewer
10	12262	Potomac Disposal Services of Virginia, LLC	
11	B	Prince William County - Balls Ford Yard Waste	Not recorded in County System, monitored through contract with Solid Waste. See DMR Reports
12	C	Prince William County Sanitary Landfill	Not recorded in County System, monitored through contract with Solid Waste. See DMR Reports
13	D	Prince William County Yard Waste Compost Facility	Not recorded in County System, monitored through contract with Solid Waste. See DMR Reports
14	E	Prince William County Yard Waste Compost Facility	Not recorded in County System, monitored through contract with Solid Waste. See DMR Reports
15	F	Virginia Concrete Company Inc - Gainesville	
16	G	Vistas at Lake Manassas Limited Liability Company	Not Piped, Not in county System
17	H	Vistas at Lake Manassas Limited Liability Company	Not Piped, Not in county System

In addition the County inspected 7 non-VPDES permitted high risk facility outfalls. This number is expected to increase over the next reporting period. All identified non-VPDES high risk facilities are expected to have associated outfalls inspected during the Permit Cycle.

BMP 4 – Review DMR Reports provided by VPDES Permitted Facilities

To comply with permit conditions, PWC requests Discharge Monitoring Reports (DMRs) from all applicable (non-exempt) VPDES permitted facilities that discharge into the County’s MS-4. Prince William County may conduct additional monitoring, or may require the facility to conduct additional monitoring, of any stormwater discharges it believes may be a source of significant pollutant loadings. Facilities that discharge in to the County’s MS-4 and do not provide the DMR’s will be directed to DEQ for compliance review (BMP 6).

BMP 5 – Identify High Risk Dischargers Not Covered Under VPDES Program

As outfalls for facilities determined to have a high risk for pollutant discharge are inspected, those which do not fall under VPDES permitting requirements or Virginia State Water Control Law are identified. These facilities are included under the County’s non-VPDES High Risk Designation.

Potential Non-VPDES High Risk facilities are identified, along with associated outfalls, through GIS desktop analysis. Using County land-use information land-uses that are identified to have a high potential for the discharge of pollutants are isolated. As with VPDES permitted facilities, a buffer is placed around a high risk parcel and the containing outfalls are identified. These outfalls are considered to be High Risk outfalls. During Dry Weather Monitoring activities, outfalls which are determined to potentially contribute pollutants to the stormsewer system are identified and added to the list of high risk discharges. These outfalls are then added to the High Risk outfall prioritization (BMP 2) list the next time it is updated. As with VPDES permitted facilities, as the County's GIS based stormsewer layer is updated, the analysis of outfalls associated with High Risk facilities will be updated. The list of high risk facilities can be found in Appendix G.

Outfalls from these facilities are included in the prioritized outfall inspection schedule described in BMP 2. Any facility found to be discharging significant pollutants to the stormsewer system will be required to adopt control measures to prevent these discharges from entering the County's MS-4 under appropriate regulatory ordinance, since they cannot be referred to DEQ for VPDES compliance review. If access to facilities that fall under these conditions cannot be obtained by watershed staff, assistance from the PWC Fire Marshal's office will be requested. This list of outfalls can be found in Appendix G.

BMP 6 – Refer Facilities in Noncompliance to DEQ for Review

PWC is required to refer the following facilities to the Department of Environmental Quality, Northern Regional Office, for DEQ compliance review under the Virginia State Water Control Law:

- Facilities and operations having non-stormwater discharges that do not have coverage under an existing VPDES permit;
- Facilities and operations identified pursuant to 40 CFR Part 122.26(b)(14) with manufacturing, processing, or raw materials storage outside that do not have coverage under an existing VPDES industrial stormwater permit.
- Any VPDES industrial stormwater permit facility where there is evidence of significant pollutant loadings to the MS4.
- Facilities that do not submit signed copies of DMRs to the permittee as required under a VPDES industrial stormwater permit.

During the reporting period one facility was deemed necessary to report to DEQ for compliance review. This number is expected to increase as PWC expands its industrial and high risk monitoring program. A copy of this correspondence can be seen in Appendix G.

h. Storm Sewer Infrastructure Management

BMP 1 – Identify MS-4 Service Area and Regulated Outfalls

An integral part of developing the County's Chesapeake Bay TMDL action plan is determining the MS-4 regulated area. Prince William County maintains a comprehensive GIS database of SWM facilities and its stormsewer system. Included in this system are approximately 665 miles of

storm drainage easements, over 8,000 stormwater outfalls, and 1,752 private and publically maintained SWM facilities; however, not all these facilities are served by MS-4 regulated areas.

In June of 2016 the County finalized the extent of its MS4 service area. This included the Regulated Outfalls and their associated drainage area. Information for each outfall included the individual ID number, local watershed, HUC and receiving water, and latitude/longitude for each MS-4 structure. The number of pervious and impervious acres served by the MS-4 and treated by MS-4 controls were also identified and reported. Prince William County has a total regulated MS-4 area of 36,365 acres, with 9,087 acres of impervious and 27,278 acres of pervious area. The delineation methods are presented in Appendix H of this document.

BMP 2 – Continue Inspection of Publicly Maintained SWM Facilities

Prince William County continues a program for the inspection and maintenance of SWM facilities maintained by the County. Publicly maintained facilities include those owned by HOA's and residential communities or by the County Board of Supervisors, and where basic maintenance responsibilities are performed by County staff. The County is responsible for the maintenance of approximately 821 facilities, most of which are dry ponds, wet ponds, infiltration trenches, or sand filter facilities. The County maintains a limited number of Bioretention and proprietary BMP facilities.

County Maintained SWM/BMP facilities are typically inspected under two scenarios; under the general inspection program which occurs once a year, or, as requested by an impacted property owner. Maintenance is prioritized by the severity of maintenance needs for the facility. Maintenance on publically maintained SWM facilities is performed by Prince William County Construction Services as necessary. All applicable permitting requirements will be met during maintenance activities.

During the reporting period County staff conducted 753 routine inspections and 41 re-inspections of publically maintained facilities. Of those facilities inspected, 570 needed maintenance with 170 needing minor maintenance and 400 needing major maintenance. A list of these facilities and their inspection date are included in Appendix H.

BMP 3 – Continue Inspection of Privately Maintained SWM Facilities

The County has a program in place to inspect more than 20 percent of the privately maintained facilities annually and to pursue enforcement actions in instances where maintenance is needed. All privately maintained facilities will be inspected within the five year permit cycle. Prince William County encompasses approximately 931 privately maintained facilities. These facilities are comprised of many structures including, dry ponds, wet ponds, constructed wetlands, bioretention facilities, proprietary stormwater inlet BMP facilities, underground storage facilities, infiltration trenches, and many more.

Facilities are selected for inspection starting with the oldest facilities in the County. Facilities in compliance with maintenance requirements are scheduled for re-inspection during the following permit cycle. Facilities with deficiencies are provided adequate time to repair issues and the owner

is provided with a detailed report outlining those deficiencies. If deficiencies are not corrected within the time period allotted a second notice is given, and additional time is provided for repairs. If the facility is still not repaired, Prince William County Construction Services conducts maintenance on the facility and the facility owner is required to reimburse the County for expenses. Follow up inspections are performed to ensure maintenance requirements are followed. Facility owners are urged to self-report maintenance activities to the County in the form of a detailed engineering report.

Before a privately maintained facility can be removed from bond, it requires a maintenance agreement to ensure the proper upkeep of the facility. A majority of the privately-maintained SWM facilities have duly-recorded Maintenance Agreements that requires the owner to perform the inspection and maintenance at a frequency identified in the Agreement. For those facilities that do not have Maintenance Agreements, our County Attorney has determined that the maintenance note on the plan is still enforceable.

The County has been successful in enforcing maintenance. During the reporting period a total of 136 routine inspections and 118 re-inspections were conducted. Of those, 47 were found to be in compliance, and 10 were sent to the County Attorney for legal action and forced compliance. 138 were in need of maintenance and are within the 60 or 30 day compliance periods; all of these facilities are expected to be brought into compliance. Table describing inspection, maintenance, and enforcement of privately maintained facilities for the reporting period along with a future inspection schedule can be found in Appendix H.

BMP 4 – Continue Inspection of MS-4 Stormsewer System

Prince William County conducts routine inspection of its storm drainage system, inspecting no less than 20% of the MS-4 annually. Until the County determines the exact extent of its MS-4, it is assumed the MS-4 includes all storm drain systems under County easement. Stormsewer is inspected using visual inspection techniques, as well as using CCTV. The County continues to implement a program to inspect all new drainage systems (eligible for County maintenance) using video cameras, prior to accepting the systems into the County’s maintenance program.

During the reporting period the County conducted routine inspections on 243.3 miles of stormsewer during the reporting period.

BMP 5 – BMP/SWM Inventory

Prince William County maintains an inventory of all SWM/BMP facilities installed in the County. This list was updated for the newest run of the Chesapeake Bay model, and includes all facilities installed after 1985. This list is updated and added to continuously as new facilities come on line, and old facilities are removed or retrofitted. This list includes the facility number, type, total acres treated, impervious acres treated, HUC code, State FIPS, and latitude/longitude and is included in an electronic form submitted with this document.

In addition, 74 facilities were added to the County’s inventory during the reporting period. These facilities are listed below.

Table 9 – BMPs added to County Inventory in FY16

FAC_ID	FACTYPE	FACD ESC	DATEINVEN	MAINT	COMMENTS	SWM_AGREEM	VAHUC6	VAHUC12NAM	SUBD
299	BMP	D	10/30/2015	P	1.5" BMP ORIFICE AT EW, DAM IS GABION BASKET	N	PL49	Neabsco Creek	PRINCE WILLIAM PARKWAY SWM POND IMPROVEMENTS
928	SWMP/BMP	D	9/11/2015	P	6'x7' RISER, 2" BMP ORIFICE AT RISER	N	PL41	Occoquan River-Lake Jackson	PARKWAY WEST PHASE 3
930	SWMP/BMP	W	11/4/2015	P	PWSE=235.73', 4'x4' RISER, 12" DRAWDOWN PIPE	N	PL34	Broad Run-Rocky Branch	BOLT PROPERTY
931	BMP	U	12/3/2015	P	BIORETENTION AREA	N	PL49	Neabsco Creek	FOREST GLEN
932	SWMP/BMP	D	12/3/2015	P	40"x52" RISER, 1.6" BMP ORIFICE AT RISER	N	PL49	Neabsco Creek	FOREST GLEN
933	SWMP/BMP	D	1/13/2016	P	3.56" BMP ORIFICE AT EW, REG POND	N	PL43	Little Bull Run	DOMINION VALLEY COUNTRY CLUB SECTION 36
934	SWMP	D	2/2/2016	P	REG POND, APR PLAN DATA	N	PL47	Occoquan River-Occoquan Reservoir	LAKE RIDGE SECTION 11-G
936	BMP	T	4/4/2016	P	BMP MICRO-MEASURE W/ MONITORING WELL	N	PL32	Broad Run-Catletts Branch	CAMP GLENKIRK (SARANAC) SECTION 1
937	SWMP/BMP	D	4/5/2016	P	3" BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	SILVER LEAF ESTATES
938	SWMP	D	4/6/2016	P	11" DRAWDOWN ORIFICE W/ SLUICE GATE	N	PL51	Powells Creek	HOPE HILL CROSSING RECREATION CENTER
939	SWMP/BMP	W	4/8/2016	P	PWSE=271.74', DRAIN VALVE AT RISER	N	PL34	Broad Run-Rocky Branch	HAILEE'S GROVE SECTION 1
940	BMP	U	5/16/2016	P	8'x4' FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
941	SWMP/BMP	U	5/16/2016	P	2 HDP CHAMBERS, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
942	BMP	B	5/16/2016	P	BIORETENTION AREA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
943	BMP	U	5/16/2016	P	8'x6' FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
944	BMP	U	5/16/2016	P	8'x6' FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
945	SWMP/BMP	U	5/16/2016	P	STORMTECH SC-740 W/ 2 ISO CHMBR, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
946	BMP	U	5/16/2016	P	ADS FLEXSTORM INLET FILTER, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
947	BMP	U	5/16/2016	P	8'x6' FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
948	BMP	U	5/16/2016	P	ADS FLEXSTORM INLET FILTER, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
949	BMP	U	5/16/2016	P	8'x4' FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
950	SWMP/BMP	D	6/13/2016	P	1.69" BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	TURNING LEAF ESTATES

5360	CSWMP/B MP	D	3/11/2016	C	GRAVEL TRENCH W/ 6" PVC UD WITHIN 935	N	PL47	Occoquan River-Occoquan Reservoir	DAVIS FORD BUSINESS PARK
5666	CSWMP/B MP	D	10/19/2015	C	6'x15' RISER, 3" BMP ORIFICE IN SLUICE GATE	Y	PL32	Broad Run-Catletts Branch	GARDNER STATION PHASE 2A
5941	CBMP	U	8/14/2015	C	12'x6' FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5942	CBMP	U	8/14/2015	C	8'x6' FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5943	CBMP	U	8/14/2015	C	6'x6' FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5944	CBMP	U	8/14/2015	C	8'x6' FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5945	CBMP	U	8/14/2015	C	8'x6' FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5946	CSWMP/B MP	D	8/14/2015	C	1" BMP ORIFICE AT RISER, 6" DRAWDOWN ORIFICE	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5947	CBMP	T	9/3/2015	C	2 SETS OF TWIN 6" PERF PVC PIPE	Y	PL49	Neabsco Creek	DALE CITY CHRISTIAN CHURCH
5948	CSWMP/B MP	W	9/16/2015	C	PWSE=122.44', 4'x4' RISER, 15" DRAWDOWN PIPE	N	PL52	Quantico Creek	CRAMERS RIDGE SECTION 1
5949	CSWMP/B MP	W	9/16/2015	C	PWSE=108.71', 4'x5' RISER, 15" DRAWDOWN PIPE	N	PL52	Quantico Creek	CRAMERS RIDGE SECTION 1
5950	CBMP	B	9/25/2015	C	VEGETATED SWALE	Y	PL49	Neabsco Creek	POTOMAC CENTER
5951	CBMP	B	9/25/2015	C	VEGETATED SWALE	Y	PL49	Neabsco Creek	POTOMAC CENTER
5952	CBMP	B	9/25/2015	C	BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5953	CBMP	B	9/25/2015	C	BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5954	CBMP	B	9/25/2015	C	BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5955	CSWMP/B MP	D	10/7/2015	C	4'x4' RISER, 3" BMP ORIFICE AT EW	Y	PL52	Quantico Creek	INTERSTATE DRIVE DEVELOPMENT
5956	CBMP	U	10/19/2015	C	10'x6' FILTERRA	Y	PL32	Broad Run-Catletts Branch	GARDNER STATION PHASE 2A
5957	CBMP	U	10/27/2015	C	FLO-GARD +PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5958	CBMP	U	10/27/2015	C	FLO-GARD +PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5959	CBMP	U	10/27/2015	C	FLO-GARD +PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5962	CSWMP/B MP	D	10/28/2015	C	1.3" BMP ORIFICE AT EW; NO SWM ESMT	N	PL49	Neabsco Creek	PWCSA HL MOONEY FAC POND REHABILITATION
5963	SSWMP/B MP	D	10/30/2015	S	2.25" BMP ORIFICE AT RISER	N	PL49	Neabsco Creek	PRINCE WILLIAM PARKWAY SWM POND IMPROVEMENTS
5964	CBMP	U	11/6/2015	C	STORMCEPTOR (STC 450i) W/ YI TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 1 LOT 11

5965	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5966	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5967	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5968	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5969	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5970	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5971	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5972	CBMP	U	11/17/2015	C	ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5973	CSWMP/B MP	U	11/17/2015	C	STORMTECH SC-740 W/ 2 ISOLATOR CHAMBERS	Y	PL44	Middle Bull Run	VALUE PLACE HOTEL - BALLS FORD ROAD
5974	CBMP	U	12/8/2015	C	CONTECH CDS2015-4-C	Y	PL51	Powells Creek	POTOMAC SHORES GOLF MAINTENANCE FACILITY
5975	CSWMP/B MP	D	12/8/2015	C	4'x4' RISER, 3.5" BMP ORIFICE AT EW	Y	PL51	Powells Creek	POTOMAC SHORES GOLF MAINTENANCE FACILITY
5976	CSWMP/B MP	W	12/16/2015	C	PWSE=110.00', 4'x2' RISER, APR PLAN DATA	Y	PL52	Quantico Creek	TRIANGLE SENIOR APARTMENTS
5977	CSWMP	D	12/17/2015	C	6" ORIFICE/REDUCER AT ES, APR PLAN DATA	N	PL50	Potomac River-Occoquan Bay	LANCASTER COMMUNITY PARK
5978	CBMP	U	1/7/2016	C	STORMCEPTOR (STC 450i) W/ DI TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 3 LOT 6A
5979	CBMP	U	1/7/2016	C	STORMCEPTOR (STC 450i) W/ DI TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 3 LOT 6A
5980	CSWMP/B MP	U	2/19/2016	C	STORMTECH SC-740 W/ ISOLATOR CHAMBER	Y	PL44	Middle Bull Run	SUDLEY SQUARE COMMERCIAL PARCEL A
5981	CSWMP/B MP	U	2/29/2016	C	STORMTECH SC-740 W/ 2 ISOLATOR CHAMBERS	Y	PL43	Little Bull Run	ALEXANDRA'S KEEP POND PLAN
5982	CSWMP/B MP	D	3/21/2016	C	31"x31" RISER, APR PLAN DATA	N	PL49	Neabsco Creek	LONG & FOSTER OFFICE BUILDING
5983	CSWMP/B MP	D	4/14/2016	C	1" BMP ORIFICE AT RISER	Y	PL52	Quantico Creek	HAMPTON INN - OLD STAGE ROAD
5984	CBMP	U	5/6/2016	C	STORMCEPTOR (STC 450i)	Y	PL34	Broad Run-Rocky Branch	WELLINGFORD IND PK PH 2 LOT 9 (NEFF RENTAL)
5985	CBMP	U	5/11/2016	C	STORMCEPTOR (STC 900i), NO ESMT	Y	PL34	Broad Run-Rocky Branch	INNOVATION - POWER LOFT DATA CENTER
5986	CSWMP/B MP	D	6/15/2016	C	0.48" BMP ORIFICE AT RISER	Y	PL34	Broad Run-Rocky Branch	TUDOR TRUCK REPAIR
5987	CSWMP/B MP	D	6/15/2016	C	0.36" BMP ORIFICE AT RISER	Y	PL34	Broad Run-Rocky Branch	TUDOR TRUCK REPAIR
5988	CSWMP/B MP	D	6/21/2016	C	3.4'x3.4' RISER, 0.08' BMP ORIFICE AT RISER	Y	PL46	Lower Bull Run	KATIE'S GROVE

5989	CSWMP/BMP	D	6/21/2016	C	5.4'x5.4' RISER, 0.1' BMP ORIFICE AT RISER	Y	PL46	Lower Bull Run	KATIE'S GROVE
5990	CBMP	U	6/28/2016	C	6'x12' STORMFILTER W/ WEIR WALL	Y	PL50	Potomac River-Occoquan Bay	DUNKIN' DONUTS/BASKIN ROBBINS
5991	CSWMP	T	6/28/2016	C	INFILTRATION TRENCH W/ GRAVEL FILTER	Y	PL50	Potomac River-Occoquan Bay	DUNKIN DONUTS
9033	CBMP	D	4/21/2016	C	PVT ST I/E, CHECK DAMS SERVE AS BMP	N	PL40	Cedar Run-Slate Run	OLD CHURCH ESTATES PRIVATE DRIVE E/S PLAN

i. County Facilities

BMP 1 – Promote Good Housekeeping Practices for Municipal Facility Operations

Prince William County promotes good housekeeping practices throughout all its municipal facilities through its Environmental Management System (EMS) program and other methods. PWC Watershed Management in partnership with PWC Risk Management enforces good housekeeping at County municipal facilities. The EMS program promotes consistency and accountability in the method for addressing environmental concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, procedures, and processes. This program emphasizes objectives such as the identification and prevention of spills, hazardous material storage and removal, storage tank inspection and maintenance, waste disposal and recycling, proper equipment and material storage, and many other environmental good housekeeping practices.

The following list shows some of the public buildings or facilities that have either Extraordinary Environmental Enterprise (E-3/E-4) or LEED certification:

- E4 – PWC Solid Waste Sanitary Landfill
- E4 – PWC Balls Ford Road Recycling & Composting Facility
- E3 – PWC Fleet Management Facility
- E3 – PWC Environmental Services Operations Building
- E3 – PWC Buildings & Grounds Central Supply
- E3 – PWC Buildings & Grounds Print Shop

In addition to the EMS program, Prince William County promotes good housekeeping activities for parks and rec facilities. These facilities are inspected biennially, to ensure good housekeeping practices are being followed. This includes properly managing yard waste and grass clippings. Police and fire vehicles are required to be washed in an environmentally safe manner, allowing no wash water to enter stormdrain systems. Most vehicles are washed in commercial car washing facilities. PWC Fleet Management has worked closely with Risk Management and Watershed Management to set up a system to prevent the leaking or spilling of vehicles on site waiting for maintenance.

Prince William County's storm drain labeling program targets high priority municipal facilities to maintain markings on storm drain inlets. This program not only labels inlets at high priority municipal facilities, but in multiple areas of the county including high risk shopping centers and residential neighborhoods.

BMP 2 – Identify High Priority Municipal Facilities

The County houses many municipal facilities that can have a high potential for industrial type discharges. Some, like the PWC landfill facility, are covered under their own VPDES permit for stormwater discharges. The County is in the process of determining which additional facilities may be determined as High Risk for stormwater discharge pollutants. In FY15, the County did a preliminary inspection of many potential high risk facilities and plans on performing another round of inspections in FY17 as part of its biennial inspections. These facilities include locations where

vehicles are stored, construction materials are housed, or fueling stations are located. The following facilities have been identified as potential High Priority Municipal Facilities:

Table 10 – High Priority Municipal Facilities

Facility Name	SWPPP Needed	SWPPP Developed
Fleet Administration	Yes	In Development
Splashdown Maintenance Building	Potential	TBD
Hellweg Maintenance Building	Potential	TBD
Water Works Bathhouse	Potential	TBD
Station 4 Fire Station	Potential	TBD

BMP 3 – Develop SWPPPs for Selected High Priority Municipal Facilities

Facilities that were deemed High Risk and are not eligible, or do not require a separate VPDES permit will be evaluated for the development of a Stormwater Pollution Prevention Plan (SWPPP). SWPPPs will include a site description that includes site map showing all outfalls, direction of flows, existing source controls, and receiving water bodies; a checklist of potential pollutants and pollutant sources; all potential non-stormwater discharges; a maintenance schedule for all source controls; policies and procedures implemented at the facility for source reduction; an inspection schedule to ensure source reduction controls are implemented and maintained properly; training schedules for facility employees; procedures for annual evaluations of the facility; dry weather monitoring procedures; and all modifications made as a result of a spill or release of pollutant. The status of SWPPP development at High Priority Municipal Facilities is presented in Table 8 located in the above section.

j. Public Education and Participation

BMP 1 – Promote Public Reporting and Recognition of Illicit Discharges

Prince William County has developed multiple avenues for the education of illicit discharges. Through the County’s Clean Water Program, multiple brochures, and videos are available for citizens to educate themselves on stormwater issues. The Clean water program focuses on 3 areas; private citizens, local commercial businesses, and local industry. As this program expands it will include proactive distribution of outreach material to business and industry found most likely to generate illicit discharges.

From June 2015 to July 2016, Prince William County has coordinated, hosted or facilitated a number of opportunities for the community to learn and serve.

- Our 15th annual Youth Ambassadors’ Conference on the Environment focused on water quality and monitoring. We hosted over 80 students and 30 student leaders at the conference. In addition, 60 adults participated in the parent symposium with the same topic.
- We enhanced our Environmental Services Web pages to include more information for citizens on pollution prevention and illicit discharge, an online tour of our stream restoration projects and useful information for developers and builders.

- We offer printed information about illicit discharge, picking up after pets, RPAs, shoreline protection for residents and pool maintenance.
- We follow an established program to address environmental spills and response with regular training for municipal employees.
- We are working on an online tutorial about illicit discharge and continue to promote a short online tutorial and test regarding watersheds for County Employees.
- Public Works has spoken at a number of community events, HOA meetings, civic organizations and public forums regarding illicit discharge and watershed improvement projects.

The County maintains an illicit discharge hotline (703-792-7070) and an email address (illicitdischarge@pwcgov.org) which connects citizens directly to Watershed Management staff to report potential environmental issues. Outreach materials are carried by IDDE staff and utilized when visiting sites in the field and may be included with warning and violation letters. Prince William County will continue to implement and improve ways citizens can learn and report illicit discharge issues in the future.

BMP 2 - Continue to Promote Involvement in Local Water Quality Improvement Projects

The Department of Public Works plays a crucial role in the community's efforts to improve water quality, protect water resources and prevent pollution. We have created a number of programs and initiatives for residents, businesses and our County coworkers. Our goal is to educate the public, raise awareness and appreciation for the protection of our local waters and encourage participation in volunteer opportunities.

- Our 15th annual Youth Ambassadors' Conference on the Environment focused on water quality and monitoring. We hosted over 80 students and 30 student leaders at the conference. In addition, 60 adults participated in the parent symposium with the same topic.
- From April to mid-May, we hosted eight conservation projects including litter pick up, planted needed trees and shrubs, improved and blazed trails, established crucial meadows for local wildlife, repurposed old soda bottles into a greenhouse, and set the stage for future studies along a discovery trail for local students. We contributed nearly 300 volunteer hours to preserve our community.
- We hosted our fifth Earth Day Festival for County employees and their families with 20 interesting displays hosted by Public Works and our partner agencies, including a number of displays on water conservation and protection. We had an estimated 200 participants.
- Public Works provided support for the annual Arbor Day Celebrations at local schools hosted by the Prince William Soil and Water Conservation District in April and May. Nearly 1400 students participate in the events.
- We recognized five community leaders with the Green Community Award and 76 families for their participation in the five conservation projects.
- Working with the County Videography team, we created Public Service Announcements on protecting our streams from runoff down the storm drains and stream restoration efforts.
- We continue to install water bottle filling stations at many County Facilities to reduce the use of bottled water.

- The County provides funding to Keep Prince William Beautiful. Their programs include recycling education, litter education and clean ups, litter surveys and inspections, storm drain labeling, and beautification projects. In FY16, there were 1130 volunteers that donated 11,986 hours of service to our community. KPWB volunteers picked up 113,463 pounds of trash and labeled 897 storm drains. In addition, over 5913 citizens participated in a variety of education programs.
- Public Works provides funding to the Prince William Soil and Water Conservation District to sponsor the Adopt-a-Stream program in the community and monitor floatables. From July 2015 to June 2016, volunteers picked up 20,877 pounds of trash along 77.4 miles of streams.
- Finally, Prince William County provides funding to the Occoquan Testing Laboratories for water monitoring programs, including Bacteria Source Tracking.

BMP 3 – Promote Integrated Management Practice (IMP) Plans for Public and Private Golf courses

Golf courses generate a significant amount of high nutrient runoff due to the nature of their operations. Prince William County has developed IMPs for all public golf courses in the County through use of a contractor. The contractor ensures the implementation and maintenance of IMPs and is managed through the Department of Parks and Recreation. Contractors are required to hold applicable Nutrient Management Certifications. The County will continue the promotion of IMP's for privately maintained courses within its MS-4 service area. IMP's for private golf courses will be promoted through public outreach initiatives as part of the Clean water Program. According to the Code of Virginia § 10.1-104.5 all golf courses, private and public, are required to develop nutrient management plans before July 1, 2017.

BMP 4 - Continue to Promote Public Good Housekeeping Practices

Public Works has partnered with citizens, business and organizations on opportunities, project and events to advance our goals to protect and preserve natural resources. The goal is to inspire all citizens to play an active role in protecting our local environment.

- Staff has created a web page dedicated to green tips and practices for the community at www.pwcgov.org/gogreen.
- We offer printed information about illicit discharge, picking up after pets, RPAs, shoreline protection for residents and pool maintenance.
- We continue to work with a local high school to collect printer cartridges, cables and cords, CDs and jewel cases and other small electronics such as cell phones and cameras. Students gain work skills and earn money for the school through this program.
- Public Works provides funding to help support educational programs on landscape and lawn care for the public through the Virginia Cooperative Extension. Citizens learn about environmentally sound ways to care for their lawns to help reduce fertilizer, herbicides and pesticides from entering streams. The Cooperative Extension has worked diligently with local residents and businesses. There are 179 active Master Gardeners and Interns working with local homeowners. They have provided 13,765.75 hours of service. There are 24 new trainees in the Master Gardener Program. The Cooperative Extension created 280

new BEST Lawns plans for a total of 70.17 acres. There are a total of 789 active BEST Lawns plans for a total of 218.91 acres in Prince William County. This data is reported to the Virginia Department of Conservation and Recreation as certified nutrient planning on a quarterly basis. Staff with the Cooperative Extension hosted 59 education events and reached 1945 youth and adults. They also provided pesticide safety education in Spanish to 35 attendees and in English to 47 attendees. Finally, the Cooperative Extension participates in regional and state efforts to properly dispose of pesticides.

- Public Works provides funding to the Prince William Soil and Water Conservation District to help reduce nutrients (nitrogen and phosphorus) from agriculture practices through BMPs and Planning, create Soil and Water Quality Conservation Plans, offer technical assistance to citizens and to provide Citizen Stream Education. In FY16, the District helped remove 15,369.9 pounds of nitrogen and 1,252.21 pounds of phosphorus. District Staff created 61 conservation plans, provided technical assistance to 146 citizens and offered education to 341 residents.
- Public Works provides twice a week collection of household hazardous waste at the County Landfill and once a month collection at the County Compost Facility. From July 2015 to June 2016, we had 26,106 citizens bring nearly 50 tons of household hazardous waste to the facility. We also accept electronic waste during these collections.
- Along with Public Works provides recycling containers at 18 convenient locations throughout the community and a weekly trash and recyclable collection in the rural section of the county.

BMP 5 - Encourage Private Property Owners to Implement Voluntary Stormwater Management Techniques and/or Retrofits

Prince William County will continue to develop programs to encourage private property owners to implement voluntary stormwater management retrofits. Currently, the County partners with the Prince William County Soil and Water Conservation District to encourage private property owners to implement voluntary stormwater management retrofits through the Virginia Conservation Assistance Program. This program promotes cost share incentives for private property owners looking to implement BMPs. As part of this partnership PWCSWCD looks to install at a minimum two voluntary retrofit projects per year. Since this is the first year the County is implementing this program, no retrofits have yet been installed.

BMP 6 - Continue to Promote Commercial, institutional and Industrial Good Housekeeping Practices

The County looks to promote commercial and industrial good housekeeping practices through its Clean Water Program. Outreach material such as brochures, pamphlets, and videos are to be Developed focusing on promoting stormwater awareness for local businesses. These businesses Include restaurants, shopping centers, grocery stores, gas stations, aggregate materials storage and sales, and many more. Materials will be developed for each type of potential pollutant producing businesses. Restaurants will have a focus on the proper disposal of grease, food waste, and making sure disposal areas are clean. Gas station outreach will be focused on spill prevention and cleanup, trash mitigation, and other good housekeeping practices. Aggregate

storage will be focused on the proper storage of such materials to prevent runoff during rain events. In FY16 the County undertook the following efforts:

Prince William County has partnered with citizens, business and organizations on opportunities, projects and events to advance our goals to protect and preserve natural resources. One of our successful collaborations is the Local Environmental Education Partners (LEEP) that focuses on environmental programs and community awareness. With our various partners, we have taken on coordinated projects and supported each other's individual projects. We are able to increase our efficiency, effectiveness and reach into the community by networking and sharing funds, talent and knowledge. Our goal is to inspire all citizens to play an active role in protecting our local environment.

Another successful collaboration for the County is working with Volunteer Prince William on an annual community recognition program. For the past four years, we have recognized individuals, families, businesses, government agencies and non-profit organizations with our Green Community Award. Many other organizations also recognize their volunteers for a variety of services to the community, including home improvements, literacy, animal protection, fundraising for charities, etc. We feel it offers all volunteers a larger audience and an appreciation for the diversity of amazing work completed by volunteers.

Since 2008, Public Works has led green initiatives for the County Government. Public Works facilitates the Green Guiding Committee and Green Champions, plus several staff members serve on the Environmental Management Systems Team. These groups tackle energy conservation, fuel conservation, recycling, waste reduction, green buildings, green procurement and water quality in our daily operations. Highlights of our efforts include:

- Staff created a new Standard Operating Procedure for managing chemicals.
- Working with our Risk Management Team, we have inventoried and disposed of chemicals stored at our facilities. We are currently updating our online SDS site and working on a preferred chemical list for future purchases and use.
- We follow an established program to address environmental spills and response with regular training.
- We follow a program for the proper disposal of Universal Waste products including difficult items such as televisions, CRTs, shredded hard drives and battery packs.

Public Works has earned the E3 rating at a number of our facilities and operations and an E4 rating for the County Landfill and Compost Facility through the Virginia Department of Environmental Quality. We also have 30 offices within the County Government that participate in DEQ's Sustainability Partners program. These partners are finding innovative ways to reduce waste, recycle more, drive more efficiently, reduce energy use and share resources.

Finally, Staff conducts regular inspections of refuse hauling equipment to reduce incidents of spills and leaks from trucks, as well as trash blowing from trucks that could make its way to local waterways. We inspected 4,199 trucks in FY16.

k. Training

BMP 1 – Continue to Train Staff in the Recognition of Illicit Discharges and Good Housekeeping Practices

Prince William County Staff will be trained on the recognition and reporting of Illicit Discharges as well as implementation of good housekeeping practices. Currently, all staff are presented basic good housekeeping, spill prevention, and illicit discharge prevention practices through required EMS training. This training is conducted annually and is required for all staff including full time parks and rec staff.

During FY16, the County is conducted additional more in depth training on disposal of universal waste, Illicit discharge prevention (vehicle/equipment washing, landscaping, and outdoor construction), and spill prevention and response. These trainings will be offered to all employees annually. Overall 697 employees attended these trainings in FY16. A copy of attendance numbers and descriptions of trainings can be seen below in Table 11. No specific dates for training are provided, as they are provided periodically in a classroom setting, as well as on demand through the County’s online training system.

To increase focus on the reporting and recognition of Illicit Discharges, as well as an overview of good housekeeping practices, a new general training will be introduced in FY17. A copy of this training can be seen in Appendix K.

Table 11 – Training Provided During FY16

Title	Course #	# Attended	Content
Chemical & Custodial Safety	EHS 411	242	Quarterly discussion with custodial staff, each with 3 focus topic: safety, wellness, and environmental compliance. Environmental topics include indoor and outdoor spill recognition and response, proper waste disposal procedures (regulated and non-regulated waste) and green chemical evaluation and use.
EMS Annual Training	EHS 440	97	This 60-minute course provides a refresher to VEEP participants on the various components of their Environmental Management System, including: training requirements, environmental impacts, regulatory compliance review, communication plans, and operational controls.
Environmental Regulation Overview	EHS 450	61	This 90-minute course is intended for personnel who manage or perform activities involving chemicals, fluorescent light bulbs, mechanical equipment, storage tanks and/or garbage and recycling. Background information will be provided and participants will learn how to ensure their facility meets applicable regulatory requirements. This course covers SPCC, RCRA, Chemical Disposal and Discharge, Watershed Protection, and an overview of the Environmental Management System.
RCRA for Generators	EHS 146	114	This course reviews the rules for the management of hazardous waste by generators. Subjects include waste identification, collecting wastes, storing wastes, required paperwork, waste shipments, and emergency planning relating to EPA hazardous wastes.
Spill Prevention and Response	EHS 401	111	Overview of methods for: preventing spills through regular tank and equipment checks; containing spills through the use of booms, absorbents, and storm drain barriers; reporting spills internally and to regulatory bodies, when necessary.

Watershed Protection / Illicit Discharge Prevention	EHS 451	72	Introduction to the importance and function of watersheds, regulations that protect them, and complying with local, state, and federal laws that prohibit illicit discharges
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BMP 2 – Continue to ensure pesticide and Herbicide Application Occurs in Accordance With Pesticide Control Board Regulations

All County staff and staff of County contractors receive appropriate training in pesticide and herbicide application. These include staff of Parks and Recreation, as well as Environmental Services Mosquito and Forest Pest Management staff. All staff are required to stay current in applicable trainings and certifications.

BMP 3 – Continue to ensure County Staff are Trained and Certified in DEQ Stormwater, E&S, and Plan Review Courses

All watershed management, plan review, and E&S staff are required as part of their position to complete and certify in DEQ stormwater, E&S, or plan review courses. Required certifications are dependent on job type. All E&S inspectors are required to be certified in DEQ E&S courses. Plan review and watershed inspection staff are required to take the stormwater and plan review certifications. Some administrative staff are required to certify as a combined administrator.

BMP 4 – Continue to ensure Emergency Response Staff are Trained in Spill Response

All uniform personnel are trained to the hazmat first responder operations level. This training teaches spill control as a defensive manner. This training is regulated by 29 CFR 1910.120(q) and NFPA 472. The 80 HAZMAT technicians or specialists and 577 career personnel are required to be current in this training, including annual refresher training. During the reporting period, all required personnel were current in Emergency Spill Response training.

I. Water Quality Screening Programs

BMP 1 – Develop and Maintain a Dry Weather Monitoring Program

During the reporting period, Prince William County conducted 1201 Dry weather Monitoring inspections. Of the 1201, 272 (22.7%) of those outfalls were found to be flowing; 99 (8.1%) of the flowing outfalls were found to have groundwater as a source, 85 (7.1%) were found to have surface water as a source (piped streams), 80 (6.7%) of those were found to have other sources (Legal discharges such as landscape irrigation, sump pump discharges, AC condensate, etc.), and 8 were found to be Illicit in nature. Two resulted in the issuance of an NOV. Descriptions of these discharges and of follow-up can be found below. Discharge reports for each instance can be found in Appendix L.

Table 12 – Dry Weather Monitoring Program Summary

Illicit Discharge - Dry Weather Monitoring - FY2016								
Outfall ID	Related Name/ Company	Address	Date of initial inspection	Characteristics of discharge	NOV Issued	Date of last inspection	comments	Status
49960	Valvoline Carwash, Automotive	12920 Hoadly Run Rd. Manassas, VA 20112	7/1/2015	Used oil discharge	No	7/2/2015	The curb inlet, conveyance sewer and outfall was cleaned by Atlas Environmental Services company the day the discharge was discovered.	Case Closed
44754	County Center Crossing Apartment	7000 Lakota Drive Woodbridge, VA 22192	7/8/2015	Soap and detergent	2015-2	10/8/2015	Corrective work was made by apartment to detach washer dryer outlet pipe, diverting it to the sanitary sewer	Case Closed
59183	Residential	2848 Wakewater WY, Woodbridge, VA 22191	8/15/2015	Suds, suspected to be soap & detergent	No	4/19/2016	Suds were found to be one time discharge as they were not found in subsequent inspections. The source was not able to be identified. Source of continued flow determined to be GW absent of soap/detergents.	Case Closed
46501	Shopping Center	6306 Hoadly Rd Manassas, VA 20112	8/17/2015	Algae, Oil Sheen	No	4/14/2016	The algae and oil sheen confirmed to be developed by Bacteriological decomposition. Source of flow confirmed to be AC condenser water and ground water seepage from underground SWM facilities belonging to this outfall.	Case Closed

16762	Stonewall Jackson Vol. Fire Dept.	7814 Garner Drive Manassas, VA 20109	1/6/2016	Unexpected discharge volume	No	2/8/2016	Case was forwarded to PWCSA. Leaking water main pipe corrected by PWC Service Authority	Case Closed
30126	Interstate Management Inc.	5360 Mapledale Plaza Woodbridge, VA 22193	4/19/2016	Grease, oil and chemicals	2016-3	5/11/2016	Hepaco, LLC was hired to capture the floating scum on 4/21/2016. The work was completed on same day	Case Closed
3529	Residential	13719 Bluefin Drive Woodbridge, VA 22193	5/13/2016	Paint Spilling	No	5/15/2016	The source of creek contamination confirmed to be dumping paint on storm sewer drop inlet located beside the property 13712 Bluefin Drive. Violator was not identified. Continued re-inspections occurring, Educational material was passed out to nearby homeowners. Periodic inspections will occur	Case Closed
23443	Residential + Open Space	7754 Virginia Oaks Dr. Gainesville, VA 20155	5/24/2016	Paint or Hydro seeding	No	6/27/2016	The observed green stain may be developed either dumping paint in storm sewer system or hydro seeding. Source unidentified due to lack of evidence. Periodic inspections will occur	Case Closed

All cases of Illicit Discharge were completed satisfactorily, or were a case of a single discharge whose responsible party could not be reasonably located. In these cases periodic inspections are performed.

BMP 2 – Develop and Maintain a Wet Weather Screening Program

Prince William County’s Wet Weather Screening Program began at the end of FY16, with first sampling expected to occur in Q1 FY17. Two sites were selected for sampling and sampling will occur during qualifying storms on a quarterly basis. Sampling will occur using auto samplers and will be analyzed by flow weighted samples through a certified laboratory. Results from the first year of sampling will be presented in the next annual report. A description of site selection and final site locations, as well as Wet Weather Monitoring procedures are located in Appendix L.

m. Infrastructure Coordination

BMP 1 – Implement Annual Coordination Meeting with VDOT

Prince William County met with VDOT on May 27th 2016. The main discussion involved comparing and contrasting the interconnectivity between VDOT and Prince William County’s MS-4 Service area. Shapefiles of the County’s service area was shared. A database of BMP’s and stormwater outfalls was shared between VDOT and The County, and an analysis was done to determine where differences occurred.

In addition to the discussion on MS-4 service area, VDOT and Prince William County shared procedures and contacts for the reporting of Illicit Discharges. The locations of water quality monitoring stations within the County were also shared.

Finally preliminary discussions on TMDL action plan and implementation credit were had. The County is currently in development of its TMDL action plan, but an understanding was made to look for potential projects where mutually beneficial outcomes could be made during the development process. VDOT shared details on its Means and Methods to achieve compliance with TMDL goals, as well as expressed areas where the County may be able to help with reaching those goals.

A sign in sheet showing members of the meeting is included in Appendix M. The County and VDOT plan to meet in FY17 in accordance with MS-4 permit requirements.

BMP 2 – Coordinate with VDOT on MS-4 Initiatives

During annual meetings with VDOT the County will discuss MS-4 interconnectivity issues such as:

Mapping – Status of mapping program and the ownership of MS-4 components

Chesapeake Bay TMDL – Means Methods and Schedule for reductions under the Chesapeake Bay TMDL special condition where impacts may occur to interconnected MS-4 areas.

Other TMDL Action Plans – Means Methods and Schedule for reductions under the other TMDL special conditions where impacts may occur to interconnected MS-4 areas.

TMDL Implementation Credit – Ensure BMP retrofits do not encounter double crediting. Discuss sharing of BMP credit if applicable.

Illicit Discharge – Share information pertaining to the County’s IDDE program and coordinate with VDOT on the identification of high risk facilities. Establish procedures for reporting discharges identified from the VDOT MS-4 system.

Water Quality Monitoring – Discuss and present results of the County’s water quality monitoring programs. This includes monitoring data collected from areas where the physically-interconnected MS-4 discharges to or flow is received from the VDOT MS-4.

II. Monitoring Requirements

1. Biological Stream Monitoring

Prince William County began its Biological Monitoring Program in FY16 with its first round of monitoring taking place in Q3 and Q4 of the reporting period. Sample collection occurred from April 12 to 14, 2016 on five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch. Benthic sampling was conducted in accordance with the Sampling Plan. The multiple habitat sampling method was used for each of the sites, consisting of a total of 20 jabs or kicks, taken from each major habitat type in the reach. Benthic macroinvertebrate samples were placed on ice in coolers and shipped overnight to Amec Foster Wheeler’s benthic macroinvertebrate laboratory in Gainesville, Florida.

The RBP defines the following condition categories based on the physical habitat characterization scores, in an effort to determine the ability of the habitat to support an optimal biological community:

- **151-200 Optimal** - The physical habitat present meets natural expectations, and is capable of supporting an optimal benthic community.
- **101-150 Suboptimal** - Physical habitat is less than desirable, but satisfies expectations under most circumstances to support a benthic community.
- **51-100 Marginal** - Physical habitat has moderate levels of degradation, with a severity at frequent intervals throughout the reach, which limit the capability of supporting a benthic community.
- **0-50 Poor Physical** - habitat has been substantially altered with severe degradation to characteristics that would support a benthic community.

Table 13 below summarizes the results of the spring sampling session.

Table 13 – Spring 2016 Field Condition and Benthic Macroinvertebrate Results

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	94	126	120	134	103
RBP Habitat Condition Category	Marginal	Suboptimal	Suboptimal	Suboptimal	Suboptimal
Taxa Richness	17	20	23	23	27
Abundance	250	211	246	225	251
EPT Index	2	1	5	4	9
EPT/EPT + Chironomidae	0.02	0.03	0.07	0.05	0.15
Percent Dominant Taxon	50.00	45.50	33.74	62.22	53.78
Percent Chironomidae	82.00	52.13	78.46	92.89	78.49
BI	5.75	5.86	5.34	5.05	4.57
BI Category	Fair	Fair	Good	Good	Good
PMA	29.4	45.43	40.12	27.11	39.72
PMA Category	Severely Impacted	Moderately Impacted	Moderately Impacted	Severely Impacted	Moderately Impacted
VSCI	27.85	35.67	39.29	32.96	46.40
VSCI Category	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Stress

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and meet Virginia’s Water Quality Standards, as outlined in Section 3. Though there were potentially elevated total phosphorus and nitrogen results, water quality does not indicate potential impairment based on the spring 2016 sampling. However, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats at all the sites, with the exception of Cow Branch, which indicated marginal habitats. The “suboptimal” category indicates that the habitat criteria are less than desirable, but that the criteria satisfy expectations under most circumstances; the “marginal” category indicates a moderate level of degradation, with severity at frequent intervals throughout the reach that do not satisfy expectations.

Though the “suboptimal” habitat assessment rating indicated that four of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate community measures showed that there was moderate to severe impairment to the benthos at all five sites, closer in agreement with the “marginal” category that was received for Cow Branch. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under

stress or severe stress for all five sites. Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

As this report represents baseline data, no stream condition changes have been observed at this time. The findings from subsequent studies, both fall and spring, will provide monitoring data to indicate the changes in stream condition of the five sites designated for Prince William County MS4 monitoring over time. Future reports will include comparative analysis performed on a station-by-station basis.

A copy of the entire spring 2016 sampling report, along with field data sheets and laboratory results can be seen in Appendix 1.

2. In-stream Monitoring

The County has maintained an in-stream water quality monitoring program for the past 25 years. In partnership with the Virginia Tech Occoquan Laboratory, the County has maintains 5 in stream water quality stations, 2 stations (Little Bull Run and Neabsco Creek) have been in operation since the early 1990s, and the remaining three stations were put on line during this reporting period:

1. The “Dawkins Branch Station”, with drainage to be comprised of older industrial and warehouse type of land uses. This station is to represent industrial land use in the County.
2. The “Cow Branch Station” with drainage area for the proposed station originating from commercial developments, such as, Potomac Mills Mall and several other commercial and residential uses along I-95 corridor. This represents a relatively high density and highly impervious area corridor.
3. The “Purcell Branch Station” was picked to represent large-acre residential lots, which is also a representative land use in the County.
4. Neabsco Creek at Delaney Rd. – Neabsco Creek is one of the most developed watersheds in the County. This station has drainage areas from several new and much older developments in Dale City area. Continuing this station will help us further establish the water quality trends for an older developed watershed.
5. Little Bull Run at Catharpin Road – Little Bull Run has drainage areas from major known developments such as Piedmont, Dominion Valley Country Club, etc. This Station represents the current development trends of well-planned subdivisions constructed with golf course amenities in the fast growing western part of the County. Continuing this station will help us further establish water quality trends.

These sites are also evaluated for effective biological monitoring sites, as described in the previous section.

a. Neabsco Creek Station

The Neabsco Creek water quality monitoring station has been in operation since 2004. It is the County’s longest running water quality monitoring station for in stream monitoring. During the reporting period 6 water quality samples, and 7 bacteriological samples were taken at the Neabsco Creek Station. In addition, one grab sample was taken as part of the Biological Monitoring Program as an additional data point.

Table 14 – Neabsco Creek Station Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	NO3_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/100mL	org/100mL
Jul-15	27.06	63.61E4	0.02	0.04	0.19	0.04	1.36	0.02	0.29	0.30	22.0	5.0	79.2	9200	3450
Sep-15	137.5	91.50E5	0.03	0.07	1.52	0.03	2.02	0.02	0.28	0.30	25.8	5.3	522	17000	19900
Oct-15	29.33	24.15E5	<0.01	0.04	0.14	<0.01	1.58	<0.01	0.02	0.02	33.2	7.7	52.8	92000	30800
Nov-15	33.43	40.52E5	0.02	0.05	0.29	0.02	2.33	0.01	0.22	0.23	25.3	4.9	80.4	17000	13000
Feb -16	85.14	49.96E5	0.02	0.04	0.34	0.16	0.78	0.01	x	0.30	22.8	4.7	197	680	548
Mar-15	29.17	13.04E5	0.02	0.02	0.54	0.06	1.84	0.01	x	0.25	32.4	6.6	199	9200	4350

The grab sample yielded the following results:

Ammonia as N	4/13/2016	16-0706 PC60	0.02	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/13/2016	16-0706 PC60	29.9	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/13/2016
Nitrate+nitrite as N	4/13/2016	16-0706 PC60	0.11	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/13/2016	16-0706 PC60	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/13/2016	16-0706 PC60	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/13/2016	16-0706 PC60	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/13/2016	16-0706 PC60	<1.0	mg/L	1.0	SM2540D	4/14/2016

Overall, Results were consistent between the grab sample and samples taken by the water quality station for Ammonia as N, Nitrate as N, and OP. TSS, E.coli, and TP showed slightly to significantly higher numbers. This could be due to the flow weighted sampling technique compared to a single grab sample. Samples with higher amounts of water quality parameters often corresponded with storms with larger flowrates and total flows. This is consistent with previous monitoring results.

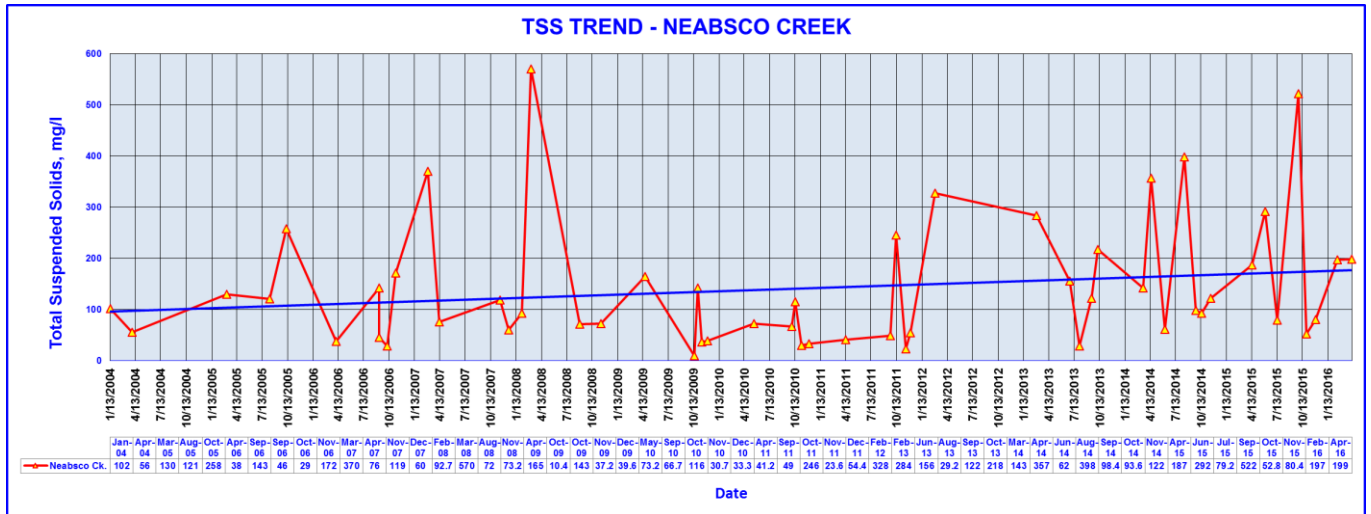


Figure 6 – Long Term TSS trends in Neabsco Creek Watershed

TSS samples show an increasing trend in the Neabsco Creek Watershed. This is slightly skewed by a large spike during a large storm event during September sampling. This spike also contributed to excess Phosphorous levels in the September sample as seen below. When removing the outlying data points the trend becomes much more neutral.

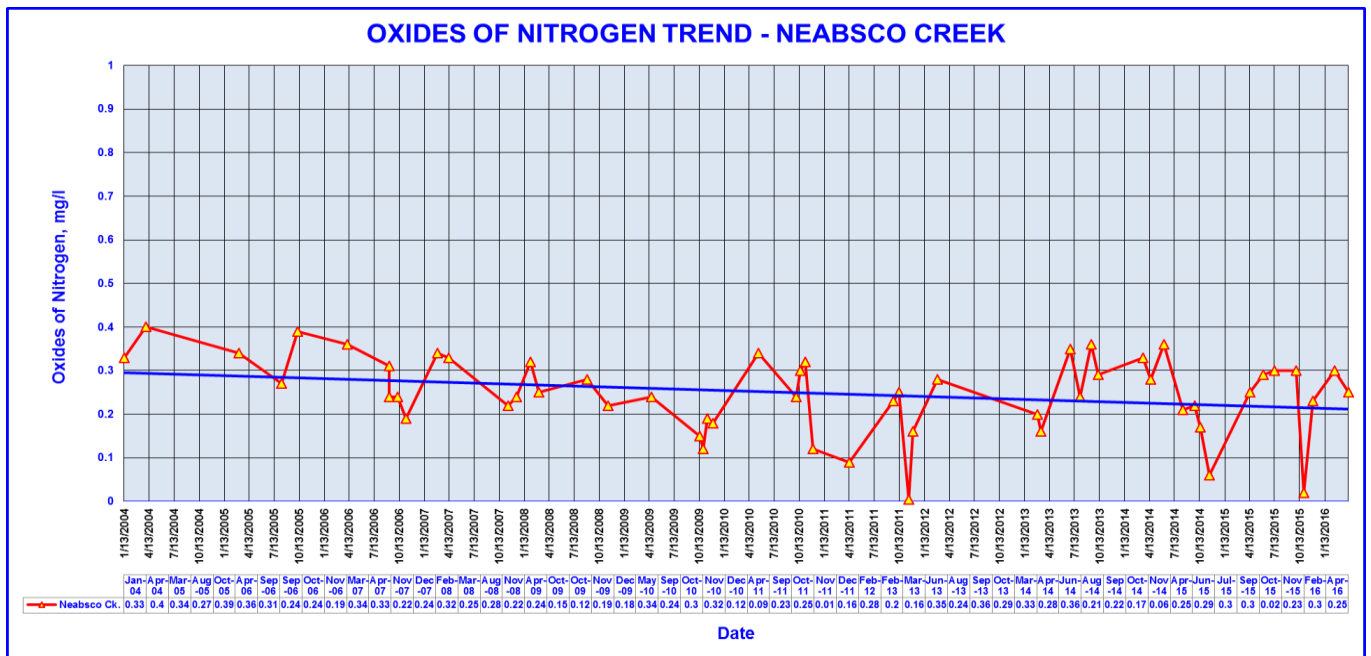


Figure 7 – Long Term TN trends in Neabsco Creek Watershed

Nitrogen is showing a decreasing trend within the Neabsco Creek Watershed. This can be interperated that stormwater control measures are making an impact within the watershed; however, with increases in total Phosphorous and TSS it may not be the case. Unlike TSS and TP, large flow rates resulted in a severe drop in concentrations. Removing this outlier brings the trend much closer to neutral.

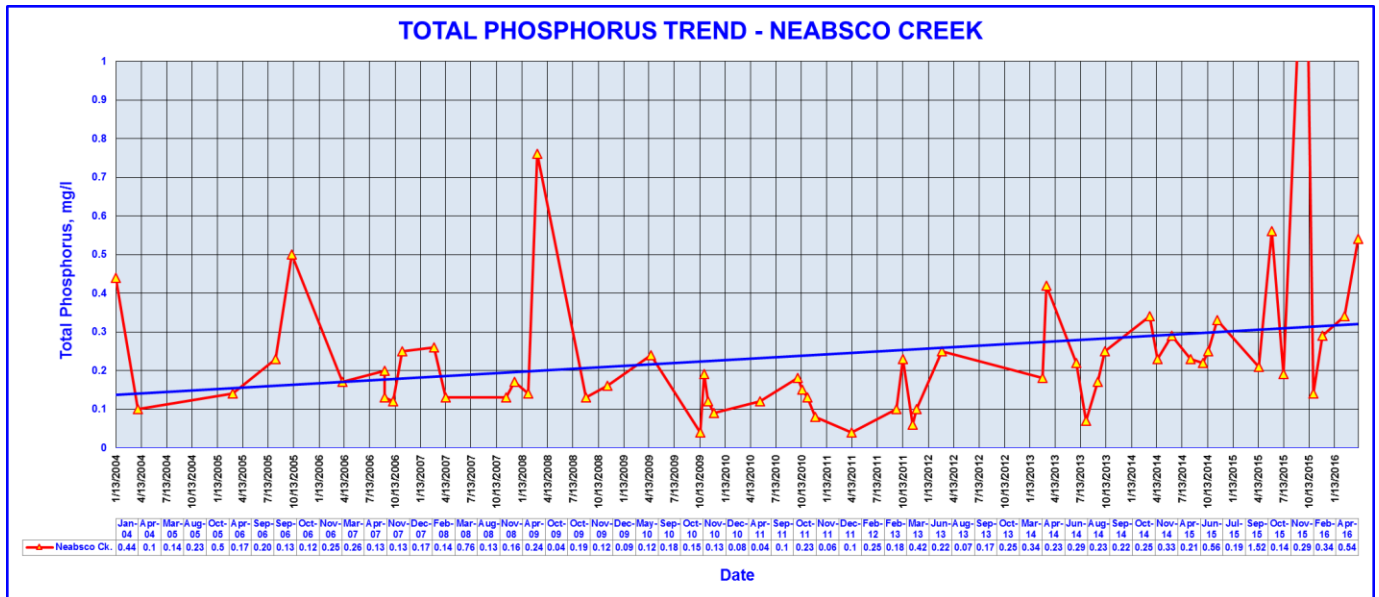


Figure 8 – Long Term TP trends in Neabsco Creek Watershed

Total Phosphorous shows an increasing trend within the Neabsco Creek Watershed. This data may be skewed more towards an increase due to several outlying peaks caused during large storm events. The most recent sample resulting in a reading of 1.52 mg/L corresponds with the reporting period’s largest flowrate through the station. It also mirrors spikes in TKN, and TSS. This sample is also preceded by an abnormally dry July resulting in an abnormally large “flush” of pollutants during the rainstorm. Reasons for volatility in phosphorous readings during the reporting period are an unknown to the County, and are being looked in to.

b. Little Bull Run

The Neabsco Creek water quality monitoring station has been in operation since 2007. It is the County’s Second longest running in stream water quality monitoring station.

Table 15 – Little Bull Run Station Water Quality Results

DATE	FLO	TOTFLO	OP	TSP	TP	NH3_N	TKN	NO2_N	OX_N	COD	BOD5	TSS	FCOLI	ECOLI
	cfs	cubic feet	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	org/100 mL	org/100 mL
7/8/2015	15.21	24200	0.04	0.07	0.12	0.02	0.90	<0.01	0.57	19.8	3.2	13.2	13000	7270
9/29/2015	50.60	64.21E5	0.07	0.11	0.61	0.04	1.79	0.01	0.45	22.8	4.9	163	5400	9210
12/1/2015	31.36	28.02E5	0.01	0.03	0.57	0.06	3.55	<0.01	0.40	.	7.8	186	3500	1300
12/17/2015	16.36	12.0E5	0.01	0.02	0.09	0.04	1.34	0.01	0.37	17.8	2.4	24.3	700	205
2/24/2016	72.70	54.62E5	0.02	0.04	0.61	0.04	1.89	0.02	0.51	26.2	3.0	354	700	166
4/7/2016	14.34	10.05E5	0.02	0.02	0.12	0.04	1.04	0.01	0.35	25.8	5.2	55.2	790	1120
5/3/2016	32.65	34.76E5	0.02	0.06	0.54	0.04	1.90	0.02	0.40	33.0	5.8	151	1700	1990

Grab samples yielded the following results:

Ammonia as N	4/12/2016	16-0622 PC90	0.02	mg/L	0.01	SM4500-NH3 G	4/19/2016
E. coli	4/12/2016	16-0622 PC90	76.7	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/12/2016
Nitrate+nitrite as N	4/12/2016	16-0622 PC90	0.29	mg/L	0.01	SM4500-NO3-F	4/19/2016
Orthophosphate as P	4/12/2016	16-0622 PC90	0.01	mg/L	0.01	SM4500-P F	4/19/2016
Total Kjeldahl Nitrogen	4/12/2016	16-0622 PC90	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/12/2016	16-0622 PC90	0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/12/2016	16-0622 PC90	<1.0	mg/L	1.0	SM2540D	4/14/2016

Overall, Results were consistent between the grab sample and samples taken by the water quality station for Ammonia as N, Nitrate as N, and OP. TSS, E.coli, and TP showed slightly to significantly higher numbers. As stated above, this could be due to a difference in sampling methods. For the grab sample, no water quality parameters violated Virginia Water Quality standards.

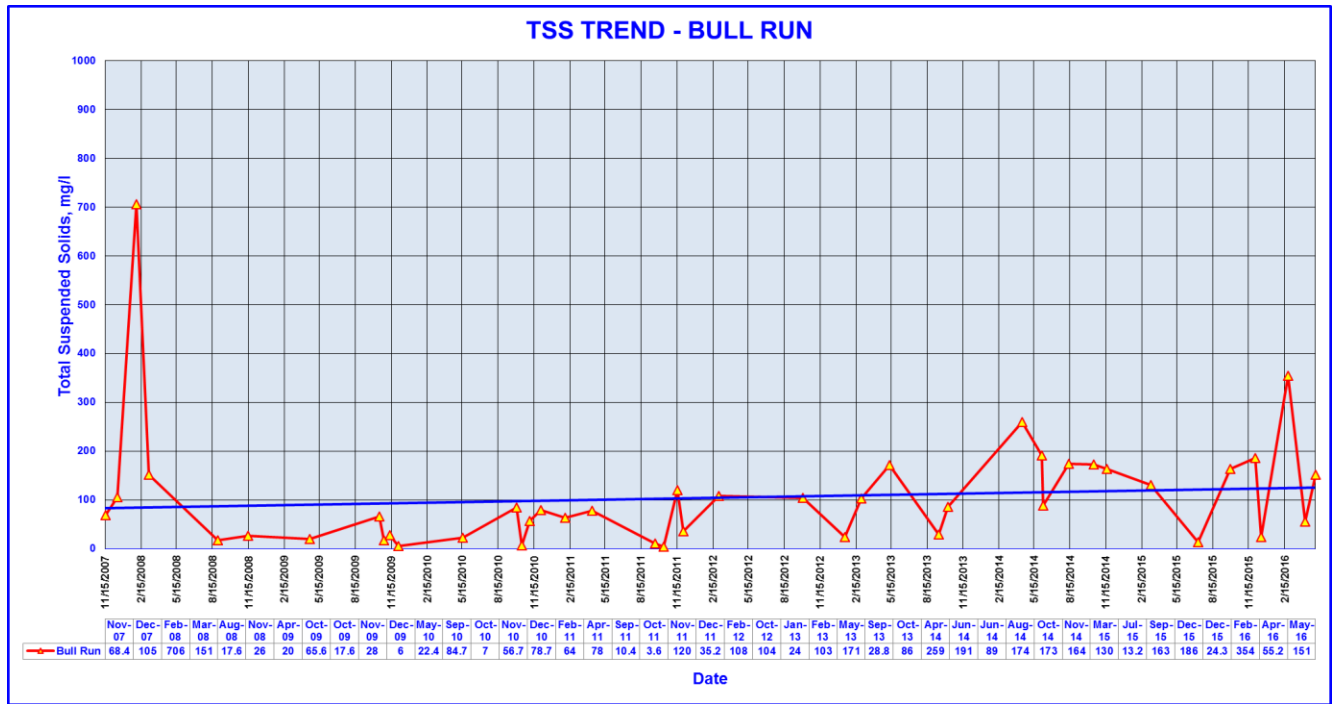


Figure 9 – Long Term TSS trends in the Bull Run Watershed

TSS in the Bull Run watershed trend slightly increasing to steady. Two outlying data points skew the results to a slight increasing trend. This is a result of large storms that occurred during the time period.

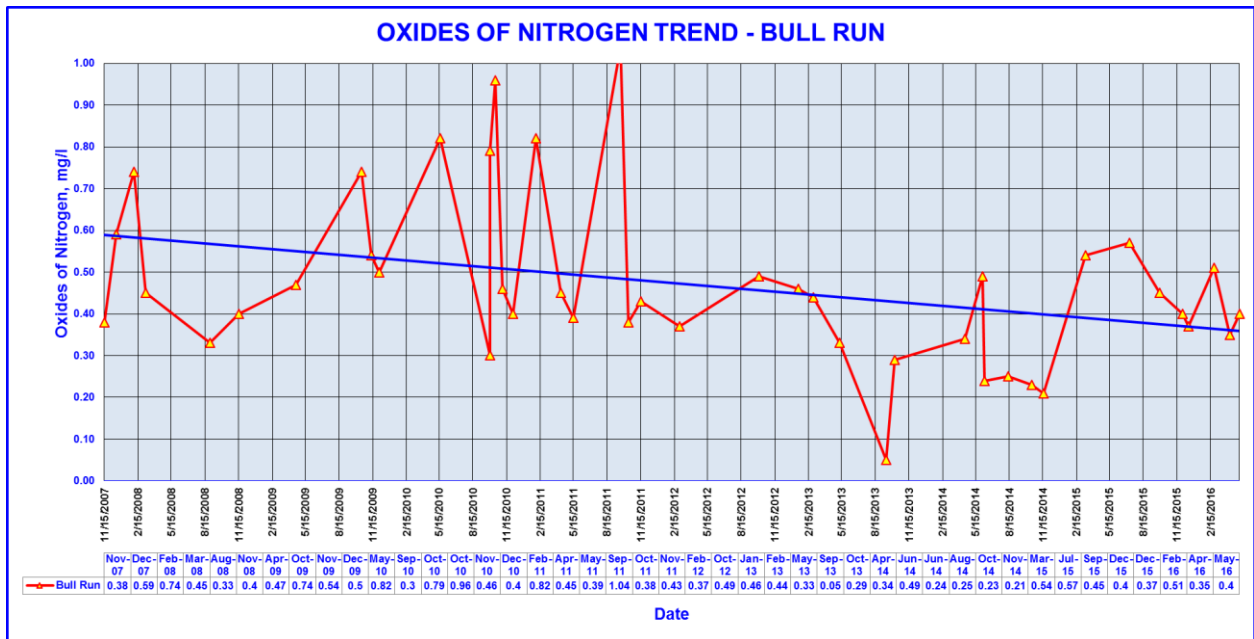


Figure 10 – Long Term TN trends in the Bull Run Watershed

As with the Neabsco Creek watershed, Oxides of nitrogen show a strong decreasing trend. This could indicate the effectiveness of stormwater controls, but as with Neabsco Creek, this trend is not reflected in concentrations of TP and TSS.

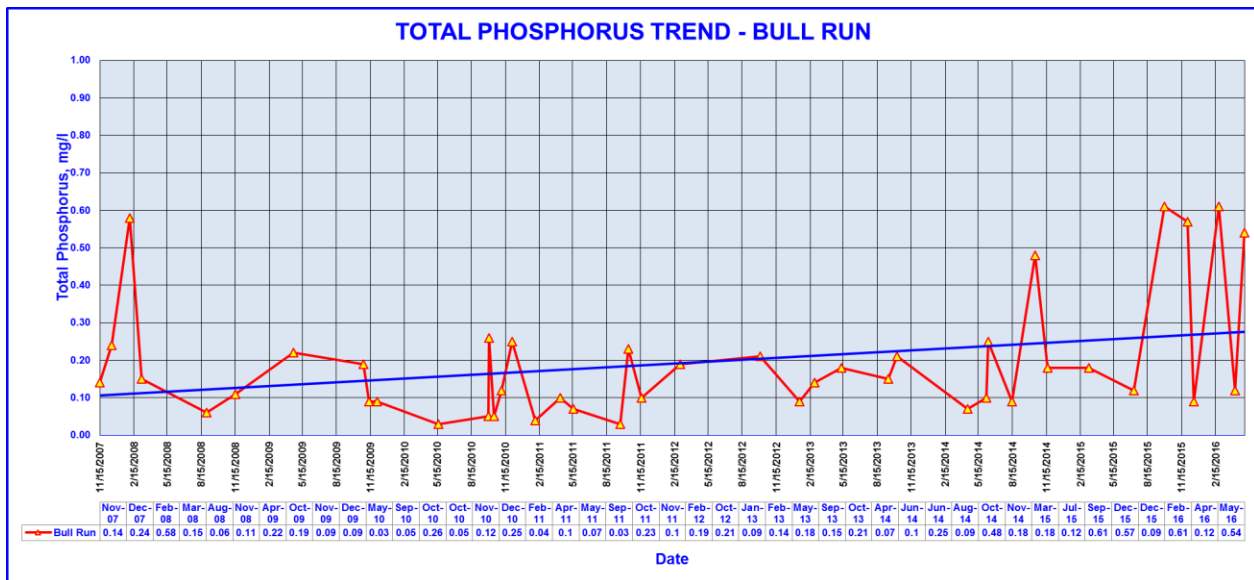


Figure 11 – Long Term TP trends in the Bull Run Watershed

TP has a strong increasing trend within the Bull Run watershed. The volatility observed in the Neabsco Creek watershed is again observed here. This seems to relate to increases in flow through the watershed due to storm events.

c. Dawkins Branch

The Dawkins Branch water quality monitoring station was installed during FY16 and produced one storm sample.

Table 16 – Dawkins Branch Water Quality Results

Type	Value
FLO	5.27
OP	0.01
TSP	0.02
TP	0.19
NH3_N	0.03
TKN	1.50
NO2_N	-0.01
OX_N	0.16
COD	27.1
BOD5	4.5
TSS	122
TDS	387
FCOLI	9200
ECOLI	8160

In addition, one grab sample has been analyzed for the station as part of the Biological Monitoring Program and yielded the following results:

Ammonia as N	4/12/2016	16-0621 PC30	0.03	mg/L	0.01	SM4500-NH3 G	4/19/2016
E. coli	4/12/2016	16-0621 PC30	62.4	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/12/2016
Nitrate+nitrite as N	4/12/2016	16-0621 PC30	0.04	mg/L	0.01	SM4500-NO3-F	4/19/2016
Orthophosphate as P	4/12/2016	16-0621 PC30	0.01	mg/L	0.01	SM4500-P F	4/19/2016
Total Kjeldahl Nitrogen	4/12/2016	16-0621 PC30	<0.50	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/12/2016	16-0621 PC30	0.02	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/12/2016	16-0621 PC30	2.5	mg/L	1.0	SM2540D	4/14/2016

Overall, the grab sample results describe a stream in good condition; however, the sample taken by the water quality monitoring station resulted in higher concentrations of some metrics. This could be due to the sampling method. According to the grab sample, no metric violated Virginia Water Quality standards. This was not the case for the station results as E.coli was shown to be extremely high. This result is often observed in all water quality stations, and bacteriological results from these stations are assumed to not accurately represent conditions. Results of the grab samples were similar to grab samples taken at other monitoring locations, with E.coli and Nitrate concentrations tending to be in the higher range comparatively. No long term trends analysis is available for this site as not enough data points are available.

d. Cow Branch

The Cow Branch Water Quality Monitoring Station was installed during FY16. This station has yet to produce any water quality samples; however, one grab sample has been analyzed for the station as part of the Biological Monitoring Program and yielded the following results:

Ammonia as N	4/14/2016	16-0707 PC20	0.08	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/14/2016	16-0707 PC20	55.7	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/14/2016
Nitrate+nitrite as N	4/14/2016	16-0707 PC20	0.43	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/14/2016	16-0707 PC20	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/14/2016	16-0707 PC20	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/14/2016	16-0707 PC20	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/14/2016	16-0707 PC20	<1.0	mg/L	1.0	SM2540D	4/14/2016

Overall, Cow Branch yielded similar results to grab samples taken at other locations. Nitrate levels were higher than in any other streams measured, but all metrics fell within Virginia Water Quality limits. No long term trends analysis is available for this site as not enough data points are available.

e. Purcell Branch

The Purcell Branch Water Quality Monitoring Station was installed during FY16. This station has yet to produce any water quality samples; however, one grab sample has been analyzed for the station as part of the Biological Monitoring Program and yielded the following results:

Ammonia as N	4/13/2016	16-0705 PC10	0.02	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/13/2016	16-0705 PC10	52.0	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/13/2016
Nitrate+nitrite as N	4/13/2016	16-0705 PC10	0.30	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/13/2016	16-0705 PC10	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/13/2016	16-0705 PC10	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/13/2016	16-0705 PC10	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/13/2016	16-0705 PC10	2.8	mg/L	1.0	SM2540D	4/14/2016

Overall, Purcell Branch showed very similar water quality results to other monitored streams. All metrics fell within Virginia Water Quality limits. No long term trends analysis is available for this site as not enough data points are available.

3. Floatables Solids Monitoring

The County has developed protocols for its Floatables Monitoring Program. The program is scheduled to begin during FY17, with a pilot study used to complete the first round of monitoring during Q1. Monitoring will be completed at 6 sites throughout the County on a quarterly basis according to the schedule posted below in Table 16.

Table 16 – Floatables Monitoring Schedule

Floatables Monitoring Schedule		Month	Site
Pilot Study	♂	July	Andrew Leitch

Floatables Monitoring Main Program Year 1		August	Dawkins Branch
			Flat Branch
		September	Liberia Ave.
			Cornice Place
	Q2	October	Andrew Leitch
			Dawkins Branch
		November	Flat Branch
			Liberia Ave.
	December	Cornice Place	
		Q3	January
	Dawkins Branch		
	February		Flat Branch
Cornice Place			
March	Liberia Ave.		
	Andrew Leitch		
Q4	April	Dawkins Branch	
		Flat Branch	
	May	Liberia Ave.	
		Cornice Place	
Floatables Monitoring Main Program Year 2	Q1	July	Andrew Leitch
			Dawkins Branch
		August	Flat Branch
	September	Liberia Ave.	
		Cornice Place	
	Q2	October	Andrew Leitch
			Dawkins Branch
		November	Flat Branch
			Liberia Ave.
	December	Cornice Place	
		Q3	January
	Dawkins Branch		
	February		Flat Branch
		Cornice Place	
	March	Liberia Ave.	
		Andrew Leitch	
Q4	April	Dawkins Branch	

			Flat Branch
		May	Liberia Ave.
		June	Cornice Place
.	.	.	.
.	.	.	.

Sites will be evaluated for the amount and type of floatables found in the stream. Volunteers will then remove all refuse from the stream. More in depth protocols, including forms used in monitoring program, can be seen in Appendix 3.

4. Structural and Source Controls Compliance Monitoring

An electronic database containing all BMP/SWM facilities within Prince William County will be provided with this document when submitted. This database currently encompasses all permittee and privately maintained facilities constructed and implemented from July 1st 1999 to current day. The database contains information on a facilities type, latitude and longitude, impervious and total acres treated, installation date, HUC 12, privately or permittee maintained status, discharging MS-4 and dates of inspection and maintenance for the past 5 fiscal years.

Prince William County maintains a program for the inspection and maintenance of permittee and privately maintained SWM/BMP facilities. More information on these inspection programs, and a list of newly constructed SWM facilities, can be found in section II.f of this document.

III. TMDL Action Plan Implementation

1. Chesapeake Bay Watershed TMDL Planning

The County is currently working on the development of its TMDL action plan. This document will be presented to the Department no later than 24 months after the effective date of the County’s MS-4 permit. A public comment period of 30 days will be provided for citizen review.

2. TMDL Action Plans other than the Chesapeake Bay TMDL

The County is currently working on the development of its Local TMDL action plans. These documents will be presented to the Department no later than 24 months after the effective date of the County’s MS-4 permit.

IV. Additional Reporting Requirements

1. Roles and responsibilities

Roles and responsibilities are provided as part of the County's MS4 program plan. Roles and responsibilities can be reviewed as part of each BMP section within the MS4 Program plan.

2. Non Compliance

There were no instances of non-compliance to record during the Reporting period.

3. Budget

Environmental Services Division - Watershed Management Branch FY16 Annual Budget Summary by Activity

Development Review & Inspections	\$ 2,745,525
Watershed Management & Inspections	\$ 5,339,688
Environmental Education	\$ 149,857
Soil & Water Conservation District	\$ 237,264
Drainage	\$ 3,009,029
TOTAL FY16 Expenditure Budget	\$ 11,481,363

A more detailed budget can be viewed in Appendix 4 of this document.

4. Permit Fees

Permit fees were submitted to the Department on September 9th with Check #504942.

Appendix A – Construction Site Runoff and Post Construction Runoff

Month	Erosion Inspections	Site Inspections	Violations	Notice to Comply	Inspection Notice	Inspection Report	Stop Work
Jul-15	296	195	6		38		
Aug-15	274	171	4		13		
Sep-15	397	277	4		20	2	
Oct-15	406	319	4		15		
Nov-15	478	377	1		11		
Dec-15	510	428			9	1	
Jan-16	402	373	1		6	1	
Feb-16	665	569	2		28	13	
Mar-16	760	658	8		25	2	
Apr-16	653	643	7		5	1	
May-16	727	557	2		10	11	
Jun-16	778	637	3		3	6	
TOTALS	6346	5204	42	0	183	37	0

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
QUANTICO HILLS OVERLOOK 03-00274R04S01 LND2016-00223	8288-20-8359 19191 CARDINAL HEIGHTS RD	STANLEY MARTIN HOMES	7039645127	10.220	04/07/2016
EAGLES POINTE EAST LB C SEC 10 10-00094R01S01 LND2016-00040	8290-35-6989 3491 EAGLE RIDGE DR	K HOVNANIAN HOMES	7038857337	0.180	08/04/2015
WALNUT TREE FARMS 10-00115R00S02 LND2016-00183	7198-44-9905 16800 BEVERLEY MILL DR	WALNUT TREE FARMS LLC	7039065673	14.116	01/04/2016
HOADLY MANOR ESTATES II 12-00131R00S03 LND2016-00115 LND2016-00197	8093-30-9136 5612 WEBSTERS WY	AL-JAWHARA HOADLEY MANOR LLC	7037870426	5.900	07/13/2015
BRIARWOOD IIB 12-00180R00S04 LND2016-00211	8289-05-7697 3400 BRIARWOOD DR	NVP INC	7033690691	5.100	01/11/2016
HOADLY MANOR ESTATES I 13-00047R00S03 LND2016-00198 LND2016-00114	8093-20-4538 5612 WEBSTERS WY	AL-JAWHARA HOADLEY MANOR LLC	7037870426	14.100	07/02/2015
WOODBRIIDGE COMMONS CORNER 13-00162R00S03 LND2016-00251	8291-67-7973 2680 OPITZ BL	WOODBRIIDGE COMMONS		2.140	01/22/2016
LAKE MANASSAS PROFESSIONAL VILLAGE 14-00184R00S02 LND2015-00028 LND2017-00030	7297-60-0041 7900 LAKE MANASSAS DR	MTH MANAGEMENT CORPORATION	5402535555	4.940	04/15/2016
MJ CHAMP WAY - PI PLAN 14-00238R00S01 LND2016-00174	7594-28-8345 10681 MARY J CHAMP WY	BROOKFIELD MANAGEMENT WASHINGTON, LLC	7032701400	1.510	01/13/2016
OLD CENTREVILLE GARDEN CONDO 14-00260R00S02 LND2017-00031	7897-03-8672 8670 PARKLAND ST	OLD CENTREVILLE GARDENS CONDO ASSOC	7038433847	0.157	07/23/2015

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
FEATHERSTONE PUBLIC IMPROVEMENTS SIDEWALK PLAN 15-00027R00S01 LND2016-00135	8391-47-7132 14511 JEFFERSON DAVIS HY A	WEBER, STEVENJ		0.920	08/28/2015
GOMEZ FUENTES COLLISION 15-00030R00S01 LND2017-00039	7597-73-4634 7490 BETHLEHEM RD	GOMEZ & FUENTES LLC		1.200	12/29/2015
POTOMAC SHORES PARKWAY PH 4 15-00036R00S01 LND2016-00228	8389-54-1076 1800 POTOMAC SHORES PY	ARGENT MANAGEMENT	7039671572	56.440	04/08/2016
LIBERTY OAKS PH 4 - PI PLAN 15-00038R00S01 LND2016-00024	7891-09-3320 8488 PATRIOT RIDGE PL	LIBERTY OAKS LLC	7037912885	4.500	08/03/2015
PWC CENTRAL DISTRICT POLICE STATION 15-00042R00S01 LND2016-00133	8093-84-7630 5026 DAVIS FORD RD WOODBIDGE, VA 22192	PWC DEPARTMENT OF PUBLIC WORKS	7037926698	18.600	08/11/2015
MIDWOOD CENTER I 15-00046R00S01 LND2016-00230 LND2016-00106	7298-41-5235 15411 JOHN MARSHALL HY HAYMARKET, VA 20169	LANDSERVICES DEVELOPMENT CORP	7037547700	44.300	04/18/2016
BRISTOW INDUSTRIAL PARK PARC B-1A1 15-00047R00S01 LND2017-00046	7496-69-1221 8100 PINEY BRANCH LN BRISTOW, VA 20136	BRISTOW INDUSTRIAL PARK LLC	7036386600	4.570	04/21/2016
REGENCY AT CREEKSIDE SEC 1 15-00050R00S01 LND2016-00127	7398-76-8206 6204 CATHARPIN RD	TOLL BROTHERS INC	7037535663	45.910	11/16/2015
REGENCY AT CREEKSIDE- PI/SAFETY PLAN PH 1 15-00061R00S01 LND2016-00221	7398-76-8206 6204 CATHARPIN RD	TOLL VA VIII L P		10.960	11/16/2015

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
SUPERIOR PAVING CORP 15-00087R00S01 LND2016-00165	7497-14-4534 5543 WELLINGTON RD	SUPERIOR PAVING	7036310004	20.090	01/21/2016
SUPERIOR PAVING 15-00087R01S01 LND2016-00087	7497-14-4534 5543 WELLINGTON RD	SUPERIOR PAVING	7036310004	20.090	08/26/2015
WENTWORTH GREEN SEC 3 & 4 PH3 SDR2015-20027 LND2016-00068	7397-90-4492 7700 LIMESTONE DR	THE PETERSON COMPANIES	7036317582	11.780	08/19/2015
POTOMAC SHORES - TOWN CENTER LAND BAY 9 BLOCK 1 SDR2015-20070 LND2016-00144	8389-54-1076 1800 POTOMAC SHORES PY DUMFRIES, VA 22026	HARBOR STATION COMMUNITIES, LLC	7035545756	29.300	11/05/2015
CLARKE PROPERTY SDR2015-20094 LND2016-00080	8193-82-5028 3709 OLD BRIDGE RD	NVP INC	7033690691	6.830	07/02/2015
WALKERS STATION SDR2015-20095 LND2016-00034	7896-31-4386 8126 QUARRY RD	MILLER & SMITH @ PEMBROOKE, LLC	7038212500	28.970	07/27/2015
DOMINION VALLEY COUNTRY CLUB SEC 53 SDR2015-20107 LND2017-00016	7299-68-5609 4506 JAMES MADISON HY HAYMARKET, VA 20169	DOMINION COUNTRY CLUB LP	7037535663	37.890	03/29/2016
CARDINAL GROVE AT EAGLES POINTE SEC 1 SDR2016-00003 LND2016-00162	8290-33-9138 15700 CARDINAL DR	POWELLS NEIGHBORHOOD II, LLC	7039645133	45.980	12/22/2015
ESTATES @ WEBSTERS WAY SDR2016-00033 LND2016-00185	8093-40-3235 5600 WEBSTERS WY	GLACIER DEV	7036590180	2.430	03/02/2016
CAYDEN RIDGE LANDBAY A SEC 1 SDR2016-00040 LND2016-00258	7895-38-8071 8100 SIGNAL HILL RD MANASSAS, VA 20111	MILLER AND SMITH	703821250014	31.200	06/06/2016

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
LAKE RIDGE SEC 8C - SWM RETROFIT #28 SDR2016-00056 LND2016-00268	8393-44-4942 1940 MAYFLOWER DR WOODBIDGE, VA 22192	RALPH CHAO/PWC PUBLIC WORKS	7037926313	1.680	06/15/2016
AVENDALE (WOODLAND GROVE) SEC 5 E&S PLAN SDR2016-00082 LND2017-00001	7595-00-8856 12015 VINT HILL RD BRISTOW, VA 20136	BROOKFIELD VINT HILL LLC	5715814791	0.500	06/03/2016
MCDONALD'S AT SUDLEY ROAD SP79-49FR03S01 LND2016-00123	7696-67-4385 8203 SUDLEY RD	MCKEEVER SERVICES CORPORATION	7036911100	0.110	08/26/2015
AMERICAN LEGION POST 364 SPR2015-20027 LND2017-00033	8292-47-4773 3640 FRIENDLY POST LN WOODBIDGE, VA 22192	AMERICAN LEGION POST 364	7038198465	2.550	11/16/2015
BELMONT TOWN CENTER LANDBAY E PARC G SPR2015-20051 LND2016-00038	8492-44-2705 641 HARBOR SIDE ST WOODBIDGE, VA 22191	CHRISTOPHER AT MARINA LANDING II LLC		0.580	07/10/2015
BROAD RUN INDUSTRIAL PARK LOT 6A4 SPR2015-20052 LND2017-00037	7595-57-5406 9459 CONTRACTORS CT MANASSAS, VA 20109	9459 CONTRACTOR COURT LC	5712925503	5.570	12/14/2015
CUSHING ROAD - PUBLIC IMPROVEMENT SPR2015-20053 LND2016-00124	7597-04-1563 7303 CUSHING RD MANASSAS, VA 20109	LAWSON, KYLE		5.580	09/29/2015
FAIRFAX ROD AND GUN CLUB - E&S SPR2015-20097 LND2015-20088 LND2016-00058	7995-18-9811 7039 SIGNAL HILL RD MANASSAS, VA 20111	GKY & ASSOCIATES INC	7038707000	19.620	07/02/2015
FINLEY ASPHALT AND SEALING - HORNBAKER ROAD SPR2015-20099	7595-77-5768 9512 HORNBAKER RD MANASSAS, VA 20109	FINLEY ASPHALT & SEALING INC	7033682289	8.300	10/21/2015

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
LND2016-00163					
INDEPENDENT HILL MAINTENANCE STORAGE BUILDING SPR2015-20115 LND2016-00192	7891-63-1898 14530 ADEN RD	PWC PUBLIC SCHOOLS	5717228902	0.690	10/22/2015
CRAFTSMAN AUTO BODY SPR2015-20120 LND2016-00194 LND2016-00250	7497-11-3275 13260 UNIVERSITY BL GAINESVILLE, VA 20155	UNIVERSITY PROPERTY LLC	7039301967	2.480	03/04/2016
VIRGINIA GATEWAY - CABELA'S SPR2015-20128 LND2016-00064	7397-94-3286 5291 WELLINGTON BRANCH DR GAINESVILLE, VA 20155	KIMLEY-HORN AND ASSOCIATES, INC	7036741321	13.300	08/10/2015
WELLINGFORD INDUSTRIAL PARK LOT 18-A SPR2015-20155 LND2016-00098	7596-39-3662 11875 LIVINGSTON RD MANASSAS, VA 20109	SKYWORKS OF VIRGINIA LLC	7033670060	1.970	07/24/2015
ROY ROGERS GAINESVILLE SPR2015-20168 LND2016-00150	7397-23-6647 7494 WEBB DR GAINESVILLE, VA 20155	PLAMONDON COMPANIES	3013788787	0.970	09/21/2015
PRINCE WILLIAM COMMERCE CENTER SPR2015-20169 LND2016-00006	7895-24-5376 9805 LIBERIA AV MANASSAS, VA 20110	PROGRESSIVE INVESTMENTS	703-335-6060	28.280	01/27/2016
NEW BRISTOW VILLAGE COMMERCIAL CENTER PH 1 SPR2015-20177 LND2016-00261	7595-40-5223 10450 BRISTOW STATION DR	SAADEH PARTNERS II LLC	5712374347	7.000	01/08/2016
RIVERGATE SPR2015-20179 LND2017-00012	8492-18-2976 13110 RIVERGATE PL PARCEL A	RIVERGATE HOLDINGS LC	7035587300	14.680	12/01/2015

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
POTOMAC SHORES - EROSION CONTROL-ELEMENTARY SCHOOL SPR2015-20187 LND2016-00056	8389-54-1076 1800 POTOMAC SHORES PY DUMFRIES, VA 22026	ARGENT MANAGEMENT	7039671572	19.950	07/16/2015
POTOMAC SHORES GOLF COURSE WEST STREAM RESTORATION SPR2015-20190 LND2016-00159	8389-18-2115 1900 POTOMAC SHORES PY DUMFRIES, VA 22026	HARBOR STATION COMMUNITIES LLC	9492418466	1.600	11/20/2015
POTOMAC SHORES GOLF COURSE EAST STREAM RESTORATION SPR2015-20191 LND2016-00148	8389-18-2115 1801 POTOMAC SHORES PY DUMFRIES, VA 22026	HARBOR STATION COMMUNITIES LLC		0.810	11/20/2015
SHEETZ AT LAKEPOINT SPR2015-20196 LND2016-00173	8292-84-3570 2500 CATON HILL RD WOODBIDGE, VA 22192	SHEETZ INC	8142396021	2.010	10/21/2015
HL MOONEY BUILDING ADDITION SPR2015-20210 LND2016-00042	8391-51-7302 1851 RIPPON BL WOODBIDGE, VA 22192	PWC SERVICE AUTHORITY	7033357929	0.028	07/27/2015
HYLBROOK STREAM RESTORATION SPR2015-20211 LND2016-00085 LND2016-00067	8392-52-5142 2430 WEST LONGVIEW DR WOODBIDGE, VA 22191	PRINCE WILLIAM COUNTY PUBLIC WORKS DEPT.	7037925534	2.300	08/03/2015
WELLINGTON GLEN LB J BUILDING E SPR2015-20216 LND2016-00195	7596-62-8129 8870 HORNBAKER RD MANASSAS, VA 20109	COFFEY E., CARLA		3.580	02/03/2016
CENTREVILLE WEST SELF STORAGE SPR2015-20219 LND2016-00177	7897-20-5791 7809 CENTREVILLE RD MANASSAS, VA 20111	ARCLAND PROPERTY COMPANY, LLC	2022437552	2.670	12/08/2015
BRIARWOOD IIA SPR2015-20221	8289-06-9616 3500 BRIARWOOD DR	NVP INC	7033694993	7.260	01/26/2016

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
LND2016-00189					
BRISTOW SHOPPING CENTER PH 1 SPR2015-20232	7595-41-5719 10501 BRISTOW CENTER DR BRISTOW, VA 20136	THE RAPPOPORT COMPANIES	5713821237	0.700	12/14/2015
LND2016-00152					
BRISTOW INDUSTRIAL PARK - TDS BUILDING SPR2015-20234	7496-59-2814 8001 INDUSTRIAL PARK CT BRISTOW, VA 20136	BLUE SPRINGS VIEW LLC	7039322002	9.500	12/22/2015
LND2016-00167					
NEABSCO ELEMENTARY SCHOOL SPR2015-20235	8191-83-6417 3800 CORDELL AV	PWC SCHOOL BOARD	7037918717	2.670	08/31/2015
LND2016-00172					
SIMMS PROPERTY LB 2 7-11 STORE SPR2015-20245	7397-68-5771 13821 HEATHCOTE BL GAINESVILLE, VA 20155	BUCHANAN PARTNERS, LLC	3014170510	14.200	08/06/2015
LND2016-00073					
POTOMAC TRUCK CTR - PROGRESS BUSINESS CTR LOT 6A SPR2015-20251	7497-12-1189 7750 PROGRESS CT GAINESVILLE, VA 20155	POTOMAC TRUCK CENTER	4106366200	0.180	10/28/2015
LND2016-00237					
HIDDEN CREEK -SALES TRAILER SPR2015-20256	7992-25-3137 7055 TOKEN VALLEY RD MANASSAS, VA	HIDDEN CREEK COMMUNITY LLC	7035901111	0.500	07/23/2015
LND2016-00023					
HEATHCOTE BOULEVARD EXTENSION - EARLY GRADING SPR2015-20258	7298-64-2019 15410 JOHN MARSHALL HY HAYMARKET, VA 20169	L.C. CLAVELLI TRUSTEE		3.940	08/19/2015
LND2016-00111					
GODDARD SCHOOL AT GAINESVILLE SPR2015-20269	7397-87-3927 7801 HERITAGE VILLAGE PZ GAINESVILLE, VA 20155	BLOCK AND TACKLE REAL ESTATE VENTURE LLC	4154253842	1.460	01/19/2016
LND2016-00166					

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
LAKE RIDGE TRAIL SPR2015-20277 LND2016-00154 LND2016-00092	8293-08-1283 12380 COTTON MILL DR WOODBIDGE, VA 22192	DEPARTMENT OF PARKS AND RECREATION	7037927060	0.240	10/28/2015
KERRYDALE ELEMENTARY SCHOOL ADDITION SPR2015-20281 LND2016-00101	8192-28-8442 13199 KERRYDALE RD	PWC SCHOOL BOARD	7037918717	0.340	09/16/2015
TYLER ELEMENTARY SCHOOL - ACTIVITY ROOM ADDITION SPR2015-20283 LND2016-00100	7397-37-7773 14500 JOHN MARSHALL HY	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	7037917308	0.340	09/02/2015
POTOMAC SHORES ELEMENTARY SCHOOL SPR2015-20284 LND2016-00234	8289-82-9396 2500 RIVER HERITAGE BL DUMFRIES, VA 22026	ROSS, FRANCE & RATLIFF LTD	7033614188	19.950	04/21/2016
ENTERPRISE ELEMENTARY SCHOOL- ACTIVITY ROOM SPR2015-20285 LND2016-00102	8092-82-1631 13900 LINDENDALE RD	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	7037917308	0.500	09/21/2015
EXECUTIVE MOVING & STORAGE BUILDING ADDITION SPR2015-20289 LND2016-00122	8391-95-0943 1250 FEATHERSTONE RD WOODBIDGE, VA 22191	KAYDEE LLC	7034972700	0.700	09/15/2015
BACON RACE FIRE & RESCUE SPR2015-20302 LND2016-00203	8093-84-7630 5022 DAVIS FORD RD WOODBIDGE, VA 22192	PWC DEPARTMENT OF PUBLIC WORKS	7037926698	2.370	11/30/2015
SKYLINE CONCRETE PUMPING SPR2016-00004 LND2016-00033	7595-58-0831 9421 DEVELOPERS DR	SKYLINE CONCRETE PUMPING INC	7033929400	1.410	07/30/2015
CHUY'S RESTAURANT SPR2016-00006	8292-82-1711 2641 PRINCE WILLIAM PY WOODBIDGE, VA 22192	COMMERCIAL SITE SOLUTIONS, INC	8648555200	0.040	08/20/2015

Land Plans with Disturbed Area that have Land Permits Issued
07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
LND2016-00044					
BROAD RUN INDUSTRIAL PARK LOT 1LA SPR2016-00010	7595-88-0593 9280 HORNBAKER RD MANASSAS, VA 20109	PHA HORNBAKER LLC	7033689995	0.100	02/10/2016
LND2016-00209					
MANASSAS MALL ADDITION SPR2016-00021	7696-65-2958 8492 RIXLEW LN	JPMG MANASSAS MALL OWNER LLC	7164811278	0.060	08/24/2015
LND2016-00060					
STONEBRIDGE @ POTOMAC CENTER SPR2016-00029	8291-95-3440 14701 RIVER WALK WY	WPPI WOODBRIDGE LLC C/O STONEBRIDGE TERRACE APTS.,		6.110	07/30/2015
LND2016-00070					
SILVER LAKE DAM REHABILITATIONS SPR2016-00036	7299-01-5241 15801 TANNING HOUSE PL HAYMARKET, VA 20169	PUBLIC WORKS	7037926984	6.100	09/14/2015
LND2016-00066					
AMERICAN WARTIME MUSEUM - E&S PLAN SPR2016-00037	8291-53-1608 3127 DALE BL	AMERICANS IN WARTIME LLC	70133681111	10.140	08/24/2015
LND2016-00053					
BLACKBURN ROAD SIDEWALK SPR2016-00039	8391-21-5568 15186 VALLEY STREAM DR WOODBIDGE, VA 22191	PRINCE WILLIAM COUNTY TRANSPORTATION	7037926347	0.370	04/14/2016
LND2016-00235					
POTOMAC PLAZA SPR2016-00043	8392-94-1637 13618 JEFFERSON DAVIS HY WOODBIDGE, VA 22191	KCA LLC DESIGN BUILD	7034909191	0.010	08/05/2015
LND2016-00074					
PWC G. RICHARD PFITZNER STADIUM- POTOMAC NATIONALS SPR2016-00054	8193-04-9341 7 COUNTY COMPLEX CT	TOVAN CONSTRUCTION INC	5402881706	0.040	08/20/2015
LND2016-00078					
HOPPMAN PROPERTY LOT 1 PH 2 SPR2016-00068	7298-51-5907 15395 JOHN MARSHALL HY GAINESVILLE, VA	COPT DC-11, LLC	7036733448	7.160	11/12/2015
LND2016-00129					

Land Plans with Disturbed Area that have Land Permits Issued
07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
STONEWALL MEMORY GARDENS SPR2016-00074 LND2016-00239	7598-30-2275 12004 LEE HY MANASSAS, VA	SCI VIRGINIA FUNERAL SERVICES, INC	7032894745	5.750	12/29/2015
7-11 STORE # 10757 @ FULLER HEIGHTS RD SPR2016-00089 LND2016-00090	8188-73-0349 18750 FULLER HEIGHTS RD	7-ELEVEN	8049307012	0.073	09/17/2015
RANDOLPH RIDGE - INDUSTRIAL PARK SPR2016-00097 LND2016-00120	7497-64-0634 12801 RANDOLPH RIDGE LN	O3B NETWORKS USA, LLC	7032068682	1.230	10/19/2015
BRISTOW INDUSTRIAL PARK - ACCESS ROAD SPR2016-00100 LND2016-00180	7496-49-5010 8126 PINEY BRANCH LN	BLUE SPRINGS VIEW LLC	7033277200	0.780	02/18/2016
PORT POTOMAC COMMERCIAL CENTER SPR2016-00118 LND2016-00130	8290-73-2655 16300 NAVIGATION DR	COMPASS-PORT POTOMAC, LLC	7036677867	0.005	10/19/2015
VERIZON WIRELESS AT GAINESVILLE FIRE DEPARTMENT SPR2016-00119 LND2016-00119	7397-37-9503 14450 JOHN MARSHALL HY	VERIZON WIRELESS	7039699309	0.005	10/20/2015
STONEWALL MANOR SEC 1 SPR2016-00120 LND2016-00131	8288-16-4136 3774 STONEWALL MANOR DR TRIANGLE, VA 22172	KLINE, RANSOM	2024681384	21.500	11/03/2015
STONEWALL MANOR REC CTR - PAVILLION & AWNING SPR2016-00121 LND2016-00132	8288-11-2440 19042 WINDSOR RD	STONEWALL MANOR HOMEOWNERS ASSN INC		1.351	10/23/2015
MILESTONE @ NOVEC WELLINGTON SUBSTATION SPR2016-00125 LND2016-00146	7596-93-7576 8236 WELLINGTON RD MANASSAS, VA 20109	MILESTONE COMMUNICATIONS	7033645604	0.090	12/14/2015

Land Plans with Disturbed Area that have Land Permits Issued
07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
POTOMAC SHORES FISHING PIER SPR2016-00127 LND2016-00175 LND2017-00004	8388-79-8558 1285 CHERRY HILL RD DUMFRIES, VA 22026	ARGENT MANAGEMENT	7039671572	0.078	05/16/2016
VETERANS MEMORIAL PARK - MAINTENANCE BLDG SPR2016-00131 LND2016-00256	8492-00-2786 14250 VETERANS DR	PWC DEPARTMENT OF PARKS & REC	7037925981	0.450	02/17/2016
DIAMONDS INDUSTRIAL PARK SPR2016-00138 LND2016-00164	7695-02-2328 11100 BERTALICE CT MANASSAS, VA 20110	AVERY CONSTRUCTION	7038159200	0.100	01/26/2016
LAKE POINTE BUSINESS PARK LOT 1 SPR2016-00139 LND2016-00202	8292-84-3871 2540 CATON HILL RD	EMBREE ASSET GROUP INC	7033901244	9.100	03/09/2016
AIRPORT GATEWAY COMMERCE CENTER SPR2016-00143 LND2016-00155	7694-97-2419 10101 HARRY J PARRISH BL	UNICORN INTEREST LLC	2026187056	17.370	12/22/2015
FAIRFAX ROD AND GUN CLUB SPR2016-00145 LND2016-00201	7995-18-9811 7039 SIGNAL HILL RD MANASSAS, VA 20111	FAIRFAX ROAD & GUN CLUB INC	5712287548	12.920	01/19/2016
PARK WEST LIONS COMMUNITY CENTER SPR2016-00149 LND2016-00143	7696-84-3493 8620 SUNNYGATE DR	PARK WEST LIONS CLUB	7032019093	2.000	11/17/2015
BELMONT ELEMENTARY SCHOOL BUILDING ADDITION SPR2016-00158 LND2016-00233	8492-24-8561 751 NORWOOD LN WOODBIDGE, VA 22191	PWC SCHOOL BOARD	7037918717	1.860	04/15/2016
WESTRIDGE ELEMENTARY SCHOOL SPR2016-00169 LND2016-00196	8193-54-1186 12400 KNIGHTSBRIDGE DR	PWC SCHOOL BOARD	7037918717	0.060	12/14/2015

Land Plans with Disturbed Area that have Land Permits Issued

07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
SAUNDERS MIDDLE SCHOOL SPR2016-00170 LND2016-00229	7992-84-7638 13557 SPRIGGS RD	PWC SCHOOL BOARD	7037918717	0.120	01/19/2016
BARRETT CONSTRUCTION MATERIALS RECYCLING FACILITY SPR2016-00171 LND2016-00204	7597-13-2998 12008 BALLS FORD RD	DANIEL H BARRETT INC		0.020	03/23/2016
LAKE RIDGE MIDDLE SCHOOL SPR2016-00180 LND2016-00208	8293-35-7322 12350 MOHICAN RD WOODBIDGE, VA 22192	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	7037917308	1.200	03/22/2016
HENDERSON ELEMENTARY SCHOOL - ADDITION SPR2016-00184 LND2016-00216	8191-31-2249 3799 WATERWAY DR DUMFRIES, VA 22025	PWC SCHOOL BOARD	7037918717	2.850	03/31/2016
WELLINGFORD IND PK LOT 2B1A2 (J&J SINGLETON) SPR2016-00190 LND2016-00252	7596-29-2052 12150 LIVINGSTON RD MANASSAS, VA 20109	J & J SINGLETON LLP	7036599033	3.550	05/18/2016
INNOVATION 2 SILOS BREWING CO SPR2016-00192 LND2017-00003	7695-04-6570 9349 HORNBAKER RD MANASSAS, VA 20109	SILVA HOLDINGS, LLC	7033823352	7.720	04/25/2016
MCAULIFFE ELEMENTARY SCHOOL SPR2016-00195 LND2016-00231	8092-31-4045 13540 PRINCE DALE DR WOODBIDGE, VA 22193	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	7037917308	0.490	03/01/2016
ANTIETAM ELEMENTARY SCHOOL SPR2016-00198 LND2016-00232	8293-57-8890 12000 ANTIETAM RD WOODBIDGE, VA 22192	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	7037917308	0.630	02/22/2016
ABEL INDUSTRIES SPR2016-00205 LND2016-00259	8289-08-8069 16811 INTERSTATE DR	ABEL INDUSTRIES	7035509446	0.330	05/20/2016

Land Plans with Disturbed Area that have Land Permits Issued
07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
CWS SITE 64 @ CATHARPIN SPR2016-00210 LND2016-00217	7498-07-7287 5513 CATHARPIN RD GAINESVILLE, VA 20155	CWS	7038451971	0.102	04/01/2016
INNOVATION BUSINESS CENTER II - BERKLEY NET SPR2016-00226 LND2016-00241	7695-18-6086 9301 INNOVATION DR MANASSAS, VA 20110	BUCHANAN PARTNERS	3014170510	4.860	05/09/2016
SAM'S CLUB @ WOODBRIDGE SPR2016-00228 LND2016-00199	8292-61-5845 14000 WORTH AV	SAM'S REAL ESTATE BUSINESS TRUST	4792734909	0.400	03/11/2016
NOTES DRIVE WAREHOUSE ADDITIONAL PARKING SPR2016-00246 LND2016-00257	7597-51-3737 7898 NOTES DR MANASSAS, VA 20109	VIRIDAN CONSULTING	7033090489	0.500	04/27/2016
THOMASSON BARN - INFRASTRUCTURE SPR2016-00262 LND2017-00026	7695-04-6570 9349 HORNBAKER RD MANASSAS, VA 20109	PWC DEPT OF TRANSPORTATION	7037928164	1.500	05/04/2016
GARBER CUSTOMER PARKING LOT SPR2016-00263 LND2016-00246	8292-56-7554 2910 GARBER WY WOODBIDGE, VA 22192	GARBER PROPERTIES		2.390	05/18/2016
CARTER MACHINERY - TENANT IMPROVEMENTS SPR2016-00269 LND2016-00264	7595-92-8422 11200 BERTALICE CT MANASSAS, VA 20110	IMUA, LLC	7032229873	0.003	03/23/2016
ENVIROSOLUTION (BROAD RUN IND PK LOT 7A) SPR2016-00270 LND2016-00243	7595-66-6386 9650 HAWKINS DR	ENVIROSOLUTIONS INC	7036333004	0.100	04/18/2016
LAKE POINTE BUSINESS PARK LOT 1 SPR2016-00291 LND2016-00247	8292-84-2891.00 2510 CATON HILL RD WOODBIDGE, VA 22192	EMBREE ASSET GROUP	5128194795	9.100	05/02/2016

Land Plans with Disturbed Area that have Land Permits Issued
07/01/2015 Through 06/30/2016

Plan Name / Plan Number / Permit Number	Parcel Number / Address	Developer / Owner	Phone	Disturbed Area	Plan Approval Date
VIRGINIA GATEWAY PH 5 - REV TO BLDG N SPR2016-00302 LND2017-00019 LND2017-00023	7397-71-9469 7921 GATEWAY PROMENADE PL GAINESVILLE, VA 20155	PROMENADE HOSPITALITY LLC	5715723226	44.670	05/26/2016
COPT DC-19 AT BETHLEHEM TECHNOLOGY PARK - EG SPR2016-00321 LND2016-00253	7596-68-3426 8170 BETHLEHEM RD MANASSAS, VA 20109	COPT DC-19, LLC	7036733449	31.530	05/20/2016
RIVER OAKS VETERINARY CLINIC SPR2016-00327 LND2017-00009	8290-89-1708 15508 NEABSCO MILLS RD WOODBIDGE, VA 22191	MCCORKINDALE, SCOTT	7035905413	0.005	05/12/2016
SAM'S CLUB - EXTERIOR CHANGES & ADDITION SPR2016-00355 LND2017-00005	8292-60-5581 14050 WORTH AV WOODBIDGE, VA 22192	SAM'S REAL ESTATE BUSINESS TRUST	4792734909	0.040	05/27/2016
COWLES FORD - CAR CHARGER PEDESTAL SPR2016-00356 LND2016-00269	8292-22-1892 13779 NOBLEWOOD PZ WOODBIDGE, VA 22193	ALJARADAT, BELAL	5712330854	0.000	06/16/2016
SILVER LAKE PARK - PICNIC SHELTER SPR2016-00359 LND2016-00254	7299-01-5241 15880 SILVER LAKE RD HAYMARKET, VA 20169	PWC DEPARTMENT OF PARKS & REC	7037925981	0.001	06/07/2016

Total Number of Land Plans: 133

Total Number of Disturbed Acres: 1,048.983

END OF REPORT

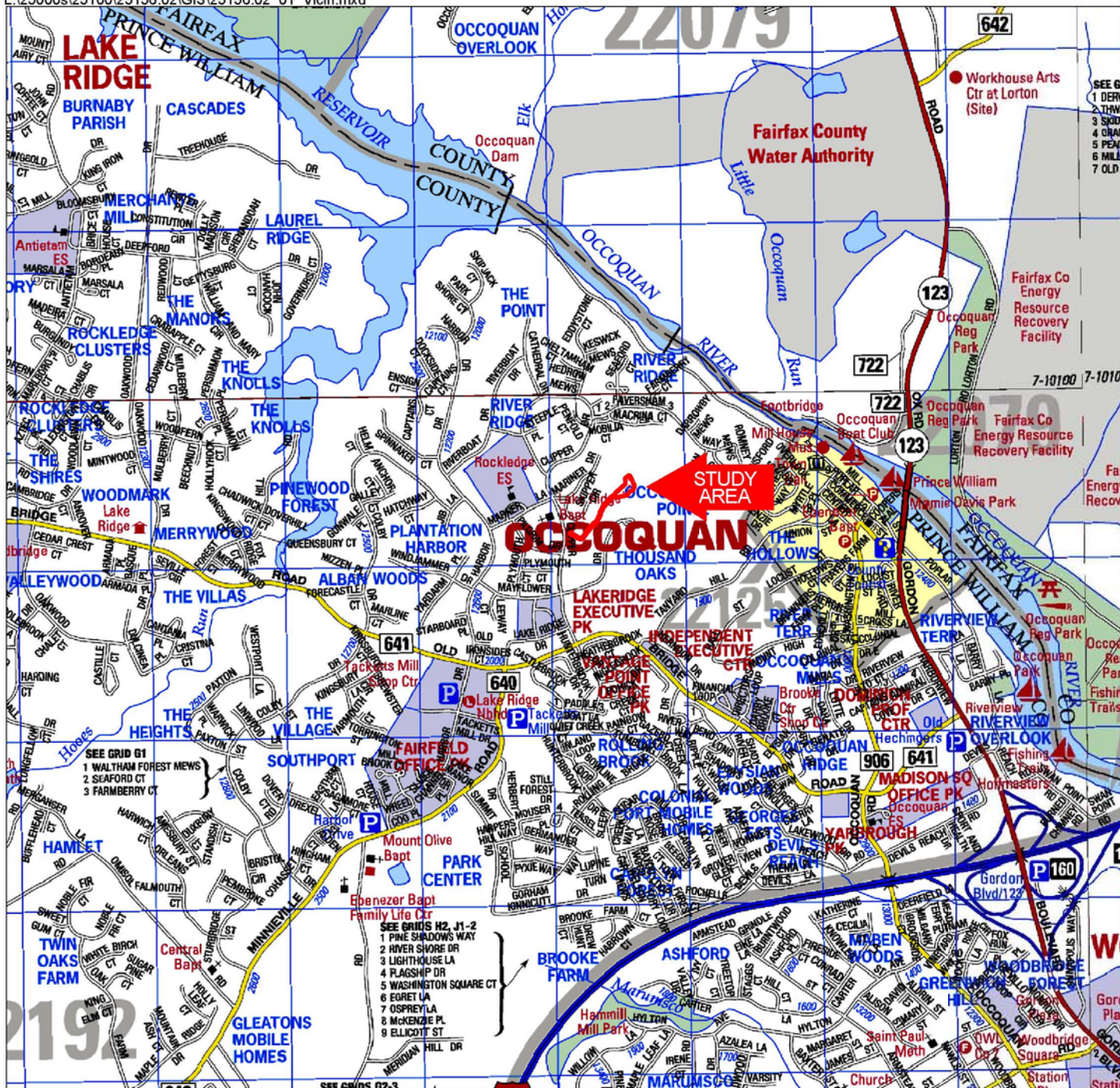
Appendix B – Retrofitting on Prior Developed Lands

SWM Facility 28 Water Quality Retrofit

Stormwater Management Facility 28 is a privately maintained facility within Subshed 448 of the Occoquan Watershed in Woodbridge, Virginia. The facility is located 700 feet east of Clipper Drive surrounded by Mariner and Macrina Drives to the north and Mayflower Drive to the southwest in the Lake Ridge Section 8C subdivision (see attached Vicinity Map).

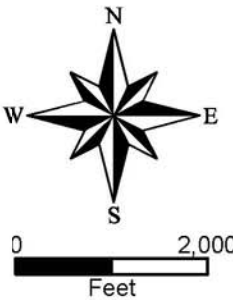
This retrofit design was developed from the conceptual design initially presented in the Occoquan Watershed - Study of Four Subwatersheds dated March 5, 2015 as prepared for the County by Wetland Studies and Solutions, Inc. (WSSI). As stated in the study, the goals of this retrofit is to (1) improve water quality treatment by storing the Water Quality Treatment Volume (Tv) and detaining it for a minimum of 24 hours, (2) protect the downstream channel, (3) maintain the 10- and 100-year outflows at existing levels, and (4) provide a minimum of 1-foot freeboard for the dam during the 100-year storm event.

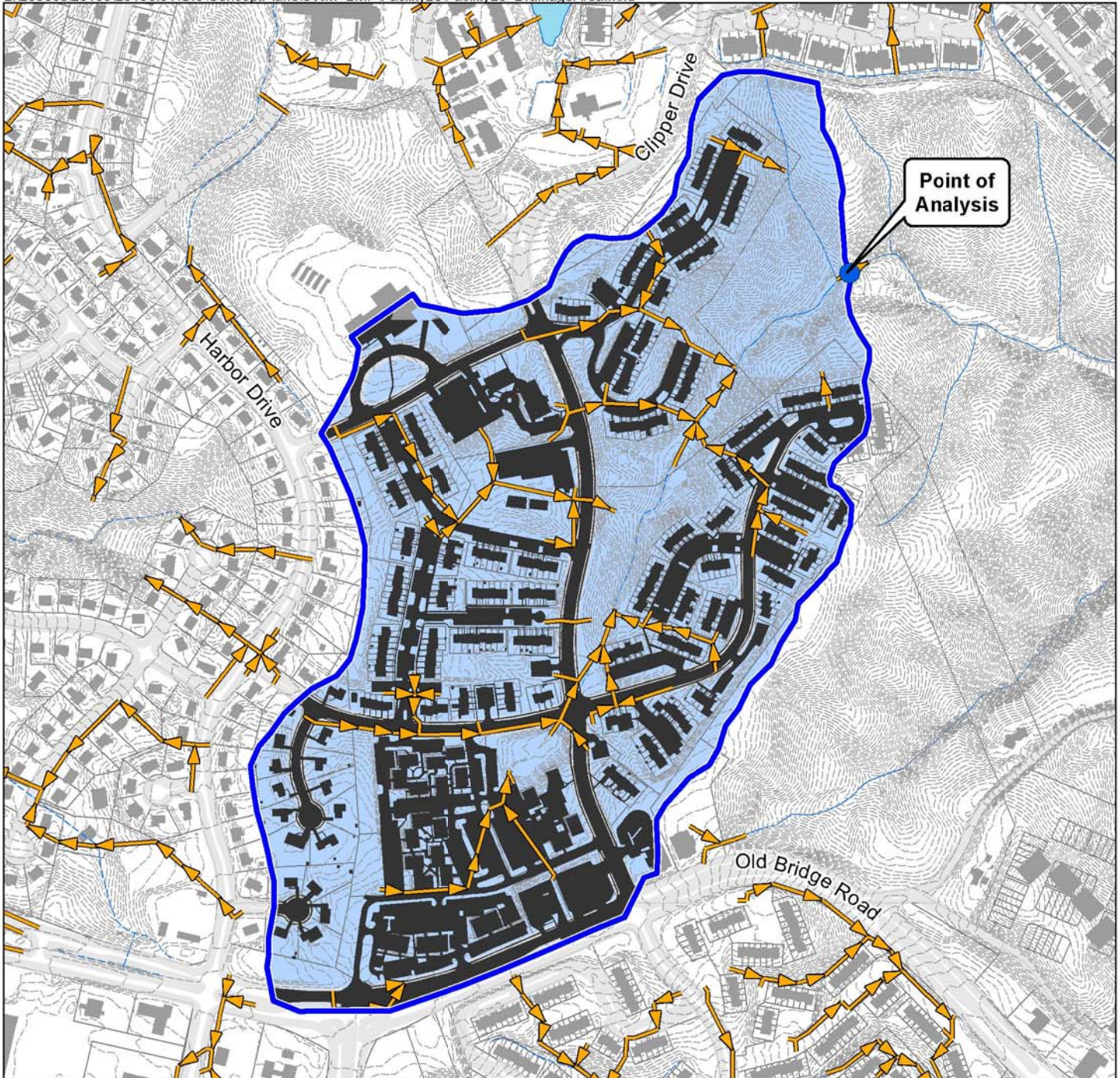
This approximately 0.9 acre facility is situated on the edge of a moderately steep terrain that is well-forested. The watershed is approximately 90 acres and predominately piped with two streams feeding directly into the facility. The stream from Clipper Drive shows signs of erosion, but is largely protected by riprap. The downstream receiving channel is stable. A drainage area map that highlights the suburban land uses and the piped network is provided (see attached Drainage Area Map).



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Vicinity Map
Occoquan Watershed -SWM Facility 28
WSSI #25156.02
Original Scale: 1" = 2000'

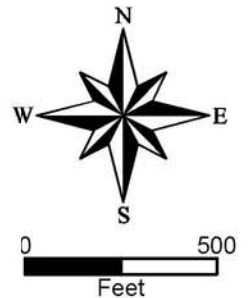




Lat: 38° 41' 3.5" N
Long: 77° 16' 15.5" W

Drainage Area Map
Prince William County Digital Data
Occoquan Subwatershed Study
Conceptual Plan - Facility 28
WSSI #25156.01
Original Scale: 1" = 500'

-  Drainage Area = 90 ac.
-  Impervious Areas within Drainage Area = 40%
-  Prince William County Roads
-  Prince William County Buildings
-  Prince William County Streams
-  Prince William County 2' Topography
-  Prince William County Parcels
-  Storm Sewer Pipe



SWM/BMP Facility 28 Site Photographs



Facility 28. Downstream view of existing sediment basin with riser structure



Facility 28. Upstream view of existing sediment basin with riser structure

**Reduction Calculation Summary
May 1, 2016**

SWM Facility #28

Wet Pond-Level 1

1 Determine existing published efficiency

BMP Type	Source	TN	TP	TSS
Dry Detention Pond	CBP	5%	10%	10%

2 Apply downward modification to BMP Efficiency

Facility Name	BMP Type	Lat	Long	Modification Type	Downward Modification Applied
SWM Facility #28	Dry Detention Pond	38.7856	-77.5102	No sediment forebay	-10%
				No micropool	-10%
Total					-20%

3 Calculate modified existing efficiency

		TN	TP	TSS
Published Efficiency	Step 1	5%	10%	10%
Efficiency Modification	Step 2	-20%	-20%	-20%
Modified Efficiency		4%	8%	8%

4 Determine efficiency of proposed BMP Type

Source	BMP Type	TN	TP	TSS
Bay Program Retrofit Equations	Wet Pond-Level 1	12%	19%	24%

Rounded to lowest whole number

Runoff storage (acre-feet)	0.39 (Final Design)
Impervious acres	26.18
Runoff depth	0.18

Retrofit Equation Results

TN	12.36%
TP	19.42%
TSS	24.73%

5 Calculate Incremental Removal Rate

		TN	TP	TSS
Removal Rate	Wet Pond-Level 1	12%	19%	24%
Modified existing efficiency	Step 3	4%	8%	8%
Incremental Removal Rate		8%	11%	16%

Bay Program Retrofit Equations

6 Calculate Load Reduction

Subsource	Pollutant	2009 EOS Loading Rate (lbs/acre/yr)	DA	Load	Efficiency	Reduction	Sub-total/POC
Regulated Urban Impervious	Nitrogen	16.86	26.18	441.39	8%	35.31	68.12
Regulated Urban Pervious	Nitrogen	10.07	31.81	320.33	8%	25.63	
Regulated Forest	Nitrogen	5.29	16.97	89.77	8%	7.18	
Regulated Urban Impervious	Phosphorus	1.62	26.18	42.41	11%	4.67	6.34
Regulated Urban Pervious	Phosphorus	0.41	31.81	13.04	11%	1.43	
Regulated Forest	Phosphorus	0.13	16.97	2.21	11%	0.24	
Regulated Urban Impervious	Total Suspended Solids	1,171.32	26.18	30,665.16	16%	4,906.43	6,018.15
Regulated Urban Pervious	Total Suspended Solids	175.80	31.81	5,592.20	16%	894.75	
Regulated Forest	Total Suspended Solids	79.91	16.97	1,356.07	16%	216.97	

7 Reduction Summary Table

Project Name	BMP Type	Lat	Long	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
SWM Facility #28	Wet Pond-Level 1	38.7856	-77.5102	68.12	6.34	6,018.15

Appendix C - Roadways

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Appendix D – Pesticide Herbicide and Fertilizer Application



Reporting

Mosquito Treatment

Adult ID

Larva ID

Gypsy Moth

Cankerworm

Adult ID Export

Mosquito Pools Log

Generic Pest Export

Mosquito Treatment Export

From:

07/01/2015

To:

06/30/2016

Technician:

Map page:

Site type:

Site Visit

Non-SWM

SWM

Other



Mosquito Treatment Report

This data is filtered by the following parameters:

From

07/01/2015

To

06/30/2016

Site Type

SWM

Treatment summary

2733 total inspections.

683 total treatments.

10.415149219467402 acres treated.



Reporting

Mosquito Treatment

[Adult ID](#)

[Larva ID](#)

[Gypsy Moth](#)

[Cankercorn](#)

[Adult ID Export](#)

[Mosquito Pools Log](#)

[Generic Pest Export](#)

[Mosquito Treatment Export](#)

From:

07/01/2015

To:

06/30/2016

Technician:

Map page:

Site type:

Site Visit

Non-SWM

SWM



Mosquito Treatment Report

This data is filtered by the following parameters:

From

07/01/2015

To

06/30/2016

Treatment summary

5727 total inspections.

1872 total treatments.

27.902830348943986 acres treated.



Reporting

Mosquito Treatment

Adult ID

Larva ID

Gypsy Moth

Cankerworm

Adult ID Export

Mosquito Pools Log

Generic Pest Export

Mosquito Treatment Export

From:

07/01/2015

To:

06/30/2016

Technician:

Map page:

Site type:

Site Visit

Non-SWM

SWM

Other



Mosquito Treatment Report

This data is filtered by the following parameters:

From

07/01/2015

To

06/30/2016

Site Type

SWM

Treatment summary

2733 total inspections.

683 total treatments.

10.415149219467402 acres treated.

Appendix E – Illicit Discharges and Improper Disposal

Illicit Discharge Report

Prem Poudel
Environmental Services

3907 Forge Drive
Woodbridge, VA 22193

Wednesday, June 01, 2016

On May 27, 2016 Prince William County Watershed Management staff received an anonymous complaint regarding the spilling of automotive grease and oil on the ground and pavement of a property off of Forge Dr. The report included a description of contaminants being washed into a nearby storm drainage system during rain events. Upon arrival on site, the area indicated with a red polygon below was assumed to be used for automotive maintenance. Oil and grease stains could be observed on pavement, ground, and adjacent fence.



Figure 1: Site map showing discharge flow path through the storm sewer system.

No one was present at home during inspection. The property was inspected from outside the boundary. The rear fence was observed from back of 3906 Forest Dale Avenue. Automotive fluids were found to be spilled within the owner's property. Although it is possible the spilled grease and oil could have been

washed away into storm water drop inlet located nearby that location, it is observed that these discharges would be negligible and hard to prove causation/quantify discharge volumes.



Spilling oil and grease on open ground and pavement, keeping oil and grease contained in vessels without lids, and leaving rusted motor parts and metals kept in the open without cover are all poor pollution prevention good housekeeping practices. The home owner should control such activities responsible for generating pollutants to soil within his property; however, this is not a clear violation of County illicit discharge ordinance at this time. Outreach for good pollution prevention practices will be distributed to the homeowner and the situation will continue to be monitored by Watershed Management staff for clear discharges to the storm sewer.

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

7754 Virginia Oaks Dr.
Gainesville, VA 20155

Tuesday, May 24, 2016

On May 18th, 2016, Prince William County Watershed management branch received a complaint regarding an illicit discharge describing a green paint discharge found draining into the duck/geese pond near the corner of Vinewood Ct and Virginia Oaks community in Gainesville. Upon arrival on site, the green paint contaminant was observed on outfall 23443 and downstream riprap towards SWM pond 5091.

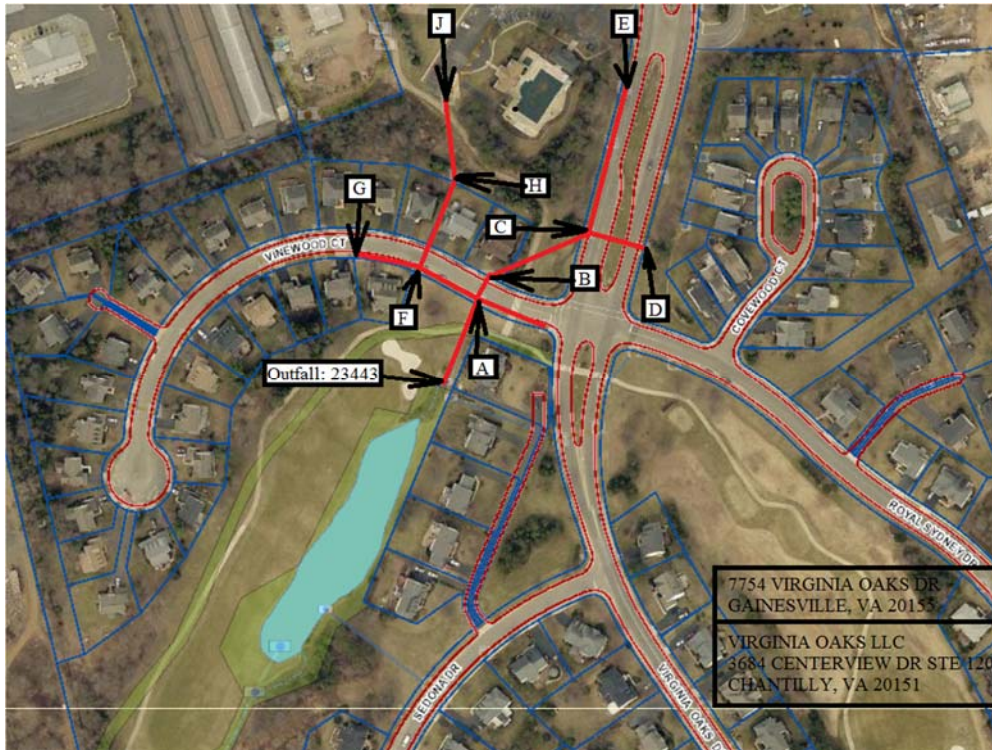


Figure 1: Site map showing discharge flow path through the storm sewer system.

Upstream storm sewer was inspected at various locations from points A to J. An attempt was made to identify the source of the discharge by inspecting manholes and drop inlets.

As a result of the investigation, the paint stain was found only at the outfall 23443 to pond 5091. Outfall 23443 is located within the Virginia Oaks Golf Club, and as a result a meeting was made with Mr. Glenn T. Payne, the General Manager of golf club to further investigate the discharge. During field

investigation, a call made to the complainant but was unable to reach him. A voice message was left in order to gain more info needed for a conclusive investigation.



The observed green stain may be developed either dumping paint in storm sewer system or hydro seeding. Follow up inspection will be continued to further investigate and identify a possible source. Notice of violation was not issued due to an inability to identify the source of the discharge.



Photo 1

7911 Notes Drive - Photos showing an operation that is contributing to offsite & windblown trash.

Photos 3 & 4 show compromised operation dumping ground glass and what is like confetti included in the mix... Mr. Tim Kinnett was advised to move the operation with the confines of the parcel address behind a closed gate.

Chief Inspector Cecil Huffman, CZA, CBMO

703 792-6022



Photo 2



Photo 3



Photo 4



Photo 5

Illicit Discharge Report

Prem Poudel
PWC Environmental Services

8006 Rocky Run
Gainesville, VA 20155

Thursday, December 17, 2015

On December 15th, 2015 the employee of Prince William County Watershed Management branch Mr. Khalid Quraishi received a complaint from Mrs. Amy Harding of 8006 Rocky Run regarding bad odor scape out from the manhole located nearby her house. On 16th December, the site found to be visited by storm drain inspection supervisor Mr. McGuire, Pat W. and VDOT employee as per husband of complainer whom I met on December 17th, 2015 in my field visit.

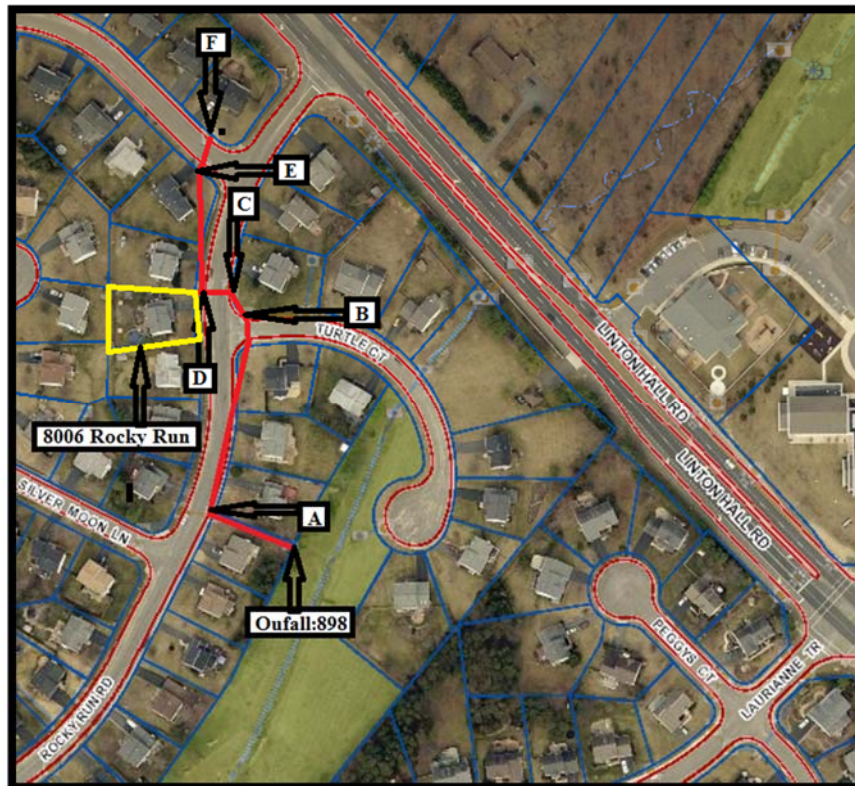


Figure 1: Site map showing discharge flow path through the storm sewer system.

Storm sewer had started to inspect from outfall. Even though it was raining there was no flow thru outfall since the sediment deposition had developed negative flow by forming dyke around outfall. There was no noticeable odor at manhole A. The faint odor had felt in manhole B. The easily noticeable odor felt at manhole C, D and E. The odor found to be gradually increased from B to E. The manhole F found to be free from odor.





In my investigation, the odor mainly associated with chemicals rather than sanitary sewage or decayed dead body of animals. The odor pretty much close to excessive chemicals and the intensity of odor found more around manhole E. From this scenario, the over application of fertilizers and chemicals in the lawn surrounding manhole E could be one of the reasons which had been wash way into storm drain which retained in as a small pockets formed in last rain fall event happened ten days ago. The spilling of chemicals nearby manhole E could be the second reasons which retained into storm sewer by the same way as explained earlier. Even though the husband of complainer request for camera VAN testing into the storm sewer system, the main reasons should be wash way chemicals thru curb and gutter inlet trapped into storm sewer as in small pockets around manhole E to B. The source of odor didn't exactly identify due to lack of evidence. The follow up action will be taken in future.

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

13719 Bluefin Drive
Woodbridge, VA 22193

Friday, May 13, 2016

The complaint received at PWC Environment Service from Mr. Randy Merritt about creek contamination by white substances on 05/13/2016. The email has received with attached pictures approximately at point D and E as shown in map below. Field inspection was made on 05/13/2016. On arrival, the creek found to be still contaminated with white substance at aforementioned point D and E. The white substance supposed to be paint spilling into storm water.



Figure 1: Site map showing discharge flow path through the storm sewer system.

The creek found to be flowing thru upstream community. Discharge started to track down towards upstream. The SWM Facility 60, located at point C found getting white discharge from inlet creek. Tracking kept continue along the creek. At point B, the white substance observed intermingled to the creek by the discharge getting from outfall 3529. After tracking storm sewer, the paint found to be dump at storm sewer inlet at point A. The house 13711 supposed to be renovating by visual outlook but

undersigned couldn't contact with the owner except renter. The renter didn't give the answer asking for renovating activities.



Point D



Point E



Point C



Point B



Point A



Point F

The source of creek contamination confirmed to be dumping paint on storm sewer drop inlet located beside the property 13712 Bluefin Drive. The violator couldn't identify at the visit. It seemed to be a

single event. The education materials were hand over to the renter and available residents of that community. The follow up inspection will be continued for further investigation.

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

13813 Foulger Square
Woodbridge, VA 22192

Friday, May 27, 2016

On May 27th, 2016 Prince William County Watershed management staff received a complaint regarding a leaky compactor behind Global Food Warehouse in Woodbridge Virginia. Upon arriving on site the compactor in complaint was identified behind the Global Food Warehouse store.

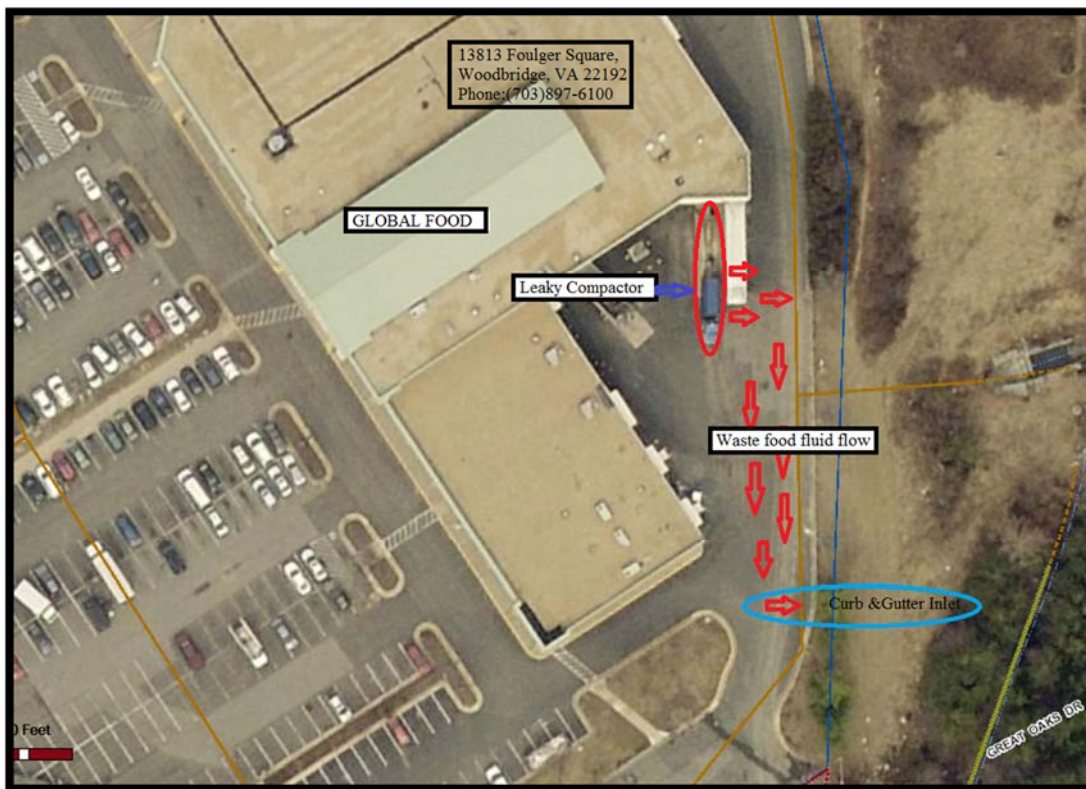


Figure 1: Site map showing discharge flow path through the storm sewer system.

The compactor was observed to be leaking substantially. Food waste fluid was found flowing down the roadway and directly into a nearby storm sewer drop inlet. Green algae were found to be developing over pavement surface in areas where flows were found. In addition, a greasy residue was found to be staining the pavement on both sides of the flow path towards the drop inlet. The greasy fluid was observed to be spread out in a larger area due to incursion via vehicle traffic. The origin of observed waste oil and grease was identified to be due to spills around a nearby grease collection tank.



Contact was made with Global Foods managing staff. The manager stated that waste handling practices were currently handled by PWC Service Authority, but the developed green algae and stain prove that observed discharges had been occurring for more than a couple of weeks. The manager was informed that the Prince William County Service Authority is not responsible for the mishandling of food wastes on private property and that it is the business owner's responsibility to properly manage and identify maintenance issues to his compactor and grease trap. In conclusion, the leakage of waste oil, food

waste, and grease debris were found to be due to the improper disposal of food and waste oils by Global Foods. This resulted in an illicit discharge, as non stormwater contaminants were allowed to be discharged into storm sewer system. As per county ordinance sec. 23.2-4.1, NOV (NOV 9-2016) was issued in order to assure compliance. PLEASE REMOVE ALL RESIDUE AND DEBRIS FROM BEHIND COMPACTOR and surrounding pavements. Put into place measures that ensure prevention of grease discharge to surrounding areas outside the grease receptacle. Periodic inspections will be performed to ensure maintenance to compactor and further resolution of the Violation.

Reinsertion:

Reinsertion made on 06/07. The deficiency mentioned in NOV 9-2016 found to be corrected as desired. The meeting made with management staff asked to pay regular inspection and attention in proper waste management practices. Minor correction were suggested for re-fixing rubber washer mounted at inlet barrel of compactor and asked the vender to pick up the load if collected early than regular pick up days. The case closed on 06/08/2016. The site will be regularly inspected in future. Following pictures were taken before closing the case.





Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

13816 Meadowbrook Rd.
Woodbridge, VA 22193-4430

Friday, April 08, 2016

The aforementioned property, 13816 Meadowbrook Road and its surrounding storm drainage inlets were inspected on 04/04/2016. Storm inlet-2 was found to have some grass clippings inside. Re-inspection made for further verification as per complainant on 04/07/2016. The rest of the curb and gutter inlets were found to be clean. The lawn of 13816 found to be recently mowed.

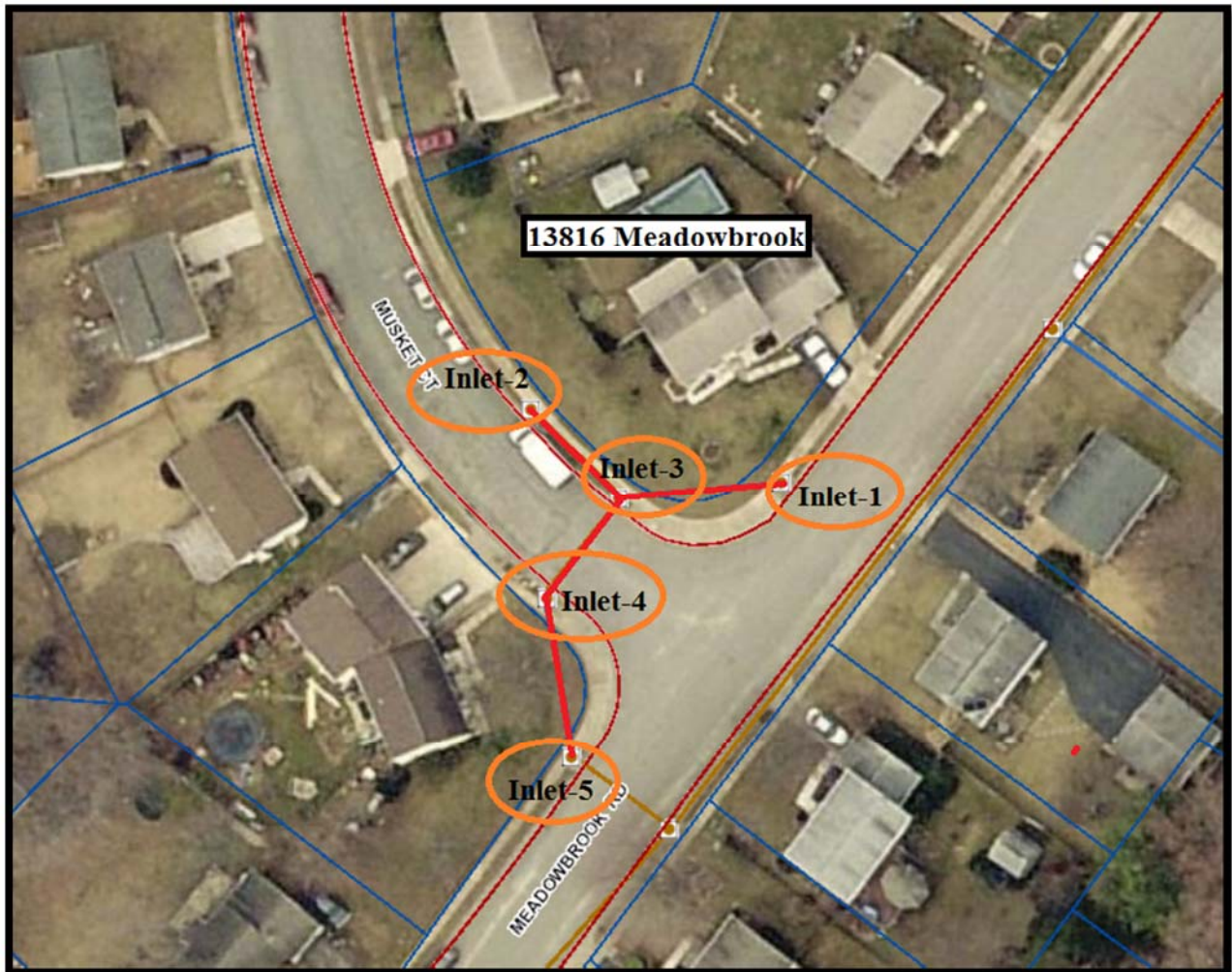


Figure 1: Site map showing discharge flow path through the storm sewer system.

A meeting was made with the property owner of 13816. According to him, the lawn mower dispersed cut out clippers to the street while mowing which may have blown into the inlet unintentionally. As I inspected, the amount of clippers observed insignificant in inlet-2.



Inlet-1 in front of property 13816



Inlet-2 with some clippers



Inlet-3



Inlet-4(across the Street)



Inlet-4(Cross the Street)



Inlet-5

Due to lack of sufficient evidence it was difficult to figure out whether the discharge had happened intentionally or non-intentionally. Educational materials were distributed to the home owner with a briefing on dumping clippings into storm sewer system. At this point, I feel uncomfortable to issue a notice of violation (NOV), both due to a lack of sufficient evidence to prove intent of discharge, and the County policy to educate homeowners for a first offence. Follow-up inspections will be continued in the future.

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector
PWC, Environmental Services

14980 Farm Creek Drive
Woodbridge, VA 22191

Wednesday, May 18, 2016

On May 18th, 2016 Prince William County Environmental Services received a report from Mr. Mike K. Hubbel, PWC Fire Marshal, regarding potential illicit discharge activity related to World Trade Company located at 14980 Farm Creek Drive. That same day a site inspection was conducted. Upon arrival at site, the property was found to be used for waste recycling processes. The ground beyond the pavement behind the facility was observed to be encroached by moving trucks and produced sludge flowing towards an adjacent creek. The pavement was found to be stained with grease and oil stains. Stains and debris were found to be washing into storm water drop inlets located in the pavement section of the property. The recycling trash found to be spread out on pavement around drop inlets and was easily available to be washed into the storm drains and adjacent creek.

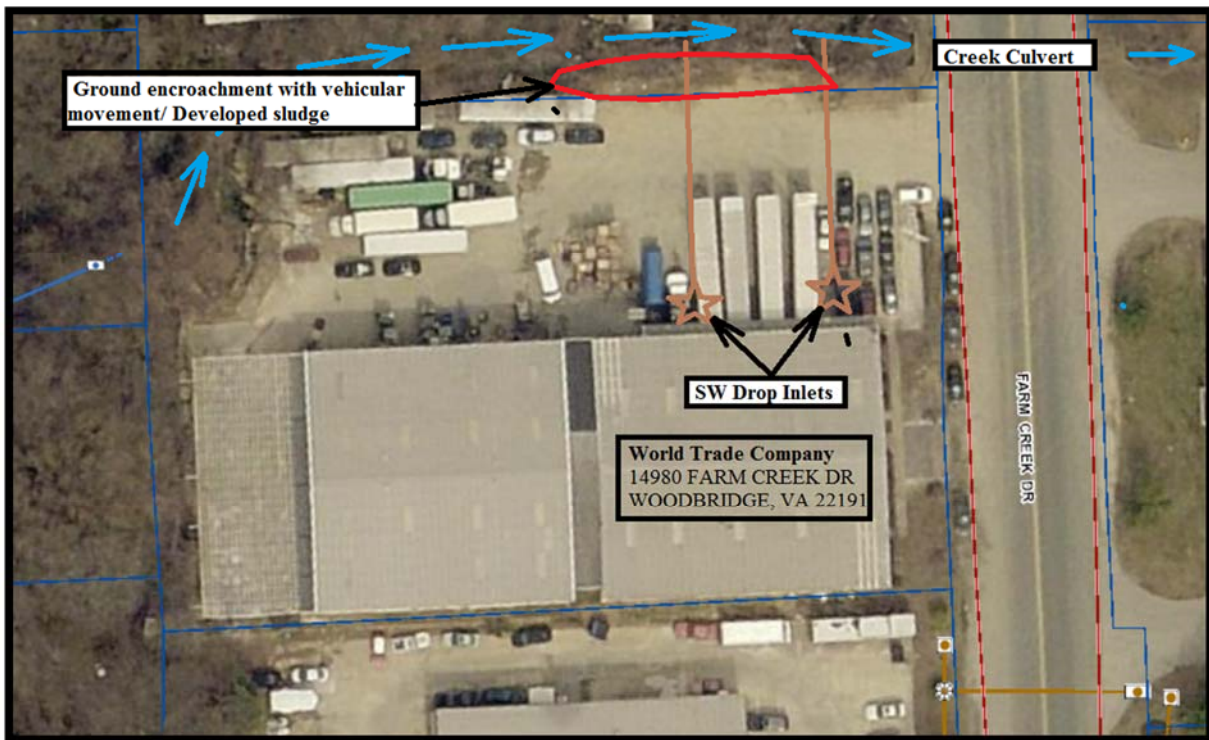


Figure 1: Site map showing discharge flow path through the storm sewer system.

Upon inspection, the creek found to be contaminated by the observed sludge, wash away grease and debris found on the World Trade Company property. A meeting was made with Mr. Rafic Eldin, the business owner, to talk about observed deficiencies. Mr. Eldin found to be very positive to address the aforementioned deficiencies.

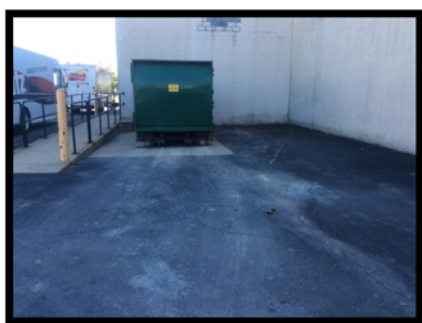


In Conclusion, World Trade Company was found responsible for unlawful discharges to the storm sewer system and waters of the county, a notice of violation (NOV 04-2016) was issued to the company as per county law section 23.2-4 and is required to mitigate damages and correct deficiencies no later than 30 days from receipt of NOV. The corrective action plan should include:

- 1) Clean grease and oil stain from pavement and take appropriate measures to control unlawful discharge flowing into storm drain inlets.
- 2) Avoid ground encroachment generating sludge discharge into the creek.
- 3) Enact good housekeeping practices immediately to prevent further discharges.

Inspected Facility: Price Rite	Address: 2090 Daniel Stuart Square Woodbridge, VA 22191
Inspected By: Prem Poudel	Date of inspection: 12/04/2015
Inspection Note: Price Rite Grocery/ Produce facility was re-inspected finally to verify the mitigation measures, on issued NOV 2015-07, taken by the facility owner on 12/04/2015. The successive inspections had been made on 09/24 and 10/20 respectively. The prompt steps had been taken to stop dumping waste around compactor and drive way as well as the integrity of the compactor to prevent future leaking in 1 st reinsertion (9/24). The mitigation measures found to be effective in 2 nd re-inspection (10/20). There was no leakage thru compactor and the accumulated greasy debris and stained residue found to be removed and cleaned as directed. Hence the case has been closed after 3 rd reinsertion(12/04) .	

Pictures:



Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
Department of Public Works, Environmental Services
5 county complex court, suite 170
Prince William, VA 22192

7501 Nyack Court
Manassas, VA 20112

Monday, July 06, 2015

Mrs. Laura Knepper, resident of 7501 Nyack Court, entered a complaint concerning the dumping of residual paints and cleaning their painting supplies into a drop inlet located near her residence. She stated the Patriot Painting crews have painted house nearby and were responsible for the discharge.



Figure 1: Vehicle of Responsible Party (provided by Complainant)

Upon reaching the aforementioned location, contact was made with Mrs. Knepper and the source of discharge was tracked down to a storm water drop inlet near the downstream creek. The truck had already left upon inspector arrival. The creek water found to be faint white colored as compared to the pictures provided by Mrs. Knepper. This is assumed to be a result of a recent rain event. There was no visible severe impact at downstream creek.



Pictures by Homeowner



Pictures taken by Inspector

The field inspection found washing activities had violated County ordinance 23.2-4.1 (a). The truck had already left and picture did not specifically show dumping activities taking place. According to the complainant the crews of Patriot Painting were responsible to the discharge. Because illicit discharge activities were not directly observed by PWC staff, or documented by the homeowner, no NOV will be issued; however, a letter stating the potential violation and indicating possible consequences of Illicit discharges along with educational material will be distributed to Patriot Painting.

Violator

Patriot Painting
scott@patriotpainting.net
571-283-4883

Complainant

Laura Knepper
7501 Nyack Court
Manassas, VA 20112
703-304-6906

Edits: Robert Jocz 7/7/15

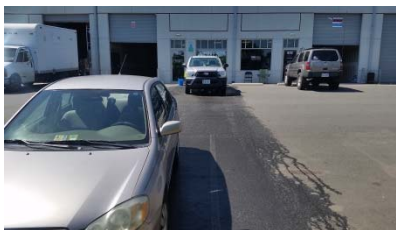
Illicit Discharge Report

Robert Jocz

**Mosquito Squad
9268 Mike Garcia Drive
Manassas VA, 20109**

Friday, July 31, 2015

During a routine drive by inspection along Mike Garcia Drive an employee of Mosquito Squad was observed washing his work truck, allowing runoff to enter a nearby storm sewer. No trackdown was needed as the discharge was identified at its source.



Upon discovery of the discharge the employee was informed of the violation to County ordinance and instructed to cease washing operations. Tyler Buckingham, a field supervisor for Mosquito Squad, was also informed of the discharge and the violation to County ordinance 23.2-4.1. It was agreed upon that Mosquito squad would find alternative methods of washing vehicles in the future, mitigating actions responsible for the violation. This site will continue to be monitored for future violations.

Illicit Discharge Report

Robert Jocz

**Shoppers Warehouse
4174 Fortuna Center Plaza
Dumfries, VA 22025**

Thursday, July 30, 2015

On July 29th, 2015 Prince William County Watershed management staff received a complaint regarding a leaky dumpster behind Shoppers Warehouse in Dumfries Virginia. Upon arriving on site the dumpster was located behind the Shoppers Warehouse food store. The reported dumpster was discovered to be a trash compactor upon arrival on site.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Oil/grease residue was found to be staining the asphalt behind the compactor in the direction of the storm drain. In addition, greasy debris was found below the back end of the compactor. It was clear that the compactor was leaking contents which were being washed into the storm drain during rain events. After discovery contact with a shopper's food manager was made.





The manager stated that the compactor had been repaired that morning. Upon further inspection It did appear that the dumpster had been fixed via a weld at the bottom of the back of the compactor. A NOV (NOV 2015-4) was issued in order to assure compliance. Periodic inspections will be performed to ensure maintenance to compactor resolves discharge problem. **PLEASE REMOVE ALL RESIDUE AND DEBRIS FROM BEHIND COMPACTOR.** This ensures no further contaminants will be washed into the storm drain during rain events.

Illicit Discharge Report

Prem Poudel
Environment compliance Inspector
PWC, Department of Public Works, Environment Services
Prince William, VA 22192

7174 Fortuna Center Plaza
Dumfries, VA 22025

Monday, August 17, 2015

On August 17, 2015 follow up inspection had been conducted upon getting citizen complain of an illicit discharge thru compactor placed behind Shoppers Warehouse in Dumfries Virginia. Notice of violation (NOV#2015-4) had been already issued to shopper on 07/30/15. Upon arriving on site, compactor was found to be significantly discharged pungent gray greasy leachate in to hanging two bucket at the bottom corner which was continuously overflowing. Minor flow found all around the compactor.



Figure 1: Site map showing discharge flow path through the storm sewer system.

The flow found to be reached up to curb and gutter inlet of storm drain located beside the drive way. Marks and flow of greasy discharge found to be extended towards storm water curbs and gutters inlet on asphalt pavement. In addition, greasy debris was found below the back end of the compactor. After discovery contact with a shopper's customer service manager Mr. Carlos Harris was made.





The manager stated that the compactator will be repaired after taking away the collected waste of compactator today. For the time being, the discharge has been collected in hanging bucket and use to discharge manually into grease inceptor. But nobody was looking for those hanging bucket at site even though it was over flowing. The minor trickle flow found to be discharged all around the compactator. A NOV (NOV 2015-5) was again issued in order to assure compliance. Periodic inspections will be performed to ensure maintenance to compactator resolves discharge problem. PLEASE REMOVE ALL RESIDUE AND DEBRIS FROM BEHIND COMPACTOR. This ensures no further contaminants will be washed into the storm drain during rain events.

Illicit Discharge Report

**Prem Poudel
Environment Compliance Inspector
5 County Complex Court, Suite 170
PWC, Department of Public Works**

**14005 Telegraph Road
Woodbridge, VA 22192**

Wednesday, July 01, 2015

Mr. Bob Barr, currently the developer of property 14005 Telegraph Rd complained about algae formation around his newly under construction storm water management facilities.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Undersigned observed algae development on recently stabilized ground. I also observed continuous flow towards silt fence from property 13901 Telegraph Road to 14005 Telegraph Rd. Water sample has been taken for preliminary test. I tracked down the source of inflow.





The property 13901 Telegraph Road was found to be used for multiple purposes. Undersigned observed junk car storage in open ground, Vehicle repair and maintenance workshop, storing and selling compost fertilizers, mulch, sand and parking large commercial truck. The ground surface mostly found graveled. The discharge found to be generated by vehicle washing, cleaning and ground water as well. There was no responsible person to talk about the issues and got information he will be back on 07/07/2015. I took the water sample for preliminary tests. The photometer test has been completed and found that the phenol exceeded the limits. From my field investigation, the property 14005 Telegraph Rd was found to be affected by the illicit discharge generating thru property 13901 Telegraph Road. The enforcement action would be better to start from whether the owner of property 13901 is properly following zoning ordinances or not.

Followings are the result of water quality taken by professional plus and photometer test.

PARAMETER	RESULT	UNITS	EXCEEDANCE LIMITS
Water temperature	72.6	°F	
pH	7.66	pH units	<6 or>9
Specific conductivity	322.9	µS/cm ^c	>2,000 µS/cm ^c
Detergents	Low	mg/L	> 0.25 mg/L
Chlorine	0.36	mg/L	> 0.4mg/L
Copper	0.30	mg/L	> 0.5mg/L
Phenol	0.57	mg/L	> 0.4mg/L
Flouride	0.02	mg/L	> 0.2 mg/L
Potassium	9.50	mg/L	≥ 20 mg/L or if NH ₄ :K>1
Ammonia	1.20	mg/L	≥ 50 mg/L or if NH ₄ :K>1
Nitrite	0.075	mg/L	
Nitrate	0.199	mg/L	



Location Map.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC Environment Services
5 County Complex Court, Suite 170
Prince William, VA 22192

17247 Wayside Drive
Dumfries, VA 22026

Thursday, October 08, 2015

Upon arrival on site in routine inspection on 10/08/2015, the dumpster located at 17247 Wayside Drive found leaking and discharging grease and waste food fluid in to storm sewer drop inlet. Oil/grease residue was found to be staining the asphalt in the direction of the storm drain.



Figure 1: Site map showing discharge flow path through the storm sewer system.

It was clear and visible that the dumpster was leaking contents which were being washed into the storm drain during rain events. Moreover the drop inlet located behind restaurant the Curry in Hurry and Sweet Frog found to have stain of waste food dumping on its gratings.



The meetings with the employee of various restaurants located in this property were made to aware them about an unlawful dumping and discharge. The owner managed the property from outside so meeting couldn't possible with the owner during inspection.

Inspected Facility: Burger King	Address: 5301 Waterway Drive Montclair, VA 22191
Date of inspection: 12/04/2015	Inspected By: Prem Poudel
Inspection Note: Aforementioned Burger King facility was re-inspected to verify the continuation of mitigation measures, on issued NOV 2015-09, taken by the facility owner on 12/04/2015. After getting call from Manager Rina, re-inspection made (11/12). Mitigation measures found to be completed as requested except removal of grease collection tank far from storm drainage inlet. Re-inspection again made (12/04). Grease and oil again found to be spilled and flowing towards storm drain. Even though it was corrected in 1st re-inspection, the case was repeated again so NOV 2015_10 issued to mitigate deficiency as per NOV. Assistant Manager Nadalie Woolfrey said; the emergency call made to the cleaning company this morning. She promised, the problem will be solved on 12/07 including relocation of tank far from storm drain.	

Pictures:



Re-Inspection:

The business facility was re-inspected on 12/11/2015 and 12/14/2015. The grease and oil collection tank found to be removed from close to far of storm sewer inlet. The store manager had begun cleaning herself on my arrival on 12/11/2015 (Picture 2nd & 3rd). The cleaning chemicals was found to be absorbed with cleaning device and squeezed into red container for disposal into sanitary sewer. The 1st picture was existing condition after removal of tank. Grease and oil collection tank found to be removed in new location as shown in 4th picture below. The site was again re-inspected on 12/14/2015 and found as shown in picture 5th and 6th.

Now the tenant found to be aware to protect storm sewer system from spilling and dumping an illicit discharge. The case has been closed but periodic inspection will be continued in future to assure mitigation effectively.



Complainant	Citizen	Inspector	Prem Poudel
Complain Received	04/25/2016	Date of inspection	05/02/2016
Address	8660 Virginia Meadows Dr. Manassas, VA 20109		



Zone-1 (Dump sludge into Settling Chamber)



Zone -2 (Silt fence around outlet of settling basin with mud bag)



Zone -2 (Silt fence around outlet –Double step with additional Straw Bale Barrier)



Zone -2 (Silt fence around outlet –Double step)







Comments:

Re-inspection made on 5/2/2016. Company N TO N CORE LLC has been started sediment control measures with Silt Fence and Straw Bale Barrier. Field inspection was made together with N to N Fiber Inc. President, Mr. Stephen Noone, his supervisor and me. Mud Bag found to be used for outlet pipe. Still there was some minor deficiency in perimeter control. Immediate corrective actions were suggested to make more effective sediment control. After the rain event of this week, company had a plan of sediment control with Diversion Dyke with permanent stabilized with turf, Mr. Noone said. Sediment found to be found to be controlled within their boundary. The clean water observed flowing into downstream shrubs and channel. The follow up inspection will be performed after 15 days.

Second re-inspection made on 5/24/2016. Because of continuous rain events in last two weeks, the company didn't get enough time to adopt permanent sediment control measures. Discharge of sludge found to be controlled flowing over their property. The step found to be started making permanent control.



Contact Info:

Mr. Stephen Noone

President

N to N Fiber Inc.

8661 Virginia Meadows Drive

Manassas, VA 20109

smnoone@ntofiber.com

Ph. (703)-331-3884
Fax: (703)-331-3854

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Environmental Service
5 County Complex Court, Suite 170
Prince William, VA 22192

8664 Virginia Meadows Dr.
Manassas, VA 20109

Thursday, September 03, 2015

Upon arriving on site for routine inspection for dry weather discharge screening, the employee of Temp Power (Generator Rental) company was washing their commercial generators with chemicals nearby drop inlet and wash water found to be directly discharged into drop inlet.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Track down of the discharge was not necessary as the discharge was discovered at its source. The discharge received at drop inlet 52455 found to be discharged in to commercial storm water management pond/BMP before discharging to the field.



The activities confirmed to be an illegal. The request made to stop those activities immediately and meeting made with responsible representative Mr. Chris Crafton. A NOV (#2015-06) was issued. Temp Power is responsible to immediately stop discharging of pollutants to the storm sewer system, and mitigate any effects from such discharges according to County Ordinance 23.2-41 Unlawful discharge to the storm sewer system. Mitigation should occur within 30 days of receipt of NOV as identified by receipt of Certified mail. Periodic re-inspections of the site will be conducted to confirm compliance. Code Case # MSSS2016-00001

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Department of Public Works, Environmental Services

9450 Hawkins Drive
Manassas, VA 20109

Friday, February 12, 2016

Environment Services received complaint regarding how the storm water handled in the industrial park in parcel 9450 and 9460 Hawkins Drive on 2/11/2016. Mr. Scott MacDonald, the Recycling Program Manager of PWC Solid Waste Division, was the complainant and also he raised the concern about litters generated by their business.

The field inspection made on 02/12/2016. The property found to be graveled and used by different tenants for various business purposes like Snow Removal Company parking their equipment, truck and stock necessary stuff, Construction Company stocking their construction materials, vehicles and equipment, Automotive company storing Junk Car and stocking automotive stuff, Recycling Company collecting and delivering household stuff, Parking Commercial truck and stocking Pallets along internal road etc. All business yard were found to be closed except Muller Erosion & Site Services, Inc. The inspection was mainly focused on storm water inlet points and litter issues.

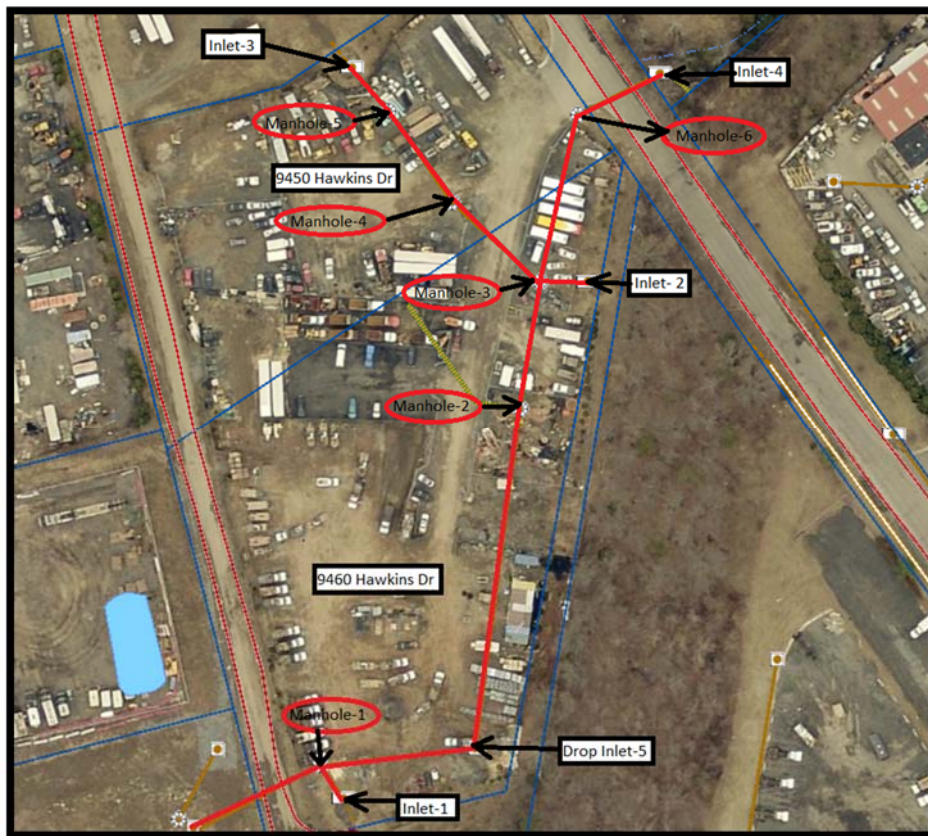


Figure 1: Site map showing discharge flow path through the storm sewer system.

The inspection made for Muller Erosion & Site Services, Inc. The inlet-1, Manhole-1 and Dropinlet-5 found to be located inside their compound. Manhole-1 found to be located along stream sewer. Inlet-1 found to be dry and well maintained. The sand and aggregate found to be stocked much closed to drop inlet-5. The aggregate and sand found to be slightly dropped into drop inlet. The gas tank found to be used for fueling. The surrounding gravel and ground of gas tank found to be stained with spilled gas and oil. The Muller has their own shade for repair and maintenance of their vehicle. The fueling activities don't meet the minimum requirement of fueling center i.e., no double tank, no safety post around the tank etc. The Operations Manager of Muller Mr. Lazaro Torres agreed to protect drop inlet-5 with silt fence and prohibit stocking and receiving vehicles moving over the drop inlet. Inlet 2 and 3 found to be located at the two extreme boundary of the property, getting storm water from adjacent properties. Both inlets found to be more or less free from litters also. Inlet 4 was receiving discharge from open channels.



Inlet-1



Inlet- 3



Inlet-2



Inlet-4



Fueling gas and oil



unprotected drop inlet



Junk Car Storage



Straw Net/ Bale Barrier Storage



Roadside Parking/ Pallet stocking



Stock Pile/Used Tires



Machine, Cables, soil & org. fertilizer dumping



Machine and Materials Storage



Snow Removal Vehicle Parking



Necessary stuffs (Oil) and Snow Removal Vehicle Parking



Transferring used stuffs



Parking Vehicle & Construction Materials



Junk Car and Its parts loading



Vehicle and other associated Materials Storage



Upstream of Inlet-3

The ground found to be contaminated with performed business activities which ultimately contaminated storm water runoff as well as ground water due to percolation in rainy season. The zoning section need to be verified whether such business activities allow in this property or not. Since it has located in industrial park, the property owner must have business permit with storm water pollution prevention plan which didn't display at site. Even though there was no flow thru inlet 1, 2, 3 and 5, the runoff during rain event ultimately enters into storm sewer system. Categorically following deficiency need to be immediately corrected to prevent an illicit discharge into storm drainage system.

1. Protect drop inlet-5 from entering sand and aggregate .
2. Fueling tank should be double wall with protecting boundaries and trapping mechanism for spilled gas and oil.
3. The chemicals, oil, grease etc. should be stored into shade or trailer.
4. The pollution prevention plan needs to be implemented to control trash and litters.

Respond with deficiency correction:

The drop inlet protection work has been corrected by Muller E &S Services and got email of Lazaro Torres, the Operation Manager with following pictures on 02/21/2016.



Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

11900 Livingston Rd
Manassas, VA 20109

Thursday, March 31, 2016

Upon arriving on site, The Shane Enterprises facility found to be much messed by keeping salt pile uncovered, spreading salt residue and leaving grease stain everywhere. Moreover, the mark of grease and salt stain found to be washed away into the storm water drop inlets, located at curb and gutter outside their storage boundary. Even though, undersigned didn't observe the cleaning activities, water has to be applied before my arrival which can be seen wet marks towards storm water inlet. The truck found to be standing beside storm water inlet having plenty salt stain on its wheel.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Track down of the discharge was not necessary as the discharge was observed at its source. The storm sewer travels thru the industrial complex having multi business including automotive services before discharging into a SWM facility. The meeting made with in charge of Shane Enterprises who found to be aware about environmental hazards due to their work practice.



As the practice of Shane Enterprise confirmed to be violation of county code 23.2-4.1, the notice of violation (NOV, 2-2016) has been issued to the company to correct the deficiency with following corrective action plan.

- 1) Immediately cover or remove the salt piles to prevent being washed away into storm sewer during rain events.
- 2) Stop spilling & spreading grease and salt on pavement surface to prevent being washed away into storm sewer during rain events.
- 3) Clean the stains of grease and salt debris having on asphalt pavement to prevent being washed away into storm sewer during rain events.

The Contact info:

Shane Enterprises

Email: jimleland3@gmail.com

Phone: 571-358-4173

Re-Inspection:

A Follow-up inspection was made [5/2] for corrective measures related to NOV#2-2016 issued on 04/04/2016. Corrective action for cleaning of salt stains adjacent to the drop inlet was completed but the salt stock pile inside the compound was still found to be uncontained, and allowed to be washed away during storm events and to flow towards the storm water inlet. This was identified as the main source of the illicit discharge violation. Current corrective measures were found to be inappropriate to control an illicit discharge from the property. Please install appropriate measures to ensure the confinement of salt to prevent further discharge. Following pictures were taken on 05/02/2016. The follow up email has been sent in aforementioned contact info.



Re-inspection:

Second follow-up inspection was made [5/6] for corrective measures related to NOV#2-2016 issued on 04/04/2016. Corrective action for cleaning of salt stains adjacent to the drop inlet was completed before first re-inspection but the salt stock pile inside the compound was still found to be uncontained. Follow up email had sent to Mr. Jim, the Manager of Shane Enterprises to employ an appropriate corrective action for deficiency mitigation. The salt stock pile found to be removed before second re-inspection. Since it has found to be one of the hot spots of unlawful discharge into storm sewer system, the follow up inspection will be continued in future. Following pictures were taken on 05/06/2016. The case has been closed for now.



Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Environmental Service, Department of Public works

13720 Smoketown Rd
Woodbridge, VA 22192

Thursday, February 11, 2016

The complaint, about uncovered salt piles on parking lot beside Lowes of smoke town plaza, has been reported by Mr. Dan Michaelson of DEQ on 02/11/2016. Upon arrival, a large pile found to be partly covered on top with small blanket. The noticeable another spot observed, that must be the location of previous stock pile used before but still there was some residue left over.

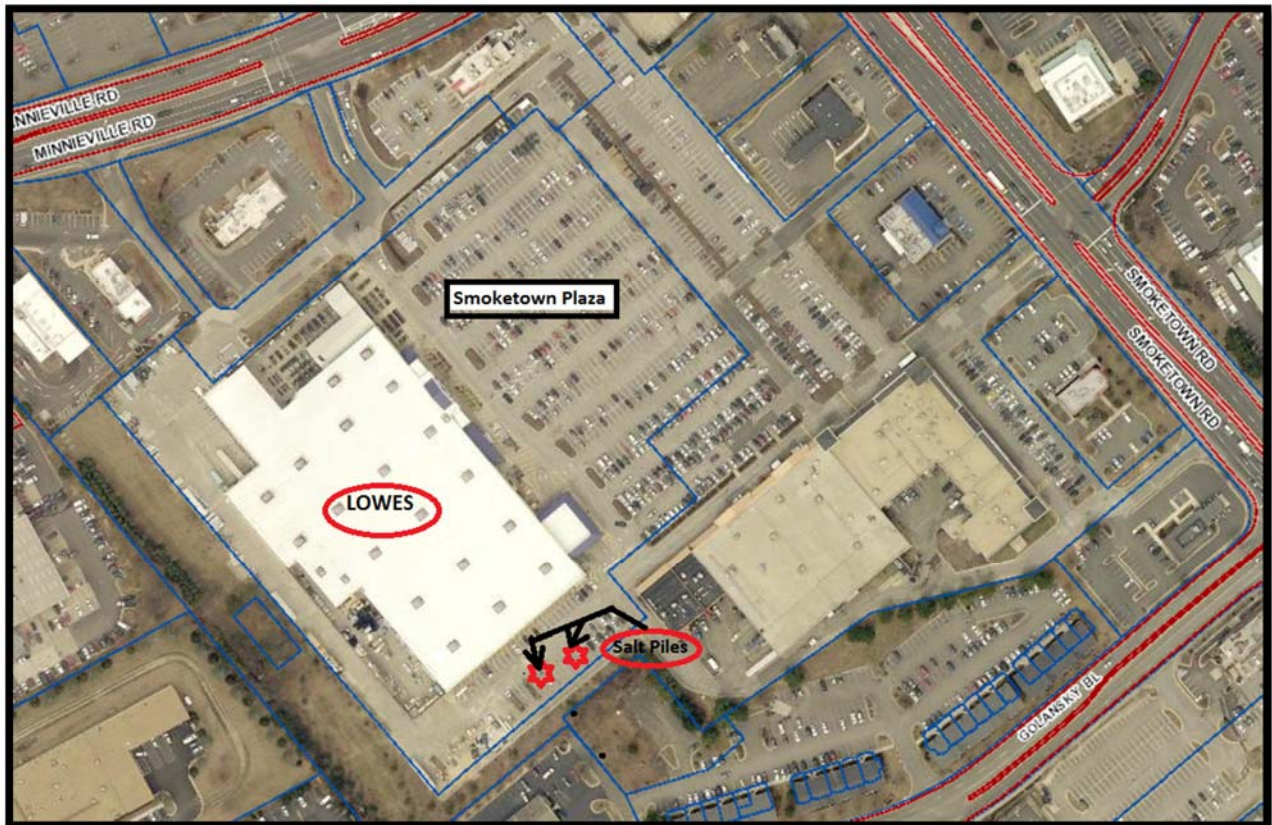


Figure 1: Site map showing discharge flow path through the storm sewer system.

Since both spots have closed to the LOWES business, meeting made with LOEWS manager Mr. Mike Walker (703-586-4000) but It comes to know, that activities done by Rappaport, the property management company. He gave me the contact info of property Management Company. The contact made with Susan Winchell (571-426-0141) who is the responsible person of property management. She

agreed to correct the deficiency at the end of the day on 02/12/2016. Following activities should be promised to mitigate the deficiency.

1) Confine the salt into closed container or cover the salt pile to prevent rain/ice/etc. from washing it away.

2) Collect and confine the residue from previous stock pile so that it does not wash way by snow or rain water.

Before correction



Partly covered salt pile



Residue left over the another pile location

After Correction



No sign of stock piles

The property management company agreed to correct the deficiency at the end of day. Since the management company located offsite, NOV didn't issue.

Contact Info for Responsible Party

Rappaport Property Management Company

Susan Winchell

swinchell@rappaportco.com

(571)426-0141

Re inspection made on 02/16/16. There were no signs of stock piles at previous location. So the uncovered salt case has been closed.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Environmental Service, Department of Public works

13720 Smoketown Rd
Woodbridge, VA 22192

Tuesday, February 16, 2016

The complaint, about uncovered salt piles on parking lot beside Auto Spa Car Wash, had reported by Mr. Dan Michaelson of DEQ on 02/16/2016. Upon arrival, the site found to be located behind the Aerobics Center instead of Auto Spa Car Wash. A large pile found to be partly covered and left without recovered after taking salt from stock pile. Three crews were found working for snow removing from side walk. The foreman gave me the name and phone number of contractor. The contractor known to be Emery Snow Removal and responsible person was Mr. Jim Emery (Cell phone- (571)212-2030) to maintain this shopping center.



Figure 1: Site map showing discharge flow path through the storm sewer system.

The call made for contractor. Mr. Jim immediately arrived at site and started work for correction. The mitigation measure suggested completing by covering and protecting the pile from wash way into storm drainage system. The mitigation activities immediately conducted while snow and ice begun melting so the impact of uncovered situation supposed to be negligible. Followings are the pictures before and after deficiency mitigation.

Before correction



Partly covered salt pile

After Correction



Properly covered & no contact with flowing water

Since the correction made immediately and the impact of uncovered time window supposed to be negligible, NOV didn't issue and case has been closed.

Trackdown Report

**Robert Jocz
RAM Hauling
9220 Mike Garcia Drive
Manassas VA, 20109**

Tuesday, June 30, 2015

On June 29th, 2015 a complaint was received by Prince William County staff detailing issues with the discharge of pollutants into the stormsewer system at a property on Mike Garcia Drive. Upon arriving on site and meeting with the complainant, it was explained that this issue was ongoing. Video and photos from security cameras was provided to the County displaying previous discharge incidents. Once arriving at the suspected discharge location, an employee was observed washing sediment off of a company vehicle into the curb and gutter, and subsequently a storm drain inlet (See photos). The employee was asked to stop and informed of a violation of County Ordinance. A supervisor was not present and no supervisor information was provided by the employee.



Figure 1: Photo of Discharge.

Trackdown of the discharge was not necessary as the discharge was discovered at its source. The stormsewer travels alongside a commercial/industrial complex before discharging into a sedimentation basin/BMP which is currently on bond.



Figure 2: Map of Trackdown/Discharge Path



Figure 3: Trackdown Photos

According to Vehicle markings, employee observation, and discharge location, RAM Hauling inc. was identified as the responsible party for the discharge. A NOV (#2015-01) was issued (included in this packet). RAM Hauling is responsible to immediately stop the discharging of pollutants to the stormsewer

system, and mitigate any effects from such discharges according to County Ordinance 23.2-41 Unlawful discharge to the stormsewer system. Prince William County holds the right to investigate storm sewer system using closed circuit television in order to assess damages at the discharger's expense. Mitigation should occur within 30 days of receipt of NOV as identified by receipt of Certified mail. Periodic re-inspections of the site will be conducted to confirm compliance.

Mitigation efforts are to include:

Removal of salt and hydrocarbon stains from asphalt and parking area adjacent to building.
Sediment accumulation within stormsewer pipes from washing of sediment laden vehicles.

Included:

- NOV and NOV letter
- County Ordinance
- Mitigation Information

Appendix F – Spill Prevention and Response



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153011226	Date: 10/7/2015
Location: 10290 Copelane Dr Manassas VA	Time: 2258
Report Completed By: LT. Dan McCleese	Incident Commander: Captain Lott (BC501)
HM 506 Personnel Responding: None HS 516 Personnel Responding: None Other HMT Personnel Responding: Phone Consult	

INCIDENT DESCRIPTION	
Phone consult to BC501 (Capt Lott) for leaking Honda Accord (VA Tag# VEV-5741). Approx 15 gal or less of gasoline was leaking out of the accord after it was flipped during a MVC. BC501 was advised to perform defensive absorbent/diking to contain the product and have the tow and recovery company handle the product. Was located in a flat turf area not near any storm or runoff drains.	
RESPONSIBLE PARTY	OTHER PARTY
Name: VA Tag VEV-5741	Name:
Company: Tow company/ Vehicle Owner	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 10/7/2015	Date:
Time: 2300	Time:
Name: Capt. Lott	Name:
Comp/Agency: BC501	Comp/Agency:
Notes: Cell: 571-269-0882	Notes:
Date:	Date:
Time:	
Name:	Time:
Comp/Agency:	Name:
Notes:	Comp/Agency:
	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments: Needed VDOT supervisor on-scene to meet with Clean up contractor to assure VDOT was satisfied that the road was safe to open. VDOT workers on the scene felt the road was still slick but were supervisors so they didn't feel comfortable making the call either way.





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153003254	Date: 7/23/2015
Location: 13901 Telegraph Road	Time: 14:07
Report Completed By: Lt. Saikowski	Incident Commander: Lt. Forbes (FM)
HM 506 Personnel Responding: Phone Consult HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION	
14:26 Received phone call from UFRO requesting phone consult with FM Lt. Forbes (703-915-5903). No further information provided. 14:27 Called number provided for FM and he advised he was participating in search warrant at a repair facility located at dispatched address and discovered what appeared to be an oil spill in the parking lot. He estimate the spill to be approximately 5 gallons with no further leaking, no waterways or storm sewers being affected. He advised he would be instructing the property occupants to have the spill cleaned up and was only calling to notify HAZMAT of the situation.	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 07-23-2015	Date:
Time: 14:50	Time:
Name: Thelma	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153008909	Date: 9/15/2015
Location: Jeff Davis Hwy and Rosedal Court	Time: 11:16
Report Completed By: Lt. Saikowski	Incident Commander: E512 OIC (Capt. Scott)
HM 506 Personnel Responding: Lt. Saikowski, Tech II Sweet, Tech I Nawaz, Tech I Mullinax HS 516 Personnel Responding: None Other HMT Personnel Responding: None	

INCIDENT DESCRIPTION	
<p>11:16 Received call from UFRO requesting a phone consult with E512 (571-221-8369) on the scene of an auto accident with overturned trailer. Requested UFRO place E506 O.O.S. while handling the phone consult. 11:19 Called E512 and spoke with Capt. Scott who advised he had a trailer with power washing equipment that had turned over (on its side) and a combination of approximately 20 gallons of diesel fuel had mixed with approximately 100 gallons of water and spilled across the roadway. He advised they had dammed along the curb to prevent the spill from entering nearby storm drains. He advised there was no more product leaking from the trailer. Requested E512 take pictures and text them to HM506 to estimate extent of spill. 11:24 E512 texts pictures of product dammed along curb. 11:26 Called E512 back and advised them HM506 would be coming out to assist with the cleanup of the recoverable product dammed along the side of the road. 11:28 Called UFRO and requested HM506 be added to the call with no additional resources required. 11:31 Enroute. 11:49 On scene. 11:52 Spoke with the owner of All American Rooter (John Bounds, 571-259-0470) regarding the situation and the process for cleaning up the spill. 11:54 Requested E512 contact VDOT for a representative to look at road conditions once cleaned up. 11:56 Owner advises he has contacted Atlas cleanup to handle the spill and they have an approximate ETA of 30 minutes. 11:58 Explained situation to BC503 via face to face. 12:00 Explained situation to Adkins via phone. 12:01 Tow truck company begins process of uprighting trailer. 12:10 Atlas arrives on scene and begins cleanup process. 12:30 Trailer uprighted, placed on tow truck and removed from scene. 12:44 Spoke with County PD regarding traffic control while Atlas completed cleanup process, placed E512 in service, spoke with Atlas regarding the cleanup process and the release of county fire and rescue units and spoke one last time with the owner to advise him of the situation. Scene turned over to county PD. HM506 ready.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: John Bounds	Name:
Company: All American Rooter	Company:
Address:	Address:
Phone#: 571-259-0470	Phone#:
Notes: Owner of company	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date: 09-15-2015	Date:
Time: 22:00	Time:
Name: Archer	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:







**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**

INCIDENT INFORMATION	
Fire Dept. Incident #: 153009303	Date: 9/18/2015
Location: Prince William Parkway/University Blvd.	Time: 1745
Report Completed By: Lt. Stephen Horvath	Incident Commander: Captain Gene Luckinbill
HM 506 Personnel Responding: Lt. Horvath, T-II Clark, T-I Nawazl HS 516 Personnel Responding: Lt. Karhan, T-II Hauser, T-II Byler, T-I Ching Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>110 ton crane had some sort of mechanical issue that caused some hydraulic lines to be damaged and start to leak. The crane then caught fire and continued to leak even after the fire was extinguished. It was reported to be a 300 gallon hydraulic fluid leak. HM506 arrived on scene along with HM Support 516 and E516 and did a face to face with the driver of the crane and the VP of the crane co. It was then determined that the leak was from the 100 gallon hydraulic fluid tank and not the 300 gallon one on the crane. Early estimates from the VP of the crane company was that they had only lost 10 to 15 gallons of hydraulic fluid. HM506 assisted the responsible party by providing them a LEPC form and explained the process. The crane co. reached out to multiple clean up contractors and was able to secure the services of GEC Environmental Contracting Corporation. GEC had an estimated ETA of 1 to 1.5 hours. Due to the contractors delay command requested VDOT to the scene with a sand truck. VDOT had an ETA of about an hour. While this was all going on crews from FE501, E525 and HM Support 516 were working on controlling the run off (damaging) from the leak and firefighting efforts as well as placing pools, buckets and absorbant pads around/under the crane to assist in catching any further runoff. HM506 notified VAEOC and DEQ of the situation and informed that PWC DFR needed no assistance at this time. Company 516 units used a coliwasa tube to get a more accurate estimate of hydraulic fluid lost. The tank was only 1/2 full. So our estimated fluid loss was approximately 50 gallons. GEC arrived on-scene and HM506 did a face to face with the crew leader John Virst. John informed me that he would be starting the clean up process by putting down absorbent, then brooming it around and then using a skid-steer with a broom on it to further clean up the material used to absorb the hydraulic fluid. It was decided by command and HM506 that the road would not be opened until the leak was completely cleaned up because of the size of the leak and not wanting traffic to spread the leak and make it larger. HM Support 516, HM506 and E525 along with command remained on-scene for multiple hours and assisted with lighting up the scene to assist with the cleanup process. VDOT workers on scene felt that the road was still slick and felt the contractor could perform more cleanup. HM506 requested that the VDOT crew on scene contact their supervisor and ask for guidance due to the fact that the road belongs to VDOT and only VDOT can decide if the road has been cleaned properly and it's safe to be opened to traffic. The VDOT crew did contact their supervisor who contacted Mike Wood of VDOT and Mike was enroute to the scene with a 30 minute ETA. Mike arrived on-scene and we did a face to face and he wanted the VDOT truck to spread a VERY THIN layer of sand on the road and have the clean-up crew remain on-scene to see if anything else would need to be done after this. Command released HM506 but Co. 16 units were requested to remain on-scene so the clean-up crew and VDOT could utilize the light tower on their unit. HM506 went in service.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Ronnie McGee	Name: Jeff Balderson (Crane Driver)
Company: McGee Crane Rental	Company: McGee Crane Rental
Address: 516 Jack Enders Blvd. Berryville, VA	Address: 516 Jack Enders Blvd. Berryville, VA
Phone#: Cell: 703-932-3909	Phone#: Cell: 703-856-2175
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date: 9-18-2015	Date: 9-18-2015
Time: 1853	Time: 1902
Name: John M. Virts II	Name: Chris Thompson
Comp/Agency: GEC Enviromental Contracting Corp.	Comp/Agency: VA EOC
Notes: Spoke at 1853 / Arrive On-Scene at 2011	Notes: 800-468-8892
Date: 9-18-2015	Date: Woody Brown
Time: 1921	Time: 1923
Name: Robert Ellis	Name: Woody Brown
Comp/Agency: VA DEQ	Comp/Agency: VDEM
Notes: Office: 703-583-3883	Notes: 540-236-8120
Date: 9-18-2015	Date:
Time: 2133	Time:
Name: Mike Wood	Name:
Comp/Agency: VDOT (Supervisor)	Comp/Agency:
Notes: Arrived on-scene at 2213	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments: Needed VDOT supervisor on-scene to meet with Clean up contractor to assure VDOT was satisfied that the road was safe to open. VDOT workers on the scene felt the road was still slick but were supervisors so they didn't feel comfortable making the call either way.





**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**



PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT







PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD153011962	Date: 10/15/2015
Location: Mike Garcia Drive/Robertson Drive	Time: 14:03
Report Completed By: Technician II Graham Clark	Incident Commander: Technician II Kevin Dewhurst
HM 506 Personnel Responding: None, Phone Consult HS 516 Personnel Responding: None Other HMT Personnel Responding: None	

INCIDENT DESCRIPTION	
<p>14:32 received a phone call at Station 6 from Lt. Dempsey at Communications that E525 was requesting a phone consult. 14:34 called E525, Technician II Kevin Dewhurst was incident commander. Dewhurst explained E525 was on an investigation call for an odor of gasoline. E525 found Gorman Paving using a mixture of 1/2 gallon gasoline and Purple Power degreaser (certified biodegradable) to wash their trucks, and using water to spray it off. Dewhurst stopped personnel from further use of product; there was no run off collection. Run off was into gravel parking lot at the intersection of Mike Garcia Drive and Robertson Drive, Manassas, VA. No threat to waterways or storm drains, all product contained to gravel lot. Dewhurst stated Fire Marshal Bob Howard was responding to the scene. Requested Dewhurst to get responsible party information. 14:52 Dewhurst reported responsible party as Pat Gorman owner of Gorman Paving, phone number 571-233-5187, 6704 Jefferson Street, Haymarket, VA 20169. Advised Dewhurst to monitor area with 4-Gas monitor. 14:59 Dewhurst reported monitoring complete, all readings normal. Advised Dewhurst to give responsible party the LEPC form for clean up, FM Howard to enforce on scene. 15:08 VAEOC notified. 16:00 VADEQ, Mark Miller notified via email.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Pat Gorman	Name:
Company: Gorman Paving	Company:
Address: 6704 Jefferson Street, Haymarket, VA 20169	Address:
Phone#: 571-233-5157	Phone#:
Notes: Incident occurred at a parking lot that company owns, intersection of Mike Garcia Drive/Robertson Drive, Manassas, VA 20109	Notes:

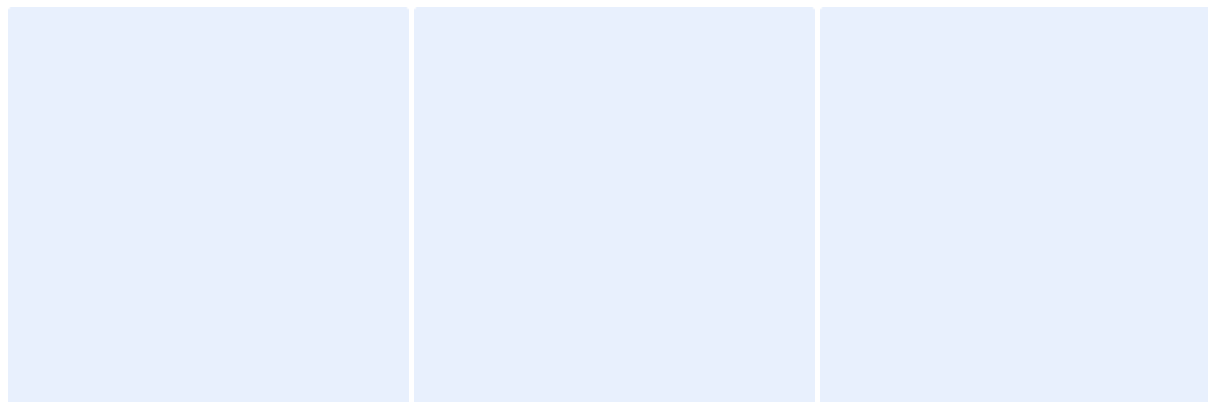
NOTIFICATIONS/CONTACTS	
Date: 10/15/2015	Date: 10/15/2015
Time: 15:08	Time: 16:00
Name: Thelma Jones	Name: Mark Miller
Comp/Agency: VAEOC	Comp/Agency: VADEQ
Notes: Courtsey Notification phone call	Notes: Courtsey Notification email
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD153012662	Date: 10/22/2015
Location: Lee Hwy and Crescent Park Drive	Time: 16:00
Report Completed By: Dan McCleese	Incident Commander: Technician II C. Gillespe
HM 506 Personnel Responding: Phone consult to E504 HS 516 Personnel Responding: None Other HMT Personnel Responding: E504 Driver was Tech II. A Crispin	

INCIDENT DESCRIPTION	
E504 requested Phone Consult to notify that towing company that was cleaning up a oil leak from an accident involving a dump truck. Oil spilled on the asphalt was cleaned up with absorbent but approx 60 qts (15 gallons) remained alongside the gravel shoulder of the road. The tow truck operator wanted to know if it was okay to leave it. HM506's Officer advised E504 that he should request VDOT to the scene so the Towing Company and VDOT could make the determination. E504 Requested VDOT, however, the PSCC DISPATCHER decided on their own (upon further investigation with UFRO Lt Samuels after the call) that VDOT would not come out for that. PSCC did not notify VDOT immediately. E504's driver called Station 6 to speak with the DHM after VDOT did arrive on scene (not sure how they were notified exactly). VDOT and the Towing Company (Gainesville Towing) were able to resolve a plan for cleanup. E504 assisted with absorbent and traffic. went in service.	
RESPONSIBLE PARTY	OTHER PARTY
Name: Justin	Name:
Company: Gainesville Towing	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 10/22/2015	Date:
Time: 16:05	Time:
Name: Thelma	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtney Notification phone call	Notes: email
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

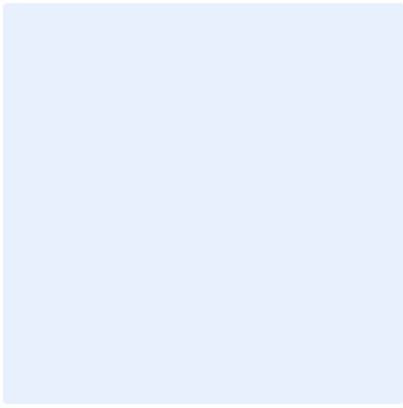
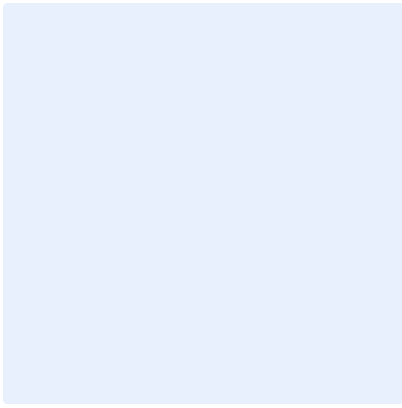
NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153014122	Date: 11/5/2015
Location: 2005 Daniel K. Ludwig Dr. Leesylvania State Park Marina, Potomac River	Time: 16:12
Report Completed By: Captain Stewart, HMO502	Incident Commander: N/A
HM 506 Personnel Responding: N/A HS 516 Personnel Responding: N/A Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>Received a call from Matt Adkins, HMO501 who had been contacted by Mark Miller, DEQ, about a potential release on the Potomac River. I initiated a call through PSCC for a Hazmat investigation and began priority 2 response to the park. Once on scene I made contact with the park manager. Per the park manager, a visitor to the park noticed a sheen on top of the water at the marina in the morning. The park manager put a team together and using booms cleaned the area of what was thought to be a petroleum product due to the appearance of the sheen as well as a very slight odor residual on her hand after touching the product. Park manager estimated the sheen in the morning to be a 500 square feet patch. Upon my arrival in the afternoon there were a few small areas approx. 10 square feet in total of very thinned out material on the surface with nothing to capture as what little was left dissipated upon contact. The source for the material was not located. The product had collected near moored/docked sailboats. The manager checked all of them in the morning but could not find any leaking. I collected a sample. PH was neutral, 0 percent LEL, 20.9 percent O2, 0ppm CO, 0ppm H2S by 4 gas, 0ppb by PPBRAE. Courtesy notifications were made via phone and email. HM506 ran the sample using Hazmat 360 and Responder RCI. Test results showed water. The first photo attached is from the park manager upon her original inspection of the area. The second is mine from the afternoon investigation.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Karen Lambey	Name:
Company: Park Manager, Leesylvania State Park	Company:
Address: 2001 Daniel K. Ludwig Dr. Woodbridge, VA 22191	Address:
Phone#: 571-477-5043	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11/5/15	Date: 11/5/2015
Time: 22:00	Time: 22:00
Name:	Name: Mark Aveni
Comp/Agency: VAEOC	Comp/Agency: PWC Public Works, Watershed Management
Notes: Previously notified	Notes: Courtesy Notification via email

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date: 11/5/15	Date:
Time: 22:00	Time:
Name: Mark Miller	Name:
Comp/Agency: DEQ	Comp/Agency:
Notes: Courtesy Notification via email	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Notes:	Notes:

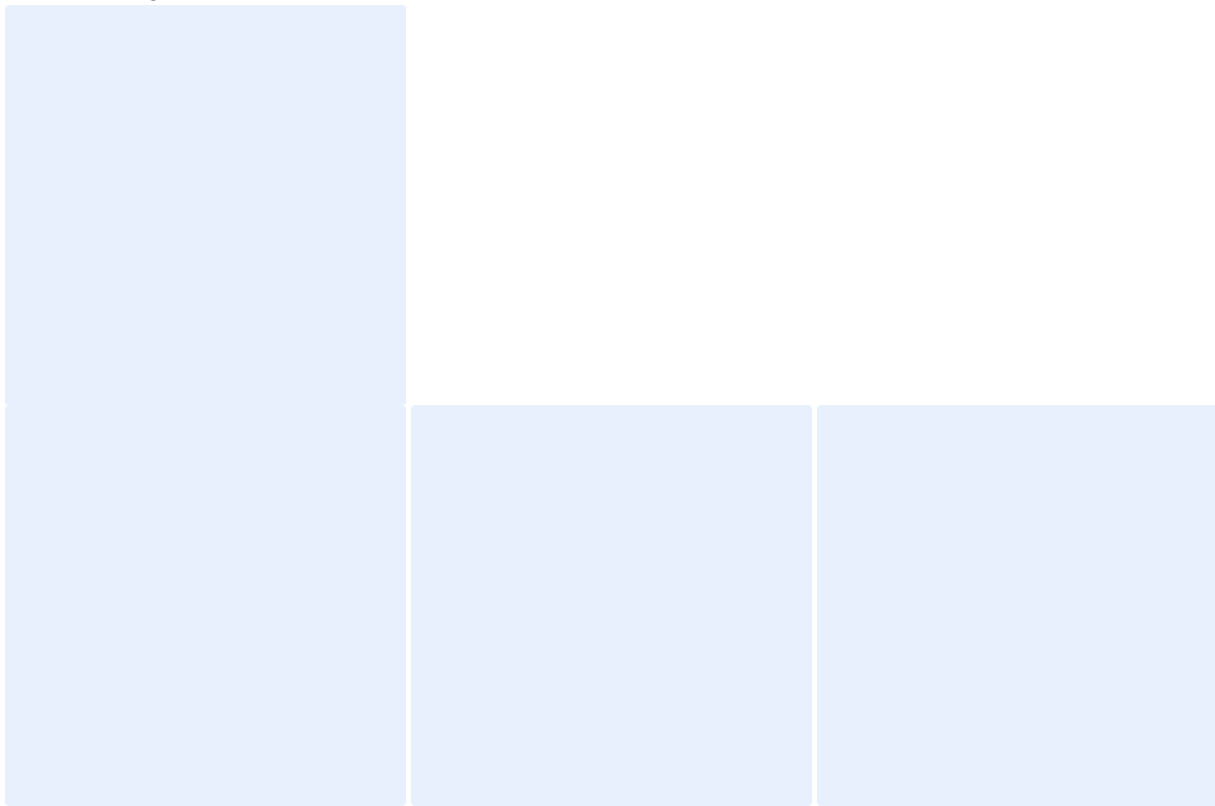
Additional Notes/Information: At 16:07 I met with a representative for the responsible party at the storage unit. All bags had been removed from the property.

HAZMAT Officer Comments:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**

INCIDENT INFORMATION	
Fire Dept. Incident #: 153015230	Date: 11/16/2015
Location: Balls Ford Rd/Notes Dr	Time: 06:01
Report Completed By: Lt Mark Schwab	Incident Commander: Capt. Jason Resse BC504
HM 506 Personnel Responding: Lt. Schwab, T-II Luke, T-Medina HS 516 Personnel Responding: Lt. Trochan, T-Sanderson, T-I Bell Other HMT Personnel Responding: HM501	

INCIDENT DESCRIPTION	
<p>HM506 was dispatched to an auto accident at Balls Ford Rd and Notes Dr. E511 was already on scene and advised that diesel fuel was leaking from the saddle tank and they were unable to stop the leak. The driver informed E511's officer that he had just filled up on fuel and had approximately 100 gallons of fuel. E511 informed HM506 enroute that they had created dams to keep the fuel from spreading any further, the fuel did not spread to any drains or waterways. Upon arrival HM506's crew spoke with command and E511's officers to get a situation update. When assessing the damage to the tractor trailer the right side saddle tank had two substantial holes that could not be plugged. The right side was completely empty and the fuel was transferring from the left side tank and actively leaking. HM506's crew set up a pool to collect the diesel fuel that was leaking while trying to stop the leak. A wooden dowel was placed into the transfer tube to slow the leak while we tried to access the fuel shut off valve. HS516's crew assessed the leak that had extended into a neighboring business's parking lot, 11777 Balls Ford Road. The leak was contained to the parking lot with no threats to any drains; the leak was approximately 10 gallons. The shut off valves were able to be reached and turned off, the leak was no longer active. There was approximately 3/4 of a tank left on the driver side. HM506's officer spoke with the driver of the tractor trailer and a representative from the trucking company. They did not have any clean up contracts down here. They were given the LEPC form and contacted Atlas to clean up the fuel spill. Advised command of the situation and that the scene would be turned over to PD.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Parfait Tadjukem	Name:
Company: Paul Miller Trucking	Company: Paul Mill Trucking
Address: 8909 Waltham Woods Dr Apt. A Parkville, MD 21234	Address: 451 Freight St Camp Hill, PA 17011
Phone#: 322-676-0186	Phone#: (703)792-5955
Notes: Driver	Notes: Owner of the truck involved

NOTIFICATIONS/CONTACTS	
Date: 11/16/15	Date:
Time: 9:40	Time:
Name: Mason	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	
Name:	Time:
Comp/Agency:	Name:
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Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153019163	Date: 12/24/2015
Location:12501 Randolph Ridge Ln	Time: 14:17
Report Completed By: Doug McCabe	Incident Commander: AC Tom Wood SJVFD
HM 506 Personnel Responding: Doug Mccabe, Eric Weaver, James Snitwongse, Cameron Malone HS 516 Personnel Responding: Wayne Moran, James Sanchez, Kristen Griener Other HMT Personnel Responding: HMO502 Stewart	

INCIDENT DESCRIPTION	
<p>E511 was dispatched for an unknown spill. They determined the spill to be an unknown pesticide during their recon of the incident. They observed 20-30 bottles of various quantities that appeared to be thrown over a guardrail and into a ditch along a state road. E511's officer contacted Hazmat for a consult and the call was upgraded to HM506 and HS516. HMO502(Stewart) and AC511 self dispatched. HM506 arrived and was briefed by E511's officer. He had not been in contact with the chemicals. Since this was a VDOT right of way, they were notified by command. Weaver and Snitwongse were the entry team to perform a recon of the area. They were dressed in Level B protective gear and SCBA. E511 was RIT and decon for the entry team. Initial readings on the 4 gas was 0% l_{el}, 0ppm H₂S, 20.8 %O₂, 0 ppm CO, 0ppb PID, no ph change. Pictures were taken and the amount of product spilled was deemed to be negligible. The product was of various pesticides, herbicides and weed killer. They appeared to have been stored in plastic bins but fell out when thrown over the guardrail. The entry team went through decon and the pictures were looked at to determine what course of action was needed to mitigate the incident. A second entry was made and the bottles were secured in the plastic bins they came from. The bins were then placed in black garden trash bags to prevent unintentional spillage and water contamination. The entry team was deconned again by E511 and E511 self deconned. The entry team doffed their ppe and reported to rehab by A525. A VDEM rep was enroute and HM502 was to remain on the scene until his arrival. Decon of the equipment used on the call was performed and HM506 went in service.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: VDOT	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/24/15	Date: 12/24/15
Time: 1500	Time: 1500
Name: Thelma	Name: Wood
Comp/Agency: VAEOC	Comp/Agency: VDOT
Notes: HMO502 made the notification	Notes: HMO502 made the notification

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments: This call was appropriately upgraded to a Hazmat call and I was dispatched. While enroute the Duty Hazmat Tech placed units in service prior to their arrival based upon a phone consult. I determined that based upon reported product, described location, potential criminal activity, and ongoing investigations and cleanup to continue to the scene in a non emergency mode. VDOT was notified through our communications center when units on scene requested a representative. Upon hearing the request and while enroute I contacted Mike Wood of VDOT knowing that there have been past issues with VDOT notifications and timely response to spills where they have been determined by units on scene and by our fire marshals to be the responsible party. Once I arrived I first met with the PWC fire marshal who reported that there was no traceable evidence of who might have dumped this product and since the product was in the median between a state maintained road and I66 exit ramp the responsible party would be VDOT. I then met with the IC and the HM506 officer who briefed me with a situational report with what was found, actions taken, and actions and resources needed. A plan for protecting the environment from continued or future release until cleanup could occur was presented and approved by myself and the IC. I then fielded a call from our communications center reporting that VDOT was not sending a representative because the environmental services needed to be contacted. I contacted Mike Wood and stated that internal communications between VDOT needed to be handled by VDOT and we do not make multiple notifications within the agency. He agreed and assisted with appropriate VDOT response. He stated that he would need to request the regional officer according to an MOU in place between the two agencies and I told him I would remain on scene to meet with the regional officer and the VDOT representative. Shortly a VDOT rep arrived on scene but said that he was there to place barrels down only. The VDEM officer, Craig Buckley, arrived and I walked him through the scene. He completed his site survey and made notifications. With the understanding that a clean up contractor identified through the state would be responding I marked myself in service and left the scene.

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153019383	Date: 12/26/2015
Location: Intersection Colchester RD and Aiden Dr Woodbridge, VA	Time: 21:35
Report Completed By: K. Stewart	Incident Commander: E512 Officer, Captain
HM 506 Personnel Responding: 0 HS 516 Personnel Responding: 0 Other HMT Personnel Responding: Phone Consult HMO502	

INCIDENT DESCRIPTION	
Contacted by Communications Lt for a phone consult. Duty Hazmat Tech assigned to another incident and unable to handle call. Spoke with E512 officer on scene describing a Honda Civic damaged in an auto accident leaking less than 1 gallon of 15W40 motor oil due to the auto accident. E512 personnel mitigated leak and diked product. Officer reported that some of the product had entered the storm drain. When asked if there was any recoverable product the Captain responded that there was not. Asked if a tow company was on scene and he said that there was and that they had already cleaned up all visible product.	
RESPONSIBLE PARTY	OTHER PARTY
Name: Carlos Alvarez	Name:
Company:	Company:
Address: 3010 Oak Green Ct Apt B Ellicott City MD 21043	Address:
Phone#:	Phone#:
Notes: vehicle owner per notes in CAD	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/26/15	Date: 12/26/15
Time: 1030	Time: 1045
Name: Chris	Name: Marc Aveni
Comp/Agency: VAEOC	Comp/Agency: Public Works: Watershed
Notes:	Notes: Courtesy notification via email
Date: 12/26/15	Date:
Time: 1045	Time:
Name: Mark Miller	Name:
Comp/Agency: DEQ	Comp/Agency:
Notes: Courtesy notification via email	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153019773	Date: 12/30/2015
Location: Interstate 95 153.3mm North	Time: 17:34
Report Completed By: Doug McCabe	Incident Commander: Scott Dixon
HM 506 Personnel Responding: Doug McCabe, Cameron Malone, Eric Weaver HS 516 Personnel Responding: n/a Other HMT Personnel Responding: n/a	

INCIDENT DESCRIPTION	
<p>Phone consult with Capt Dixon concerning an electric sign board on the side of the Interstate that was hit by a vehicle. The sign was battery powered and 2 of the batteries were damaged due to the impact. A small amount of battery acid had leaked and had run into the grass on the side of the road. It did not appear to have run off into the concrete drainage ditch in the pictures he sent. It was raining steadily before and after the event occurred. A contractor was on scene and it was assumed that they were there to clean up the spill. It was later determined that they were there to only clean up the physical debris and remove the sign from the road. HMO502 (Stewart) was contacted and it was decided that the spill was minor and no clean up was required. VDOT was notified and made aware of the situation. No Hazmat units responded.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Unknown	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/30/15	Date: 12/30/15
Time: 2145	Time: Unknown
Name: Archer	Name: Nancy
Comp/Agency: VAEOC	Comp/Agency: VDOT
Notes: Notification Only	Notes: Unknown how or who contacted her
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
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Comp/Agency:	Comp/Agency:
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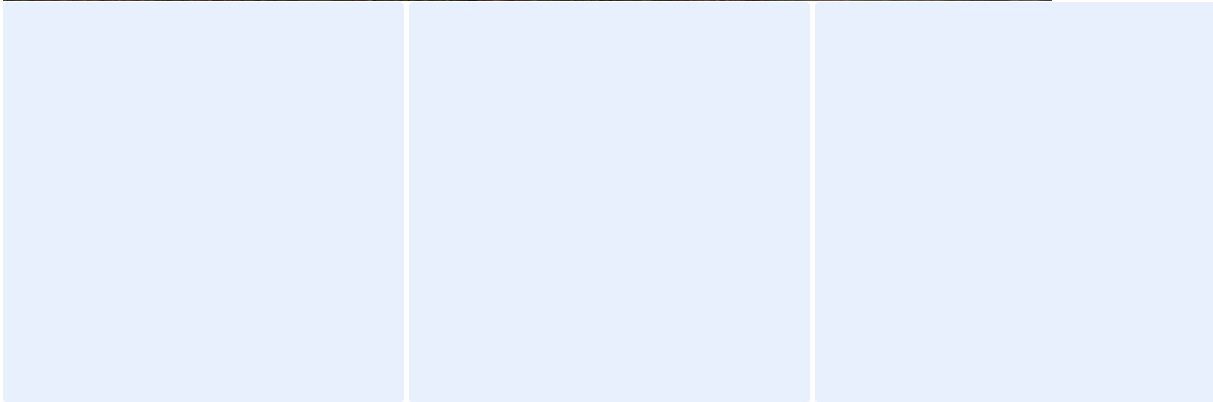
Additional Notes/Information:

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 153019784	Date: 12/30/2015
Location: I66 W 47.9 MM	Time: 1824
Report Completed By: Tech II Weaver	Incident Commander: Lt Grieve
HM 506 Personnel Responding: Captain McCabe, Tech II Weaver, Tech I Malone HS 516 Personnel Responding: Tech II Sanchez, Tech II Sampiller, Tech I Saxon, Tech I Carter Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
E504 arrived on scene of a tractor trailer that had jacked knifed and ran off the side of the road into the ditch. As the truck went into the ditch the passenger side saddle tanks fuel line was ripped out of the bottom of the tank. Diesel fuel was actively leaking when E504 arrived. The truck driver plugged the hole with a plastic bag. There was about 30 gallons of diesel that had leaked out and into the ditch heading toward a storm drain. E504 dammed and diked the ditch to keep product from going into the drain. HM516 arrived on scene and provided E504 with the materials so they could damn and dike. HM506 arrived and looked over the saddle tank patch to make sure it was holding. HM506 got the drivers info and made sure that they called a clean up company to clean up the product that had leaked out. The scene was turned over to VDOT	
RESPONSIBLE PARTY	OTHER PARTY
Name: Donald Alton Thomas	Name:
Company: Icicle	Company:
Address: 3610 Keota Street Alexandria, VA 22303-1143	Address:
Phone#: 410-446-6439	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 12/30/2015	Date:
Time: 2155	Time:
Name: Archer	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:

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**PRINCE WILLIAM COUNTY
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INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160001009	Date: 1/11/2016
Location: 1522 James St Woodbridge VA	Time: 14:01
Report Completed By: Doug McCabe	Incident Commander: K Pumphrey
HM 506 Personnel Responding: D McCabe, C Malone, E Weaver HS 516 Personnel Responding: Sanchez, Battenfeld, Saxon Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>E502 was on the scene of an unknown red liquid flowing between houses and down the street into a storm drain. They requested a phone consult with the duty Hazmat officer (McCabe). I was told of the situation and had HM506, HS516 and a BC dispatched. Enroute I had them start defensive operations and dam and dike the storm drain. On our arrival we determined that a fuel oil tank was leaking fuel oil. The tank was approximately 250 gallons and had been filled earlier in the day by Griffith Energy. 231 gallons were delivered. We observed the tank to be empty and had released all of its contents. HS516's crew reinforced the dams while HM506 checked storm drains for product. All of the product was contained to 2 storm drains and had not entered a waterway. No 4 gas or PID readings were noted during our recon of the area. PWC Service Authority was notified to respond. DEQ (Mike Clark) arrived and met with HM506 to discuss what was happening. Griffith Energy had a rep on the scene to determine what went wrong. It was determined that the tank failed on the bottom somewhere and released the contents. The tank did not overflow. The homeowners were on scene and they were briefed on what was happening. DEQ was determined to be the lead organization to head up mitigation after an incident brief with Hazmat, PWCSA, and Command. PWCSA was ok with this.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: James Joseph	Name:
Company: Homeowner	Company:
Address: 1522 James St Woodbridge VA	Address:
Phone#: 202 384 7856	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 1/11/16	Date: 1/11/16
Time:	Time:
Name: Chuck Cornwell	Name: Robert Jocz
Comp/Agency: Griffith Energy	Comp/Agency: PWCSA
Notes: 301 322 5100/240 417 5285	Notes: 703 792 4797
Date: 1/11/16	Date: 1/11/16
Time:	Time:
Name: Mike Clark	Name: VAEOC
Comp/Agency: DEQ	Comp/Agency: Chris
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
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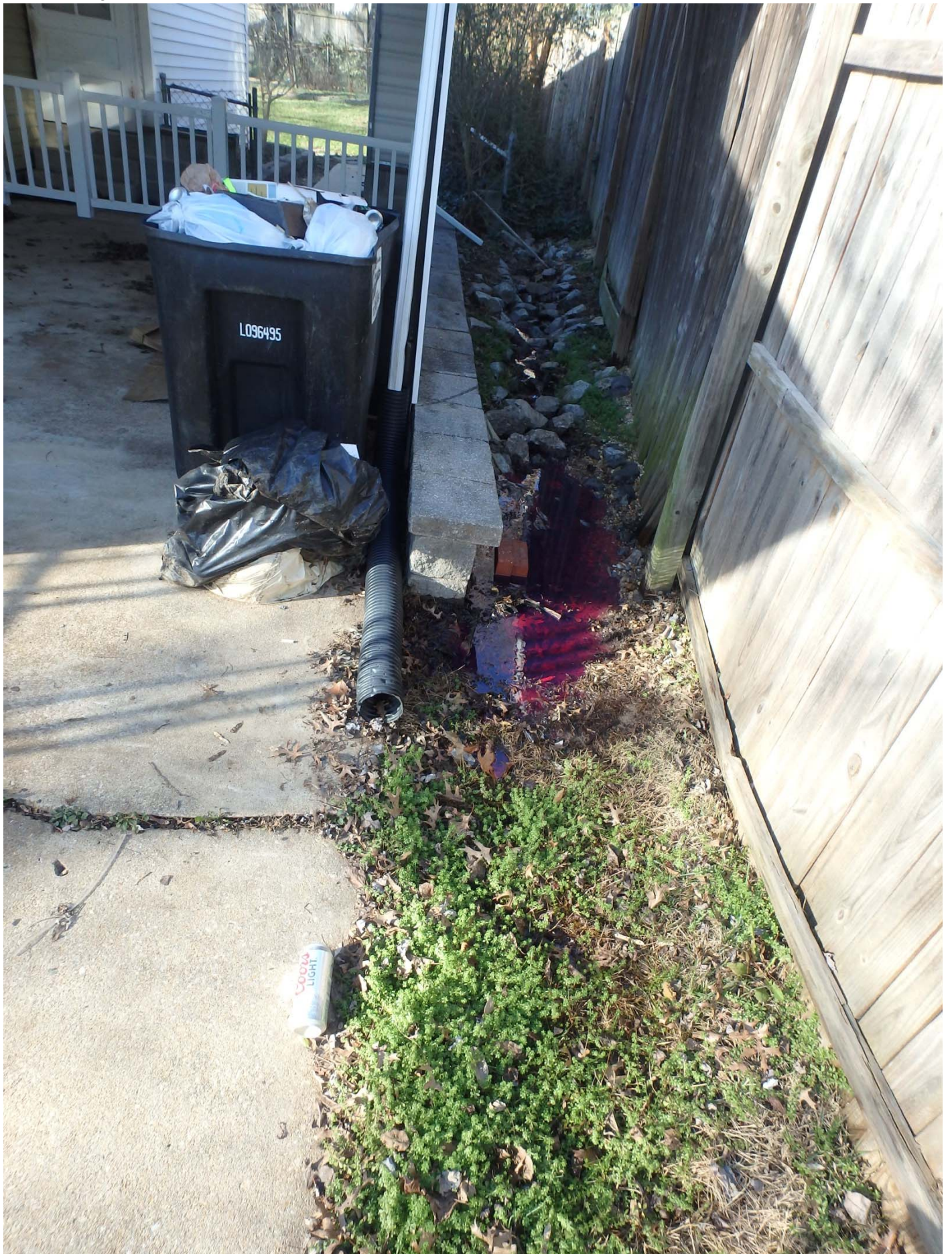
Additional Notes/Information:

HAZMAT Officer Comments:

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INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160004470	Date: 2/13/2016
Location: Int 95 151 N	Time: 14:26
Report Completed By: Doug McCabe	Incident Commander: E523
HM 506 Personnel Responding: Doug McCabe phone consult HS 516 Personnel Responding: na Other HMT Personnel Responding: na	

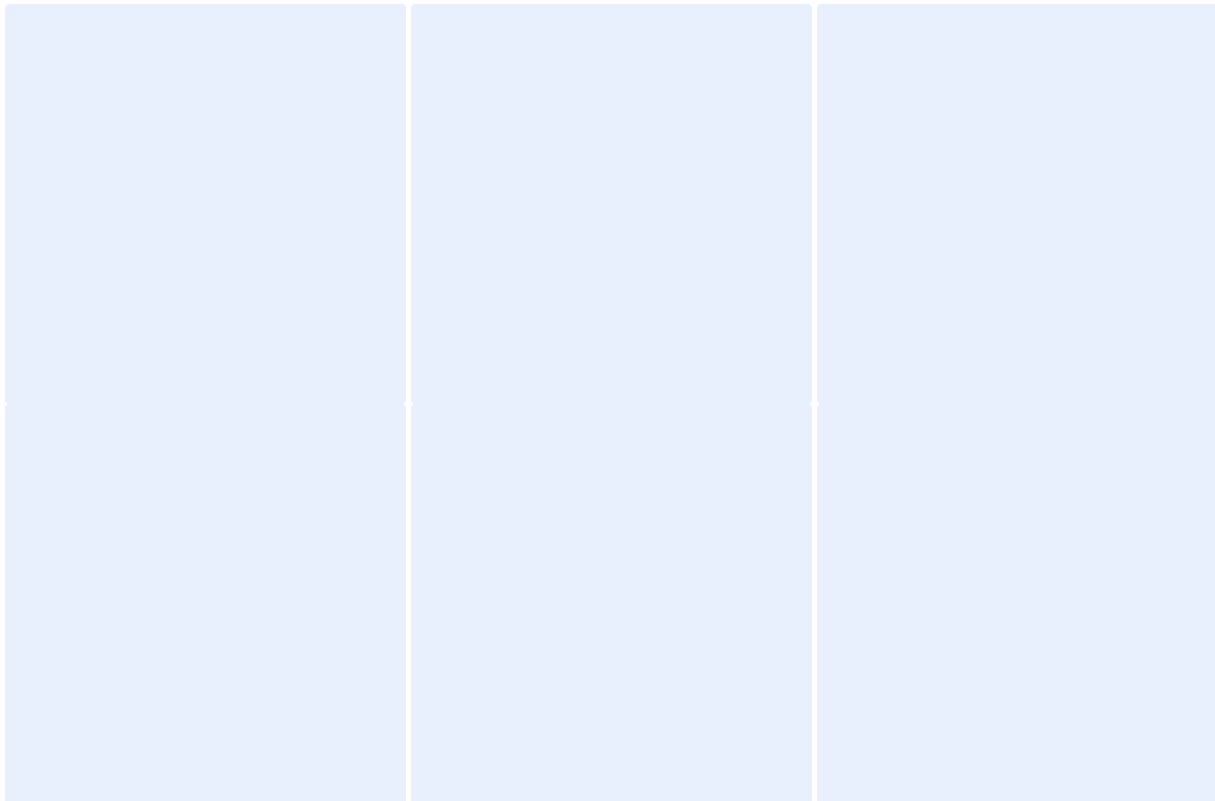
INCIDENT DESCRIPTION	
E523 was on the scene of a passenger van that went off the highway and had a leak in the gasoline tank. They advised that the tank has less than 20 gallons in it. They said some had spilled onto the ground and was absorbed. No run off into waterways. When the rollback tow truck was pulling the vehicle onto the road, some more fuel spilled. Very small quantity. They wanted to know what could we do to stop the spillage. They were advised that we cannot plug the leak and then have it go down the road. It would need to be pumped off, it could not be towed with a patch. HM506 did not respond.	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160005126	Date: 2/19/2016
Location:5683 Spriggs Meadow Dr	Time: 2104
Report Completed By: Weaver	Incident Commander: McClelland
HM 506 Personnel Responding: McCabe, Weaver, Malone, Favole	
HS 516 Personnel Responding:	
Other HMT Personnel Responding:	

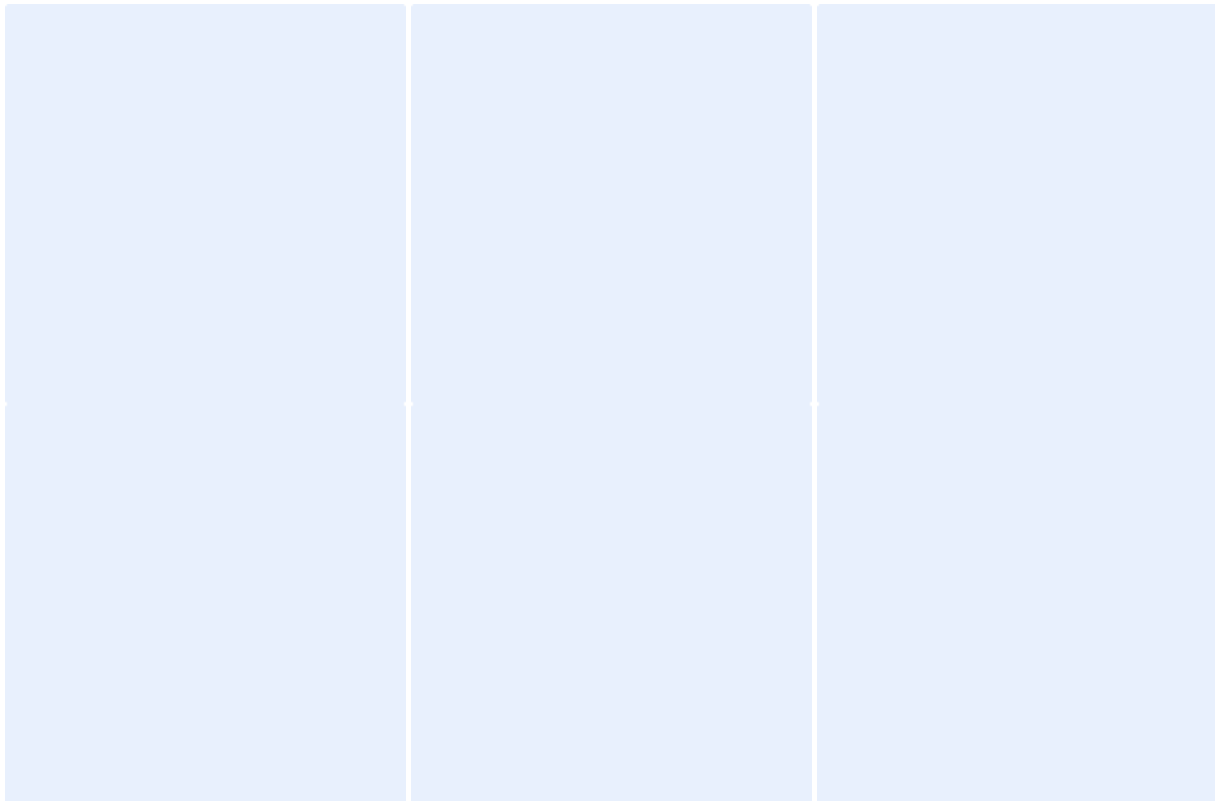
INCIDENT DESCRIPTION	
HM506 Duty Hazmat recieved a phone consulant form E517. E517 had a smell of Gasoline in the storm water pipes around the dispatched address. E517 did not see any product and was getting normal readings on there 4 gas monitor. HM506 added themselves to the call. HM506 arrived and started monitoring with the PBBrae 3000 and Multi Rae pro. HM506 was getting readings in PPM around the dispatched address all the way down to the retention pond at the end of Spriggs Meadow Dr. HM506 only found trace amount of product in on vault near the retention pond. HM506 was unable to find the source of the fuel. HM506 cleared no hazard found.	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/19/16	Date:
Time: 2337	Time:
Name: A.J	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160006181	Date: 2/29/2016
Location: Wayside Dr./Jefferson Davis HWY	Time: 13:42
Report Completed By: Lt. Anthony	Incident Commander: BC 503 (Capt. Ross)
HM 506 Personnel Responding: Anthony, Cooke, Richard HS 516 Personnel Responding: Trochan, Hayes, Sawicki Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION	
<p>HM506 and HMS516 was added to an accident in 23's due by Command. They had an SUV vs. a tractor trailer. The tractor trailer was on its side, in the middle of the intersection of Wayside dr. and Jefferson Davis HWY. The truck was leaking Diesel from the passengers side saddle tank, as well as Hydraulic fluid from the Hydraulic tank located between both saddle tanks. The truck was hauling mulch. When we arrived on scene, we could observe 25 to 30 gallons of fluid on the roadway. The fluid had been prevented from spreading further down the roadway by the engine crews placing absorbant down. HM506's crew place a collection pool underneath the tank to collect the fluids leaking. I consulted with command as well as Waggys tow truck drivers. Waggys towing had three large wreckers on scene before we got there. We agreed that if Waggys could get the truck right side up, the leaking would stop. Two of the wreckers were already in place actively setting up for this operation. Five minutes later, the truck was on its wheels and the leaking stopped. By this time, William A. Hazel had a Bobcat loader as well as a large front end loader on scene. They were dumping mulch on the fluid to absorbe it as well as loading the other mulch back into the bed of the trailer. I made phone contact with Jay Goff, the Safety Director of William A. Hazel. He said he was aware of the situation. He thanked us for our help, and stated his crew would clean up the roadway. I informed him that we used one of our collection pools and his company would be responsible to replace it. Jay let me know that one of his safety officers, Tim Clemmons would be arriveing on scene momentarily to oversee the clean up. BC 503 was comfortable with this, then placed all units in service.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Jay Goff, Safety Director	Name:
Company: William A. Hazel INC.	Company:
Address: P.O. Box 600 Chantilly, Virginia 20151	Address:
Phone#: 703-378-8300	Phone#:
Notes: Spoke With Tim Clemmons on scene.	Notes:

NOTIFICATIONS/CONTACTS	
Date: 02/29/2016	Date:
Time: 16:14	Time:
Name: Christopher Blake	Name:
Comp/Agency: VA. EOC	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
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INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160006437	Date: 3/03/2016
Location:13711 Dumfries Rd.	Time: 08:16
Report Completed By: Lt. Anthony	Incident Commander: BC 502
HM 506 Personnel Responding: Anthony Richard, Lagagna HS 516 Personnel Responding: Placed in service by HM506 Other HMT Personnel Responding: Matt Adkins	

INCIDENT DESCRIPTION	
<p>E506 was dispatched to a hazmat call, a truck leaking fuel. State Police and local PD were on scene and called for a Hazmat response. Upon dispatch E506's crew moved over to the Hazmat unit and responded across the street. M507 was on scene immediately after dispatch as they were returning from a sickness in 6's due. We arrived on scene and was briefed by M507's crew. There was a medium size box truck heading west bound on Dumfries Rd. U.S. DOT#497832. The truck lost its front right wheel. This caused the right side saddle tank to sustain damage and leak. HM506 along with M507 and E507, began hazmat operations, using dirt and absorbent to control the spill from spreading. The tow truck arrived and we had him lift up the truck so we could place a containment pool underneath the fuel tank. We also attempted to plug the leak with putty which did not work. However the wax ring did seal and hold the leak. At this time the leak was stopped and the spill was contained. We estimate there to be between 50 and 75 gallons of diesel fuel on th right shoulder of the road. Coyle trucking was told of there responsibility to have the spill cleaned up. They chose Atlas Envirmental. All units cleared the scene while PD and Matt adkins remains untill Atlas Arrived.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Kelly/Safety Director	Name:
Company: Coyle Trucking Inc.	Company:
Address: 260 RT 516, Eighty Four, PA, 15330	Address:
Phone#: 724-350-6060	Phone#:
Notes: Matt Adkins Made contact with Kelly.	Notes:

NOTIFICATIONS/CONTACTS	
Date: 03/03/2016	Date:
Time: 11:20	Time:
Name: Thelma	Name:
Comp/Agency: VA. EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

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NOTIFICATIONS/CONTACTS	
Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160007804	Date: 3/9/2016
Location:18170 Park Entrance Rd. Triangle, VA 22172.	Time: 15:29
Report Completed By: HMO502, Capt. Stewart	Incident Commander: N/A
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding: HMO501, HMO502	

INCIDENT DESCRIPTION	
<p>Received a call at 15:29 from HMO501 about a complaint of potential dumping or a spill at Prince William Forest Park. Arrived on scene at approx. 16:12 and drove with the park ranger to remote location at PWF on Pyrite Mine Road (park land) which backed against Mine Rd (residential land). Ranger had recently noticed an unusual white substance located in drainage to Quantico Creek. Upon arrival at the site I observed a white gelatinous substance collecting on soil on the edges of the water, the soil underwater, as well as on the stems and leaves of other organic material in the water. There were no changes in levels of O2, LEL, H2S, CO, Gamma via Multirae Pro and 4 gas monitors. Ph was neutral in two samples of the water and one sample of the substance sitting on top of soil at edges of water. A PPBrae was also taken downrange with minimum changes in VOC's- approx. 600 ppb's at what appeared to be the origin of the product. I collected a sample and tested via M908 using the liquid setting. There were no results found. I did not observe signs of illegal dumping. There were no cans, containers or bottles left at the scene. I did observe what appeared to be structures of material around stems, wild grass, and natural organic material. I also noticed what appeared to be a green "mat" placed on the ground under the area of origin. The Ranger identified it as an erosion control mat. These observations led me to believe that the product may be organic and naturally occurring but additional testing would need to be performed. No hazards were found through detection and monitoring so I left the scene instructing the ranger to construct a dirt dike to prevent additional runoff and that I would be back in touch the next day. I contacted VAEOC and reported the incident as I left the scene.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Eric Kelly, Park Ranger	Name:
Company: Prince William Forest Park	Company:
Address:	Address:
Phone#: 571-477-5203	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 03/09/2016	Date: 3/10/2016
Time: 17:51	Time: 08:11
Name: Archer	Name: Mark Miller
Comp/Agency: VA. EOC	Comp/Agency: DEQ
Notes:	Notes:

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NOTIFICATIONS/CONTACTS	
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: Morning of March 10th performed the following tests: 20/20- negative for protein, Hazmat 360- water, Responder RCI, no result. Met with Mark Miller in the afternoon at the site and he will advise Park personnel regarding necessary cleanup. Incident left with DEQ for appropriate follow-up.

HAZMAT Officer Comments:

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HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 160008592	Date: 3/24/2016
Location:14783 Build America Dr.	Time: 13:32
Report Completed By: Michael Anthony	Incident Commander: Lt. Hebert
HM 506 Personnel Responding: No HS 516 Personnel Responding: No Other HMT Personnel Responding: No	

INCIDENT DESCRIPTION	
<p>I was contacted by communications that E512 was on scene of a fuel leak and was requesting a phone consult. I called E512's unit phone and spoke with Lt. Hebert. He informed me that his crew was on scene at 14783 Jefferson Davis Hwy. This was the address to Del Pueblo Auto Service. They were dispatched to a hazard. They found a 3500 utility Truck with a broken fuel line. About 4-5 Gallons fo diesel fuel had spilled on the ground. An employee of the shop was actively hosing down the parking lot pushing some of the product into the nearest sewer drain. They immediately told the man to stop. They contained the fuel with absorbant. I asked about fuel in the drain. They guess about 1 gallon of dilluted fuel made it down the drain. The tank was currently empty and no more fuel was leaking on to the ground. I felt there was no additional actions HM506 could add to the call. I advised E512 we would notify VAEOC. Lt. Hebert said he was going to give the owner of the shop a LAPC form and explain that he was responsible for cleaning up the spill.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Del Pueblo Auto Services	Company:
Address: 14783 Build America Dr. Woodbridge, 22191	Address:
Phone#: 703-492-2880	Phone#:
Notes: 703-492-7979	Notes:

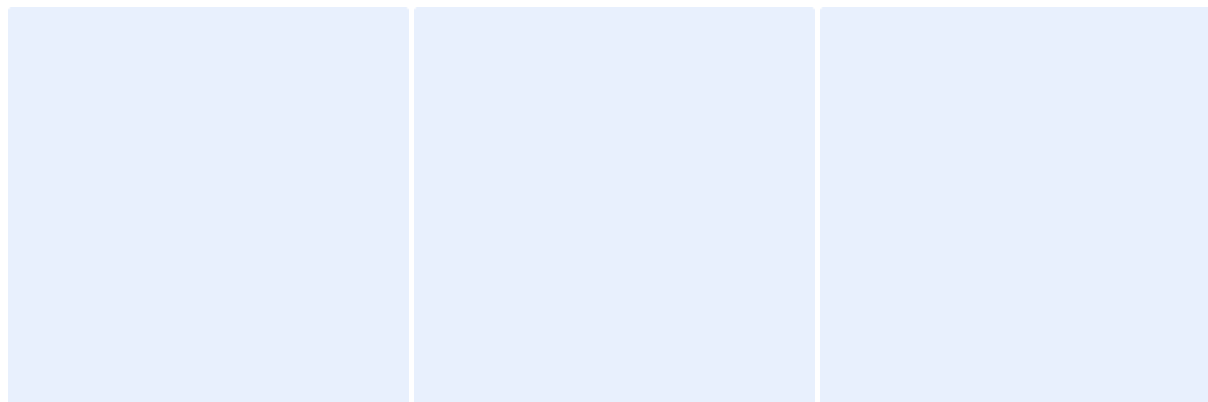
NOTIFICATIONS/CONTACTS	
Date: 03/24/2016	Date:
Time: 1332	Time:
Name: Thelma	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

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NOTIFICATIONS/CONTACTS	
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**

INCIDENT INFORMATION	
Fire Dept. Incident #: 160012361	Date: 4/28/2016
Location:13000 Balls Ford Rd. Manassas VA 20109	Time: 06:30
Report Completed By: Technician II Favole	Incident Commander: BC 501 Stephen Yannarell
HM 506 Personnel Responding: Captain Doug McCabe, Technician II Michael Favole, Technician II James Snitwongse HS 516 Personnel Responding: Technician II Michael Hauser, Technician II Adam Sampiller, Technician I Jonathan Carter Other HMT Personnel Responding: Captain Kim Stewart, Matt Adkins	

INCIDENT DESCRIPTION	
<p>E525 was dispatched to a fire at the land fill on 13000 Balls Ford RD Manassas VA 20109. E525 arrived on scene to find that a DZH 5000 series grinder was on fire. E525 called for additional resources and they got E511B, T511, K505, K516, and BC501. Once the fire was under control, they noticed that there was diesel fuel leaking from the tank so they requested a hazmat response. Once Hazmat 506 arrived on scene Captain McCabe advised command to get access to a loader to place mulch around the grinder to contain the leak. Command had one of the employees at the landfill use the loader to make that happen. HM516 started to put absorbent booms down to help with containing the leak as well. The leak was contained and no product got into the water way that was adjacent to the grinder. HM506's crew made their way to the grinder and determined that the leak was coming from a fuel line. HM506 also found out that the tank had just been filled and it held 350 gallons of diesel fuel. HM506 placed two vice grips on the fuel line which slowed down the leak to a drip. HM506 then place two 66 gallon collection pools down to capture any remaining product that was leaking. HM506 determined that approximately 30 gallons of product had been spilled from the fuel tank. Matt Adkins (HM501) made contact with the manager to inform him about getting it cleaned up and it was determined that the hazmat coordinator would be coordinating the cleanup process. HM506 was then placed in service.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Hazmat Coordinator for the PWC Landfill	Name: Jeff Morton
Company:	Company: PWC Landfill Manager
Address:	Address:
Phone#: 703-792-7405	Phone#: 540-905-5471
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 4/28/2016	Date:
Time: 14:55	Time:
Name: Thelma	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:

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NOTIFICATIONS/CONTACTS	
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Additional Notes/Information:

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD160018395	Date: 6/20/2016
Location: 14195 Minnieville Rd Woodbridge, VA 22193	Time: 20:16
Report Completed By: Schwab	Incident Commander: BC Kerns
HM 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>BC505 requested a phone consult for a fuel leak reported as 50 gallons of gasoline. After E513 arrived on scene they found a fuel leak from the dispatched address to the adjacent address. They spoke with the attendant at the station and they said a driver earlier had driven off with the nozzle still in the car. The leak was found to be closer to 5 gallons of fuel and wasn't effecting any water ways or drainage systems. E513 applied what absorbant they had. There was no active leak and Exxon had enough time from the incident till someone reported it to replace the damaged hose. I advised BC505 to give the attendant an LEPC form and ensure they had the name of the clean up company and a time that they would be out before clearing the scene. I also advised BC505 to get in touch with the Duty FM, since Exxon didn't have any containment supplies on site, which is a code violation.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Exxon	Company:
Address: 14195 Minnieville Road Woodbridge, VA	Address:
Phone#:	Phone#:
Notes:	Notes:

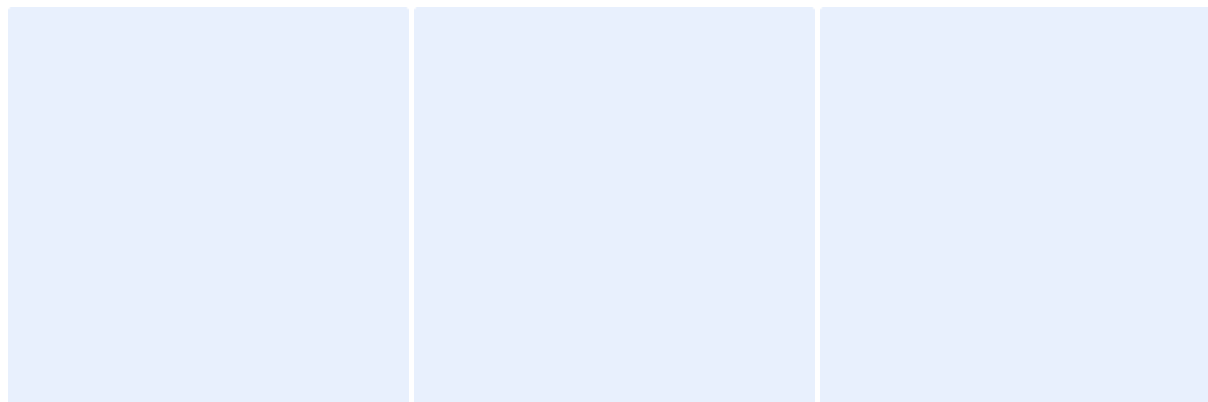
NOTIFICATIONS/CONTACTS	
Date: 6/20/2016	Date:
Time: 21:06	Time:
Name: Chris	Name:
Comp/Agency: VA EOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**

INCIDENT INFORMATION	
Fire Dept. Incident #: 160018461	Date: 6/21/2016
Location: Int 95N @ 159 mm	Time: 13:41
Report Completed By: Doug McCabe	Incident Commander: Kim Pumphrey
HM 506 Personnel Responding: McCabe, Weaver, C Malone HS 516 Personnel Responding: Gonzalez, Hornaday, Carter Other HMT Personnel Responding: Stewart	

INCIDENT DESCRIPTION	
<p>Hm506, HS516, HMO502 were dispatched to a auto accident on Int 95 to assist with a diesel fuel leak from a saddle tank. Command (Pumphrey) advised they had approx 150 gallons of diesel in the tanks and the leak could not be secured. She advised that defensive measures were in place. She then advised of the mixed load of corrosives and flammables had a potential leak as advised by R510 officer (Tobey). HMO502 and HS516 arrived prior to HM506 and a game plan was being developed. HM506 was to make entry to recon the trailer and check for leaks from the totes, poly and steel drums on board. A manifest was obtained and preliminary reasearch (Weaver) was started to check compatability and hazards. The diesel fuel leak of less than 1 gallon was contained by R510. Hazmat entry (McCabe, Malone) wore structural PPE and SCBA to perform recon. 4 gas readings, 0%lel, 0ppm h2s, 20.9% O2, 0ppm CO. 1,000 ppb on the PID. No rad above back ground was detected with the ludlum, no ph paper changes in open air at the rear of the trailer. The drums and totes were checked for leaks and none were found. Several of the poly drums had slid forward in the collision and had some indentation/deformity due to the weight of the other drums pushing forward. Again, no leaks were observed and no change in 4 gas reading at the front of the trailer. PID max reading was approx 4300ppb at the ceiling of the trailer. It was determined that the trailer was safe to move to a towing yard and have the drums and totes repositioned to relive the starin on them and allow them to continue to their destination. Redman towing was responsible for the towing. HMO502 worked with VDOT and Redman on a plan for clean up actions. The trailer was towed without further incident. HM506 crew was deconeed prior to leaving the scene. No products were used during the incident that needed to be replaced. VDOT was coordinating the clean-up.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Frank McKenna	Name:
Company: Care Environmental	Company:
Address: 429 E Blacwell St Dover NJ 07801	Address:
Phone#: 973-4451776	Phone#:
Notes: 973-398-5100	Notes:

NOTIFICATIONS/CONTACTS	
Date: 6/21/2016	Date:
Time: 21:40	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
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Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**









PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 1530113907	Date: 11/3/2015
Location:2504 Lookout Rd Haymarket VA	Time: 17:30
Report Completed By: LT.Dan McCleese	Incident Commander: Tech II C. Hooks
HM 506 Personnel Responding: None HS 516 Personnel Responding: None Other HMT Personnel Responding: None	

INCIDENT DESCRIPTION	
E515 said they had a vehcile travel up Lookout Rd with a small diesel fuel leak. They began the process of contacting commuicaiton for a consult, but discovered that the spill was significantly less than 50 gallons, Tech II Hooks advised that VDOT was bringing out a sand truck to please complaints from citizens. E515 required no further assistance or had any questions for the Duty HM.	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

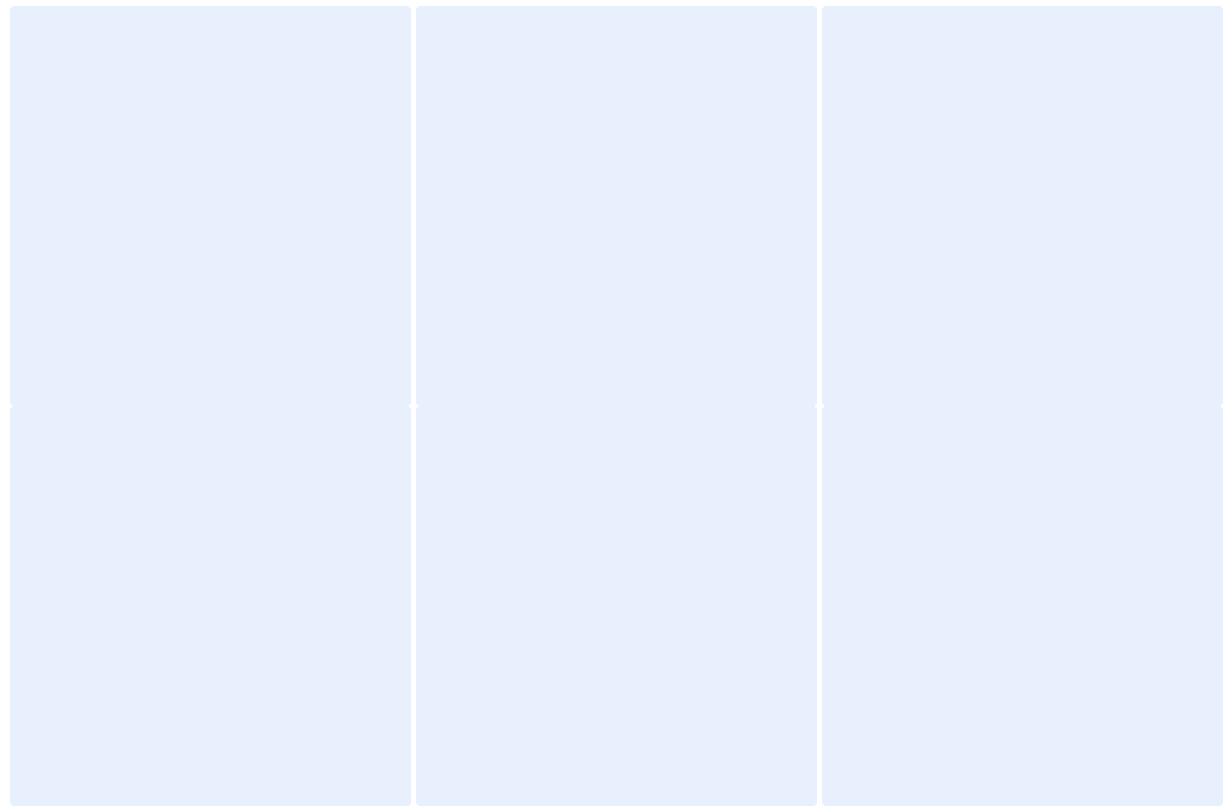
NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	
Name:	Time:
Comp/Agency:	Name:
Notes:	Comp/Agency:
	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD1512130025614	Date: 12/13/2015
Location: Interstate 95NB 153.4	Time: 05:05
Report Completed By: Dan McCleese	Incident Commander: E503 Officer- Griffin
HM 506 Personnel Responding: Phone consult to E503 HS 516 Personnel Responding: None Other HMT Personnel Responding: None	

INCIDENT DESCRIPTION	
E503 requested a phone consult with the Duty HM regarding a leaking battery that was left behind after the scene of an earlier accident. E503 Officer advised the material was contained with a dirt berm and that the battery was from a commercial type truck. E503 was advised by Lt McCleese the role of responsible parties and that the Virginia State Police (onscene) should contact the tow company used for the wreckage to retrieve the battery. E503's Officer was also advised that if the Tow Truck company could not be contacted, that State Police should have a representative of VDOT made aware since the spill occurred on VDOT property.	
RESPONSIBLE PARTY	OTHER PARTY
Name: VDOT	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes: email
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
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Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:

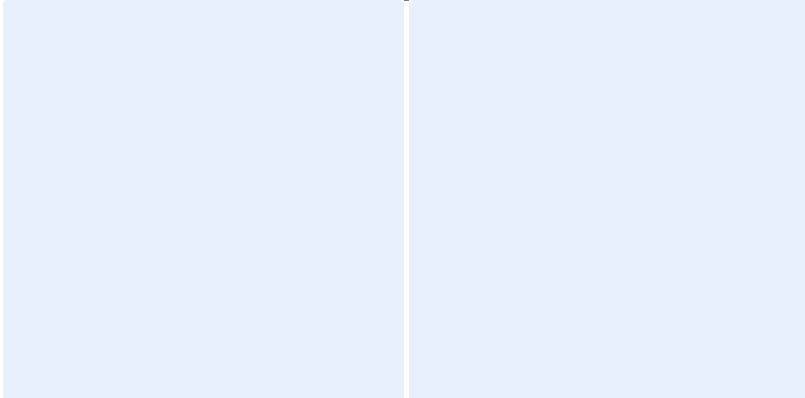
**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15071600004509	Date: 7/16/2015
Location: Exit 47 I66W	Time: 20:30
Report Completed By: Technician II Luke	Incident Commander: Capt. Mirible
HM 506 Personnel Responding: Technician II Luke HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>Duty Hazmat received a call from communications to contact Company 4 for a phone consult. Technician II Luke contacted them and talked with Captain Mirible of E504. Captain Mirible advised there was a fluid that appeared to be deisel fuel spread across the road running 200 yards down I66 West. The fluid was not enough to where it was moving down the road anymore, just a small layer. Technician Luke advised company 4 that VDOT needed to be contacted and they were the responsible party of the road. Captain Mirible had said that VDOT was on there way and would have them handle it when they arrived.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: VDOT	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/16/2015	Date:
Time: 21:15	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD15072400005607	Date: 7/24/2015
Location: CLOVERDALE RD/CORDELL AVE	Time: 09:26
Report Completed By: LT. D. MCCLEESE	Incident Commander: E510 CAPT-ROSS
HM 506 Personnel Responding: PHONE CONSULT HS 516 Personnel Responding: NONE Other HMT Personnel Responding: NONE)	

INCIDENT DESCRIPTION	
<p>E510 was dispatched to a call to a complaint from PWC litter crews. There was an area underneath the power lines that someone had dumped approx 15-25 one gallon containers of paint/stain/paint thinner. Public Works has been directed to have "questionable items verified by HAZMAT". Capt Ross per the phone consult with HAZMAT was able to conclude that the contents of the containers, which had lids, were safe for Public Works to dispose of in the appropriate manner- they were consistent with household painting supplies, drywall compound, and paint thinner. Public works was taking responsibility for the clean up. Virginia EOC was contacted as a notification/ fyi. Due to the location- under power line right of way- I contacted the Duty FM Lt. T Forbes to make him aware of the location being used for dumping. There was a car fire in the same area a few weeks prior to this incident.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Coppage, Derrick	Name:
Company: Initial Caller	Company:
Address:	Address:
Phone#: 571-263-4534	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/24/2015	
Time: 12035	Date:
Name:	Time:
Comp/Agency: VAEOC	Name:
Notes: Courtesy notification- passed on to VDEM HMOs	Comp/Agency:
	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date: 7/25/2015	Date:
Time: 1300	Time:
Name: T. Forbes	Name:
Comp/Agency: PWC FMO	Comp/Agency:
Notes: duty fm	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15073000006527	Date: 7/30/2015
Location: 9601 Prince William St. Manassas VA	Time: 10:40
Report Completed By: K. Stewart	Incident Commander: n/a
HM 506 Personnel Responding: 0 HS 516 Personnel Responding: 0 Other HMT Personnel Responding: HMO501, HMO502	

INCIDENT DESCRIPTION	
<p>At 1036 HMO501 and 502 were notified that there appeared to be a dumping of chemicals in the Cannon Branch Tributary, near Dean Elementary School in Manassas. HMO501 and 502 responded priority 2 and met with a representative from the City of Manassas. Upon arrival it was observed that the creek was white/gray in color as far as the stream could be seen. The product was naturally contained by a retention pond and a dozer was used to further secure the partial dike at the mouth of the stream. Manassas officials had already placed absorbent pads and booms in the water. When sampled, pH paper turned blue indicating a base that was 8/9 on the pH scale. Public safety samples were collected for further evaluation if necessary. It was determined that work on the high school track approximately two miles away was the source of the contamination. Workers had dumped residual amounts of a product entitled PlexiTrac, used on the track, into a storm drain. Research of the product showed low environmental hazards and the makeup up of the product was primarily ethylene glycol. After monitoring the high school site where the dumping occurred as well as the creek without any changes from normal readings, the scene was turned over to the City of Manassas and DEQ representative, Mark Miller.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: American Tennis Court	Company:
Address: Baltimore MD	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 7/30/15	Date:
Time: 17:40	Time:
Name: Archer	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date: 7/30/15	Date:
Time: 10:15	Time:
Name: Craig Buckley	Name:
Comp/Agency: VDEM	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
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Comp/Agency:	Comp/Agency:
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Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:





**AMERICAN
TENNIS COURTS**

INC.

**BALTIMORE, MD
US DOT 175549**

POWERSTROKE





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15080900007967	Date: 8/9/2015
Location: 4345 Inn St. Triangle, Va 22172	Time: 14:58
Report Completed By: Lt. Campbell	Incident Commander: N/A E503 was point of contact
HS 506 Personnel Responding: Campbell, Cook, Luke HS 516 Personnel Responding: Trochan, Smith, Sanderson, Sawicki Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
HM506 & HS516 were dispatched to assist E503 with a vehicle collision resulting in a fuel leak. E503 advised that approx 1.5 gallons of gasoline was on the ground and that the towing company would be able to handle the situation. HM 506 & HS516 were placed in service prior to arrival.	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 08/09/15	
Time: 15:17	Date:
Name: VAEOC	Time:
Comp/Agency:	Name:
Notes: VAEOC was notified of the situation and provided the address and INC #	Comp/Agency:
	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15081100008224	Date: 8/11/2015
Location: Davis Ford RD and Evans Ford RD	Time: 10:06
Report Completed By: Technician II Favole	Incident Commander:
HM 506 Personnel Responding: Tech II Favole, Tech II Weaver, Tech I Budkiewicz HS 516 Personnel Responding: Tech II Sanchez, Tech I Saxon, Tech I Greiner Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION	
HM506 was dispatched to a unknown leak for a vehicle in 16s due at the intersection of Davis ford and Evans ford road. HM506 was added to the call shortly after E516 and HS516 were responding. E516 marked on scene and reported that "the vehicle was leaking a small amount of fluids and the leak was contained." E516 placed all units in service and HM506 was ready.	
RESPONSIBLE PARTY	OTHER PARTY
Name: Unkown	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD15081400008596	Date: 8/14/2015
Location:I-95 N 153mm	Time: 0544
Report Completed By: Lt. Schwab	Incident Commander: BC Spitzer
HM 506 Personnel Responding: Lt. Schwab, T-II Snitwongsee, T-I Malone HS 516 Personnel Responding: Capt. Moran, T-I Greiner, T-I Saxon Other HMT Personnel Responding: T-II Favole, Capt. Stewart	

INCIDENT DESCRIPTION	
<p>HM 506 dispatched for a diesel fuel leak from an auto accident on I95 Northbound. E523 informed us that two tractor trailers, from a previous accident, were leaking diesel fuel and approximately 60 gallons had already leaked out. When HM506 arrived on scene and met with E523's officer he informed us that there was no active leak and both tanks were almost empty. After speaking with the driver he told me that that there was approximately 135 gallons of diesel fuel in the two saddle tanks at the time of the accident. E523's crew had already begun containment efforts for the leak prior to our arrival. HM506's assessed the situation and was able to contain the fuel which leaked in to a drainage ditch. Most of the fuel was contained to a small retention pool in the drainage system. HM506 took samples to confirm that it was diesel fuel in the water of the retention pool and that there was no fuel past the drainage system. No water ways were affected by the diesel fuel. UPS had contacted their clean up contractor, Clean Harbor, no ETA. The area that was contaminated was flagged and marked off with tape. HM506's officer obtained all pertinent information from the responsible party and all notifications were made. Scene turned over to State PD and VDOT.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Troy N. Candy	Name:
Company: UPS	Company:
Address: 6335 Sweitzer Ln Laurel, MD 20707	Address:
Phone#: 240-468-6883	Phone#:
Notes: 301-604-4661 Leon, UPS point of contact	Notes:

NOTIFICATIONS/CONTACTS	
Date: 8/14/21015	Date: 8/14/2015
Time: 0648	Time: 0855
Name: Thelma	Name: Mark Miller
Comp/Agency: VAEOC	Comp/Agency: DEQ
Notes:	Notes: No answer left voicemail
Date: 8/14/2015	Date:
Time: 0855	Time:
Name: Mark Aveni	Name:
Comp/Agency: PWC Watershed	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information: HM506 was the only unit dispatched to assist with the fuel leak. After obtaining information from E523 enroute to the call, we decided to upgrade the incident for a full Hazmat response.

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT



PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15091400013107	Date: 09/14/2015
Location: 16518 Gaines Rd Broad Run, VA 20169	Time: 17:43
Report Completed By: Lt. Campbell	Incident Commander: N/A
HS 506 Personnel Responding: Campbell, Luke, Laganga HS 516 Personnel Responding: Other HMT Personnel Responding: Adkins	

INCIDENT DESCRIPTION	
<p>E504 requested a phone consult with the DHM Tech for a 500 gallon propane tank which was run over by a concrete truck. E504's officer (Captain Mirabile) advised that it was an underground tank that was 100 feet from a house. He advised that they had monitored around the entire structure including inside with all normal readings. He stated the tank was still actively leaking, so HM506 responded to assist. Once on scene HM506 confirmed the LEL readings were normal around the house. The tank was inspected and it was discovered that the relief valve had been sheared off. An attempt was made to plug the hole without success. HM506 crew decided to flare off the remaining 30% of propane in the tank. Matt Adkins showed up and agreed with the decision to flare the tank. After approx. 20 minutes of flaring, a representative from the propane company arrived on the scene and stated that he could plug the leak. The leak was successfully plugged by the propane company, so the flaring operation was discontinued. He advised that he would stay with the tank until a truck could come drain the remaining propane. No further services needed, information was gathered from the homeowner and propane company, HM506 ready.</p>	
RESPONSIBLE PARTY	eOTHER PARTY
Name: Carla Valentino	Name: Patrick Heffron
Company: Home Owner	Company: Heffron Propane
Address: 16518 Gaines Rd	Address:
Phone#: 703-754-0970	Phone#: 540-364-6446 / 540-216-6162
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 09/14/15	Date: 9/14/15
Time: 18:20	Time: 22:00
Name: Matt Adkins	Name: VAEOC
Comp/Agency:	Comp/Agency:
Notes: Spoke with Matt to see if he agreed with the decision to flare the tank prior to his arrival.	Notes: Reported to Chris Blak at EOC for documentation purposes

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
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Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:









**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15092900015226	Date: 9/29/2015
Location: 12131 Nokesville Rd	Time: 09:39
Report Completed By: Technician II Tim Luke	Incident Commander: Capt. Reingruber
HM 506 Personnel Responding: Technician II Luke HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Tech II Luke received a phone call from communications to contact E505 officer pertaining to a mineral oil leak coming from a truck that got in an accident. Capt. Reingruber advised that it was close to 10 to 20 gallons spill on the side of the road. Technician Luke advised that the truck driver was responsible and E505 could provide the LEPC form to the truck driver for him to choose a proper clean up company. Unknown of responsible party, see E505 report for further information.	
RESPONSIBLE PARTY	OTHER PARTY
Name: Unknown, see E505 report	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 9/29/2015	Date:
Time: 18:38	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
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NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 15111000021153	Date: 11/10/2015
Location:Prince William PKWY / ELM Farm Rd	Time: 1830
Report Completed By: Lt. Samuels	Incident Commander:
HM 506 Personnel Responding: 0 HS 516 Personnel Responding: 0 Other HMT Personnel Responding: 0	

INCIDENT DESCRIPTION	
E520B reports 3 car accident with no injuries. One car is leaking gasoline. E520B requested HM506 to bring absorbent because they ran out containing the gasoline. Communications called St.6 and asked for the on duty HMT. Lt. Samuels requested a number to contact the officer of E520B for a phone consult in reference to a 20 gallon gasoline spill on the side of the road. Lt.Samuels spoke with the officer on E520B Thomas Mazzo. Mazzo reported that there was no water ways or storm drains effected by the gasoline leak. E520B just needed more absorbent. Lt.Samuels informed Mazzo that Prince William Parkway is a state maintained road that VDOT was responsible for the gasoline that has leaked out. Lt.Samuels recommended that Mazzo contact communications and ask for a representative from VDOT to come to above location. Lt.Samuels also suggested that he speak to the tow truck driver to see if the driver had some absorbent on his truck and was capable of cleaning up the absorbent that was put down. The current weather conditions are: 54 degrees rain and fog producing wet road ways	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes:	Notes:

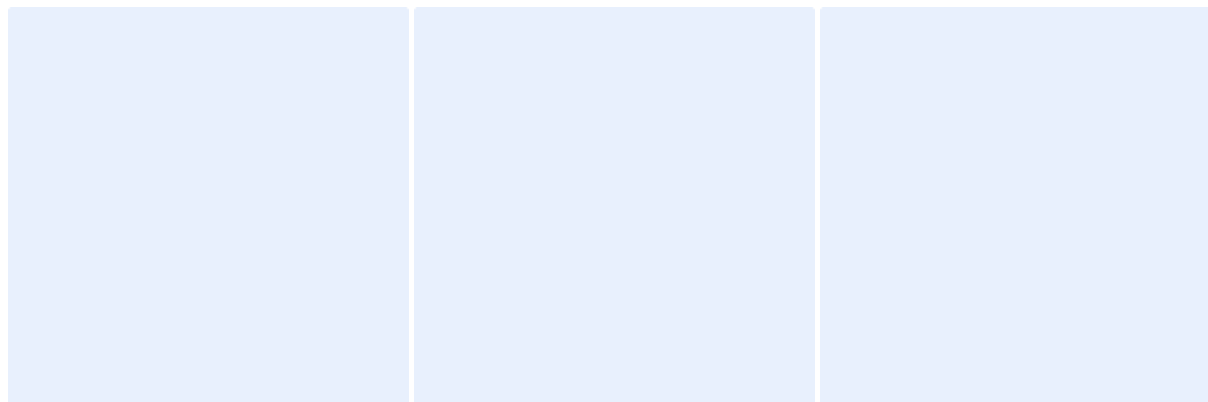
NOTIFICATIONS/CONTACTS	
Date: 11-10-2015	Date:
Time: 2035	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: #15112300022922	Date: 11/23/2015
Location: 9053 Wellington Rd	Time: 15:51
Report Completed By: Lt. Saikowski	Incident Commander: E511
HM 506 Personnel Responding: Phone Consult HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION	
<p>15:51 Received phone call from UFRO requesting phone consult with E511 (571-451-4300) re: possible fuel spill at Sunoco gas station on Wellington Rd. Requested UFRO place E506 OOS while phone consult was handled and would advise when incident was resolved. 15:54 Called E511 and spoke with Engine Officer who advised he was on the scene with what appeared to be a fuel spill at one of the fuel pumps. He estimated the spill to be approximately two gallons. He advised the fuel had no gone anywhere other than the immediate area, no waterways were affected and the pump was no longer leaking. He also advised the gas station employee was already out at the fuel pump cleaning up the spill and wanted to know if there was any additional action E511 needed to take. Advised him there was no further action for E511. Called UFRO and advised the incident had been handled and to place E506 back in service.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Sunoco Gas Station	Company:
Address: 9053 Wellington Rd	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 11-23-2015	Date:
Time: 19:20	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 16010100000046	Date: 1/1/2016
Location: 15511 Farm Creek Drive	Time: 09:19
Report Completed By: Lt. Saikowski	Incident Commander: E512
HM 506 Personnel Responding: Phone Consult HS 516 Personnel Responding: NA Other HMT Personnel Responding: NA	

INCIDENT DESCRIPTION	
09:19 Received phone call from UFRO re: phone consult with E512 reported to be on the scene with a small oil spill at location. Advised UFRO to place E506 OOS while phone consult handled. 09:27 Spoke with E512 and they advised they were at the location (VRE parking lot) with what they believed to be a one gallon jug of motor oil that had been left behind and broken open. He advised it appeared that some of the oil had leaked out of the jug and that it was still approximately 1/4 full. He advised the oil had created a "small" puddle in the parking lot, was not spreading, was no longer leaking from the jug, had not gone down any drains or affected any waterways. He advised they had already placed some dirt on the spill. E512 was advised to contact VDOT and inform them of the spill so they could take the appropriate clean up action.	
RESPONSIBLE PARTY	OTHER PARTY
Name: VDOT	Name:
Company:	Company:
Address:	Address:
Phone#:	Phone#:
Notes: Property owner	Notes:

NOTIFICATIONS/CONTACTS	
Date: 01-01-2016	Date:
Time: 13:45	Time:
Name: Thelma	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD16010300000274	Date: 1/3/2016
Location: I66 West MM 47	Time: 13:20
Report Completed By: Campbell	Incident Commander: Chief Wood
HS 506 Personnel Responding: HS 516 Personnel Responding: Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
<p>A phone consult was requested for an outside fire on I66 at the 47MM. This was the same location as the tractor trailer accident on 12/30/15 where hazmat responded to secure a leaking saddle tank. Chief Wood advised that there were booms still on scene and the contaminated soil was burning. He was advised to extinguish the fire and that VDOT was handling the cleanup. Nancy Ross (VDOT supervisor) was contacted and made aware of the situation. She then followed up with Atlas to see why the scene had not been cleaned up. They stated that they were following their protocols, and they were in the process of obtaining a work zone permit to remove the soil. Work on the site is scheduled to resume on 1/4/16.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: VDOT	Company:
Address:	Address:
Phone#: 703-877-3401	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 01/03/16	
Time: 13:25	Date:
Name: VAEOC	Time:
Comp/Agency: Reported to VA EOC for documentation purposes and for them to have a VDOT rep contact FS506	Name:
	Comp/Agency:
	Notes:
Notes:	

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date: 01/03/2016	Date:
Time: 13:20	Time:
Name: Matt Adkins	Name:
Comp/Agency:	Comp/Agency:
Notes: Spoke with Matt to advise that the spill form 12/30/15 had not been cleaned up.	Notes:
Date: 01/03/16	Date:
Time: 14:00	Time:
Name: Nancy Ross	Name:
Comp/Agency: VDOT	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: FD16010500000492	Date: 1/5/2016
Location:9009 Center Street Manassas, Va	Time: 07:07
Report Completed By: James Sanchez	Incident Commander: Chief Lupton (BC582)
HM 506 Personnel Responding: Doug McCabe, Matthew Schultz, Michael Favole, James Snitwongse HS 516 Personnel Responding: James Sanchez, Kristen Greiner, Christopher Saxon, Jonathan Carter Other HMT Personnel Responding:	

INCIDENT DESCRIPTION	
Was dispatched to parking lot of Mifco Energy Services where a parked tractor trailer had a damaged right saddle tank that had leaked approximately 5 to 10 gallons of diesel fuel. Arrived on scene and assumed prime Duty Hazmat Technician. Engine 501 officer stated that tank had approximately 50 gallons of fuel in it, fuel spilled on pavement had been contained with absorbent, and remaining fuel was transferred into second saddle tank by activating transfer valve. The product did not enter any waterway or appear to endanger any waterways or storm/sewer drains. Tractor Trailer driver (John Monroe) stated he was backing up, when he struck the parked tractor trailer, damaging the saddle tank. John Monroe also stated that employer (Valley Ice) rented the facility from Mifco Energy Services and had contacted employer to send clean up company. John Monroe stated employer had own clean up company and was already en route to scene (2 hour ETA). Battalion 582 was notified of status of clean up situation.	
RESPONSIBLE PARTY	OTHER PARTY
Name: John Monroe	Name:
Company: Valley Ice Ph: 540-477-3131	Company:
Address: 308 Helsey Road Edinburg, Va 22824	Address:
Phone#: 540-333-3314	Phone#:
Notes: CDL: T64410425 Insurance: Federated Services Insurance Cmpny. 888-333-4949	Notes:

NOTIFICATIONS/CONTACTS	
Date: Jan 5, 2016	Date:
Time: 07:20	Time:
Name:	Name:
Comp/Agency: Valley Ice (private clean up company)	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

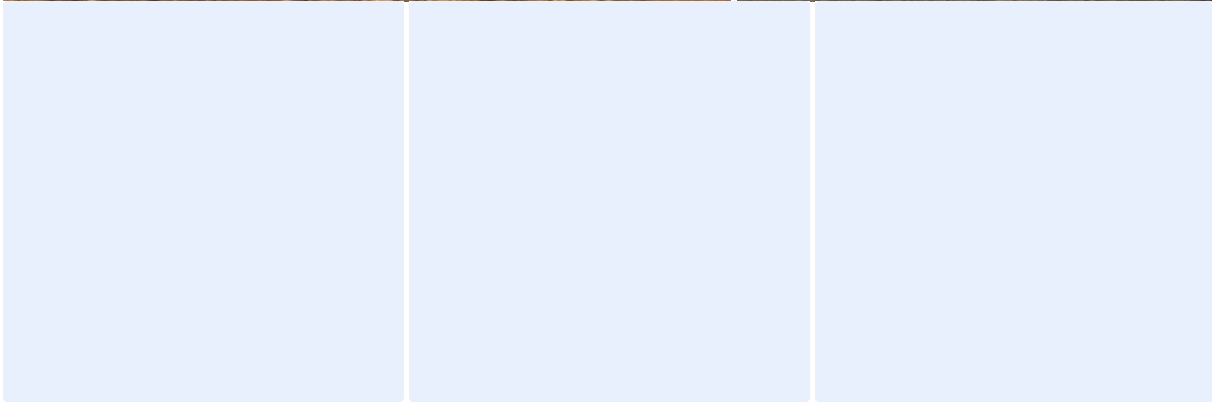
Additional Notes/Information:

HAZMAT Officer Comments:

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT



PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 16022200007151	Date: 2/22/2016
Location: 7522 Centreville Road	Time: 16:00
Report Completed By: Adkins	Incident Commander: Capt. Ferguson
HM 506 Personnel Responding: N/A HS 516 Personnel Responding: N/A Other HMT Personnel Responding: Adkins - HMO 501	

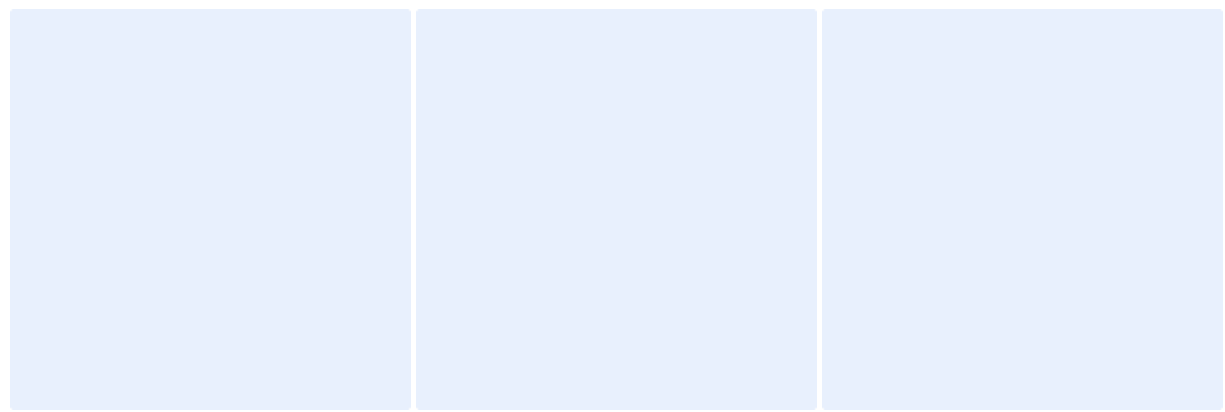
INCIDENT DESCRIPTION	
<p>Initial call was a phone consult with Capt. Ferguson upon discussing need with Capt. McCabe, HM506 was put in service and HMO501 responded. Requested by Fire Marshal's Office to assist with identification of product contained in spill pans of fuel pumps at the Oceanic fuel station. Upon arrival I met Captain Ferguson and Lt. Smiljanich and was asked to assist with identification and samples if necessary of liquid product in the pump spill pans. Using 4 Gas, PID, I found normal readings on 4 Gas with PID readings exceeding 300 PPM in the enclosed space of the pump spill pan. The 4 Gas did not register LEL due to the inability to get the device in the enclosed space. Using a probe with oil test paper, we sampled the fuel at each of the 4 pumps. Two vaults had over four inches of product, and two had less but all had indications of poor maintenance resulting in small spills that have accumulated. The Oil paper tested positive. Based on the testing HMO501 determined the likely product was gasoline. A LEPC Discharge notice was provided to the property owner. Property owner stated they have a contractor on retainer. FMO provided direction to remove and remediate the spill, fix all leaks and contact FMO prior to reopening. Photographs are in possession of FMO.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Mr. Gupta	Name:
Company: Yorkshire Service Center	Company:
Address: 7522 Centreville Road	Address:
Phone#:	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/22/2016	
Time: 16:30	Date: 2/22/2016
Name: Mark Miller	Time: 16:30
Comp/Agency: VADEQ	Name: VAEOC
Notes: sent email that was forwarded to Randy Chapman at DEQ. Mr. Chapman advised Unground Storage Tank Inspector would visit the site on 2/23/2016	Comp/Agency:
	Notes: Notification made through DEQ
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

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**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 16022400007402	Date: 2/24/2016
Location: 10934 Coverstone Dr.	Time: 11:46
Report Completed By: ADKINS	Incident Commander: N/A
HM 506 Personnel Responding: Lt. Schwab - Phone Consult HS 516 Personnel Responding: Other HMT Personnel Responding: Adkins - Followup Response	

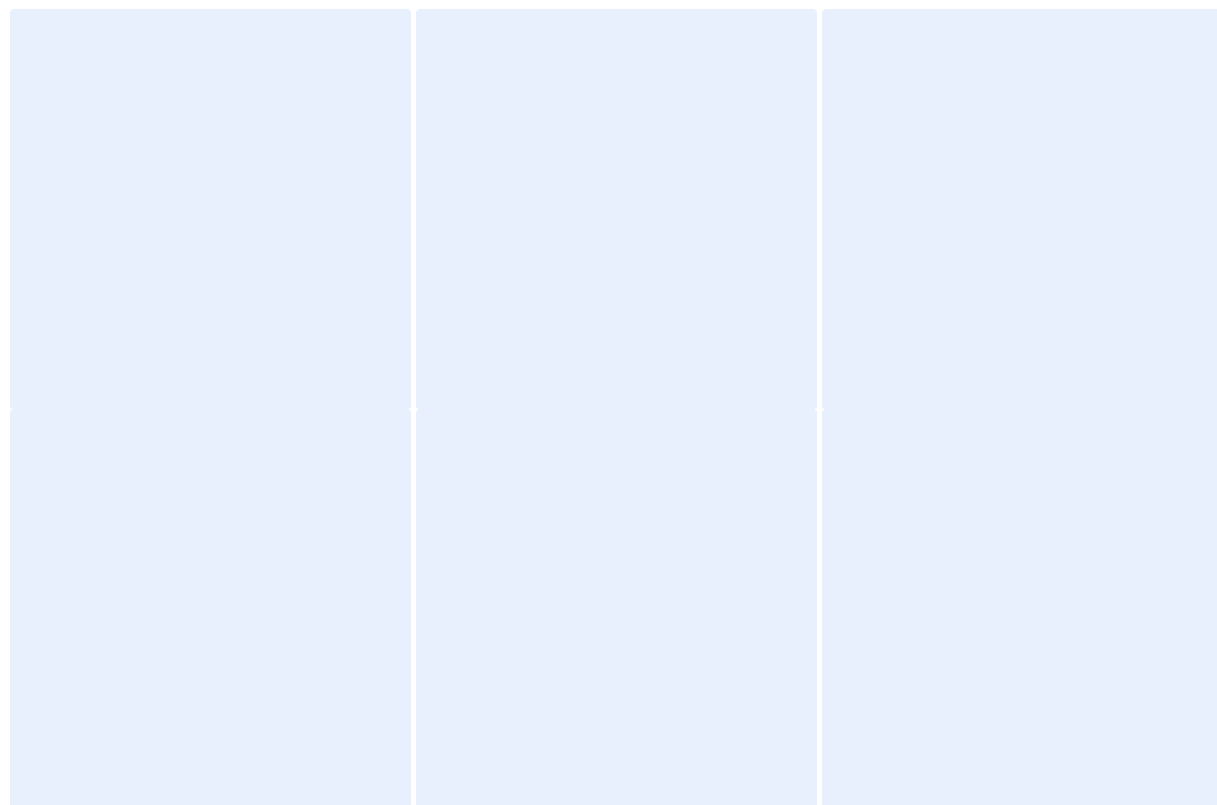
INCIDENT DESCRIPTION	
Reported Garbage Truck spilled less than 3 gallons hydraulic oil. Company advised they would cleanup spill themselves and had shop mechanics enroute to complete cleanup.	
RESPONSIBLE PARTY	OTHER PARTY
Name: Kimberly Harris	Name:
Company: Republic Services	Company:
Address: 4619 West Ox Rd, Fairfax, VA 22030	Address:
Phone#: 571-328-7585	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 2/24/2016	Date:
Time: 12.30	Time:
Name:	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes: Courtesy Notification	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments: HMO501 Adkins - Conducted followup at the site to insure cleanup. No sign of a spill in the area. No further action required.





**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 16060100021499	Date: 6/1/2016
Location: 7901 Lake Manassas Dr. Gainesville Va	Time: 15:57
Report Completed By: Technician II Luke	Incident Commander: BC Crispin
HM 506 Personnel Responding: Tech II Cook, Tech I Laganga, Tech I Campbell HS 516 Personnel Responding: Lt. Trochan, Tech II Smith, Tech I Bell Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION	
<p>HM506 was called to assist with an auto accident that resulted in a fatality. The two vehicles involved had caught on fire. One of the vehicles, a trash truck had also ruptured their fuel tanks and its hydraulic lines had been cut. Approximately 50 to 75 gallons had leaked onto the road and possibly 2 gallons had gone in the storm drains. Upon arrival, multiple units contained the leak from the storm drains by setting up a dam. HM506 checked multiple storm drains and it appeared that only two storm drain lengths were affected. When HS516 arrived, booms were placed in a couple of the storm drains to stop any further leakage. Early readings from the PID showed 2100 PPB and 20.1% O2 inside the storm drain. Later readings showed readings to all be normal. The product looked to have evaporated later in the incident. Tow truck company arrived and called ATLAS to be the primary clean up company. The trash inside the tow truck had been smoldering from the earlier fire but to avoid dumping all the trash on a major highway, the tow truck moved the trash truck to their place of business while E504 followed them. The tow truck company's property had been in 6's due so E506 replaced E504 so the trash could be dumped and completely extinguished. The address of the tow truck company "Waggies" 6933 Colchester Dr. Manassas.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name: Bill Keating	Name: Carlos Diaz
Company: Rapid Rolloff	Company:
Address:	Address: 2207 Princess Anne Lane, Woodbridge
Phone#: 202-355-5282	Phone#:
Notes: Owner of company	Notes: Driver of truck that leaked

NOTIFICATIONS/CONTACTS	
Date: 6/1/2016	Date: 6/1/2016
Time: 17:10	Time: 17:13
Name: Chris	Name: Mark Miller
Comp/Agency: VAEOC	Comp/Agency: DEQ
Notes: Courtesy notification	Notes: Courtesy Notification

PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT

NOTIFICATIONS/CONTACTS	
Date: 6/1/2016	Date:
Time: 17:17	Time:
Name: Marc Aveni	Name:
Comp/Agency: PWC Public Works	Comp/Agency:
Notes: Message left	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:





















**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION	
Fire Dept. Incident #: 16060200021647	Date: 6/2/2016
Location: 204 Union Street	Time: 16:21
Report Completed By: Capt. Stewart	Incident Commander: E502 officer- Lt. Howdysshell
HM 506 Personnel Responding: n/a HS 516 Personnel Responding: n/a Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION	
<p>E502B was dispatched to a hazard involving oil leaking from an overhead, on pole, electrical transformer. I was off duty in a county vehicle on my way home and had heard via the radio that E502B confirmed a minor leak over a period of 6 weeks that had stained the ground. Dominion Power was en route and that E502B had put absorbent on the ground. I passed the incident on my way home and stopped to assess containment and clean up needs. Due to age of transformer and size I was not concerned that the oil posed a PCB hazard. Area of oil residue had an approximate diameter of 1 foot and I estimated spill at less than a quart over time with nothing recoverable. The spill was contained by the absorbent. E502 placed hazard tape around the area and left it to Dominion Power. I told the officer that I would confirm cleanup the next day but otherwise no additional hazmat notifications or resources were required from him. I called Communications to place me on the call for report and notification needs. Contacted VAEOC. Drove by at approximately 11:00 June 3rd and it appeared that leak was stopped and absorbent removed. No other actions taken.</p>	
RESPONSIBLE PARTY	OTHER PARTY
Name:	Name:
Company: Dominion Power	Company:
Address:	Address:
Phone#: 888-667-3000	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS	
Date: 6/2/16	Date:
Time: 17:15	Time:
Name: Chris	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes: I	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
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Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:

HAZMAT Officer Comments:



**PRINCE WILLIAM COUNTY
DEPARTMENT OF FIRE AND RESCUE
HAZARDOUS MATERIALS RESPONSE PROGRAM
INCIDENT REPORT FORM**



INCIDENT INFORMATION

Fire Dept. Incident #: 15090300011573	Date: 9/3/2015
Location: Gordon Blvd and Devils Reach Rd.	Time: 16:55
Report Completed By: Captain Stewart	Incident Commander: BC Spitzer
HM 506 Personnel Responding: LT. Saikowski, Tech II Sweet, Tech II Clark HS 516 Personnel Responding: Lt. McNally, TII Hauser, TI Santiago Other HMT Personnel Responding: Capt. Stewart	

INCIDENT DESCRIPTION

E502 arrived on scene to a tractor-trailer with fire from the engine compartment. The truck was parked on a steep hill that led to the edge of the Occoquan River. Heat from the fire caused rupture to the diesel saddle tanks with a loss of approximately 50-60 gallons of diesel. The incident was upgraded to a Hazmat call type. HMO502 arrived as the first Hazmat unit and was provided information from the E502 officer, also a Hazmat Technician, that diesel was contained near the tanker truck along the side of the road in a natural trench and diked approximately 150 ft. past the truck. The engine officer then relayed his concern that product entered the storm water drain located beside the tractor-trailer. HS516 were next on scene and were sent to find additional access to the area on the lower part of the hill near the river, presumably where the storm drain terminated, and to begin damming and diking to protect the river. HM506 arrived and was assigned by HMO502 through the IC to check the upper contained area, confirm containment, and to begin documentation and notifications. HMO502 assisted HS516 with accessing the lower area on Swans Point Rd. and directed the initial placement of a boom downstream of the area that had a strong odor of diesel to offer some protection while other areas were checked. Further investigation showed that the storm water drain led directly to the Occoquan River via a concrete open ditch which followed the high side of Swans Point Rd and then entered a pipe running perpendicular to the concrete ditch. A dike was constructed using nearby soil as a secondary protection at the mouth of the pipe leading to the river. Additional monitoring by HM506 personnel showed that the area above the initial boom was where the product appeared to be naturally contained and constructed another dike from nearby soil in an attempt to reduce the cleanup area to this area of containment. Monitoring personnel reported that readings on the PPBRAE were less than 7000ppb closest to the area of containment with all else being normal. The two areas were marked with fire line tape to assist the cleanup crew. Atlas was contracted by the responsible party for clean up. Cleanup will be ongoing over the next day.

RESPONSIBLE PARTY	OTHER PARTY
Name: Shawn Williamson	Name:
Company: Eagle Logistics	Company:
Address:	Address:
Phone#: 844-836-9645 410-499-2166	Phone#:
Notes:	Notes:

NOTIFICATIONS/CONTACTS

**PRINCE WILLIAM COUNTY DEPARTMENT OF FIRE AND RESCUE
HAZMAT REPORT**

NOTIFICATIONS/CONTACTS	
Date: 9/3/15	Date:
Time: 18:21	Time:
Name: Mark Miller	Name:
Comp/Agency: DEQ	Comp/Agency:
Notes:	Notes:
Date: 9/3/15	Date:
Time: 18:56	Time:
Name: Archer	Name:
Comp/Agency: VAEOC	Comp/Agency:
Notes:	Notes:
Date: 9/4/15	Date:
Time: 12:24	Time:
Name: Mark Aveni	Name:
Comp/Agency: PWC Watershed	Comp/Agency:
Notes: courtesy notification via email	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:
Date:	Date:
Time:	Time:
Name:	Name:
Comp/Agency:	Comp/Agency:
Notes:	Notes:

Additional Notes/Information:
HAZMAT Officer Comments:







Appendix G – Industrial and High Risk Runoff

7994-94-6606	5901 DAVIS FORD	RD	MANASSAS	20112 OCCOQUAN FOREST SANITARY DISTRICT	7994SE	190 Other Industrial	4 PWC SERVICE AUTHORITY
7697-60-2801	10309 LOMOND	DR	MANASSAS	20109 NORTHERN VIRGINIA ELECTRIC COOP	7697SE	216 Auto Parking	3 NORTHERN VIRGINIA ELECTRIC COOP
7895-71-8052	10404 MOORE	DR	MANASSAS	20111 MCGARRY ALLAN D & KIL S MCGARRY	7895SE	390 Retail	3 KONDOLOY ROSTAM BUCKHALL GENERAL STORE
8292-23-6078	13550 MINNIEVILLE	RD	WOODBIDGE	22192 DOMINION CENTER LLC	8292SW	312 Shopping Center	3 DOMINION CENTER LLC DOMINION CENTER - RETAIL
7694-24-6033	11713 BRISTOW	RD	BRISTOW	20136 JOHN RUFF AND PHILLIP WHEELER PTNSHP	7694SW	910 Agricultural Resources	3 BRISTOW BROADRUN LLC
8492-43-8235	499 HARBOR SIDE	ST	WOODBIDGE	22191 HARBOR VIEW ASSOCIATES LLC	8492SW	841 Swimming Pool	3 UNIT OWNERS HARBOR VIEW CONDO AT
8189-69-1607	4100 TALON	DR	DUMFRIES	22025 7 ELEVEN INC	8189NE	344 Convenience Store with Gas	4 SEI ASSET MANAGEMENT & INVESTMENT CO 7-ELEVEN
7896-18-7963	8104 CENTREVILLE	RD	MANASSAS	20111 RESTLESS WHEELS INC	7896NW	390 Retail	3 RESTLESS WHEELS INC RESTLESS WHEELS CAMPER SALES
7497-02-2220.01	7679 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 VG 145 LLC BLDG B UNIT 145
7497-01-3993.01	7699 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER BLDG C UNIT 135
7497-01-2895.01	7699 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER BLDG C UNIT 120
7497-02-2818.01	7679 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 FOUR CORNERS REAL ESTATE INVESTMENT GROUP BLDG B UNIT 135
7496-07-8757	8217 LINTON HALL	RD	BRISTOW	20136 AMERICA ONLINE INC	7496NW	191 Technology Services	1 PORPOISE VENTURES LLC AOL II
8092-54-6085	13698 MAPLEDALE	AV	WOODBIDGE	22193 HYLTON CECIL D ESTATE	8092SE	354 Restaurant	3 HYLTON CONRAD C TR & MALCOLM W COOK TR & MCDONALD'S @ MAPLEDALE
7396-83-1971	13900 ESTATE MANOR	DR	GAINESVILLE	20155 TOWER GROUP LLC	7396SE	311 Small Shopping Center	3 GLENKIRK RETAIL CENTER LLC FAMILY MART
7696-77-3723	8319 SUDLEY	RD	MANASSAS	20109 MANAPORT PLAZA LLC	7696NE	313 Shopping Center	3 MANAPORT PLAZA LLC MANAPORT S C
8192-05-3469	4802 DALE	BL	WOODBIDGE	22193 DELANEY PLAZA LLC	8192NW	312 Shopping Center	3 WOODBRIDGE VILLAGE LLC DELANEY PLAZA
7595-66-6386	9650 HAWKINS	DR	MANASSAS	20109 NEWBILL HOLDINGS LLC	7595NE	190 Other Industrial	4 ASHLAND INVESTMENTS LLC NEWBILL HOLDINGS
8193-50-0347	4255 SEETON	SQ	WOODBIDGE	22192 EXXON CORP	8193SE	344 Convenience Store with Gas	4 SOUTHSIDE OIL LLC EXXON - THE GLEN SHOP CTR
8292-72-9509	2651 PRINCE WILLIAM	PY	WOODBIDGE	22192 BRINKER VIRGINIA INC	8292SE	351 Restaurant	3 COLE OB WOODBRIDGE VA LLC ON THE BORDER
8292-51-4135	13901 SMOKE TOWN	RD	WOODBIDGE	22192 MINI U STORAGE WOODBRIDGE LTD PTNSHP ET	8292SE	151 Mini Warehousing	3 MINI U STORAGE WOODBRIDGE LTD PTNSHP ET AL MINI-U STORAGE - OFFICE/APT
8292-23-2492	3340 ELM FARM	RD	WOODBIDGE	22192 LORD FAIFAX COMMUNITY COLLEGE	8292SW	151 Mini Warehousing	3 POTOMAC MILLS LAND LLLP EZ SELF STORAGE
8190-62-6732	4202 FORTUNA CENTER	PZ	DUMFRIES	22025 FORTUNA REGENCY LLC	8190SE	313 Shopping Center	3 BRE DDR CROCODILE FORTUNA CENTER LLC FORTUNA CENTER - SHOPPERS, etc
8393-22-9054	2010 OLD BRIDGE	RD	WOODBIDGE	22192 BOROCZI SCOTT TR	8393SW	366 Service Station	5 RUBY & HARRY LLC SUNOCO-OLD BRIDGE & CLIPPER
8292-55-3681	13606 FOWKE	LN	WOODBIDGE	22192 GARBER J MANLEY JEANETTE ESTATE	8292NE	361 Motor Vehicle Sales	3 GARBER DANIEL C Lake Ridge Auto Sales
7298-37-4137	5942 INTERLACHEN	CT	HAYMARKET	20169 DOMINION COUNTRY CLUB LP	7298NW	831 Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC
7298-77-8242	15191 GOLF VIEW	DR	HAYMARKET	20169 DOMINION COUNTRY CLUB LP	7298NE	831 Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC
7298-79-3018	15201 ARNOLD PALMER	DR	HAYMARKET	20169 DOMINION COUNTRY CLUB LP	7298NE	831 Golf Course	2 DOMINION VALLEY COUNTRY CLUB I LLC
7595-57-0682	9400 CONTRACTORS	CT	MANASSAS	20109 L F JENNINGS INC	7595NE	190 Other Industrial	4 L F JENNINGS INC L F JENNINGS INC
7497-12-2047	7750 PROGRESS	CT	GAINESVILLE	20155 POTOMAC GAINESVILLE PROPERTY LLC	7497SW	160 Industrial Service Garage	4 POTOMAC GAINESVILLE PROPERTY LLC POTOMAC MACK SALES/SERVICE
8190-66-1721	16500 EDGEWOOD	DR	DUMFRIES	22025 U S GOLF PROPERTIES LP	8190NE	832 Golf Course	2 CJ EAGLE LLC MONTCLAIR COUNTRY CLUB
8190-52-9272	4406 FORTUNA CENTER	PZ	DUMFRIES	22025 FORTUNA REGENCY LLC	8190SE	352 Restaurant	3 BRE DDR CROCODILE FORTUNA CENTER LLC PANERA BREAD & STARBUCKS
8193-40-9299	4350 PRINCE WILLIAM	PY	WOODBIDGE	22192 LEOPOLD CHARLES W JAQUELINE M SURV	8193SE	190 Other Industrial	4 G & L ENTERPRISES LLC MAINTENANCE BLDG @ THE GLEN
7696-84-7480	8621 SUNNYGATE	DR	MANASSAS	20109 SUNNYGATE DRIVE SELF STORAGE LLC	7696NE	151 Mini Warehousing	3 U-STORE-IT LP CUBESMART
7497-24-9109	7201 RAIL LINE	CT	GAINESVILLE	20155 DALRYMPLE REALTY CORP	7497SW	121 Durable Manufacturing	4 DALRYMPLE REALTY CORPORATION CHEMUNG ASPHALT PLANT
7397-20-9268	7754 VIRGINIA OAKS	DR	GAINESVILLE	20155 NGP REALTY SUB LP	7396SE	832 Golf Course	2 VIRGINIA OAKS LLC
7595-57-1046	9430 CONTRACTORS	CT	MANASSAS	20109 9430 INC	7595NE	190 Other Industrial	4 9430 INC A
8492-44-5722	530 HARBOR SIDE	ST	WOODBIDGE	22191 BELMONT TOWN CENTER ASSOCS LLC	8492NE	851 Marina	3 BELMONT TOWN CENTER ASSOCS LLC BELMONT BAY CENTER MARINA
7595-67-6742	9489 HAWKINS	DR	MANASSAS	20109 TOUSHA NOBLE A ROBIN	7595NE	150 Wholesale Warehousing	4 TOUSHA NOBLE A & ROBIN EQUIPMENT SPECIALISTS
8391-88-6685	14398 MELBOURNE	AV	WOODBIDGE	22191 PWC PARK AUTHORITY	8391NE	224 Sewage	2 PWC BOARD OF COUNTY SUPERVISORS
7596-24-1508	12021 WILTON MEADOWS	CT	MANASSAS	20109 BENFIELD AND DRESSLER LLC	7596NW	150 Wholesale Warehousing	4 NAGETTTE RICHARD R V LLC BENFIELD ELECTRIC
8391-59-8873	14211 JEFFERSON DAVIS	HY	WOODBIDGE	22191 JD HWY LLC	8391NE	361 Motor Vehicle Sales	3 JD HWY LLC LUSTINE DODGE - JEEP
7396-59-3972	7689 VIRGINIA OAKS	DR	GAINESVILLE	20155 NGP REALTY SUB LP	7396SE	832 Golf Course	2 VIRGINIA OAKS LLC
7595-56-9398	11331 INDUSTRIAL	RD	MANASSAS	20109 HUGHES EDDY W	7595NE	150 Wholesale Warehousing	4 DAVID RAMOS FAMILY LLC MIKE & BRYAN CONTRACTORS
8192-41-7315	4326 DALE	BL	WOODBIDGE	22193 TRUSTEES OF THE IRENE V HYLTON CHARITABL	8192SW	312 Shopping Center	3 GLENDALE PLAZA LLC GLENDALE PLAZA
7596-14-5500	8780 VIRGINIA MEADOWS	DR	MANASSAS	20109 PEREIRA ANTONIO AND MARIO RAMOS ETAL	7596NW	190 Other Industrial	4 PEREIRA ANTONIO & MARIO RAMOS ETAL POTOMAC CONCRETE
7697-50-9508	10319 LOMOND	DR	MANASSAS	20109 NORTHERN VIRGINIA ELECTRIC COOP	7697SE	216 Auto Parking	3 NORTHERN VIRGINIA ELECTRIC COOP
7595-67-8821	9651 HAWKINS	DR	MANASSAS	20109 HAMP WILLIAM A III TR	7595NE	190 Other Industrial	4 HAWKINS DRIVE LLC CALVERT MASONRY
7496-50-4931	12912 HUNTING COVE	PL	BRISTOW	20136 BRIDGEWOOD AT BRIDLEWOOD MANOR ASSOC LLC	7496SE	841 Swimming Pool	3 BRIDLEWOOD MANOR COMMUNITY ASSN
7993-01-0402	12805 DUSTY WILLOW	RD	MANASSAS	20112 OAK RIDGE SWIM CLUB INC	7993SW	841 Swimming Pool	3 OAK RIDGE SWIM CLUB INC
8391-56-6917	1551 FEATHERSTONE	RD	WOODBIDGE	22191 HALL MICHAEL T TR	8391NE	343 Convenience Store	2 THE KENTLAND FOUNDATION INC 7 MARKET FOOD STORE
8193-37-0594	4600 ASDEE	LN	WOODBIDGE	22192 OLD HICKORY GOLF CLUB LLC	8193NW	832 Golf Course	2 OLD HICKORY GOLF CLUB LLC OLD HICKORY GOLF CLUB STOR/BAT
7497-02-0329.01	7669 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 TEAMC PROPERTIES LLC BLDG A UNIT 100
8293-04-3660	3310 OLD BRIDGE	RD	WOODBIDGE	22192 OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313 Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC FESTIVAL-OLD BRIDGE
7497-01-6089.01	7689 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 DLE LLC BLDG D UNIT 135
7497-01-3594.01	7699 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER BLDG C UNIT 130
7497-01-1299.01	7699 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER BLDG C UNIT 100
7497-02-3417.01	7679 LIMESTONE	DR	GAINESVILLE	20155 GATEWAY BUSINESS CENTER LP	7497SW	156 Wholesale Warehousing (Condo)	2 GATEWAY BUSINESS CENTER BLDG B UNIT 120
8391-58-3691	14335 JEFFERSON DAVIS	HY	WOODBIDGE	22191 LYNNWOOD SHOPPING CENTER LLC	8391NE	312 Shopping Center	3 LYNNWOOD SHOPPING CENTER LLC LYNNWOOD SHOPPING CENTER
8193-93-5944	3514 OLD BRIDGE	RD	WOODBIDGE	22192 EXXON CORP	8193SE	344 Convenience Store with Gas	4 SOUTHSIDE OIL LLC EXXON-OLD BRIDGE & SMOKE TOWN
8293-04-2352	3312 OLD BRIDGE	RD	WOODBIDGE	22192 OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313 Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC FESTIVAL-OLD BRIDGE FOOD LION
8191-35-7187	14797 DARBYDALE	AV	WOODBIDGE	22193 TRAVERS ROBERT L TR	8191NW	343 Convenience Store	2 TRAVERS ROBERT L TR 7-ELEVEN
8293-03-0262	3318 OLD BRIDGE	RD	WOODBIDGE	22192 STORAGE SQUIREBAC 101 LTD PTNSHP	8293SW	151 Mini Warehousing	3 STORAGE SQUIREBAC 101 LTD PTNSHP STORAGE USE - BLDG D
8292-88-9614	13059 MINNIEVILLE	RD	WOODBIDGE	22192 ARCHIE HENRY E SR & ANNIE WILLIAMS	8292NE	369 Other Automotive	4 ARCHIE HENRY ELVIN JR Penny's Used Auto Parts
8193-93-0718	12576 GRAND TARGHEE	DR	WOODBIDGE	22192 AMOCO OIL CO	8193SE	344 Convenience Store with Gas	4 OLD BRIDGE 101 LLC Car Wash
8293-05-8957	3500 COMMISSION	CT	WOODBIDGE	22192 COMMISSION COURT LLLC	8293NW	151 Mini Warehousing	3 COMMISSION COURT LLC ATLANTIC STORAGE
8193-92-0448	3705 OLD BRIDGE	RD	WOODBIDGE	22192 MICHAEL R VANDERPOOL ET ALL	8193SE	390 Retail	3 JVG LLC LOW ROOFED GREENHOUSE
7595-68-5645	11141 INDUSTRIAL	RD	MANASSAS	20109 S S REAL ESTATE HOLDINGS L L C	7595NE	150 Wholesale Warehousing	4 11141 INDUSTRIAL ROAD LLC S & S REAL ESTATE
8392-88-5002	13244 PUTNAM	CL	WOODBIDGE	22191 GREENWICH HILL HOMEOWNERS ASSOC	8392NE	841 Swimming Pool	3 GREENWICH HILL HOMEOWNERS ASSOC
8292-80-9997	14103 TELEGRAPH	RD	WOODBIDGE	22192 HAMILTON C ISAAC TR & JUDITH TR	8292SE	131 NonDurable Manufacturing	4 TELEGRAPH MANAGEMENT GROUP LLC HAMILTON IRON WORKS
8292-51-2288	13889 SMOKE TOWN	RD	WOODBIDGE	22192 PUBLIC STORAGE INC	8292SE	151 Mini Warehousing	3 PUBLIC STORAGE INC PUBLIC STORAGE BLDG A
8391-82-5162	15060 FARM CREEK	DR	WOODBIDGE	22191 TRIDEX ASSOCIATES INC	8391SE	150 Wholesale Warehousing	4 TRIDEX ASSOCIATES INC TRIDEX MACHINE SHOP/WAREHOUSE
8193-30-7146	4383 RIDGEWOOD CENTER	DR	WOODBIDGE	22192 PFITZNER G RICHARD TR	8193SW	216 Auto Parking	3 PFITZNER G RICHARD TR
7595-58-6956	11250 INDUSTRIAL	RD	MANASSAS	20109 KALOS PETER VERON L KALOS	7595NE	190 Other Industrial	4 COSTA ENTERPRISES LLC

7896-17-1798	8501 MAPLEWOOD	DR	MANASSAS	20111 BEATTY FAMILY LP	7896NW	216 Auto Parking	3 BEATTY FAMILY LP	
8393-01-9573	2219 OLD BRIDGE	RD	WOODBIDGE	22192 TACKETTS MILL CENTER LLC	8393SW	311 Small Shopping Center	3 TACKETT'S MILL CENTER LLC	TACKETTS MILL
7697-14-7746	7651 STREAM WALK	LN	MANASSAS	20109 E A SOUTHEAST LTD PTNSHP	7697NW	313 Shopping Center	3 AMCB MANASSAS PROMENADE LLC	MANASSAS PROMENADE
8291-58-4206	14142 SMOKETOWN	RD	WOODBIDGE	22192 PRINCE WILLIAM SQUARE INVESTORS LLC	8291NE	313 Shopping Center	3 PRINCE WILLIAM SQUARE INVESTORS LLC	PW SQUARE
8392-05-3846	13455 TELEGRAPH	RD	WOODBIDGE	22192 PWC BOARD OF COUNTY SUPERVISORS	8392NW	216 Auto Parking	3 PWC BOARD OF COUNTY SUPERVISORS	
8392-87-7647	13249 OCCOQUAN	RD	WOODBIDGE	22191 AMETHYST COMPANY LLC	8392NE	311 Small Shopping Center	3 AMETHYST COMPANY LLC	WOODBIDGE SQUARE
7300-54-9159	14050 SHELTER	LN	HAYMARKET	20169 LATHAM CARROLL H AND MARY ANNE L	7300SE	911 Agricultural Resources	3 LATHAM FAMILY LAND LLC	
8192-40-8479	4300 DALE	BL	WOODBIDGE	22193 TRUSTEES OF THE IRENE V HYLTON CHARITABL	8192SW	351 Restaurant	3 GLENDALE PLAZA LLC	PIZZA HUT
8393-11-8693	12700 MINNIEVILLE	RD	WOODBIDGE	22192 EXXON CORPORATION	8393SW	344 Convenience Store with Gas	4 SOUTHSIDE OIL LLC	CAR WASH
7595-83-2458	10040 SOWDER VILLAGE	SQ	MANASSAS	20109 INNOVATION E AND A LLC	7595SE	313 Shopping Center	3 INNOVATION (E&A) LLC	RED ROBIN
7595-46-9946	9480 CONTRACTORS	CT	MANASSAS	20109 BROAD RUN DEVELOPMENT LLC	7595NE	190 Other Industrial	4 TRANSATLANTIC REALTY LLC	INDUSTRIAL SHELL
7595-56-3112	9520 CONTRACTORS	CT	MANASSAS	20109 BROAD RUN DEVELOPMENT LLC	7595NE	190 Other Industrial	4 FMJS COMMERCIAL PROPERTIES LLC	BROAD RUN BUSINESS
8191-59-7049	4176 DALE	BL	WOODBIDGE	22193 TRUSTEES OF THE IRENE V HYLTON CHARITABL	8191NE	312 Shopping Center	3 FORESTDALE PLAZA LLC	FORESTDALE PLAZA
8092-43-9145	5301 DALE	BL	WOODBIDGE	22193 PWC PARK AUTHORITY	8092SW	841 Swimming Pool	3 PWC BOARD OF COUNTY SUPERVISORS	DALE CITY
8292-70-7645	2860 POTOMAC MILLS	CL	WOODBIDGE	22192 POTOMAC MILLS OPERATING CO LLC	8292SE	315 Large Mall	3 MALL AT POTOMAC MILLS LLC	POTOMAC MILLS PHASE 3
8292-70-0588	14070 WORTH	AV	WOODBIDGE	22192 RED ROBIN INTERNATIONAL INC	8292SE	351 Restaurant	3 RED ROBIN INTERNATIONAL INC	RED ROBIN
8291-79-1954	2700 POTOMAC MILLS	CL	WOODBIDGE	22192 POTOMAC MILLS OPERATING CO LLC	8291NE	315 Large Mall	3 MALL AT POTOMAC MILLS LLC	POTOMAC MILLS I&II
8091-45-7860	14640 MINNIEVILLE	RD	WOODBIDGE	22193 ZP NO 44 LLC	8091NW	311 Small Shopping Center	3 ZP NO. 44 LLC	STAPLES MILL SC
7896-16-8253	8391 CENTREVILLE	RD	MANASSAS	20111 ABDI PARVIZ AND MAHBOUBEH SAEEDI	7896NW	390 Retail	3 8391 CENTREVILLE ROAD LLC	CARPET GALLERY
7495-77-7361	12691 BRAEMAR VILLAGE	PZ	BRISTOW	20136 BRAEMAR SHOPPING CENTER LLC	7495NE	311 Small Shopping Center	3 CAR BRAEMAR VILLAGE LLC	BRAEMAR SHOPPING CTR
8293-04-2120	3314 OLD BRIDGE	RD	WOODBIDGE	22192 OLD BRIDGE RETAIL INVESTMENTS LLC	8293SW	313 Shopping Center	3 OLD BRIDGE RETAIL INVESTMENTS LLC	FESTIVAL AT OLD BRIDGE
7696-30-1623	10850 PYRAMID	PL	MANASSAS	20110 ARE VIRGINIA NO 2 LLC	7696SW	140 Research and Testing	2 COMMONWEALTH OF VA DEPT OF FORENSIC SCIENCE	VIRGINIA FORENSICS LAB
7496-60-1866	9100 DEVLIN	RD	BRISTOW	20136 BRISTOW COMMONS LLC	7496SE	313 Shopping Center	3 BC PLAZA LLC	Building 3
7497-12-0220	7800 PROGRESS	CT	GAINESVILLE	20155 WMB LC	7497SW	190 Other Industrial	4 WMB LC	BERGER BUILDING
8093-72-2873	12601 GALVESTON	CT	MANASSAS	20112 HOADLY REGENCY LLC	8093SE	311 Small Shopping Center	3 HOADLY REGENCY LLC	HARRIS TEETER
7296-19-0372	7900 CRESCENT PARK	DR	GAINESVILLE	20155 MADISON CRESCENT RETAIL LLC	7296NW	313 Shopping Center	3 MADISON CRESCENT RETAIL LLC	MADISON CRESCENT BUILDING B
7595-58-7311	11301 INDUSTRIAL	RD	MANASSAS	20109 TECHNOLOGY LEASING CONSULTANTS INC	7595NE	190 Other Industrial	4 TECHNOLOGY & LEASING CONSULTANTS INC	ACUTY AUDIO VISUAL
8291-94-2928	2401 OPITZ	BL	WOODBIDGE	22191 DIAMOND POTOMAC TOWN CENTER LLC	8291SE	314 Large Mall	3 DIAMOND POTOMAC TOWN CENTER LLC	BLDG 1 - EYE DOCTOR
8393-23-6788	12500 CLIPPER	DR	WOODBIDGE	22192 THOUSAND OAKS TOWNHOUSE ASSOC	8393SW	841 Swimming Pool	3 THOUSAND OAKS TOWNHOUSE ASSOC	COMMUNITY POOL
7696-85-6632	8500 SUDLEY	RD	MANASSAS	20109 ABEL FAMILY LTD PARTNERSHIP LLP	7696NE	361 Motor Vehicle Sales	3 ABEL FAMILY LIMITED PARTNERSHIP LLP	MILLER TOYOTA
7497-12-6630	7755 PROGRESS	CT	GAINESVILLE	20155 BILLYS LLC	7497SW	190 Other Industrial	4 PROGRESS COURT LLC	FANNON OIL
8391-51-7302	1851 RIPPON	BL	WOODBIDGE	22191 PWC SERVICE AUTHORITY	8391SE	224 Sewage	2 PWC SERVICE AUTHORITY	H.L. MOONEY
8292-34-8341	13470 MINNIEVILLE	RD	WOODBIDGE	22192 SOLANO NELIDA & ITALO F TRS	8292SW	352 Restaurant	3 SOLANO NELIDA J & ITALO F SOLANO TRS	EL POLLO RICO
8191-06-5175	14410 MINNIEVILLE	RD	WOODBIDGE	22193 TRAVERS GUY CHRISTOPHER	8191NW	343 Convenience Store	2 TRAVERS GUY CHRISTOPHER	7-ELEVEN
8093-73-7672	5019 DAVIS FORD	RD	WOODBIDGE	22192 CREST LIMITED PARTNERSHIP	8093SE	150 Wholesale Warehousing	4 CREST LIMITED PARTNERSHIP	PALM POOLS

FID	STRUC_ID	OUTFALL
41	21270	24
158	21517	15
534	20186	30
536	20188	24
652	19942	36
655	19950	24
818	20789	15
827	17878	0
852	30228	15
1059	18570	21
1065	18576	12
1070	18588	36
1075	18593	27
1630	16261	30
1886	15542	0
1944	14926	0
2176	15305	15
2570	32176	18
2756	11631	0
2764	12308	0
2798	12353	21
2800	12355	15
3013	60379	36
3301	11361	18
3304	11366	8
3382	11707	15
3561	27032	0
3682	4722	15
3683	4724	18
3947	9761	15
3969	9843	15
3972	10321	36
3973	10322	0
3974	10323	36
3975	10324	0
3976	10325	12
3978	10327	30
4101	10033	48
4186	9482	42
4789	2279	228
5004	36226	18
5007	34453	24
5662	36869	24
5671	36828	15
6267	37801	0
6291	37374	24

6426	27777	0
6543	36874	15
6545	37690	27
6565	37660	15
6848	8399	15
7291	32345	15
7369	61713	0
7378	61717	0
7426	61707	0
7430	61711	0
8067	956	0
8457	4429	36
8932	35986	42
8937	36087	24
8939	36069	18
8966	35934	0
8974	35905	21
9532	2295	15
9533	2311	24
9620	30650	66
9696	37976	15
9740	37973	0
9741	18854	0
9807	30709	0
9818	30720	60
9890	25177	15
9899	25199	36
10012	38703	0
10047	37974	15
10056	37986	15
10145	40728	0
10146	40729	15
10267	31940	0
10268	31942	0
10372	39737	18
10376	39743	15
10381	40742	36
10412	14975	36
10476	25755	0
10538	26012	0
10539	26014	0
10540	26017	0
10593	33082	48
10623	39748	15
10632	39699	18
10637	39753	15
10639	39705	15

10648	39714	24
10653	39719	15
10876	34159	41
10877	34163	42
10970	39722	15
11006	39413	15
11164	26774	42
11165	26776	36
11439	26876	0
11555	41239	48
11811	36824	42
12124	36793	15
12413	28284	60
12445	39375	24
12457	37980	12
12786	37964	15
12794	19553	0
12805	34733	0
12811	37975	0
12970	23443	36
13366	39287	36
13611	24019	36
13731	38247	21
13894	2394	18
14069	19554	15
14268	30155	42
14565	51105	30
14799	7558	18
14805	7574	0
15254	51141	30
15363	19919	36
15379	19946	18
15397	11488	0
15413	4263	18
15420	4368	0
15429	4437	18
15434	4457	0
15855	19316	15
15874	13639	48
15888	13580	15
15933	26655	135
16198	13811	24
16199	13813	15
16225	30625	0
16226	30626	80
16594	9759	21
16618	9795	33

16619	9797	15
16650	9871	42
16658	9882	21
16668	9874	15
16800	27474	23
17106	41551	0
17526	9465	21
17845	8397	15
18366	21282	36
18513	16264	0
18517	16270	36
18518	16272	30
19626	11009	0
19847	34739	27
19854	38615	42
20770	34735	0
20797	18855	15
20807	38073	21
21437	31024	0
21438	31025	48
21570	27139	15
21671	35935	121
21686	35932	18
21688	35896	21
21698	39443	15
21803	46092	0
21821	46110	24
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21940	36025	15
21950	35901	18
21959	12262	21
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22059	40053	15
22267	36341	18
22356	39906	15
22572	36424	47
22970	37363	48
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23283	37344	24
23522	2278	0
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26463	42330	42
26468	42335	18
26481	42348	21
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26568	25185	36
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27013	35489	15
27199	25756	53
27259	29576	27
27400	23686	30
27527	26013	24
27528	26016	0
27529	26015	18
27530	26018	36
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28499	26775	0
28533	30153	0
28621	41817	72
28749	26873	0
28751	26877	18
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29075	27128	48
29773	14979	15
30528	22257	24
30529	22350	0
30531	22352	24
30549	22373	15
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30552	22376	24
30733	14388	24
30734	14391	15
31063	31048	72
31463	12795	60
31545	45846	0

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31547	45848	0
31551	45852	18
31554	45855	15
31555	45856	0
32076	19769	30
32079	19772	21
32080	19789	0
32081	19796	46
32082	19809	30
32083	19822	18
32287	43448	30
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32290	43451	0
32428	31941	18
32715	29827	24
32820	42563	36
32822	42565	36
32958	44481	15
33105	45337	0
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33111	45341	0
33112	45342	15
33248	34912	18
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33381	12969	18
33397	32955	0
33487	8392	15
33637	44484	0
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33649	36534	0
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33968	36535	18
33985	36110	15
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34646	14338	42
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36493	13197	0
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36501	13205	21
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36933	31045	21
38013	46739	0
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38016	46742	15
38293	27770	0
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38462	33077	48
38479	48353	15
38488	48362	21
38525	48403	39
38528	48406	15
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39023	43434	48
39046	47150	18
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39464	5523	24
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39805	10513	0
39807	10521	15
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40496	4161	27
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43316	4535	144
43319	4538	21
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43529	2678	0
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43531	2680	0
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44423	2007	18
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44682	3188	0
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45069	51726	30
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46415	40175	48
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46555	32959	36
46751	52159	0
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46904	25531	53
46945	28197	48
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47235	29077	18
47239	30238	18
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51180	57668	30
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52396	30865	84
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58015	4718	0
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58537	59734	36
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60196	26106	15
60376	64095	21
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60537	64181	21
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60735	63043	54
61074	52341	0
61543	62841	24
61788	62906	54
62021	62984	54
62036	62994	30
62396	8565	15
62877	14650	18
63079	63185	36
63263	63203	30

63566	63338	0
63568	63340	15



COUNTY OF PRINCE WILLIAM
5 County Complex Court, Suite 170
Prince William, Virginia 22192-5308
(703) 792-7070 Metro 631-1703
FAX: (703) 792-6297

**DEPARTMENT OF
PUBLIC WORKS**

Environmental
Services Division

Thomas Bruun
Director

January 19, 2016

Ms. Susan Mackert
Regional Industrial Stormwater Coordinator
Virginia Department of Environmental Quality
Northern Regional Office
13901 Crown Court
Woodbridge, VA 22193

Reference: American Auto Salvage Permit No. VAR051939
14210 Jefferson Davis Highway
Woodbridge, VA 22191

Dear Ms. Mackert:

In accordance with Part I.B.g)5) of Prince William County's Municipal Separate Storm Sewer System (MS4) permit (No: VA0088595), "the permittee shall refer the following facilities to the Department of Environmental Quality, Northern Regional Office, for DEQ compliance review under the Virginia Water Control Law:

- (a) Facilities and operations having non-stormwater discharges that do not have coverage under an existing VPDES permit;
- (b) Facilities and operations identified pursuant to 40 CFR Part 122.26(b)(14) with manufacturing, processing, or raw materials storage outside that do not have coverage under an existing VPDES industrial stormwater permit.
- (c) Any VPDES industrial stormwater permit facility where there is evidence of significant pollutant loadings to the MS4.
- (d) Facilities that do not submit signed copies of DMRs to the permittee as required under a VPDES industrial stormwater permit.

The above referenced facility appears to require a compliance review by DEQ in accordance with part(s) (d) from the above list. American Auto Salvage has failed to submit DMR's to the County, despite the County's Request to do so.

Please report any findings or conclusions regarding this facility to the following address:

Robert Jocz, Environmental Engineer
Prince William County Department of Public Works, Watershed Management Branch
Environmental Services Division
5 County Complex Court, Suite 170
Prince William, VA 22035-0052

We appreciate your cooperation in this matter. Please contact Robert Jocz at 703-792-4797 or Rjocz@pwcgov.org with any questions or concerns you may have regarding the above request.

Sincerely,

Madan Mohan
Watershed Management Branch Chief

cc: Robert Jocz, Environmental Engineer, Watershed Management Branch, Environmental Services Division
County Attorney's Office

VPDES Permitted Facilities

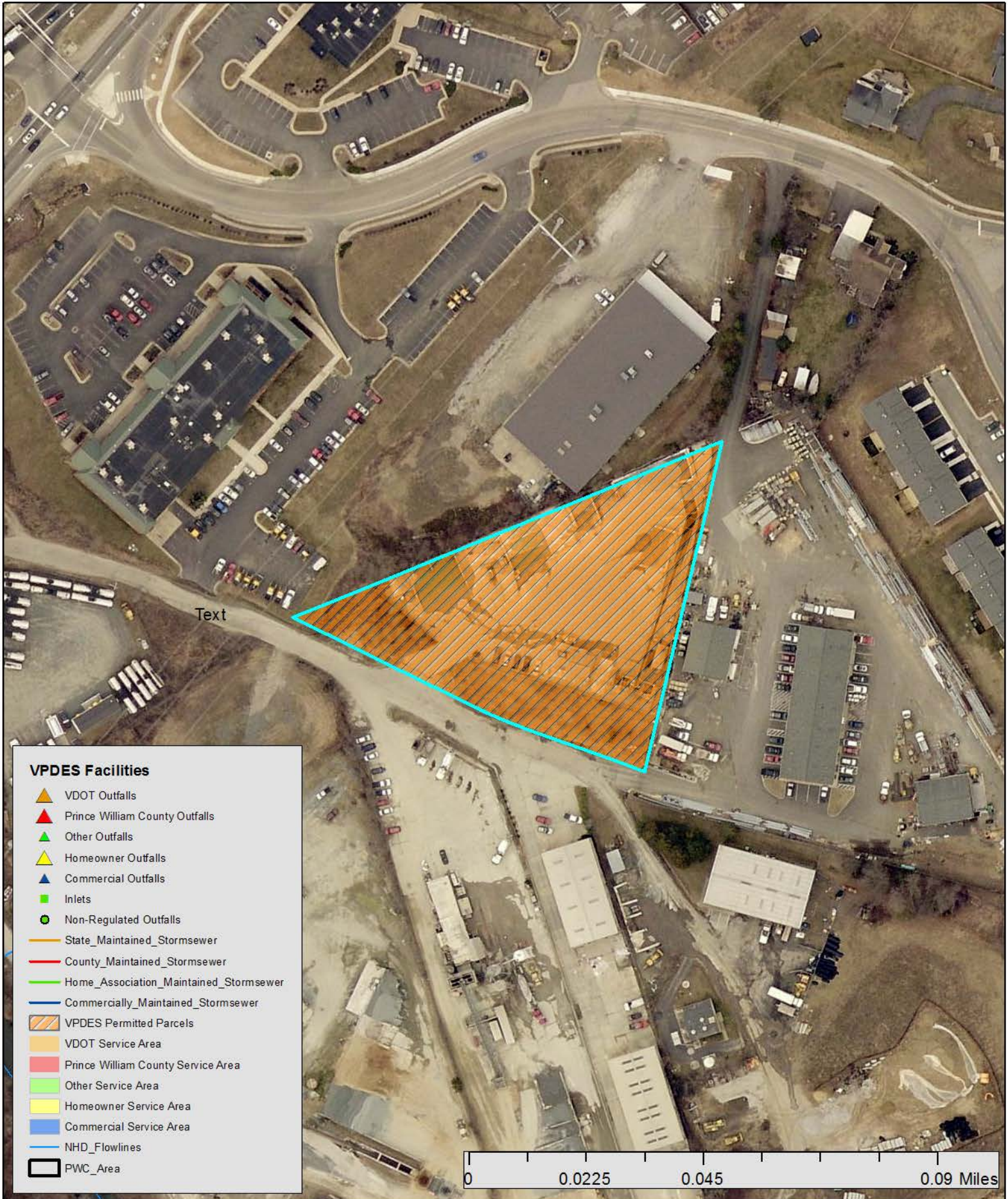
234 Auto and Truck Salvage Limited Liability Company
Permit No: VAR052243



VPDES Permitted Facilities

Aggregate Industries MAR - Dumfries

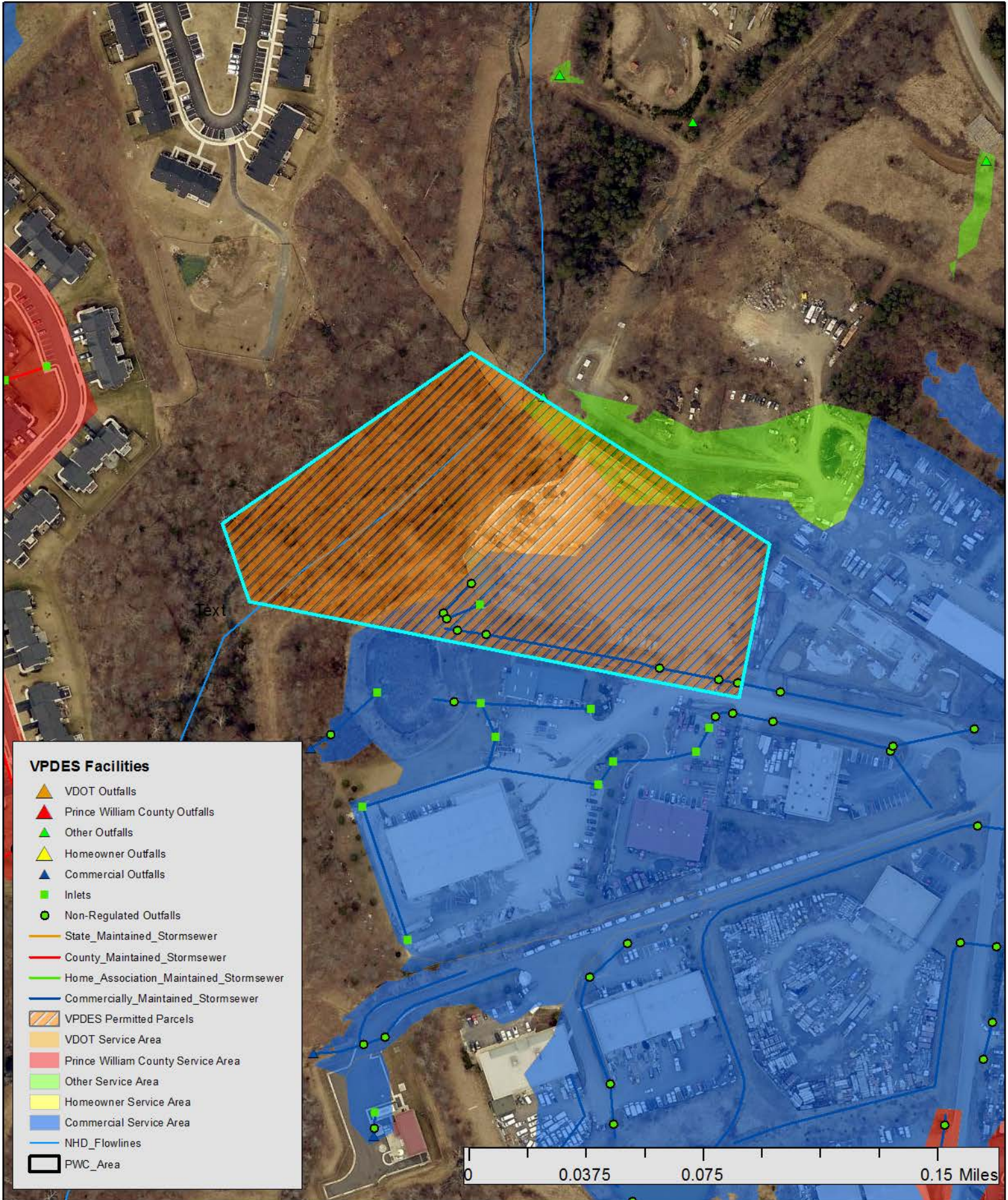
Permit No: VAG110097



VPDES Permitted Facilities

Aggregate Industries MAR - Manassas

Permit No: VAG110111



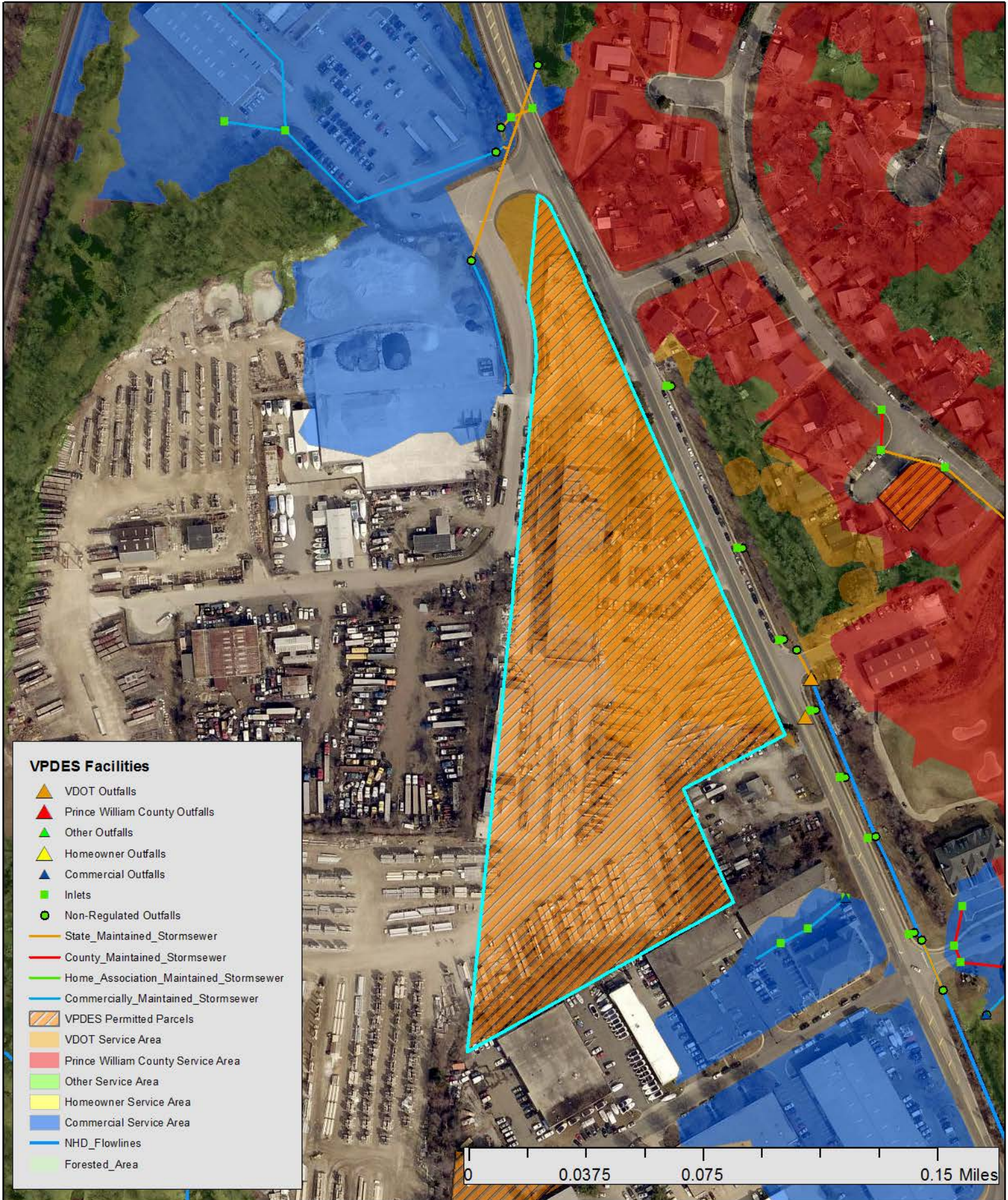
VPDES Permitted Facilities

American Auto Salvage
Permit No: VAR051939



VPDES Permitted Facilities

Arban and Carosi Incorporated
Permit No: VAG110068



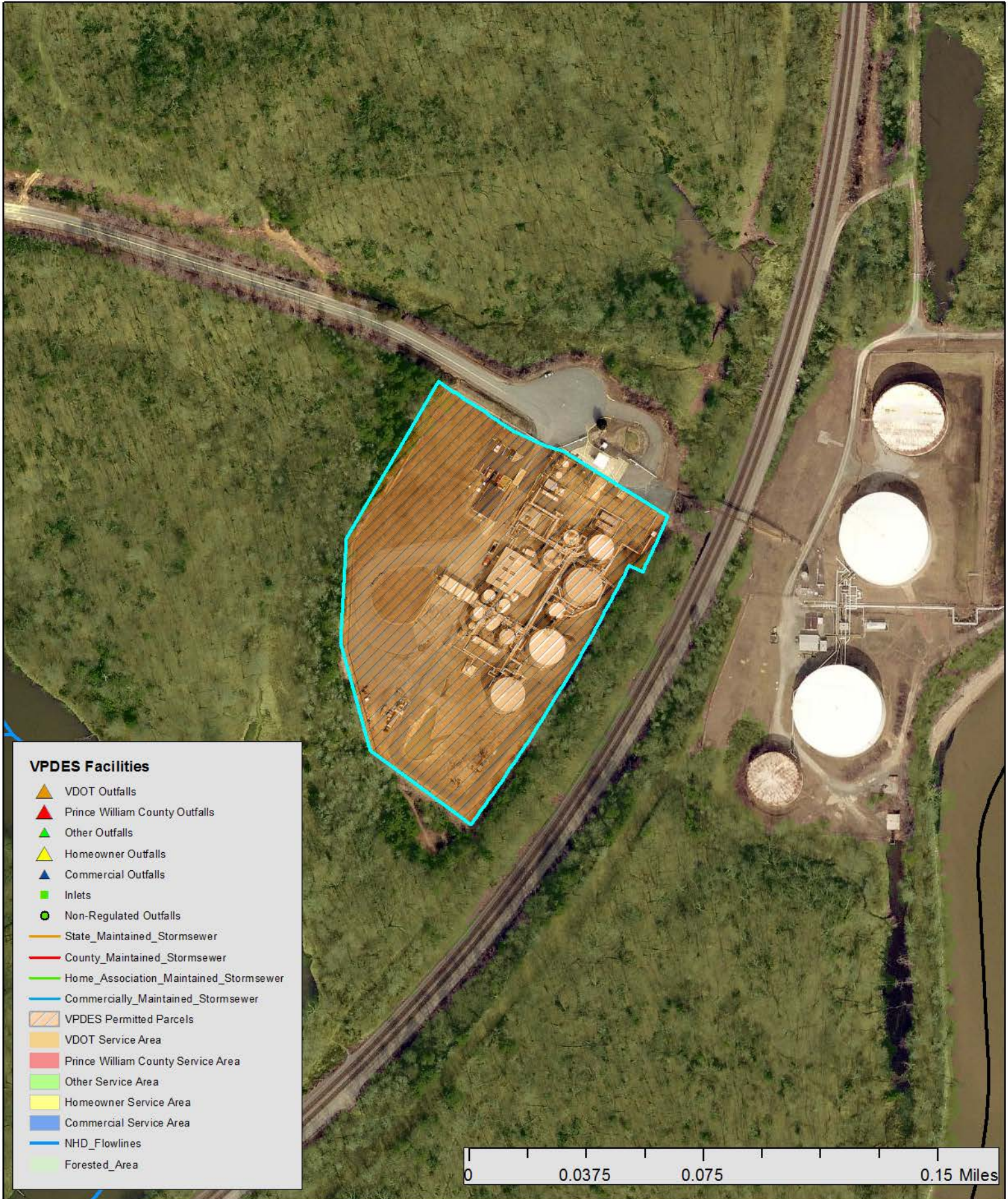
VPDES Permitted Facilities

Asphalt Emulsion Inc
Permit No: VAR051911



VPDES Permitted Facilities

Axeon Specialty Products
Permit No: VAR051039



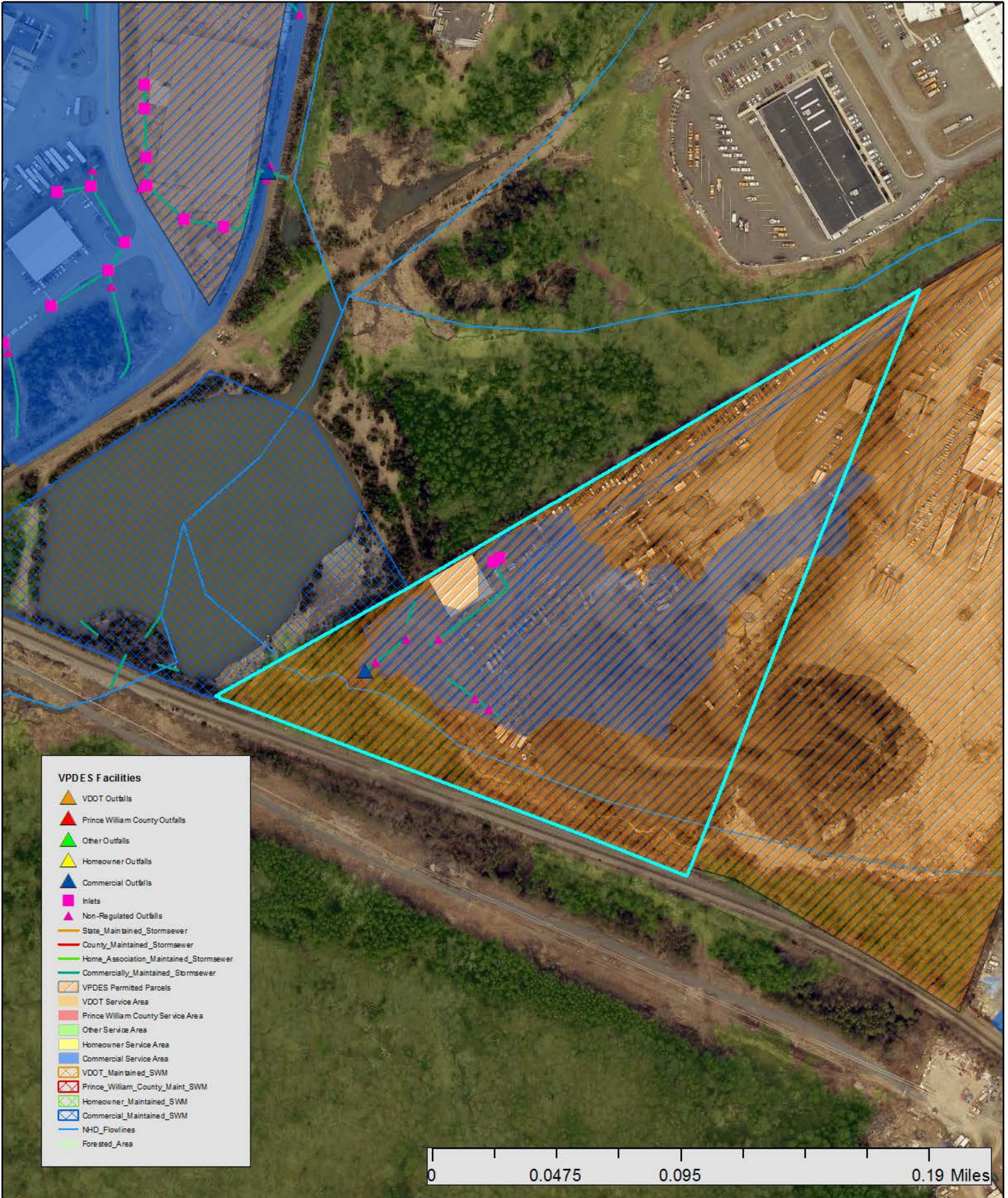
VPDES Permitted Facilities

Betco Supreme Incorporated
Permit No: VAG110312



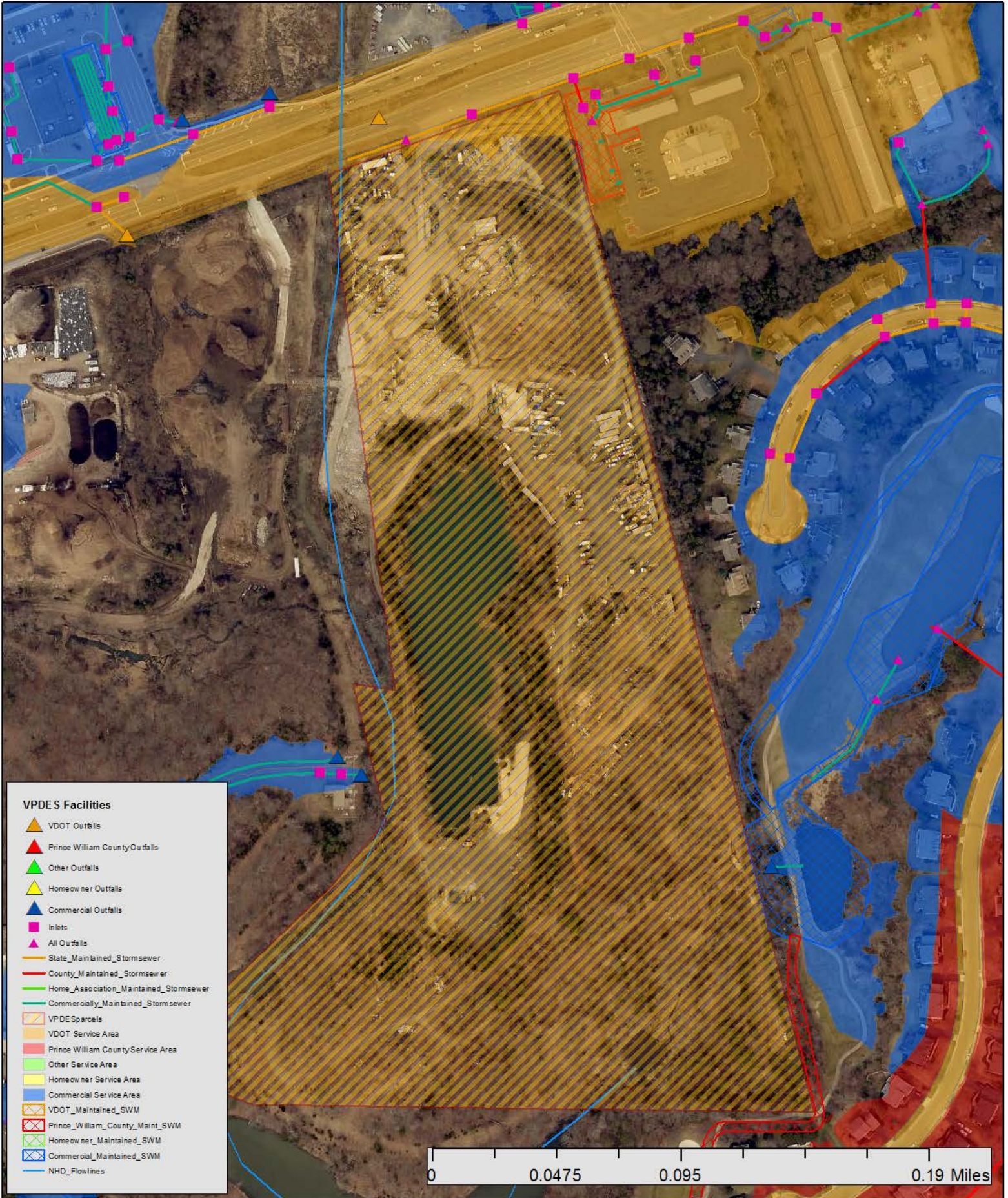
VPDES Permitted Facilities

Branscome Paving Company - Manassas
Permit No: VAR050908



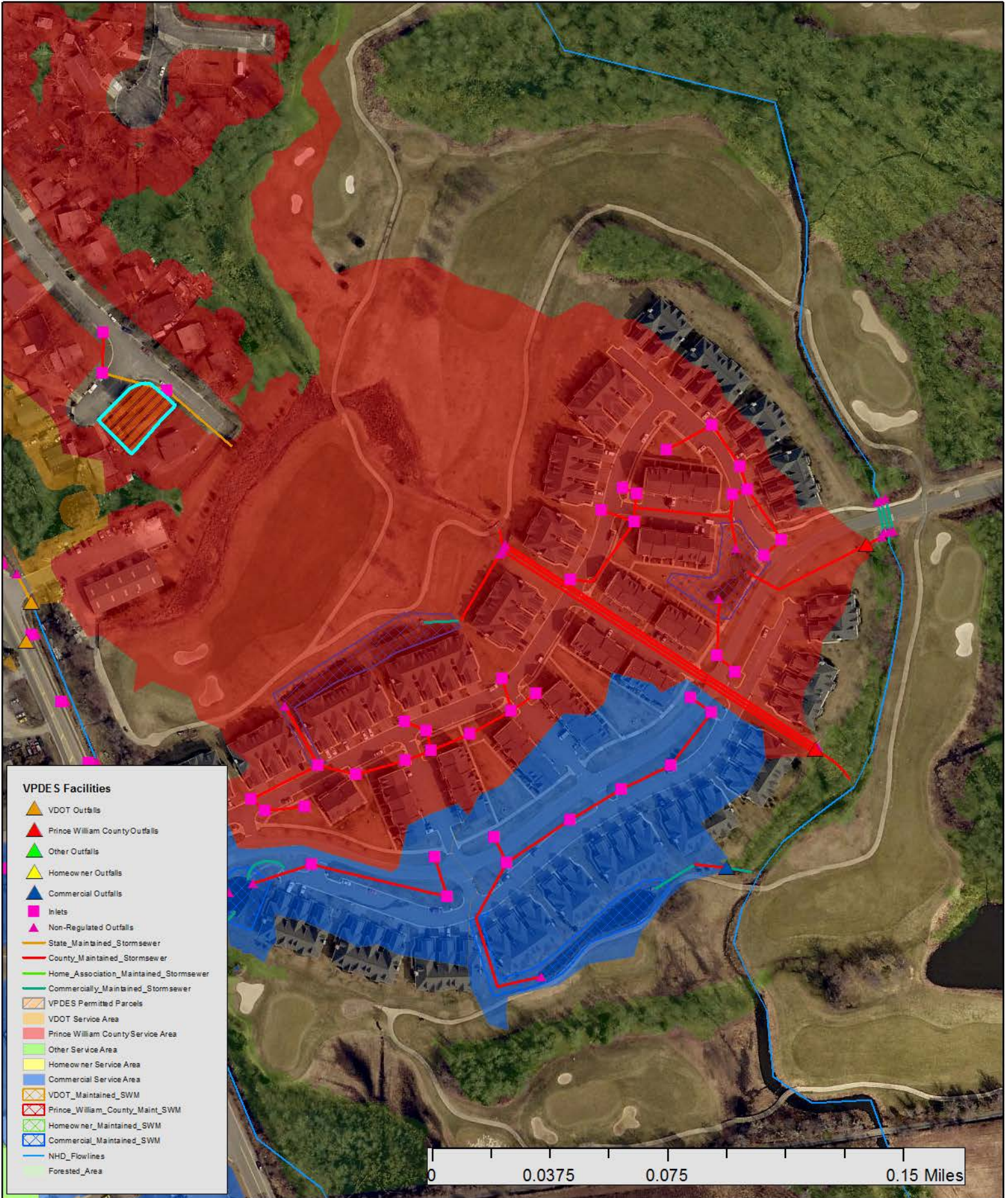
VPDES Permitted Facilities

Chaney Enterprises, LP Gainesville RMC Plant
Permit No: VAG110351



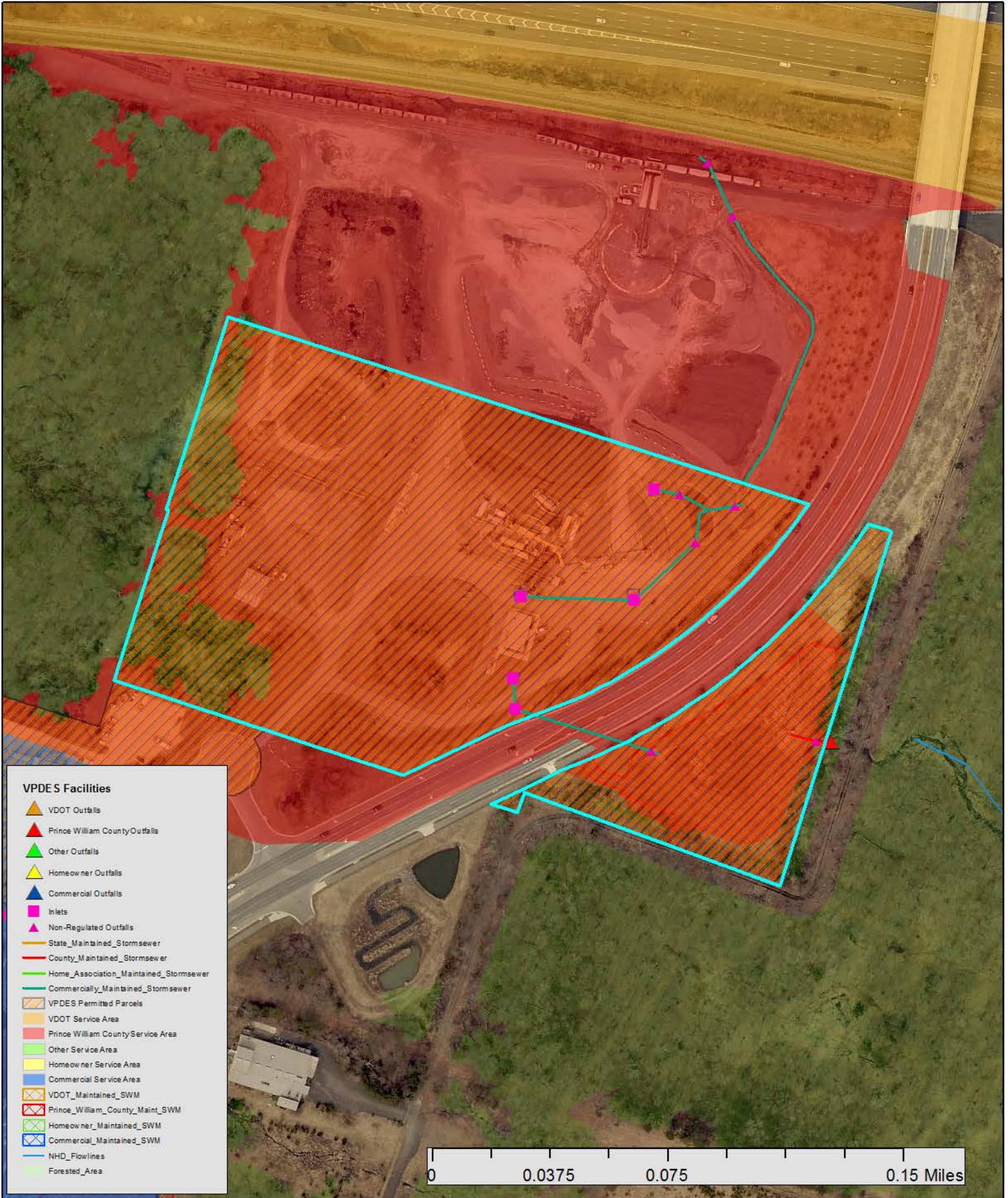
VPDES Permitted Facilities

Chase David D Residence
Permit No: VAG830458



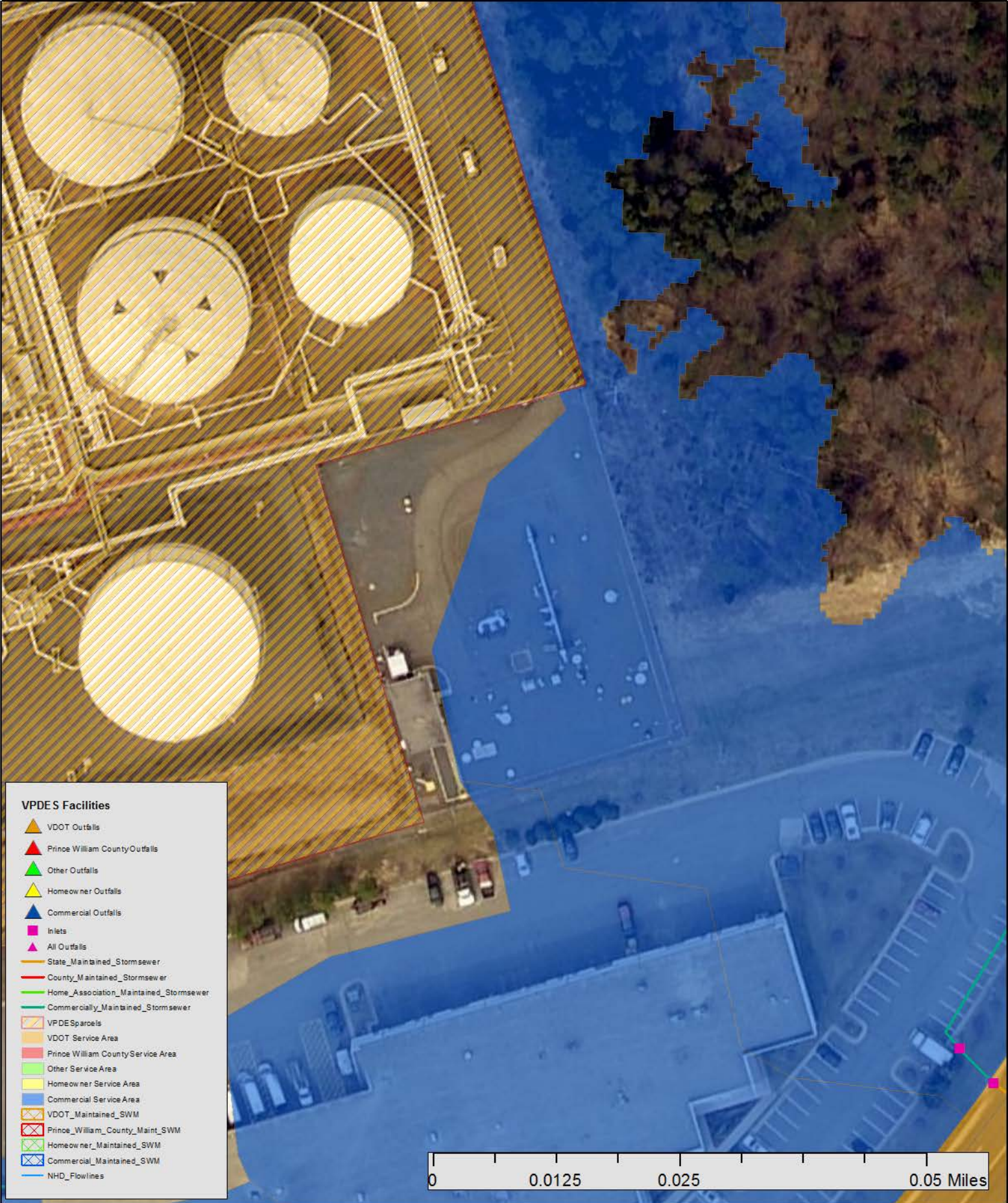
VPDES Permitted Facilities

Chemung Contracting Corporation - Gainesville
Permit No: VAR051949



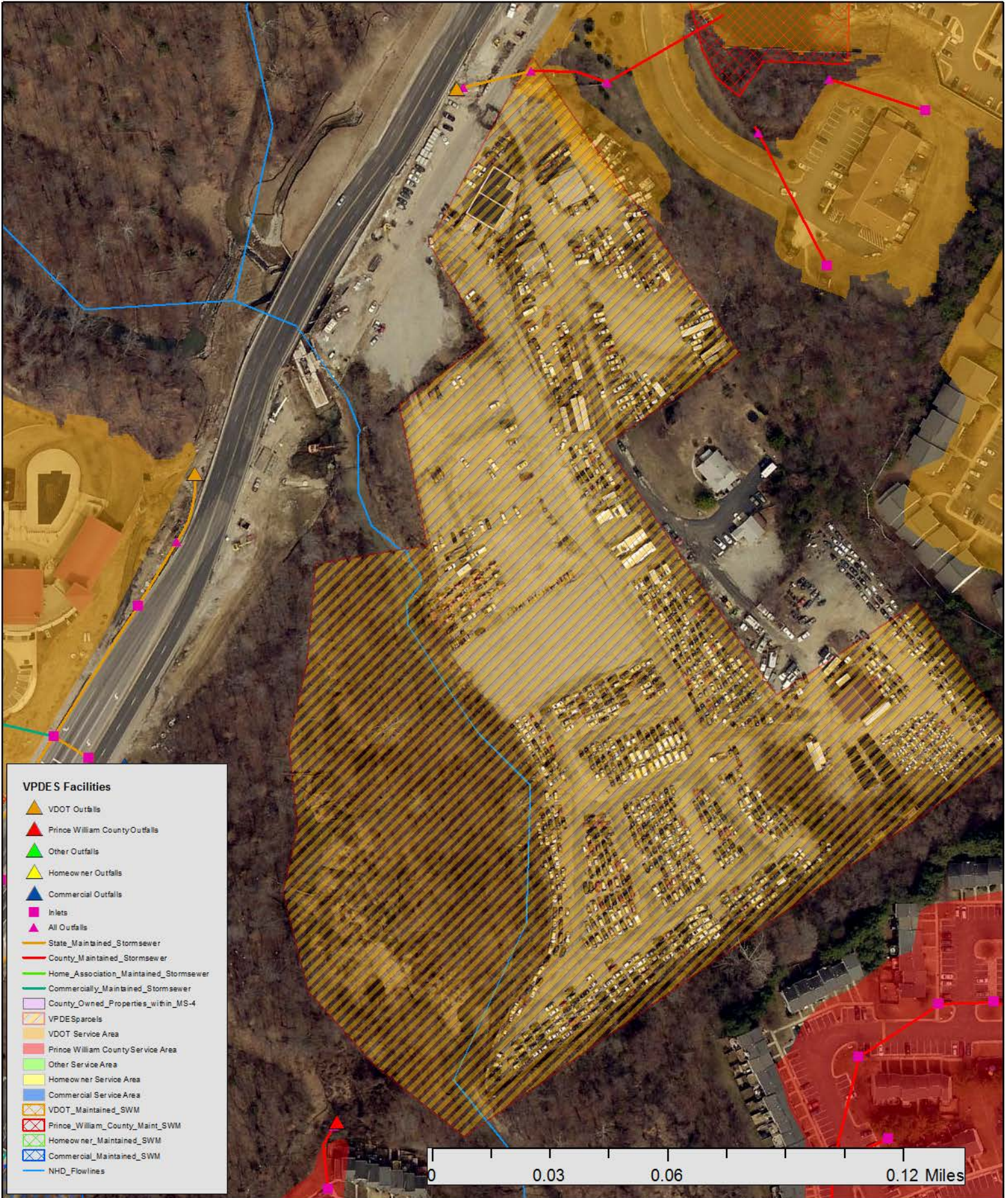
VPDES Permitted Facilities

Colonial Pipeline - Bull Run
 Permit No: NO EXPOSURE



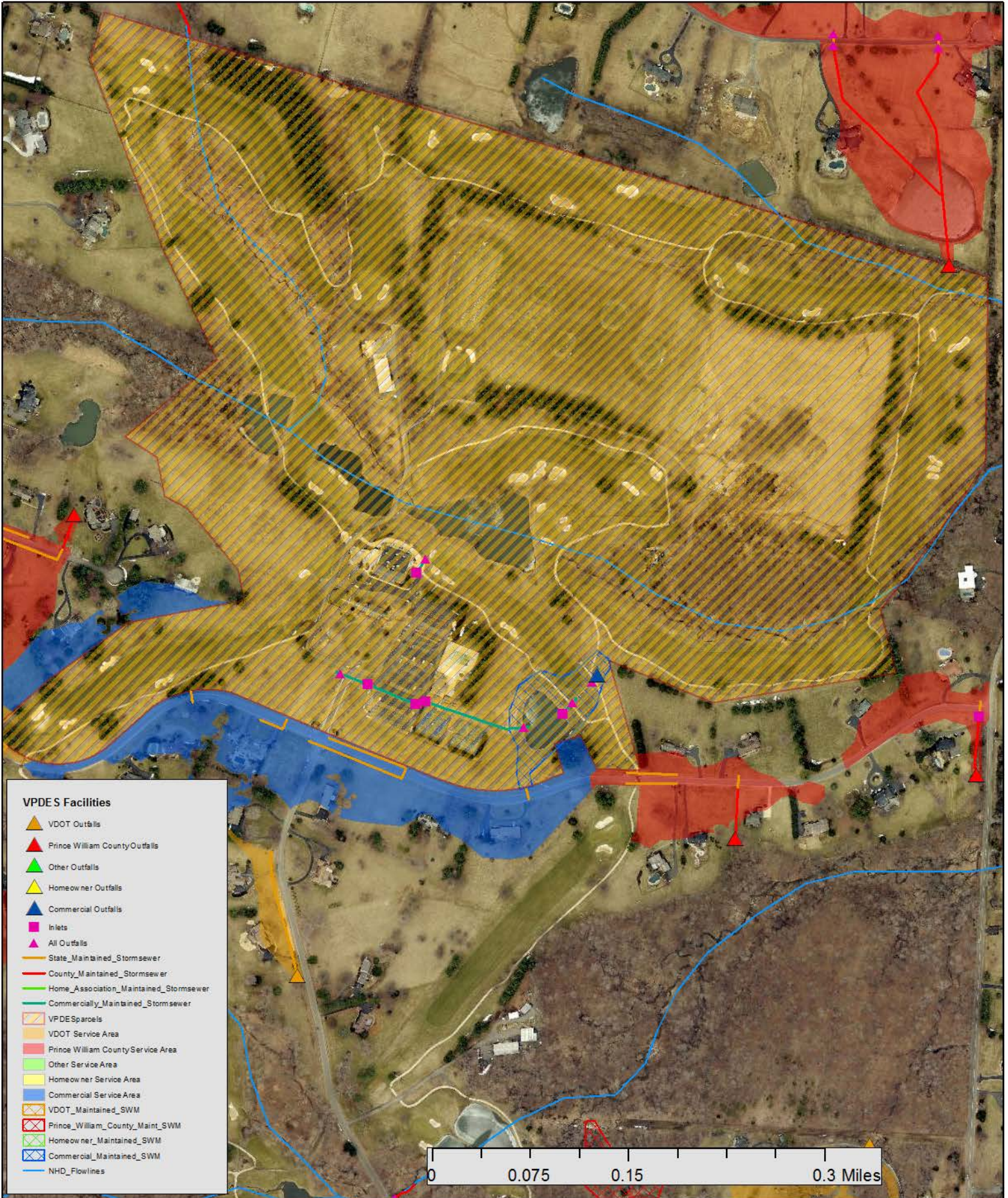
VPDES Permitted Facilities

Double T Automotive Incorporated
Permit No: VAR052014



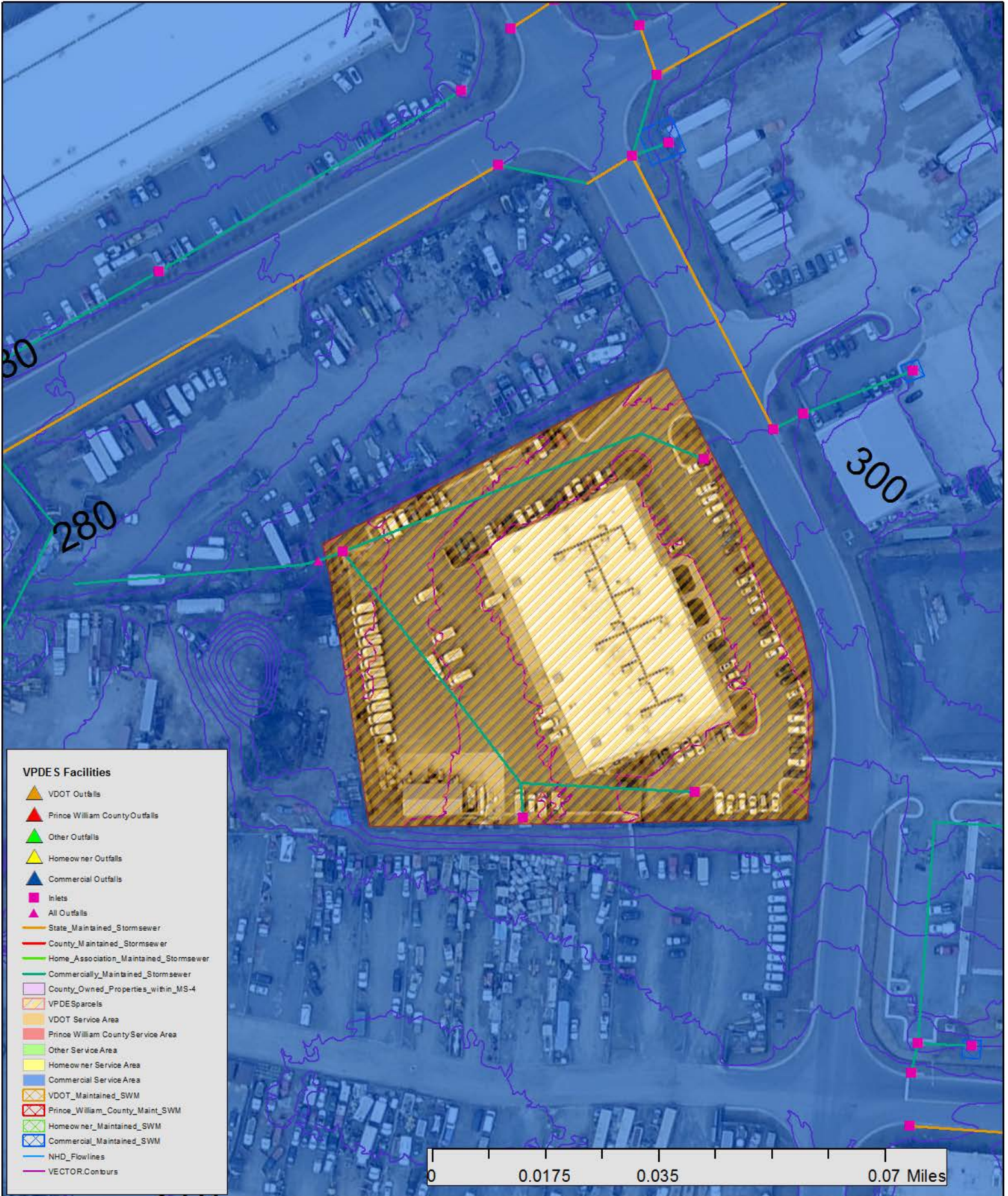
VPDES Permitted Facilities

Evergreen Country Club
Permit No: VA0087891



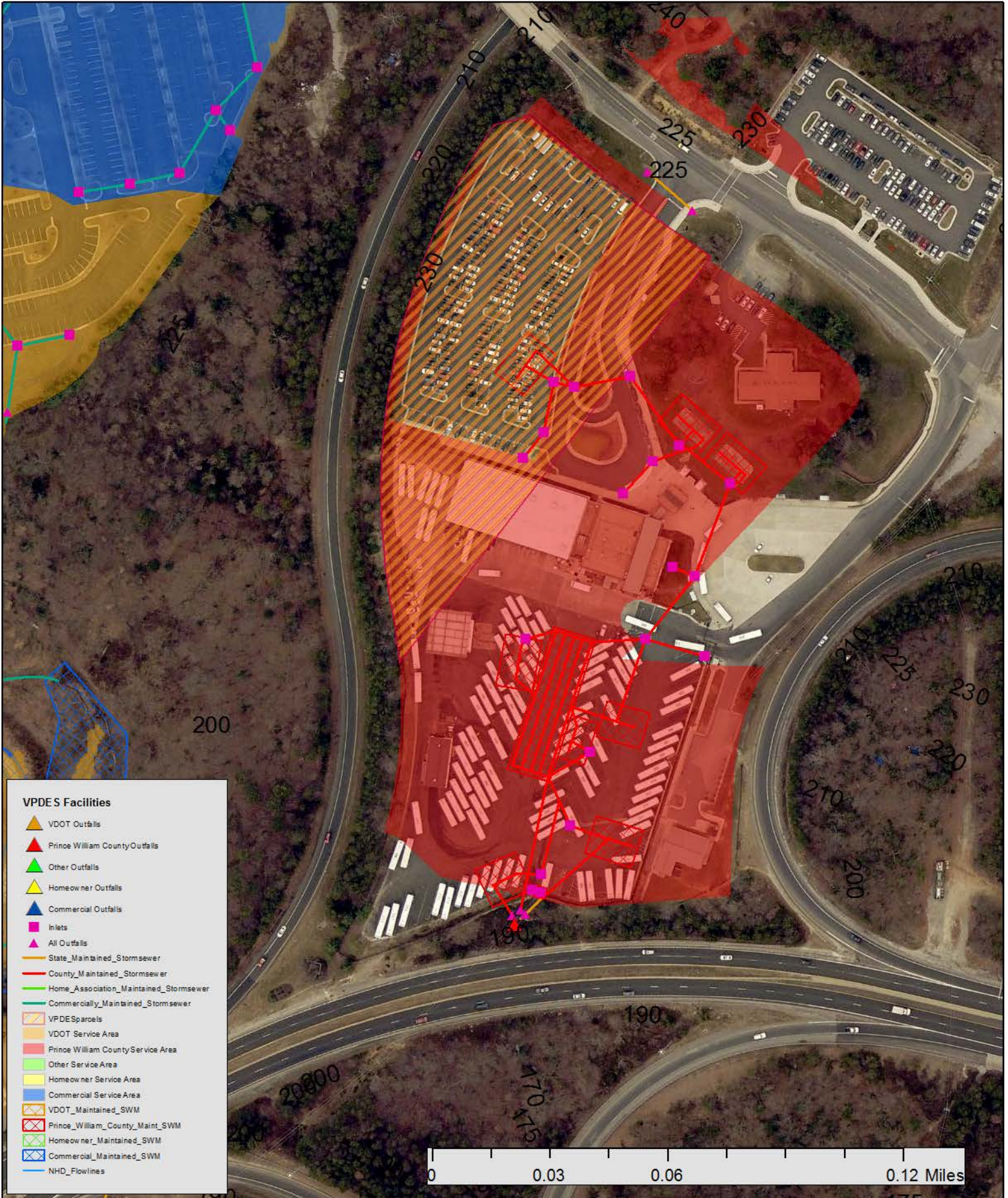
VPDES Permitted Facilities

F H Furr Plumbing Heating and Air Conditioning Inc
Permit No: VAG750237



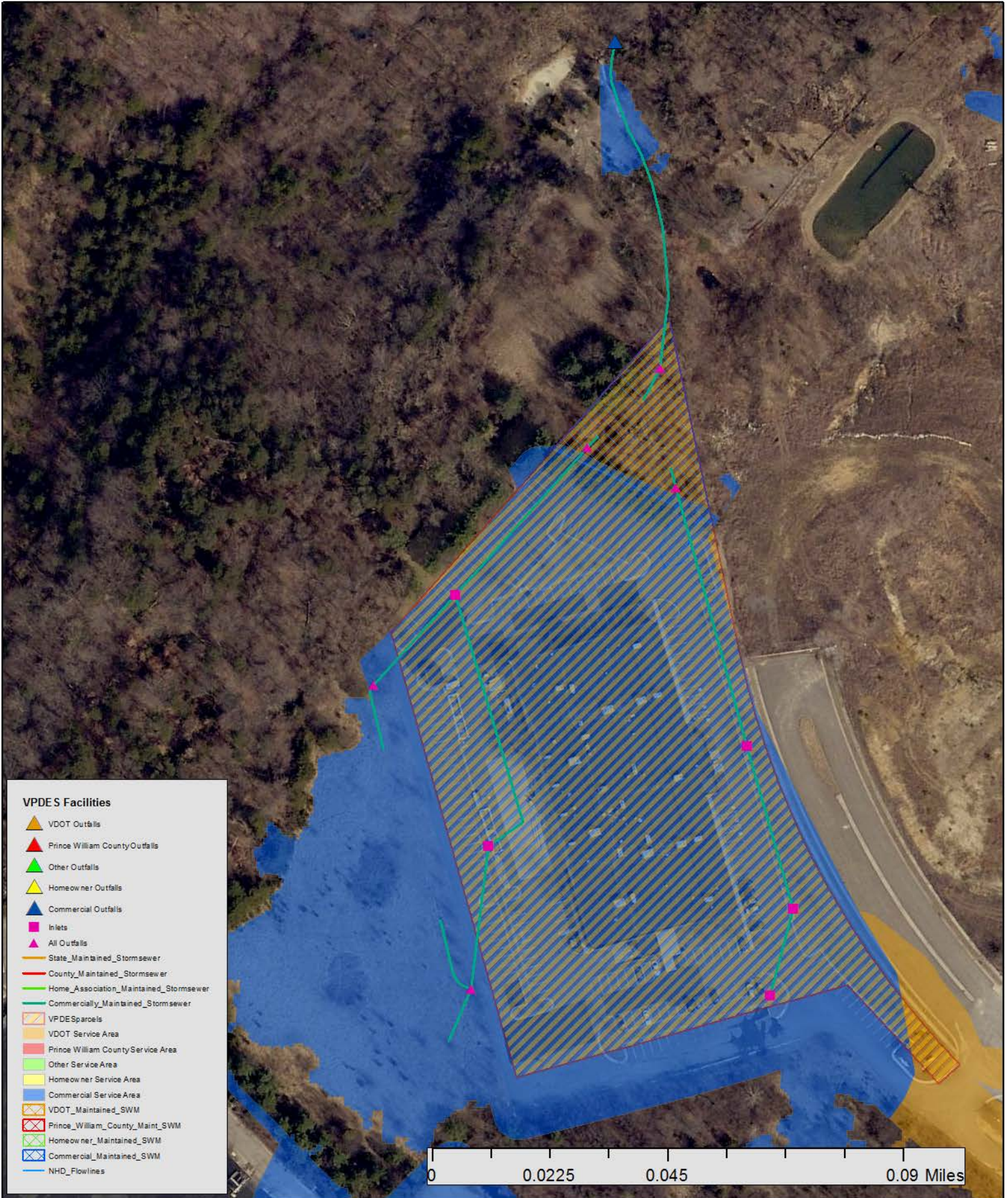
VPDES Permitted Facilities

First Transit Incorporated
Permit No: VAR051477



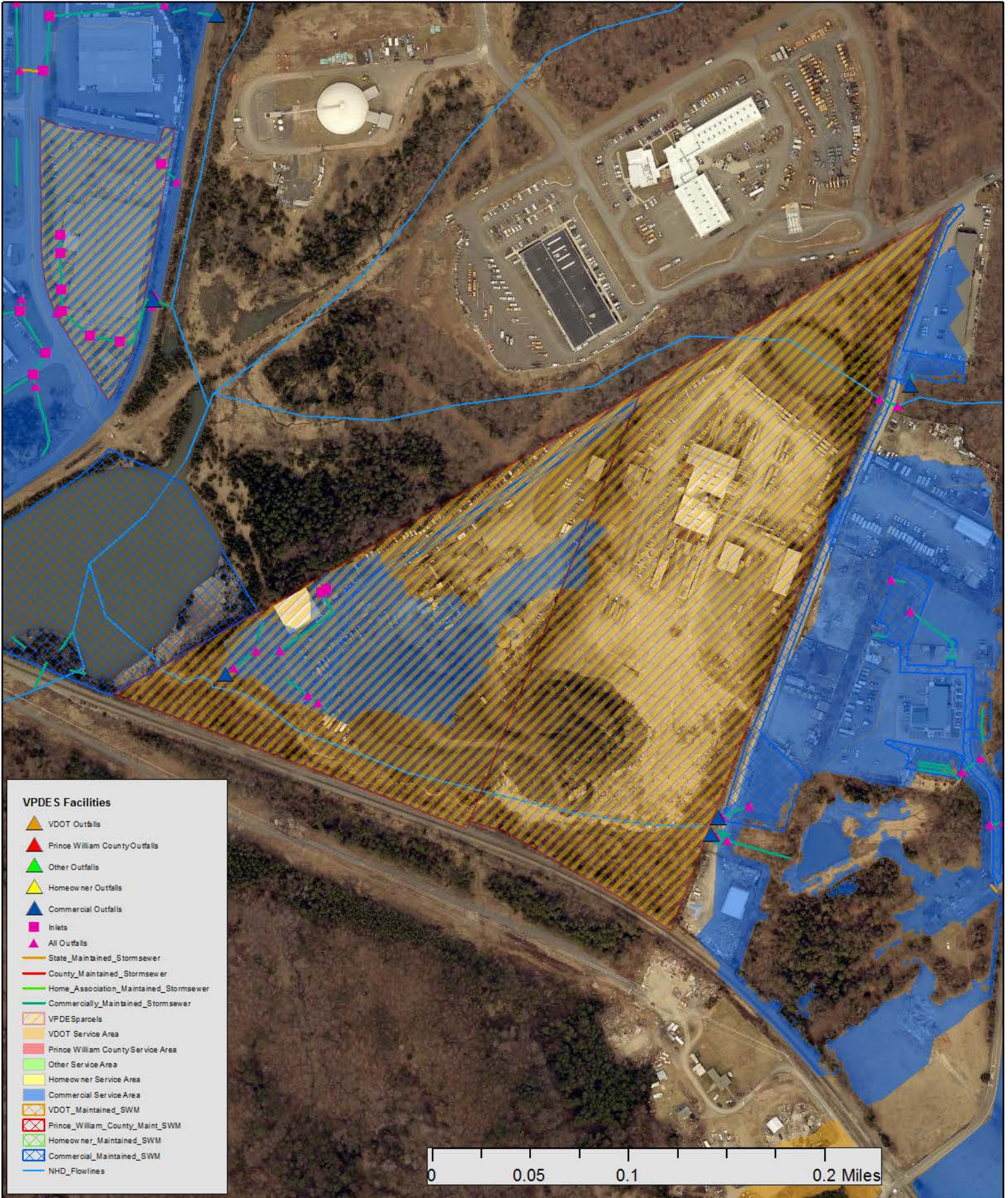
VPDES Permitted Facilities

General Dynamics Amphibious Systems AAV Tech Ctr
Permit No: VAR051293



VPDES Permitted Facilities

Hanson Pipe and Precast Incorporated
Permit No: VAG110313



VPDES Permitted Facilities

Hard Rock Concrete Limited Liability Corporation
Permit No: VAG110067



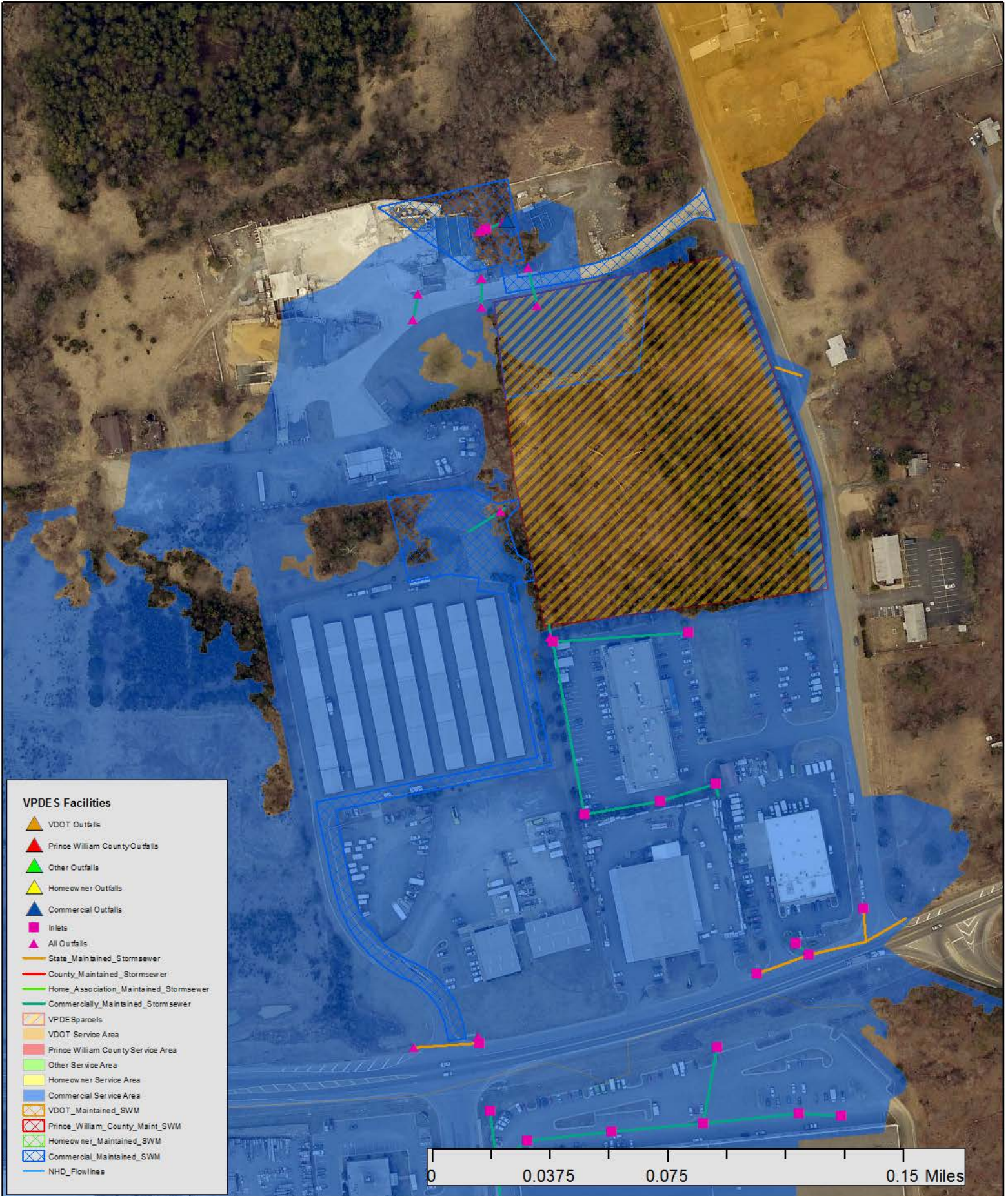
VPDES Permitted Facilities

Hoffmasters Marina
Permit No: VAR051183



VPDES Permitted Facilities

M and F Concrete Incorporated
Permit No: VAR052190




















VPDES Permitted Facilities

Manassas City Water Treatment Plant

Permit No: VA0050181

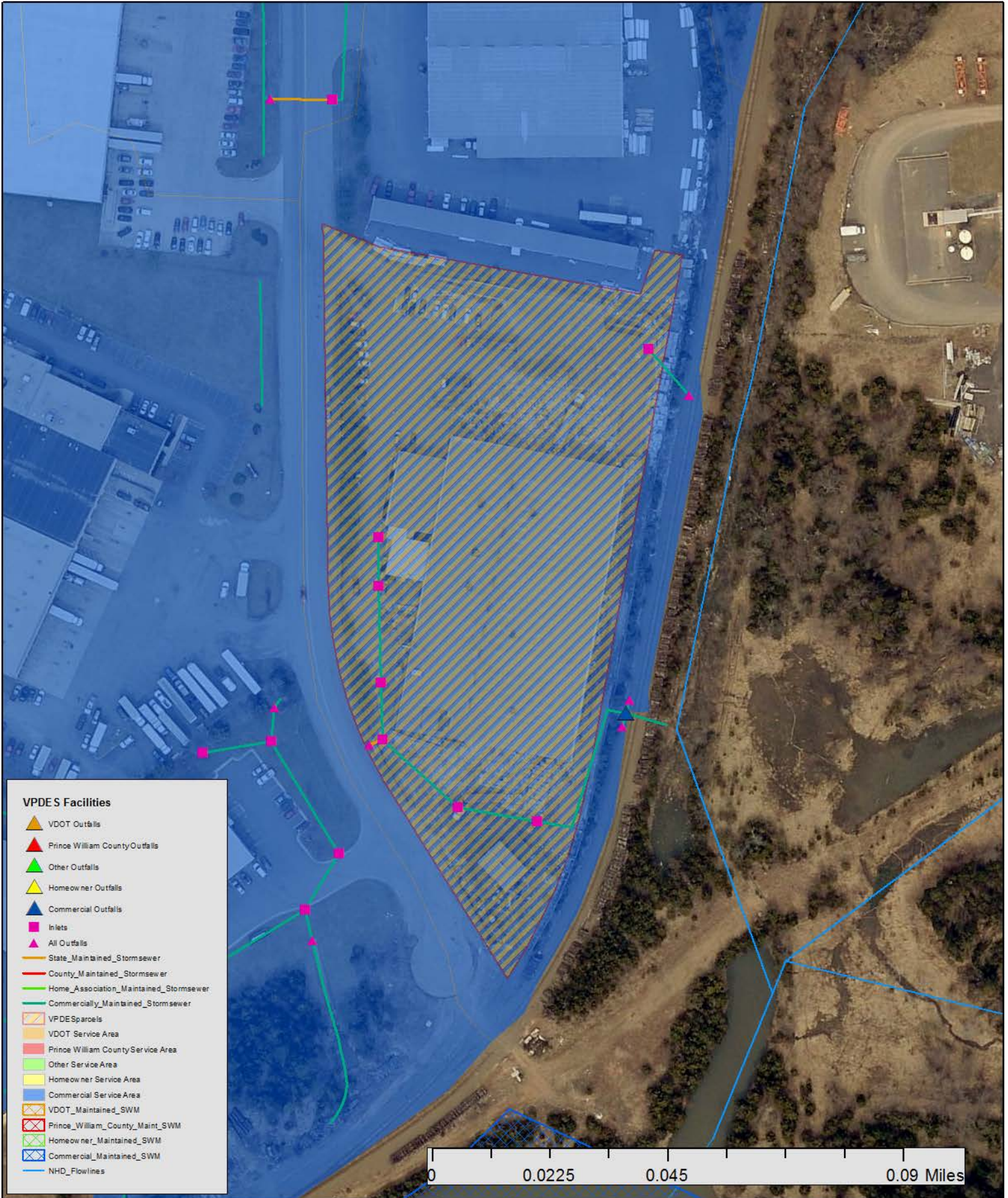


VPDES Facilities

-  VDOT Outfalls
-  Prince William County Outfalls
-  Other Outfalls
-  Homeowner Outfalls
-  Commercial Outfalls
-  Inlets
-  All Outfalls
-  State_Maintained_Stormsewer
-  County_Maintained_Stormsewer
-  Home_Association_Maintained_Stormsewer
-  Commercially_Maintained_Stormsewer
-  VPDES Parcels
-  VDOT Service Area
-  Prince William County Service Area
-  Other Service Area
-  Homeowner Service Area
-  Commercial Service Area
- VDOT_Maintained_SWM
- Prince William County_Maint_SWM
- Homeowner_Maintained_SWM
- Commercial_Maintained_SWM
- NHD_Flowlines

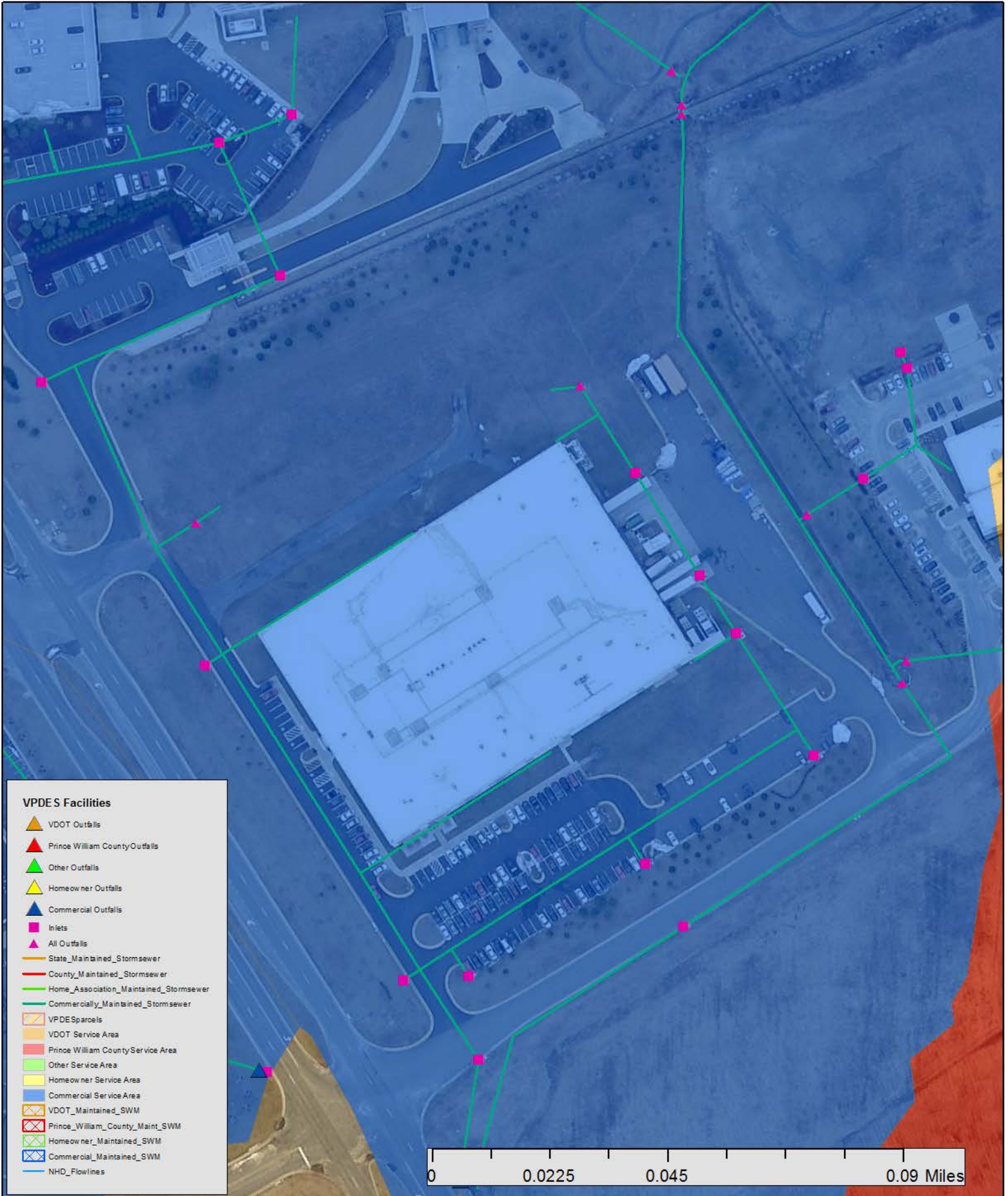
VPDES Permitted Facilities

Manassas Material Recovery Facility
Permit No: VAR052074



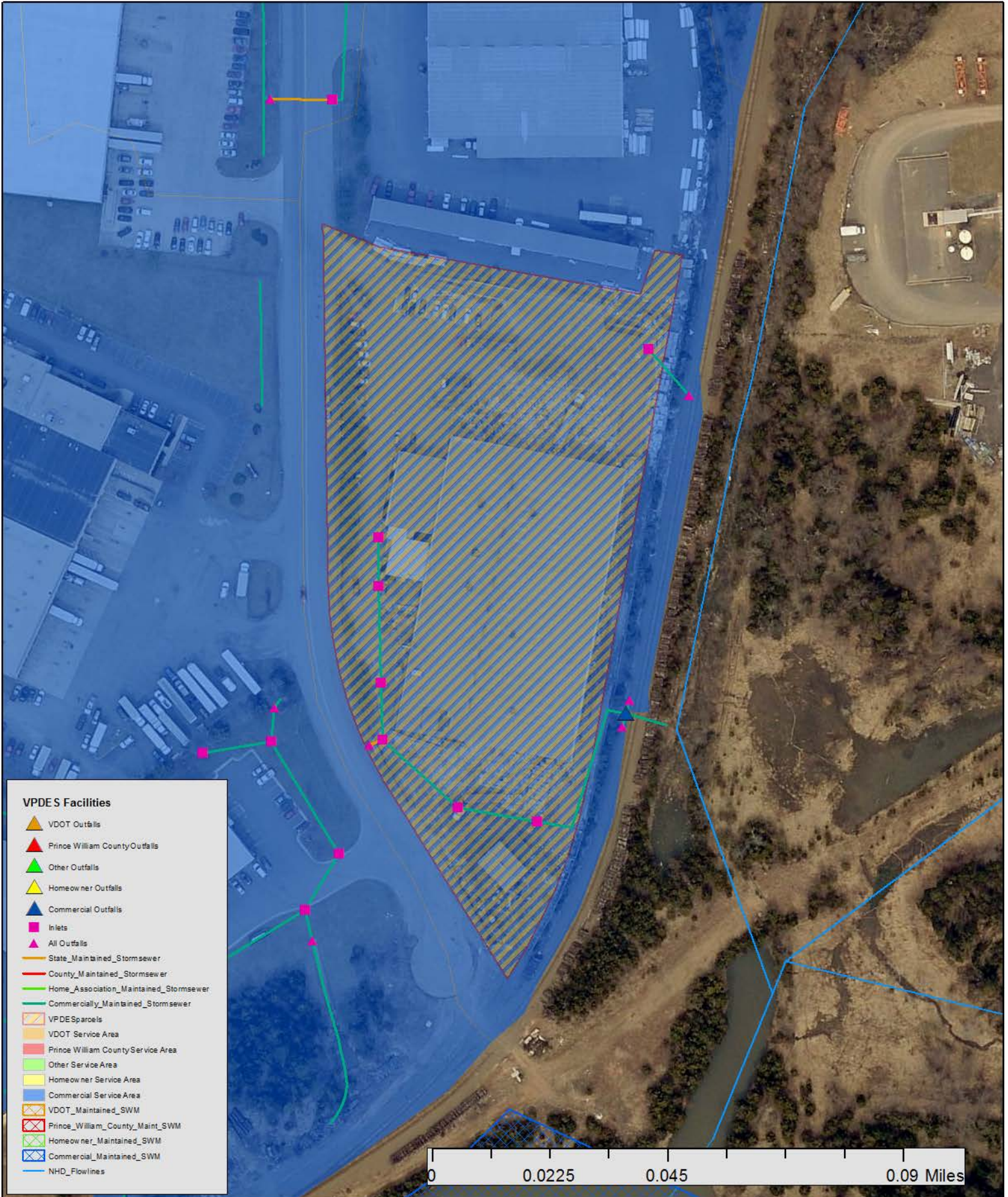
VPDES Permitted Facilities

Mediatech, Inc.
Permit No: No Exposure



VPDES Permitted Facilities

Northern Virginia Material Recovery Facility
Permit No: VAR052074



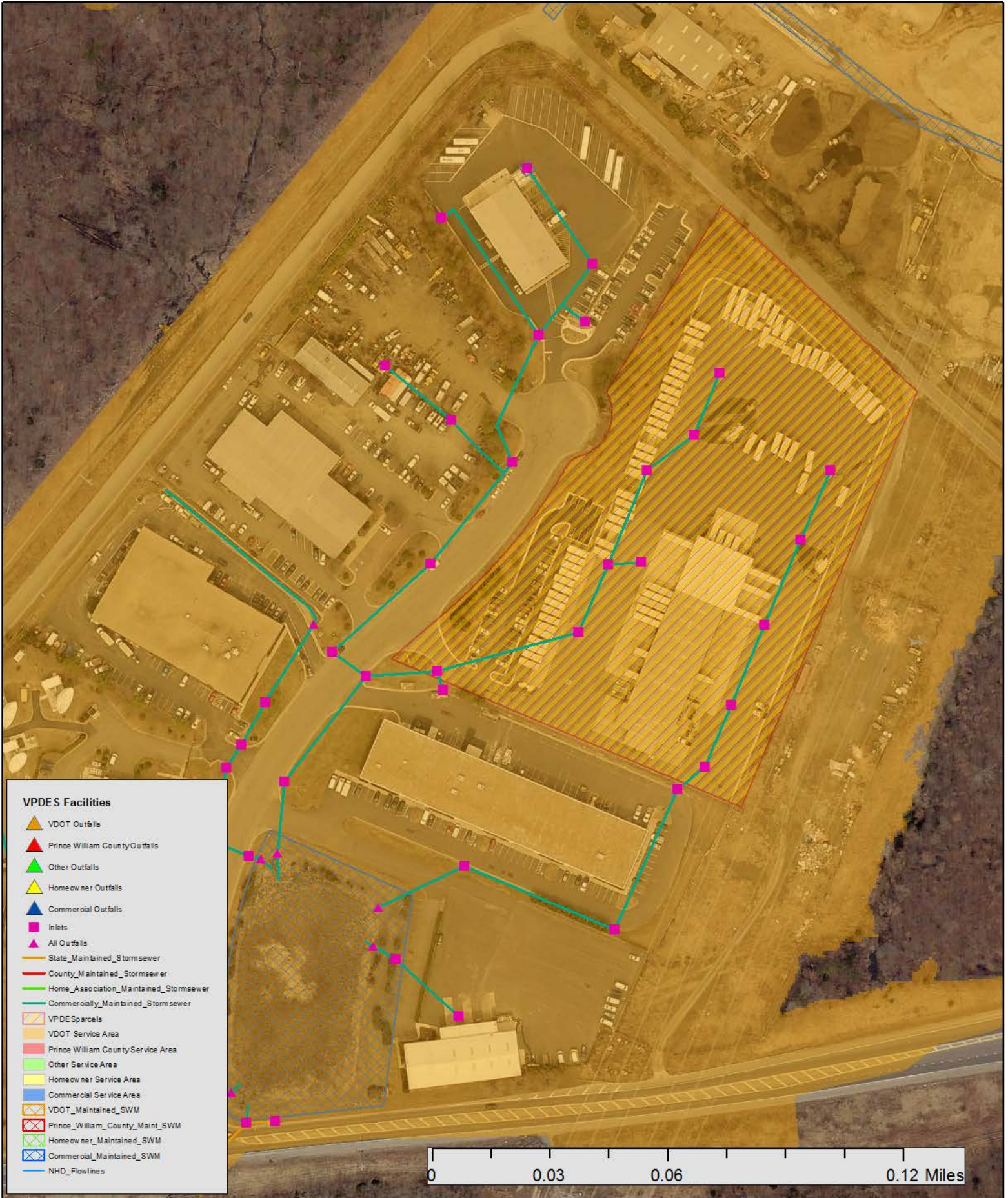
VPDES Permitted Facilities

Occoquan Harbour Marina Incorporated
Permit No: VAR050983



VPDES Permitted Facilities

Old Dominion Freight Line Incorporated - Bristow
Permit No: VAR051476



VPDES Permitted Facilities

Paxton Van Lines
Permit No: No Exposure



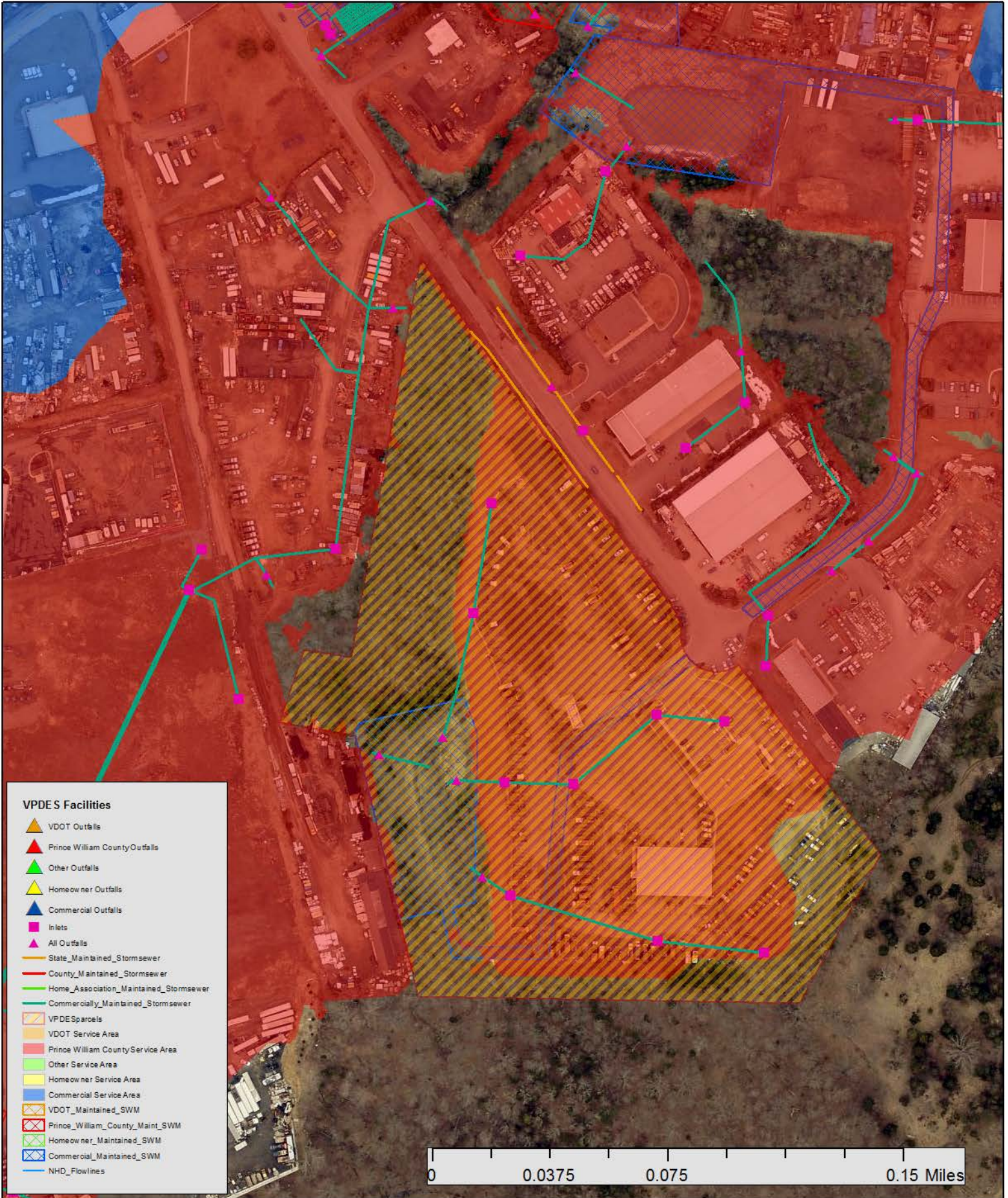
VPDES Permitted Facilities

Penny's Used Auto Parts
Permit No: VAR052115



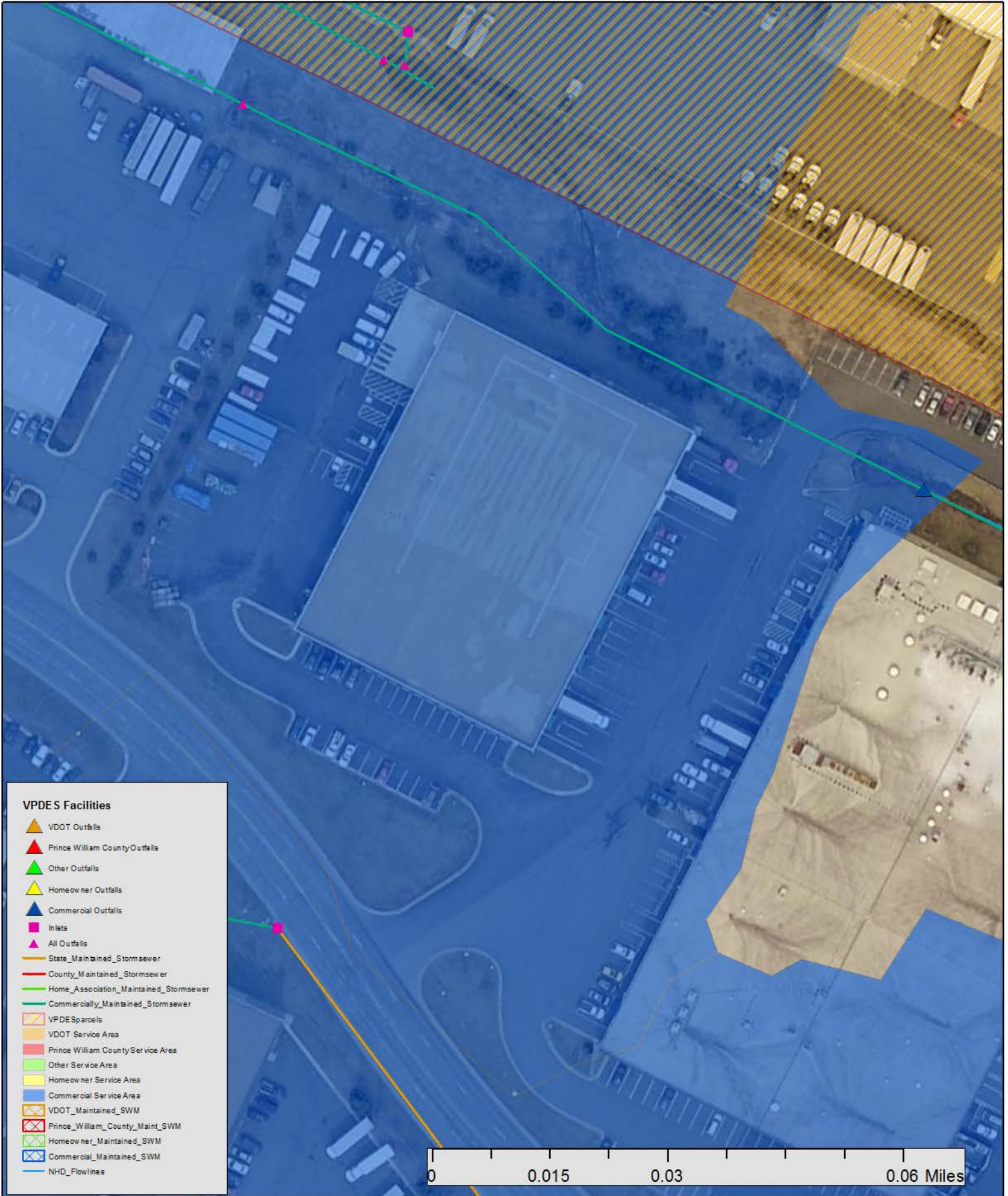
VPDES Permitted Facilities

Potomac Disposal Services of Virginia, LLC
Permit No: VAR051639



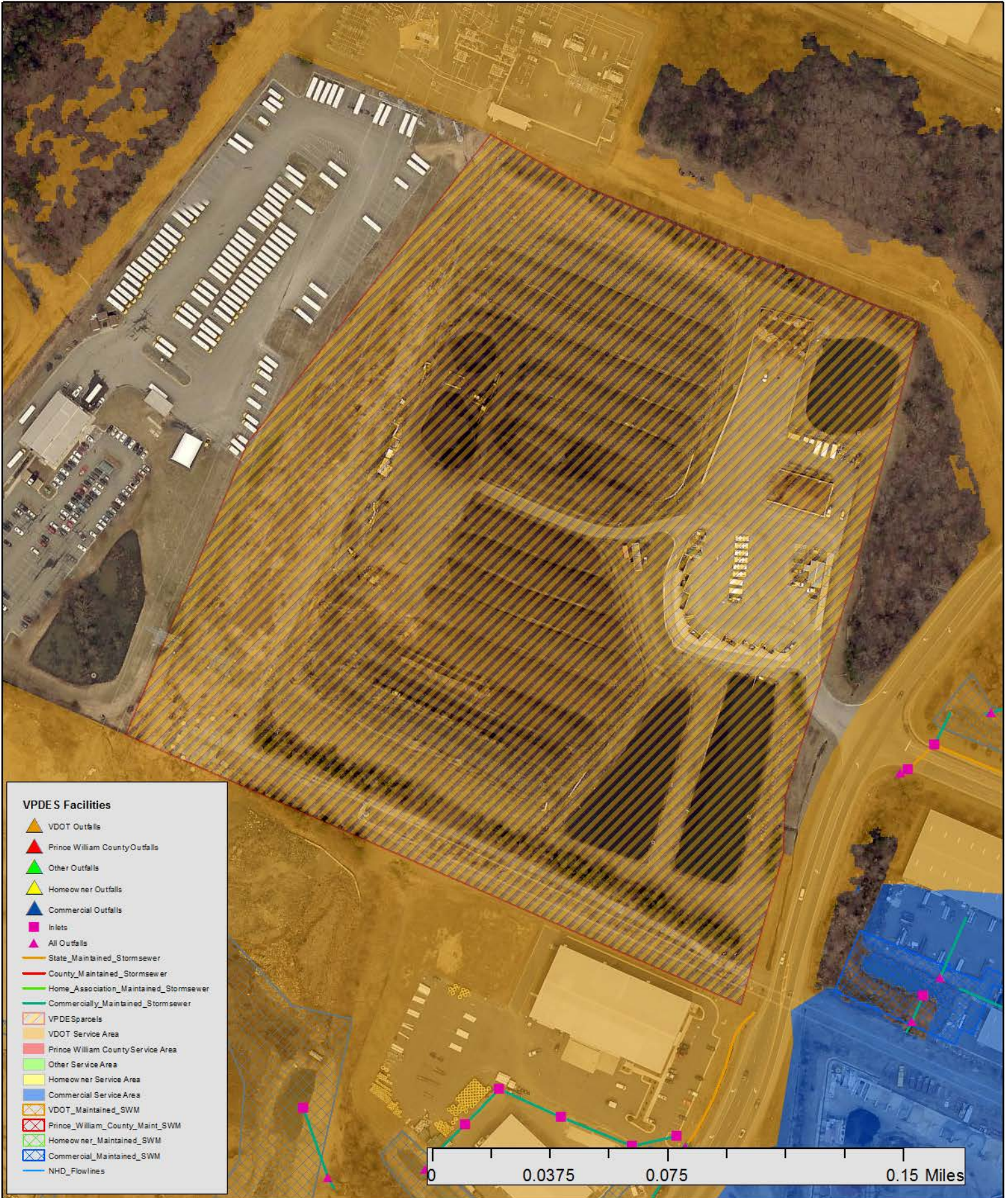
VPDES Permitted Facilities

Potomac eScrap LLC
Permit No: No Exposure



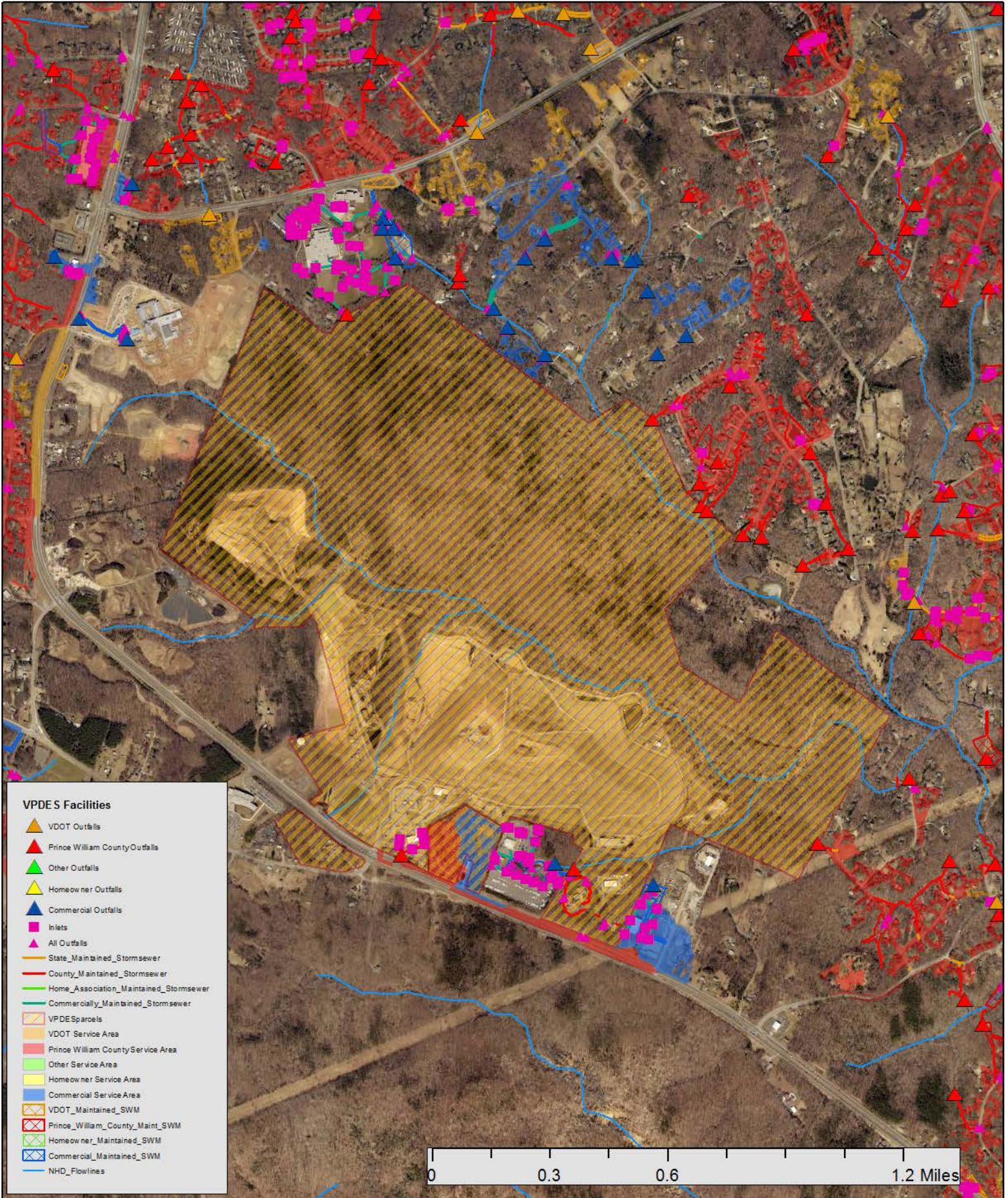
VPDES Permitted Facilities

Prince William County - Balls Ford Yard Waste
Permit No: VA0088510



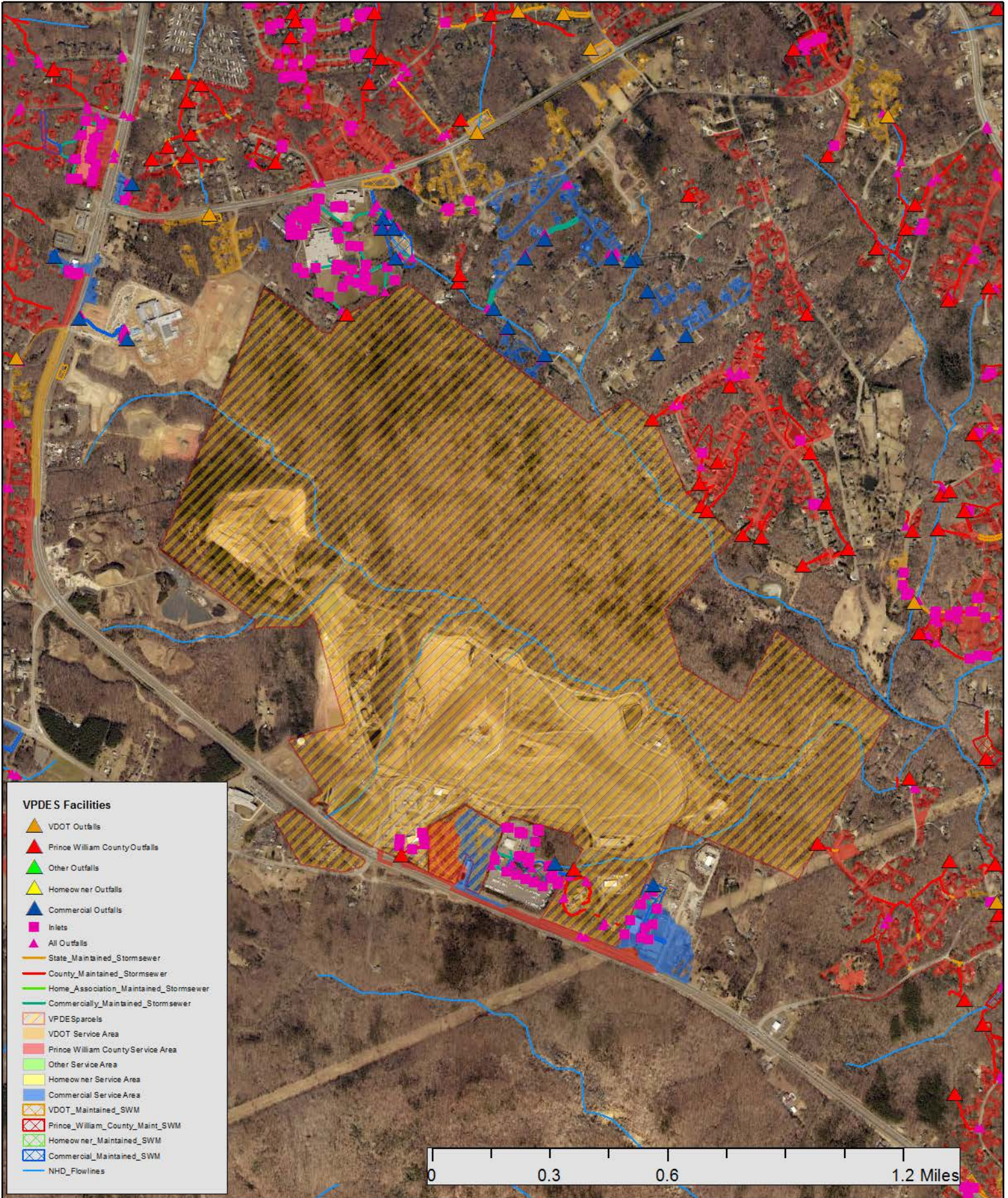
VPDES Permitted Facilities

Prince William County Sanitary Landfill
Permit No: VAR051078



VPDES Permitted Facilities

Prince William County Yard Waste Compost Facility
Permit No: VA0086797



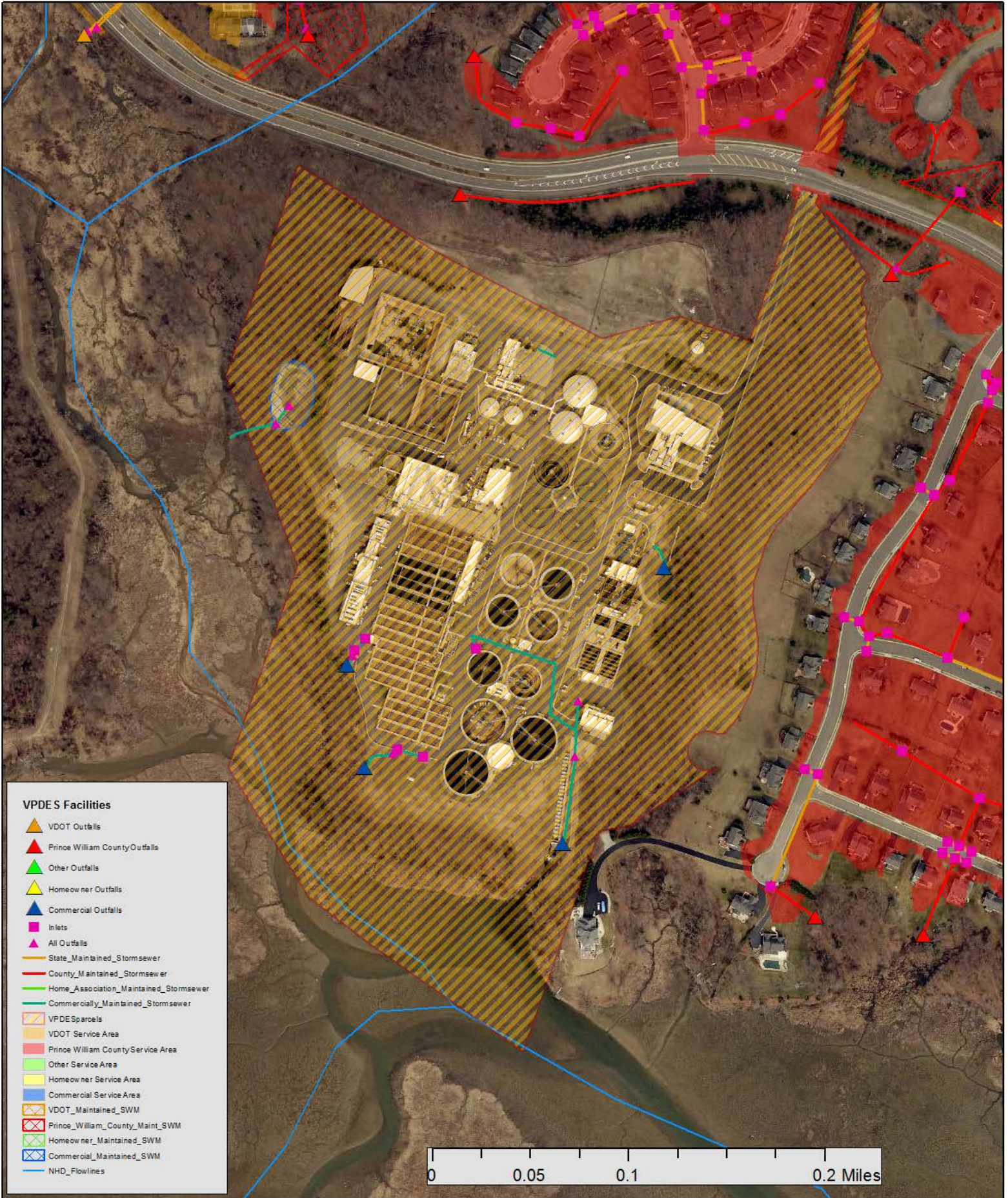
VPDES Permitted Facilities

Prince William Metal
Permit No: VAR052008



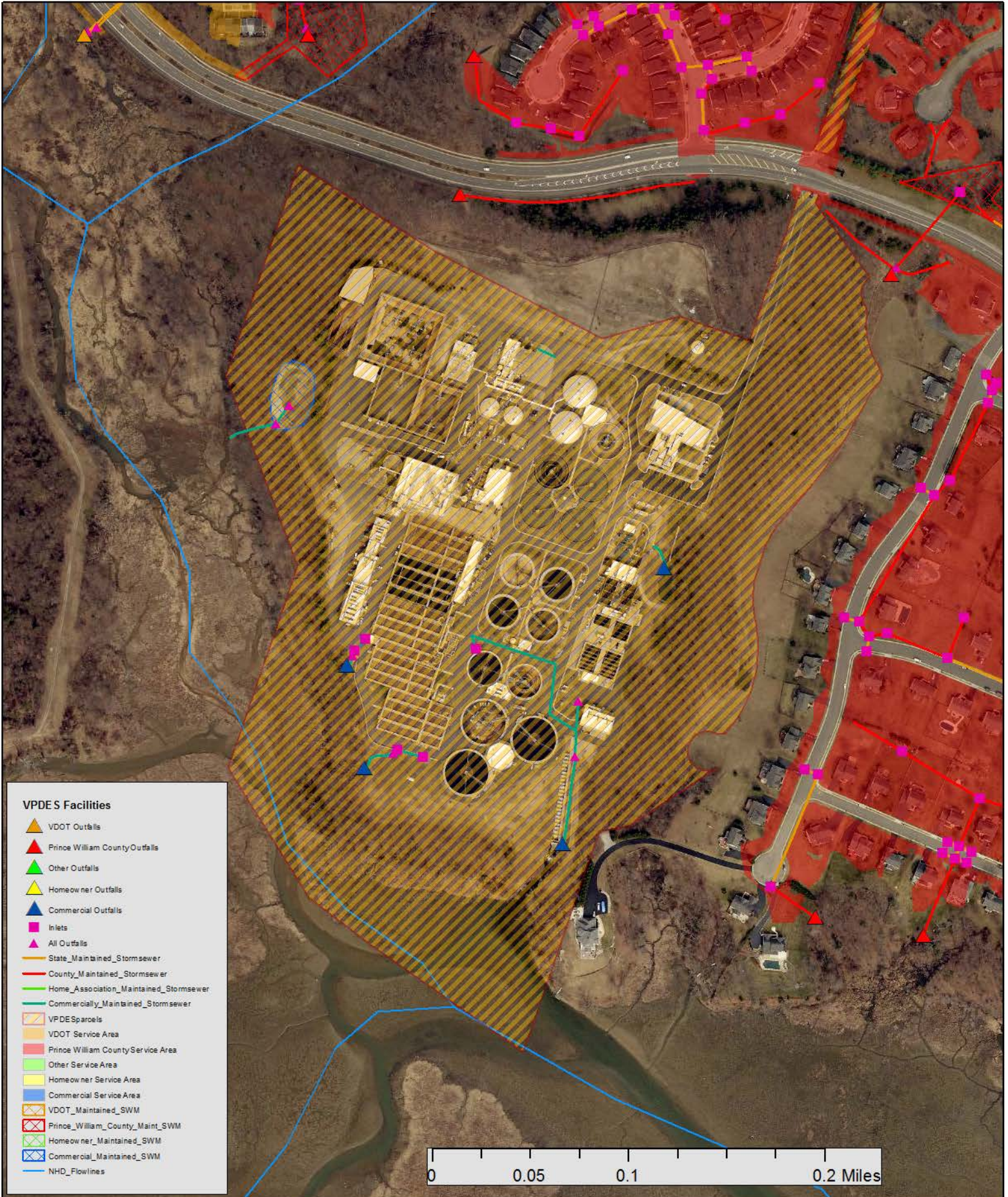
VPDES Permitted Facilities

PWCSA - H L Mooney Wastewater Treatment Works
Permit No: VA0025101



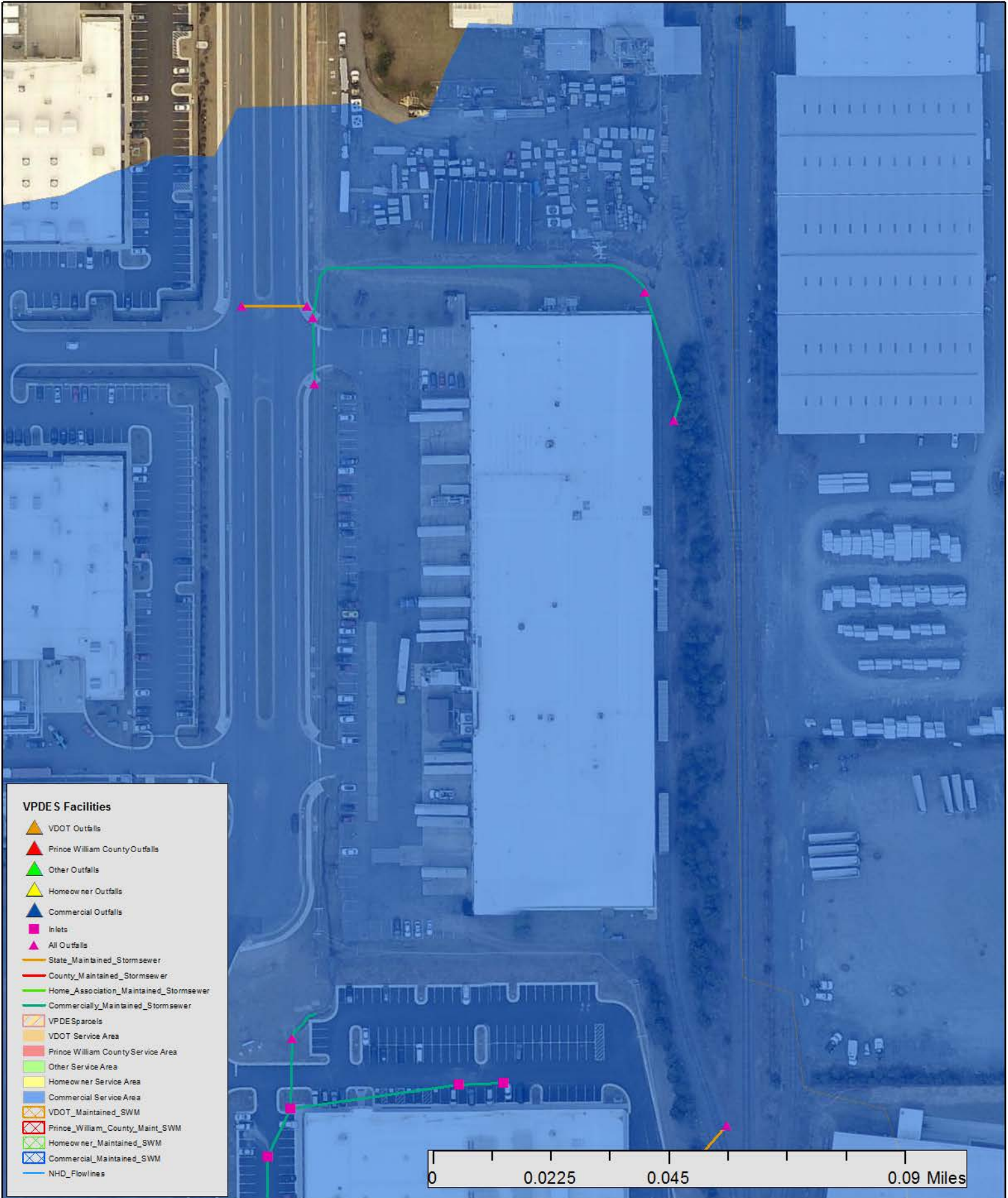
VPDES Permitted Facilities

PWCSA - H L Mooney Wastewater Treatment Works_Nutrient
Permit No: VAN010018



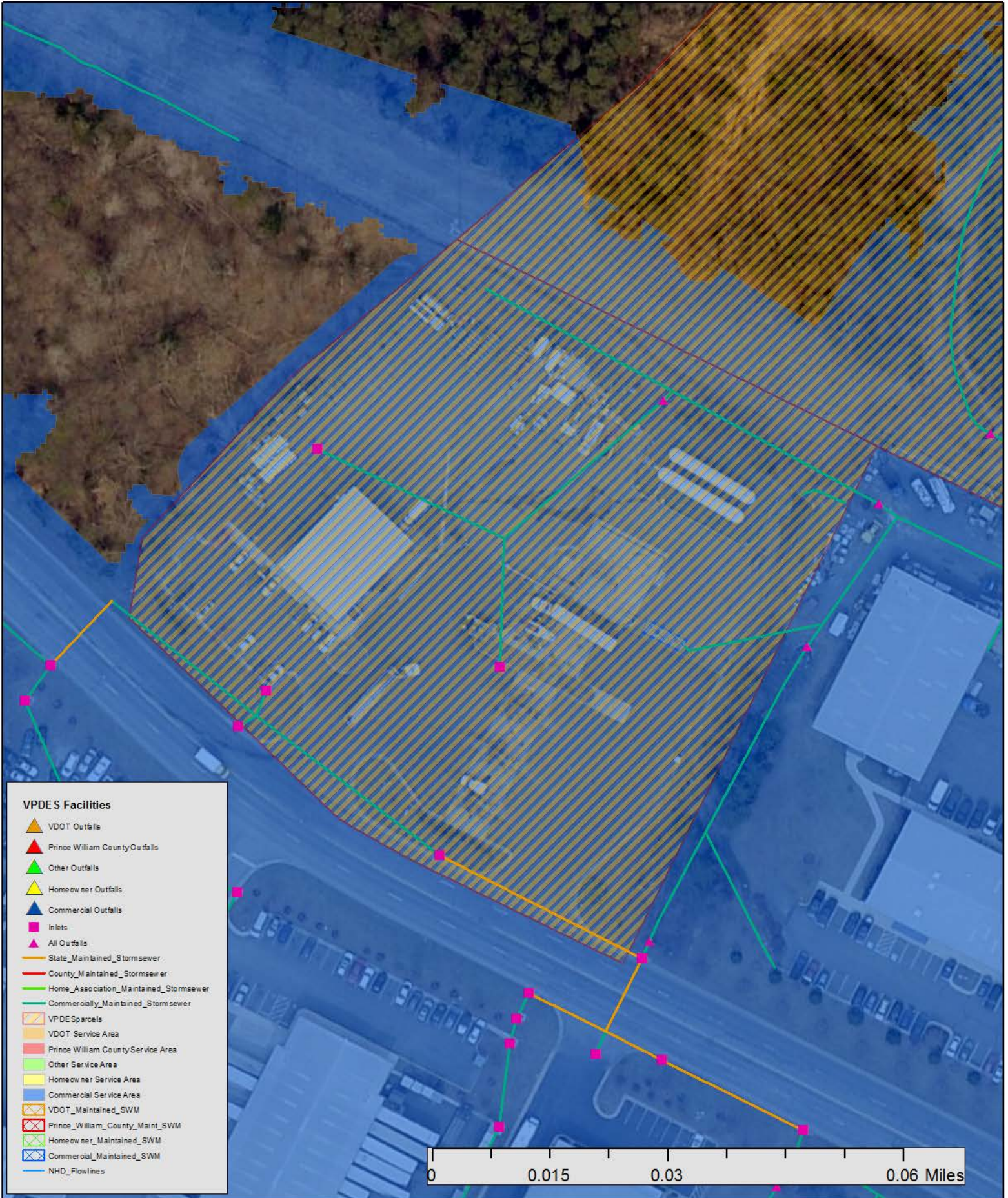
VPDES Permitted Facilities

QG Printing II Corp
Permit No: No Exposure



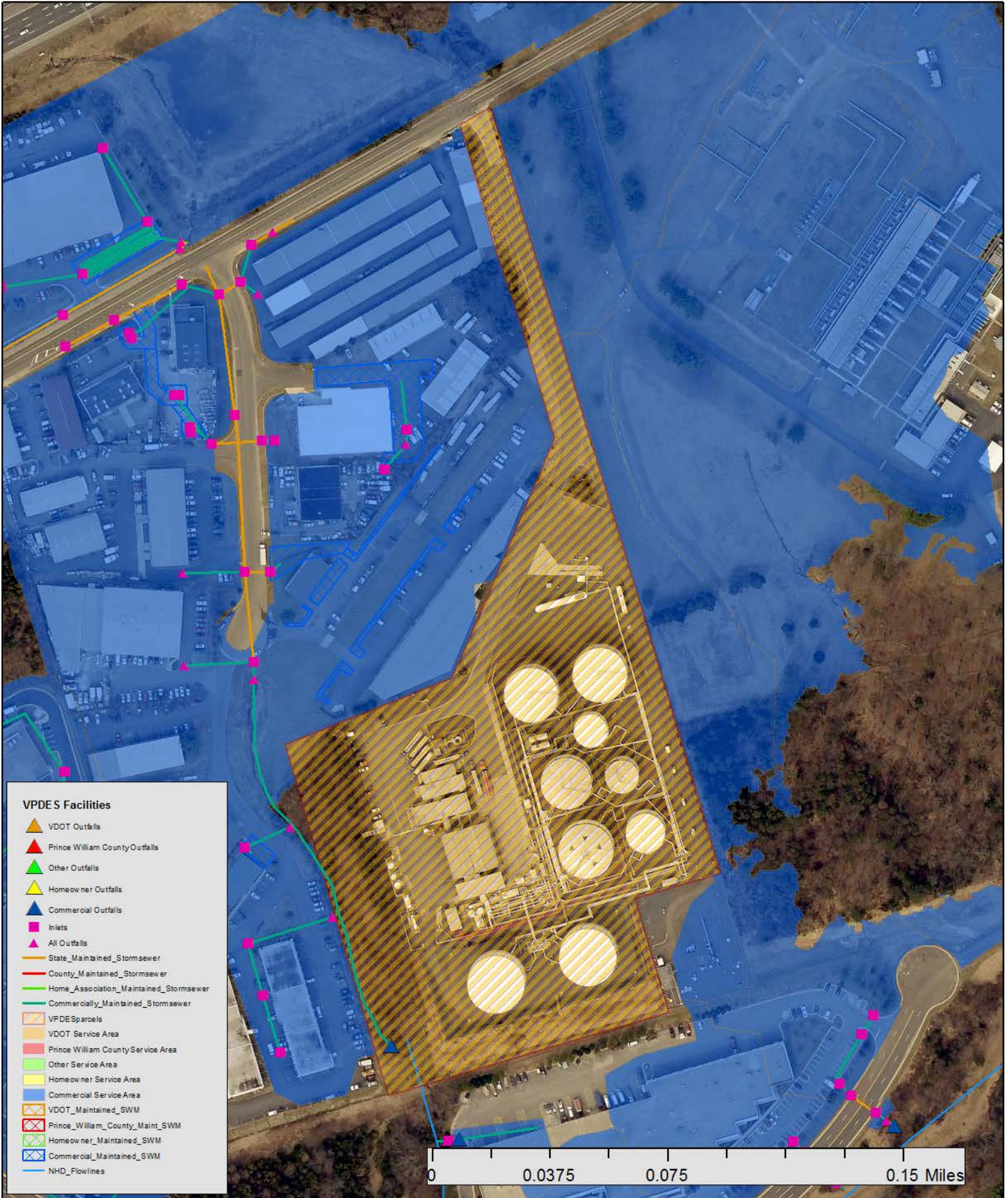
VPDES Permitted Facilities

Quarles Petroleum - Manassas Bulk Plant
Permit No: VAR051085



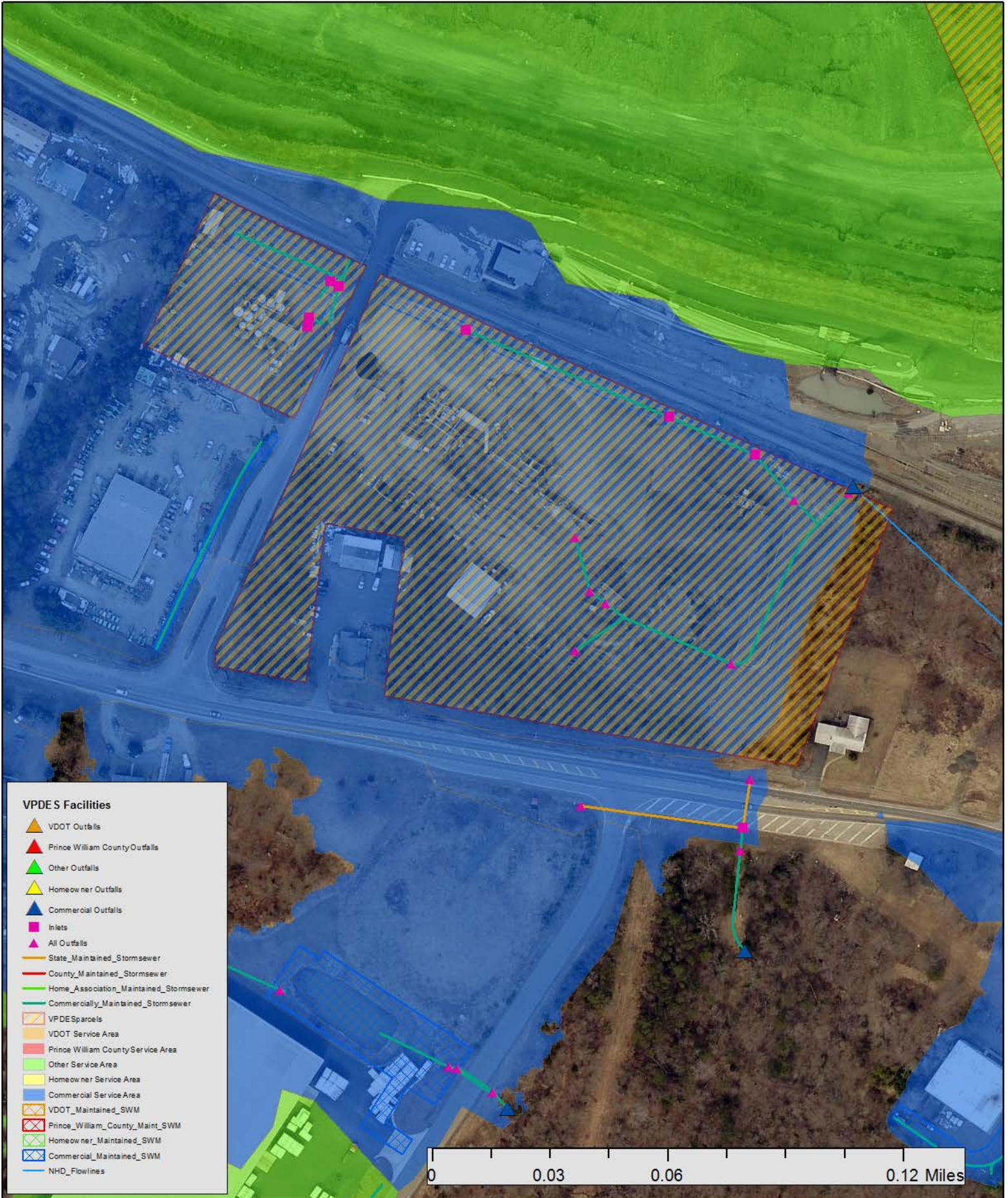
VPDES Permitted Facilities

Sunoco - Manassas Terminal
Permit No: VA0087858



VPDES Permitted Facilities

Superior Paving Corporation - Manassas Plant
Permit No: VAR050901



VPDES Permitted Facilities

Tyme n Tyde Marina
Permit No: VAR050982



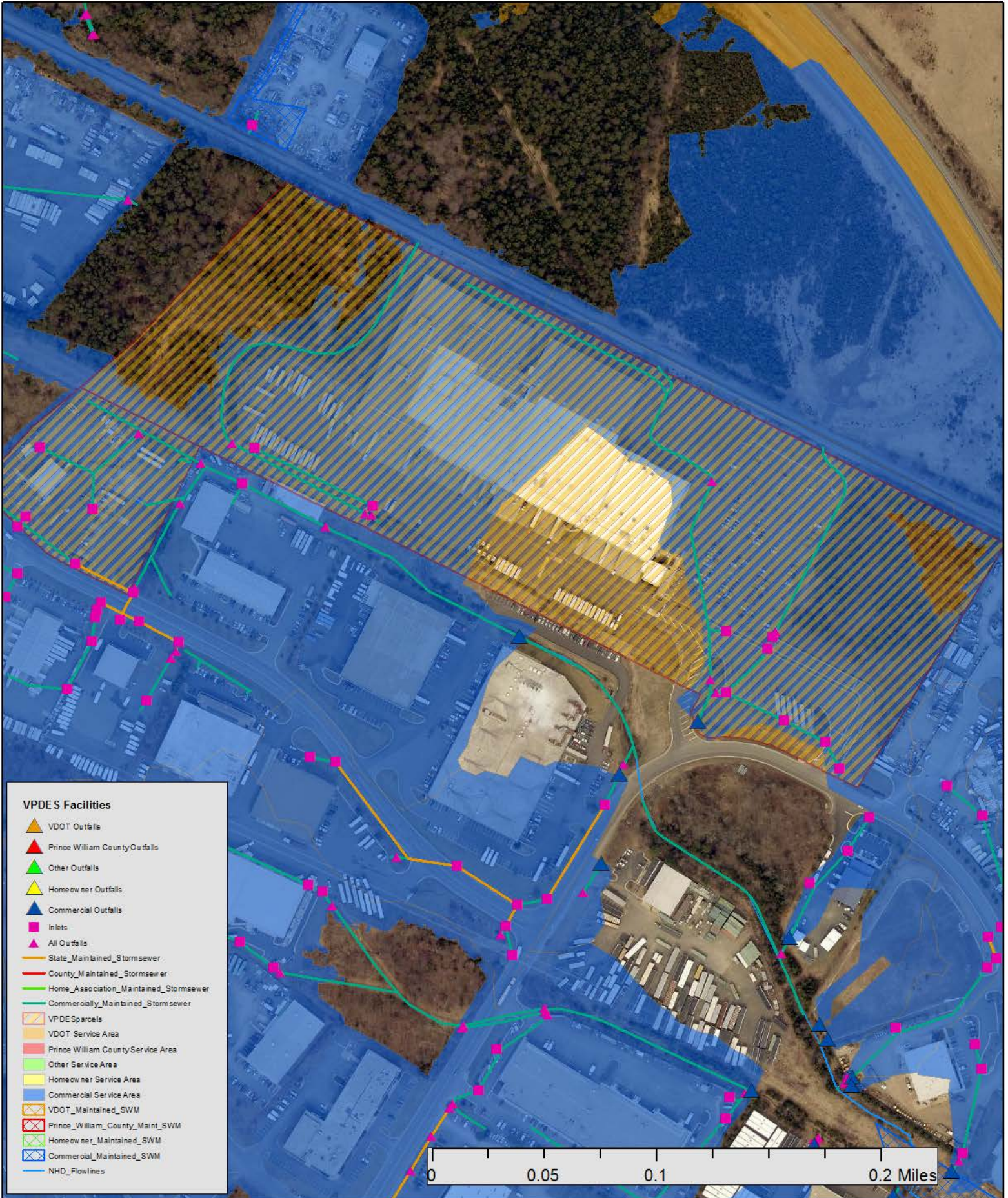
VPDES Permitted Facilities

UPS Freight - Bristow
Permit No: VAR051030



VPDES Permitted Facilities

US Foods Incorporated
Permit No: VAR051117



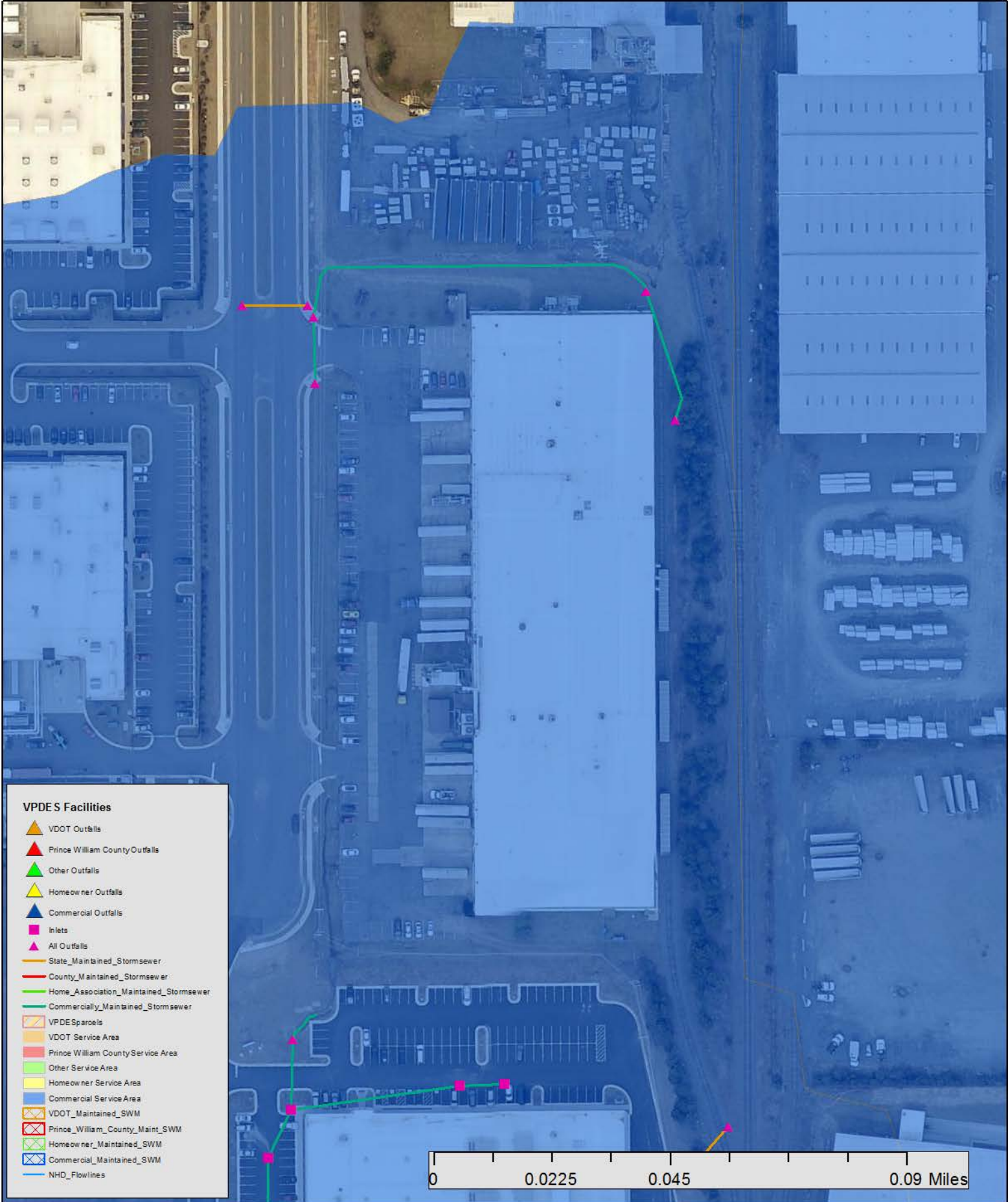
VPDES Permitted Facilities

USPS - Prince William Branch
Permit No: No Exposure



VPDES Permitted Facilities

Vertis Communication
Permit No: No Exposure



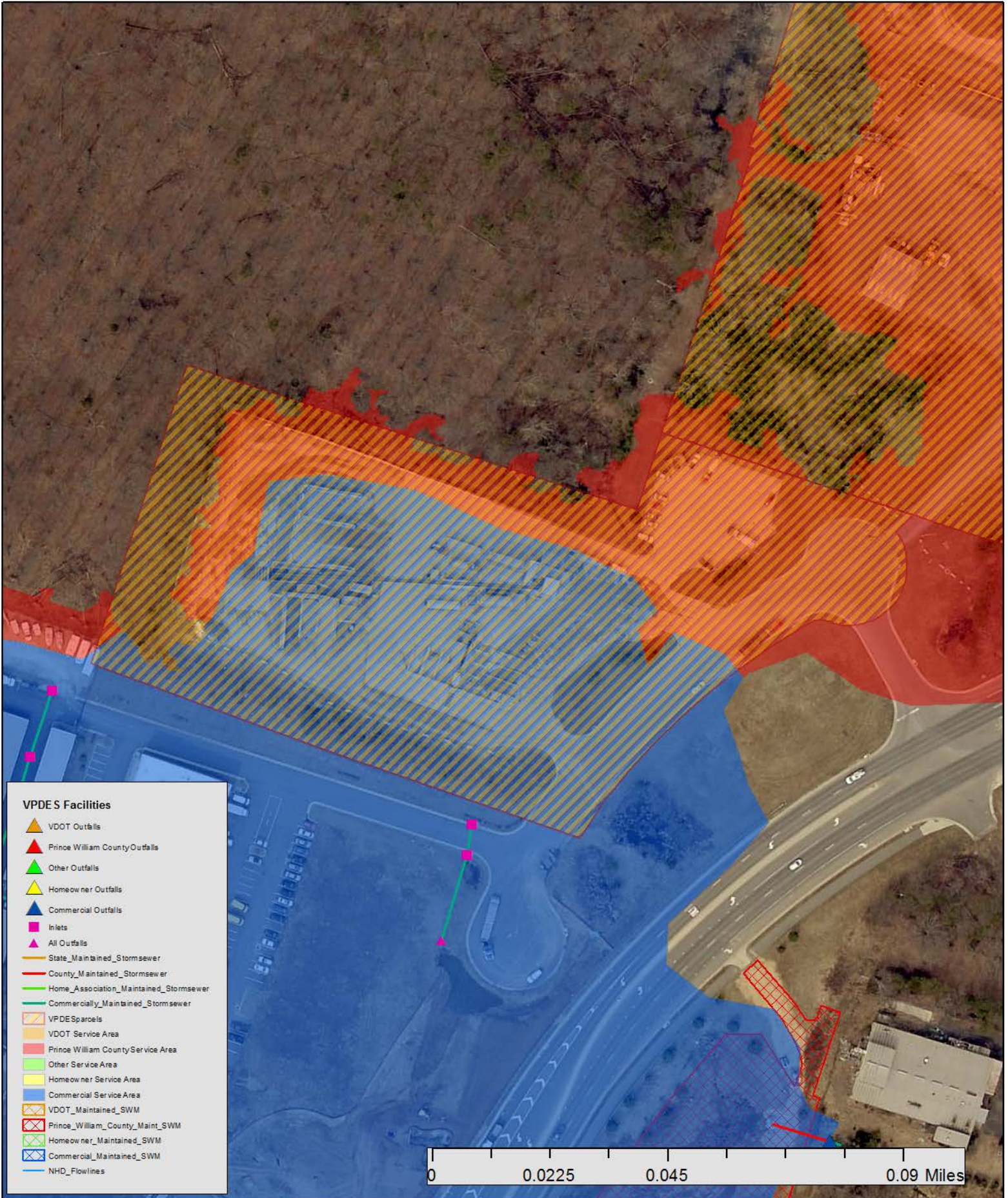
VPDES Permitted Facilities

Virginia American Water Prince William
Permit No: VA0024724



VPDES Permitted Facilities

Virginia Concrete Company Inc - Gainesville
Permit No: VAG110100



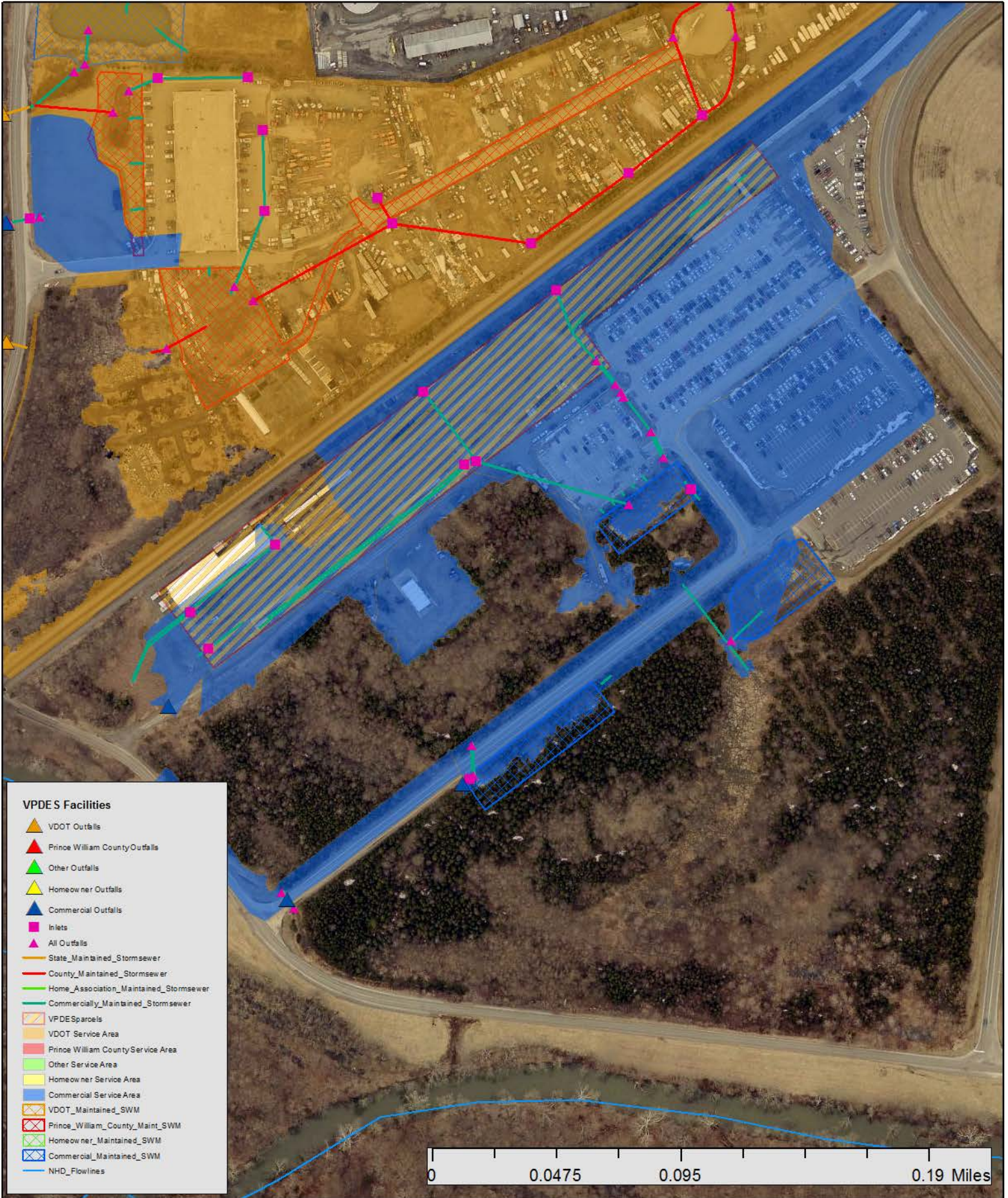
VPDES Permitted Facilities

Virginia Concrete Company Inc - Woodbridge
Permit No: VAG110083



VPDES Permitted Facilities

Virginia Railway Express - Broad Run Yard
Permit No:VAR051886



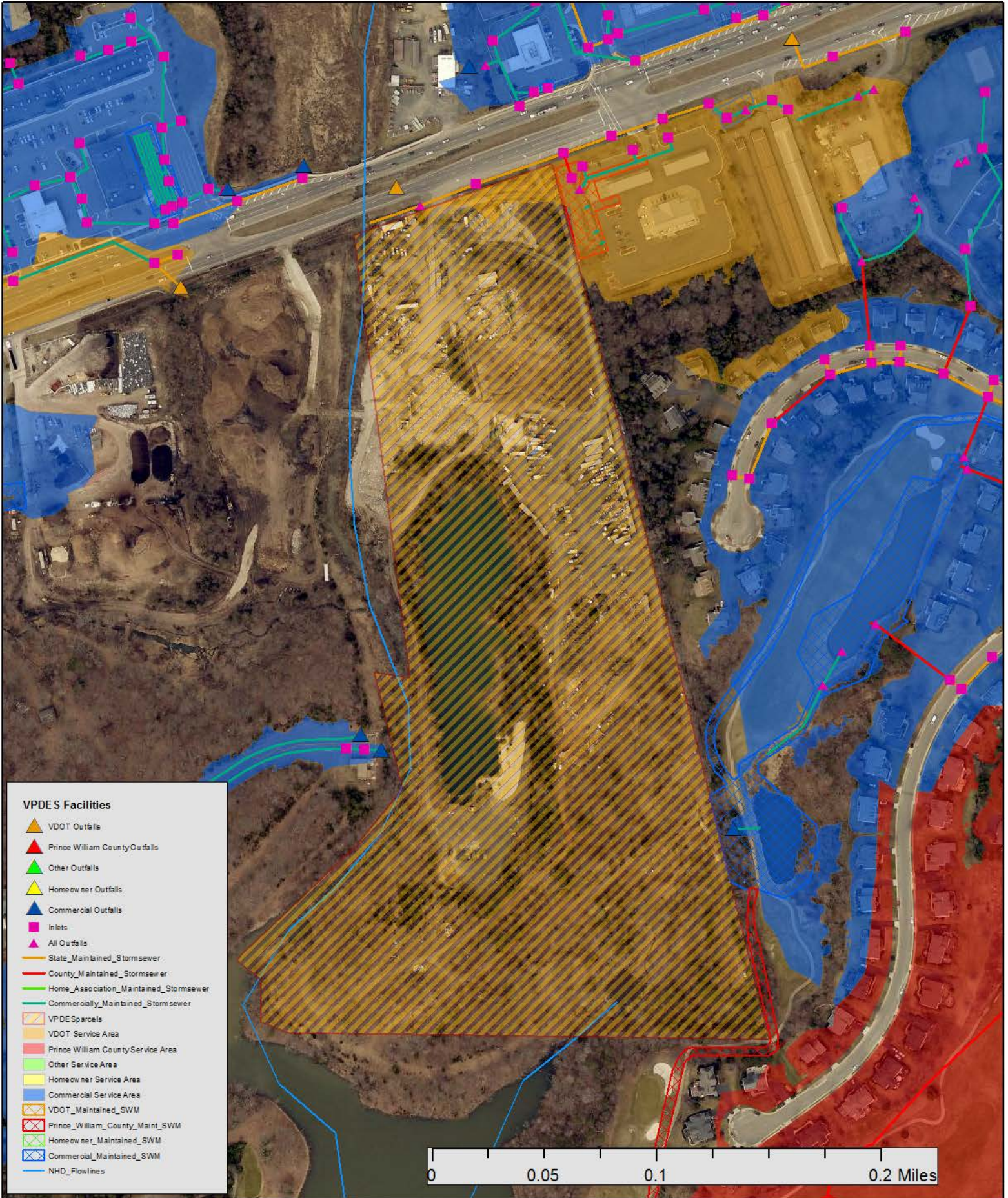
VPDES Permitted Facilities

Virginia Scrap Corp
Permit No:VAR051992



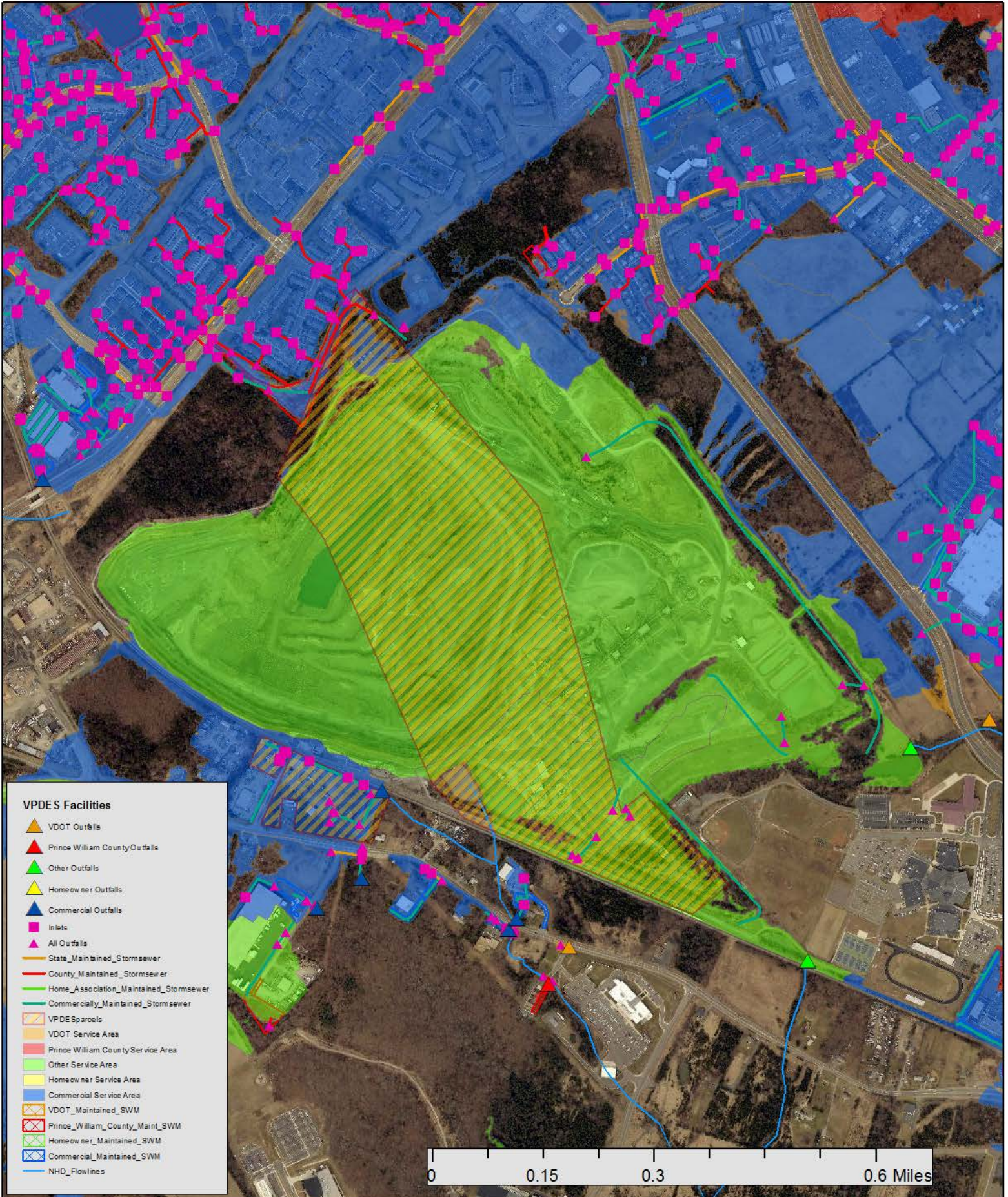
VPDES Permitted Facilities

Vistas at Lake Manassas Limited Liability Company
Permit No: VAR051298



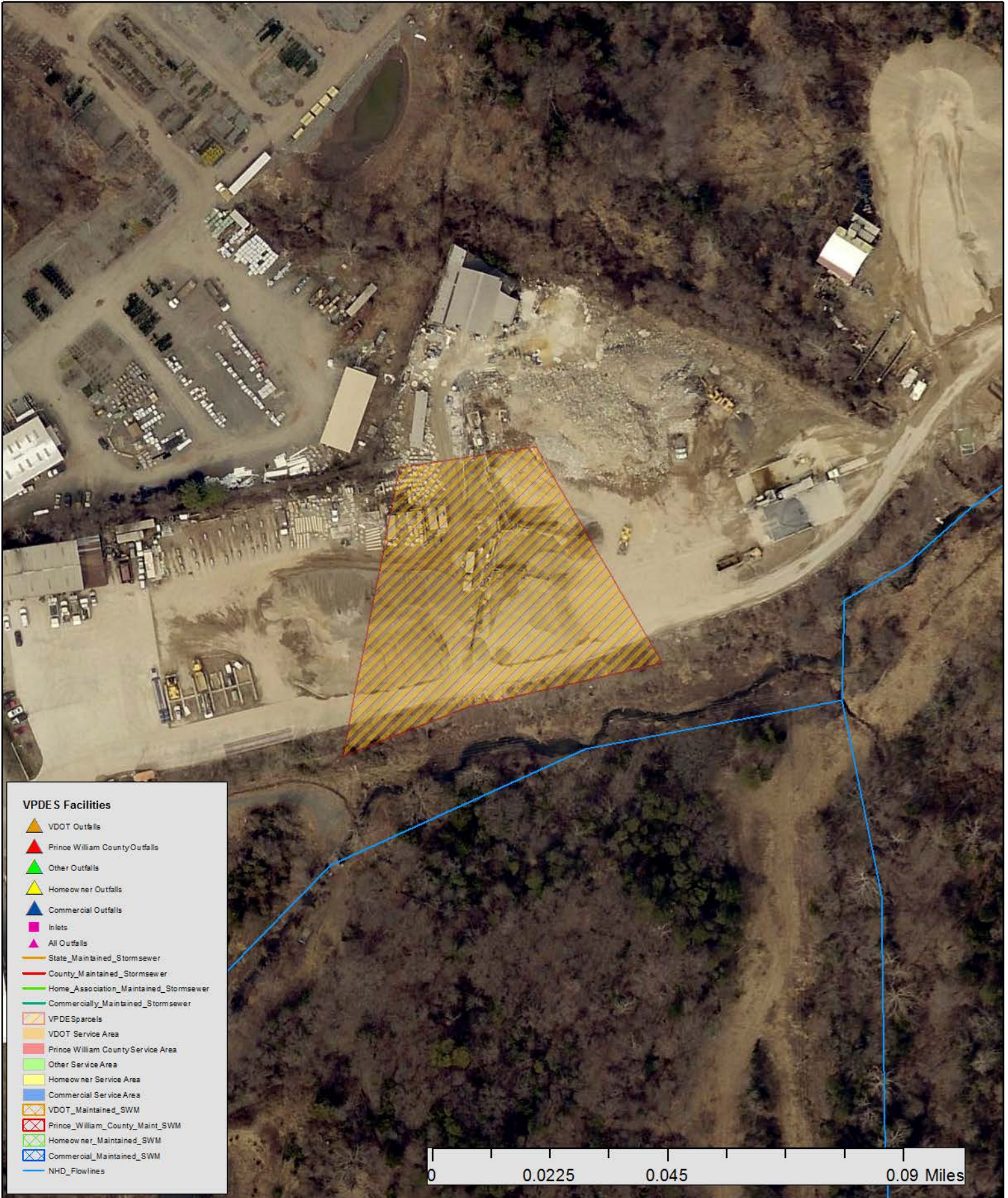
VPDES Permitted Facilities

Vulcan Construction Materials LLC - Manassas
Permit No: VAG840092



VPDES Permitted Facilities

Waste Management of Virginia - Stafford
Permit No:VAR051295



VPDES Permitted Facilities

Woodbridge Metal Recycling Inc
Permit No:VAR051996



VPDES Permitted Facilities

Woodbridge Mobile Home Park STP
Permit No:VA0027855



Appendix H – Stormsewer Infrastructure Management

FAC_ID	FACTYPE	FACDESC	RISER	RISERIDA	FENCE	OUTSTRUCTY	BMP_TREATE	DATEINVEN	MAINT	COMMENTS	SWM_AGREEM	VAHUC6	VAHUC12NAM	SUBD
299	BMP	D	N	0	N	PVC	0.00	10/30/2015 P		1.5" BMP ORIFICE AT EW, DAM IS GABION BASKET	N	PL49	Neabsco Creek	PRINCE WILLIAM PARKWAY SWIM POND IMPROVEMENTS
928	SWMP/BMP	D	Y	88	Y	RCP	5.29	9/11/2015 P		6.5" RISER, 2" BMP ORIFICE AT RISER	N	PL41	Occoquan River-Lake Jackson	PARKWAY WEST PHASE 3
930	SWMP/BMP	W	Y	54	Y	RCP	13.59	11/4/2015 P		PWSE=235.73', 4"x4" RISER, 12" DRAWDOWN PIPE	N	PL34	Broad Run-Rocky Branch	BOLT PROPERTY
931	BMP	U	N	0	N	PVC	0.91	12/3/2015 P		BIORETENTION AREA	N	PL49	Neabsco Creek	FOREST GLEN
932	SWMP/BMP	D	Y	51	Y	RCP	3.45	12/3/2015 P		40"x52" RISER, 1.6" BMP ORIFICE AT RISER	N	PL49	Neabsco Creek	FOREST GLEN
933	SWMP/BMP	D	N	0	Y	RCP	123.77	1/13/2016 P		3.56" BMP ORIFICE AT EW, REG POND	N	PL43	Little Bull Run	DOMINION VALLEY COUNTRY CLUB SECTION 36
934	SWMP	D	N	0	Y	CMP	126.00	2/2/2016 P		REG POND, APPR PLAN DATA	N	PL47	Occoquan River-Occoquan Reservoir	LAKE RIDGE SECTION 11-G
936	BMP	T	N	0	N	HDP	0.87	4/4/2016 P		BMP MICRO-MEASURE W/ MONITORING WELL	N	PL32	Broad Run-Catletts Branch	CAMP GLENNK (SARANAC) SECTION 1
937	SWMP/BMP	D	Y	54	Y	RCP	13.31	4/5/2016 P		3" BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	SILVER LEAF ESTATES
938	SWMP	D	Y	48	Y	RCP	2.45	4/6/2016 P		11" DRAWDOWN ORIFICE W/ SLUICE GATE	N	PL51	Powells Creek	HOPE HILL CROSSING RECREATION CENTER
939	SWMP/BMP	W	Y	48	Y	RCP	6.22	4/8/2016 P		PWSE=271.74', DRAIN VALVE AT RISER	N	PL34	Broad Run-Rocky Branch	HALLEE'S GROVE SECTION 1
940	BMP	U	N	0	N	PVC	0.18	5/16/2016 P		8"x4" FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
941	SWMP/BMP	U	N	0	N	HDP	0.85	5/16/2016 P		2 HDP CHAMBERS, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
942	BMP	B	N	0	N	RCP	0.67	5/16/2016 P		BIORETENTION AREA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
943	BMP	U	N	0	N	PVC	0.29	5/16/2016 P		8"x6" FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
944	BMP	U	N	0	N	PVC	0.17	5/16/2016 P		8"x6" FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
945	SWMP/BMP	U	N	0	N	RCP	1.32	5/16/2016 P		STORMTECH SC-740 W/ 2 ISO CHMBR, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
946	BMP	U	N	0	N	RCP	0.24	5/16/2016 P		ADS FLEXSTORM INLET FILTER, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
947	BMP	U	N	0	N	PVC	0.31	5/16/2016 P		8"x6" FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
948	BMP	U	N	0	N	RCP	0.29	5/16/2016 P		ADS FLEXSTORM INLET FILTER, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
949	BMP	U	N	0	N	PVC	0.14	5/16/2016 P		8"x4" FILTERRA, B&G MAINT	N	PL43	Little Bull Run	GAINESVILLE COMMUNITY LIBRARY
950	SWMP/BMP	D	Y	60	N	RCP	6.86	6/13/2016 P		1.69" BMP ORIFICE AT RISER	N	PL34	Broad Run-Rocky Branch	TURNING LEAF ESTATES
5360	CSWMP/BMP	D	Y	60	N	RCP	12.76	3/11/2016 C		GRAVEL TRENCH W/ 6" PVC UD WITHIN 935	N	PL47	Occoquan River-Occoquan Reservoir	DAVIS FORD BUSINESS PARK
5666	CSWMP/BMP	D	Y	128	Y	RCP	22.70	10/19/2015 C		6"x15" RISER, 3" BMP ORIFICE IN SLUICE GATE	Y	PL32	Broad Run-Catletts Branch	GARDNER STATION PHASE 2A
5941	CBMP	U	N	0	N	PVC	0.50	8/14/2015 C		12"x6" FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5942	CBMP	U	N	0	N	PVC	0.26	8/14/2015 C		8"x6" FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5943	CBMP	U	N	0	N	PVC	0.25	8/14/2015 C		6"x6" FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5944	CBMP	U	N	0	N	PVC	0.32	8/14/2015 C		8"x6" FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5945	CBMP	U	N	0	N	PVC	0.27	8/14/2015 C		8"x6" FILTERRA	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5946	CSWMP/BMP	D	Y	48	Y	RCP	4.78	8/14/2015 C		3" BMP ORIFICE AT RISER, 6" DRAWDOWN ORIFICE	Y	PL44	Middle Bull Run	TRACTOR SUPPLY
5947	CBMP	T	N	0	N	PVC	0.06	9/3/2015 C		2 SETS OF TWIN 6" PERP PVC PIPE	Y	PL49	Neabsco Creek	DALE CITY CHRISTIAN CHURCH
5948	CSWMP/BMP	W	Y	54	Y	RCP	22.18	9/16/2015 C		PWSE=122.44', 4"x4" RISER, 15" DRAWDOWN PIPE	N	PL52	Quantico Creek	CRAMERS RIDGE SECTION 1
5949	CSWMP/BMP	W	Y	61	Y	RCP	18.99	9/16/2015 C		PWSE=108.71', 4"x5" RISER, 15" DRAWDOWN PIPE	N	PL52	Quantico Creek	CRAMERS RIDGE SECTION 1
5950	CBMP	B	N	0	N		0.00	9/25/2015 C		VEGETATED SWALE	Y	PL49	Neabsco Creek	POTOMAC CENTER
5951	CBMP	B	N	0	N		0.00	9/25/2015 C		VEGETATED SWALE	Y	PL49	Neabsco Creek	POTOMAC CENTER
5952	CBMP	B	N	0	N	RCP	0.98	9/25/2015 C		BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5953	CBMP	B	N	0	N	RCP	1.09	9/25/2015 C		BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5954	CBMP	B	N	0	N	RCP	0.63	9/25/2015 C		BIORETENTION SYSTEM, 6" PERFORATED UNDERDRAIN	Y	PL49	Neabsco Creek	POTOMAC CENTER
5955	CSWMP/BMP	D	Y	54	Y	RCP	8.00	10/7/2015 C		4"x4" RISER, 3" BMP ORIFICE AT EW	Y	PL52	Quantico Creek	INTERSTATE DRIVE DEVELOPMENT
5956	CBMP	U	N	0	N	PVC	0.43	10/19/2015 C		10"x6" FILTERRA	Y	PL32	Broad Run-Catletts Branch	GARDNER STATION PHASE 2A
5957	CBMP	U	N	0	N	RCP	0.38	10/27/2015 C		FLO-GARD PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5958	CBMP	U	N	0	N	RCP	0.12	10/27/2015 C		FLO-GARD PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5959	CBMP	U	N	0	N	RCP	0.05	10/27/2015 C		FLO-GARD PLUS FILTER INSERT	Y	PL34	Broad Run-Rocky Branch	VIRGINIA GATEWAY PHASE 5 FUELING STATION
5962	CSWMP/BMP	D	Y	48	N	RCP	4.87	10/28/2015 C		1.3" BMP ORIFICE AT EW, NO SWM ESMT	N	PL49	Neabsco Creek	PWCSA HL MOONEY FAC POND REHABILITATION
5963	SSWMP/BMP	D	Y	48	Y	RCP	0.00	10/30/2015 S		2.25" BMP ORIFICE AT RISER	N	PL49	Neabsco Creek	PRINCE WILLIAM PARKWAY SWIM POND IMPROVEMENTS
5964	CBMP	U	N	0	N	RCP	1.61	11/6/2015 C		STORMCEPTOR (STC 450J) W/ Y1 TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 1 LOT 11
5965	CBMP	U	N	0	N	HDP	0.20	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5966	CBMP	U	N	0	N	HDP	0.81	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5967	CBMP	U	N	0	N	HDP	0.30	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5968	CBMP	U	N	0	N	RCP	0.75	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5969	CBMP	U	N	0	N	RCP	0.14	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5970	CBMP	U	N	0	N	HDP	0.49	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5971	CBMP	U	N	0	N	HDP	0.36	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5972	CBMP	U	N	0	N	HDP	0.29	11/17/2015 C		ADS FLEXSTORM INLET FILTER	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5973	CSWMP/BMP	U	N	0	N	HDP	3.97	11/17/2015 C		STORMTECH SC-740 W/ 2 ISOLATOR CHAMBERS	Y	PL44	Middle Bull Run	VALLE PLACE HOTEL - BALLS FORD ROAD
5974	CBMP	U	N	0	N	RCP	0.36	12/8/2015 C		CONTECH CDS2015-4-C	Y	PL51	Powells Creek	POTOMAC SHORES GOLF MAINTENANCE FACILITY
5975	CSWMP/BMP	D	Y	54	N	RCP	0.82	12/8/2015 C		4"x4" RISER, 3.5" BMP ORIFICE AT EW	Y	PL51	Powells Creek	POTOMAC SHORES GOLF MAINTENANCE FACILITY
5976	CSWMP/BMP	W	Y	38	Y	RCP	2.82	12/16/2015 C		PWSE=110.00', 4"x2" RISER, APPR PLAN DATA	Y	PL52	Quantico Creek	TRIANGLE SENIOR APARTMENTS
5977	CSWMP	D	N	0	Y	RCP	3.54	12/17/2015 C		6" ORIFICE/REDUCER AT ES, APPR PLAN DATA	N	PL50	Potomac River-Occoquan Bay	LANCASTER COMMUNITY PARK
5978	CBMP	U	N	0	N	RCP	2.44	1/7/2016 C		STORMCEPTOR (STC 450J) W/ DI TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 3 LOT 6A
5979	CBMP	U	N	0	N	RCP	1.80	1/7/2016 C		STORMCEPTOR (STC 450J) W/ DI TOP	Y	PL34	Broad Run-Rocky Branch	HORNBAKER INDUSTRIAL PARK PHASE 3 LOT 6A
5980	CSWMP/BMP	U	N	0	N	RCP	2.11	2/19/2016 C		STORMTECH SC-740 W/ ISOLATOR CHAMBER	Y	PL44	Middle Bull Run	SUDLEY SQUARE COMMERCIAL PARCEL A
5981	CSWMP/BMP	U	N	0	N	RCP	2.18	2/19/2016 C		STORMTECH SC-740 W/ 2 ISOLATOR CHAMBERS	Y	PL43	Little Bull Run	ALEXANDRA'S KEEP POND PLAN
5982	CSWMP/BMP	D	Y	35	N	RCP	0.69	2/21/2016 C		31"x31" RISER, APPR PLAN DATA	N	PL49	Neabsco Creek	LONG & FOSTER OFFICE BUILDING
5983	CSWMP/BMP	D	Y	48	Y	RCP	2.10	4/14/2016 C		1" BMP ORIFICE AT RISER	Y	PL52	Quantico Creek	HAMPTON INN - OLD STAGE ROAD
5984	CBMP	U	N	0	N	RCP	0.06	5/6/2016 C		STORMCEPTOR (STC 450J)	Y	PL34	Broad Run-Rocky Branch	WELLINGFORD IND PK PH 2 LOT 9 (NEFF RENTAL)
5985	CBMP	U	N	0	N	HDP	0.58	5/11/2016 C		STORMCEPTOR (STC 900J), NO ESMT	Y	PL34	Broad Run-Rocky Branch	INNOVATION - POWER LOFT DATA CENTER
5986	CSWMP/BMP	D	Y	48	Y	RCP	1.08	6/15/2016 C		0.48" BMP ORIFICE AT RISER	Y	PL34	Broad Run-Rocky Branch	TUDOR TRUCK REPAIR
5987	CSWMP/BMP	D	Y	48	Y	RCP	0.40	6/15/2016 C		0.36" BMP ORIFICE AT RISER	Y	PL34	Broad Run-Rocky Branch	TUDOR TRUCK REPAIR
5988	CSWMP/BMP	D	Y	46	Y	RCP	3.15	6/21/2016 C		3.4"x3.4" RISER, 0.08" BMP ORIFICE AT RISER	Y	PL46	Lower Bull Run	KATIE'S GROVE
5989	CSWMP/BMP	D	Y	73	Y	RCP	5.55	6/21/2016 C		5.4"x5.4" RISER, 0.1" BMP ORIFICE AT RISER	Y	PL46	Lower Bull Run	KATIE'S GROVE
5990	CBMP	U	N	0	N	RCP	0.54	6/28/2016 C		6"x12" STORMFILTER W/ WEIR WALL	Y	PL50	Potomac River-Occoquan Bay	DUNKIN' DONUTS/BASKIN ROBBINS
5991	CSWMP	T	N	0	N	PVC	0.54	6/28/2016 C		INFILTRATION TRENCH W/ GRAVEL FILTER	Y	PL50	Potomac River-Occoquan Bay	DUNKIN' DONUTS
9033	CBMP	D	N	0	N		6.85	4/21/2016 C		PVT ST VE, CHECK DAMS SERVE AS BMP	N	PL40	Cedar Run-Slate Run	OLD CHURCH ESTATES PRIVATE DRIVE E/S PLAN

Revised Inspection Schedule

Schedule	Facility #	Plan Year	Inspection Type
FY17	5142		Re-inspection
FY17	5319		Re-inspection
FY17	5320		Re-inspection
FY17	5318		Re-inspection
FY17	5317		Re-inspection
FY17	5316		Re-inspection
FY17	5315		Re-inspection
FY17	5314		Re-inspection
FY17	5313		Re-inspection
FY17	5312		Re-inspection
FY17	5303		Re-inspection
FY17	5306		Re-inspection
FY17	5307		Re-inspection
FY17	5308		Re-inspection
FY17	5309		Re-inspection
FY17	5310		Re-inspection
FY17	5311		Re-inspection
FY17	5304		Re-inspection
FY17	5305		Re-inspection
FY17	5146		Re-inspection
FY17	5221		Re-inspection
FY17	5223		Re-inspection
FY17	5988		Re-inspection
FY17	5989		Re-inspection
FY17	5990		Re-inspection
FY17	5991		Re-inspection
FY17	5955		Re-inspection
FY17	5010		Re-inspection
FY17	5011		Re-inspection
FY17	5012		Re-inspection
FY17	5716		Re-inspection
FY17	5717		Re-inspection
FY17	5718		Re-inspection
FY17	5719		Re-inspection
FY17	5720		Re-inspection
FY17	5722		Re-inspection
FY17	5723		Re-inspection
FY17	5535		Re-inspection
FY17	5536		Re-inspection
FY17	5537		Re-inspection

FY17	5538		Re-inspection
FY17	5539		Re-inspection
FY17	5540		Re-inspection
FY17	5294	1989	Routine
FY17	5350	1981	Routine
FY17	5470	1999	Routine
FY17	5853	2003	Routine
FY17	5960	2012	Routine
FY17	5159	1986	Routine
FY17	5160	1989	Routine
FY17	5223	1989	Routine
FY17	5231	1985	Routine
FY17	5268	1980	Routine
FY17	5272	1988	Routine
FY17	5337	1987	Routine
FY17	5349	2000	Routine
FY17	5355	1987	Routine
FY17	5146	1988	Routine
FY17	5221	1997	Routine
FY17	5393	1988	Routine
FY17	5291	1998	Routine
FY17	5292	1988	Routine
FY17	5378	1988	Routine
FY17	5218	2003	Routine
FY17	5277	1997	Routine
FY17	5288	1986	Routine
FY17	5345	1979	Routine
FY17	5153	1978	Routine
FY17	5192	1996	Routine
FY17	5208	1997	Routine
FY17	5226	1992	Routine
FY17	5263	1985	Routine
FY17	5370	1998	Routine
FY17	5383	1988	Routine
FY17	5396	2001	Routine
FY17	5441	UKN	Routine
FY17	5462	UKN	Routine
FY17	5465	2000	Routine
FY17	5466	2000	Routine
FY17	5469	2005	Routine
FY17	5185	1998	Routine
FY17	5271	1989	Routine
FY17	5290	1983	Routine
FY17	5468	2002	Routine
FY17	5510	2005	Routine
FY17	5092	1990	Routine
FY17	5242	1996	Routine

FY17	5261	1991	Routine
FY17	5300	1992	Routine
FY17	5333	1989	Routine
FY17	5402	1984	Routine
FY17	5405	1997	Routine
FY17	5406	1997	Routine
FY17	5407	1997	Routine
FY17	5408	1997	Routine
FY17	5409	1997	Routine
FY17	5420	1988	Routine
FY17	5483	1992	Routine
FY17	5484	1992	Routine
FY17	5485	1996	Routine
FY17	5486	1996	Routine
FY17	5056	2003	Routine
FY17	5289	1986	Routine
FY17	5376	2002	Routine
FY17	5010	UKN	Routine
FY17	5011	UKN	Routine
FY17	5012	UKN	Routine
FY17	5032	UKN	Routine
FY17	5062	UKN	Routine
FY17	5063	1992	Routine
FY17	5068	1985	Routine
FY17	5155	1989	Routine
FY17	5156	1989	Routine
FY17	5244	1985	Routine
FY17	5247	1995	Routine
FY17	5248	2006	Routine
FY17	5249	UKN	Routine
FY17	5264	1984	Routine
FY17	5273	1988	Routine
FY17	5381	1991	Routine
FY17	5560	2007	Routine
FY17	5015	UKN	Routine
FY17	5122	1991	Routine
FY17	5361	2000	Routine
FY17	5388	1990	Routine
FY17	5576	2005	Routine
FY17	5577	2005	Routine
FY17	5578	2005	Routine
FY17	5579	2005	Routine
FY18	5580	2005	Routine

1	5067	7/10/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
2	5068	7/11/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
3	5069	7/12/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
4	5071	7/13/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
5	5227	7/14/2015	Re-inspection	Maintenance needed	Minor	Y	
6	5228	7/15/2015	Re-inspection	Maintenance needed	Minor	Y	
7	5555	7/16/2015	Re-inspection	Maintenance needed	Minor	Y	
8	5556	7/17/2015	Re-inspection	Maintenance needed	Minor	Y	
9	5557	7/18/2015	Re-inspection	Maintenance needed	Minor	Y	
10	5558	7/19/2015	Re-inspection	Maintenance needed	Minor	Y	
11	5559	7/20/2015	Re-inspection	Work Completed	Minor	Y	
12	5287	7/13/2015	Routine	No maintenance needed	None	N	
13	5133	7/17/2015	Re-inspection	Work Completed	None	N	
14	5269	7/17/2015	Routine	Maintenance needed	Minor	Y	
15	5270	7/17/2015	Routine	Maintenance needed	Minor	Y	
16	5007	7/28/2015	Re-inspection	Work Completed	None	N	
17	5917	7/28/2015	Re-inspection	Work Completed	None	N	
18	5164	7/29/2015	Re-inspection	Maintenance needed	Minor	Y	
19	5076	7/29/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor		Y
20	5077	7/29/2015	Re-inspection	Work Completed	None	N	
21	5222	7/29/2015	Routine	Maintenance needed	Minor	Y	
22	5363	7/29/2015	Routine	Maintenance needed	Minor	Y	
23	5509	7/30/2015	Re-inspection	Work Completed	None	N	
24	5332	7/30/2015	Routine	No maintenance needed	None	N	
25	5152	7/30/2015	Routine	Maintenance needed	Minor	Y	
26	5125	7/30/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
27	5362	7/30/2015	Routine	Maintenance needed	Minor	Y	
28	5076	7/30/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	Y	
29	5190	8/5/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
30	5509	8/5/2015	Re-inspection	Work Completed	None	N	
31	5332	8/5/2015	Re-inspection	Work Completed	None	N	
32	5725	8/5/2015	Routine	Maintenance needed	Minor	Y	
33	5542	8/6/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
34	5069	8/6/2015	Re-inspection	Punch list not completed	Minor	N	
35	5069	8/10/2015	Re-inspection	Work Completed	None	N	
36	5224	8/11/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
37	5199	8/12/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
38	5903	8/14/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
39	5904	8/14/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
40	5905	8/14/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
41	5906	8/14/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
42	5336	8/19/2015	Re-inspection	Punch list not completed	Minor	N	
43	5043	8/19/2015	Routine	Maintenance needed	Major	Y	
44	5222	8/19/2015	Routine	No maintenance needed	None	Y	
45	9032	8/20/2015	Routine	No maintenance needed	None	Y	
46	5941	8/20/2015	Routine	No maintenance needed	None	Y	
47	5942	8/20/2015	Routine	No maintenance needed	None	Y	
48	5943	8/20/2015	Routine	No maintenance needed	None	Y	
49	5944	8/20/2015	Routine	No maintenance needed	None	Y	
50	5945	8/20/2015	Routine	No maintenance needed	None	Y	
51	5946	8/20/2015	Routine	No maintenance needed	None	Y	
52	5903	8/20/2015	Re-inspection	Work Completed	None	N	
53	5904	8/21/2015	Re-inspection	Work Completed	None	N	
54	5905	8/21/2015	Re-inspection	Work Completed	None	N	
55	5906	8/21/2015	Re-inspection	Work Completed	None	N	
56	5042	8/21/2015	Routine	Maintenance needed	Major	Y	
57	5190	9/2/2015	Re-inspection	Work Completed	None	N	
58	5216	9/3/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
59	5336	9/11/2015	Re-inspection	Work Completed	None	N	

60	5725	9/16/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y
61	5946	9/17/2015	Re-inspection	Work Completed	None	N
62	5396	9/17/2015	Routine	No maintenance needed	None	Y
63	5398	9/17/2015	Routine	Maintenance needed	Minor	Y
64	5397	9/17/2015	Routine	Maintenance needed	Minor	Y
65	5128	9/18/2015	Routine	Maintenance needed	Minor	Y
66	5352	9/18/2015	Routine	Maintenance needed	Minor	Y
67	5224	9/18/2015	Re-inspection	Work Completed	None	N
68	5216	9/18/2015	Re-inspection	Work Completed	None	N
69	5070	9/18/2015	Re-inspection	Work Completed	None	N
70	5164	9/18/2015	Re-inspection	Work Completed	None	N
71	5098	9/25/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y
72	5181	9/25/2015	Routine	Maintenance needed	Minor	Y
73	5157	9/29/2015	Routine	No maintenance needed	None	Y
74	5295	10/1/2015	Routine	No maintenance needed	None	Y
75	5353	10/1/2015	Routine	Maintenance needed	Minor	Y
76	5354	10/1/2015	Routine	Maintenance needed	Minor	Y
77	5269	10/5/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
78	5270	10/5/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
79	5165	10/5/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
80	5362	10/5/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
81	5363	10/5/2015	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
82	5071	10/8/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y
83	5347	10/23/2015	Re-inspection	Work Completed	None	N
84	5725	10/23/2015	Re-inspection	Work Completed	None	N
85	5467	10/30/2015	Re-inspection	Work Completed	None	N
86	5049	10/6/2015	Routine	No maintenance needed	None	Y
87	5371	10/6/2015	Routine	Maintenance needed	Minor	Y
88	5047	10/6/2015	Routine	No maintenance needed	None	N
89	5072	10/7/2015	Routine	Maintenance needed	Minor	Y
90	5141	10/7/2015	Routine	Maintenance needed	Minor	Y
91	5197	10/7/2015	Routine	Maintenance needed	Minor	Y
92	5059	10/13/2015	Re-inspection	Work Completed	None	N
93	5301	10/20/2015	Routine	Maintenance needed	Minor	Y
94	5505	10/20/2015	Routine	No maintenance needed	None	N
95	5102	10/23/2015	Routine	No maintenance needed	None	N
96	5220	10/23/2015	Routine	Maintenance needed	Minor	Y
97	5210	10/26/2015	Routine	Maintenance needed	Minor	Y
98	5125	10/26/2015	Routine	No maintenance needed	None	N
99	5385	10/28/2015	Routine	Maintenance needed	Minor	Y
100	5040	11/5/2015	Re-inspection	Work Completed	None	N
101	5907	11/23/2015	Re-inspection	Work Completed	None	N
102	5072	10/28/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	Y
103	5397	12/14/2015	Re-inspection	Work Completed	None	N
104	5128	12/14/2015	Re-inspection	Work Completed	None	N
105	5072	10/28/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N
106	5181	12/14/2015	Re-inspection	Work Completed	None	N
107	5141	12/29/2015	Re-inspection	Work Completed	None	N
108	5371	12/29/2015	Re-inspection	Work Completed	None	N
109	5477	12/31/2015	Complaint	Maintenance needed	Minor	N
110	5077	12/2/2015	Re-inspection	Work Completed	None	N
111	5076	12/2/2015	Re-inspection	Work Completed	None	N
112	5353	12/2/2015	Re-inspection	Work Completed	None	N
113	5091	12/9/2015	Routine	No maintenance needed	Minor	Y
114	5090	12/9/2015	Routine	No maintenance needed	Minor	Y
115	5088	12/9/2015	Routine	No maintenance needed	Minor	Y
116	5089	12/9/2015	Re-inspection	Work Completed	None	N
117	5131	12/22/2015	Re-inspection	Work Completed	None	N
118	5362	1/7/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y

119	5363	1/7/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
120	5043	1/8/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
121	5074	1/8/2016	Routine	No maintenance needed	Minor	Y	
122	5043	1/13/2016	Re-inspection	Punch list not completed	Minor	N	
123	5427	1/19/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
124	5043	1/20/2016	Re-inspection	Work Completed	None	N	
125	5976	2/4/2016	Routine	Maintenance needed	Minor	Y	
126	5977	2/4/2016	Routine	Maintenance needed	Minor	Y	
127	5398	12/14/2015	Re-inspection	Punch list not completed	Minor	N	
128	5152	3/21/2016	Re-inspection	Work Completed	None	N	
129	5354	3/25/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
130	5269	3/29/2016	Re-inspection	Work Completed	None	N	
131	5270	3/29/2016	Re-inspection	Work Completed	None	N	
132	5165	3/29/2016	Re-inspection	Work Completed	None	N	
133	5362	3/29/2016	Re-inspection	Uable to access facility	Minor	Y	
134	5363	3/29/2016	Re-inspection	Uable to access facility	Minor	Y	
135	5220	2/12/2016	Re-inspection	Punch list not completed	Minor	N	
136	5301	2/8/2016	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N	
137	5352	2/9/2016	Re-inspection	Work Completed	None	N	
138	5398	3/9/2016	Re-inspection	Work Completed	None	N	
139	5263	3/25/2016	Re-inspection	Maintenance needed	Minor	Y	
140	5083	3/25/2016	Re-inspection	Maintenance needed	Minor	Y	
141	5084	3/25/2016	Re-inspection	Maintenance needed	Minor	Y	
142	5099	3/25/2016	Re-inspection	Maintenance needed	Minor	Y	
143	5059	3/29/2016	Complaint	Maintenance needed	Minor	Y	
144	5965	4/5/2016	Routine	Maintenance needed	Minor	Y	
145	5966	4/5/2016	Routine	Maintenance needed	Minor	Y	
146	5967	4/5/2016	Routine	Maintenance needed	Minor	Y	
147	5968	4/5/2016	Routine	Maintenance needed	Minor	Y	
148	5969	4/5/2016	Routine	Maintenance needed	Minor	Y	
149	5970	4/5/2016	Routine	Maintenance needed	Minor	Y	
150	5971	4/5/2016	Routine	Maintenance needed	Minor	Y	
151	5972	4/5/2016	Routine	Maintenance needed	Minor	Y	
152	5973	4/5/2016	Routine	Maintenance needed	Minor	Y	
153	5134	4/5/2016	Routine	No maintenance needed	None	Y	
154	5143	4/5/2016	Routine	No maintenance needed	None	Y	
155	5101	4/5/2016	Routine	No maintenance needed	None	Y	
156	5151	4/5/2016	Routine	No maintenance needed	None	Y	
157	5974	4/6/2016	Routine	No maintenance needed	None	Y	
158	5975	4/6/2016	Routine	No maintenance needed	None	Y	
159	5608	4/7/2016	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor		Y
160	5079	4/8/2016	Routine	No maintenance needed	None	Y	
161	5513	4/8/2016	Complaint	No maintenance needed	None	Y	
162	5514	4/8/2016	Complaint	Maintenance needed	Minor	Y	
163	5356	4/12/2016	Routine	No maintenance needed	None	Y	
164	5357	4/12/2016	Routine	No maintenance needed	None	Y	
165	5354	4/12/2016	Re-inspection	Work Completed	None	N	
166	5142	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
167	5319	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
168	5320	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
169	5318	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
170	5317	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
171	5316	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
172	5315	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
173	5314	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
174	5313	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
175	5312	4/14/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
176	5303	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	
177	5306	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N	

178	5307	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
179	5308	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
180	5309	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
181	5310	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
182	5311	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
183	5304	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
184	5305	4/15/2016	Routine	Maintenance needed - Plat / plan research needed	Major	N
185	5923	4/18/2016	Routine	No maintenance needed	None	Y
186	5924	4/18/2016	Routine	Maintenance needed	Minor	Y
187	5925	4/18/2016	Routine	Maintenance needed	Minor	Y
188	5957	4/18/2016	Routine	No maintenance needed	None	Y
189	5958	4/18/2016	Routine	No maintenance needed	None	Y
190	5959	4/18/2016	Routine	No maintenance needed	None	Y
191	5244	4/22/2016	Complaint	Maintenance needed	Minor	Y
192	5200	5/2/2016	Routine	Maintenance needed	Minor	Y
193	5274	5/2/2016	Routine	Maintenance needed	Minor	Y
194	5234	5/2/2016	Routine	Maintenance needed	Minor	Y
195	5245	5/2/2016	Routine	Maintenance needed	Minor	Y
196	5214	5/2/2016	Routine	No maintenance needed	None	Y
197	5301	5/8/2016	Re-inspection / Construction Estimate	Construction estimate inspection / CAO	Minor	N
198	5146	5/10/2016	Routine	Maintenance needed	Minor	Y
199	5221	5/10/2016	Routine	Maintenance needed	Minor	Y
200	5223	5/10/2016	Routine	Maintenance needed	Minor	Y
201	5988	5/10/2016	Routine	Maintenance needed	Minor	Y
202	5989	5/10/2016	Routine	Maintenance needed	Minor	Y
203	5990	5/10/2016	Routine	Maintenance needed	Minor	Y
204	5991	5/10/2016	Routine	Maintenance needed	Minor	Y
205	5955	5/16/2016	Routine	Maintenance needed	Minor	Y
206	5016	5/16/2016	Routine	No maintenance needed	None	Y
207	5010	5/19/2016	Routine	Maintenance needed	Minor	Y
208	5011	5/19/2016	Routine	Maintenance needed	Minor	Y
209	5012	5/19/2016	Routine	Maintenance needed	Minor	Y
210	5716	5/19/2016	Routine	Maintenance needed	Minor	Y
211	5717	5/19/2016	Routine	Maintenance needed	Minor	Y
212	5718	5/19/2016	Routine	Maintenance needed	Minor	Y
213	5719	5/20/2016	Routine	Maintenance needed	Minor	Y
214	5720	5/20/2016	Routine	Maintenance needed	Minor	Y
215	5722	5/20/2016	Routine	Maintenance needed	Minor	Y
216	5723	5/20/2016	Routine	Maintenance needed	Minor	Y
217	5042	5/20/2016	Re-inspection	Work Completed	None	N
218	5965	6/8/2016	Re-inspection	Punch list not completed	Minor	N
219	5966	6/8/2016	Re-inspection	Work Completed	None	N
220	5967	6/8/2016	Re-inspection	Work Completed	None	N
221	5968	6/8/2016	Re-inspection	Work Completed	None	N
222	5969	6/8/2016	Re-inspection	Work Completed	None	N
223	5979	6/8/2016	Re-inspection	Work Completed	None	N
224	5971	6/8/2016	Re-inspection	Work Completed	None	N
225	5972	6/8/2016	Re-inspection	Work Completed	None	N
226	5973	6/8/2016	Re-inspection	Punch list not completed	Minor	N
227	5514	6/14/2016	Re-inspection	Punch list not completed	Minor	N
228	5263	6/17/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y
229	5356	6/17/2016	Re-inspection	Work Completed	None	N
230	5357	6/17/2016	Re-inspection	Work Completed	None	N
231	5931	6/21/2016	Routine	No maintenance needed	None	Y
232	5936	6/21/2016	Routine	No maintenance needed	None	Y
233	5400	6/27/2016	Routine	No maintenance needed	None	Y
234	5046	6/27/2016	Routine	Maintenance needed	Minor	Y
235	5142	6/27/2016	Routine	No maintenance needed	None	Y
236	5535	6/29/2016	Routine	Maintenance needed	Minor	Y

237	5536	6/29/2016	Routine	Maintenance needed	Minor	Y	
238	5537	6/29/2016	Routine	Maintenance needed	Minor	Y	
239	5538	6/29/2016	Routine	Maintenance needed	Minor	Y	
240	5539	6/29/2016	Routine	Maintenance needed	Minor	Y	
241	5540	6/29/2016	Routine	Maintenance needed	Minor	Y	
242	5924	6/29/2016	Re-inspection	Work Completed	None	N	
243	5925	6/29/2016	Re-inspection	Work Completed	None	N	
244	5832	6/29/2016	Routine	No maintenance needed	None	Y	
245	5833	6/29/2016	Routine	No maintenance needed	None	Y	
246	5871	6/29/2016	Routine	No maintenance needed	None	Y	
247	5545	6/30/2016	Re-inspection / Site Meeting	Maintenance needed	Minor	Y	
248	5239	6/30/2016	Routine	No maintenance needed	None	Y	
249	5985	6/30/2016	Routine	No maintenance needed	None	Y	
250	5352	10/13/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
251	5397	10/13/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
252	5398	10/13/2015	Re-inspection / Site Meeting	Maintenance needed	Minor	N	
253	5210	2/2/2016	Re-inspection	Work Completed	Minor	N	
254	5398	2/12/2016	Re-inspection	Punch list not completed	None	N	

**Summary of Routines
Annual Reporting Period**

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
1	173	7/1/2015	Routine	Maintenance needed	None	Yes
2	234	7/1/2015	Routine	Maintenance needed	Yes	Yes
3	242	7/1/2015	Routine	Maintenance needed	Yes	Yes
4	243	7/8/2015	Routine	Maintenance needed	Yes	Yes
5	304	7/8/2015	Routine	Maintenance needed	None	Yes
6	410	7/8/2015	Routine	Maintenance needed	Yes	None
7	439	7/8/2015	Routine	No maintenance needed	None	None
8	141	7/16/2015	Routine	Maintenance needed	Yes	None
9	142	7/16/2015	Routine	Maintenance needed	Yes	None
10	143	7/16/2015	Routine	Maintenance needed	Yes	None
11	247	7/16/2015	Routine	Maintenance needed	Yes	Yes
12	248	7/16/2015	Routine	Maintenance needed	Yes	None
13	249	7/16/2015	Routine	Maintenance needed	Yes	Yes
14	356	7/16/2015	Routine	No maintenance needed	None	None
15	455	7/16/2015	Routine	Maintenance needed	Yes	Yes
16	502	7/16/2015	Routine	No maintenance needed	None	None
17	543	7/16/2015	Routine	Maintenance needed	Yes	Yes
18	555	7/16/2015	Routine	Maintenance needed	None	Yes
19	603	7/16/2015	Routine	Maintenance needed	None	Yes
20	391	7/23/2015	Routine	Maintenance needed	Yes	None
21	392	7/23/2015	Routine	Maintenance needed	Yes	None
22	393	7/23/2015	Routine	Maintenance needed	Yes	None
23	506	7/23/2015	Routine	Maintenance needed	Yes	None
24	507	7/23/2015	Routine	Maintenance needed	Yes	None
25	513	7/23/2015	Routine	Maintenance needed	Yes	None
26	588	7/23/2015	Routine	Maintenance needed	Yes	None
27	589	7/23/2015	Routine	Maintenance needed	Yes	None
28	692	7/23/2015	Routine	Maintenance needed	Yes	None
29	870	7/23/2015	Routine	No maintenance needed	None	None
30	922	7/23/2015	Routine	Maintenance needed	Yes	None
31	9	8/11/2015	Routine	Maintenance needed	Yes	Yes
32	17	8/11/2015	Routine	Maintenance needed	Yes	Yes
33	313	8/11/2015	Routine	Maintenance needed	Yes	None
34	639	8/11/2015	Routine	Maintenance needed	Yes	None
35	25	8/19/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
36	26	8/19/2015	Routine	Maintenance needed	None	Yes
37	396	8/19/2015	Routine	No maintenance needed	None	None
38	688	8/19/2015	Routine	Maintenance needed	None	Yes
39	30	8/25/2015	Routine	No maintenance needed	None	None
40	106	8/25/2015	Routine	Maintenance needed	Yes	Yes
41	147	8/25/2015	Routine	Maintenance needed	None	Yes
42	844	8/25/2015	Routine	Maintenance needed	Yes	None
43	38	9/8/2015	Routine	Maintenance needed	Yes	None
44	158	9/8/2015	Routine	Maintenance needed	Yes	Yes
45	380	9/8/2015	Routine	Maintenance needed	Yes	None
46	594	9/8/2015	Routine	No maintenance needed	None	None
47	53	9/9/2015	Routine	Maintenance needed	None	Yes
48	218	9/9/2015	Routine	Maintenance needed	Yes	Yes
49	422	9/9/2015	Routine	Maintenance needed	Yes	None
50	595	9/9/2015	Routine	No maintenance needed	None	None
51	54	10/23/2015	Routine	Maintenance needed	Yes	Yes
52	336	10/23/2015	Routine	Maintenance needed	Yes	None
53	542	10/23/2015	Routine	Maintenance needed	Yes	None
54	596	10/23/2015	Routine	No maintenance needed	None	None
55	55	11/5/2015	Routine	Maintenance needed	None	Yes
56	82	11/5/2015	Routine	No maintenance needed	None	None
57	123	11/5/2015	Routine	Maintenance needed	Yes	Yes
58	124	11/5/2015	Routine	Maintenance needed	Yes	Yes
59	200	11/5/2015	Routine	Maintenance needed	Yes	Yes
60	201	11/5/2015	Routine	Maintenance needed	Yes	Yes
61	338	11/5/2015	Routine	Maintenance needed	Yes	None
62	339	11/5/2015	Routine	Maintenance needed	Yes	None
63	72	11/6/2015	Routine	No maintenance needed	None	None
64	79	11/6/2015	Routine	Maintenance needed	Yes	Yes
65	83	11/6/2015	Routine	Maintenance needed	None	Yes
66	102	11/6/2015	Routine	Maintenance needed	Yes	Yes
67	109	11/6/2015	Routine	Maintenance needed	Yes	Yes
68	110	11/6/2015	Routine	Maintenance needed	Yes	None
69	111	11/6/2015	Routine	Maintenance needed	Yes	Yes
70	113	11/6/2015	Routine	Maintenance needed	Yes	Yes
71	117	11/6/2015	Routine	Maintenance needed	Yes	None
72	118	11/6/2015	Routine	Maintenance needed	Yes	None
73	119	11/6/2015	Routine	No maintenance needed	None	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
74	135	11/6/2015	Routine	No maintenance needed	None	None
75	145	11/6/2015	Routine	No maintenance needed	None	None
76	169	11/6/2015	Routine	Maintenance needed	None	Yes
77	185	11/6/2015	Routine	Maintenance needed	Yes	Yes
78	192	11/6/2015	Routine	Maintenance needed	None	Yes
79	206	11/6/2015	Routine	No maintenance needed	None	None
80	210	11/6/2015	Routine	Maintenance needed	Yes	Yes
81	223	11/6/2015	Routine	No maintenance needed	None	None
82	224	11/6/2015	Routine	Maintenance needed	None	Yes
83	245	11/6/2015	Routine	Maintenance needed	None	Yes
84	246	11/6/2015	Routine	No maintenance needed	None	None
85	278	11/6/2015	Routine	Maintenance needed	None	Yes
86	340	11/6/2015	Routine	Maintenance needed	Yes	None
87	343	11/6/2015	Routine	Maintenance needed	Yes	None
88	379	11/6/2015	Routine	Maintenance needed	Yes	Yes
89	387	11/6/2015	Routine	Maintenance needed	Yes	None
90	411	11/6/2015	Routine	Maintenance needed	Yes	None
91	494	11/6/2015	Routine	Maintenance needed	Yes	Yes
92	517	11/6/2015	Routine	Maintenance needed	Yes	None
93	520	11/6/2015	Routine	Maintenance needed	Yes	Yes
94	525	11/6/2015	Routine	Maintenance needed	Yes	Yes
95	526	11/6/2015	Routine	Maintenance needed	Yes	Yes
96	528	11/6/2015	Routine	Maintenance needed	Yes	None
97	559	11/6/2015	Routine	Maintenance needed	Yes	None
98	562	11/6/2015	Routine	Maintenance needed	None	Yes
99	567	11/6/2015	Routine	Maintenance needed	Yes	None
100	580	11/6/2015	Routine	Maintenance needed	Yes	None
101	605	11/6/2015	Routine	No maintenance needed	None	None
102	647	11/6/2015	Routine	No maintenance needed	None	None
103	15	11/7/2015	Routine	No maintenance needed	None	None
104	136	11/7/2015	Routine	No maintenance needed	None	None
105	606	11/7/2015	Routine	Maintenance needed	None	Yes
106	613	11/7/2015	Routine	Maintenance needed	Yes	Yes
107	5	11/12/2015	Routine	Maintenance needed	Yes	None
108	93	11/12/2015	Routine	Maintenance needed	Yes	None
109	94	11/12/2015	Routine	No maintenance needed	None	None
110	137	11/12/2015	Routine	No maintenance needed	None	None
111	138	11/12/2015	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
112	139	11/12/2015	Routine	No maintenance needed	None	None
113	618	11/12/2015	Routine	Maintenance needed	Yes	Yes
114	627	11/12/2015	Routine	Maintenance needed	Yes	Yes
115	651	11/12/2015	Routine	No maintenance needed	None	None
116	669	11/12/2015	Routine	Maintenance needed	Yes	None
117	690	11/12/2015	Routine	No maintenance needed	None	None
118	694	11/12/2015	Routine	Maintenance needed	Yes	Yes
119	140	11/13/2015	Routine	No maintenance needed	None	None
120	161	11/13/2015	Routine	No maintenance needed	None	None
121	184	11/13/2015	Routine	Maintenance needed	Yes	Yes
122	277	11/13/2015	Routine	No maintenance needed	None	None
123	808	11/13/2015	Routine	Maintenance needed	None	Yes
124	811	11/13/2015	Routine	Maintenance needed	Yes	Yes
125	818	11/13/2015	Routine	Maintenance needed	Yes	None
126	836	11/13/2015	Routine	Maintenance needed	Yes	None
127	6	11/17/2015	Routine	Maintenance needed	Yes	None
128	23	11/17/2015	Routine	Maintenance needed	Yes	None
129	44	11/17/2015	Routine	Maintenance needed	Yes	Yes
130	47	11/17/2015	Routine	Maintenance needed	Yes	Yes
131	482	11/17/2015	Routine	Maintenance needed	Yes	Yes
132	97	11/17/2015	Routine	Maintenance needed	Yes	Yes
133	98	11/17/2015	Routine	Maintenance needed	Yes	None
134	107	11/17/2015	Routine	Maintenance needed	Yes	Yes
135	114	11/17/2015	Routine	Maintenance needed	Yes	Yes
136	144	11/17/2015	Routine	Maintenance needed	Yes	Yes
137	151	11/17/2015	Routine	Maintenance needed	Yes	Yes
138	155	11/17/2015	Routine	No maintenance needed	None	None
139	204	11/17/2015	Routine	Maintenance needed	Yes	None
140	205	11/17/2015	Routine	No maintenance needed	None	None
141	215	11/17/2015	Routine	Maintenance needed	Yes	None
142	216	11/17/2015	Routine	Maintenance needed	Yes	Yes
143	217	11/17/2015	Routine	Maintenance needed	None	Yes
144	226	11/17/2015	Routine	Maintenance needed	Yes	None
145	227	11/17/2015	Routine	Maintenance needed	Yes	None
146	228	11/17/2015	Routine	Maintenance needed	Yes	None
147	230	11/17/2015	Routine	Maintenance needed	Yes	Yes
148	231	11/17/2015	Routine	Maintenance needed	None	Yes
149	232	11/17/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
150	235	11/17/2015	Routine	Maintenance needed	Yes	Yes
151	237	11/17/2015	Routine	No maintenance needed	None	None
152	238	11/17/2015	Routine	Maintenance needed	Yes	None
153	241	11/17/2015	Routine	Maintenance needed	Yes	Yes
154	272	11/17/2015	Routine	Maintenance needed	Yes	Yes
155	273	11/17/2015	Routine	Maintenance needed	Yes	None
156	275	11/17/2015	Routine	Maintenance needed	Yes	Yes
157	285	11/17/2015	Routine	No maintenance needed	None	None
158	293	11/17/2015	Routine	No maintenance needed	None	None
159	294	11/17/2015	Routine	No maintenance needed	None	None
160	329	11/17/2015	Routine	Maintenance needed	Yes	Yes
161	364	11/17/2015	Routine	No maintenance needed	None	None
162	434	11/17/2015	Routine	Maintenance needed	Yes	None
163	477	11/17/2015	Routine	No maintenance needed	None	None
164	482	11/17/2015	Routine	Maintenance needed	Yes	Yes
165	837	11/17/2015	Routine	No maintenance needed	None	None
166	850	11/17/2015	Routine	Maintenance needed	Yes	Yes
167	888	11/17/2015	Routine	Maintenance needed	Yes	Yes
168	59	11/18/2015	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
169	59	11/18/2015	Routine	Maintenance needed	Yes	Yes
170	84	11/18/2015	Routine	Maintenance needed	Yes	Yes
171	85	11/18/2015	Routine	Maintenance needed	Yes	Yes
172	188	11/18/2015	Routine	Maintenance needed	Yes	Yes
173	276	11/18/2015	Routine	Maintenance needed	Yes	Yes
174	282	11/18/2015	Routine	Maintenance needed	Yes	Yes
175	283	11/18/2015	Routine	Maintenance needed	Yes	None
176	301	11/18/2015	Routine	Maintenance needed	Yes	Yes
177	302	11/18/2015	Routine	Maintenance needed	Yes	Yes
178	365	11/18/2015	Routine	No maintenance needed	None	None
179	366	11/18/2015	Routine	No maintenance needed	None	None
180	367	11/18/2015	Routine	No maintenance needed	None	None
181	386	11/18/2015	Routine	Maintenance needed	Yes	Yes
182	388	11/18/2015	Routine	Maintenance needed	Yes	None
183	389	11/18/2015	Routine	Maintenance needed	Yes	Yes
184	390	11/18/2015	Routine	No maintenance needed	None	None
185	405	11/18/2015	Routine	Maintenance needed	Yes	Yes
186	414	11/18/2015	Routine	Maintenance needed	Yes	Yes
187	492	11/18/2015	Routine	No maintenance needed	None	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
188	503	11/18/2015	Routine	Maintenance needed	Yes	Yes
189	49	11/24/2015	Routine	Maintenance needed	Yes	None
190	165	11/24/2015	Routine	Maintenance needed	Yes	Yes
191	167	11/24/2015	Routine	Maintenance needed	Yes	Yes
192	195	11/24/2015	Routine	Maintenance needed	Yes	Yes
193	258	11/24/2015	Routine	Maintenance needed	Yes	Yes
194	307	11/24/2015	Routine	Maintenance needed	Yes	Yes
195	320	11/24/2015	Routine	No maintenance needed	None	None
196	344	11/24/2015	Routine	Maintenance needed	Yes	Yes
197	350	11/24/2015	Routine	No maintenance needed	None	None
198	357	11/24/2015	Routine	Maintenance needed	Yes	Yes
199	362	11/24/2015	Routine	No maintenance needed	None	None
200	363	11/24/2015	Routine	Maintenance needed	None	Yes
201	464	11/24/2015	Routine	Maintenance needed	None	Yes
202	481	11/24/2015	Routine	Maintenance needed	Yes	Yes
203	493	11/24/2015	Routine	No maintenance needed	None	None
204	529	11/24/2015	Routine	Maintenance needed	Yes	Yes
205	535	11/24/2015	Routine	Maintenance needed	Yes	None
206	546	11/24/2015	Routine	Maintenance needed	Yes	Yes
207	556	11/24/2015	Routine	Maintenance needed	Yes	None
208	556	11/24/2015	Routine	Maintenance needed	Yes	None
209	641	11/24/2015	Routine	Maintenance needed	Yes	Yes
210	648	11/24/2015	Routine	No maintenance needed	None	None
211	664	11/24/2015	Routine	No maintenance needed	None	None
212	805	11/24/2015	Routine	No maintenance needed	None	None
213	823	11/24/2015	Routine	No maintenance needed	None	None
214	849	11/24/2015	Routine	No maintenance needed	None	None
215	864	11/24/2015	Routine	No maintenance needed	None	None
216	890	11/24/2015	Routine	No maintenance needed	None	None
217	891	11/24/2015	Routine	No maintenance needed	None	None
218	413	12/1/2015	Routine	Maintenance needed	Yes	Yes
219	461	12/1/2015	Routine	Maintenance needed	Yes	None
220	865	12/1/2015	Routine	Maintenance needed	Yes	Yes
221	34	12/7/2015	Routine	Maintenance needed	Yes	Yes
222	35	12/7/2015	Routine	Maintenance needed	None	Yes
223	36	12/7/2015	Routine	Maintenance needed	Yes	Yes
224	39	12/7/2015	Routine	Maintenance needed	Yes	Yes
225	46	12/7/2015	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
226	61	12/7/2015	Routine	Maintenance needed	Yes	Yes
227	69	12/7/2015	Routine	Maintenance needed	Yes	Yes
228	91	12/7/2015	Routine	Maintenance needed	Yes	Yes
229	92	12/7/2015	Routine	Maintenance needed	None	Yes
230	99	12/7/2015	Routine	Maintenance needed	Yes	Yes
231	105	12/7/2015	Routine	Maintenance needed	Yes	Yes
232	108	12/7/2015	Routine	Maintenance needed	Yes	Yes
233	120	12/7/2015	Routine	Maintenance needed	Yes	None
234	128	12/7/2015	Routine	Maintenance needed	Yes	Yes
235	152	12/7/2015	Routine	Maintenance needed	Yes	Yes
236	162	12/7/2015	Routine	Maintenance needed	None	Yes
237	166	12/7/2015	Routine	Maintenance needed	Yes	None
238	174	12/7/2015	Routine	Maintenance needed	Yes	Yes
239	175	12/7/2015	Routine	Maintenance needed	Yes	Yes
240	176	12/7/2015	Routine	Maintenance needed	Yes	Yes
241	196	12/7/2015	Routine	Maintenance needed	Yes	Yes
242	197	12/7/2015	Routine	No maintenance needed	None	None
243	209	12/7/2015	Routine	No maintenance needed	None	None
244	252	12/7/2015	Routine	Maintenance needed	Yes	Yes
245	311	12/7/2015	Routine	Maintenance needed	Yes	Yes
246	319	12/7/2015	Routine	Maintenance needed	Yes	Yes
247	321	12/7/2015	Routine	No maintenance needed	None	None
248	330	12/7/2015	Routine	No maintenance needed	None	None
249	345	12/7/2015	Routine	Maintenance needed	Yes	Yes
250	369	12/7/2015	Routine	Maintenance needed	Yes	None
251	372	12/7/2015	Routine	No maintenance needed	None	None
252	412	12/7/2015	Routine	Maintenance needed	Yes	None
253	424	12/7/2015	Routine	Maintenance needed	Yes	Yes
254	462	12/7/2015	Routine	Maintenance needed	Yes	None
255	469	12/7/2015	Routine	Maintenance needed	Yes	Yes
256	479	12/7/2015	Routine	No maintenance needed	None	None
257	491	12/7/2015	Routine	No maintenance needed	None	None
258	495	12/7/2015	Routine	No maintenance needed	None	None
259	496	12/7/2015	Routine	No maintenance needed	None	None
260	497	12/7/2015	Routine	No maintenance needed	None	None
261	499	12/7/2015	Routine	No maintenance needed	None	None
262	500	12/7/2015	Routine	No maintenance needed	None	None
263	522	12/7/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
264	523	12/7/2015	Routine	Maintenance needed	Yes	Yes
265	544	12/7/2015	Routine	Maintenance needed	None	Yes
266	545	12/7/2015	Routine	Maintenance needed	None	Yes
267	560	12/7/2015	Routine	Maintenance needed	None	None
268	561	12/7/2015	Routine	Maintenance needed	Yes	Yes
269	565	12/7/2015	Routine	Maintenance needed	Yes	None
270	587	12/7/2015	Routine	Maintenance needed	Yes	Yes
271	597	12/7/2015	Routine	Maintenance needed	Yes	Yes
272	614	12/7/2015	Routine	Maintenance needed	Yes	None
273	615	12/7/2015	Routine	Maintenance needed	Yes	None
274	620	12/7/2015	Routine	No maintenance needed	None	None
275	622	12/7/2015	Routine	Maintenance needed	Yes	Yes
276	623	12/7/2015	Routine	No maintenance needed	None	None
277	625	12/7/2015	Routine	Maintenance needed	Yes	Yes
278	634	12/7/2015	Routine	No maintenance needed	None	None
279	635	12/7/2015	Routine	No maintenance needed	None	None
280	637	12/7/2015	Routine	Maintenance needed	Yes	Yes
281	638	12/7/2015	Routine	Maintenance needed	Yes	None
282	684	12/7/2015	Routine	Maintenance needed	Yes	Yes
283	693	12/7/2015	Routine	No maintenance needed	None	None
284	819	12/7/2015	Routine	Maintenance needed	Yes	None
285	822	12/7/2015	Routine	Maintenance needed	Yes	Yes
286	874	12/7/2015	Routine	No maintenance needed	None	None
287	881	12/7/2015	Routine	No maintenance needed	None	None
288	882	12/7/2015	Routine	No maintenance needed	None	None
289	910	12/7/2015	Routine	Maintenance needed	Yes	Yes
290	916	12/7/2015	Routine	Maintenance needed	Yes	Yes
291	935	12/7/2015	Routine	No maintenance needed	None	None
292	3	12/8/2015	Routine	Maintenance needed	Yes	Yes
293	16	12/8/2015	Routine	Maintenance needed	None	Yes
294	22	12/8/2015	Routine	Maintenance needed	Yes	Yes
295	24	12/8/2015	Routine	Maintenance needed	Yes	Yes
296	50	12/8/2015	Routine	Maintenance needed	Yes	Yes
297	52	12/8/2015	Routine	Maintenance needed	Yes	None
298	58	12/8/2015	Routine	No maintenance needed	None	None
299	74	12/8/2015	Routine	Maintenance needed	None	Yes
300	126	12/8/2015	Routine	Maintenance needed	Yes	Yes
301	132	12/8/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
302	186	12/8/2015	Routine	No maintenance needed	None	None
303	244	12/8/2015	Routine	Maintenance needed	Yes	Yes
304	295	12/8/2015	Routine	No maintenance needed	None	None
305	306	12/8/2015	Routine	Maintenance needed	Yes	Yes
306	308	12/8/2015	Routine	Maintenance needed	Yes	None
307	309	12/8/2015	Routine	Maintenance needed	Yes	Yes
308	310	12/8/2015	Routine	Maintenance needed	Yes	Yes
309	322	12/8/2015	Routine	Maintenance needed	Yes	Yes
310	373	12/8/2015	Routine	Maintenance needed	None	Yes
311	374	12/8/2015	Routine	No maintenance needed	None	None
312	375	12/8/2015	Routine	Maintenance needed	None	Yes
313	399	12/8/2015	Routine	Maintenance needed	Yes	Yes
314	432	12/8/2015	Routine	Maintenance needed	Yes	Yes
315	433	12/8/2015	Routine	Maintenance needed	Yes	Yes
316	443	12/8/2015	Routine	No maintenance needed	None	None
317	449	12/8/2015	Routine	No maintenance needed	None	None
318	450	12/8/2015	Routine	No maintenance needed	None	None
319	474	12/8/2015	Routine	Maintenance needed	Yes	None
320	476	12/8/2015	Routine	Maintenance needed	Yes	Yes
321	511	12/8/2015	Routine	Maintenance needed	Yes	None
322	521	12/8/2015	Routine	Maintenance needed	Yes	Yes
323	538	12/8/2015	Routine	Maintenance needed	Yes	Yes
324	539	12/8/2015	Routine	Maintenance needed	Yes	Yes
325	554	12/8/2015	Routine	No maintenance needed	None	None
326	557	12/8/2015	Routine	Maintenance needed	Yes	Yes
327	558	12/8/2015	Routine	Maintenance needed	Yes	None
328	564	12/8/2015	Routine	Maintenance needed	Yes	None
329	572	12/8/2015	Routine	No maintenance needed	None	None
330	573	12/8/2015	Routine	No maintenance needed	None	None
331	574	12/8/2015	Routine	No maintenance needed	None	None
332	585	12/8/2015	Routine	Maintenance needed	Yes	Yes
333	608	12/8/2015	Routine	Maintenance needed	Yes	Yes
334	617	12/8/2015	Routine	No maintenance needed	None	None
335	662	12/8/2015	Routine	Maintenance needed	Yes	None
336	685	12/8/2015	Routine	Maintenance needed	Yes	Yes
337	695	12/8/2015	Routine	Maintenance needed	Yes	None
338	817	12/8/2015	Routine	No maintenance needed	None	None
339	838	12/8/2015	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
340	839	12/8/2015	Routine	No maintenance needed	None	None
341	845	12/8/2015	Routine	Maintenance needed	Yes	Yes
342	847	12/8/2015	Routine	Maintenance needed	Yes	Yes
343	862	12/8/2015	Routine	Maintenance needed	Yes	Yes
344	875	12/8/2015	Routine	No maintenance needed	None	None
345	876	12/8/2015	Routine	No maintenance needed	None	None
346	877	12/8/2015	Routine	Maintenance needed	Yes	Yes
347	879	12/8/2015	Routine	No maintenance needed	None	None
348	886	12/8/2015	Routine	Maintenance needed	None	Yes
349	934	12/8/2015	Routine	Maintenance needed	None	Yes
350	32	12/9/2015	Routine	No maintenance needed	None	None
351	103	12/9/2015	Routine	No maintenance needed	None	None
352	104	12/9/2015	Routine	Maintenance needed	Yes	Yes
353	134	12/9/2015	Routine	Maintenance needed	Yes	None
354	198	12/9/2015	Routine	Maintenance needed	Yes	Yes
355	346	12/9/2015	Routine	Maintenance needed	None	Yes
356	436	12/9/2015	Routine	Maintenance needed	Yes	None
357	456	12/9/2015	Routine	Maintenance needed	None	Yes
358	505	12/9/2015	Routine	Maintenance needed	None	Yes
359	532	12/9/2015	Routine	Maintenance needed	Yes	None
360	687	12/9/2015	Routine	Maintenance needed	Yes	Yes
361	820	12/9/2015	Routine	Maintenance needed	Yes	Yes
362	821	12/9/2015	Routine	No maintenance needed	None	None
363	868	12/9/2015	Routine	Maintenance needed	Yes	None
364	878	12/9/2015	Routine	Maintenance needed	Yes	Yes
365	4	12/11/2015	Routine	Maintenance needed	None	Yes
366	11	12/11/2015	Routine	Maintenance needed	Yes	Yes
367	40	12/11/2015	Routine	Maintenance needed	Yes	Yes
368	159	12/11/2015	Routine	Maintenance needed	Yes	Yes
369	199	12/11/2015	Routine	Maintenance needed	Yes	Yes
370	236	12/11/2015	Routine	Maintenance needed	Yes	None
371	315	12/11/2015	Routine	Maintenance needed	Yes	Yes
372	316	12/11/2015	Routine	No maintenance needed	None	None
373	318	12/11/2015	Routine	No maintenance needed	None	None
374	327	12/11/2015	Routine	Maintenance needed	Yes	None
375	332	12/11/2015	Routine	No maintenance needed	None	None
376	407	12/11/2015	Routine	Maintenance needed	Yes	Yes
377	408	12/11/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
378	409	12/11/2015	Routine	Maintenance needed	None	Yes
379	426	12/11/2015	Routine	Maintenance needed	Yes	None
380	463	12/11/2015	Routine	Maintenance needed	Yes	None
381	466	12/11/2015	Routine	Maintenance needed	Yes	Yes
382	533	12/11/2015	Routine	Maintenance needed	None	Yes
383	536	12/11/2015	Routine	Maintenance needed	Yes	Yes
384	537	12/11/2015	Routine	Maintenance needed	Yes	Yes
385	583	12/11/2015	Routine	Maintenance needed	Yes	Yes
386	663	12/11/2015	Routine	Maintenance needed	Yes	None
387	806	12/11/2015	Routine	Maintenance needed	Yes	Yes
388	807	12/11/2015	Routine	Maintenance needed	Yes	None
389	840	12/11/2015	Routine	No maintenance needed	None	None
390	841	12/11/2015	Routine	No maintenance needed	None	None
391	842	12/11/2015	Routine	Maintenance needed	Yes	None
392	95	12/14/2015	Routine	Maintenance needed	Yes	None
393	127	12/14/2015	Routine	Maintenance needed	Yes	Yes
394	460	12/14/2015	Routine	Maintenance needed	Yes	Yes
395	467	12/14/2015	Routine	No maintenance needed	None	None
396	551	12/14/2015	Routine	Maintenance needed	Yes	None
397	551	12/14/2015	Routine	Maintenance needed	Yes	None
398	590	12/14/2015	Routine	Maintenance needed	Yes	None
399	41	12/15/2015	Routine	Maintenance needed	Yes	Yes
400	45	12/15/2015	Routine	Maintenance needed	None	Yes
401	66	12/15/2015	Routine	Maintenance needed	Yes	Yes
402	88	12/15/2015	Routine	Maintenance needed	Yes	Yes
403	168	12/15/2015	Routine	Maintenance needed	Yes	Yes
404	190	12/15/2015	Routine	Maintenance needed	Yes	Yes
405	191	12/15/2015	Routine	Maintenance needed	None	Yes
406	284	12/15/2015	Routine	Maintenance needed	None	Yes
407	468	12/15/2015	Routine	No maintenance needed	None	None
408	472	12/15/2015	Routine	No maintenance needed	None	None
409	530	12/15/2015	Routine	Maintenance needed	Yes	None
410	568	12/15/2015	Routine	Maintenance needed	Yes	Yes
411	14	12/16/2015	Routine	Maintenance needed	Yes	Yes
412	20	12/16/2015	Routine	Maintenance needed	Yes	Yes
413	21	12/16/2015	Routine	Maintenance needed	Yes	Yes
414	57	12/16/2015	Routine	Maintenance needed	Yes	Yes
415	60	12/16/2015	Routine	Maintenance needed	None	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
416	70	12/16/2015	Routine	Maintenance needed	Yes	Yes
417	76	12/16/2015	Routine	Maintenance needed	None	Yes
418	77	12/16/2015	Routine	Maintenance needed	None	Yes
419	90	12/16/2015	Routine	Maintenance needed	Yes	Yes
420	101	12/16/2015	Routine	Maintenance needed	None	Yes
421	182	12/16/2015	Routine	Maintenance needed	Yes	Yes
422	183	12/16/2015	Routine	Maintenance needed	Yes	Yes
423	187	12/16/2015	Routine	No maintenance needed	None	None
424	220	12/16/2015	Routine	Maintenance needed	Yes	Yes
425	225	12/16/2015	Routine	Maintenance needed	Yes	Yes
426	271	12/16/2015	Routine	Maintenance needed	Yes	Yes
427	298	12/16/2015	Routine	Maintenance needed	Yes	None
428	299	12/16/2015	Routine	Maintenance needed	None	Yes
429	300	12/16/2015	Routine	No maintenance needed	None	None
430	314	12/16/2015	Routine	Maintenance needed	Yes	Yes
431	326	12/16/2015	Routine	Maintenance needed	Yes	Yes
432	328	12/16/2015	Routine	Maintenance needed	None	Yes
433	333	12/16/2015	Routine	No maintenance needed	None	None
434	334	12/16/2015	Routine	Maintenance needed	Yes	Yes
435	335	12/16/2015	Routine	Maintenance needed	None	Yes
436	360	12/16/2015	Routine	Maintenance needed	Yes	None
437	361	12/16/2015	Routine	Maintenance needed	Yes	Yes
438	368	12/16/2015	Routine	Maintenance needed	Yes	None
439	371	12/16/2015	Routine	Maintenance needed	None	Yes
440	377	12/16/2015	Routine	Maintenance needed	Yes	Yes
441	382	12/16/2015	Routine	Maintenance needed	None	Yes
442	394	12/16/2015	Routine	Maintenance needed	Yes	Yes
443	406	12/16/2015	Routine	Maintenance needed	None	Yes
444	421	12/16/2015	Routine	Maintenance needed	Yes	Yes
445	423	12/16/2015	Routine	Maintenance needed	None	Yes
446	425	12/16/2015	Routine	Maintenance needed	Yes	Yes
447	440	12/16/2015	Routine	Maintenance needed	Yes	Yes
448	441	12/16/2015	Routine	Maintenance needed	Yes	Yes
449	447	12/16/2015	Routine	No maintenance needed	None	None
450	448	12/16/2015	Routine	No maintenance needed	None	None
451	471	12/16/2015	Routine	Maintenance needed	Yes	Yes
452	484	12/16/2015	Routine	Maintenance needed	Yes	None
453	489	12/16/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
454	501	12/16/2015	Routine	Maintenance needed	Yes	Yes
455	510	12/16/2015	Routine	Maintenance needed	Yes	Yes
456	512	12/16/2015	Routine	Maintenance needed	Yes	Yes
457	514	12/16/2015	Routine	Maintenance needed	Yes	None
458	515	12/16/2015	Routine	Maintenance needed	Yes	None
459	516	12/16/2015	Routine	Maintenance needed	Yes	Yes
460	519	12/16/2015	Routine	No maintenance needed	None	None
461	566	12/16/2015	Routine	Maintenance needed	Yes	None
462	575	12/16/2015	Routine	Maintenance needed	Yes	None
463	584	12/16/2015	Routine	Maintenance needed	Yes	None
464	592	12/16/2015	Routine	Maintenance needed	Yes	None
465	600	12/16/2015	Routine	Maintenance needed	Yes	Yes
466	601	12/16/2015	Routine	Maintenance needed	None	Yes
467	602	12/16/2015	Routine	Maintenance needed	None	Yes
468	604	12/16/2015	Routine	No maintenance needed	None	None
469	607	12/16/2015	Routine	Maintenance needed	Yes	None
470	610	12/16/2015	Routine	Maintenance needed	None	Yes
471	616	12/16/2015	Routine	Maintenance needed	None	Yes
472	619	12/16/2015	Routine	Maintenance needed	Yes	None
473	621	12/16/2015	Routine	No maintenance needed	None	None
474	624	12/16/2015	Routine	Maintenance needed	Yes	Yes
475	630	12/16/2015	Routine	Maintenance needed	Yes	None
476	631	12/16/2015	Routine	Maintenance needed	Yes	None
477	640	12/16/2015	Routine	Maintenance needed	None	Yes
478	642	12/16/2015	Routine	Maintenance needed	Yes	None
479	643	12/16/2015	Routine	Maintenance needed	Yes	Yes
480	644	12/16/2015	Routine	No maintenance needed	None	None
481	645	12/16/2015	Routine	Maintenance needed	Yes	Yes
482	646	12/16/2015	Routine	Maintenance needed	None	Yes
483	649	12/16/2015	Routine	Maintenance needed	Yes	Yes
484	650	12/16/2015	Routine	No maintenance needed	None	None
485	654	12/16/2015	Routine	Maintenance needed	Yes	None
486	655	12/16/2015	Routine	Maintenance needed	Yes	Yes
487	656	12/16/2015	Routine	No maintenance needed	None	None
488	667	12/16/2015	Routine	Maintenance needed	Yes	None
489	683	12/16/2015	Routine	No maintenance needed	None	None
490	699	12/16/2015	Routine	Maintenance needed	Yes	None
491	800	12/16/2015	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
492	801	12/16/2015	Routine	Maintenance needed	Yes	None
493	802	12/16/2015	Routine	No maintenance needed	None	None
494	803	12/16/2015	Routine	Maintenance needed	Yes	Yes
495	809	12/16/2015	Routine	No maintenance needed	None	None
496	812	12/16/2015	Routine	No maintenance needed	None	None
497	816	12/16/2015	Routine	Maintenance needed	Yes	Yes
498	846	12/16/2015	Routine	Maintenance needed	Yes	None
499	848	12/16/2015	Routine	No maintenance needed	None	None
500	880	12/16/2015	Routine	No maintenance needed	None	None
501	883	12/16/2015	Routine	Maintenance needed	Yes	Yes
502	889	12/16/2015	Routine	No maintenance needed	None	None
503	892	12/16/2015	Routine	No maintenance needed	None	None
504	7	12/21/2015	Routine	Maintenance needed	None	Yes
505	8	12/21/2015	Routine	Maintenance needed	None	Yes
506	12	12/21/2015	Routine	Maintenance needed	None	Yes
507	67	12/21/2015	Routine	Maintenance needed	Yes	Yes
508	146	12/21/2015	Routine	No maintenance needed	None	None
509	160	12/21/2015	Routine	No maintenance needed	None	None
510	170	12/21/2015	Routine	Maintenance needed	Yes	Yes
511	171	12/21/2015	Routine	Maintenance needed	Yes	None
512	178	12/21/2015	Routine	Maintenance needed	Yes	Yes
513	179	12/21/2015	Routine	Maintenance needed	Yes	Yes
514	211	12/21/2015	Routine	Maintenance needed	Yes	None
515	233	12/21/2015	Routine	Maintenance needed	Yes	None
516	253	12/21/2015	Routine	Maintenance needed	None	Yes
517	577	12/21/2015	Routine	Maintenance needed	Yes	Yes
518	582	12/21/2015	Routine	Maintenance needed	Yes	Yes
519	661	12/21/2015	Routine	Maintenance needed	Yes	Yes
520	670	12/21/2015	Routine	Maintenance needed	Yes	Yes
521	671	12/21/2015	Routine	Maintenance needed	Yes	None
522	851	12/21/2015	Routine	No maintenance needed	None	None
523	872	12/21/2015	Routine	Maintenance needed	Yes	None
524	893	12/21/2015	Routine	Maintenance needed	Yes	Yes
525	121	12/22/2015	Routine	Maintenance needed	None	Yes
526	229	12/22/2015	Routine	Maintenance needed	Yes	Yes
527	259	12/22/2015	Routine	Maintenance needed	Yes	Yes
528	260	12/22/2015	Routine	Maintenance needed	None	Yes
529	261	12/22/2015	Routine	No maintenance needed	None	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
530	262	12/22/2015	Routine	No maintenance needed	None	None
531	263	12/22/2015	Routine	Maintenance needed	None	Yes
532	264	12/22/2015	Routine	Maintenance needed	None	Yes
533	305	12/22/2015	Routine	Maintenance needed	None	Yes
534	312	12/22/2015	Routine	Maintenance needed	None	Yes
535	370	12/22/2015	Routine	No maintenance needed	None	None
536	398	12/22/2015	Routine	Maintenance needed	Yes	Yes
537	430	12/22/2015	Routine	Maintenance needed	Yes	Yes
538	431	12/22/2015	Routine	Maintenance needed	Yes	Yes
539	509	12/22/2015	Routine	Maintenance needed	Yes	Yes
540	534	12/22/2015	Routine	Maintenance needed	None	Yes
541	552	12/22/2015	Routine	Maintenance needed	Yes	None
542	553	12/22/2015	Routine	Maintenance needed	None	None
543	553	12/22/2015	Routine	No maintenance needed	None	None
544	570	12/22/2015	Routine	Maintenance needed	Yes	Yes
545	697	12/22/2015	Routine	Maintenance needed	Yes	None
546	698	12/22/2015	Routine	Maintenance needed	Yes	Yes
547	75	12/29/2015	Routine	Maintenance needed	Yes	Yes
548	125	12/29/2015	Routine	Maintenance needed	Yes	Yes
549	265	12/29/2015	Routine	Maintenance needed	Yes	None
550	266	12/29/2015	Routine	Maintenance needed	None	Yes
551	871	12/29/2015	Routine	Maintenance needed	Yes	Yes
552	873	12/29/2015	Routine	Maintenance needed	Yes	Yes
553	18	12/30/2015	Routine	Maintenance needed	Yes	Yes
554	27	12/30/2015	Routine	Maintenance needed	None	Yes
555	73	12/30/2015	Routine	Maintenance needed	Yes	Yes
556	80	12/30/2015	Routine	No maintenance needed	None	None
557	112	12/30/2015	Routine	Maintenance needed	Yes	None
558	202	12/30/2015	Routine	Maintenance needed	Yes	Yes
559	267	12/30/2015	Routine	Maintenance needed	Yes	None
560	268	12/30/2015	Routine	Maintenance needed	Yes	Yes
561	269	12/30/2015	Routine	Maintenance needed	None	Yes
562	279	12/30/2015	Routine	No maintenance needed	None	None
563	286	12/30/2015	Routine	Maintenance needed	Yes	Yes
564	894	12/30/2015	Routine	Maintenance needed	Yes	Yes
565	28	12/31/2015	Routine	Maintenance needed	Yes	Yes
566	63	12/31/2015	Routine	Maintenance needed	Yes	Yes
567	64	12/31/2015	Routine	Maintenance needed	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
568	81	12/31/2015	Routine	Maintenance needed	Yes	None
569	86	12/31/2015	Routine	Maintenance needed	Yes	None
570	96	12/31/2015	Routine	Maintenance needed	Yes	Yes
571	129	12/31/2015	Routine	Maintenance needed	Yes	Yes
572	149	12/31/2015	Routine	No maintenance needed	None	None
573	150	12/31/2015	Routine	Maintenance needed	Yes	Yes
574	156	12/31/2015	Routine	Maintenance needed	Yes	None
575	296	12/31/2015	Routine	Maintenance needed	Yes	Yes
576	303	12/31/2015	Routine	Maintenance needed	Yes	Yes
577	348	12/31/2015	Routine	Maintenance needed	None	Yes
578	349	12/31/2015	Routine	No maintenance needed	None	None
579	352	12/31/2015	Routine	Maintenance needed	Yes	Yes
580	353	12/31/2015	Routine	No maintenance needed	None	None
581	355	12/31/2015	Routine	Maintenance needed	Yes	None
582	376	12/31/2015	Routine	Maintenance needed	Yes	Yes
583	404	12/31/2015	Routine	Maintenance needed	None	Yes
584	428	12/31/2015	Routine	Maintenance needed	Yes	None
585	445	12/31/2015	Routine	Maintenance needed	Yes	None
586	446	12/31/2015	Routine	No maintenance needed	None	None
587	485	12/31/2015	Routine	Maintenance needed	Yes	Yes
588	486	12/31/2015	Routine	Maintenance needed	Yes	Yes
589	508	12/31/2015	Routine	Maintenance needed	Yes	Yes
590	547	12/31/2015	Routine	Maintenance needed	Yes	Yes
591	548	12/31/2015	Routine	Maintenance needed	Yes	Yes
592	581	12/31/2015	Routine	Maintenance needed	Yes	Yes
593	612	12/31/2015	Routine	No maintenance needed	None	None
594	665	12/31/2015	Routine	No maintenance needed	None	None
595	666	12/31/2015	Routine	Maintenance needed	Yes	None
596	668	12/31/2015	Routine	Maintenance needed	Yes	None
597	869	12/31/2015	Routine	Maintenance needed	Yes	None
598	48	1/5/2016	Routine	No maintenance needed	None	None
599	51	1/5/2016	Routine	Maintenance needed	Yes	None
600	89	1/5/2016	Routine	Maintenance needed	Yes	Yes
601	115	1/5/2016	Routine	Maintenance needed	Yes	None
602	116	1/5/2016	Routine	Maintenance needed	None	Yes
603	122	1/5/2016	Routine	Maintenance needed	None	Yes
604	130	1/5/2016	Routine	Maintenance needed	Yes	None
605	131	1/5/2016	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
606	133	1/5/2016	Routine	No maintenance needed	None	None
607	148	1/5/2016	Routine	No maintenance needed	None	None
608	163	1/5/2016	Routine	Maintenance needed	Yes	Yes
609	177	1/5/2016	Routine	Maintenance needed	Yes	Yes
610	189	1/5/2016	Routine	Maintenance needed	Yes	None
611	193	1/5/2016	Routine	Maintenance needed	Yes	None
612	194	1/5/2016	Routine	Maintenance needed	Yes	Yes
613	203	1/5/2016	Routine	No maintenance needed	None	None
614	207	1/5/2016	Routine	Maintenance needed	Yes	Yes
615	208	1/5/2016	Routine	Maintenance needed	Yes	Yes
616	221	1/5/2016	Routine	No maintenance needed	None	None
617	250	1/5/2016	Routine	Maintenance needed	Yes	None
618	255	1/5/2016	Routine	No maintenance needed	None	None
619	256	1/5/2016	Routine	No maintenance needed	None	None
620	257	1/5/2016	Routine	No maintenance needed	None	None
621	270	1/5/2016	Routine	Maintenance needed	Yes	None
622	274	1/5/2016	Routine	Maintenance needed	Yes	None
623	280	1/5/2016	Routine	Maintenance needed	Yes	Yes
624	281	1/5/2016	Routine	Maintenance needed	Yes	Yes
625	288	1/5/2016	Routine	No maintenance needed	None	None
626	289	1/5/2016	Routine	No maintenance needed	None	None
627	290	1/5/2016	Routine	No maintenance needed	None	None
628	291	1/5/2016	Routine	No maintenance needed	None	None
629	292	1/5/2016	Routine	Maintenance needed	Yes	Yes
630	297	1/5/2016	Routine	No maintenance needed	None	None
631	325	1/5/2016	Routine	Maintenance needed	Yes	Yes
632	337	1/5/2016	Routine	No maintenance needed	None	None
633	341	1/5/2016	Routine	Maintenance needed	Yes	Yes
634	342	1/5/2016	Routine	Maintenance needed	Yes	Yes
635	347	1/5/2016	Routine	Maintenance needed	Yes	Yes
636	351	1/5/2016	Routine	Maintenance needed	None	Yes
637	354	1/5/2016	Routine	Maintenance needed	Yes	Yes
638	358	1/5/2016	Routine	No maintenance needed	None	None
639	381	1/5/2016	Routine	Maintenance needed	None	Yes
640	395	1/5/2016	Routine	Maintenance needed	Yes	None
641	401	1/5/2016	Routine	No maintenance needed	None	None
642	402	1/5/2016	Routine	Maintenance needed	Yes	Yes
643	403	1/5/2016	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
644	427	1/5/2016	Routine	No maintenance needed	None	None
645	435	1/5/2016	Routine	Maintenance needed	Yes	None
646	437	1/5/2016	Routine	No maintenance needed	None	None
647	438	1/5/2016	Routine	No maintenance needed	None	None
648	444	1/5/2016	Routine	Maintenance needed	Yes	Yes
649	451	1/5/2016	Routine	No maintenance needed	None	None
650	452	1/5/2016	Routine	No maintenance needed	None	None
651	454	1/5/2016	Routine	No maintenance needed	None	None
652	457	1/5/2016	Routine	Maintenance needed	Yes	Yes
653	458	1/5/2016	Routine	Maintenance needed	Yes	None
654	459	1/5/2016	Routine	Maintenance needed	Yes	None
655	465	1/5/2016	Routine	Maintenance needed	Yes	Yes
656	475	1/5/2016	Routine	Maintenance needed	Yes	None
657	478	1/5/2016	Routine	No maintenance needed	None	None
658	483	1/5/2016	Routine	Maintenance needed	Yes	None
659	487	1/5/2016	Routine	No maintenance needed	None	None
660	488	1/5/2016	Routine	No maintenance needed	None	None
661	490	1/5/2016	Routine	Maintenance needed	Yes	Yes
662	518	1/5/2016	Routine	Maintenance needed	Yes	None
663	524	1/5/2016	Routine	Maintenance needed	Yes	Yes
664	541	1/5/2016	Routine	No maintenance needed	None	None
665	549	1/5/2016	Routine	Maintenance needed	Yes	Yes
666	569	1/5/2016	Routine	No maintenance needed	None	None
667	576	1/5/2016	Routine	Maintenance needed	Yes	Yes
668	578	1/5/2016	Routine	Maintenance needed	Yes	Yes
669	579	1/5/2016	Routine	Maintenance needed	Yes	Yes
670	586	1/5/2016	Routine	Maintenance needed	None	Yes
671	593	1/5/2016	Routine	Maintenance needed	Yes	Yes
672	599	1/5/2016	Routine	No maintenance needed	None	None
673	609	1/5/2016	Routine	Maintenance needed	Yes	Yes
674	611	1/5/2016	Routine	Maintenance needed	None	Yes
675	632	1/5/2016	Routine	Maintenance needed	None	Yes
676	633	1/5/2016	Routine	Maintenance needed	Yes	Yes
677	657	1/5/2016	Routine	Maintenance needed	Yes	Yes
678	682	1/5/2016	Routine	Maintenance needed	Yes	None
679	686	1/5/2016	Routine	No maintenance needed	None	None
680	813	1/5/2016	Routine	Maintenance needed	Yes	Yes
681	814	1/5/2016	Routine	Maintenance needed	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
682	815	1/5/2016	Routine	No maintenance needed	None	None
683	843	1/5/2016	Routine	No maintenance needed	None	None
684	853	1/5/2016	Routine	Maintenance needed	Yes	Yes
685	854	1/5/2016	Routine	Maintenance needed	Yes	None
686	855	1/5/2016	Routine	Maintenance needed	Yes	None
687	856	1/5/2016	Routine	No maintenance needed	None	None
688	857	1/5/2016	Routine	No maintenance needed	None	None
689	863	1/5/2016	Routine	No maintenance needed	None	None
690	885	1/5/2016	Routine	Maintenance needed	Yes	Yes
691	895	1/5/2016	Routine	Maintenance needed	None	Yes
692	896	1/5/2016	Routine	Maintenance needed	None	Yes
693	897	1/5/2016	Routine	Maintenance needed	None	Yes
694	923	1/5/2016	Routine	No maintenance needed	None	None
695	928	1/5/2016	Routine	No maintenance needed	None	None
696	929	1/5/2016	Routine	Maintenance needed	Yes	None
697	239	1/6/2016	Routine	Maintenance needed	Yes	Yes
698	323	1/6/2016	Routine	No maintenance needed	None	None
699	324	1/6/2016	Routine	Maintenance needed	Yes	Yes
700	359	1/6/2016	Routine	Maintenance needed	Yes	Yes
701	397	1/6/2016	Routine	No maintenance needed	None	None
702	418	1/6/2016	Routine	Maintenance needed	Yes	None
703	419	1/6/2016	Routine	Maintenance needed	Yes	None
704	563	1/6/2016	Routine	No maintenance needed	None	None
705	626	1/6/2016	Routine	Maintenance needed	None	Yes
706	652	1/6/2016	Routine	Maintenance needed	Yes	Yes
707	653	1/6/2016	Routine	Maintenance needed	Yes	None
708	660	1/6/2016	Routine	Maintenance needed	Yes	Yes
709	689	1/6/2016	Routine	Maintenance needed	None	Yes
710	691	1/6/2016	Routine	Maintenance needed	Yes	Yes
711	860	1/6/2016	Routine	Maintenance needed	Yes	Yes
712	920	1/6/2016	Routine	No maintenance needed	None	None
713	925	1/6/2016	Routine	Maintenance needed	None	Yes
714	123	1/12/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	None
715	124	1/12/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
716	379	1/12/2016	Routine	Maintenance needed	Yes	Yes
717	238	2/22/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
718	233	3/1/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
719	270	3/9/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	None

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
720	458	3/9/2016	Routine	Maintenance needed	Yes	None
721	459	3/9/2016	Routine	Maintenance needed	Yes	None
722	858	3/9/2016	Routine	Maintenance needed	None	Yes
723	884	3/9/2016	Routine	Maintenance needed	None	Yes
724	336	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
725	338	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
726	339	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
727	340	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
728	343	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
729	387	3/11/2016	Routine	Maintenance needed	Yes	Yes
730	411	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	None
731	528	3/11/2016	Routine	Maintenance needed	Yes	None
732	559	3/11/2016	Routine	Maintenance needed	Yes	Yes
733	567	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
734	580	3/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	None
735	669	3/11/2016	Routine	Maintenance needed	Yes	None
736	837	3/11/2016	Routine	Maintenance needed	None	None
737	98	3/14/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
738	388	3/14/2016	Routine	Maintenance needed	Yes	Yes
739	529	3/14/2016	Routine	Maintenance needed	Yes	Yes
740	823	3/23/2016	Routine	Maintenance needed	None	None
741	859	3/23/2016	Routine	Maintenance needed	Yes	Yes
742	672	4/1/2016	Routine	Maintenance needed	Yes	Yes
743	673	4/1/2016	Routine	Maintenance needed	Yes	Yes
744	674	4/1/2016	Routine	Maintenance needed	Yes	Yes
745	675	4/1/2016	Routine	Maintenance needed	Yes	Yes
746	676	4/1/2016	Routine	Maintenance needed	Yes	Yes
747	677	4/1/2016	Routine	Maintenance needed	Yes	Yes
748	678	4/1/2016	Routine	Maintenance needed	Yes	Yes
749	679	4/1/2016	Routine	Maintenance needed	Yes	Yes
750	680	4/1/2016	Routine	Maintenance needed	Yes	Yes
751	681	4/1/2016	Routine	Maintenance needed	Yes	Yes
752	816	4/1/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
753	70	4/6/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
754	73	4/6/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
755	212	4/19/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
756	213	4/19/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
757	592	4/21/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes

Count	Facility #	Date of Routine	Routine Type	Comments	Maintenance Required	
					Minor	Major
758	31	4/25/2016	Complaint	Maintenance needed	Yes	Yes
759	533	5/2/2016	Complaint	No maintenance needed	None	None
760	592	5/2/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
761	888	5/2/2016	Complaint	Maintenance needed	Yes	Yes
762	493	5/10/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
763	865	5/10/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
764	931	5/10/2016	Routine	No maintenance needed	None	Yes
765	932	5/10/2016	Routine	No maintenance needed	None	None
766	937	5/10/2016	Routine	No maintenance needed	None	Yes
767	939	5/10/2016	Routine	Maintenance needed	Yes	Yes
768	552	5/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
769	553	5/11/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
770	128	5/12/2016	Complaint	Maintenance needed	Yes	Yes
771	196	5/12/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
772	424	5/12/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
773	916	5/12/2016	Routine	Maintenance needed	Yes	Yes
774	846	5/16/2016	Complaint	Maintenance needed	Yes	Yes
775	200	5/18/2016	Re-inspection	Work completed	Yes	Yes
776	201	5/18/2016	Re-inspection	Work completed	Yes	Yes
777	204	6/7/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
778	245	6/7/2016	Complaint	Maintenance needed	Yes	Yes
779	600	6/7/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
780	910	6/7/2016	Complaint	Maintenance needed	Yes	Yes
781	439	6/13/2016	Complaint	No maintenance needed	None	Yes
782	846	6/14/2016	Re-inspection	Maintenance needed	Yes	Yes
783	292	6/15/2016	Complaint	Maintenance needed	Yes	Yes
784	321	6/15/2016	Complaint	Maintenance needed	Yes	Yes
785	600	6/15/2016	Complaint	Maintenance needed	Yes	Yes
786	813	6/15/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
787	814	6/15/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
788	815	6/15/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
789	466	6/16/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
790	554	6/16/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
791	840	6/16/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes
792	841	6/16/2016	Site meeting / re-inspection	Met owner to discuss punch list	Yes	Yes

Technical Manual

MS4 Delineation & Stormwater Tool

Prepared for:



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Prince William, Virginia

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Project No. 151270001

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1 Introduction

Prince William County (the County) hired Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) to analyze geospatial data depicting the County's stormwater network in order to delineate the total area drained by their Municipal Separate Stormsewer System (MS4). This process involved the identification of regulated MS4 outfalls – that is, stormwater outfalls owned or operated by Prince William County that discharge to waters of the United States. Amec Foster Wheeler assigned one of five ownership classes to each outfall: County, Homeowners, Commercial entities, Virginia Department of Transportation (VDOT), and Other owners. Typically, regulated MS4 outfalls were placed at the terminus of infrastructure (e.g. stormsewers, BMPs) and ownership was assigned using classification codes stored within the attribute tables of the spatial data provided by the County. Stormsewer ownership was determined using the coded values within the "SYM" field, while BMP ownership was determined using the "MAINT" field values. Regulated MS4 outfalls were placed before the terminus of the infrastructure if terminal placement would result in drainage area delineations that erroneously captured jurisdictional waters and their riparian areas (rather than solely MS4 service area). Secondly, parcel ownership and easement records were used to determine ownership if existing infrastructure data was not available.

Over 4,800 outfalls were identified, 3,495 of which were assigned County ownership. Based on this regulated MS4 outfall determination, the County's MS4 service area totals 23,156 acres. These regulated MS4 outfalls serve as a crucial input for the Stormwater Tool to function. The Stormwater Tool delineates the pervious and impervious drainage area to each outfall, creating a dataset that can be analyzed by the user to determine the County's MS4 service area as infrastructure is added to the County's database. Specifically, the Stormwater Tool provides the necessary information to meet *Part 1.B.2.h) 3-4* of the County's MS4 Permit (Permit No: VA0088595).

2 Purpose and Objectives

This manual provides a guide for using the Stormwater Tool to delineate Prince William County's MS4 service area. The following sections of the report explain:

- 1) The structure of the Stormwater Tool and pertinent spatial data;
- 2) The three scripts composing the Stormwater Tool;
- 3) Maintaining the data utilized by the Stormwater Tool allowing for future integration in stormwater planning activities as the County's network expands;
- 4) An example exercise for a small region of the County's stormwater network.

The objective of this document is to provide any potential user with basic GIS experience the ability to use the Stormwater Tool and receive an output of the MS4 drainage area for selected outfalls. Users with a stronger background in GIS and geospatial processing will be able to further

customize the Stormwater Tool, if desired, by modifying the source code provided to the County. Amec Foster Wheeler has provided a functional, efficient tool that automates a laborious, yet critical step in ensuring the County meets its regulatory requirements and ultimately improves water quality within the Chesapeake Bay.

3 Stormwater Tool Structure

Amec Foster Wheeler provided the finished tool to the County on a flashdrive. A folder titled “MS4” houses the complete Stormwater Tool. The ArcGIS processing component of the Stormwater Tool consists of three scripts stored in the “Stormwater Tool” toolbox. The folder also contains the primary geodatabase, “MS4.gdb”, and a scratch geodatabase, “scratch.gdb”.

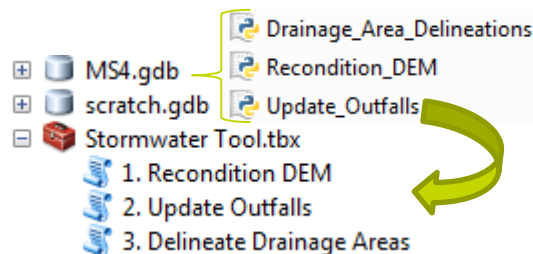


Figure 1 Python Script Storage Location

Note that scratch.gdb is created upon running any of the three scripts in the Stormwater Tool. Three source code python scripts are stored within MS4.gdb and are utilized by scripts in the toolbox. The location of the source code scripts is paramount because the scripts rely on relative pathname connections to interact with relevant data stored in the MS4 geodatabase. Moving the scripts to a new location without further modification to the source code will cause the Stormwater Tool to fail.

Users can interact with the three scripts in the Stormwater Tool toolbox directly in ArcMap. The scripts open like native ArcGIS tools and should be run in sequential order:

1. Recondition DEM
2. Update Outfalls
3. Delineate Drainage Areas

NOTE: This document will refer to the Stormwater Tool, which is the suite of ArcGIS tools developed by Amec Foster Wheeler for the County to delineate their MS4 Service Area. The three scripts within this suite will be referred to as “components”. Also, one should not confuse the Stormwater Tool or its components with the native ArcGIS tools alluded to further on in this manual.

4 Geodatabase Setup

There are two geodatabases contained within the Stormwater Tool folder:

- **MS4.gdb** contains the necessary inputs (both native and user-specified) as well as the final outputs of the Stormwater Tool. Contained within MS4.gdb are several feature datasets and feature classes the user should familiarize themselves with before using the Stormwater Tool:

- **Interconnected** contains areas that should not be included in the County's MS4 area because they are either excluded per the DEQ Guidance Memo No 15-2005 or regulated under a separate MS4 permit.
 - *VPDES* – Parcels that are regulated under General or individual VPDES permits.
 - *VDOT* – Right-of-way that VDOT claimed as their MS4 area within the County.
 - *GMU* – George Mason University parcel which is regulated by a separate MS4 permit.
 - *Schools* – Parcels owned by Prince William County Public Schools, which are regulated by a separate MS4 permit.
 - *NOVA* – Northern Virginia Community College parcel which is regulated by a separate MS4 permit.
 - *Forested* - Forested lands excluded from the MS4 regulated area. These were delineated from 4-band multispectral imagery at 1 meter spatial resolution. See Appendix B for further information.

NOTE: There are other interconnected MS4s (City of Manassas, Marine Corps Base Quantico, et al.) whose MS4 service area was not available. These can be incorporated into the tool at a later date. Amec Foster Wheeler determined that the County MS4 Service Area did not capture any significant area that would be “double counted”.

- **LandUse** contains the impervious surface area for the County. These areas are used to calculate the percent of delineated MS4 drainage areas that are impervious.
 - *Impervious2009* – Impervious surface feature class for Prince William County as of June 30th, 2009. This feature class should be used to meet Phase 1 of the Chesapeake Bay TMDL.
 - *Impervious2012* – Current impervious surface feature class available for Prince William County. This feature class could be used in MS4 service area delineations for future TMDL action plans, as needed.
- **Network** contains two polyline files: the County stormwater network and customized NHD Flowlines. Both of these polylines are used to recondition the DEM and form a unified drainage network.
 - *Amec_Single_Network* – Modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer

system and the stream network. It includes both the County stormsewer system and hydrologic connections to the stream network, both of which were edited by Amec Foster Wheeler under direction from the County. MS4 and BMP outfalls are snapped to this feature class.

- *NHD_flowlines* – Modified version of the NHD high-resolution (24K) flowlines. This feature class serves as the unidirectional stream network for Prince William County. Each segment of the NHD contains a unique identifier, or “REACHCODE” as it is stored within the attribute table, which is identified as the downstream receiving waterbody in the “2. Update Outfalls” script. Modification of the original NHD flowlines involved deleting specific segments that were either buried or heavily modified with BMPs during development. The position of NHD flowlines were occasionally adjusted to reflect more accurate flow patterns apparent within the LiDAR DEM.
- **Outfalls** contains feature classes that can be used as drainage delineation points for delineating drainage areas. The Stormwater Tool will update the attribute data for each outfall to include a unique ID, its latitude and longitude in decimal degrees, the local watershed (WTRSHD_ID), the 5th and 6th order VA HUC, the HUC12, and the waterbody receiving outflow (listed as a REACHCODE). Outfalls also contain ownership and maintenance responsibility information.
 - *ms4_outfalls* – Feature class consisting of points demarcating where MS4 discharges to waters of the United States. Outfall ownership and “origin” (referring to the infrastructure or data that characterized the point as an MS4 outfall, ex. rip-rap ditch) are assigned upon creation by the user according to preset domains.
 - *BMPs* – Feature class containing the outfalls for the County’s legacy BMPs. While the Stormwater Tool was designed for determining the MS4 Service Area, it can also be used for determining drainage areas for each historic BMP. Care should be taken when using the Stormwater Tool for the BMPs to ensure proper drainage area delineation.
- **Polygons** contains several feature classes including MS4 drainage areas and watersheds. Important outputs can be stored in this feature dataset.
 - *Subwatersheds* – Input for the “2. Update Outfalls” script that provides the local watershed draining each outfall (WTRSHD_ID).
 - *HUC12* – Input for the “2. Update Outfalls” script that provides the HUC 12 from the NHD draining each outfall.

- *BMP_da* – Pervious and impervious drainage area for each BMP. Note that several BMPs capture entire stream valleys which would not be considered regulated MS4 service area.
- *MS4_Service_Area* – Total MS4 service area in the County attributed to the five ownership & maintenance classes. Each delineated MS4 area includes: ownership, origin, corresponding outfall ID, HUC12, local watershed (*WTRSHD_ID*), total drainage area (acres), pervious drainage area (acres), and impervious drainage area (acres).
- **Raster data** contains inputs and outputs (in raster format) utilized for delineating drainage areas.
 - *burned* – Hydrologically conditioned 3-meter resolution DEM. *NHD_flowlines* and *Amec_Single_Network* are “burned” into this DEM to enforce proper hydrologic routing of the stormsewer network. This process is explained in Section 5.1.
 - *Dem_3 meter* – 3-meter resolution digital elevation model for the County obtained from the National Elevation Dataset (NED). The NED is a seamless mosaic of best-available elevation data that is maintained by the USGS. This high-resolution elevation data provides a realistic depiction of the County’s topography and serves as the basis for hydrologic routing in the Stormwater Tool.
 - *Flow_acc* – Flow accumulation raster based on the burned, hydrologically reconditioned DEM created during the “1. Recondition DEM” script. Information stored within each cell provides the accumulated flow upstream of that point.
 - *Flow_dir* - Flow direction raster based on the burned, hydrologically reconditioned DEM created during the “1. Recondition DEM” script. The D8 flow algorithm is used to assign flow direction to each cell. The resulting flow direction grid is used to assign drainage areas to each outfall.
- **Scratch.gdb** contains intermediate outputs of the Stormwater Tool, and can be cleared out after each run if desired. This serves as a “background” where these intermediate outputs can be accessed by the Stormwater Tool without creating clutter within *MS4.gdb*.

5 Stormwater Tool Components

5.1 DEM Reconditioning

A digital elevation model (DEM) is a 3-D representation of the Earth's surface. DEMs have been used for a number of geospatial applications, including modeling surface water hydrology. Surface water hydrology is relatively easy to model in natural environments; however, urban environments present additional challenges. Namely, manmade infrastructure (i.e. stormwater pipes, curb inlets, and drainage ditches) substantially alters the natural drainage network and can transfer water between subwatersheds.

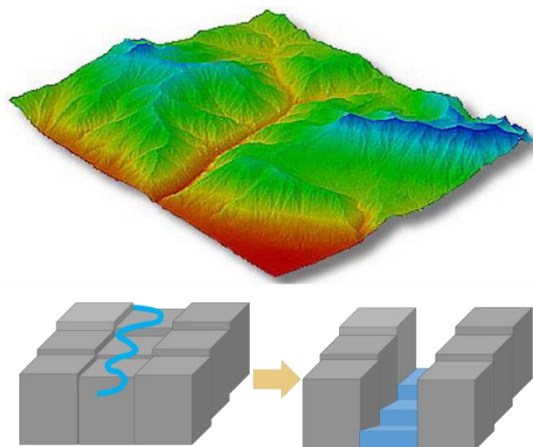


Figure 2 Burning in Hydrologic Network

Since a DEM depicts the Earth's surface using a rectangular grid of cells, it struggles to depict the below ground stormwater network and small hydrologic features that often drain urban environments. Consequently, it's necessary to lower the elevation of cells in the DEM containing urban hydrologic features to ensure accurate flowpaths are reflected across the County. This elevation modification is often referred to as "burning".

This DEM reconditioning process can be achieved using the "1. Recondition DEM" component in the Stormwater Tool toolbox. It merges the vector NHD flowlines and Amec Single Network to create a rasterized version of this contiguous hydrologic network. The rasterized hydrologic network serves as a mask, and each hydrologic network grid cell is lowered (-3000 feet for stream cells and -2000 feet for Amec Single Network cells) in the DEM relative to neighboring cells that are not within the hydrologic network (i.e. land not within a streamchannel). Essentially, this process cuts a network of canyons into the DEM surface along cells coincident with the merged hydrologic network, which then serves to redirect local drainage into these digitally carved hydrologic network channels.

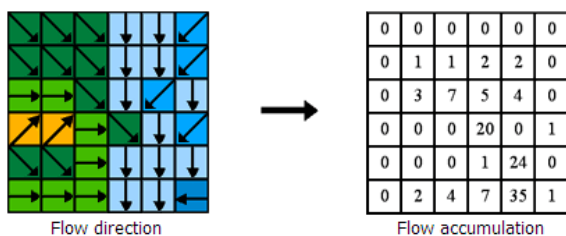


Figure 3 Source: ArcGIS Resources

Depressions and flat areas are then removed using a depression filling technique to create a hydrologically corrected DEM. The corrected DEM reflects a continuously, monotonically descending flowpath connecting each grid cell to the data edge, with burned-in canyons coincident with the mapped hydrologic network. The hydrologically corrected

DEM is then used to determine local drainage direction and flow accumulation (upslope drainage area). The local drainage direction, or flow direction, is calculated using an algorithm, which

directs flow from each cell to its steepest downslope neighboring cell. This flow algorithm uses information about local surface gradient and orientation, calculated from the DEM, to model spatial patterns of flow direction. Flow accumulation is then calculated for each cell by summing the number of cells that flow into each downslope cell. This component creates three outputs: a flow direction raster, a flow accumulation raster, and a hydrologically corrected DEM. These outputs are all stored in MS4.gdb and are used by subsequent components in the Stormwater Tool toolbox.

5.2 Update Outfalls

The County is responsible for mapping the MS4 service area and each MS4 outfall in accordance with *Part I.B.2.h*) of MS4 Permit No. VA0088595. Specifically, the County must track the information contained in Figure 4 for each MS4 outfall and its corresponding drainage area. The “2. Update Outfalls” component in the Stormwater Tool toolbox updates this information for each outfall and stores the data in the attribute table as shown below.

Figure 4 Outfall Attribution

Reporting Requirement	Field Name in Attribute Table
Individual Identification Number	“Outfall_ID”
Local Watershed	“WTRSHD_ID”
Sixth Order HUC	“VAHU6”
Receiving Water	“REACHCODE”
Latitude in Decimal Degrees	“Lat_DD”
Longitude in Decimal Degrees	“Long_DD”

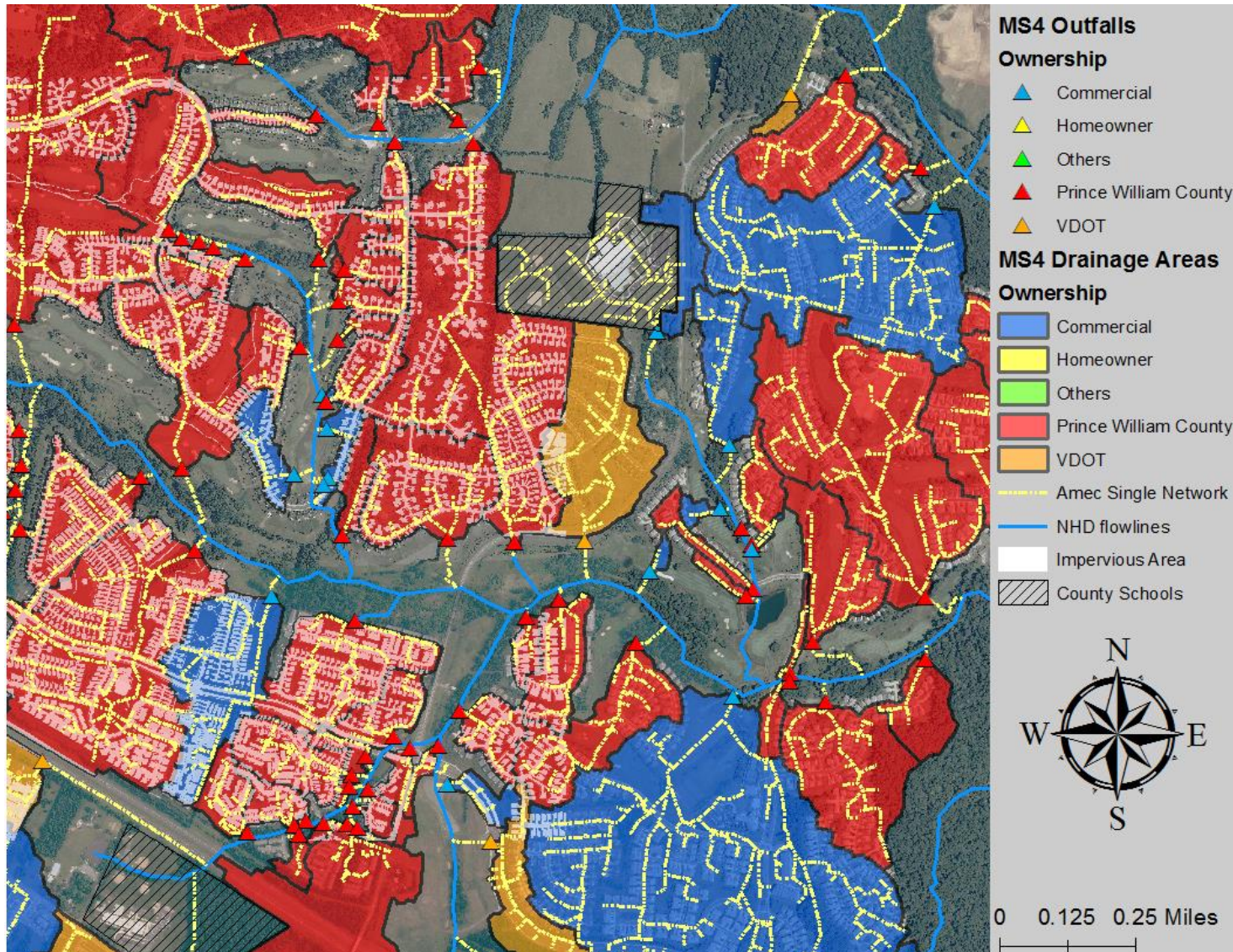


Figure 5 MS4 Outfall Drainage Area Delineation

5.3 Delineate Drainage Areas

Drainage areas for each MS4 outfall can be delineated once the DEM is hydrologically corrected and the outfall information is updated. Each outfall point location is adjusted using the Snap Pour Point tool to be coincident with the neighboring cell with the largest flow accumulation value. Snap distance is set according to DEM resolution, so outfalls can only be moved to a cell in the surrounding 3 meter x 3 meter cell window. Once the adjacent cell with the largest flow accumulation value is identified, the outfall point feature is converted to a raster and given a value based on the outfall's Individual Identification Number. The Watershed tool then calculates the upslope drainage area contributing flow to a common outlet as concentrated drainage (in the case of the Stormwater Tool, each MS4 outfall). Flow is routed from the upslope area to each outfall using the flow direction grid created in the "1. Recondition DEM" component. Unique raster drainage areas are then delineated for each outfall and converted to vector polygons.

Polygon drainage areas are dissolved based on their outfall identification number ("Outfall_ID"), to eliminate tiny, illegitimate watersheds that are a relic of the raster-vector conversion process. The Calculate Field Management tool then calculates the total drainage area, in acres, via field geometry. Next, impervious surface data (represented by *Impervious2009*) is removed from the dissolved polygon drainage areas with the Erase tool, which produces pervious surface polygons. Interconnected MS4s can then optionally be erased from the drainage areas, as well, if the user chooses. The interconnected MS4s are first merged and then erased from the pervious surface area. Then the pervious surface area is calculated in acres with the Calculate Field Management tool. The pervious acres field is then joined back to the dissolved drainage area polygons with the Add Join Management tool. Fields with each drainage area's local watershed and sixth order HUC are also added. Impervious surface area is then determined for each drainage area by subtracting attribute data for pervious acreage from total acreage. The resulting polygon feature class contains the impervious, pervious, and total acreage for each MS4 drainage area stored within attribute data. Additionally, the feature class contains pertinent information for *Part I.B.2.h) 4)* of the County's MS4 permit as of June 30th, 2009, displayed below.

Figure 6 Drainage Area Attribution

Reporting Requirement	Field Name in Attribute Table
Total MS4 Acres Served	"TotAcres"
Pervious MS4 Acres Served	"PervAcres"
Impervious MS4 Acres Served	"ImpAcres"
Individual Identification Number	"Outfall_ID"
Local Watershed	"WTRSHD_ID"
Sixth Order HUC	"VAHU6"
Receiving Water	"REACHCODE"
Individual Identification Number	"Outfall_ID"

5.4 Data Maintenance & Updates

Data can be updated to incorporate area added from new development within the County. The County's existing procedures for cataloging stormwater infrastructure are thorough; however, they will need to be supplemented to accommodate the Stormwater Tool. Specifically, three feature classes will require updates, which should be conducted as follows:

1. *Amec_Single_Network*¹ – New County stormsewer lines should be loaded into the Amec_Single_Network feature class in ArcCatalog. Users should then connect the new features to the existing NHD_flowlines using a DEM to determine the downslope flowpath to the stream. Additionally, there are several considerations to make when adding segments to the Amec Single Network:
 - a. Avoid hydrologic loops (i.e. flow should travel downstream in a single path and avoid braiding).
 - b. Do not create Amec_Single_Network segments that are closer to each other than the DEM resolution you plan to use in the Stormwater Tool. For instance if you plan to use a 10 foot resolution DEM (~3 meter), segments should be at least 10.1 feet away from one another.
 - c. Check that all Amec_Single_Network segments are connected and snapped to the NHD-flowlines, otherwise they will be filled during the “1. Recondition DEM” component run. This can be verified using the Topology toolset within ArcGIS.
2. *ms4_outfalls*² - MS4 outfalls should be added when new manmade infrastructure is integrated into the County's stormsewer lines data. The outfalls should be placed at the end of manmade infrastructure (i.e. new stormsewer lines), but far enough away (3.5 times the DEM resolution) from the NHD_flowlines to avoid being snapped to the stream network during the processing for the “3. Delineate Drainage Areas” component. The “Ownership” and “Origin” fields need to be input as well. “Ownership” is assigned based on the “MAINT” code for each terminal segment of new infrastructure (i.e. the last stormsewer segment) and “Origin” is determined by the terminal segment's “SYM” code.

1 This is a modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer system and the stream network. It includes both the County modified stormsewer system and user-created hydrologic connections to the stream network.

2 A feature class containing points demarcating where the municipal separate stormsewer (MS4) discharges to waters of the United States. Outfall ownership and origin (origin refers to the infrastructure or data that identified the point as an MS4 outfall, ex. rip-rap ditch) are assigned upon creation by the user according to preset domains.

3. *BMPs*³ - BMP outfalls need to be added when new stormwater management facilities are added to the existing inventory. Outfalls should be placed at the terminus of the BMP and snapped to either Amec Single Network or the NHD flowlines.

5.5 Demonstration: Expanding the Infrastructure Network

The Stormwater Tool operates using its own geodatabase, which was based on the County's existing stormwater data, as its data source. As development occurs in the County, new stormwater infrastructure will continue to be integrated into the County's data through the existing data entry tool. **This new data still needs to be incorporated into the Stormwater Tool's geodatabase.** This section provides a step-by-step illustration of how to: 1) load new stormwater infrastructure into the Stormwater Tool's geodatabase, 2) add and assign MS4 outfalls, and 3) run the Stormwater Tool. This process will compliment the County's robust data entry tool and also allow the County to produce an updated MS4 service area throughout permit phases.

5.5.1 Loading New Infrastructure into the Stormwater Tool's Geodatabase

Amec Foster Wheeler received stormwater infrastructure data from the County in October of 2015. Existing stormsewer data from this time served as the basis for the creation of the Amec Single Network⁴. Since the County's existing stormsewer system lacked hydrologic connections to the stream network, Amec Foster Wheeler edited the stormsewer system to create hydrologic connections between the stream network and stormwater infrastructure.



Figure 7 New Urban Development

Additional data editing - such as eliminating hydrologic loops, clarifying flowpaths, etc. - further modified the County's existing stormsewer network. The result of these efforts was the creation of the Amec Single Network, which represents a contiguous, hydrologically connected stormsewer system.

New areas of stormwater infrastructure should be added to the Amec Single Network by replicating this process. The first step in replicating this process is to load newly entered stormwater infrastructure data into the Stormwater Tool's geodatabase. Note that this data was first entered into the County's system using the data entry tool. Figures below demonstrate how to complete the loading process in ArcCatalog.

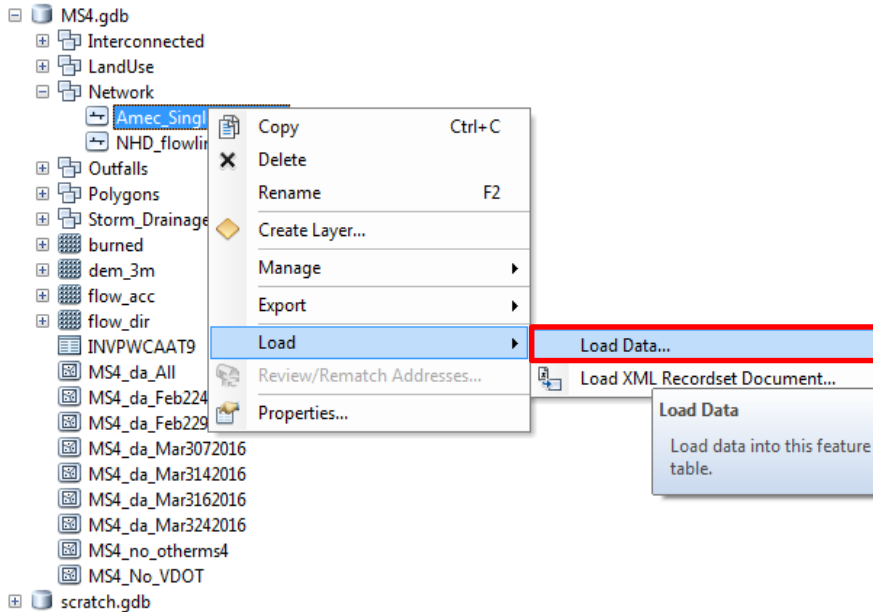
3 A feature class containing the outfalls for the historic best management practices (BMPs) in Prince William County.

4 Modified County stormsewer feature class that establishes hydrologic connectivity between the County stormsewer system and the stream network. It includes both the County stormsewer system and hydrologic connections to the stream network, both of which were edited by Amec Foster Wheeler under direction from the County. MS4 and BMP outfalls are snapped to this feature class.

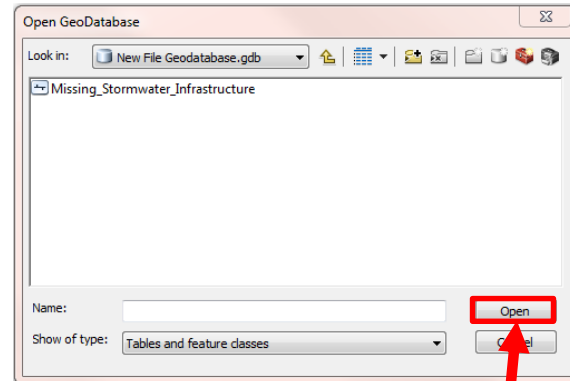
Beginning: Open ArcCatalog and navigate to MS4.gdb



1



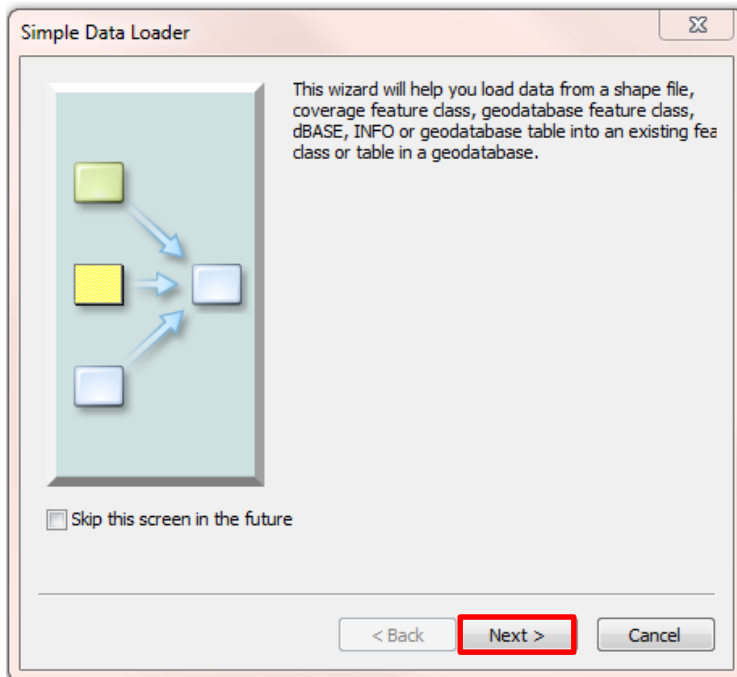
4



Navigate to the file pathname of the new or missing data you would like to load into the existing feature class. Select the data and then click 'Open'.

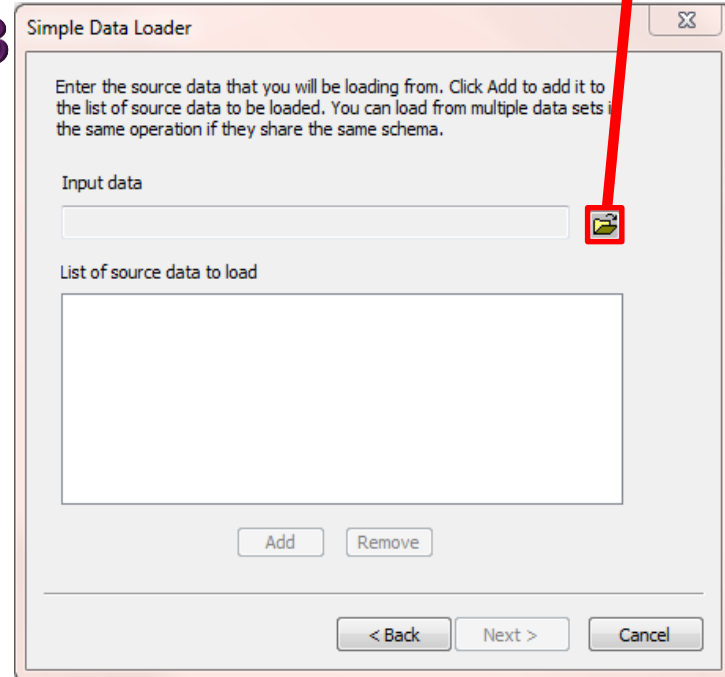
Load the new stormwater infrastructure data into the appropriate feature class in ArcCatalog. For instance for new stormsewer lines data, right click on Amec_Single_Network, then select "Load" and then follow the navigation arrow to "Load Data..."

2



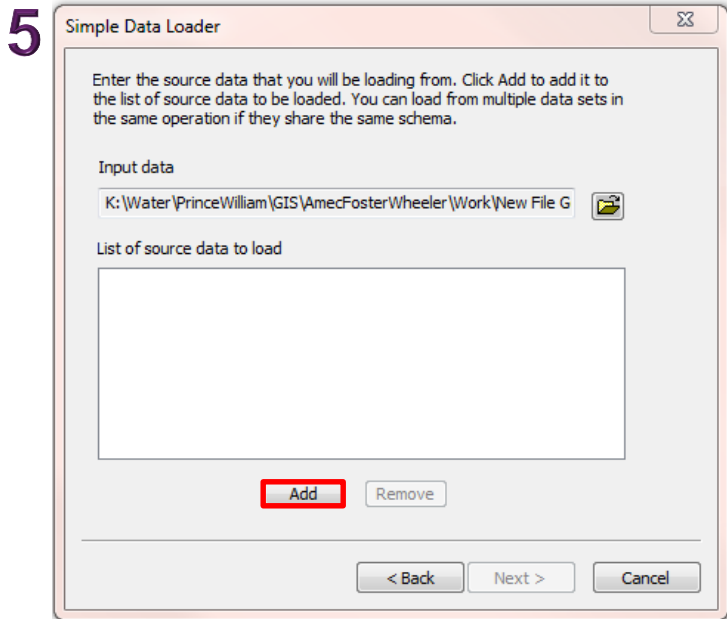
Simple Data Loader wizard opens, click 'Next >'.

3

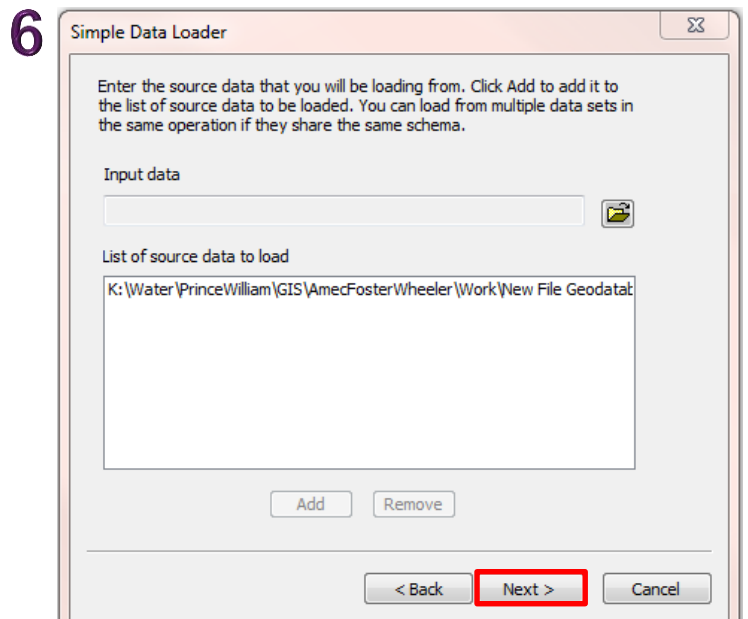


Under 'Input Data' click the open folder button.

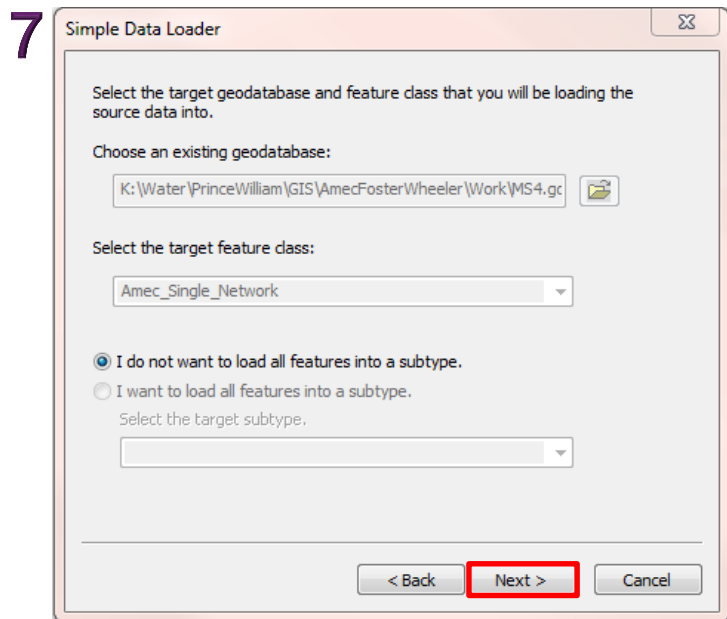
Amec Foster Wheeler Environment & Infrastructure, Inc.



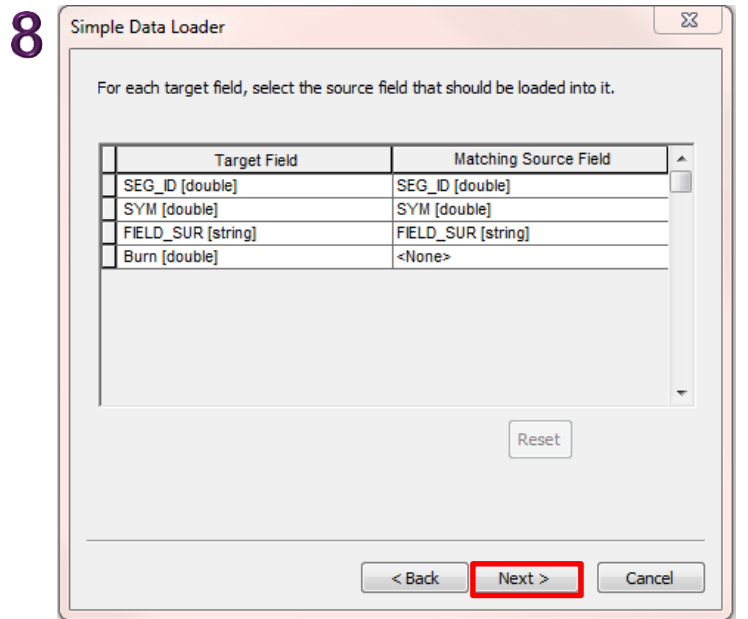
If the “Input Data” file pathname is correct, click the “Add” button.



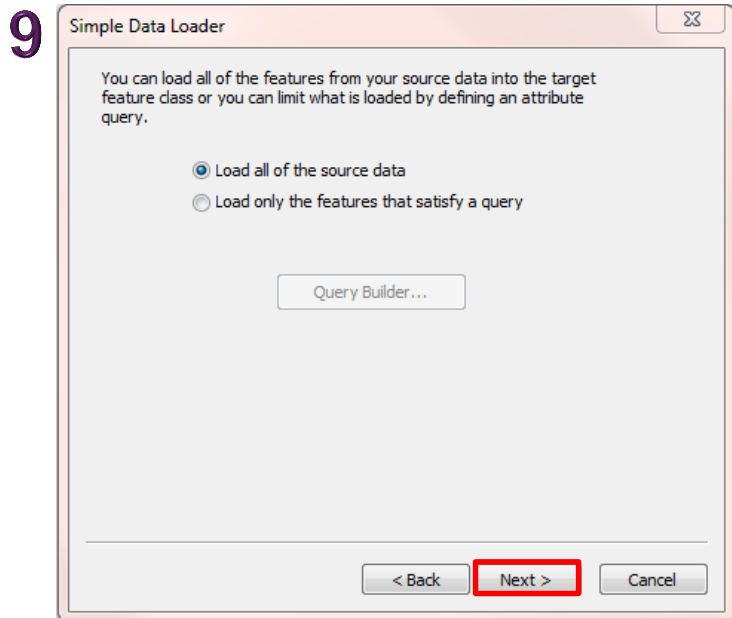
The pathname to the new or missing data should now be listed under ‘List of source data to load’. More than one data class source can be loaded into an existing feature class by repeating steps 3 - 5.



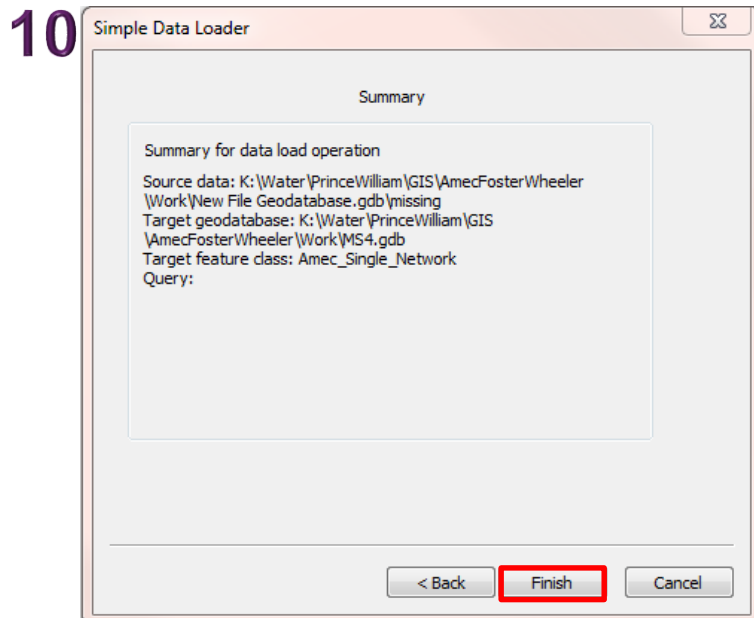
Select ‘Next’.



Make sure that the relevant fields from the new or missing data (‘Matching Source Field’) match the existing feature class (‘Target Field’).



Click the 'Load all of the source data' radio button. Then select 'Next >'.



Select 'Finish'.

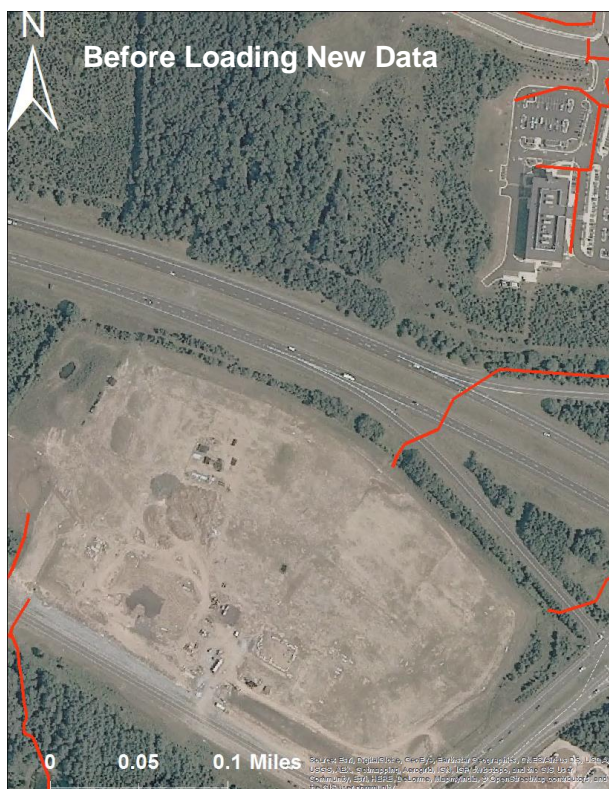
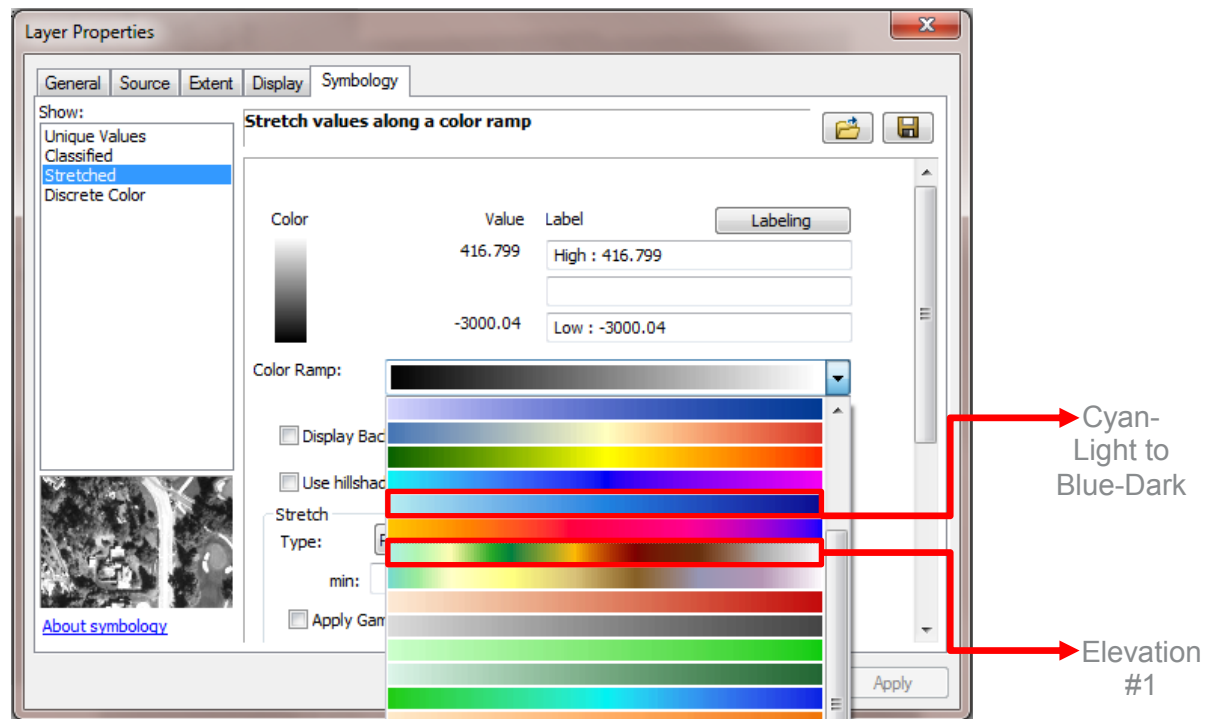
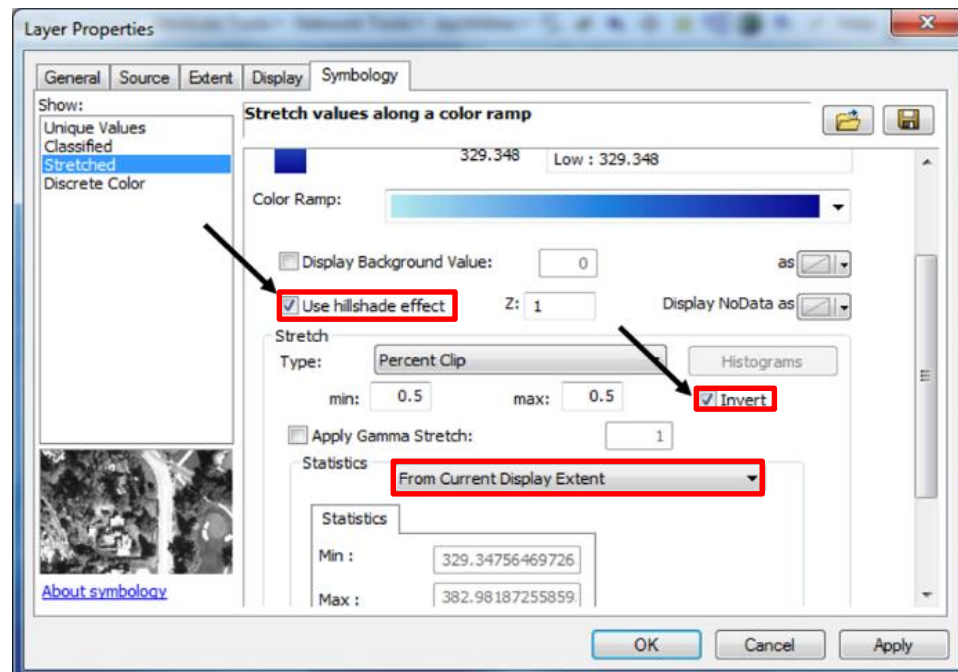


Figure 8. Depicts post-2009 development along Highway 15 and I-66 in Haymarket, VA. The image on the left shows the location in 2009, while the image on the right shows the area in 2015 after loading the new data into the Amec Single Network. Newly added segments still require editing to create a hydrologic connection. Editing procedures for creating this hydrologic connection are described below.

5.5.1 Recommendations for Setting DEM Symbology Prior to Editing

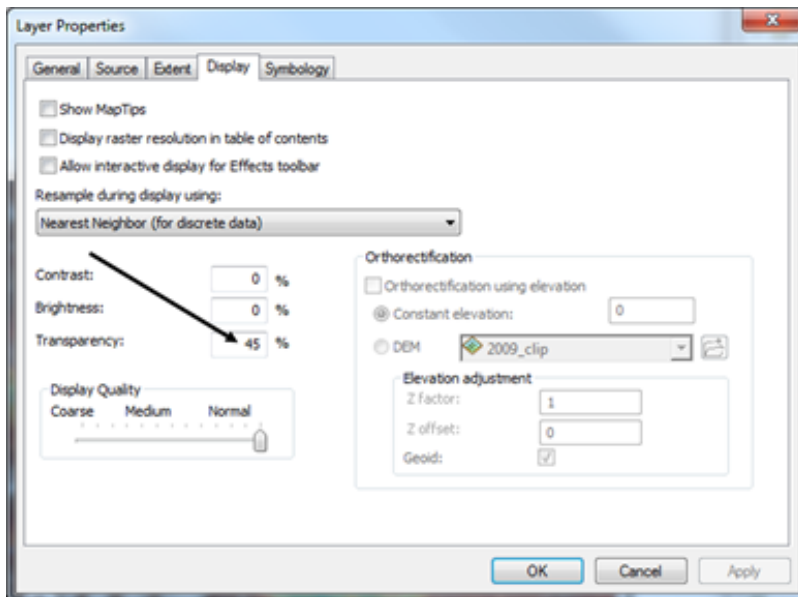


Under the Symbology tab, select the Elevation #1 color ramp. Alternatively, using the Cyan-Light to Blue-Dark color ramp is helpful when visualizing river valleys.

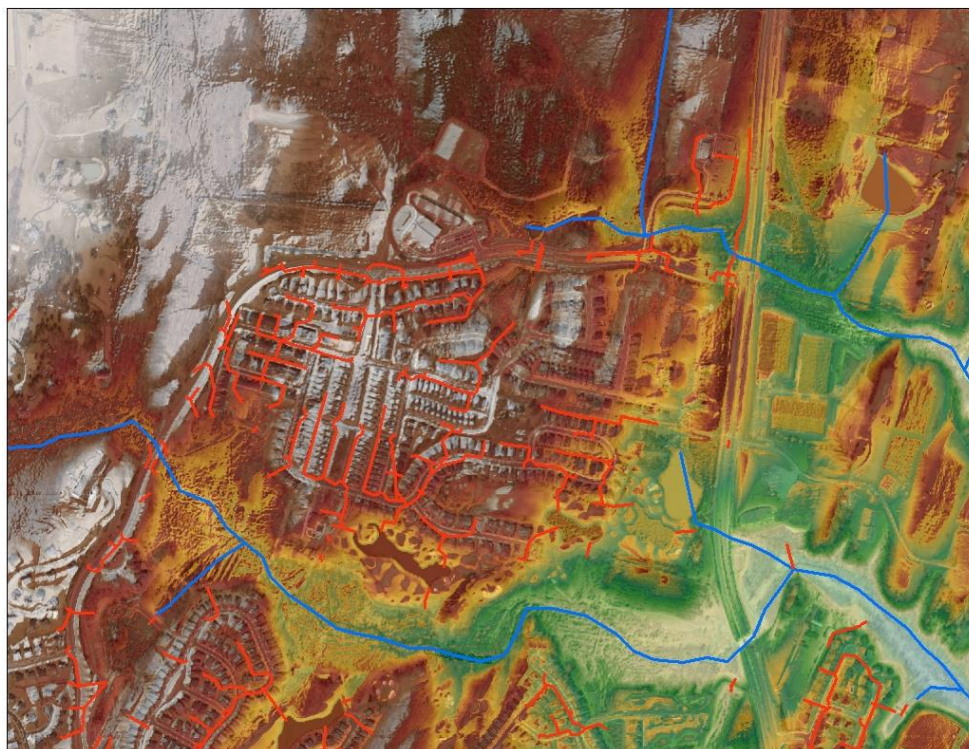


Scrolling down within the window of the Symbology tab will bring up the 'Stretch' menu. Under 'Statistics', select 'From Current Display Extent'. This will create a dynamic DEM display within

the map document, allowing for easier visualization of local flow patterns. Additionally, select the check boxes for “Use hillshade effect”. If using the blue color ramp, select “Invert”.



Adjusting the transparency of the DEM makes the layer a useful overlay to get a sense of the topography in relation to what’s displayed in the aerial imagery. Within the Display tab, set the Transparency level to a value that allows for the aerial imagery to be clearly visible through the DEM surface (45% is recommended, see above). The resulting DEM symbology should be similar to what is shown below.



5.5.2 Assign Jurisdictional Outfalls



Figure 9. This view shows what the user would see after loading in a new set of stormwater infrastructure into the geodatabase. MS4 outfalls and hydrologic connections still need to be added by the user. Note the stormwater infrastructure is a discontinuous network within itself, but also lacks continuity with the NHD Flowlines.

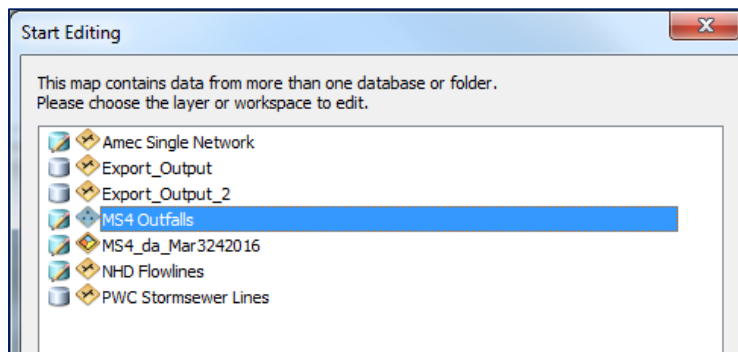
The first step in preparing the newly loaded infrastructure for analysis within the Stormwater Tool is identifying jurisdictional outfalls and assigning proper ownership. The following examples illustrate two common situations a user may encounter where a jurisdictional outfall must be assigned: BMPs (Figure 10) and grass swales or ditches extending from subsurface pipes (Figure 11). Before we add outfalls, we must begin an editing session that will allow us to add to the infrastructure network.

Starting an editing session

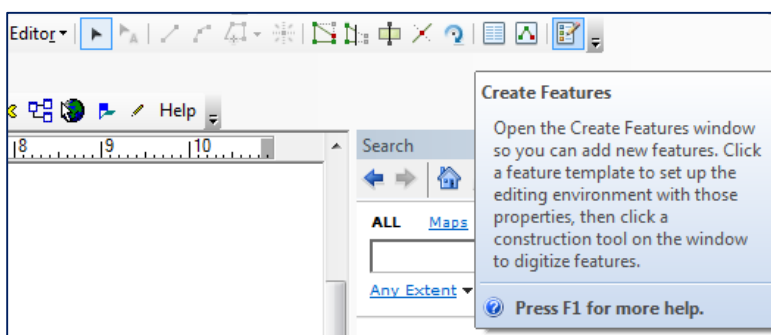
From the top ribbon within ArcMap, select Customize → Toolbars → Editor. The Editor Toolbar will appear. Click on the Editor drop down menu and select “Start Editing”.



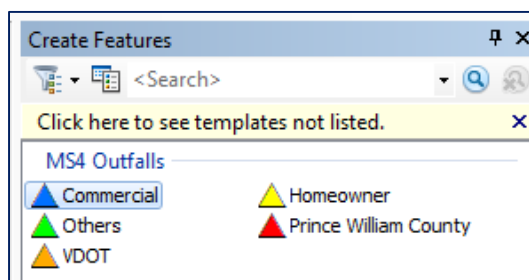
Within the Start Editing window, select the layer you will be editing. For the next session, you will be adding outfalls, so select MS4 Outfalls (or the name of the layer as it appears in the ArcMap window). You will be adding new outfalls to the layer of outfalls that have been already mapped by Amec Foster Wheeler.



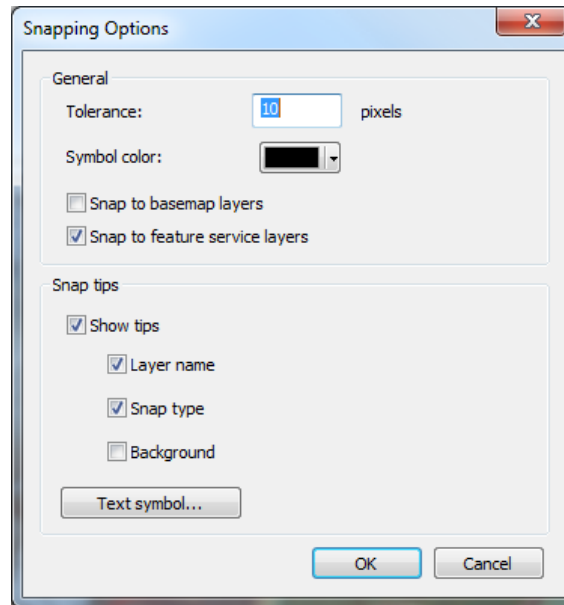
Returning to the Editor drop down menu, select Editing Windows → Create Features. The Create Features window can also be accessed from the Editor Toolbar.



Within the Create Features window, you can select which type of outfall you would like to add, by Ownership. This is explained in greter detailed previously in this document. The first outfall we will be assigning is for a commercial BMP, so select “Commercial”.



It is important to check that the points are snapping to stormwater infrastructure segments. You can access Snapping Options from the Editor drop down menu (Editor → Snapping → Snapping Options). Verify that “Snap to feature service layers” is selected.



You can now assign the commercial outfall for the BMP of interest.

Outfall Addition Example 1: BMPs

Consider the position of the BMP within the stormwater drainage network. There are two stormwater pipes draining to the pond, with flow direction heading south. This infrastructure will be connected at a later step, but for now we are concerned with assigning the outfall at the terminus of this system. Examining the NHD confirms that flow is draining south of the BMP, and an outfall is added (Figure 9).

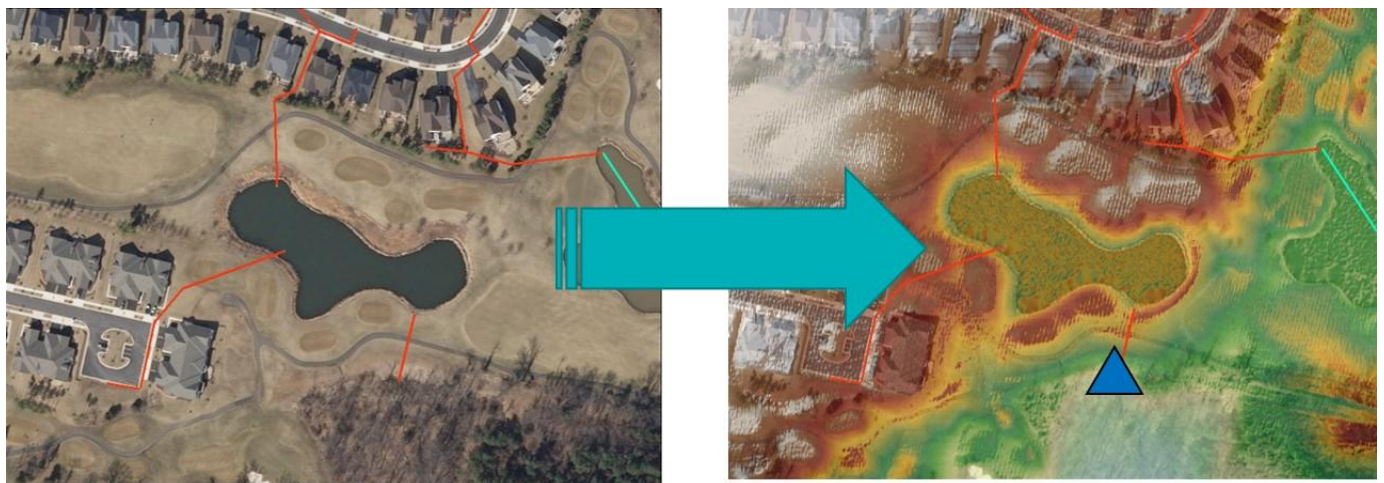


Figure 10. BMP outfall assignment. Note that the two upstream segments are not assigned outfalls, as they do not lie at the terminus of the stormsewer system.

Outfall Addition Example 2: Ditches

While the rationale behind this assignment is straightforward (the outfall is placed at the end of the line segment), it is important to note that line segments within the Stormsewer Lines or Amec

Single Network layers are not all representative of 'solid' infrastructure, such as pipes, grates, and culverts, but can represent the drainage ditches that were excavated out of the sides of hillslopes for facilitating storm drainage to river valleys. Further aerial imagery analysis can assist in clarifying any uncertain areas.

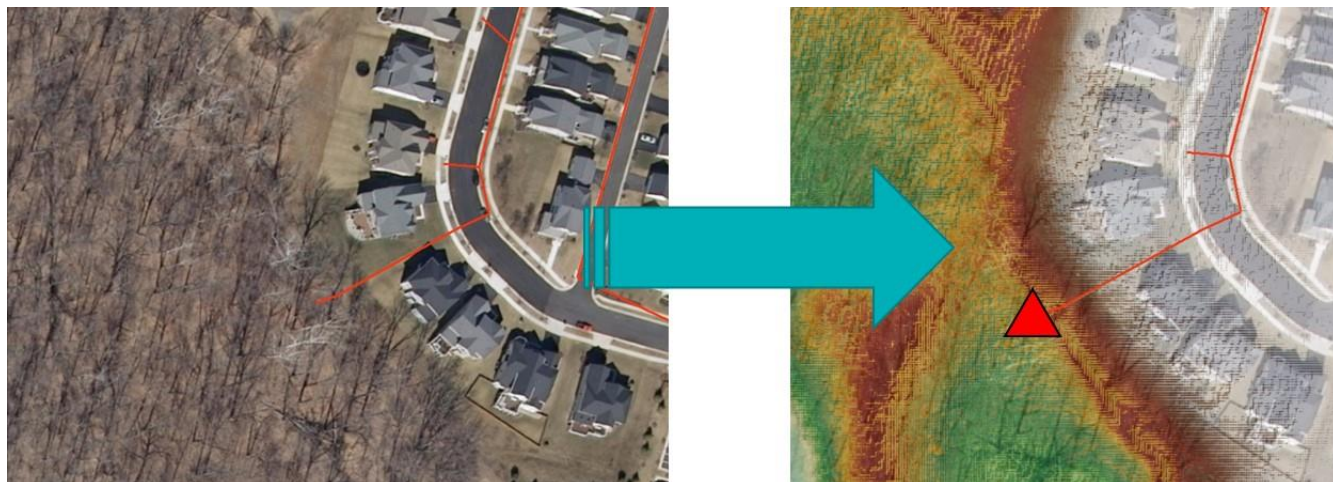


Figure 11 Rip rap ditch outfall assignment. Note that the outfall has been placed at the end of the line segment. Outfall location can be verified using other aerial imagery services, such as Bing or Google Maps.

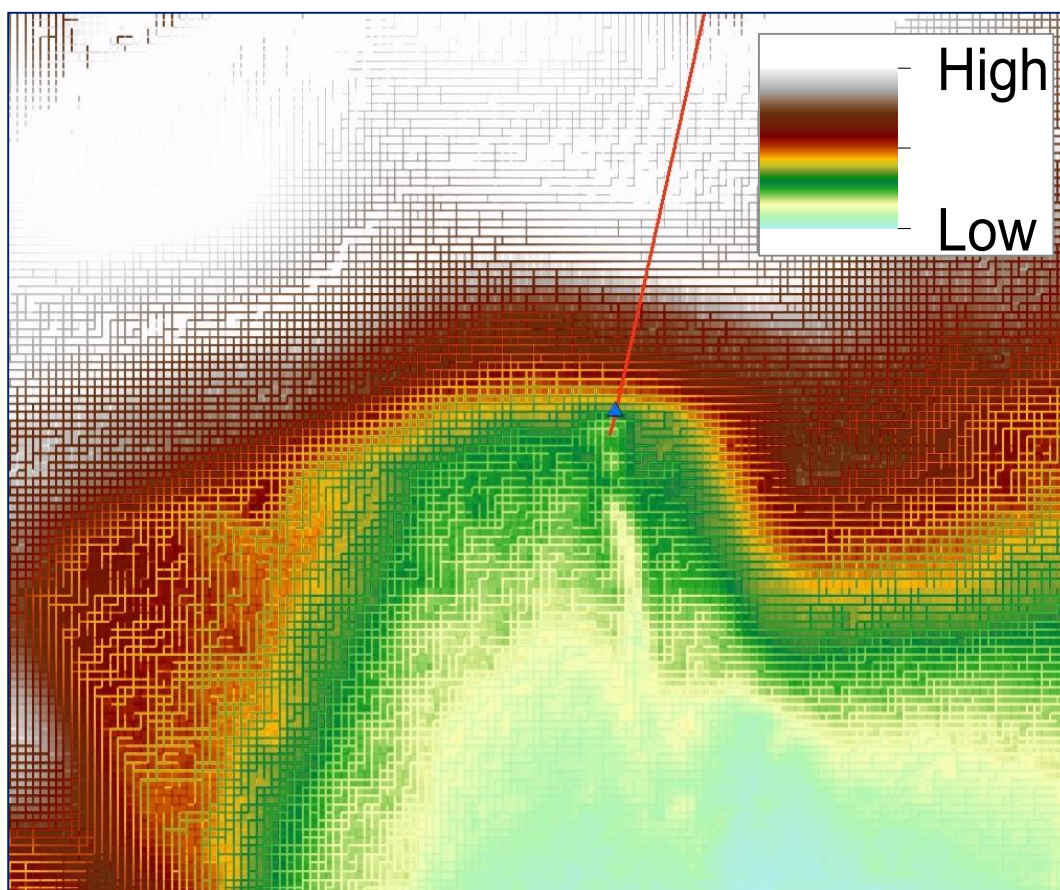


Figure 12 Enhanced view of Figure 10. It is critical to understand the rationale behind outfall placement.

Figure 12 illustrates an important point in placing outfalls. The user must not place an outfall where it will capture upstream flow that does not originate from the MS4 (i.e. river valleys). Figure 12 is an enlarged image from Example 1 from this exercise: at the terminal point of the commercial BMP drainage system. Careful outfall placement will provide the most precise results.

5.5.3 Add Hydrologic Connection

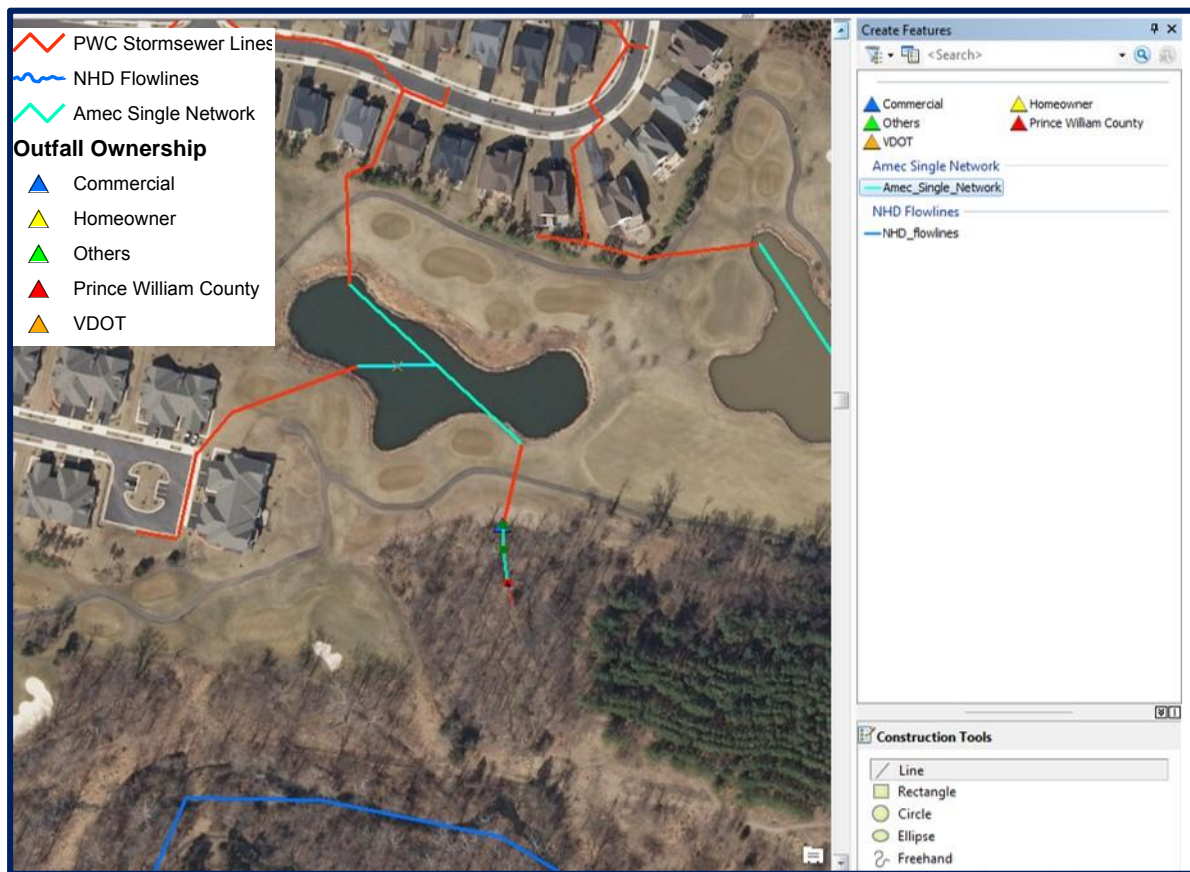


Figure 13 Opening the Create Features Toolbar will allow the user to draw segments connecting the infrastructure to NHD flowlines.

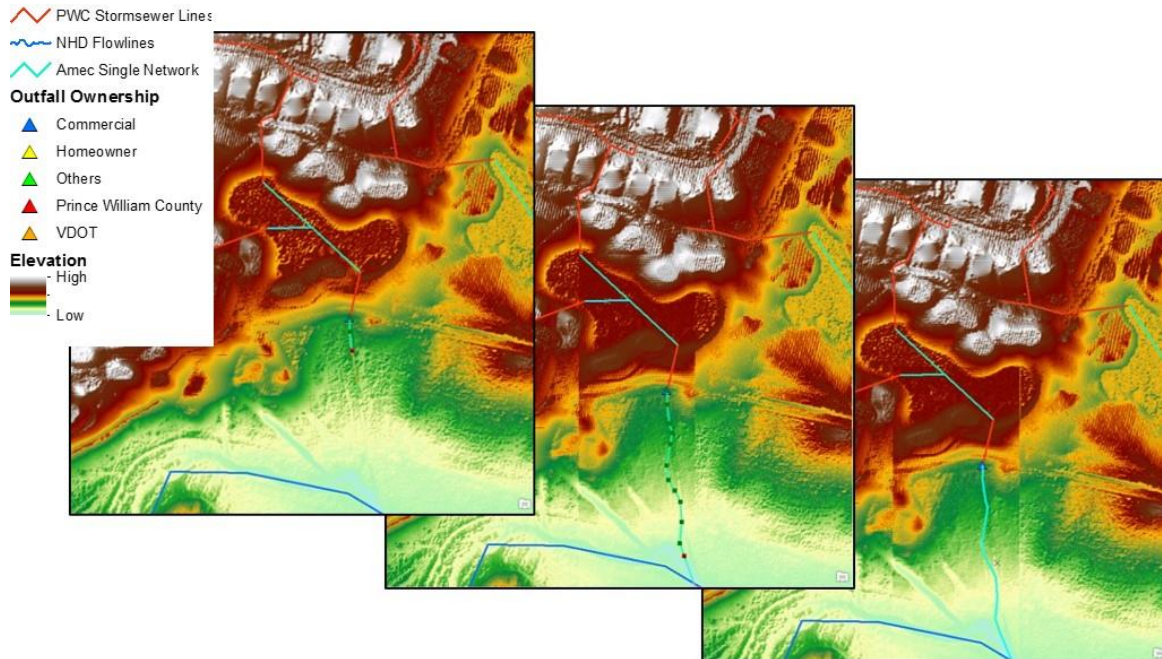


Figure 14 Addition of hydrologic connection segment originating from a BMP.

Maintaining a contiguous network of stormwater flow patterns is necessary for reconditioning the DEM in a later processing step. These concepts are further explained in Sections 5.1 and 5.3. Check that the Spatial Analyst extension for your ArcMap license is enabled (Customize → Extensions → Spatial Analyst) and the Editor Toolbar is open (Customize → Toolbars → Editor). Start editing Amec_Single_Network by adding new segments connecting stormwater infrastructure to the NHD Flowlines. Use the 1 meter DEM as a reference to check that the new network is reflecting local hydrologic flow patterns. Results can be seen in Figures 14 and 15.

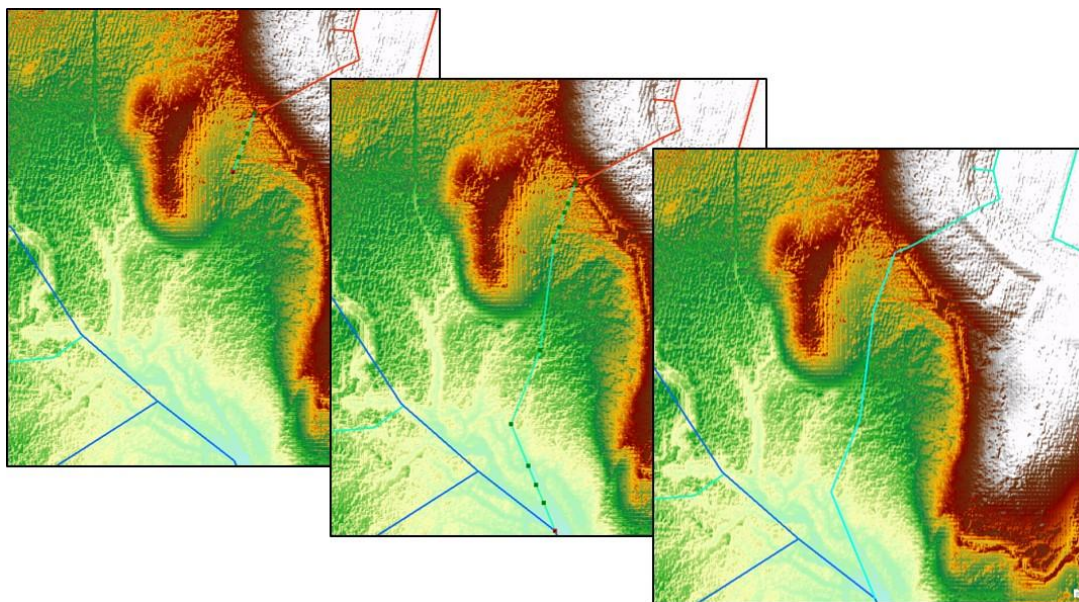


Figure 15 Addition of hydrologic connection segment originating from a drainage ditch.

5.6 Demonstration: Running the Stormwater Tool

Open a new map document without loading in any layers. Any layers that are in use during the time of the Stormwater Tool run will create a schema lock and prevent it from functioning. Navigate to “Stormwater Tool.tbx” within the catalog, and open up the first component script, “1. Recondition DEM”.

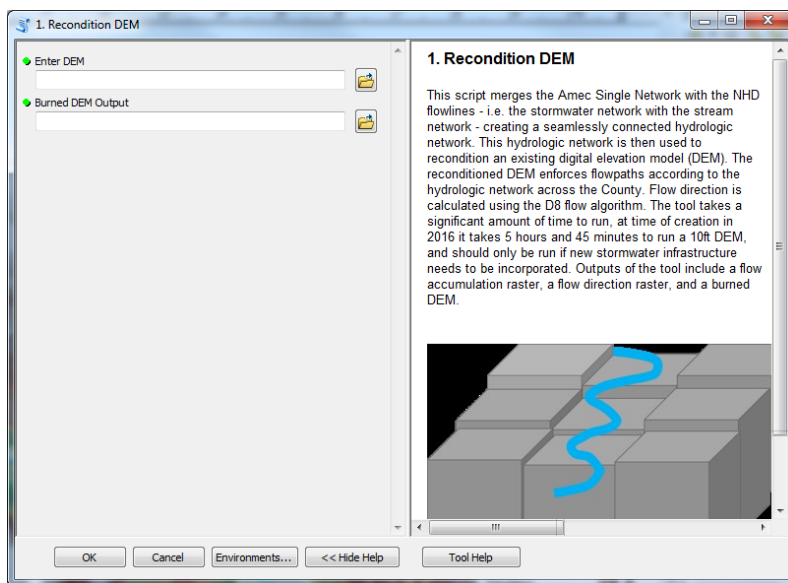
5.6.1 Recondition DEM

This component merges the stormwater network with the NHD flowlines, creating a contiguous network in order to accurately capture localized flow patterns in the reconditioned DEM. This allows for the Stormwater Tool to effectively model stormwater flow at a county-wide scale using simple surface flow hydrology principles.

Enter DEM: Specifies the DEM to be reconditioned. Any DEM

can be used; however, the resolution should be at least 10 feet (or 3 meters). Increases in resolution will result in longer processing time. A suitable 3 meter DEM of the County is included in the MS4.gdb.

Burned DEM Output: Specifies the output location for the reconditioned DEM. Select “scratch.gdb” and name the output “burned”. Alternatively, it can be stored wherever the user desires. After the desired input and output locations are specified, click ‘OK’ to begin processing. The reconditioned DEM should display a network of cells that overlaps with the NHD and



Stormwater Network polylines. Overlaying the 'burned' DEM with the demonstration area will show a similar visual as seen below:

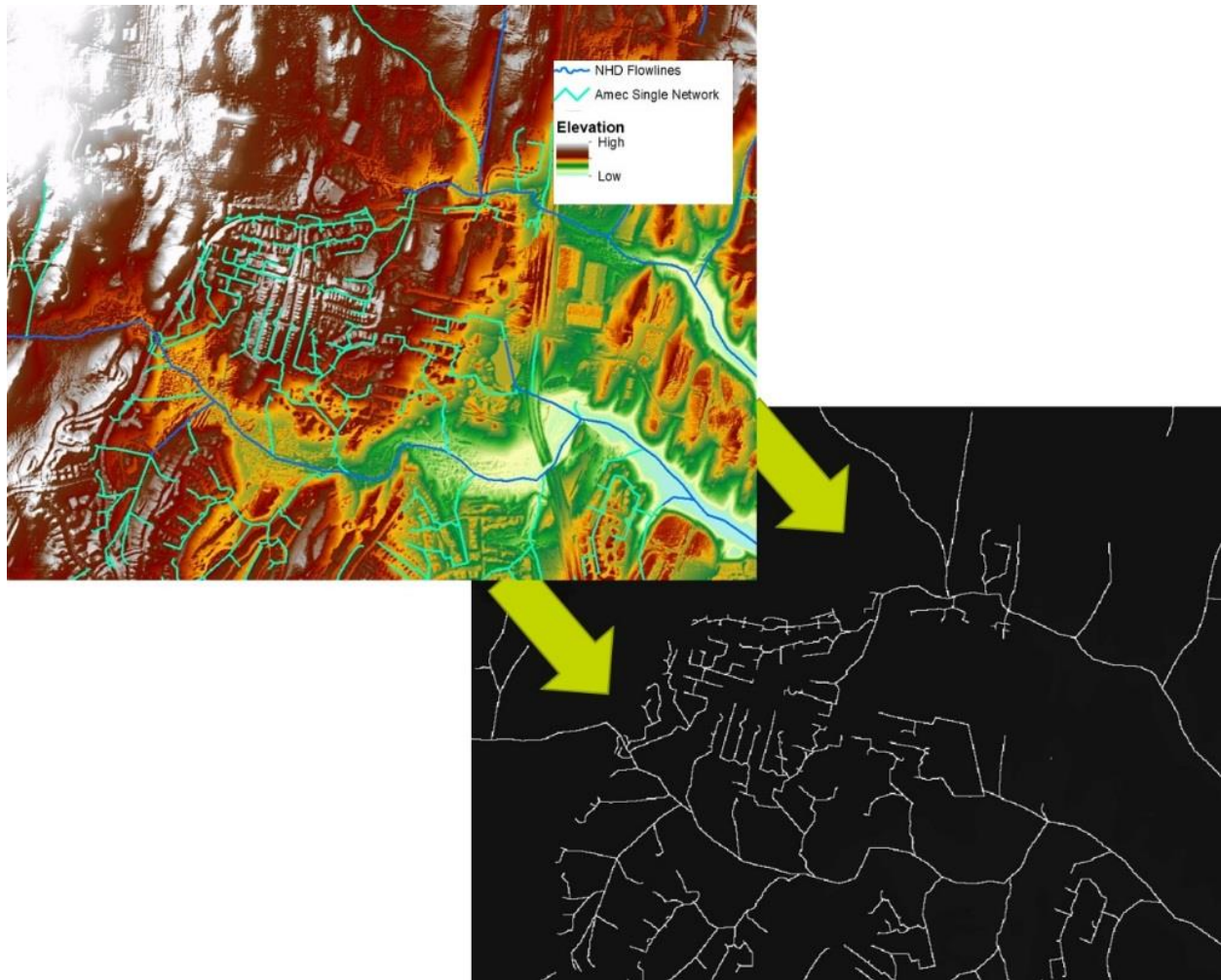


Figure 16 The DEM displays the merged stormwater infrastructure and hydrologic connection networks and NHD Flowlines (collectively known as the Amec Single Network) that were burned into the DEM raster surface. The stark contrast in elevation shows the 'canyons' created by the DEM reconditioning. Using this reconditioned DEM ensures the calculated flow accumulation captures accurate storm flow overland into stormwater conveyances.

5.6.2 Update Outfalls

This component does not produce any new layers that can be observed. Outfall attribute data are being updated to serve in the County's record keeping as required by *Part I.B.2.h) 4)* of their VSMP Permit.

This component uses "joins" to update the attribute table for "ms4_outfalls" so that the Stormwater Tool outputs contain information required by the County's MS4 permit.

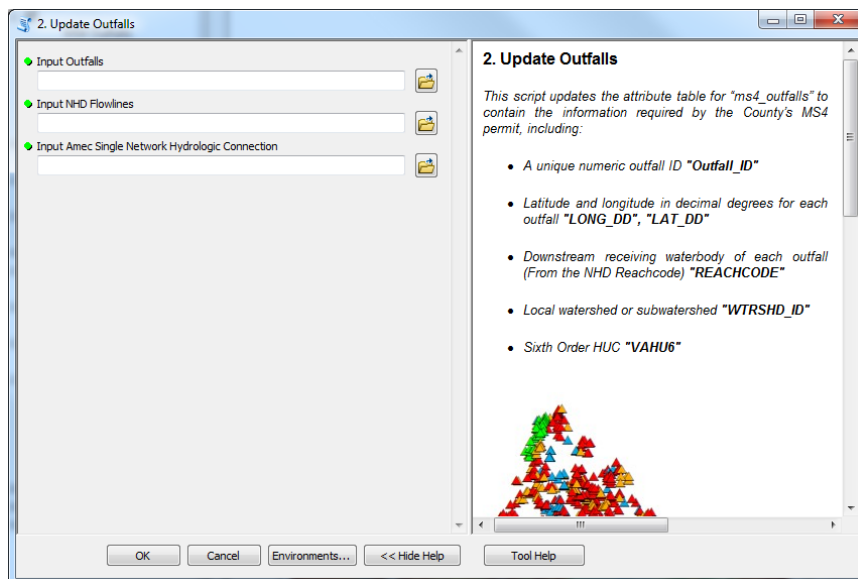
- It assigns a unique outfall ID to each point for use in later tool functions
- It finds the points of intersection between the County's stormwater network and NHD flowlines to identify receiving waterbodies for each outfall, performs a watershed delineation to these points, and then spatially joins the Reach Code for each relevant branch with its outfall.
- It identifies the lat/long for each outfall
- It identifies the HUC12 and Local Watershed (fifth and sixth order) that each outfall discharges stormwater

Input Outfalls: Input the outfall point feature class to assign information. To input the County's MS4 outfalls, navigate to the "Outfalls" feature dataset in the MS4.gdb and select "ms4_outfalls"

Input NHD Flowlines: Specifies the NHD flowlines used to assign receiving waterbody information. Navigate to the "Network" feature dataset and select "NHD_flowlines".

Input Amec Single Network Hydrologic Connection: Specifies the stormwater network to be used. Navigate to the "Network" feature dataset and select "Amec_Single_Network".

The following information has been added to the attribute data for "ms4_outfalls": receiving waterbody, local watershed (Virginia Sixth Order), HUC12, and latitude/longitude coordinates. You can verify this by opening the attribute table (Figure 17).



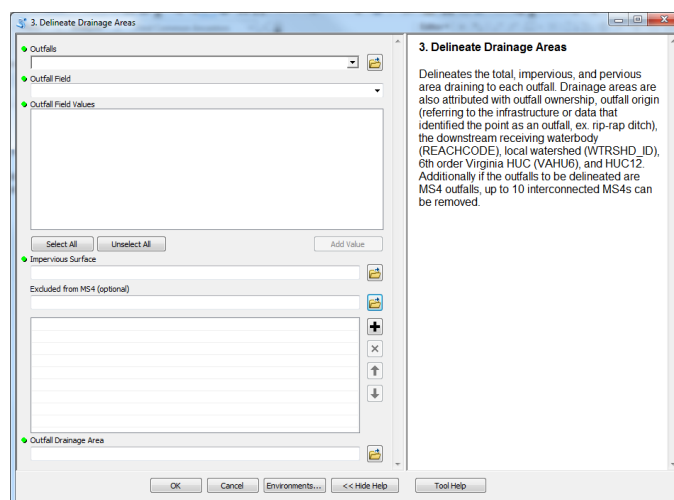
OBJECTID *	SHAPE *	Ownership	Origin	Outfall_ID	REACHCODE	VAHU5	VAHU6	HUC_12
1	Point	Prince William County	BMP	1	02070010003058	PL-O	PL41	020700100801
2	Point	Commercial	RRD	2	02070010001992	PL-N	PL42	020700100701
3	Point	Prince William County	GD	3	02070010001981	PL-N	PL42	020700100701
4	Point	Prince William County	GD	4	02070010001977	PL-N	PL42	020700100701
5	Point	Prince William County	GD	5	02070010002023	PL-N	PL42	020700100701
6	Point	Prince William County	GD	6	02070010000835	PL-N	PL42	020700100701
7	Point	Commercial	BMP	7	02070010000835	PL-N	PL42	020700100701
8	Point	Others	STP	8	02070010000849	PL-N	PL42	020700100701
9	Point	VDOT	STP	9	02070010002060	PL-N	PL42	020700100701
10	Point	Commercial	BMP	10	02070010000848	PL-N	PL42	020700100701
11	Point	Commercial	BMP	11	02070010000848	PL-N	PL42	020700100701

Figure 17 Attribute table for resulting updated outfall information.

5.6.3 Delineate Drainage Areas

This component delineates the drainage area to each outfall, and then assigns the relevant data mentioned in 'Update Outfalls' tool from the corresponding outfalls.

- After performing the watershed delineation for each outfall in `ms4_outfalls`, it converts the resulting rasters to polygons
- It calculates the total pervious area contributing runoff within each drainage area by erasing the impervious area from the total drainage area
- It calculates the total impervious area contributing runoff by subtracting the pervious area from the total area for each drainage area polygon
- It spatially joins the attribute information from “`ms4_outfalls`” to the drainage area polygons by identifying each polygons’ corresponding outfall that lies “within” the polygon.



Note that use of this component will cause the Frequency tool to concurrently run as the user makes a selection of Field categories to select outfall ownership types. This is due to validation Python code that interacts with ArcMap and updates field values to be selectable for the user.

Input Outfall Points: Requires the drainage delineation point input file. Attribute information for “ms4_outfalls” has now been updated. Navigate to the “Outfalls” feature dataset and select it.

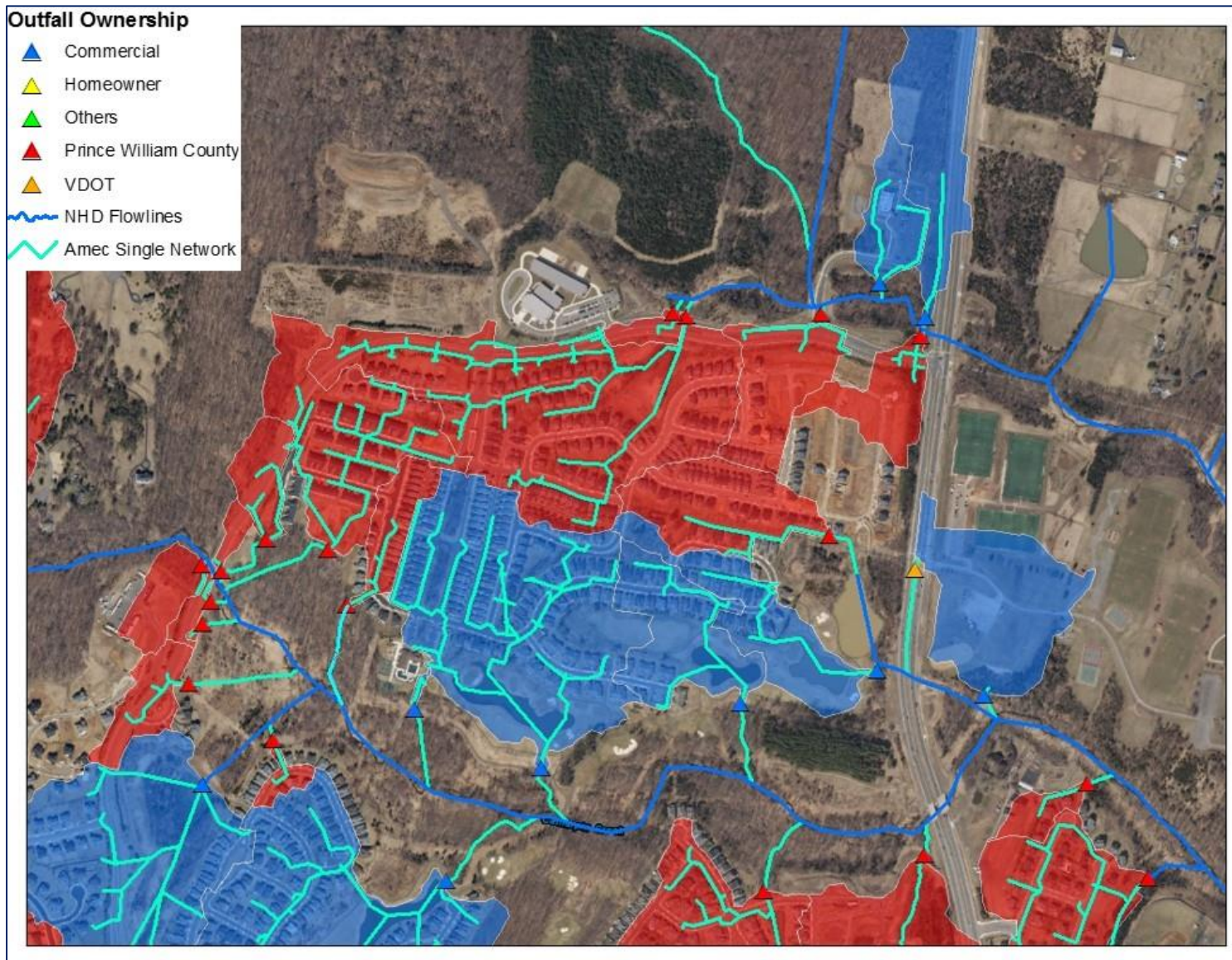
Outfall Field: Specifies the field from the attribute table that the MS4 drainage area selection will use. Choose “Ownership” from the drop-down menu.

Outfall Field Values: Allows the user to select which values to select from the specified field in the “ms4_outfalls” attribute table. The subarea for this exercise only contains outfalls owned and maintained by the County and Other entities. Select “County” and “Other”.

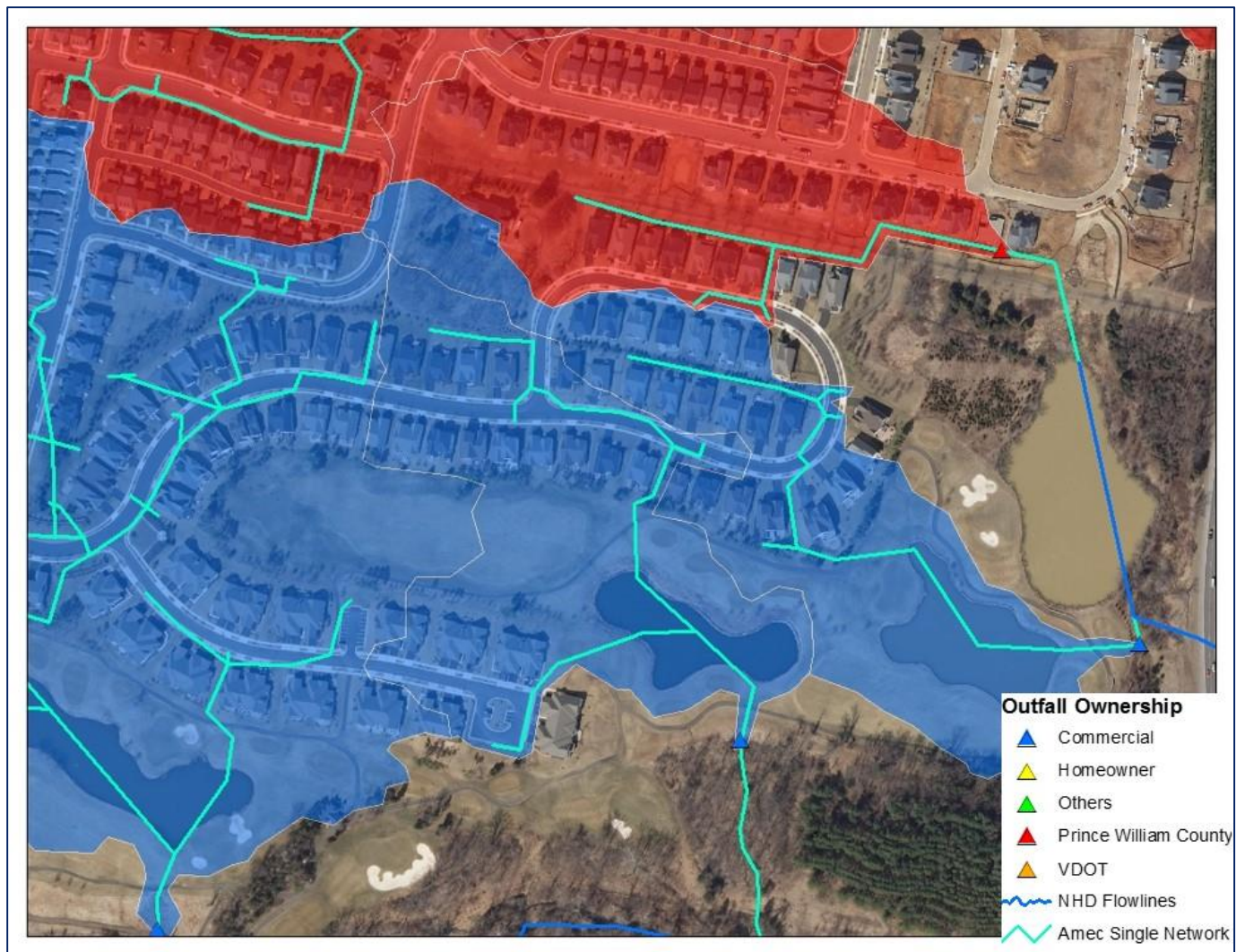
Impervious Surface: Lets the user specify which impervious surface data to use to determine the impervious area for each drainage area. This allows the County to update their drainage areas with each permit cycle (impervious data from 2009 will be used in phase 1 of the cycle).

Excluded from MS4: Permits the user to remove areas that should be excluded from the MS4 drainage area calculations. This includes interconnected MS4s (e.g. VDOT) and areas specifically excluded from regulated urban impervious and pervious cover, such as forested lands. These are all contained in the feature dataset “Interconnected”.

Outfall Drainage Area: Specifies the file name and location for the output of the component. Once a filename is specified, the ‘Delineate Drainage Areas’ tool may be run.



Focusing in on a familiar area can reveal more about the particular details of the contributing stormsewer system. Notice that the area drained by the Amec Single Network and the NHD flowlines are flowing to the outfalls, which serve as accumulation nodes for those upstream networks of pipes, streams, and BMPs.



Finally, users attempting to determine the MS4 service area should remove all excluded lands contained in the 'Interconnected' feature dataset. This can be achieved in the 'Delineate Drainage Areas' component in the 'Excluded from MS4' parameter. The result of removing these areas from the MS4 service area (undeveloped forested land, interconnected MS4s, and VPDES permitted entities) is depicted below.

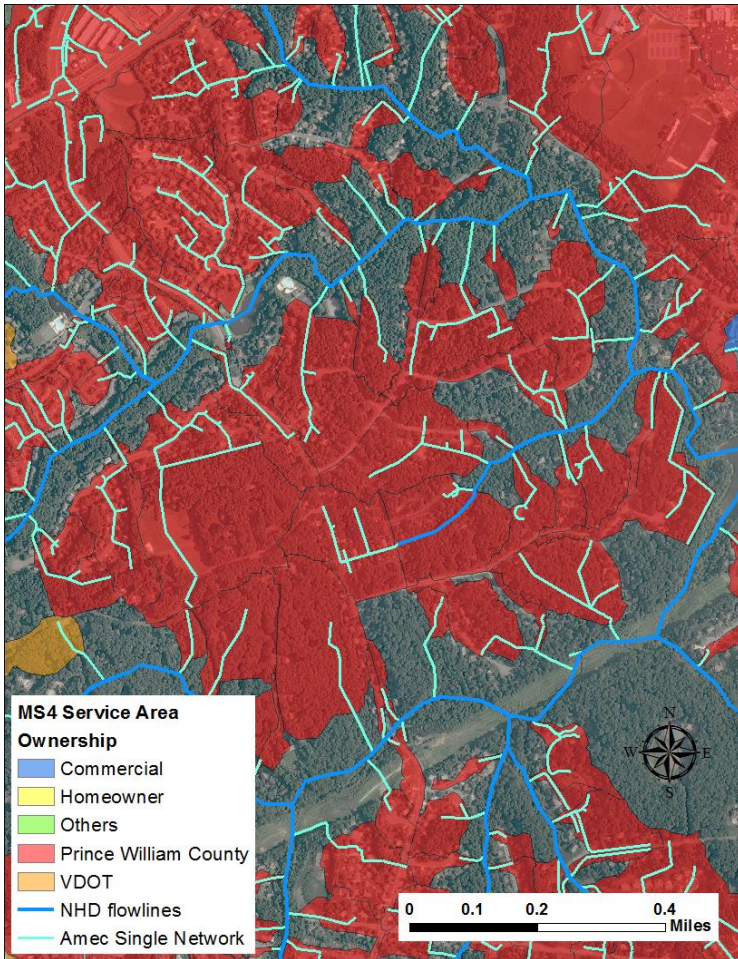


Figure 18 MS4 Service Area Before Removing Excluded Areas

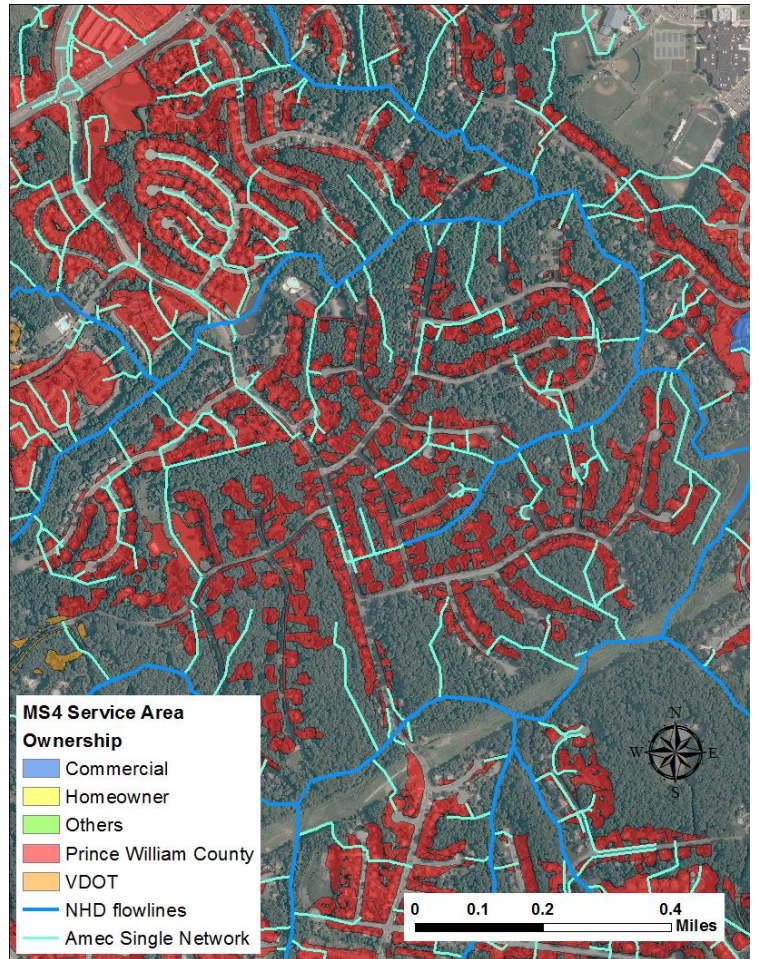


Figure 19 MS4 Service Area After Removing Excluded Areas

6 Appendix A: Source Code

```
# -----  
# Name: Recondition_DEM.py  
# Purpose: This tool reconditions a digital elevation model (DEM) to include new  
           segments of the stormwater network.  
# Author: John P. Miller  
# Copyright:(c) Amec Foster Wheeler | Prince William County, Virginia  
# ArcGIS Version: 10.2  
# Python Version: 2.7.3  
# -----  
  
# Import the Modules  
import arcpy, sys, os  
from arcpy import env  
from arcpy.sa import *  
  
# Checkout Spatial License (Required!)  
arcpy.CheckOutExtension("spatial")  
  
# Overwrite Existing Files!  
arcpy.env.overwriteOutput = True  
  
# Get Relative Paths  
rootWS = os.path.dirname(sys.path[0])  
MS4 = os.path.join(rootWS,'MS4.gdb')  
  
# Set Env Variables  
arcpy.env.workspace = MS4  
arcpy.env.scratchWorkspace = rootWS  
  
# Prompt User for DEM Pathname  
DEM = arcpy.GetParameterAsText(0)  
if (not DEM):  
    arcpy.AddMessage("Select your DEM")  
    DEM = raw_input("Enter the DEM File Pathway")  
  
# Project DEM to "NAD_1983_StatePlane_Virginia_North_FIPS_4501_Feet"  
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")  
spatialRef =  
"PROJCS['NAD_1983_StatePlane_Virginia_North_FIPS_4501_Feet',GEOGCS['GCS_North_America  
n_1983',DATUM['D_North_American_1983',SPHEROID['GRS_1980',6378137.0,298.257222101]],PRI  
MEM['Greenwich',0.0],UNIT['Degree',0.0174532925199433]],PROJECTION['Lambert_Conformal_Co  
nic'],PARAMETER['False_Easting',11482916.666666666],PARAMETER['False_Northing',6561666.666  
666666],PARAMETER['Central_Meridian',-  
78.5],PARAMETER['Standard_Parallel_1',38.03333333333333],PARAMETER['Standard_Parallel_2',
```

```
39.2],PARAMETER['Latitude_Of_Origin',37.666666666666666],UNIT['Foot_US',0.3048006096012192]"]
```

```
arcpy.ProjectRaster_management(DEM, DEM_proj, spatialRef, "BILINEAR")
```

```
# Set Raster Environment Settings
```

```
arcpy.env.snapRaster = DEM_proj
```

```
arcpy.env.cellSize = DEM_proj
```

```
arcpy.env.mask = DEM_proj
```

```
# Local Variables:
```

```
Network = os.path.join(MS4,'Network')
```

```
NHD_flowlines = os.path.join(Network,"NHD_flowlines")
```

```
Amec_Single_Network = os.path.join(Network,"Amec_Single_Network")
```

```
merged_network = os.path.join(arcpy.env.scratchGDB, "merged_network")
```

```
merged_stormwater_raster = os.path.join(arcpy.env.scratchGDB, "merge_storm")
```

```
assignmentType = "Maximum_Combined_Length"
```

```
priorityField = "Shape_Length"
```

```
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight
```

```
# Geoprocessing
```

```
# Add "Burn" Field and Calculate Burn Depth for Amec_Single_Network
```

```
arcpy.AddField_management(Amec_Single_Network, 'Burn', 'Double') # Add 'Burn' field to
```

```
Amec_Single_Network
```

```
arcpy.CalculateField_management(Amec_Single_Network, "Burn", -2000) # Calculate 'Burn' value of -2000 feet for stormsewer infrastructure and hydrologic connections
```

```
# Add "Burn" Field and Calculate Burn Depth for NHD_flowlines
```

```
arcpy.AddField_management(NHD_flowlines, 'Burn', 'Double') # Add 'Burn' field to
```

```
NHD_flowlines
```

```
arcpy.CalculateField_management(NHD_flowlines, "Burn", -3000) # Calculate 'Burn' value of -2000 feet for streams
```

```
# Merge Amec_Single_Network with the Modified NHD_flowlines
```

```
arcpy.Merge_management([Amec_Single_Network, NHD_flowlines], merged_network)
```

```
# Convert Merged Network to Raster with Burn Depth as the Value and the Cellsize Based on the DEM
```

```
arcpy.PolylineToRaster_conversion(merged_network, "Burn", merged_stormwater_raster,
```

```
assignmentType, priorityField, DEM_resolution)
```

```
# Reclassify NoData Cells to Zero
```

```
reclass_dem = Reclassify(merged_stormwater_raster, "Value",
```

```
RemapValue([[-3000,-3000],[-2000,-
```

```
2000],[["NODATA", 0]])) # NHD Flowlines at -3000, Amec_Single_Network at -2000 and Everything Else (land cells) at 0
```

```
reclass_dem.save(os.path.join(arcpy.env.scratchGDB,"reclass_dem"))
```

```
# Save reclassified DEM as "reclass_dem" in scratchGDB
```

```
# Burn the Streams into the Original DEM by Dropping the Stream and Stormsewer Network
Burned_DEM = arcpy.GetParameterAsText(1) # Set the
hydrologically reconditioned DEM as the second parameter
if (not Burned_DEM): # If
statement to prompt for file pathway to save the hydrologically reconditioned DEM
    arcpy.AddMessage("Enter Output Location for Burned DEM") # Python message to appear when
running as standalone script
    Burned_DEM = raw_input("Enter Burned DEM Ouput") # Prompts second parameter
outPlus = Plus(DEM_proj, reclass_dem) # Use raster math
to add the burned DEM with the original DEM. Results in a hydrologically reconditioned DEM
outPlus.save(Burned_DEM) # Save the
hydrologically reconditioned DEM

# Fill DEM
Fill_DEM = Fill(outPlus) # Fill pits
and depressions
Fill_DEM.save(os.path.join(arcpy.env.scratchGDB,"fill")) # Save filled DEM as "fill" in scratchGDB

# Flow Direction
Flow_Dir = FlowDirection(Fill_DEM,"NORMAL") # Calculate the flow direction of each cell using the
D8 algorithm from O'Callaghan & Mark, 1984
Flow_Dir.save(os.path.join(MS4,"flow_dir")) # Save flow direction as "flow_dir" in MS4.gdb

# Flow Accumulation
Flow_Acc = FlowAccumulation(Flow_Dir) # Calculate the number of upstream cells that flow
into each cell using the flow accumulation tool
Flow_Acc.save(os.path.join(MS4,"flow_acc")) # Save flow accumulation as "flow_acc" in
MS4.gdb

# -----
# Name: Update_Outfalls.py
# Purpose: This tool updates the latitude, longitude, unique ID, receiving waterbody,
local watershed, and 6th order HUC
# for each outfall.
# Author: John P. Miller
# Copyright:(c) Amec Foster Wheeler | Prince William County, Virginia
# ArcGIS Version: 10.2
# Python Version: 2.7.3
# -----

# Import the Modules
import arcpy, sys, os
from arcpy import env
from arcpy.sa import *

# Checkout Spatial License (Required!)
arcpy.CheckOutExtension("spatial")

# Overwrite Existing Files!
```

Technical Manual
MS4 Delineation & Stormwater Tool
Prince William County, Virginia
arcpy.env.overwriteOutput = True

Get Relative Paths

```
rootWS = os.path.dirname(sys.path[0])  
MS4 = os.path.join(rootWS,'MS4.gdb')
```

Set Environment Variables

```
arcpy.env.workspace = MS4  
arcpy.env.scratchWorkspace = rootWS
```

Set Globals Variables

```
inFlowDirection = os.path.join(MS4,"flow_dir")  
inFlowAccum = os.path.join(MS4,"flow_acc")  
Outfalls = os.path.join(MS4,"Outfalls")  
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")  
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight  
InputFeatureClass_copy = os.path.join(arcpy.env.scratchGDB, "InputFeatureClass_copy")  
outfall_WB = os.path.join(arcpy.env.scratchGDB, "outfall_WB")  
outfall_ReceivingWB = os.path.join(arcpy.env.scratchGDB, "Outfall_ReceivingWB")  
ReceivingWB_Pts = os.path.join(arcpy.env.scratchGDB, "ReceivingWB_Pts")  
WB_pourpoints = os.path.join(arcpy.env.scratchGDB,"WB_pourpoints")  
WB_outfall_poly = os.path.join(arcpy.env.scratchGDB, "WB_outfall_poly")  
WB_outfall_da_ras = os.path.join(arcpy.env.scratchGDB,"WB_outfall_da_ras")  
WB_sheds = os.path.join(arcpy.env.scratchGDB, "WB_sheds")  
WB_da = os.path.join(arcpy.env.scratchGDB, "WB_da")  
Polygons = os.path.join(MS4,"Polygons")  
HUC12 = os.path.join(Polygons,"HUC12")  
outfall_HUC = os.path.join(arcpy.env.scratchGDB,"outfall_HUC")  
Subwatersheds = os.path.join(Polygons,"Subwatersheds")  
outfall_sheds = os.path.join(arcpy.env.scratchGDB,"outfall_sheds")  
outfall_layer = os.path.join(arcpy.env.scratchGDB,"outfall_layer")
```

Prompt User for Outfalls Pathname

```
InputFeatureClass = arcpy.GetParameterAsText(0)
```

Set outfalls as first parameter

```
if (not InputFeatureClass):
```

If statement to prompt for outfall feature class

```
arcpy.AddMessage("Select the points you want to delineate")
```

Python message to appear when running as standalone script

```
InputFeatureClass = raw_input("Enter the File Pathway for Your Delineation Points") # Prompts first  
parameter
```

Prompt User for NHD Flowline Pathname

```
nhdInput = arcpy.GetParameterAsText(1)
```

Set NHD_flowlines as second parameter

```
if (not nhdInput):
```

If statement to prompt for

polyline feature class

```
arcpy.AddMessage("Select NHD Flowlines")
```

Python message to appear when running as

standalone script


```
nhdInput = raw_input("Enter NHD Flowlines") # Prompts second parameter

# Prompt User for Stormwater Network Pathname
networkInput = arcpy.GetParameterAsText(2) # Set
Amec_Single_Network as third parameter
if (not networkInput): # If
statement to prompt for polyline feature class
    arcpy.AddMessage("Select Stormwater Network") # Python message to
appear when running as standalone script
    networkInput = raw_input("Enter Amec Single Network") # Prompts third parameter

# Add Unique IDs to Drainage Points Using "Outfall_ID" Field Name, Sequentially Created
existingFields = [] # Empty list
for field in arcpy.ListFields(InputFeatureClass): # Iterate over fields
    existingFields.append(field.name) # Add the attribute name to list for each
field

# Create String to Use as Field Name
Outfall_ID = "Outfall_ID"
if Outfall_ID not in existingFields: #
Verify if field "Outfall_ID" exists
    arcpy.AddField_management(InputFeatureClass, 'Outfall_ID', 'LONG') # If field "Outfall_ID" doesn't
exists, create it
else:
    # If above statement is false, then
    print "Outfall_ID field already exists, no need to add" # If field "Outfall_ID" does
exist, do nothing

# Calculate a Unique Identifier for Each Outfall Missing an ID in the 'Outfall_ID' Field (1, 2, 3, etc.)
with arcpy.da.UpdateCursor(InputFeatureClass, Outfall_ID) as rows: # Create an update cursor
to go through each row in the Outfall_ID field
    for i, row in enumerate(rows, start=1): # For each value in row, a tuple is produced
with (counter, row); the for loop binds that to variable 'i' and row respectively
        if row[0] is None: # If an outfall ID has not been assigned (in attribute
table as <NULL>)
            row[0] = i # Substitute the index counter value (1, 2, 3, etc.) for
Outfall_ID value in each row
        elif row[0] is not None: # If an outfall ID has already been assigned (i.e. not
<NULL>)
            print "No IDs to add" # Do nothing
            rows.updateRow(row) # Update this row in the table

# Create Points at the Intersection of the Stormwater and Stream Network
arcpy.Intersect_analysis([nhdInput, networkInput], ReceivingWB_Pts, "No_FID", DEM_resolution,
"point")

# Add Unique IDs to the Intersection Points Using "WB_Pt_ID" Field Name
WB_Fields = [] # Empty list
```

```
for field in arcpy.ListFields(ReceivingWB_Pts):      # Iterate over fields
    WB_Fields.append(field.name)                    # Add the attribute name to list for each
field

WB_Pt_ID = "WB_Pt_ID"
    # Create field name as string
if WB_Pt_ID not in WB_Fields:
    # Check if an ID number for the intersection points exists
    arcpy.AddField_management(ReceivingWB_Pts, 'WB_Pt_ID', 'LONG') # If ID number does not
exist already, create field in attribute table
else:
    # Otherwise
    print "WB_Pt_ID exists"
    # If field already exists skip

# Calculate a Unique Value for Each Receiving Waterbody Point (ReceivingWB_Pts) Starting with 1
(1, 2, 3, etc.)
with arcpy.da.UpdateCursor(ReceivingWB_Pts, WB_Pt_ID) as rows:      # Create an update
cursor to go through each row in the Outfall_ID field
    for i, row in enumerate(rows,1):                                # For each
value in row, a tuple is produced with (counter, row); the for loop binds that to variable 'i' and row
respectively
        row[0] = i
        # Substitute the index counter value (1, 2, 3, etc.) for Outfall_ID value in each row
        rows.updateRow(row)
        # Update this row in the table

# Snap Intersecting Points to Flow Accumulation Pathway to Ensure Proper Delineation
if arcpy.Exists(WB_pourpoints):      # Check if this snap pour points raster already
exists
    arcpy.Delete_management(WB_pourpoints) # If it already exists, delete it
else:      # Otherwise
    print "Snap pour points"          # Do nothing

# Snap the points created from intersecting the Amec_Single_Network and NHD_flowlines to the
adjacent cell in the 3 x 3 cell window with the highest flow accumulation value
WB_outSnapPour = SnapPourPoint(ReceivingWB_Pts, inFlowAccum, DEM_resolution, "WB_Pt_ID")
WB_outSnapPour.save(WB_pourpoints) # Save output as WB_pourpoints

# Delineate Drainage Area to WB Points
if arcpy.Exists(WB_outfall_da_ras):      # Check if the
drainage area raster for the intersecting points exists
    arcpy.Delete_management(WB_outfall_da_ras) # If it already exists, delete
it
else:
    # Otherwise
    print "Delineate Receiving Water Body Drainage Areas" # Do nothing
```

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Delineate the upstream watersheds for each downstream receiving waterbody

```
WB_outfall_da_ras = Watershed(inFlowDirection, WB_outSnapPour, "VALUE")
```

```
WB_outfall_da_ras.save(os.path.join(arcpy.env.scratchGDB,"WB_outfall_da_ras")) # Save output as  
WB_outfall_da_ras
```

Convert Raster Drainage Areas to Polygons

```
arcpy.RasterToPolygon_conversion(WB_outfall_da_ras, WB_outfall_poly, "SIMPLIFY", "VALUE")
```

Dissolve Watersheds by Gridcode to Eliminate Tiny Watersheds

```
arcpy.Dissolve_management(WB_outfall_poly, WB_da, ["gridcode"], "", "MULTI_PART",  
"DISSOLVE_LINES")
```

Add Receiving Waterbody information to the Waterbody Drainage Area

```
arcpy.MakeFeatureLayer_management(WB_da, "Waterbody_area") # Create feature
```

layer for dissolved polygon upstream watersheds for receiving waterbodies

```
arcpy.MakeFeatureLayer_management(ReceivingWB_Pts, "WB_points") # Create feature layer for  
receiving waterbody points
```

```
arcpy.JoinField_management("Waterbody_area", "gridcode", "WB_points", "WB_Pt_ID") # Join  
receiving waterbody point IDs to receiving waterbody drainage areas based on "gridcode"
```

```
arcpy.CopyFeatures_management("Waterbody_area", WB_sheds)
```

```
# Save a copy of the feature layer as a feature class named "WB_sheds"
```

Create a Copy MS4 Outfalls to Facilitate Join

```
arcpy.CopyFeatures_management(InputFeatureClass, InputFeatureClass_copy) # Create a copy of  
the outfalls
```

```
arcpy.MakeFeatureLayer_management(InputFeatureClass_copy, "CopyLayer") # Make  
feature layer from copy of outfalls
```

```
arcpy.DeleteField_management(InputFeatureClass_copy, ["REACHCODE"]) # In  
feature class that is a copy of the outfalls
```

#Use Spatial Join to Add Waterbody Drainage Area to User Selected Outfall Points

```
arcpy.SpatialJoin_analysis(InputFeatureClass_copy, WB_sheds, outfall_WB, "", "", "",
```

```
"COMPLETELY_WITHIN") # Join attribute table from receiving waterbody drainage areas to the  
copy of the outfalls
```

```
arcpy.JoinField_management(outfall_WB, "WB_Pt_ID", "CopyLayer", "Outfall_ID")
```

```
# Join Outfall ID field from feature layer of outfalls
```

#Delete Unnecessary Fields

```
fields = arcpy.ListFields(outfall_WB)
```

```
# Create a list with all of the fields in new outfalls feature class that  
contains the receiving waterbody "REACHCODE"
```

```
WBkeepFields = ["SHAPE", "OBJECTID", "Ownership", "Origin", "Outfall_ID", "REACHCODE"] #
```

Create list with these relevant field names. "Shape" and "OBJECTID" required!

```
WBdropFields = [x.name for x in fields if x.name not in WBkeepFields]
```

```
# Identify fields in outfall_WB that are not in the WBkeepFields list created above.
```

```
arcpy.DeleteField_management(outfall_WB, WBdropFields)
```

```
# Delete fields in outfall_WB not listed in WBkeepFields
```

```
# Use Spatial Join to Add 6th Order HUC Data
arcpy.SpatialJoin_analysis(outfall_WB, HUC12, outfall_HUC, "", "", "", "WITHIN")

# Remove Unnecessary Fields
arcpy.DeleteField_management(HUC12, ["Join_Count", "TARGET_FID"])

# Use Spatial Join to Add Local Watershed
arcpy.SpatialJoin_analysis(outfall_HUC, Subwatersheds, outfall_sheds, "", "", "", "WITHIN")

# Remove Unnecessary Fields
arcpy.DeleteField_management(outfall_sheds, ["Join_Count", "TARGET_FID", "Join_Count_1",
"TARGET_FID_1", "OBJECTID_1", "AREA", "PERIMETER", "SUBAREA", "SUBAREA_",
"SUBAREA_ID", "SYMBOL", "WMPPLAN", "ACRES", "MAJSHED", "SHAPE_LENG", "SHD_NAME" ])

# Overwrite Initial Outfalls Feature Class (First Parameter)
arcpy.CopyFeatures_management(outfall_sheds, InputFeatureClass)

# Add Latitude and Longitude Fields to Outfalls
LONG_DD = "LONG_DD"

if LONG_DD in existingFields:
    # If LONG_DD field exists
    arcpy.DeleteField_management(InputFeatureClass, ["LONG_DD", "LAT_DD"])# Delete Lat/Long
    Fields
else:
    # Otherwise
    print "Need to add Lat/Long"
    # Do nothing

# Add Outfall Location in Decimal Degrees
arcpy.AddField_management(InputFeatureClass, 'LONG_DD', 'FLOAT', 7, 5) # Add field for
longitude in decimal degrees
LAT_DD = "LAT_DD"
# Create string for field
arcpy.AddField_management(InputFeatureClass, 'LAT_DD', 'FLOAT', 7, 5) # Add field for
latitude in decimal degrees

# Calculate Latitude and Longitude Decimal Degree Coordinates for the Outfall Points
dsc = arcpy.Describe(InputFeatureClass)
# Use "Describe" function to determine the shape type
prjFile = os.path.join(arcpy.GetInstallInfo()["InstallDir"],
r"Coordinate Systems\Geographic Coordinate Systems\World\WGS 1984.prj") # Datum of
data for spatial reference
spatialRef = arcpy.SpatialReference(prjFile)
# Coordinate system that defines what map projection options are used to
define horizontal coordinates
```

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```
updCursor = arcpy.UpdateCursor(InputFeatureClass,"", spatialRef)      # Establish read-write
access for outfalls
for row in updCursor:
    # Loop through each row in the outfall feature class
    shape = row.getValue(dsc.shapeFieldName)                          # Create
geometry object 'shape'
    geom = shape.getPart(0)
    # Read geometry of each point
    x = geom.X
    # Store x from spatial reference
    y = geom.Y
    # Store y from spatial reference
    row.setValue('LONG_DD', x)
    # Add x value from spatial reference to the point in the field LONG_DD
    row.setValue('LAT_DD', y)                                         # Add
y value from spatial reference to the point in the field LAT_DD
    updCursor.updateRow(row)
    # Updates the current row in the outfalls table

del updCursor, row # Close loop and delete cursor
```

```
# -----
# Name:          Drainage_Area_Delineations.py
# Purpose:       This tool delineates the upstream area to a set of user defined points
                 and determines the percent of the
                 drainage area that is pervious and impervious
# Author:        John P. Miller
# Copyright:(c)  Amec Foster Wheeler | Prince William County, Virginia
# ArcGIS Version: 10.2
# Python Version: 2.7.3
# -----
```

```
# Import the Modules
import arcpy, sys, os
from arcpy import env
from arcpy.sa import *
```

```
# Checkout Spatial License (Required!)
arcpy.CheckOutExtension("spatial")
```

```
# Overwrite Existing Files!
arcpy.env.overwriteOutput = True
```

```
# Get Relative Paths
rootWS = os.path.dirname(sys.path[0])
MS4 = os.path.join(rootWS,'MS4.gdb')
```

```
# Set Environment Variables
```

```
arcpy.env.workspace = MS4
```

```
arcpy.env.scratchWorkspace = rootWS
```

```
# Set Globals Variables
```

```
inFlowDirection = os.path.join(MS4,"flow_dir")
```

```
inFlowAccum = os.path.join(MS4,"flow_acc")
```

```
Polygons = os.path.join(MS4,"Polygons")
```

```
Outfalls = os.path.join(MS4,"Outfalls")
```

```
Interconnected = os.path.join(MS4,"Interconnected")
```

```
DEM_proj = os.path.join(arcpy.env.scratchGDB,"DEM_proj")
```

```
DEM_resolution = arcpy.Describe(DEM_proj).meanCellHeight
```

```
outfall_poly = os.path.join(arcpy.env.scratchGDB,"outfall_poly")
```

```
dis_outfall_da = os.path.join(arcpy.env.scratchGDB,"dis_outfall_da")
```

```
LandUse = os.path.join(MS4,"LandUse")
```

```
GMU = os.path.join(Interconnected,"GMU")
```

```
NOVA = os.path.join(Interconnected,"NOVA")
```

```
Schools = os.path.join(Interconnected,"Schools")
```

```
VDOT = os.path.join(Interconnected,"VDOT")
```

```
VPDES = os.path.join(Interconnected,"VPDES")
```

```
interconnected_ms4 = os.path.join(arcpy.env.scratchGDB,"interconnected_ms4")
```

```
Phase1_MS4 = os.path.join(arcpy.env.scratchGDB,"Phase1_MS4")
```

```
pervious_da = os.path.join(arcpy.env.scratchGDB,"pervious_da")
```

```
pervious_layer = os.path.join(arcpy.env.scratchGDB,"pervious_layer")
```

```
drainage_area = os.path.join(arcpy.env.scratchGDB,"drainage_area")
```

```
drainage_area_layer = os.path.join(arcpy.env.scratchGDB,"da_layer")
```

```
join_da = os.path.join(arcpy.env.scratchGDB,"join_da")
```

```
outfall_layer = os.path.join(arcpy.env.scratchGDB,"outfall_layer")
```

```
area_layer = os.path.join(arcpy.env.scratchGDB,"area_lyr")
```

```
all_areas = os.path.join(arcpy.env.scratchGDB,"all_areas")
```

```
drainage_area_selection = os.path.join(arcpy.env.scratchGDB,"drainage_area_selection")
```

```
# Set Raster Environment Settings
```

```
arcpy.env.snapRaster = DEM_proj
```

```
arcpy.env.cellSize = DEM_proj
```

```
arcpy.env.extent = DEM_proj
```

```
# Prompt User for Outfalls Pathname
```

```
InputFeatureClass = arcpy.GetParameterAsText(0) # Set outfalls as first parameter
```

```
if (not InputFeatureClass): # If statement to prompt for outfall feature class
```

```
    arcpy.AddMessage("Select your the points you want to delineate") # Python message to appear  
when running as standalone script
```

```
    InputFeatureClass = raw_input("Enter the File Pathway for Your Delineation Points") # Prompts first  
parameter
```

```
# Prompt User for Attribute Field
```

```
InputField = arcpy.GetParameterAsText(1) # Set 'user' selected field name as second parameter
```

```
if (not InputField): # If statement to prompt users to decide which field they would like to select outfalls  
by
```

```
arcpy.AddMessage("Select Input Field") # Python message to appear when running as  
standalone script
```

```
InputField = raw_input("Enter Input Field") # Prompts second parameter
```

```
# This Choice List is Populated Dynamically from Unique Values in the Input Field Defined in the  
Second Parameter (InputField)
```

```
InputValue = arcpy.GetParameterAsText(2) # Select field values for the third parameter
```

```
if (not InputValue): # If statement to prompt for values
```

```
arcpy.AddMessage("Select Areas to Delineate") # Python message to appear when running  
as standalone script
```

```
InputValue = raw_input("Enter Subset") # Prompts third parameter
```

```
# The Selected Value of Parameter 2 is Passed to Set Parameter 3 Output
```

```
arcpy.SetParameter(3, InputValue)
```

```
# Prompt User for Representative Impervious Cover (i.e. 2009 for Phase 1)
```

```
impervious_area = arcpy.GetParameterAsText(4) # Select impervious cover dataset for the fifth  
parameter
```

```
if (not impervious_area): # If statement to prompt for feature class
```

```
arcpy.AddMessage("Select the impervious cover") # Python message to appear when running as  
standalone script
```

```
impervious_area = raw_input("Enter the File Pathway for Your Impervious Area") # Prompts fifth  
parameter
```

```
# Prompt User for Interconnected MS4s
```

```
other_ms4s = arcpy.GetParameterAsText(5) # Select impervious cover dataset for the fifth parameter
```

```
if (not other_ms4s): # If statement to prompt for feature class
```

```
arcpy.AddMessage("Select all other MS4s from 'Interconnected' folder") # Python message to  
appear when running as standalone script
```

```
other_ms4s = raw_input("Enter interconnected MS4s") # Prompts sixth parameter
```

```
# Prompt User for Delineated Areas Output Location
```

```
outfall_area = arcpy.GetParameterAsText(6) # Select output location for the fifth parameter
```

```
if (not outfall_area): # If statement to prompt for pathname
```

```
arcpy.AddMessage("Add Delineated Areas Output Location") # Python message to appear when  
running as standalone script
```

```
outfall_area = raw_input("Enter Output Location") # Prompts seventh parameter
```

```
# Snap Drainage Delineation Points to Flow Accumulation Pathway to Ensure Proper Delineation
```

```
Outfall_ID = "Outfall_ID" # Create Outfall_ID string for field name
```

```
outSnapPour = SnapPourPoint(InputFeatureClass, inFlowAccum, DEM_resolution, Outfall_ID) # Snap  
outfalls to the adjacent cell in the 3 x 3 cell window with the highest flow accumulation value
```

```
outSnapPour.save(os.path.join(arcpy.env.scratchGDB, "pourpoints")) # Save snap pour points output  
as "pourpoints"
```

```
# Delineate Drainage Area to MS4 Outfalls
```

```
outfall_da_ras = Watershed(inFlowDirection, outSnapPour, "VALUE") # Delineate upstream  
contributing area to each snapped outfall
```

```
outfall_da_ras.save(os.path.join(arcpy.env.scratchGDB,"outfall_da")) # Save drainage areas
```

```
# Convert Raster Drainage Areas to Polygons
```

```
arcpy.RasterToPolygon_conversion(outfall_da_ras, outfall_poly, "SIMPLIFY", "VALUE")
```

```
# Dissolve Watersheds by Gridcode to Eliminate Tiny Watersheds
```

```
arcpy.Dissolve_management(outfall_poly, drainage_area, ["gridcode"], "", "MULTI_PART",  
"DISSOLVE_LINES")
```

```
# Merge Interconnected MS4s.
```

```
splitMS4s = other_ms4s.split(";")
```

```
if splitMS4s ==[""]:
```

```
    z = 0
```

```
else :
```

```
    z = len(splitMS4s)
```

```
if z == 0 : # If no interconnected MS4s are selected
```

```
    Phase1_MS4 = drainage_area # Skip merging interconnected MS4 polygons
```

```
elif z == 1: # If there is 1 other MS4
```

```
    arcpy.Merge_management([splitMS4s[0]], interconnected_ms4)
```

```
elif z == 2: # If there are 2 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1]], interconnected_ms4)
```

```
elif z == 3: # If there are 3 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2]], interconnected_ms4)
```

```
elif z == 4: # If there are 4 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3]],  
interconnected_ms4)
```

```
elif z == 5: # If there are 5 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4]],  
interconnected_ms4)
```

```
elif z == 6: # If there are 6 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],  
splitMS4s[5]], interconnected_ms4)
```

```
elif z == 7: # If there are 7 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],  
splitMS4s[5], splitMS4s[6]], interconnected_ms4)
```

```
elif z == 8: # If there are 8 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],  
splitMS4s[5], splitMS4s[6], splitMS4s[7]], interconnected_ms4)
```

```
elif z == 9: # If there are 9 other MS4s
```

```
    arcpy.Merge_management([splitMS4s[0], splitMS4s[1], splitMS4s[2], splitMS4s[3], splitMS4s[4],  
splitMS4s[5], splitMS4s[6], splitMS4s[7], splitMS4s[8]], interconnected_ms4)
```

```
else:
```

```
    print "Other MS4s not selected"
```

```
    arcpy.AddError("No other MS4s selected, output will not reflect interconnected MS4s")
```

```
# Erase Interconnected MS4's from MS4 Area
```

```
if z > 0: # If there are interconnected ms4s
```



```
arcpy.Erase_analysis(drainage_area, interconnected_ms4, Phase1_MS4) # Erase them from the  
outfall drainage area
```

```
else: # If there are not interconnected ms4s
```

```
    print "No interconnected MS4s" # Skip this step
```

```
    arcpy.AddError("No other MS4s selected, output will not reflect interconnected MS4s")
```

```
# Calculate Total Acres in Each Drainage Area
```

```
arcpy.AddField_management(Phase1_MS4, 'TotAcres', 'DOUBLE') # Add field for total acres in each  
drainage area
```

```
arcpy.CalculateField_management(Phase1_MS4, 'TotAcres', '!shape.area@acres!', 'PYTHON') #
```

```
Calculate total drainage area in acres and store in 'TotAcres' field
```

```
# Erase Impervious Area from Drainage Area
```

```
arcpy.Erase_analysis(Phase1_MS4, impervious_area, pervious_da)
```

```
# Add Pervious Acres Field and Calculate Geometry
```

```
arcpy.AddField_management(pervious_da, 'PervAcres', 'DOUBLE') # Add field for pervious acres in  
each drainage area (i.e. area remaining after erasing impervious area from each drainage area)
```

```
arcpy.CalculateField_management(pervious_da, 'PervAcres', '!shape.area@acres!', 'PYTHON') #
```

```
Calculate pervious drainage area in acres and store in 'PervAcres' field
```

```
# Create Feature Layers for Join
```

```
arcpy.MakeFeatureLayer_management(Phase1_MS4, drainage_area_layer) # Create feature layer of  
total drainage areas for each outfall
```

```
arcpy.MakeFeatureLayer_management(pervious_da, pervious_layer) # Create feature layer of  
pervious drainage areas for each outfall
```

```
# Join Pervious Area to the Dissolved MS4 Drainage Areas
```

```
arcpy.AddJoin_management(drainage_area_layer, "gridcode", pervious_layer, "gridcode") # Join  
pervious area feature layer to total drainage area layer based on gridcode
```

```
arcpy.CopyFeatures_management(drainage_area_layer, join_da) # save joined pervious/total  
drainage feature layer as feature class named 'join_da'
```

```
# Remove Attribute Table Fields That Are Not Necessary
```

```
arcpy.DeleteField_management(join_da, ["pervious_da_OBJECTID", "pervious_da_gridcode",  
"pervious_da_TotAcres"])
```

```
# Remove Any <Null> Values and Replace with 0
```

```
codeblock = """def calc(pervious_da_PervAcres):
```

```
    if pervious_da_PervAcres is None:
```

```
        return 0
```

```
    else:
```

```
        return pervious_da_PervAcres"""
```

```
arcpy.CalculateField_management(join_da, 'pervious_da_PervAcres',
```

```
"calc(!pervious_da_PervAcres!)", 'PYTHON', codeblock) # Inserts codeblock SQL statement to  
change any Null pervious area value to 0 to facilitate impervious area calculation
```

```
# Calculate Impervious Area
```

```
arcpy.AddField_management(join_da, 'ImpAcres', 'DOUBLE') # Add field for impervious acres named 'ImpAcres'
```

```
arcpy.CalculateField_management(join_da, 'ImpAcres', '!Phase1_MS4_TotAcres!-!pervious_da_PervAcres!', 'PYTHON') # Calculate impervious area by subtracting pervious drainage area from the total drainage area for each outfall
```

```
# Create Feature Layers for Join
```

```
arcpy.MakeFeatureLayer_management(InputFeatureClass, outfall_layer) # Create feature layer from outfall feature class
```

```
arcpy.MakeFeatureLayer_management(join_da, area_layer) # Create feature layer from drainage area polygon feature class containing total, impervious, and pervious for each outfall
```

```
# Join Outfall Ownership and Origin Information
```

```
arcpy.JoinField_management(area_layer, "Phase1_MS4_gridcode", outfall_layer, Outfall_ID, InputField + ";Origin;Outfall_ID;VAHU6;HUC_12;WTRSHD_ID;REACHCODE") # Join outfall information to the drainage area feature class and keep relevant field for the permit
```

```
arcpy.CopyFeatures_management(area_layer, all_areas) # Create a feature class for drainage area feature class containing all relevant information for outfalls and drainage areas
```

```
arcpy.DeleteField_management(all_areas, "Phase1_MS4_gridcode") # Delete unnecessary field that resulted from join
```

```
# Split User Input Into List
```

```
InputString = str(InputValue) # Create string from the third parameter to be parsed through statement below
```

```
SaveSplit = InputString.split(";") # Split string from the third parameter, so that each value in the field is it's own string
```

```
# Create Variable to be Used in Logical Statement to Build SQL statement
```

```
x = len(SaveSplit) # Calculate how many unique values are in the field from parameter 3 (e.g. if Ownership is the field and it has County, Homeowner, & Commercial as possible values the length would be 3)
```

```
exp1 = str(InputField) + " = " + str(SaveSplit[0]) + "" # SQL statement that selects the first value (SaveSplit[0]) from the field selected in parameter 3
```

```
# Logical Sequence Building SQL Expression, Based upon Number of User Inputs for the Third Parameter (GetParameterAsText(2)) (x)
```

```
if x < 2 : # if the number of unique values selected by the user is 1
```

```
    sql_exp = exp1 # SQL selection statement takes the selected field (second parameter) and selects the first field value (third parameter)
```

```
elif 3 > x > 1: # if the number of unique values selected by the user is 2
```

```
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" # SQL selection statement takes the selected field (second parameter) and selects the first and second field value (third parameter)
```

```
elif 4 > x > 2: # if the number of unique values selected by the user is 3
```

```
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[2]) + "" # SQL selection statement takes the selected field (second parameter) and selects the first, second, & third field value (third parameter)
```

```
elif 5 > x > 3: # if the number of unique values selected by the user is 4
```

```
sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" # SQL selection  
statement takes the selected field (second parameter) and selects the first, second, third, & fourth  
field value (third parameter)  
elif 6 > x > 4: # if the number of unique values selected by the user is 5  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" # SQL selection statement takes the selected field  
(second parameter) and selects the first, second, third, fourth, & fifth field value (third parameter)  
elif 7 > x > 5: # if the number of unique values selected by the user is 6  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[5]) + ""  
elif 8 > x > 6: # if the number of unique values selected by the user is 7  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[5]) + ""  
+ " OR " + str(InputField) + " = " + str(SaveSplit[6]) + ""  
elif 9 > x > 7: # if the number of unique values selected by the user is 8  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[5]) + ""  
+ " OR " + str(InputField) + " = " + str(SaveSplit[6]) + "" + " OR " + str(InputField) + " = " +  
str(SaveSplit[7]) + ""  
elif 10 > x > 8: # if the number of unique values selected by the user is 9  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[5]) + ""  
+ " OR " + str(InputField) + " = " + str(SaveSplit[6]) + "" + " OR " + str(InputField) + " = " +  
str(SaveSplit[7]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[8]) + ""  
elif 10 > x > 8: # if the number of unique values selected by the user is 10  
    sql_exp = exp1 + " OR " + str(InputField) + " = " + str(SaveSplit[1]) + "" + " OR " + str(InputField) +  
" = " + str(SaveSplit[2]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[3]) + "" + " OR " +  
str(InputField) + " = " + str(SaveSplit[4]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[5]) + ""  
+ " OR " + str(InputField) + " = " + str(SaveSplit[6]) + "" + " OR " + str(InputField) + " = " +  
str(SaveSplit[7]) + "" + " OR " + str(InputField) + " = " + str(SaveSplit[8]) + "" + " OR " + str(InputField)  
+ " = " + str(SaveSplit[9]) + ""  
elif x > 10: # if the number of unique values is more than 10, all values will be selected.  
    sql_exp = InputField  
else:  
    print "Too many unique values to select"  
    arcpy.AddError("No outfalls selected, output will be empty")
```

```
# Select Choice List Selections from the Input Feature Class  
arcpy.Select_analysis(all_areas, drainage_area_selection, sql_exp)
```

```
arcpy.CopyFeatures_management(drainage_area_selection, outfall_area) # Save output of drainage  
areas with user selected field values (e.g. County owned outfalls)
```

7 Appendix B: Forested Lands Delineation Process

PURPOSE

In order to support service area delineation and the land use change BMP, forested areas were quickly delineated from 4-band multispectral imagery at 1 meter spatial resolution. Existing available land cover information for Prince William County is available from the Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database (NLCD). However, the NLCD products were derived at 30m spatial resolution, limiting detail and potentially including a very large amount of estimation error when considering BMP's at a local scale. For example, when considering 900m² contiguous forested area, 2 pixel results at 30m resolution would be identified as a forested area from the NLCD dataset. Unfortunately, most remote sensing processes may take effort in reducing such small classification results as anomalous, and therefore remove small, but in this case, significant contiguous pixel results. By utilizing 1 meter resolution imagery products tree canopy detection was rapidly delineated, and higher resolution allowed multiple pixel clusters to be identified meeting the 900m² minimum mapping unit with higher confidence. Image processing was conducted using ERDAS Imagine, ArcGIS, and Feature Analyst software packages.

IMAGERY

The United States Department of Agriculture (USDA), National Agricultural Inventory Program (NAIP) provides ortho-corrected multispectral imagery with 1 meter spatial resolution at no cost over most of the United States. The multispectral imagery consists of typical blue, green, and red imagery bands for natural color representation, along with 4th band that covers the near infrared part of the electromagnetic spectrum. The near infrared band allows rapid vegetation detection through indices and classification techniques due to its sensitive response to chlorophyll from plant material. Healthy plants absorb red, green, and blue light, and reflects higher levels of infrared energy. Additionally, the near infrared bands allows the ability to segregate healthy from stressed vegetation by detecting different levels of near infrared reflection after identifying the presence of chlorophyll initially.

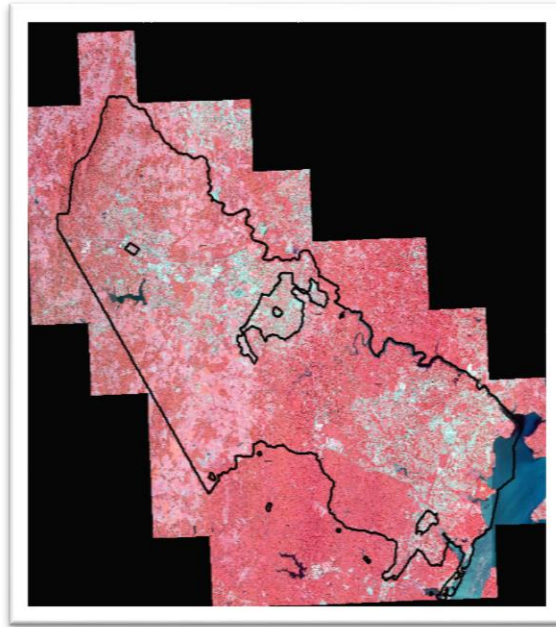
PROCESSING

The image processing used for this delineation consisted of three primary steps: 1) Image Pre-Processing, 2) Image Processing, and 3) Image Post-Processing. The area of interest (AOI) utilized consisted of areas within the Prince William County service area alone. No other MS4 areas were included in this delineation.

7.0.1 Image Pre-Processing

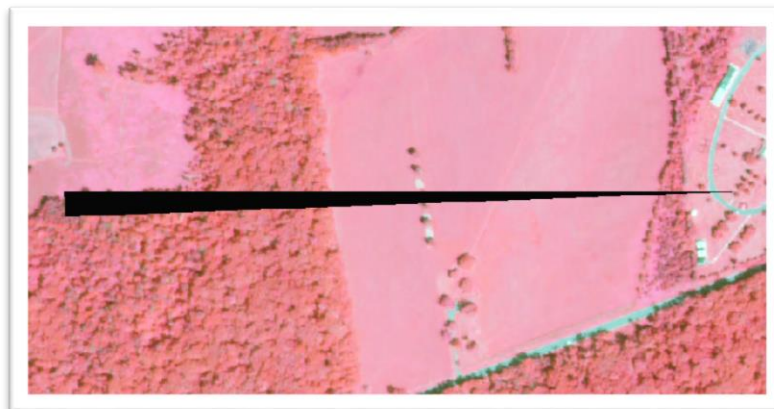
Pre-Processing tasks include AOI delineation, image collection, imagery quality review, and initial vegetation extraction. A buffer of 500ft around the study AOI prior to image processing in order to account for edge detection anomalies that typically occur with automated image extraction. Once complete, NAIP imagery was collected at the extent of the buffer to ensure complete coverage as

available. NAIP imagery at 4-band resolution is provided at DOQQ extents and readily available from the USGS EarthExplorer website (<http://earthexplorer.usgs.gov/>). A total of 43 NAIP tiles were downloaded and produced into a seamless mosaic product covering the AOI, and were collected in August, 2014:



(Mosaic NAIP imagery with Color Infrared Representation)

The mosaic product was reviewed for seamlines and raw data anomalies such as band striping or dropped pixels. No band striping or seamlines were found in the mosaic dataset, and only minor areas of dropped pixels were identified. However, the areas with dropped pixels were not covering vast areas and did not require additional image datasets to rectify; dropped pixels were accounted for in the post processing phase due to limited impact on initial classification:



The final step of the pre-processing phase utilized the Normalized Difference Vegetation Index (NDVI) to segregate the image between vegetation and non-vegetation features. This is rapidly done due to

the way chlorophyll reflects energy in the near infrared band by using band math which results in a new raster data set with pixels containing values ranging from -1 to 1. Pixels with values closer to 1 represent vegetation, while those closer to -1 are non-vegetation.



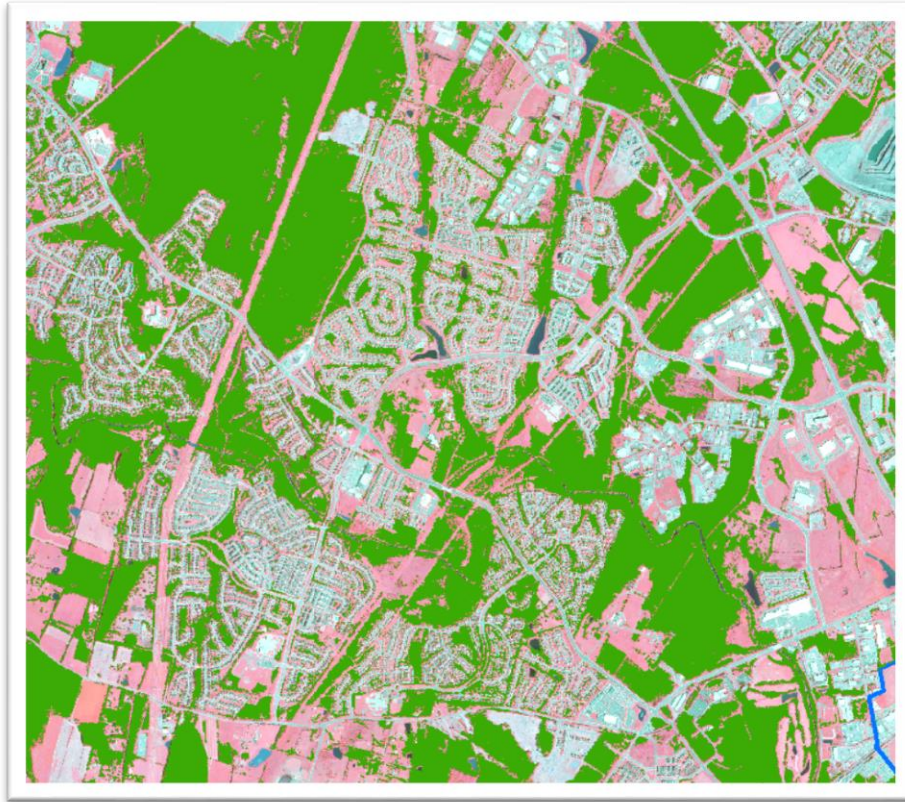
(NDVI Result showing vegetation and non-vegetation)

The NDVI result was then reviewed to locate the correct threshold where a representative split between vegetation and non-vegetation could be identified. Once determine, the NDVI dataset was rendered to a 2-class result, where vegetation pixels were utilized as an analysis mask where tree canopy could be identified. The threshold was set a bit higher for this study since trees tend to reflect much higher values (i.e. much closer to 1) given their height and foliage. This result also reduces false detections within open fields, dry grasslands, and shorter shrub areas:



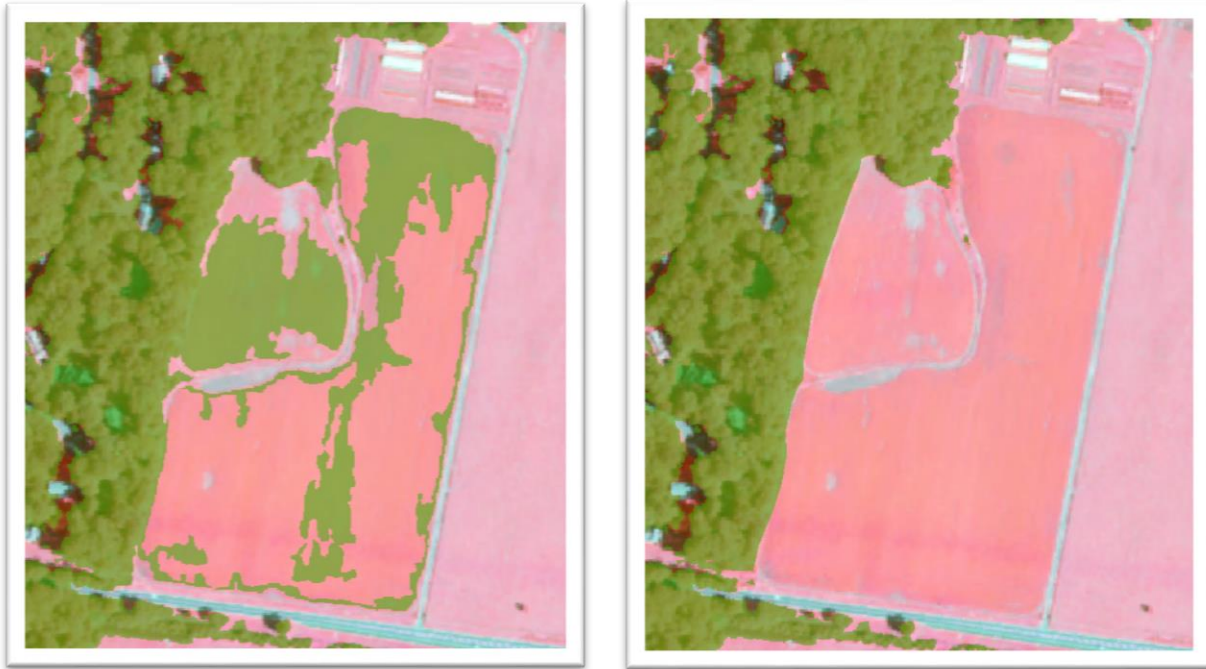
7.0.2 Image Processing

In order to identify tree canopy in Prince William County, multiple processing techniques and software packages were used to gain the best possible results. Initially, unsupervised image classification was performed, segregating the raw image into 50 different classes of statistically similar pixels. The 50 class clusters were reviewed and identified as belonging to tree canopy, water, grass, impervious surfaces, and unclassified (shadow) areas. The tree canopy clusters were then saved as new AOI's within ERDAS Imagine, and augmented with digitized samples in all locations of the study area. These samples were then supplied in the Maximum Likelihood Supervised Classification algorithm, with 2 – class fuzzy results and distance layers being produced. “Fuzzy” pixel results showed similarity between 2 possible land cover classes, and the distance result was utilized to effectively place the fuzzy pixels in the more statistically correct class. Feature Analyst is a separate classification algorithm that focuses more on feature shape along with spectral variability. Training samples were then applied to Feature Analyst, where iterations of results were performed to obtain the cleanest results. By utilizing shape as a detection method, similar patterns can be segregated in the image, also allowing for the reduction in misclassification from shadows. Once complete, all results were then merged into a single layer and clipped to the NDVI vegetation results and non-buffered MS4 AOI.



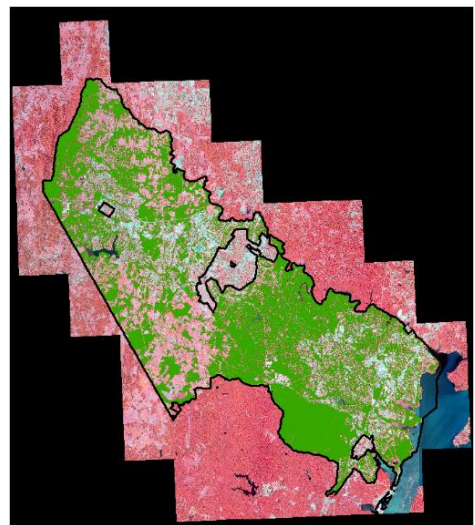
7.0.3 Image Post-Processing

Post processing tasks included image result aggregation and manual QA/QC procedures. Image processing result aggregation is a procedure used to fill small holes in otherwise continuous features and remove salt-and-pepper results by defining an arbitrary minimum mapping unit. The results from this process further clean extracted features of interest which can substantially improve estimations and metrics performed across the dataset. The manual QA/QC period performed looked for final anomalies in the resulting dataset that should not exist. Such anomalies include misclassification of commission and omission. In these cases, either polygons were added to fill in a missing area or polygons were trimmed to remove unnecessary features. Typical errors of omission exist in the middle of large forests, where trees cast shadows amongst each other. Typical errors of commission tend to exist in agricultural areas and golf courses where grasses and fields are very lush and mowed with varying patterns.



7.0.4 FINAL DATA SET DESCRIPTION AND ACCURACY STATEMENT

The final data set was produced using remote sensing techniques, which represent target features with a reasonable estimation or approximation. This is due to the possibility of remaining errors of omission and commission, spatial resolution limitations, and temporal capabilities. The estimations and representation of these results is based on the surface conditions at the time of imagery collection (8/2014). Polygon features are dissolved and exploded to ensure continuous feature representation, while maintaining topology with non-multipart feature representation. Estimated accuracy of the forest area delineation is approximately 80-85%. This is reasonable for the purposes of the service area delineation and land use BMP study. It is recommended that additional manual QA/QC be performed if this dataset is needed for official UTC classification, along with a minimum of 5-Class land cover computation



Appendix I – County Facilities

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Appendix J – Public Education/Participation

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Appendix K - Training



ILLICIT DISCHARGE, DETECTION, AND ELIMINATION

Stormwater Training

EHS 451

STORMWATER RUNOFF IMPACTS A WATERSHED!

Generated from rain, snow

Flows off of land, pavement, rooftops


Takes contaminants with it into water bodies



SANITARY SEWERS VERSUS STORM DRAINS



THE COUNTY'S MS4 AND MS4 PERMIT

A photograph of a large, circular opening in a concrete pipe, looking out onto a stream with green foliage and rocks. The pipe's interior is visible, showing a textured concrete surface. The stream outside is calm, reflecting the surrounding greenery and the opening of the pipe.

MS4:

Drainage System

Collects and moves
stormwater

Includes drains,
pipes, ditches, etc.

Permit:

Allows conditional
discharge from MS4
to surface water

IF IT IS ON THE GROUND, IT ENDS UP IN PWC WATERS



EXAMPLES OF ILLICIT DISCHARGE

(ALL FROM PWC COUNTY FACILITIES)



DISCHARGES ALLOWED UNDER COUNTY PERMIT



- Firefighting activities
- Landscape irrigation
- Street sweeping
- Potable water discharges

IDENTIFYING ILLICIT DISCHARGES

Sheens, odors, and foaming can all be indicators of an illicit discharge:



Oil or Fuel



Grease



Sediment



Soap/Detergent

REPORTING ILLICIT DISCHARGES

911

Any spill with immediate hazard to people or property, such as fuel

Watershed

All other discharges:

(703)792-4797 or

Illicitdischarge@pwcgov.org

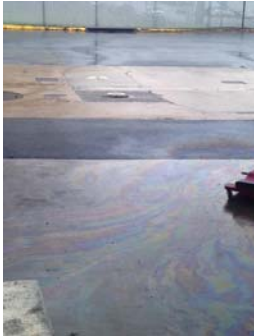
Report any discharge observed entering and/or exiting the stormsewer system!

GOOD HOUSEKEEPING: CARS, TANKS, & EQUIPMENT

- ✓ Use commercial car washes
- ✓ Direct wash water to grass or gravel area
- ✓ Monitor fueling activities and use spill response kits
- ✓ Clean up any fuel drips or spills
- ✓ Keep tanks in good repair



Improper



Good Housekeeping



GOOD HOUSEKEEPING: SOIL, SAND, SALT, LEAVES

- ✓ Cover and contain all soil, sand or salt piles
- ✓ Outdoor piles are not for long-term storage
- ✓ Keep piles out of parking lots or roadways
- ✓ Don't over-salt
- ✓ No leaf piles and grass clippings in lots



Improper



Good Housekeeping



GOOD HOUSEKEEPING: OUTDOOR STORAGE

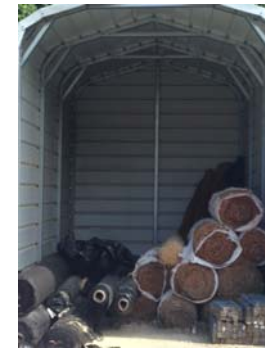
- ✓ Inspect outdoor equipment and storage areas
- ✓ Cover or contain
- ✓ Keep dumpster lids closed
- ✓ Pick up or report litter



Improper



Good Housekeeping



BE PREPARED!

- ✓ Locate spill kits in areas you frequent
- ✓ Protect stormdrains
- ✓ Report it
- ✓ Quarantine the area
- ✓ Seek more information and training



CONTACT INFORMATION

For inquiries, support, and to report discharges, please contact:

Watershed Management
(703) 792-4797 or x4797
illicitdischarge@pwcgov.org

1. If a discharge is identified, what should you do?

- Call (703) 792-4797
- Email illicitdischarge@pwcgov.org (correct)
- Nothing if you didn't cause it
- Both A & B

2. Which of the following stormwater discharges is legal under the PWC MS4 permit?

- Non-hazardous household chemicals, such as soap
- Minor fuel and oil drips from vehicles
- Fire hydrant flushing (correct)
- Grass clippings and yard waste

3. T or F: an illicit discharge is any unpermitted, non-stormwater discharge to the stormdrain (True)

4. Which of the following is a best management practice to prevent illicit discharges?

Wash all vehicles at a commercial facility

Cover and contain construction fill that is stored outside

Keep dumpster lids closed

All of the above (correct)

(continued on next page)

5. True or False: Discharges to the stormdrain are treated before being discharged to local waterways (False)

6. Which of the following is expected of ALL PWC employees:

Report discharges and spills, regardless if you caused them or just found them

Close the lid on dumpsters when you see them open, or report it to management

Pick up or report litter

Stand next to the gas pump when fueling vehicles

All of the above (correct)

Must get 4 out of 6 to “pass”

Appendix L – Water Quality Programs

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

7754 Virginia Oaks Dr.
Gainesville, VA 20155

Tuesday, May 24, 2016

On May 18th, 2016, Prince William County Watershed management branch received a complaint regarding an illicit discharge describing a green paint discharge found draining into the duck/geese pond near the corner of Vinewood Ct and Virginia Oaks community in Gainesville. Upon arrival on site, the green paint contaminant was observed on outfall 23443 and downstream riprap towards SWM pond 5091.

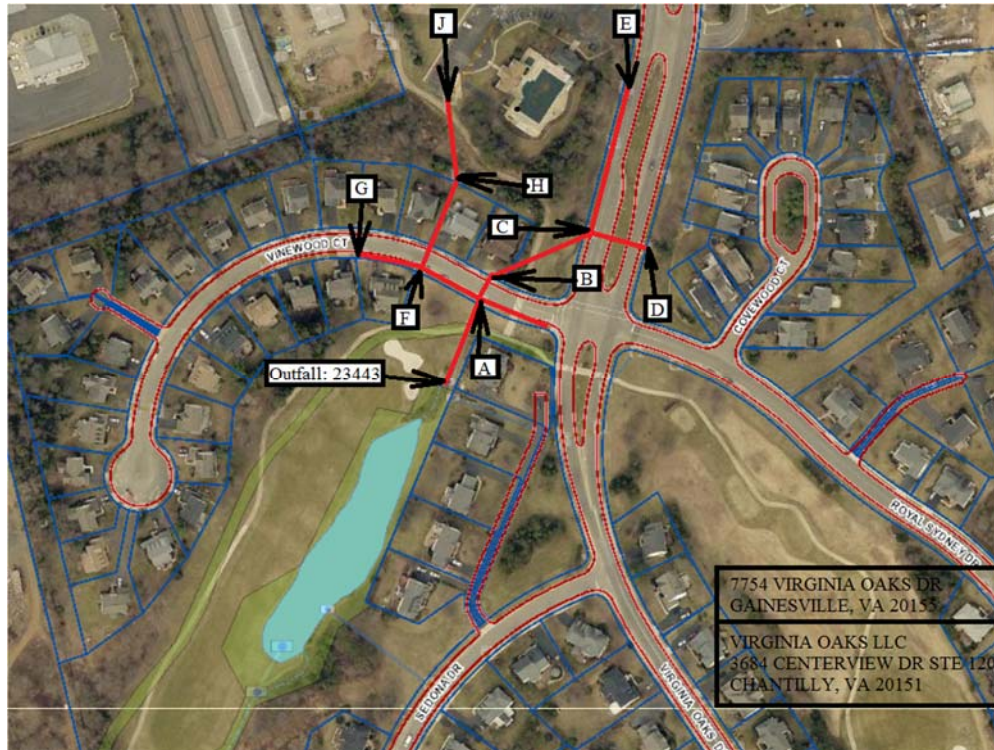


Figure 1: Site map showing discharge flow path through the storm sewer system.

Upstream storm sewer was inspected at various locations from points A to J. An attempt was made to identify the source of the discharge by inspecting manholes and drop inlets.

As a result of the investigation, the paint stain was found only at the outfall 23443 to pond 5091. Outfall 23443 is located within the Virginia Oaks Golf Club, and as a result a meeting was made with Mr. Glenn T. Payne, the General Manager of golf club to further investigate the discharge. During field

investigation, a call made to the complainant but was unable to reach him. A voice message was left in order to gain more info needed for a conclusive investigation.



The observed green stain may be developed either dumping paint in storm sewer system or hydro seeding. Follow up inspection will be continued to further investigate and identify a possible source. Notice of violation was not issued due to an inability to identify the source of the discharge.

Illicit Discharge Report

Prem Poudel
Environmental Compliance Inspector

13719 Bluefin Drive
Woodbridge, VA 22193

Friday, May 13, 2016

The complaint received at PWC Environment Service from Mr. Randy Merritt about creek contamination by white substances on 05/13/2016. The email has received with attached pictures approximately at point D and E as shown in map below. Field inspection was made on 05/13/2016. On arrival, the creek found to be still contaminated with white substance at aforementioned point D and E. The white substance supposed to be paint spilling into storm water.



Figure 1: Site map showing discharge flow path through the storm sewer system.

The creek found to be flowing thru upstream community. Discharge started to track down towards upstream. The SWM Facility 60, located at point C found getting white discharge from inlet creek. Tracking kept continue along the creek. At point B, the white substance observed intermingled to the creek by the discharge getting from outfall 3529. After tracking storm sewer, the paint found to be dump at storm sewer inlet at point A. The house 13711 supposed to be renovating by visual outlook but

undersigned couldn't contact with the owner except renter. The renter didn't give the answer asking for renovating activities.



Point D



Point E



Point C



Point B



Point A



Point F

The source of creek contamination confirmed to be dumping paint on storm sewer drop inlet located beside the property 13712 Bluefin Drive. The violator couldn't identify at the visit. It seemed to be a

single event. The education materials were hand over to the renter and available residents of that community. The follow up inspection will be continued for further investigation.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector

5360 Mapledale Plaza
Woodbridge, VA 22193

Tuesday, April 19, 2016

During routine inspection, County staff observed discharge of a greasy substance through outfall 30126 to SWM Facility 814. A Yellow greasy substance was observed floating on the downstream pool and channel. The discharge found to be moderate. Upon initial discovery, the greasy substance appeared to be waste oil with chemicals.

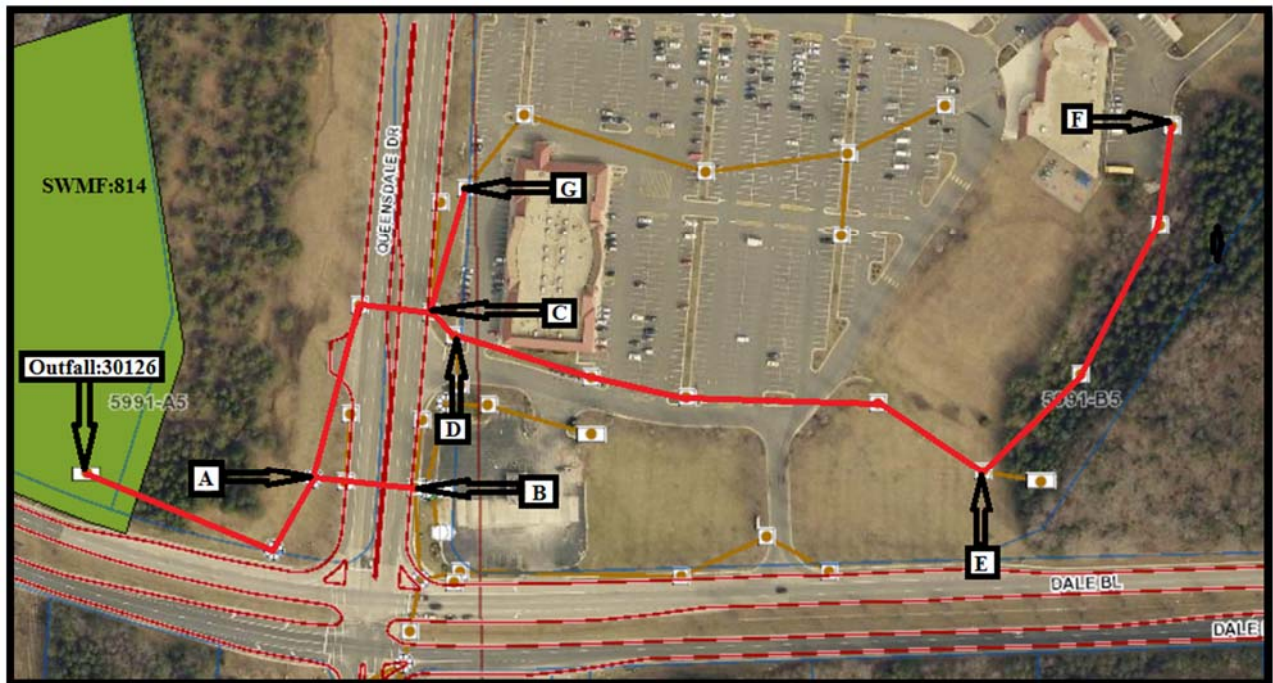


Figure 1: Site map showing discharge flow path through the storm sewer system.

The discharge was then tracked down from the outfall. Manholes A, B, C, D, E, F and G were opened and observed for flow during tracking. At point A, discharges were found to be flowing from both AB and AC directions. At point B, the manhole was found to be moist and clean, leading the inspector to believe that the flow between section AB was due to groundwater seepage. Meanwhile, at manhole C, flow was found to be occurring from the CD direction and a black stain was observed at the bottom surface of pipe GC. Flow was observed coming from the ED direction at point D, and also at manhole E from the EF direction. Manhole F was found to be dry. This led the inspector to believe the main source of flow from the DF direction to be ground water seepage in the pipes between Manhole E and F from located in the low lying woody area on the east side of the shopping center. Also adding to this assumption is the fact that the volume of discharge was found to be gradually diminished as the inspection proceeded toward manhole F. It was determined that the source of the discharge was not from this direction, due to the

lack of evidence of grease discharge within that section of pipe system.

Upon further inspection, a greasy black stain was observed leading to the drop inlet at point G. This was determined to be the source for the illicit discharge observed at outfall 30126. In addition, the grass around the drop inlet at point G was found to show signs of additional dumping and attempted cleanup.



A meeting onsite was made with Ms. Liz Tucker, the property manager of Mapledale Plaza, and subsequently a notice of violation (NOV 3-2016) was issued to Interstate Management Inc. for the discharge of pollutants to the storm sewer system. Interstate management Inc. will be responsible for the cleanup and mitigation of the grease and other contaminants discharged into the stormsewer as manager of the Mapledale Plaza. Action should be taken as soon as possible, but not to exceed 30 days from receipt of the NOV violation packet. Interstate management is also responsible for preventing any future discharges. The County will assist Interstate Management on any training/outreach needed to prevent future discharges if requested.

Re-inspection:

Follow up inspection made [5/11], the greasy materials found to be curtailed and captured by absorbent sock around downstream pool. Downstream channel seemed to be reinstated as pre-contaminated condition.

In-person meeting made with Property Manager Liz Tucker. According to her, one of the county listed cleaning companies; Hepaco, LLC was haired to capture the floating scum on 4/21/2016. The work was completed on same day. The education materials of an illicit discharge attached with NOV were shared with their tenants to create awareness. The case has been closed but follow up inspection will be continued for effective control in future. Following pictures were taken during visit.



Prem Poudel
Environmental Compliance Inspector
05/11/2016

Illicit Discharge Report

Robert Jocz and Prem Poudel
Environment Engineer and Inspector
PWC, Department of Public Works, Environment Services
Prince William, VA 22192

7000 Lakota Drive
Woodbridge, VA 22192

Tuesday, August 18, 2015

A meeting with County Crossing Center apartment staff was conducted on August 18th to track the illicit discharge reported previously. Along with maintenance supervisor, inspectors employed dye testing at apartment 7030 in south faced right side three level units, and one left side unit. Testing concluded that all tested units are discharging grey water into storm sewer system from the laundry room washing machine drain. It was assumed all apartments in this complex were discharging grey water to the storm sewer system.

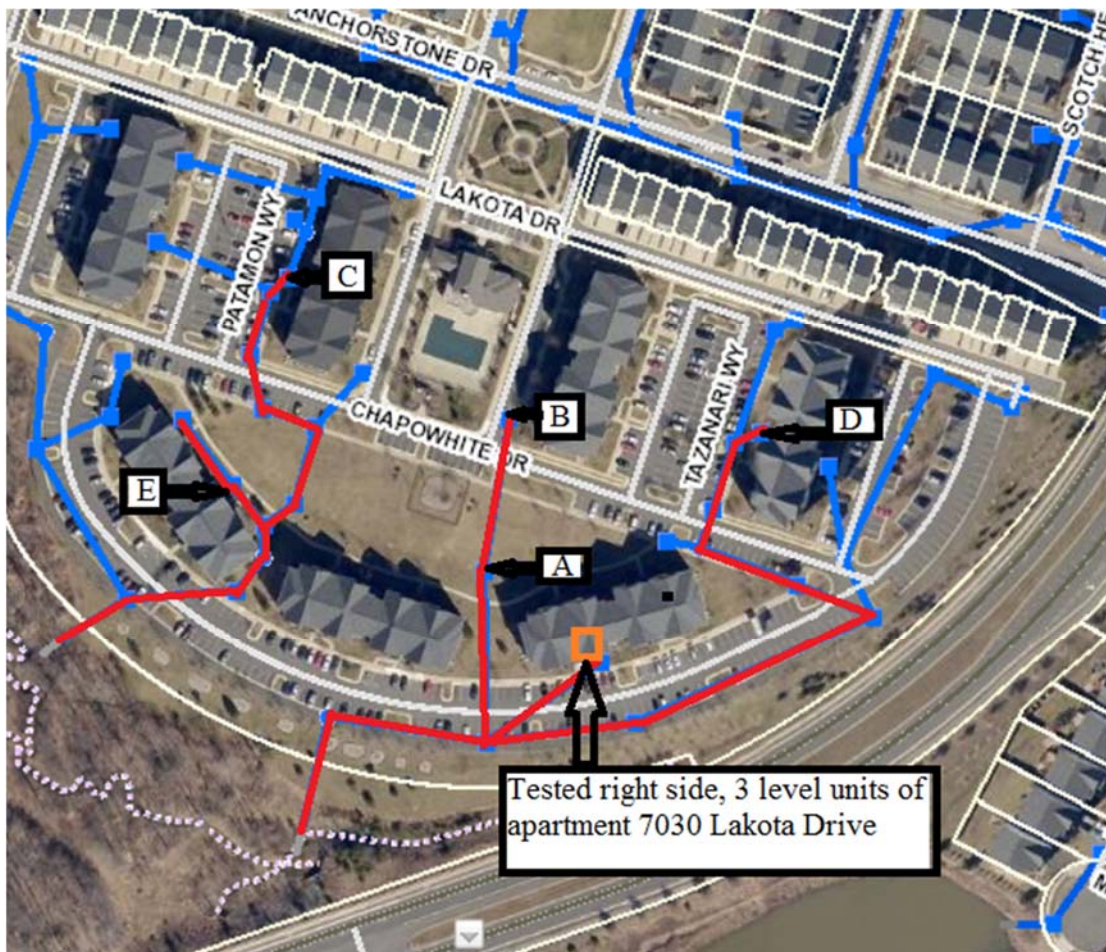


Figure 1: Site map showing discharge flow path through the storm sewer system.

It is assumed that gray water connections existed from initial construction and investigations into other similar complexes' on the site was commenced. At drop inlet A, observed flow having detergent odor and stain from AB direction. At Manhole B, PVC pipe found to be connected discharging grey water. Similarly Grey water found to be discharge at points C, D and E via PVC pipe from apartment no 13104, 13001, 13101 and 7050 as well.

In conclusion; it was discovered the grey water connection has been existent from very beginning during construction. After conclusion, contact made with Stefanie Edmonds, the Property manager, to set up the meeting with corporate management as quick as possible to resolve the problem with action plan for all units. County Center Crossing will be provided reasonable time upon the development of action plan to correct grey water connections to storm sewer.

Illicit Discharge Report

Prem Poudel
Environmental compliance Inspector
Prince William County
Department of Public works
Environmental Service, Watershed Branch, VA

12920 Hoadly Run Rd
Manassas, VA, 20112

Thursday, July 02, 2015

Undersigned observed cleaning of spilt oil stain at the curb inlet, conveyance sewer and outfall. That oily stain found to be reached up to outfall from curb inlet.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Spilled oil mark found to be cleaned in and around curbs inlet, storm sewer and outfall by professionals of Atlas Environmental Services. The washed chemicals, oily substances and used water pumped into dump truck while cleaning and taken way for properly haulage.







The cleaning of spoilt oil and grease has been completed properly.



Prince William County

Wet Weather Screening Program

Permit No.
VA0088595

Prince William County Department of Public Works
Watershed Management Branch
5 County Complex Court, Suite 170
Prince William, Virginia 22192

12/1/2015

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I. Introduction

Prince William County is dedicated to providing its citizens with the healthiest environment possible. It is with this goal the County establishes programs aimed at reducing pollutant impacts from heavily urbanized and industrialized areas. Non-point source pollution from urban and industrial areas within the County is a great concern due to its potential to impact water quality. Pollutants are transported from these areas during rain events and often deposited untreated into nearby streams and rivers. To mitigate this issue, the Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VA-DEQ) have instituted programs aimed at reducing the potential impact of pollutants from urban areas.

Under the Virginia Pollutant Discharge Elimination System Permit Program (VPDS) and Virginia Stormwater Management Program (VSMP) permits are issued aimed at reducing pollution runoff from industrial and urban areas containing Municipal Separate Storm Sewers Systems or MS-4s. These systems transport water from urbanized areas to streams and rivers and are a major concern of point and non-point source pollution. Discharges from MS4s are regulated under the Virginia Stormwater Management Act and Clean Water Act (CWA) through permits issued by DEQ and the EPA. Through this program, Prince William County maintains a Phase 1 VSMP MS-4 permit (Permit No. VA0088595).

Through its VSMP permit, the County is required to monitor pollutants from areas suspected to be contributing excess levels of pollutants to its MS-4 by implementing a Wet Weather Screening Program. Unlike the Dry Weather Monitoring Program, the Wet Weather Screening Program is aimed at assessing pollutant load and composition during rain events. Using information obtained through this program, the County is to then develop strategies to reduce this pollutant load from these areas. The County's MS-4 permit, issued on December 17th, 2014, outlines requirements for the Wet Weather Screening Program as follows:

I.B.1).2) Wet Weather Screening Program: In addition to the monitoring required in Part I.C., the permittee shall continue to investigate, and address areas within their jurisdiction that are suspected to be contributing excessive levels of pollutants to the MS4. No later than 12 months after the effective date of this permit, the permittee shall develop written procedures for a wet weather screening program which shall include standard operating procedures to be used for initial screening and follow-up purposes. The written procedures shall be incorporated as part of the MS4 Program Plan.

The County has identified potential high risk discharge sites through its hotspot analysis GIS model. This model will be used to guide site location through the identification of areas designated for further research during the field screening stage of the program. A qualified laboratory or contractor will be chosen to perform field sampling, and to present results to the County

This program manual describes the methods and procedures for Prince William County's Wet Weather Screening Program. All procedures are subject to modification as program feasibility and applicability are assessed during program implementation. All program modifications will be noted as part of the County's Program Plan.

II. Wet Weather Monitoring Site Selection

Using the IDDE hotspot Identification and Analysis Model as a basis, locations for Wet Weather monitoring are to be assessed and selected by County personnel. Initial screening locations will be selected using the Hotspot Identification tool and additional GIS desktop analysis. Sites selected in initial screening will be investigated further through field screening activities. Final sites for Wet Weather Screening will be identified using results from the field screening process.

i. Initial Site Screening

The IDDE Hotspot Identification and Analysis model is a tool used by the County to determine where to focus Dry Weather Monitoring Activities. The tool uses several metrics to determine where the highest probability of illicit discharges and discharge of pollutants are to occur. The tool breaks down the County into ADC zones and prioritizes those ADC zones with the highest probability for pollutant discharge to occur. These zones are then used to schedule which outfalls to screen during Dry Weather Monitoring activities. The Hotspot Identification and Analysis Modeling process can be viewed in the document located in [Appendix A](#), but is explained in lesser detail in the following section.

a) Hotspot ADC Zone selection

The Hotspot ID model uses various GIS data layers to determine pollutant discharge potential. Layers depicting Land Use, Residential development, VPDES permitted facilities, High Risk Land Use, Sanitary Sewer Cross Points, Impervious Area, Outfall Locations, Waterways, and 303(d) listed Impaired waterways are incorporated in the analysis. Each feature within a layer is assigned a probability of discharge, pollutant discharge, or component score according to a perceived ability to pollute (potential of discharge to occur, and potential for that discharge to cause harm to the environment, or in the case of an outfall, the number of potential pollution discharge locations). These probabilities of discharge are then summed within a defined area, in this case ADC zones, in order to determine where in the County illicit or other pollutant discharges are likely to occur.

Land uses are analyzed according to use code. High risk use codes were determined from parcels throughout Prince William County and assigned a relative probability of discharge from 1-5 according to their perceived discharge potential (1 being low, 5 being high).

Table 1 - Probability of Discharge According to Use Code

Use code	Use description	Use Probability
191	Technology Services	1
229	Other Utilities	1
349	Food Stores	1
140	Research and Testing	2
156	Wholesale Warehousing (Condo)	2
224	Sewage	2

343	Convenience Store	2
831	Golf Course	2
832	Golf Course	2
112	Industrial Conglomeration	3
151	Mini Warehousing	3
216	Auto Parking	3
311	Small Shopping Center	3
312	Shopping Center	3
313	Shopping Center	3
314	Large Mall	3
315	Large Mall	3
317	Shopping Center	3
318	Shopping Center	3
320	Building Materials	3
351	Restaurant	3
352	Restaurant	3
353	Restaurant	3
354	Restaurant	3
361	Motor Vehicle Sales	3
520	Barber/laundry/cleaners/etc	3
590	Barber/laundry/cleaners/etc	3
841	Swimming Pool	3
851	Marina	3
910	Agricultural Resources	3
911	Agricultural Resources	3
930	Agricultural Resources	3
121	Durable Manufacturing	4
126	Durable Manufacturing (Condo)	4
131	NonDurable Manufacturing	4
150	Wholesale Warehousing	4
160	Industrial Service Garage	4
190	Other Industrial	4
211	Railroad	4
212	Rail Rapid Transit	4
213	Bus	4
214	Motor Freight Transportation	4
219	Other Transportation	4
225	Solid Waste Disposal	4
344	Convenience Store with Gas	4
362	Gas and Service Station	4
363	Gas Station	4
369	Other Automotive	4
540	Other Repair	4

973	Storage Yard	4
366	Service Station	5
530	Motor Vehicle Repair	5

Also included in the analysis are parcels for which VPDES permits are associated. Permitted sites were screened for those which discharge into Prince William County's MS-4 and assigned a probability of discharge in the same manner as high risk parcels above. The results of this analysis are displayed below.

Table 2 - Probability of Discharge Scores for VPDES Permitted facilities

NAME	Permit No.	Score
PWCBOCS	VAR051078	0
CHASE DAVID D	VAG830458	1
GENERAL DYNAMICS LAND SYSTEMS INC	VAR051293	1
OVERNITE TRANSPORTATION CO	VAR051030	1
US FOODSERVICE INC	VAR051117	1
OLD DOMINION FREIGHT LINE INC	VAR051476	1
REMODELERS CREDIT CORP	VAR051996	2
PWC	VAR051477	2
FURR FLOYD H AND BARBARA J	VAG750237	2
SUPPORT TERMINALS OPERATING PTNSHP	VAR051039	2
7905 LC	VAR052008	2
W M TINDER INC	VAR052074	2
EVERED INC	VAR052190	3
POTOMAC & RAPPAHANNOCK TRANSPORTATION E	VAR051886	3
LAND VENTURE ONE L C	VAR051295	3
DALRYMPLE REALTY CORPORATION	VAG110100	3
THIRD GENERATION L P	VAR051085	3
KRAUSS RICHARD L TR	VAR050983	3
NEWBILL HOLDINGS LLC	VAR051639	3
ARCHIE HENRY E SR & ANNIE WILLIAMS	VAR052115	3
BURBAGE J E JR E M BURBAGE	VAR051939	3
VENABLE JEAN S	VAR052243	3
HOFFMASTERS MARINA INC	VAR051183	3
SLURRY PAVERS INC	VAR051911	3
DAVIS TEDDY R JR HELEN M ETAL	VAR052014	3
ENNSTONE INC	VAG110111	4
COSNER MEDFORD R	VAR051009	4
VIRGINIA CONCRETE CO INC	VAG110083	4
DALRYMPLE REALTY CORP	VAR051949	4
JULIUS BRANSCOME INC	VAR050908	4
JONES SAMUEL M ESTATE	VAR051298	4
CONCRETE PIPE AND PRODUCTS CO INC OF	VAG110313	4

ARBAN CAROSI INC	VAG110068	4
HARD ROCK CONCRETE LLC	VAG110067	4
SUPERIOR PROPERTIES INC	VAR051992	4
SUPERIOR PAVING CORP	VAR050901	4
POTOMAC LANDFILL INC	VAR051073	5

Additional values scored in the analysis include outfalls, cross connection points, residential development, impervious area, streams, and impaired waterways. These features are scored as described in the table below.

Table 3 - Discharge Probability Scores for other Features

NAME	Score
Outfalls - Standard	10
- VPDES Outfalls	30
- High Risk Outfalls	30
Cross Connection Points	20
Residential Areas	1
Impervious Area	1
Streams and Waterways	1
Impaired Streams and waterways	2

As stated above, scores were then summed within an ADC index area. The ADC index is a mapping tool used by the County for navigation. The ADC index's break the County into equal area blocks which are assigned alpha-numeric values that help identify their location within the County for mapping. These equal area blocks are ideal for use in segmenting the County for stormwater analysis and Dry Weather Monitoring activities. The top 20 ADC indexes are to be selected for further analysis as described below.

b) Field Screening Site Selection

Once the initial 20 ADC zones are selected for potential field screening they will be narrowed down to a final 5 for field screening. The 20 ADC zones selected in the first screening are sufficient for Dry Weather Monitoring activities, but need to be further analyzed for use in the Wet Weather Monitoring program due to different constraints on the program. ADC zones will be scored according to the worksheet in [Appendix B](#). The Desktop analysis worksheet analyzes the following aspects of each ADC zone:

- **Ms-4 service area** – The focus of the Wet Weather Monitoring Program is to assess pollutant discharges within areas covered under its VSMP MS-4 Permit. For this reason ADC zones with drainage areas discharging to the County's MS-4 will be required.
- **Size of drainage system** – Drainage systems in Prince William County can span many acres. It is important to select candidate sites with drainage systems that allow the County to focus on a particular type of land use category. Monitoring larger drainage systems is also complicated due

to the increased probability of MS-4 interconnectivity. Monitoring drainage catchments that include VDOT or other MS-4s can reduce the value of results by convoluting the identification of pollutant sources. Although such data may be valuable in some circumstances, it is not the County's goal for this program.

- **Location of drainage system** – Identifying which land uses drain into candidate sites allows for a better characterization of the pollutant-land use relationship. Selecting candidate sites that involve succinct, identifiable drainage locations is a priority.
- **Land use, VPDES permits** – Areas with a high density of high risk land use and/or VPDES permits will be preferred. These areas have a higher probability of pollutant discharge, and therefore are of particular interest to the County. A more homogeneous mixture of land use is preferred. This gives the County a better understanding of the types of pollutants discharged from a particular land use, and helps develop better strategies for reducing pollutant loadings. For example, a site which drains mostly from commercial land uses will give the County a better understanding of the discharges coming from these areas, as opposed to a mixture of many different land uses (Commercial/industrial/residential), where the pollutants identified during monitoring cannot be as easily attributed to their sources.
- **County Easements** – In order to be able to run the monitoring station, the County must have legal authority to place it within the stormsewer system. Candidate sites must have access through County maintenance and repair easements. Proper permissions must be given by any stakeholders that may be attached to the site. Sites are preferred to be easily and safely accessible to staff and lab officials collecting samples.
- **Potential Monitoring sites** – Due to time constraints to County staff, sites which have more potential monitoring sites will be preferred. A site which contains more potential monitoring sites reduces the amount of travel and assessment time as opposed to visiting ADC zones with only one potential monitoring site. This also gives the County more choices to find an acceptable Wet Weather Monitoring location.

ii. Final Site Selection

The final sites selected will be evaluated further through a field assessment. Potential sites will be evaluated using the scoring matrix provided in [Appendix C](#). This form incorporates all aspects of final site selection protocol in order to quantifiably compare potential monitoring locations. Factors that influence final site selection are as follows:

Evaluate environmental impact of site – Identify and locate areas where aggregate materials are stored, vehicles are permanently parked, the location of dumpsters and grease traps, locations where spills may occur. Identify potential pollutants that could enter the environment for the sampling site.

Evaluate outfall locations for potential sampling – Locate outfalls and further evaluate ability to facilitate sampling equipment. It is difficult for a desktop analysis to fully convey outfall conditions including ease of access and its ability to house sampling equipment. Assess whether the outfall is in good condition, headwalls are intact, and if the outfall is submerged or blocked by sediment. Assess potential security issues for sampling equipment. Identify all potential monitoring sites.

Evaluate Drainage Systems for overall sampling impact – more specifically identify areas from which the monitoring site drains. Confirm land use for businesses/industry contributing to runoff.

The top two scoring sites will be selected for Wet Weather Monitoring. Sites selected will be gauged to determine flow rates, and measured for the retrofit of sampling equipment.

III. Wet Weather Monitoring Field Procedures

i. Sampling Methods

Sampling will be accomplished using an automated sampler. The sampler is an electronic sampling device which collects discrete samples of stormwater runoff at intervals throughout a storm event. Flow rates will be recorded in order to compute flow weighted composite samples. This should provide the County with an idea of how pollutant concentrations change during the length of a storm event.

Samplers will be attached to outfalls of sampling sites as selected in the above protocol. When applicable, grab samples may be utilized in order to gather analyte data such as TPH. The specific model of sampler will be determined by the contractor or contracted laboratory when selected to perform modeling activities.

ii. Analytes

The Wet Weather Monitoring Program will test for a host of analytes commonly found in stormwater runoff. These include various nutrients, metals, hydrocarbons, and sediments. Many of these analytes are also measured as part of the County's Dry Weather and In-Stream Monitoring programs. A list of these analytes can be seen below.

Table 4 - Wet Weather Program Monitoring Analytes

Analyte
pH
COD
Zinc
Copper
Led
Nickel
Total Phosphorous
Total Kjeldahl Nitrogen
Nitrate and Nitrite
TSS
Ammonia as Nitrogen

This list will be modified during the life of the program. Analytes may be added/removed according to results obtained during monitoring according to the effectiveness of monitoring efforts. Analytes will also be added or removed as recommended by assigned contractor or laboratory responsible for monitoring efforts.

iii. Sampling Schedule

There is no specific sampling schedule or threshold presented in the County's MS-4 Permit. The County would like to assess two Wet Weather Monitoring sites on a biennial basis. This allows the County to assess the concentration of pollutants during the first yearly cycle, install appropriate BMP's designed to reduce pollutants, and finally use the second yearly monitoring cycle to assess the installed BMPs effectiveness. Samples will be taken at the two sites on a quarterly basis. Once the two year monitoring cycle is complete, two additional sites will be selected for Wet Weather Monitoring activities using the protocols described in the preceding sections. During this time, program procedures will be re-evaluated and updated as needed.

IV. Documentation and Reporting

This section will describe the documentation and reporting processes for the County's Wet Weather Monitoring Program.

i. Site Selection

Results of site selection will be presented in the County's Annual Report once complete. This includes procedures for the desktop and field analysis protocols presented in this document. All applicable forms, site plans, photos, diagrams, and calculations will be included in this analysis. All procedures dealing with site selection should be completed by the County's next annual reporting period (June 30TH, 2016). Information detailing the sites location (latitude and longitude), internal ID number,

ii. Monitoring Station Construction

Processes detailing monitoring site installation and construction will be included in the County's Annual Report when completed. Details on the type of automatic sampling hardware, including in depth procedures dealing with the sampling and transportation of samples, as well as analyte processing procedures will be included in the updated manual once determined by contractor or certified laboratory. All maintenance activities on monitoring hardware will be reported as completed.

iii. Annual Reporting

As required by the County's MS-4 permit, each annual report will include a list of locations Wet Weather Screening has occurred and the results of monitoring samples. In addition, the County will include as part of each annual report the weather conditions, date and time, and time of most recent storm event for each discrete sample taken. Meteorological data associated with the most recent storm event to the time of sample taken will be gathered from weatherunderground.com.

iv. Trends and Long Term Analysis and Program Follow-up

As the County is proposing to monitor sites on a biennial basis, each annual report will present monitoring trends. This will include a trends analysis as samples are processed quarterly for the year, as well as an assessment of effectiveness of BMP's installed as part of the biennial monitoring process. Results from year 1 of monitoring efforts will be used to implement BMP's in the monitoring site drainage area aimed at reducing critical pollutants. The effectiveness of those BMP's will be evaluated in year 2 of the Wet Weather Monitoring Program. All results of this analysis will be presented in the County's Annual Report.

Appendix A – Hotspot Identification and Analysis Model



Prince William County

Wet Weather Screening Program

Introduction

As a requirement for meeting guidelines mandated by the USEPA (Part 1.B.2.l)1) of Permit No VA0088595), Prince William County must identify and inventory “areas of concern” or areas predisposed to illicit discharges within its Municipal Separate Storm Sewer system (MS4). These “areas of concern” include: areas such as car washes, car dealerships, pet kennels, and restaurants; sites with previously occurring illicit discharges; areas of older development; areas representing the general land use of the county; sites with a history of citizen complaint; and areas located near environmentally sensitive features. Previously the County identified areas for dry weather monitoring by using a schedule of grids and a subjective assessment of areas of interest. In an attempt to generate a more quantitative assessment of illicit discharge “hot spots” around the County, a GIS based risk assessment was developed.

Variables

GIS layers

- County Municipal boundaries and ADC Index
- Land Use
- Residential Development
- VPDES Permitted Facilities
- High Risk Land Use Facilities
- Sanitary Sewer Cross Points
- Impervious Area
- County Outfall locations (outfalls >15in)
- County Streams
- 303(d) listed Impaired Virginia Waterways
- Raster based County imagery

Data

- Previous discharges according to land use
- History of citizen complaint according to land use

Procedures

Data Collection

Data layers were collected from the County GIS system via database linkage within version 10.3 of ArcGIS, with the exception of the 303(d) listed impaired streams data, which was acquired through the DEQ website.

Initial Layer Synthesis and Input

In order to complete the hotspot analysis, data layers must be modified to yield the information needed. First, use codes were assessed for various land uses of interest and used to select a subset of parcels which could be determined as “high risk” land uses. A “use probability” was applied to each land use, which characterizes a land use’s probability for a discharge to occur, and potential severity of that discharge should it occur. This “use probability” is initially applied subjectively, but will be further defined as more data from the IDDE program is gathered and can be re-input into the model. Figure 1 displays the location of various land uses of interest of Prince William County.

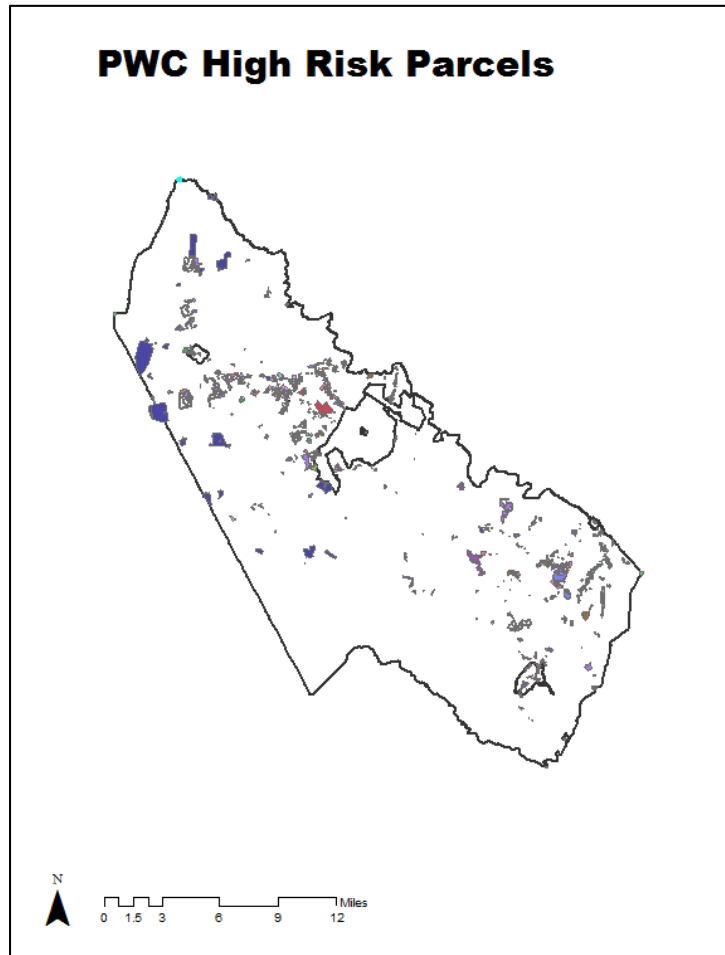


Figure 1: High Risk Parcels hotspot identification map

The impact value is a number from 1 to 5 characterizing each land use according to the potential of illicit discharge occurrence (determined from historical discharge data, low probability denotes low risk) and potential discharge severity (an assumption of the possible damage that may occur from a discharge). A list of land uses, use codes, and the initial scores given to the land uses can be seen below in Table 1.

Table 5: Impact values for Land Use hotspot identification

Use code	Use description	Use Probability
191	Technology Services	1
229	Other Utilities	1
349	Food Stores	1
140	Research and Testing	2
156	Wholesale Warehousing (Condo)	2
224	Sewage	2
343	Convienience Store	2
831	Golf Course	2
832	Golf Course	2
112	Industrial Conglomeration	3
151	Mini Warehousing	3
216	Auto Parking	3
311	Small Shopping Center	3
312	Shopping Center	3
313	Shopping Center	3
314	Large Mall	3
315	Large Mall	3
317	Shopping Center	3
318	Shopping Center	3
320	Building Materials	3
351	Restaurant	3
352	Restaurant	3
353	Restaurant	3
354	Restaurant	3
361	Motor Vehicle Sales	3
520	Barber/laundry/cleaners/etc	3
590	Barber/laundry/cleaners/etc	3
841	Swimming Pool	3
851	Marina	3
910	Agricultural Resources	3
911	Agricultural Resources	3
930	Agricultural Resources	3
121	Durable Manufacturing	4
126	Durable Manufacturing (Condo)	4
131	NonDurable Manufacturing	4
150	Wholesale Warehousing	4
160	Industrial Service Garage	4
190	Other Industrial	4
211	Railroad	4
212	Rail Rapid Transit	4

213	Bus	4
214	Motor Freight Transportation	4
219	Other Transportation	4
225	Solid Waste Disposal	4
344	Convenience Store with Gas	4
362	Gas and Service Station	4
363	Gas Station	4
369	Other Automotive	4
540	Other Repair	4
973	Storage Yard	4
366	Service Station	5
530	Motor Vehicle Repair	5

The same process was used for VPDES general stormwater discharge permit holders within the County. VPDES permitted facilities were identified using data obtained from DEQ. A determination on which VPDES permittees discharged into the County’s MS-4 system was made, and a score (discharge probability) was assigned to each facility according to its assumed probability to discharge pollutants.

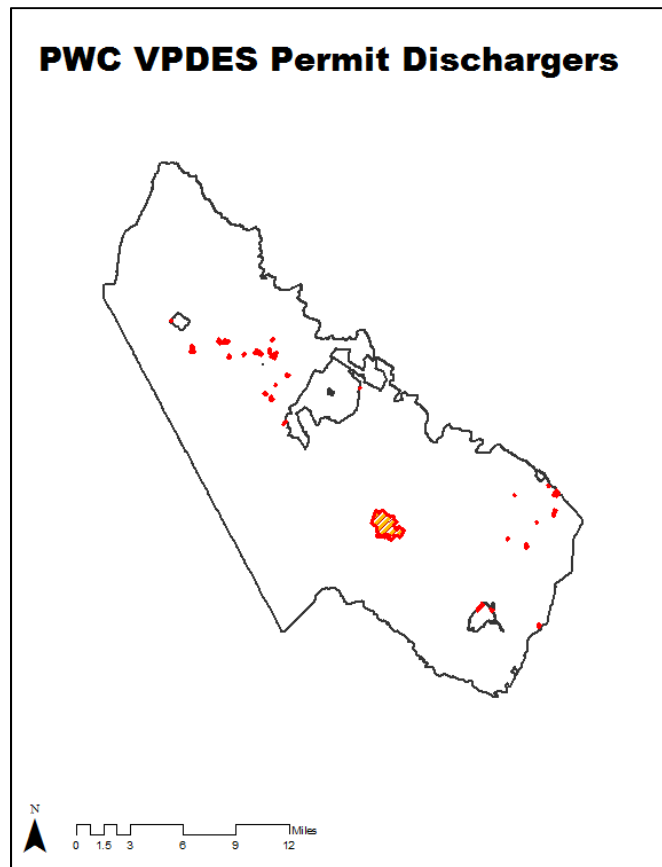


Figure 22: VPDES permitted facilities hotspot identification map

Table 2: Impact values for VPDES hotspot identification

NAME	Permit_No	Score
PWCBOCS	VAR051078	0
CHASE DAVID D	VAG830458	1
GENERAL DYNAMICS LAND SYSTEMS INC	VAR051293	1
OVERNITE TRANSPORTATION CO	VAR051030	1
US FOODSERVICE INC	VAR051117	1
OLD DOMINION FREIGHT LINE INC	VAR051476	1
REMODELERS CREDIT CORP	VAR051996	2
PWC	VAR051477	2
FURR FLOYD H AND BARBARA J	VAG750237	2
SUPPORT TERMINALS OPERATING PTNSHP	VAR051039	2
7905 LC	VAR052008	2
W M TINDER INC	VAR052074	2
EVERED INC	VAR052190	3
POTOMAC & RAPPAHANNOCK TRANSPORTATION E	VAR051886	3
LAND VENTURE ONE L C	VAR051295	3
DALRYMPLE REALTY CORPORATION	VAG110100	3
THIRD GENERATION L P	VAR051085	3
KRAUSS RICHARD L TR	VAR050983	3
NEWBILL HOLDINGS LLC	VAR051639	3
ARCHIE HENRY E SR & ANNIE WILLIAMS	VAR052115	3
BURBAGE J E JR E M BURBAGE	VAR051939	3
VENABLE JEAN S	VAR052243	3
HOFFMASTERS MARINA INC	VAR051183	3
SLURRY PAVERS INC	VAR051911	3
DAVIS TEDDY R JR HELEN M ETAL	VAR052014	3
ENNSTONE INC	VAG110111	4
COSNER MEDFORD R	VAR051009	4
VIRGINIA CONCRETE CO INC	VAG110083	4
DALRYMPLE REALTY CORP	VAR051949	4
JULIUS BRANSCOME INC	VAR050908	4
JONES SAMUEL M ESTATE	VAR051298	4
CONCRETE PIPE AND PRODUCTS CO INC OF	VAG110313	4
ARBAN CAROSI INC	VAG110068	4
HARD ROCK CONCRETE LLC	VAG110067	4
SUPERIOR PROPERTIES INC	VAR051992	4
SUPERIOR PAVING CORP	VAR050901	4
POTOMAC LANDFILL INC	VAR051073	5

Since the point of discharge is the ultimate target of the analysis, outfalls greater than 15 inches were identified through Prince William County. Applicable outfalls were identified and isolated using the feature selection tool and processed into an individual layer. The greater the density of outfalls within

an area the larger the chance of a discharge occurring. Outfalls associated with VPDES and High Risk facilities were also determined by creating a buffer around VPDES and High Risk parcels, and capturing all outfalls within the buffer. Outfalls were given a uniform impact value and factor in during the overall hotspot analysis (Standard outfall = 10, VPDES outfall = 30, High Risk Outfall = 30). Figure 3 displays the location of outfalls within the county.

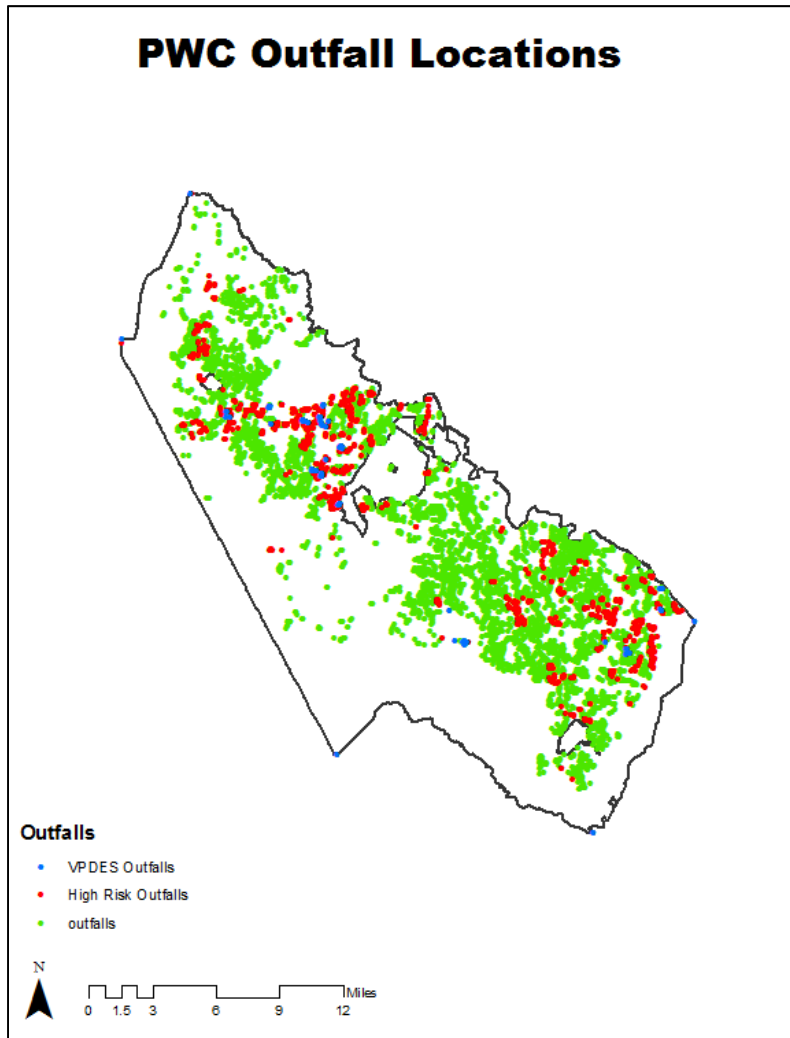


Figure 3: Location of outfalls within Prince William County

To address the potential impact of illicit discharge on environmentally sensitive areas, a streams and water body layer was included in the analysis (Figure 3). Major streams and rivers were isolated from man-made ditches and conveyances within the layer. These streams were given a uniform impact value. The area of stream within a region influences the potential discharge probability score by quantifying the amount of environmentally sensitive features in an area. Streams listed on the EPA 303(d) list of impaired water bodies have a greater potential of impact from illicit discharges and are therefore given an additional weight in model outputs.

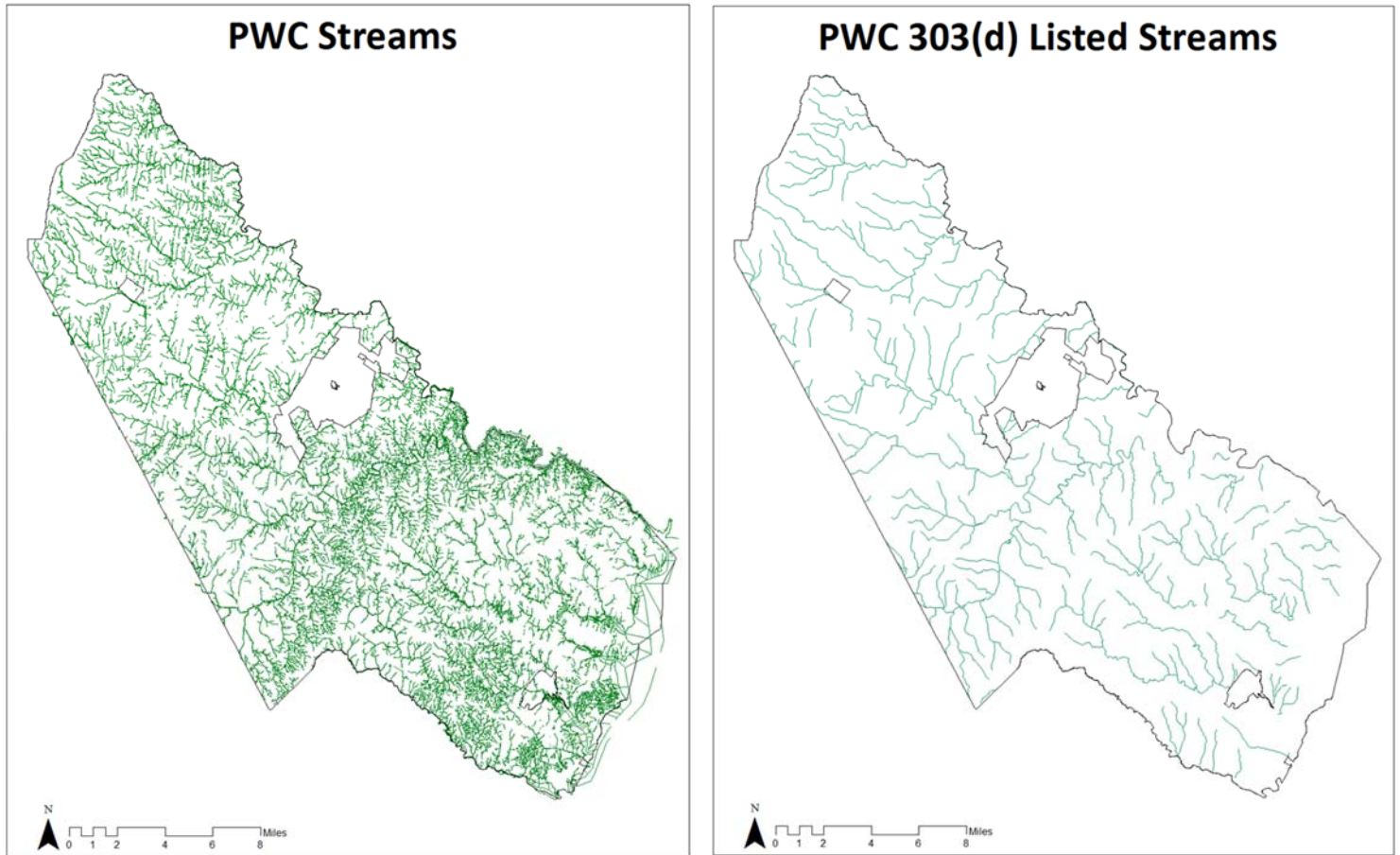


Figure 4: Streams and impaired streams within Prince William County's jurisdictional area

Next an assessment of potential areas for cross connections between the storm sewer and sanitary sewer system was performed. Areas where the storm and sanitary sewer system overlap create potential for cross contamination due to leaking sanitary sewer infrastructure. This analysis was accomplished by overlaying the storm and sanitary sewer layers using GIS, and isolating the locations where they overlap. These locations were turned into point features and assigned a uniform potential discharge probability score (20). This analysis is displayed below in Figure 5.

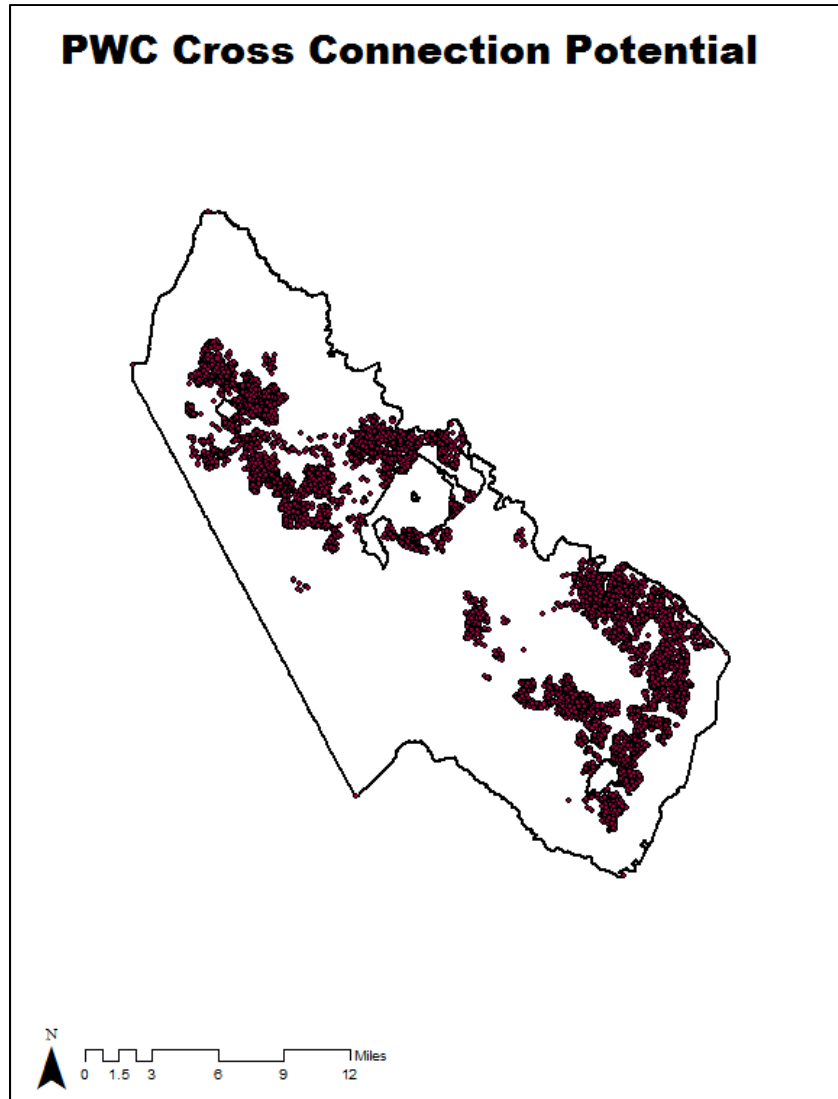


Figure 5: Location of potential cross connection sites within Prince William County

Often, areas with a higher percentage of impervious surfaces tend to contribute greater to pollutant loads. To account for this, a layer depicting impervious surface within the County was incorporated in the model. Impervious surface area is assigned a discharge score of 1. A low score was selected because the large areas covered by impervious surface can cause large impacts to model outputs. A score which balances the impact of impervious surface on pollutant output without weighing too much into model outcomes was desired. Figure 6 below shows impervious area within the County.

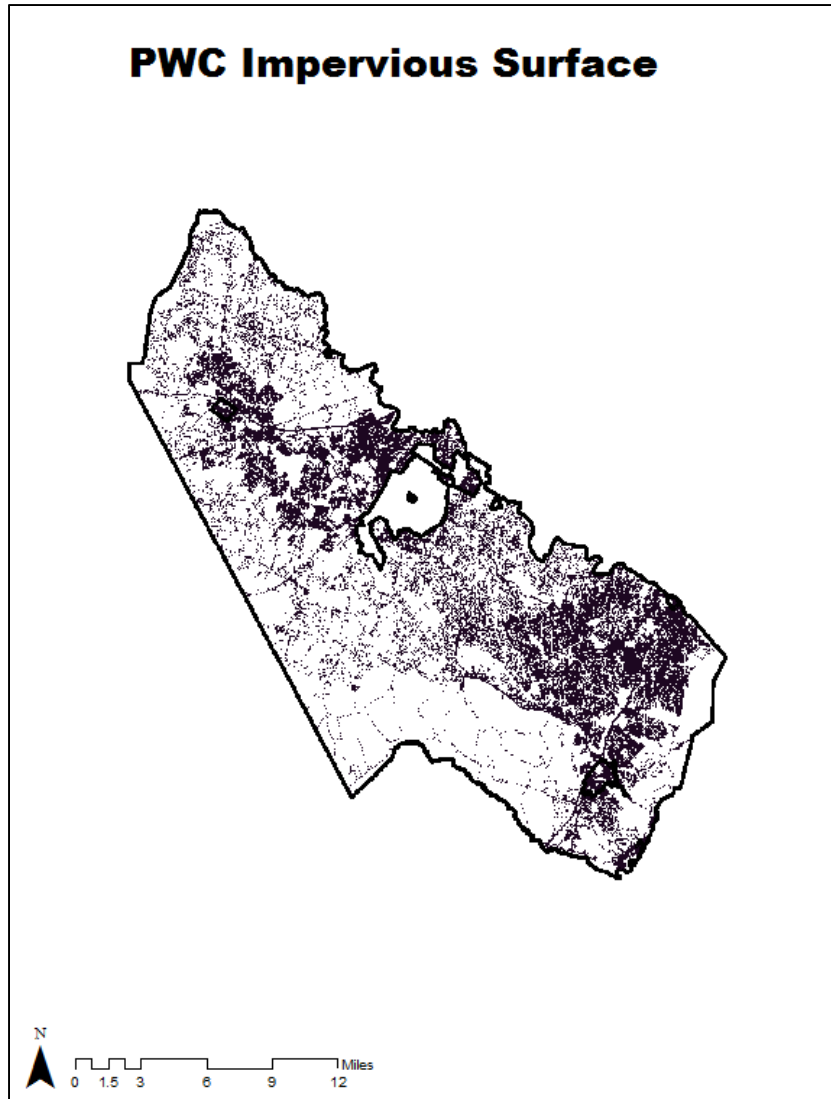


Figure 6: Impervious surface in Prince William County

Lastly, discharges from residential areas had to be accounted for. Although commercial and industrial areas were well represented in the hotspot analysis, residential areas within the County were lacking sufficient input into the model. Using a layer depicting the residential development in the County, these areas were isolated and assigned a discharge score of 1. This gives residential areas a proportioned impact on hotspot scores.

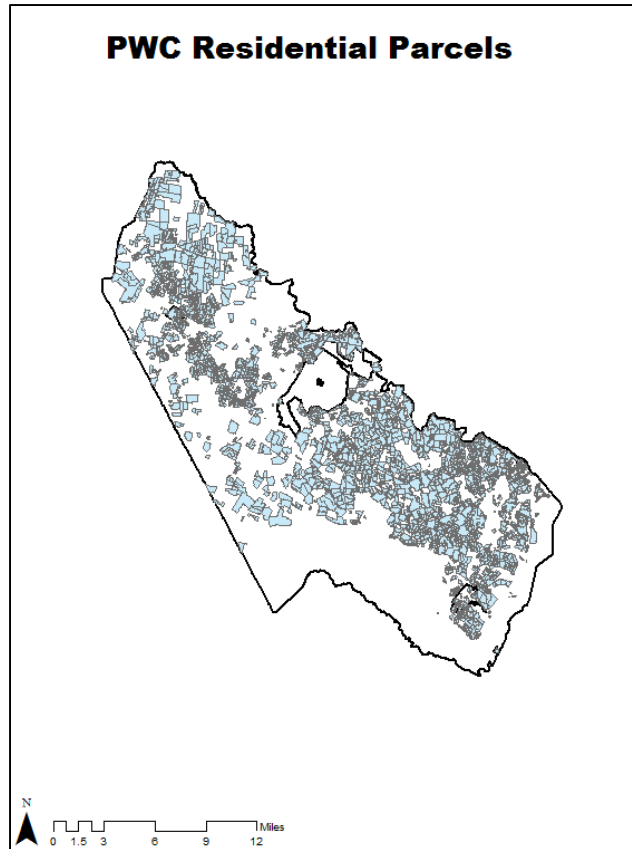


Figure 7: Impervious surface in Prince William County

Hotspot Analysis

Once the layers were manipulated to yield the desired data they had to be combined to produce the final hotspot analysis. Layers were converted from a polygon, line, or point to a raster format to allow for easier compatibility of the various data layers. The Raster format represents data in small cells, allowing for a point by point analysis of each location on the map. It facilitates the ability for data with different layer types (i.e. polygon, line, point) to be combined simply, since they are not compatible otherwise due to differences in shape, size, and location. Areas within a layer where empty space exists cause discontinuity when trying to combine them into the overall analysis. To remedy this, the Reclassify Raster tool was used. This tool removes the “Nodata” classification automatically applied to empty spots in the layer during the raster conversion, allowing a numerical value to be assigned in its place (0). Without this step, only the overlapping areas of data in each layer would be included in the analysis and an incomplete assessment of discharge probability would result.

Each layer was combined for hotspot analysis using the Raster Calculator tool. This tool performs simple mathematical operations at the cellular level, to combine the data into an overall assessment of County hotspots. The tool essentially adds together each included layer combining the discharge probability scores from each cell. Figure 8 below shows a simple representation of this process.

Data is then transposed to the ADC index and watershed maps of the County through simple Spatial Statistics tool. The Spatial Statistics tool performs a basic statistical analysis on raster cells within a specified polygon. For the purpose of this study the mean and sum of probabilities within both the

ADC index areas and sub-watersheds of the County were assessed.

Analysis using Mean vs. Area (Average) Score

There are various ways to interoperate the data output from the model. A score had to be generated for each ADC Index number and watershed in order to effectively assess and utilize model outputs; however, this presented a problem as to what mathematical method of assessment should be

used. The ArcGIS model is generated to output values for the mean, median, minimum, maximum, and sum of each individual ADC index area and watershed. As stated before, for the purpose of this analysis, only the sum and mean probability of discharge are of interest. The sum is the result of all cells within the identified area added together, while the mean is the average cell value within the area. For a watershed scale analysis, the mean probability of discharge must be used. This is because the area of each watershed differs, leaving the sum of the probabilities of each watershed highly dependent on its size. Larger watersheds will accommodate more cells leading to a larger overall probability of discharge. The ADC index, on the other hand has a uniform area removing the effect of size on the output. This allows for the sum of probabilities to be used, which gives a better overall assessment of the characteristics within that area.

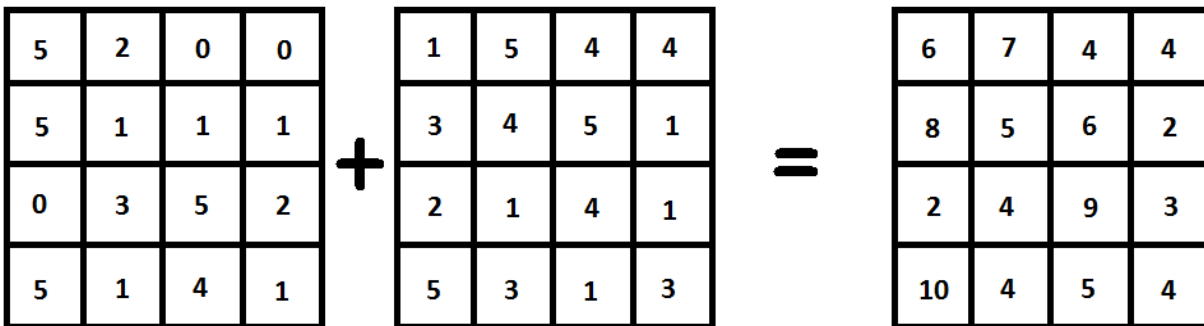


Figure 8: Raster Calculator Example

Isolation of Hotspots and Identification of Outfalls of interest

The first step in using hotspot analysis to identify outfalls for field inspection is to select the ADC index number with the highest probability of discharge is selected from the generated list. The ADC index was chosen as a basis for field analysis for a few reasons: it is easy to navigate to, being the basis for street map navigation; it encompasses a relatively small area, typically containing 8-10 outfalls per Index which is a good size for a day’s field assessment; and, it can be combined easily to into a larger area allowing for an broader perspective on illicit discharge trends. Assessing discharges on a watershed scale would incorporate too large of an area and would not be suitable for a quality comparison

between areas of the County. Once an index number is selected, then an index area map is generated showing all outfalls, storm sewer system, roads, and land uses of interest. Each map is created using ArcGIS tools to zoom to the applicable map location (ADC Index number), and to highlight all applicable features. From this map, a list of all outfalls and their size can be created. This map, with outfall information, can then be used as a field guide for the outfall monitoring.

Model Calibration

Model calibration is an important step in model development. Model outputs must be adjusted to more closely portray actual conditions. Since the raster layers used to sum severities in the model skew the data by giving more weight to larger polygons, point-sized items like outfalls must be given a larger value to compensate and allow ADC areas to more closely reflect the desired weight proportion between inputs. The value given to outfalls was adjusted so that their impact on model outputs was more representative of actual conditions.

Originally, some areas of the map contained a high probability of discharge, despite being located in more rural areas. This was found to be due to an increased proportion of streams meandering throughout the grid. In order to correct this, a balance was struck between the impact value given to streams, and their actual impact on real-world conditions. Similarly, rural areas were triggering high probabilities of discharge due to the age of parcel development despite not having substantial storm sewer systems. To remedy this, the residential and commercial layers were given a larger score to better reflect in-situ conditions.

The model will continue to be adjusted as more data becomes available pertaining to discharges within the County. Data will be used to validate and or adjust assumptions made in this version of the model.

Results and Conclusions

The results of the analysis showed areas with the greatest probability of discharge within Prince William County were consistent with previous field observations and expectations. The Route 1 corridor, Bull Run commercial area, and Potomac Mills Mall all generated high probabilities of discharge. Residential areas had a fairly constant probability of discharge. The highest probability of discharge was located around the specified land uses of interest including shopping centers and auto-related industrial areas. Rural areas with little to no storm sewer system recorded the lowest probability of discharge, as would be expected. A detailed map displaying parcel-based discharge probability was created using the methods described above (see figure 9). The land uses of interest are distinctly represented in red describing the highest discharge potential. Residential areas shown primarily in yellow present a moderate discharge potential. Rural areas are mostly indicated in blue, describing a low discharge potential which are most likely out of the scope for dry weather discharge monitoring. Outfall locations and numbers are not factored in this analysis.

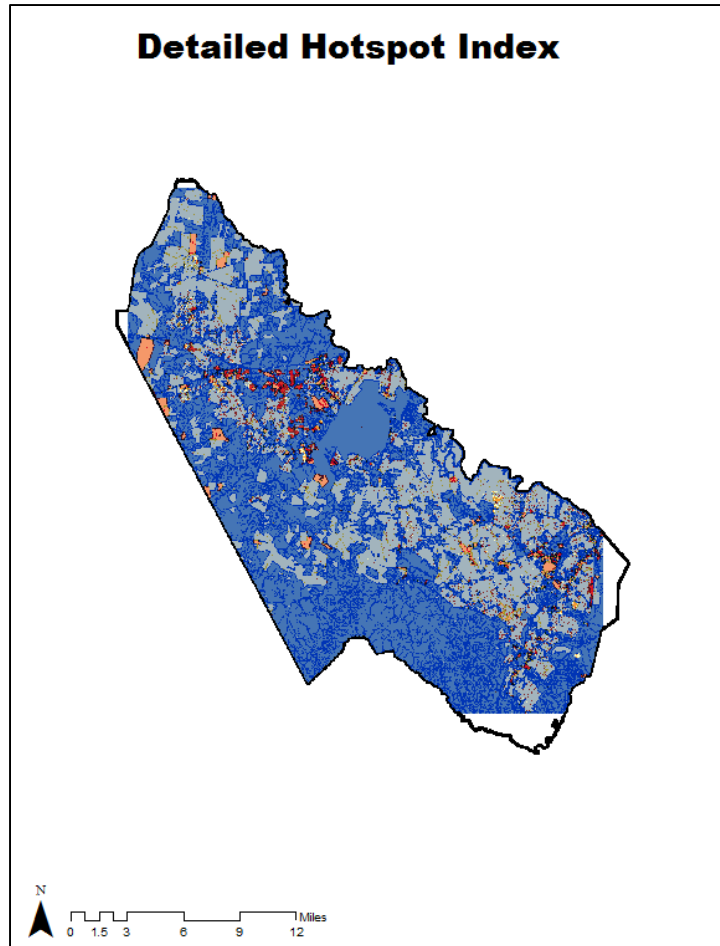


Figure 9: Detailed Discharge Probability

Previously a hotspot analysis was performed on a watershed scale. However, a watershed approach to discharge monitoring tends to skew the data, since discharge probabilities are averaged over the entire watershed making smaller pockets with high discharge; therefore, the ADC index method was determined to be the best.

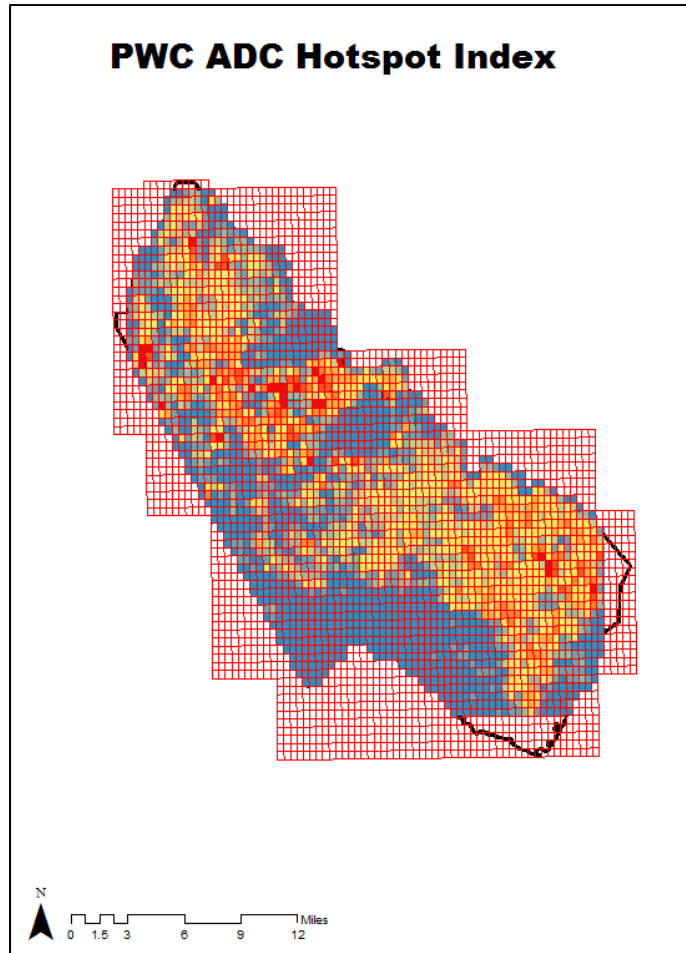


Figure 10: ADC index probability of discharge

The ADC index hotspot map, shown above (figure 10), is used for the inspection scheduling and field analysis of outfalls. As indicated in the parcel and watershed level assessments, County hotspots exist along the Route 1 corridor, Bull Run commercial area, and Town of Haymarket. Unlike the parcel and watershed level assessments, the ADC hotspot map provides a more thorough analysis of where the most probable locations for illicit discharge might actually be present. Table 3, shown below, displays the 50 ADC index areas with the highest probability of discharge. Sorted from highest to lowest, the table serves as the basis for the scheduling of dry weather outfall monitoring in the County.

Table6: Sum and mean probability of discharge scores by ADC index number

ADC_ID	MEAN	SUM
5992-C8	34916	56459172
5990-K5	34175	54919225
5756-G7	31523	51130306
5756-H7	30976	50243072
5991-A6	28771	46896730
5756-G3	27086	43879320
5992-C7	25886	42427154

5992-D7	24576	39641088
6110-G2	24456	39349704
5756-J7	24228	39322044
5757-A2	24170	39227910
5992-A6	23838	39189672
5991-A7	23096	37461712
5992-B6	22846	36782060
5991-A5	22637	36694577
5756-H4	22435	36322265
5992-G9	21579	35605350
5992-H8	21376	35270400
5756-K7	20886	33918864
5874-H7	20478	33542964
5638-G10	20215	33132385
5756-H5	20055	32609430
5756-K6	19838	32097884
5755-C4	19460	31914400
5872-C1	18951	30814326
5992-D8	18811	30624308
5874-J7	18896	30592624
5992-H7	18536	29842960
5756-H8	18295	29839145
5991-G7	18524	29675448
5756-J5	18332	29624512
5992-K10	17877	29211018
5990-C9	17834	29087254
5991-F7	17543	29033665
5992-E10	17820	28921860
5872-H10	17359	28746504
5756-G10	17724	28624260
5756-J6	17357	28222482
5991-B7	17339	28193214
5754-F5	17186	28167854
5756-C10	17250	28031250
5638-H10	17069	27839539
5756-G8	17085	27677700
5992-K6	16869	27597684
5755-E4	16728	27233184
5872-D1	16318	26777838
6110-E3	16210	26762710
5757-H6	16567	26623169
5991-K1	16215	26527740

Future Development of Model

The model will be updated as more detailed discharge information is gathered through the county monitoring program. In addition, updated data layers pertaining to the storm sewer system, outfalls, impaired stream listings, age of development, county land use, and parcel location will continually be introduced to the model. If more specific data on the age of storm sewer infrastructure becomes available, this will also be included in the model. Also, when the extent of the County's MS4 system is identified, model data will be adjusted accordingly. Finally, methods to incorporate the history of complaints and poorly maintained commercial areas will be evaluated and incorporated, if possible, into the assessment. All steps to increase the accuracy of the hotspot analysis will be evaluated for the model on an annual basis, and the model outputs will be re-assessed. An evaluation of the accuracy of the hotspot analysis, as well as verification of model outputs will be conducted on an annual basis.

Appendix B – Desktop Analysis Scoring Worksheet

Appendix C – Field Assessment Scoring Worksheet

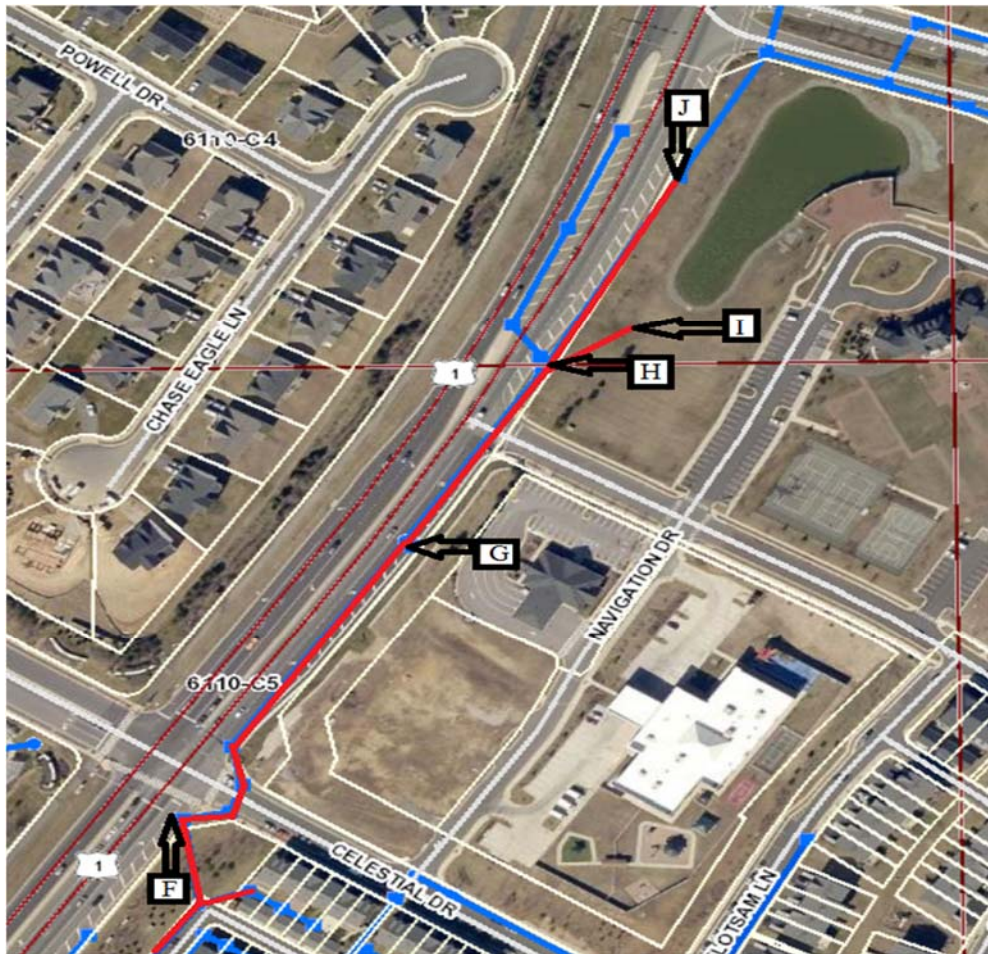
Illicit Discharge Report

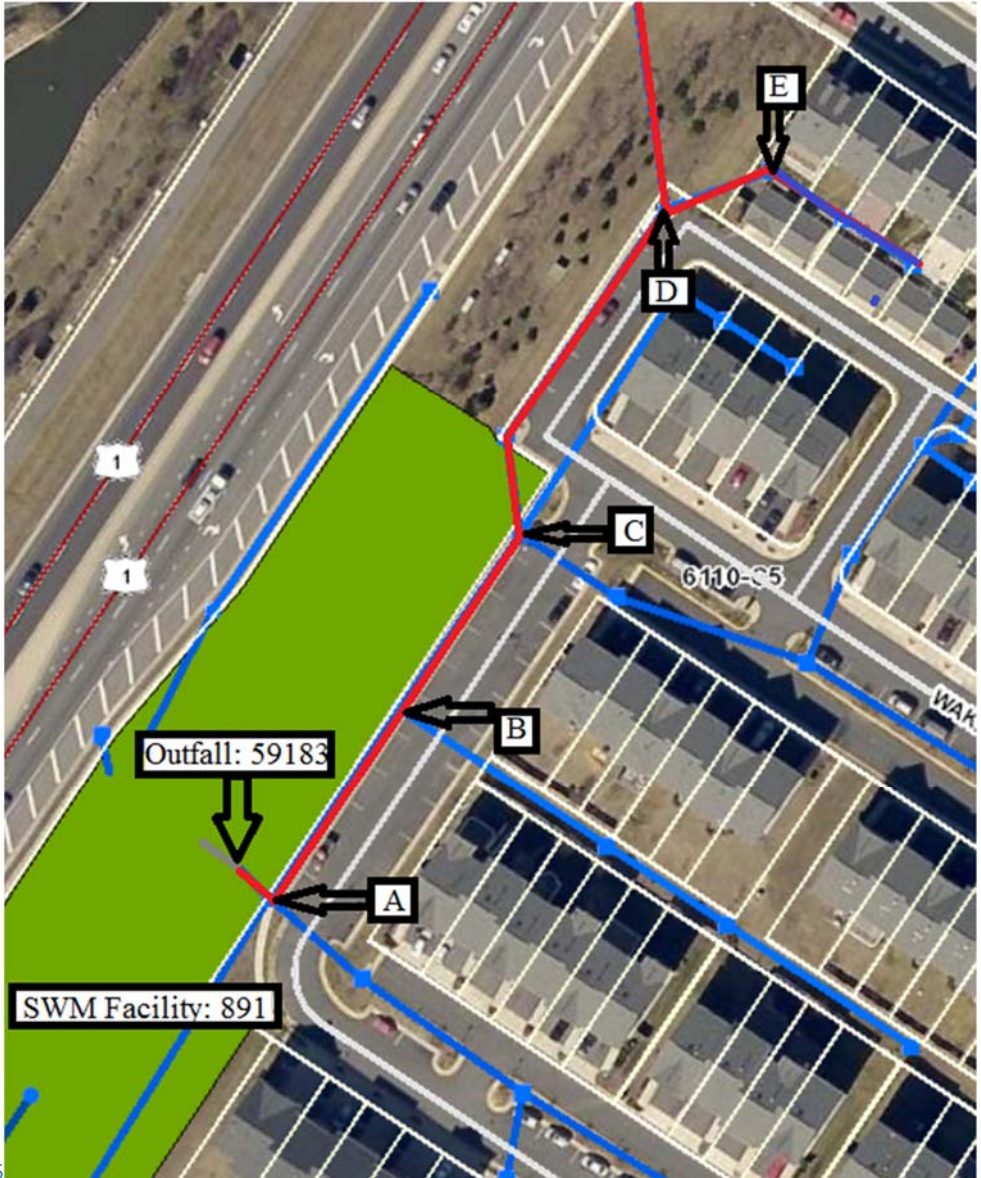
Prem Poudel
Environment Compliance Inspector
PWC, Department of Public works
Environmental Service, Watershed Branch, VA

Outfall: 59183 ADC Map: 6110-C5
2848 Wakewater WY, Woodbridge, VA 22191

Friday, August 14, 2015

During routine inspection for dry weather screening, outfall found to be discharged flow in detention basin. The nature of flow was shallow. Foam observed on filter fabric placed after outfall but the water sample found to be color and odor less. Storm sewer belongs to outfall 59183 was combine residential, Road and open space areas.





4.5

Figure 1: Site map showing discharge flow path through the storm sewer system.

Source of discharge had tracked from outfall. Vault A had baffle wall specially designed for diverting initial flow during rainfall toward pond thru outfall 59182 and pick flow divided both outfall 59182 and 59185 respectively. Flow was observed at points A, B, C, D, F, G and H. The access didn't get thru private property towards branch DE, even though it contained flow. The vault J and drop inlet I found to be dry. There was a fountain at artificial pool of Port Potomac apartment just beside the vault J and drop inlet I. The water quality parameters were found within the standard limits.



Foam found to be developed on filter fabric laid after outfall in detention basin. After tracking discharge it had been concluded that the significant amount of discharge generated by ground seepage thru leaky joints along storm sewer. The inclusive investigation will need to inspect storm sewer, laid in- between houses and parking garage of house no 2739 to 2731 Celestial Drive, in which access was not available at this inspection. Observed foam gassed to be produced by singular events of washing and cleaning with soap, detergent or chemicals in storm sewer commanding areas because there was no permanent stain on structural surfaces and the result of water quality parameter found within the standard limits. The violator could not identify so the case has been closed. However, Periodic inspections need to be done for inclusive investigation since it had been kept in suspected outfall in future.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Department of Public works
Environmental Service, Watershed Branch, VA

Outfall: 46501 ADC Map: 5990-G3
6306 Hoadly Rd Manassas, VA 20112

Monday, August 17, 2015

During routine inspection for dry weather screening, outfall found to be discharged flow in stream. The nature of flow was shallow. Algae found to be grown on pipe and pool. Storm sewer belongs to outfall 46501 was shopping center. The storm sewer system found to be connected with two different underground SWM Facilities.



Figure 1: Site map showing discharge flow path through the storm sewer system.

Discharge had tracked down from outfall. Vault A received two different flow from AB and AD direction. At point B, flow observed from BC direction only. At point C, flow received from underground SWM Facility. On the other side, discharge found to be generated from Point E and flowing along EDA. The

field test water quality parameters (Temperature, Conductivity and pH) were found within the standard limits.



The discharge supposed to be generated from both underground SWM Facilities. Inclusive additional investigation needed to confirm the exact source of discharge. The investigation is under the process. No violation latter issued at this time.

Illicit Discharge Report

Prem Poudel
Environment Compliance Inspector
PWC, Environmental Service, Department of Public works

Outfall: 16762 ADC Map: 6110-C5
7814 Garner Drive Manassas, VA 20109

Wednesday, January 06, 2016

During routine inspection for dry weather screening, outfall 16762 was found to be discharging flow to an open channel. The nature of flow was moderate or stagnant. The color visually observed clear. The field test parameters are found within standard limits.

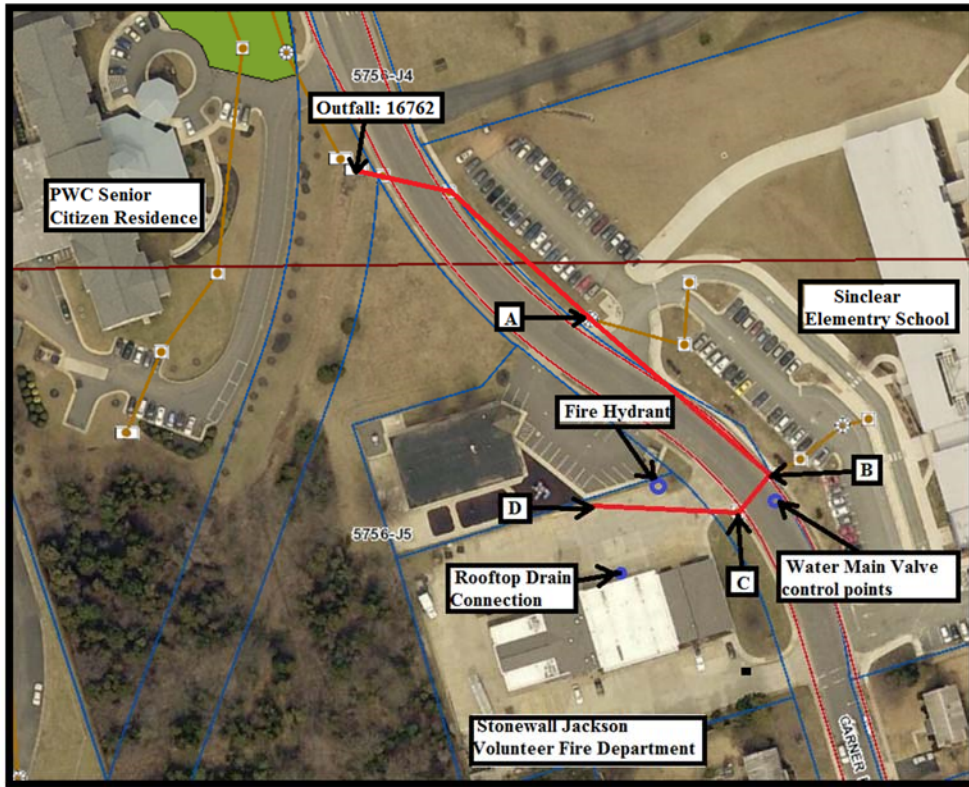


Figure 1: Site map showing discharge flow path through the storm sewer system.

The source of discharge was tracked from the outfall. Manhole A had flow from AB direction only. At point B, flow observed from BC direction only. At manhole B, discharge found forcefully flowing from the BC direction with moderate quantity. The Manhole C found almost dry but the sound of water could be heard when keeping an ear close to manhole. At point D, the drop inlet was observed to be dry. Across point B and C, a drinking water control valve could be observed slightly above storm sewer

alignment. Across point C and D, a fire hydrant could be seen slightly below the storm sewer alignment. Points B and C were located at two sides of road in small stretch but the discharge found to be generated in-between while tracking. The sound of flowing water can be heard in Manhole C, sound from downstream stormsewer pipe may be due to leakage in water main between point B and C.



Outfall



Manhole B



Manhole C



Water Main control valve

The discharge was observed in a small stretch having high velocity with odorless and colorless nature. After investigation, discharge is suspected to be generated by leakage thru water supply transmission main. No sanitary sewer cross connection was observed to the storm sewer system. NOV was not issued since the source of discharge still unidentified. Inclusive investigation needs additional assistance. This issue will be forwarded to water supply authority of this locality for investigation. Further inspection and investigation will be periodically continued from PWC IDDE program. The case was taken over by PWC service authority. The leakage thru transmission main towards fire hydrant found to be leaked and corrected it on 01/11/16, reported by PWCSA.

#684: Bull Run, Lowes Parking Lot



- 84" x 54" box culvert
- Contribution from upstream BMP
- ~1" flow during storm (7/18)
- Low visibility, steep slopes







Access: Difficult



#941: Bull Run, Prince Wm. Parkway



- **54" concrete pipe**
- **Signs of recent repair**
- **1/4" water, level with spillway**
- **Debris in spillway**

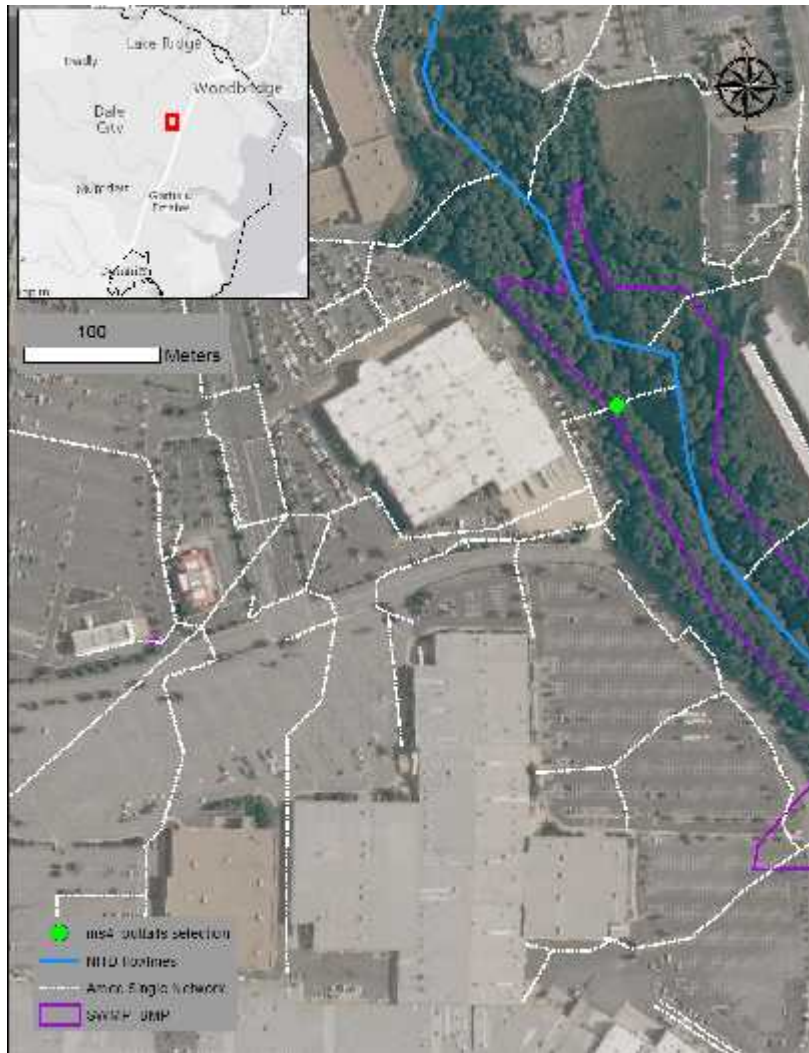




Access: Easy

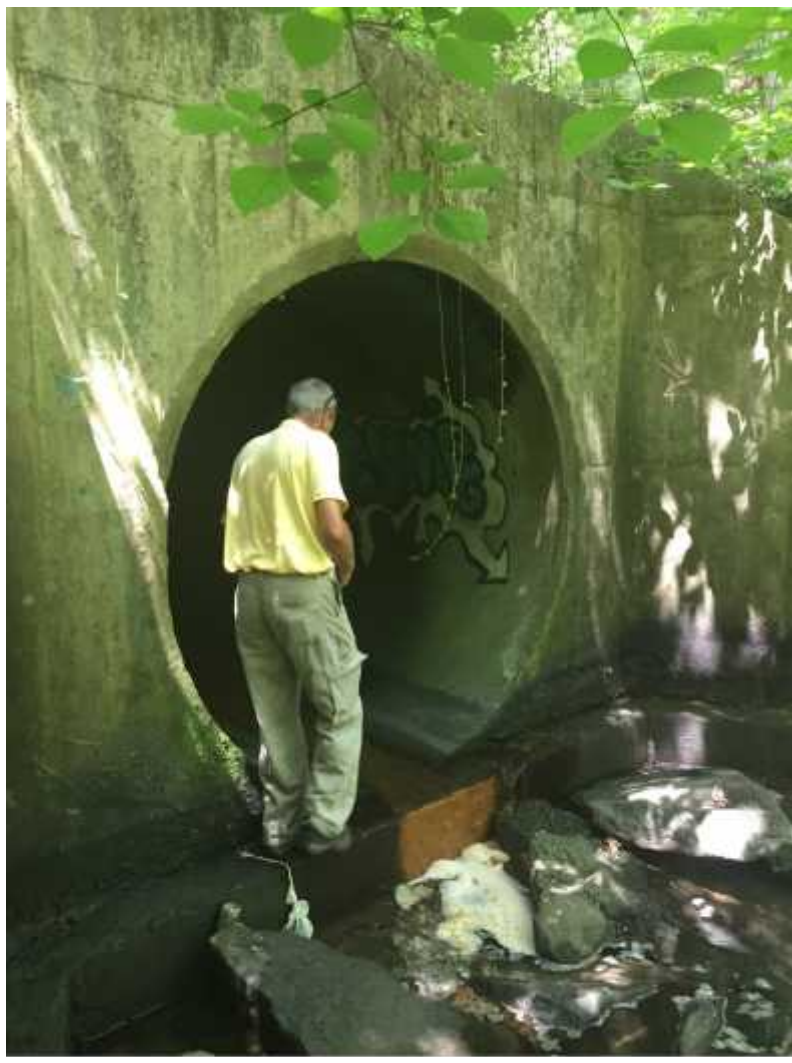


#3471: Woodbridge, Potomac Mills



- 84" concrete pipe
- < 1/4" flow
- Signs of human presence, uncertain frequency

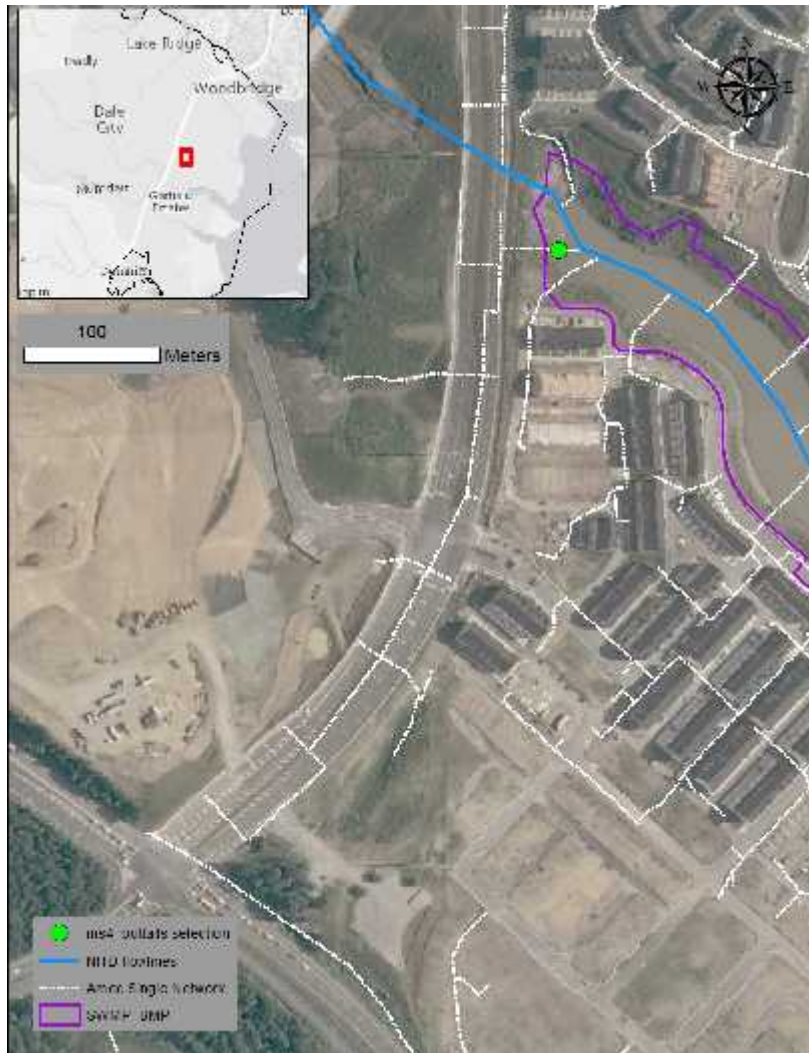




Access: Easy



#4684: Dale City



- **54" concrete pipe**
- **Low flow draining to scour pool**
- **Steep banks surrounding outfall**





Access: Moderate



Additional Slides: Bull Run



Additional Slides: Bull Run



Additional Slides: Pr. Wm. Pkwy



Additional Slides: Pr. Wm. Pkwy



Additional Slides: Pr. Wm. Pkwy



Additional Slides: Potomac Mills



Additional Slides: Potomac Mills



Additional Slides: Potomac Mills



Additional Slides: Dale City



Additional Slides: Dale City

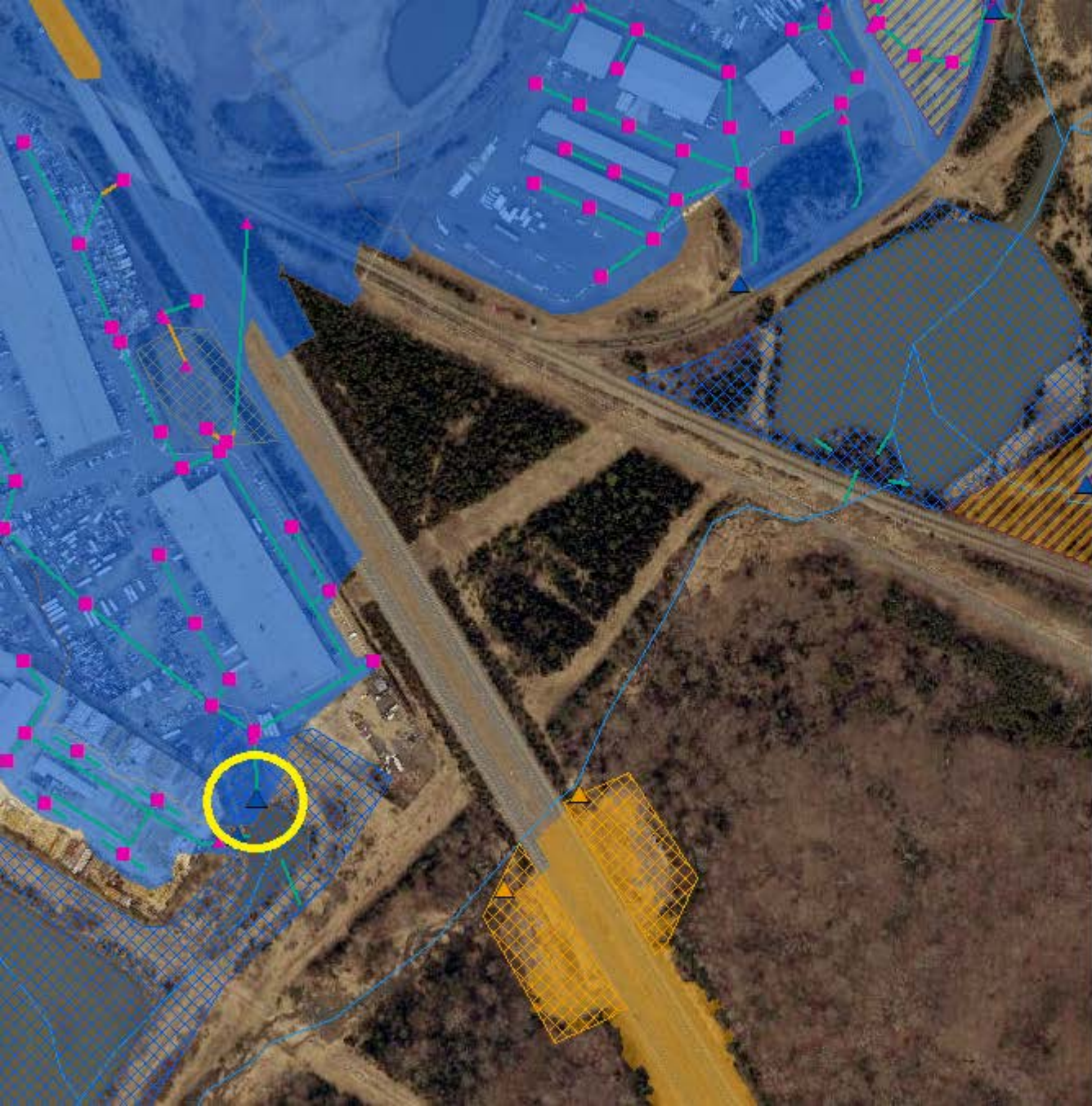


Additional Slides: Dale City



Additional Slides: Dale City



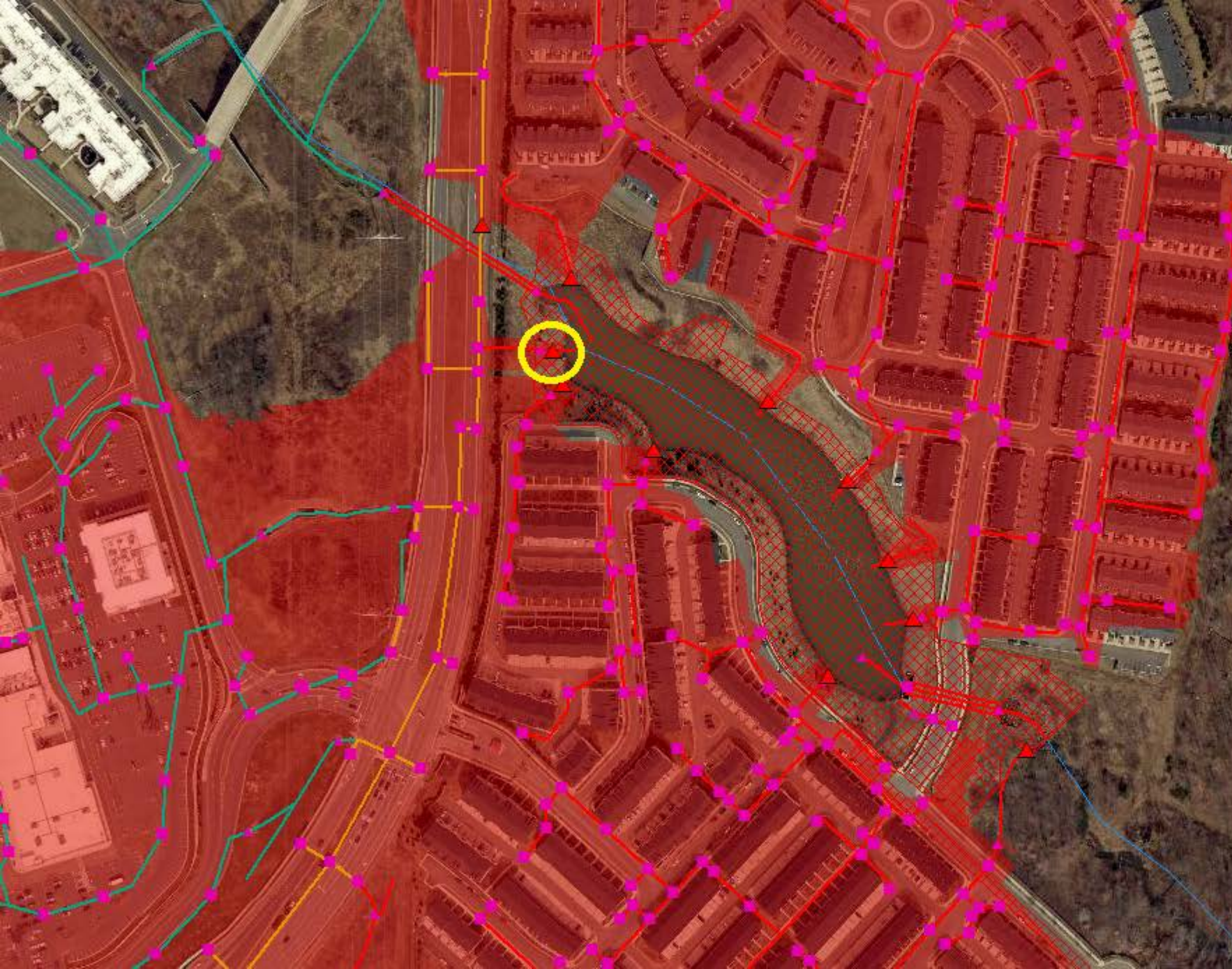


Commercial Outfalls

C

Location: 11,754,329.043 6,968,987.129 Feet

Field	Value
FID	940
Shape	Point
OBJECTID	941
Ownership	C
Origin	RRD
Outfall_ID	941
REACHCODE	02070010002743
VAHU5	PL-L
VAHU6	PL34
HUC_12	020700100504
WTRSHD_ID	262
LONG_DD	-77.5479
LAT_DD	38.7813



Prince William County Outfalls
P

Location: 11,830,482.063 6,914,570.169 Feet

Field	Value
FID	4180
Shape	Point
OBJECTID	4181
Ownership	P
Origin	RRD
Outfall_ID	4181
REACHCODE	02070010000478
VAHU5	PL-O
VAHU6	PL49
HUC_12	020700100804
WTRSHD_ID	845
LONG_DD	-77.2833
LAT_DD	38.6294

Appendix M – Infrastructure Coordination

VDOT - Prince William County Coordination Meeting

5/27/2016

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Appendix 1 – Biological Stream Monitoring

Sampling Plan Benthic Macroinvertebrate Population and Water Quality Monitoring

Prepared for:



Prince William County Department of Public Works
Virginia

Prepared by:

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Kennesaw, Georgia 30144
(770) 421-3400

December 29, 2015

Project No. 151270003.0001

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APPENDICES

Appendix A	Sampling Stations
Appendix B	Field Forms
Appendix C	Laboratory Forms

LIST OF ACRONYMS

Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
BI	Biotic Index
cm	Centimeter
COC	Chain of Custody
CWA	Clean Water Act
CFR	Code of Federal Regulations
DO	Dissolved Oxygen
<i>E. coli</i>	<i>Escherichia coli</i>
EPT	Ephemeroptera/Plecoptera/Tricoptera
GPS	Global Positioning System
m	Meter
µm	Micrometer
MS4	Municipal Separate Storm Sewer System
PMA	Percent Model Affinity
RBP	USEPA Rapid Bioassessment Protocol
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VSCI	Virginia Stream Condition Index
VSMP	Virginia Stormwater Management Program

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) has prepared this sampling plan for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Permit, Municipal Separate Storm Sewer System (MS4) Permit Number VA0088595, issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. Section I.C.1 of the permit requires the continued implementation of a biological stream monitoring program that includes an assessment of the habitat and benthic macroinvertebrate community of select Prince William County streams. This sampling plan provides detailed descriptions of the sampling and analytical activities, as well as a technical approach and methods to scientifically evaluate natural conditions in Prince William County streams.

1.1 BACKGROUND

The United States Environmental Protection Agency (USEPA) delegated the authority to implement Section 402 of the Clean Water Act (CWA) to the Commonwealth of Virginia on March 31, 1975. Subsequently, Section 62.1-44.15:25 of the Virginia Stormwater Management Act authorizes VDEQ to issue, deny, amend, revoke, terminate, and enforce permits for the control of stormwater discharges from MS4s. The VSMP Permit Number VA0088595 authorizes point source discharges of stormwater runoff and certain non-stormwater discharges from the MS4 operated or owned by Prince William County. Part I.C of the VSMP permit outlines the monitoring requirements guided by Section 9VAC25-870-380 C.2.c.(4) of the VSMP regulations.

1.2 PURPOSE AND OBJECTIVES

The purpose of this sampling plan is to outline a plan of study that will be used to comply with the biological stream (Part I.C.1) and in-stream monitoring (Part I.C.2) requirements outlined in Prince William County's permit. The specific objectives are to gather sufficient data to evaluate, and subsequently demonstrate, upstream best management practices effectiveness.

2.0 SITE BACKGROUND AND SETTING

A MS4 is a system of conveyances which may include roads with drainage systems, municipal streets, catch basins, ditches, gutters, curbs, man-made channels, or storm drains. It is designed to collect or convey stormwater. The Prince William County MS4 is composed of numerous sites throughout Prince William County and contains over 11,000 miles of stormwater conveyance structures. The Prince William County MS4 discharges stormwater into 24 6th order hydrologic units within 9 major watersheds of the Potomac River Basin.

Prince William County is 338 square miles in area and is bordered by the Potomac River to the east, Fairfax and Loudoun Counties to the north, Fauquier and Stafford Counties to the south, and Fauquier County to the west. The majority of Prince William County is located in the Piedmont Province with the remainder in the Atlantic Coastal Plain province. The Piedmont Province is an eastward sloping plateau characterized by moderate to very steep slopes. The Atlantic Coastal Plain province has primarily flat terrain with elevations ranging from sea level to about 300 feet. The Fall Line is a transitional area where the softer, less consolidated rocks of the Coastal Plain to the east intersect with harder and more resistant metamorphic rocks of the Piedmont to the west, forming an area of ridges, waterfalls and rapids. Land use surrounding the proposed sampling locations includes residential, undeveloped, commercial and recreational areas.

3.0 SAMPLING, ANALYSIS, AND REPORTING

This section describes the activities for the biological stream monitoring and in-stream monitoring required by Part I.C.1 and I.C.2 of VSMP MS4 Permit VA0088595.

3.1 SAMPLING LOCATIONS

Benthic macroinvertebrate and surface water samples will be collected from five locations in Prince William County (Appendix A).

- Little Bull Run, Catharpin Road, Gainesville, Virginia;
- Dawkins Branch, Wellington Road, Manassas, Virginia;
- Purcell Branch, Purcell Road, Manassas, Virginia;
- Neabsco Creek, Delaney Road, Dale City, Virginia;
- Cow Branch, Mellott Road, Woodbridge, Virginia.

Benthic macroinvertebrate sampling reaches will be 100 meters (m) long, ideally located 100 m upstream from road or bridge crossings, and have no major tributaries discharging to the reach. Sample locations will be verified using a handheld global positioning system (GPS) unit. The limits will be marked in the field using survey stakes, pins, or an appropriate alternative for subsequent sampling events. Sample stations and their limits will be re-verified each sampling event using a handheld GPS and will be re-marked, if necessary.

3.2 SAMPLING AND FIELD DATA COLLECTION ACTIVITIES

Sampling and field data collection activities will include physical and chemical data collection, habitat assessment and benthic macroinvertebrate sampling. Sampling will be conducted following the requirements of VSMP MS4 Permit VA0088595 and procedures outlined in the USEPA Rapid Bioassessment Protocol (RBP) (Barbour et al. 1999).

3.2.1 Physical and Chemical Data Collection

Physical and chemical data collection includes collection of in-situ water quality readings, collection of surface water samples, and documentation of stream characteristics. The equipment needed for collection of these data includes a YSI Model 556 water quality meter (or equivalent), Lamotte 2020 turbidity meter (or equivalent), sample collection bottles, gloves, RBP Physical Characterization and Water Quality Field Data Sheets (Appendix B), a camera, a 100-m tape measure, and a flow meter (such as the Marsh-McBirney Flo-Mate). Field activities, measurements and observations will be recorded in indelible ink in a bound field logbook.

3.2.1.1 Water Quality

Water quality readings and surface water samples will be collected prior to disturbance of the sample reach. In-stream monitoring is required to be conducted at 5 stream sites for the following parameters per VSMP MS4 Permit VA0088595:

- pH,
- dissolved oxygen (DO),
- temperature,
- total suspended solids (TSS),
- ammonia as nitrogen,
- nitrate plus nitrite nitrogen,
- total Kjeldahl nitrogen (TKN),
- total nitrogen (calculation),
- dissolved phosphorus,
- total phosphorus, and
- *Escherichia (E.) coli*.

The RBP Physical Characterization and Water Quality Field Data Sheet (Appendix B) requires the measurement of pH, DO, and temperature as well as the following parameters in addition to those required by VSMP MS4 Permit VA0088595:

- conductivity or specific conductance, and
- turbidity.

In-situ water quality data will be collected using a multiprobe water quality meter (YSI Model 556 or equivalent) and a handheld turbidity meter (Lamotte 2020 or equivalent). The multiprobe will be calibrated daily using standard solutions. A calibration form is included in Appendix B.

Multiprobe readings are taken mid-channel and the unit should be allowed to stabilize before recording readings.

Grab surface water samples to be collected for laboratory analysis of TSS, ammonia, nitrate/nitrite, total Kjeldahl nitrogen (TKN), dissolved phosphorus, total phosphorus, and *E. coli* should be collected at mid-channel at the zero mark of the reach in an area with cross-sectional homogeneity, and well mixed water. The samples will be placed in coolers on ice and shipped overnight under chain-of-custody (COC) procedures to a qualified laboratory licensed in the Commonwealth of Virginia. Custody seals will be employed to check for tampering during shipment. Samples will be analyzed in accordance with 1VAC30-45, Certification for Noncommercial Environmental Laboratories, or 1VAC30-46, Accreditation for Commercial

Environmental Laboratories. Methods used for sample analysis will be those approved by Title 40 Code of Federal (CFR) Regulations Part 136 or alternative methods approved by USEPA.

3.2.1.2 Stream Characteristics

Upstream and downstream photographs will be taken at each sampling location to document conditions at the time of sampling. Physical characteristics of the streams will be recorded on the Physical Characterization and Water Quality Field Data Sheet of the RBP (Appendix B). This field sheet includes a description of the sample location, weather conditions, stream characterization, watershed features (surrounding land use, non-point source pollution, erosion), riparian vegetation, instream features (high water mark, width, depth, morphology, velocity, canopy cover, channelization, and dams), large woody debris, aquatic vegetation, water quality, and substrate (odors, oils, deposits, components). The high water mark to be recorded on the form is defined as the vertical distance from the bankfull margin of the stream bank to the peak overflow level, as indicated by debris hanging in riparian or floodplain vegetation and deposition of silt or soil.

An estimate of large woody debris in contact with the stream water is recorded on the Physical Characterization and Water Quality Field Data Sheet (Appendix B). Each woody debris formation with a surface area in the plane of the water surface that is greater than 0.25 square m is recorded on the stream reach drawing with the size of the woody debris estimated to the nearest 0.5 m. Only the portion in contact with the water is measured. Woody debris with a length or width less than 0.5 m is not counted. Root wads and logs/limbs in the water margin that are in contact with the water are arbitrarily given a width of 0.5 m. The length and width of each formation are multiplied and the resulting products are summed to give the aquatic habitat area influenced. This area is divided by the water surface area within the reach to obtain the large woody debris density.

3.2.2 Habitat Assessment

Habitat characteristics will be assessed using the Habitat Assessment Field Data Sheet (Appendix B), as specified in the RBP. The habitat assessment is performed along the 100-m reach from which the biological sampling is to be conducted. Care will be taken not to disturb the benthic macroinvertebrate sampling habitat during the habitat assessment.

The Habitat Assessment Field Data Sheet (Appendix B) of the RBP will be completed at each location. There are high gradient stream and low gradient stream versions of this form. The high gradient form is used for streams located in moderate to high gradient landscapes with coarse substrates. The low gradient form is used for streams that are located in low to moderate

gradient landscapes and have fine substrates. The appropriate data form for each sampling location will be determined during the site reconnaissance.

The habitat assessment incorporates features of the entire sampling reach. The form rates ten parameters as optimal, suboptimal, marginal, or poor. The parameters to be rated include epifaunal substrate, embeddedness or pool substrate characterization, velocity/depth regime or pool variability, sediment deposition, channel flow status, channel alteration, riffle frequency or channel sinuosity, bank stability, bank vegetative protection, and riparian zone. The Habitat Assessment Field Data Sheet should be completed by a team of 2 or more qualified personnel that come to a consensus on determination of quality.

3.2.3 Benthic Macroinvertebrate Sample Collection

Biological stream monitoring will be conducted twice per year, spring and fall, at 5 locations (Appendix B). The collection of wildlife for scientific and/or educational purposes in Virginia requires a scientific collection permit. Permit applications are available from the Virginia Department of Game and Inland Fisheries (VDGIF) and should be submitted at least 1 month prior to benthic macroinvertebrate sample collection. The permit requires annual renewal and submittal of annual catch report. VDGIF requests to be notified seven days in advance of each sampling event.

The multiple habitat sampling method will be used to characterize the benthic macroinvertebrate community, as outlined in USEPA RBP Section 7.2. This method is used to collect benthic macroinvertebrates from various substrate types and micro-habitats available within a 100-m sampling reach. Sampling begins at the downstream end of the reach and proceeds upstream. Habitats will be sampled by using a 0.3-m wide, 500-micrometer (μm) mesh, D-frame dip net. A total of 20 jabs or kicks are taken from all major habitat types in the reach. A jab consists of forcefully thrusting the net into a productive habitat for a linear distance of 0.5 m. A kick is accomplished by positioning the net and disturbing the substrate for a distance of 0.5 m upstream of the net.

Different types of habitat are to be sampled in approximate proportion to their representation of surface area of total macroinvertebrate habitat in the reach. The habitats sampled typically consist of loose cobble, fallen logs and tree limbs (snags), vegetated banks or undercut banks with exposed plant root material, sand and silt bottom materials, and submerged macrophytes. Other habitats that may be sampled include bedrock, large rocks, boards and litter; and detrital pockets of twigs and leaves. The RBP Benthic Macroinvertebrate Field Data Sheet (Appendix B) will be completed for each sample. This form includes a summary of the percent of each

habitat type present, the number of jabs or kicks taken in each habitat type, and field observations of aquatic biota.

The jab or kick method varies with habitat type. Shallow areas with coarse substrates are sampled by holding the bottom of the dip net against the substrate and kicking the substrate upstream of the net. Submerged woody debris can be sampled by kicking while placing a net downstream, jabbing directly into medium-sized woody debris or by rinsing the woody debris directly into the sieve bucket. Sample submerged undercut banks by jabbing into the habitat. Bump or jab the net along the bottom of plants in the stream to sample rooted macrophytes. Sand and soft sediment can be sampled by bumping the net along the surface of the substrate.

The 20 jabs and kicks will be composited into a 0.5- μ m mesh sieve bucket to obtain a single homogenous sample. The net will be thoroughly back-washed into the sieve bucket every few jabs to facilitate collection of benthic macroinvertebrates that are not readily visible. Large debris will be rinsed and removed from the sieve bucket. Observable benthic macroinvertebrates will be collected from the net with forceps and placed in a labeled, sample container. Small debris will be transferred from the sieve bucket to the sample container. An index card indicating the sample identification, date, stream name, sample location, and sampler name will be placed inside each sample container. The index card will be printed in pencil to prevent dissolution of the label by preservative which will be added by the analytical laboratory.

Benthic macroinvertebrate samples will be placed on ice in coolers and shipped overnight under COC procedures to an accredited benthic macroinvertebrate laboratory. Custody seals will be employed to check for tampering during shipment.

3.2.4 Field Duplicates

Duplicates are collected in the field for surface water analytical samples and benthic macroinvertebrate samples at a frequency of 1 per ten samples. Since there are five sample locations, duplicates will be collected every other sampling event at one sample location. Surface water duplicates will be collected by filling extra grab sample bottles for each analysis. The benthic macroinvertebrate duplicates will be collected from a sample location with habitat available for 2 sets of 20 jabs within the sample reach.

3.3 BENTHIC MACROINVERTEBRATE SAMPLE SORTING

The laboratory will sort, mount, identify, enumerate, evaluate, and classify benthic macroinvertebrates. In addition to sorting and identification of benthic macroinvertebrates, the laboratory staff will perform appropriate benthic macroinvertebrate index calculations and will perform and interpret statistical analyses of the benthic macroinvertebrate database. The

laboratory staff will also utilize the habitat descriptions and evaluations and the field physical/chemical water data parameters collected by field sampling personnel in the evaluation of benthic macroinvertebrates in the context of their physical/chemical habitats at the sampling location.

Samples should be logged in on a designated form or logbook such as the RBP Benthic Macroinvertebrate Sample Log-In Sheet (Appendix C). The log-in should contain the information from the sample label and the number of containers. A minimum of 200 ± 20 percent organisms will be sorted from each benthic macroinvertebrate sample, using the Caton subsampler (Caton 1991). This subsampler consists of square metal frame with a gridded mesh bottom (screen), a plastic tray that accommodates the frame, a square metal “cookie cutter” (cutter), and a metal scoop. The sample will be emptied onto the 500- μ m mesh screen and washed to remove fixative and excess detritus. The sample and screen will then be placed into the tray and enough water added to cover the sample contents. The contents will be evenly distributed over the screen, which will then be lifted from the tray of water so the sample contents will settle onto the screen, which is divided into 6 centimeter (cm) by 6 cm portions (grids). After randomly-selecting four grids and locating them using an alphanumeric designation and crosspieces on the top of the screen, the contents of each grid will be removed using a scoop and a brush. A minimum of four grids will be used to obtain the specified number. If the four grids do not contain 200 ± 20 percent organisms, enough grids will be examined to acquire this number. If the four grids contain too many organisms, they will be emptied into a smaller subsampler of similar design, and four grids randomly chosen for sorting.

The contents from each grid will be transferred to a container, and enough water will be added to keep the organisms moist during the sorting process. The selected subsample will then be taken to the sorting station. Small aliquots of sample will be put into a gridded Petri dish, and the organisms removed, counted and placed into patent lip vials containing 70 percent ethanol by major group (e.g., Trichoptera, Ephemeroptera, Bivalvia, etc.). Vials will be labeled with site, date, major group, number of individuals, and size of subsample. The RBP Benthic Macroinvertebrate Laboratory Bench Sheet (Appendix C) should be completed. The sorted and unsorted portions of the sample will be preserved separately using the original fixative.

Organisms will be identified to the generic/specific level, except for groups such as nematodes, and damaged or very small individuals. Organisms, except oligochaetes and chironomid larvae, will be identified using a stereomicroscope. Oligochaetes and chironomid larvae will be mounted on microscope slides using CMC mounting medium prior to identification using a compound microscope.

3.3.1 Quality Assurance/Quality Control Procedures

Subsequent to benthic macroinvertebrate sample sorting, the residue from a minimum of 10 percent of the samples will be rechecked to document that 95 percent of the total number of organisms has been removed. If there is an error of greater than 5 percent, then all of the samples completed by that particular sorter will be re-examined. The results from these checks will be recorded on the laboratory bench sheets (Appendix C) and will be presented with the other data in the report.

A voucher collection for Prince William County dataset, consisting of one to three specimens for each taxon will be prepared in accordance with the RBP. These slides will be labeled, kept separate from the remaining identifications, and noted on the laboratory bench sheets. A taxonomist not responsible from the original identifications should spot check samples according to the identifications on the bench sheet.

Data will be entered into a standardized Excel spreadsheet and double-checked for accuracy.

3.3.2 Benthic Macroinvertebrate Sample Results Evaluation

Metrics are biological attributes that represent elements of the structure and function of the bottom-dwelling macroinvertebrate assemblage. Metrics are specific measures of diversity, composition, and tolerance to pollution, and when combined into a multimetric index can integrate biological community characteristics and measure the overall response of the community to environmental stressors. Biological metrics include:

- **Taxa Richness** – The number of taxa reflects the health of the community through a measurement of the variety of taxa present. This measure generally increases with increasing water quality, habitat diversity, and/or habitat suitability.
- **Abundance** – The number of individual organisms found at each location. This measure can indicate whether an area is supporting a large, and when coupled with taxa richness, diverse community.
- **EPT Index (Ephemeroptera/Plecoptera/Trichoptera [mayflies/stoneflies/caddisflies])** – The EPT Index is the total number of distinct taxa within these three orders. This value summarizes taxa richness within the insect orders that are generally considered to be the most sensitive to pollution.
- **EPT/EPT + Chironomidae (midgeflies) Ratio** – A measure of abundance ratio of these two groupings indicates the balance of the benthic community diversity.

- **Percent Dominant Taxon** – This measure is the percentage occurrence of the most dominant taxon for each location. This measure is based on the assumption that dominance by a single taxon reflects an impaired community.
- **Percent Chironomidae** -- This measure is the ratio of the abundance of Chironomidae to the total number of organisms found in a replicate. The response of this measure is to increase with increased perturbation.
- **Biotic Index (BI)** – The BI assigns tolerance values to individual taxa ranging from 0 to 10, with 0 being intolerant of pollution and 10 being very tolerant of pollution. The tolerance values assigned to the various taxa are taken from a variety of sources that best reflect the area sampled, such as Bode et al. (2002), Klemm et al. (1990), Hilsenhoff (1987), North Carolina Department of Environment, Health, and Natural Resources (2003), and the Tennessee Department of Environment and Conservation (2011). The formula for calculating the BI is:

$$BI = \sum [(tv)_i n_i / N]$$

where:

- (tv)_i = the tolerance value of the ith taxon,
- n_i = the abundance of the ith taxon, and
- N = the total number of individuals in the sample.

- **Percent Model Affinity (PMA)** – The PMA expresses the sample as the percentage composition of seven major organism groups (Chironomidae, Trichoptera, Ephemeroptera, Plecoptera, Coleoptera [beetles], Oligochaeta [aquatic segmented worms], and others) and compares it to an ideal community composition derived from data from unpolluted streams (Bode et al., 2002). The degree of affinity of the sample percentage composition with that of the ideal is used to make a judgment about the water quality of the stream being studied.

Additional biological metrics will be used, if appropriate, such as:

- percentage oligochaetes + chironomids,
- percentage scrapers/scrapers + filterers,
- percentage clingers
- percentage EPT,
- percentage Oligochaeta,
- percentage Hydropsychidae/Trichoptera, and
- number of taxa in each tolerance category.

VDEQ has developed the Virginia Stream Condition Index (VSCI) (TetraTech 2003) that predicts the health of Virginia's non-coastal streams. The VSCI uses biological, physical, and chemical conditions from a least disturbed reference site within the region and has been statistically calibrated by VDEQ data. Eight VSCI metrics are combined in a multimetric approach to identify biological impairment as discussed in the VDEQ 2008 Quality Assurance Project Plan (VDEQ 2008). The eight biological measures used in the VSCI are: total taxa, EPT taxa, percent Ephemeroptera, percent Plecoptera-Trichoptera less Hydropsychidae, percent scrapers, percent Chironomidae, percent top 2 dominant taxa, and biotic index. Prince William County benthic macroinvertebrate samples will be evaluated using the VSCI.

3.3 REPORTING

An annual summary report will be prepared following each year of sampling. This report will summarize the macroinvertebrate and in-stream monitoring results and analyses, and include an interpretation of the data with respect to long-term patterns and trends. Initial or first year results from sampling and analysis will serve as a benchmark at each station for subsequent sampling events, and for comparative analysis performed on a station-by-station basis. Report appendices will include data and documentation from that year of sampling events.

4.0 REFERENCES

- Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish. 2nd ed. EPA 841-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.
- Bode, R. W., M. A. Novak, L. E. Abele, D. L. Heitzman, and A. J. Smith. 2002. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYS Dept. Environ. Conserv., Division of Water Albany. 115 pp.
- Caton, L. W. 1991. Improved Subsampling Methods for the EPA "Rapid Bioassessment" Benthic Protocols. Bull. N. Amer. Benthological Soc. 8: 317-319.
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- Klemm, D. J., P. A. Lewis, F. Fulk, and J. M. Lazorchak, 1990. Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters. EPA/600/4-90/030. U.S. Environmental Protection Agency, Cincinnati. 256 pp.
- North Carolina Department of Environment, Health, and Natural Resources. 2003. Standard Operating Procedures for Benthic Invertebrates. NCDENR Biological Assessment Unit.
- Tennessee Department of Environment and Conservation. 2011. Division of Water Pollution Control. Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys.
- TetraTech, 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Owings Mill, MD. September 2003.
- Virginia Department of Environmental Quality, 2008. Biological Monitoring Program Quality Assurance Project Plan for Wadeable Streams and Rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, VA. August 2008.

**APPENDIX A
SAMPLING STATIONS**



Little Bull Run - Catharpin Road



1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Little Bull Run - Catharpin Road



1 in = 400 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

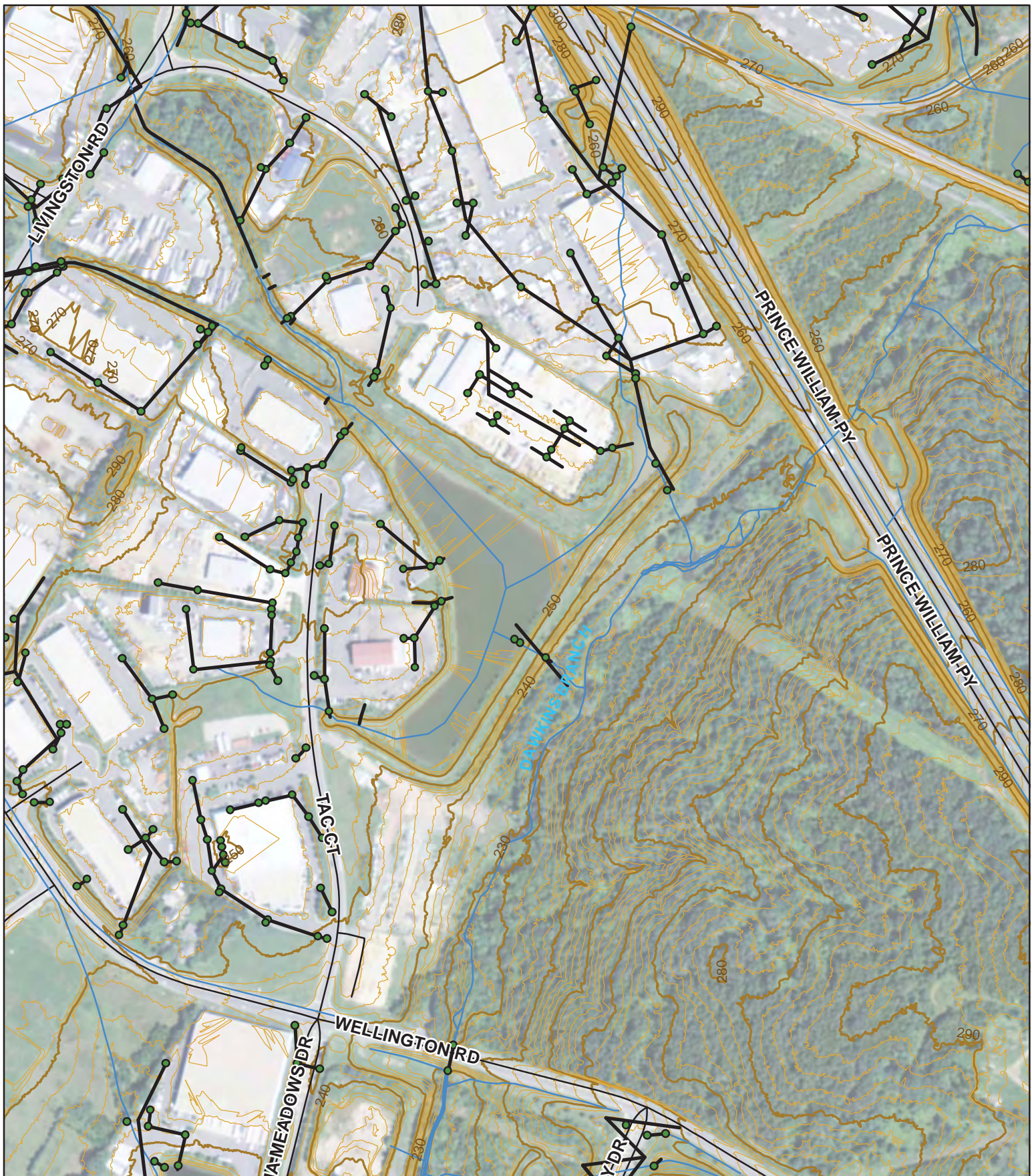


Dawkins Branch - Wellington Road



1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Dawkins Branch - Wellington Road



1 in = 400 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA/USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Purcell Branch - Purcell Road



1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

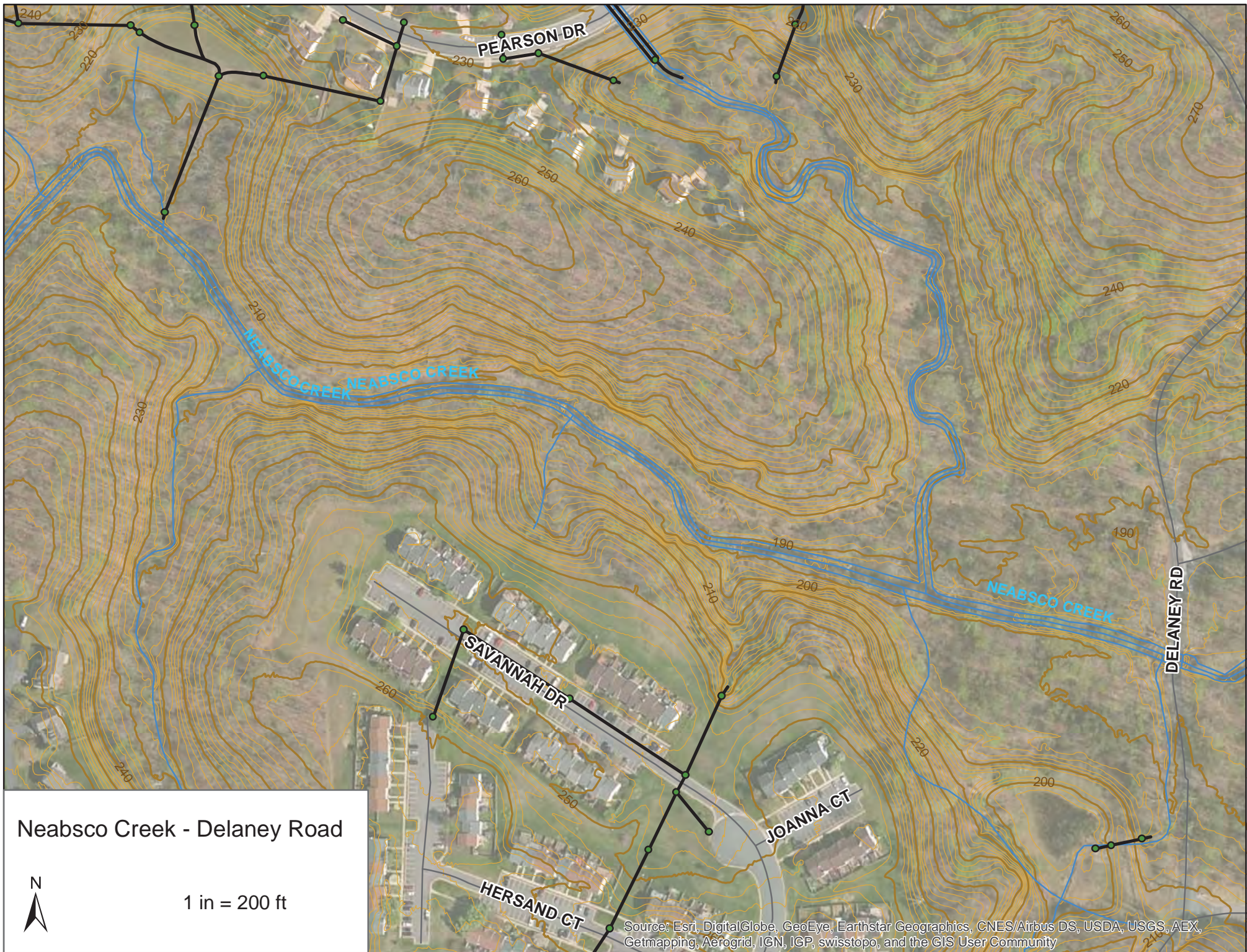


Purcell Branch - Purcell Road



1 in = 400 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Neabsco Creek - Delaney Road



1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Neabsco Creek - Delaney Road



1 in = 400 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Cow Branch - Mellott Road



1 in = 200 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Cow Branch - Mellott Road



1 in = 400 ft

Source: Esri, DigitalGlobe, GeoEye, Earthstar/Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**APPENDIX B
FIELD FORMS**

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME _____	LOCATION _____	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS _____		
FORM COMPLETED BY _____	DATE _____ AM PM	REASON FOR SURVEY _____

WEATHER CONDITIONS	Now <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> % _____ <input type="checkbox"/>	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No Air Temperature _____ °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____		
	Stream Type <input type="checkbox"/> Coldwater <input type="checkbox"/> Warmwater Catchment Area _____ km ²		

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(BACK)**

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	Local Watershed NPS Pollution <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources Local Watershed Erosion <input type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length _____ m Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded Estimated Stream Width _____ m High Water Mark _____ m Sampling Reach Area _____ m ² Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____% <input type="checkbox"/> Run _____% <input type="checkbox"/> Pool _____% Area in km ² (m ² x1000) _____ km ² Estimated Stream Depth _____ m Surface Velocity _____ m/sec Channelized <input type="checkbox"/> Yes <input type="checkbox"/> No (at thalweg) Dam Present <input type="checkbox"/> Yes <input type="checkbox"/> No	
LARGE WOODY DEBRIS	LWD _____ m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation _____%	
WATER QUALITY	Temperature _____ °C Water Odors <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ Specific Conductance _____ Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs <input type="checkbox"/> Flecks <input type="checkbox"/> None <input type="checkbox"/> Other _____ Dissolved Oxygen _____ pH _____ Turbidity (if not measured) <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____ Turbidity _____ WQ Instrument Used _____	
SEDIMENT/SUBSTRATE	Odors <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other _____ Oils <input type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME _____		LOCATION _____	
STATION # _____ RIVERMILE _____		STREAM CLASS _____	
LAT _____ LONG _____		RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____			
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category																			
		Optimal				Suboptimal				Marginal				Poor							
Parameters to be evaluated broader than sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.				Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.				Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.				Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.				Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.				Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.				Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.				Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.				Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.				Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.							
	Note: determine left or right side by facing downstream.																				
	SCORE ___ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0		
SCORE ___ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0			
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.				70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.				50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.				Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.							
	SCORE ___ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0		
	SCORE ___ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0		
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.				Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.				Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.				Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.							
	SCORE ___ (LB)	Left Bank	10	9			8	7	6			5	4	3			2	1	0		
	SCORE ___ (RB)	Right Bank	10	9			8	7	6			5	4	3			2	1	0		

Total Score _____

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME _____		LOCATION _____	
STATION # _____ RIVERMILE _____		STREAM CLASS _____	
LAT _____ LONG _____		RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____			
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category																			
		Optimal				Suboptimal				Marginal				Poor							
Parameters to be evaluated broader than sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.				Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.				Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.				Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)				The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.				The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.				Channel straight; waterway has been channelized for a long distance.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.				Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.				Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.				Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.				70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.				50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.				Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.				Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.				Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.				Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME _____		LOCATION _____	
STATION # _____	RIVERMILE _____	STREAM CLASS _____	
LAT _____	LONG _____	RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____		LOT NUMBER _____	
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

HABITAT TYPES	Indicate the percentage of each habitat type present <input type="checkbox"/> Cobble _____% <input type="checkbox"/> Snags _____% <input type="checkbox"/> Vegetated Banks _____% <input type="checkbox"/> Sand _____% <input type="checkbox"/> Submerged Macrophytes _____% <input type="checkbox"/> Other (_____) _____%
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other _____ How were the samples collected? <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat Indicate the number of jabs/kicks taken in each habitat type. <input type="checkbox"/> Cobble _____ <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other (_____) _____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3 = Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3 = Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

YSI Calibration Form

Project: _____
 Date: _____
 Pre-Calibration Time (24-hr Clock): _____
 Post-Calibration Time (24-hr Clock): _____

Pine Sonde ID No.: _____
 Pine Handset ID No.: _____
 Battery Voltage (%): _____

Prior to Operation - Check the Following Items:

- Ensure Equipment is Operable Prior to Mobilization - Checked By _____
- Attach Carabiner to Sonde
- Attach Safety Line (Non-Wadeable Conditions) NA (Wadeable Conditions)
- Check Batteries/Back-Up Batteries



User Tips:

Keep the handset and sonde in the shade when not in use (i.e., cooler, bucket, bin).
 Keep the sensors damp between readings, check the sponge to ensure adequate moisture.
 Do not keep the slotted cover on the sonde between readings or sites, or during mobilization.
 If the calibration is "outside of range", call Pine Environmental at (770) 925-2855 or (800) 842-1088 for assistance, or for instructions to reset the default calibration settings.

Pre- Post-
 Calibration Calibration

DISSOLVED OXYGEN (DO)			
Was DO membrane changed? Yes, Time/Date: _____ <input type="checkbox"/> No <input type="checkbox"/> NA (optical sensor)			
Current Air Temperature °C (meter reading):			
Current Barometric Pressure (from Weather Channel or NOAA.gov, which is corrected to sea level):	<input type="checkbox"/> NA (YSI includes barometer)		
Elevation Corrected Barometric Pressure to enter into YSI DO calibration (or YSI barometer reading if available):	Ex.: 30.02 in. Hg x 25.4 = mm Hg; subtract 2.54 mm Hg for every 100 ft. above sea level: 565/100 x 2.54 = 14.4 mm Hg Elevation: Calvert, AL is 50 ft, and Athens, GA site is 700 ft.		
DO concentration before Calibration (mg/L):			
DO concentration after Calibration (mg/L):			
CONDUCTIVITY [Note: Calibrate before pH]			
Temperature (°C)			
Reading before Calibration (mS/cm ²)			
Reading AFTER Calibration (mS/cm ²)			
pH			
pH 7.0 value before calibration:			
pH 7.0 value after calibration:			
pH 7.0 mV (range is -50 to +50 mV):			
pH 10.0 value before calibration:			
pH 10.0 value after calibration:			
pH 10.0 mV (range is -130 to -230 mV):			
pH 4.0 value before calibration:			
pH 4.0 value after calibration:			
pH 4.0 mV (range is 130 to 230 mV):			
OXIDATION/REDUCTION POTENTIAL (ORP)			
Calibration Temperature (°C):			
Reading before calibration (mV):			
Reading after calibration (mV):			
TURBIDITY			
0 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
1 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
10 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
126 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:

Pre-Calibrated By: _____

Post-Calibrated By: _____

Checked by: _____

**APPENDIX C
LABORATORY FORMS**

BENTHIC MACROINVERTEBRATE SAMPLE LOG-IN SHEET

Date Collected	Collected By	Number of Containers	Preservation	Station #	Stream Name and Location	Date Received by Lab	Lot Number	Date of Completion		
								sorting	mounting	identification

Serial Code Example: B0754001(1)
 B = Benthos (F = Fish; P = Periphyton) ■ 0754 = project number ■ 001 = sample number ■ (1) = lot number (e.g., winter 1996 = 1; summer 1996 = 2)

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BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page _____ of _____

STREAM NAME _____	LOCATION _____
STATION # _____ RIVERMILE _____	STREAM CLASS _____
LAT _____ LONG _____	RIVER BASIN _____
STORET # _____	AGENCY _____
COLLECTED BY _____ DATE _____	LOT # _____
TAXONOMIST _____ DATE _____	SUBSAMPLE TARGET <input type="checkbox"/> 100 <input type="checkbox"/> 200 <input type="checkbox"/> 300 <input type="checkbox"/> Other _____

Enter Family and/or Genus and Species name on blank line.

Organisms	No.	LS	TI	TCR	Organisms	No.	LS	TI	TCR
Oligochaeta					Megaloptera				
Hirudinea					Coleoptera				
Isopoda									
Amphipoda					Diptera				
Decapoda									
Ephemeroptera					Gastropoda				
					Pelecypoda				
Plecoptera									
					Other				
Trichoptera									
Hemiptera									

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms _____

Total No. Taxa _____

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (BACK)

<p>SUBSAMPLING/SORTING INFORMATION</p> <p>Sorter _____</p> <p>Date _____</p>	<p>Number of grids picked: _____</p> <p>Time expenditure _____ No. of organisms _____</p> <p>Indicate the presence of large or obviously abundant organisms:</p> <p>_____</p> <hr/> <p>QC: <input type="checkbox"/> YES <input type="checkbox"/> NO QC Checker _____</p> <div style="text-align: center;"> <table style="margin: auto;"> <tr> <td style="text-align: center;"># organisms originally sorted</td> <td style="text-align: center;">÷</td> <td style="text-align: center;">(</td> <td style="text-align: center;"># organisms recovered by checker</td> <td style="text-align: center;">+</td> <td style="text-align: center;"># organisms originally sorted</td> <td style="text-align: center;">)</td> <td style="text-align: center;">=</td> <td style="text-align: center;">% sorting efficiency</td> </tr> <tr> <td style="text-align: center;">[]</td> <td></td> <td></td> <td style="text-align: center;">[]</td> <td></td> <td style="text-align: center;">[]</td> <td></td> <td></td> <td style="text-align: center;">[]</td> </tr> </table> </div> <p>≥90%, sample passes _____</p> <p><90%, sample fails, action taken _____</p> <hr/>	# organisms originally sorted	÷	(# organisms recovered by checker	+	# organisms originally sorted)	=	% sorting efficiency	[]			[]		[]			[]
# organisms originally sorted	÷	(# organisms recovered by checker	+	# organisms originally sorted)	=	% sorting efficiency											
[]			[]		[]			[]											
<p>TAXONOMY</p> <p>ID _____</p> <p>Date _____</p>	<p>Explain TCR ratings of 3-5:</p> <p>Other Comments (e.g. condition of specimens):</p> <p>_____</p> <hr/> <p>QC: <input type="checkbox"/> YES <input type="checkbox"/> NO QC Checker _____</p> <table style="width:100%;"> <tr> <td style="width:50%;">Organism recognition</td> <td style="width:25%;"><input type="checkbox"/> pass</td> <td style="width:25%;"><input type="checkbox"/> fail</td> </tr> <tr> <td>Verification complete</td> <td><input type="checkbox"/> YES</td> <td><input type="checkbox"/> NO</td> </tr> </table>	Organism recognition	<input type="checkbox"/> pass	<input type="checkbox"/> fail	Verification complete	<input type="checkbox"/> YES	<input type="checkbox"/> NO												
Organism recognition	<input type="checkbox"/> pass	<input type="checkbox"/> fail																	
Verification complete	<input type="checkbox"/> YES	<input type="checkbox"/> NO																	

General Comments (use this space to add additional comments):

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME _____	LOCATION _____	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS _____		
FORM COMPLETED BY _____	DATE _____ AM PM	REASON FOR SURVEY _____

WEATHER CONDITIONS	Now <input type="checkbox"/> storm (heavy rain) <input type="checkbox"/> rain (steady rain) <input type="checkbox"/> showers (intermittent) <input type="checkbox"/> %cloud cover _____ <input type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> % _____	Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No Air Temperature _____ °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)		
STREAM CHARACTERIZATION	Stream Subsystem <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal		Stream Type <input type="checkbox"/> Coldwater <input type="checkbox"/> Warmwater
	Stream Origin <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed <input type="checkbox"/> Non-glacial montane <input type="checkbox"/> Mixture of origins <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____		Catchment Area _____ km ²

**PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(BACK)**

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	Local Watershed NPS Pollution <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources Local Watershed Erosion <input type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length _____ m Canopy Cover <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded Estimated Stream Width _____ m High Water Mark _____ m Sampling Reach Area _____ m ² Proportion of Reach Represented by Stream Morphology Types <input type="checkbox"/> Riffle _____% <input type="checkbox"/> Run _____% <input type="checkbox"/> Pool _____% Area in km ² (m ² x1000) _____ km ² Estimated Stream Depth _____ m Surface Velocity _____ m/sec Channelized <input type="checkbox"/> Yes <input type="checkbox"/> No (at thalweg) Dam Present <input type="checkbox"/> Yes <input type="checkbox"/> No	
LARGE WOODY DEBRIS	LWD _____ m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae dominant species present _____ Portion of the reach with aquatic vegetation _____%	
WATER QUALITY	Temperature _____ °C Water Odors <input type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Specific Conductance _____ <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Dissolved Oxygen _____ <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ pH _____ Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs <input type="checkbox"/> Flecks <input type="checkbox"/> None <input type="checkbox"/> Other _____ Turbidity _____ Turbidity (if not measured) <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid WQ Instrument Used _____ <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____	
SEDIMENT/SUBSTRATE	Odors <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ Oils <input type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input type="checkbox"/> No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME _____		LOCATION _____	
STATION # _____ RIVERMILE _____		STREAM CLASS _____	
LAT _____ LONG _____		RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____			
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category																									
		Optimal					Suboptimal					Marginal					Poor										
Parameters to be evaluated broader than sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.										
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0					
	7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.					Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.					Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.					Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.										
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0					
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.										
	Note: determine left or right side by facing downstream.																										
	SCORE ___ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0	Right Bank		10	9	8	7	6	5	4	3	2	1	0
	SCORE ___ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0	Left Bank		10	9	8	7	6	5	4	3	2	1	0
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.										
	SCORE ___ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0	Right Bank		10	9	8	7	6	5	4	3	2	1	0
	SCORE ___ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0	Left Bank		10	9	8	7	6	5	4	3	2	1	0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.										
	SCORE ___ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0	Right Bank		10	9	8	7	6	5	4	3	2	1	0
	SCORE ___ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0	Left Bank		10	9	8	7	6	5	4	3	2	1	0

Total Score _____

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME _____		LOCATION _____	
STATION # _____ RIVERMILE _____		STREAM CLASS _____	
LAT _____ LONG _____		RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____			
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (BACK)

	Habitat Parameter	Condition Category																			
		Optimal				Suboptimal				Marginal				Poor							
Parameters to be evaluated broader than sampling reach	6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.				Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.				Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.				Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)				The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.				The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.				Channel straight; waterway has been channelized for a long distance.							
	SCORE	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	8. Bank Stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.				Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.				Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.				Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							
	9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.				70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.				50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.				Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.				Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.				Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.				Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.							
	SCORE __ (LB)	Left Bank		10	9	8	7	6	5	4	3	2	1	0							
	SCORE __ (RB)	Right Bank		10	9	8	7	6	5	4	3	2	1	0							

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME _____		LOCATION _____	
STATION # _____	RIVERMILE _____	STREAM CLASS _____	
LAT _____	LONG _____	RIVER BASIN _____	
STORET # _____		AGENCY _____	
INVESTIGATORS _____		LOT NUMBER _____	
FORM COMPLETED BY _____		DATE _____ TIME _____ AM PM	REASON FOR SURVEY _____

HABITAT TYPES	Indicate the percentage of each habitat type present <input type="checkbox"/> Cobble _____% <input type="checkbox"/> Snags _____% <input type="checkbox"/> Vegetated Banks _____% <input type="checkbox"/> Sand _____% <input type="checkbox"/> Submerged Macrophytes _____% <input type="checkbox"/> Other (_____) _____%
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other _____ How were the samples collected? <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat Indicate the number of jabs/kicks taken in each habitat type. <input type="checkbox"/> Cobble _____ <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other (_____) _____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3 = Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3 = Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

YSI Calibration Form

Project: _____
 Date: _____
 Pre-Calibration Time (24-hr Clock): _____
 Post-Calibration Time (24-hr Clock): _____

Pine Sonde ID No.: _____
 Pine Handset ID No.: _____
 Battery Voltage (%): _____

Prior to Operation - Check the Following Items:

- Ensure Equipment is Operable Prior to Mobilization - Checked By _____
- Attach Carabiner to Sonde
- Attach Safety Line (Non-Wadeable Conditions) NA (Wadeable Conditions)
- Check Batteries/Back-Up Batteries



User Tips:

Keep the handset and sonde in the shade when not in use (i.e., cooler, bucket, bin).
 Keep the sensors damp between readings, check the sponge to ensure adequate moisture.
 Do not keep the slotted cover on the sonde between readings or sites, or during mobilization.
 If the calibration is "outside of range", call Pine Environmental at (770) 925-2855 or (800) 842-1088 for assistance, or for instructions to reset the default calibration settings.

Pre- Post-
 Calibration Calibration

DISSOLVED OXYGEN (DO)			
Was DO membrane changed? Yes, Time/Date: _____ <input type="checkbox"/> No <input type="checkbox"/> NA (optical sensor)			
Current Air Temperature °C (meter reading):			
Current Barometric Pressure (from Weather Channel or NOAA.gov, which is corrected to sea level):	<input type="checkbox"/> NA (YSI includes barometer)		
Elevation Corrected Barometric Pressure to enter into YSI DO calibration (or YSI barometer reading if available):	Ex.: 30.02 in. Hg x 25.4 = mm Hg; subtract 2.54 mm Hg for every 100 ft. above sea level: 565/100 x 2.54 = 14.4 mm Hg Elevation: Calvert, AL is 50 ft, and Athens, GA site is 700 ft.		
DO concentration before Calibration (mg/L):			
DO concentration after Calibration (mg/L):			
CONDUCTIVITY [Note: Calibrate before pH]			
Temperature (°C)			
Reading before Calibration (mS/cm ²)			
Reading AFTER Calibration (mS/cm ²)			
pH			
pH 7.0 value before calibration:			
pH 7.0 value after calibration:			
pH 7.0 mV (range is -50 to +50 mV):			
pH 10.0 value before calibration:			
pH 10.0 value after calibration:			
pH 10.0 mV (range is -130 to -230 mV):			
pH 4.0 value before calibration:			
pH 4.0 value after calibration:			
pH 4.0 mV (range is 130 to 230 mV):			
OXIDATION/REDUCTION POTENTIAL (ORP)			
Calibration Temperature (°C):			
Reading before calibration (mV):			
Reading after calibration (mV):			
TURBIDITY			
0 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
1 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
10 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:
126 NTU Turbidity Standard	<input type="checkbox"/> NA (No Standard)	Before Cal:	After Cal:

Pre-Calibrated By: _____

Post-Calibrated By: _____

Checked by: _____

BENTHIC MACROINVERTEBRATE SAMPLE LOG-IN SHEET

Date Collected	Collected By	Number of Containers	Preservation	Station #	Stream Name and Location	Date Received by Lab	Lot Number	Date of Completion		
								sorting	mounting	identification

Serial Code Example: B0754001(1)

B = Benthos (F = Fish; P = Periphyton) ■ 0754 = project number ■ 001 = sample number ■ (1) = lot number (e.g., winter 1996 = 1; summer 1996 = 2)

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BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (FRONT)

page _____ of _____

STREAM NAME _____		LOCATION _____
STATION # _____	RIVERMILE _____	STREAM CLASS _____
LAT _____	LONG _____	RIVER BASIN _____
STORET # _____		AGENCY _____
COLLECTED BY _____	DATE _____	LOT # _____
TAXONOMIST _____	DATE _____	SUBSAMPLE TARGET <input type="checkbox"/> 100 <input type="checkbox"/> 200 <input type="checkbox"/> 300 <input type="checkbox"/> Other _____

Enter Family and/or Genus and Species name on blank line.

Organisms	No.	LS	TI	TCR	Organisms	No.	LS	TI	TCR
Oligochaeta					Megaloptera				
Hirudinea					Coleoptera				
Isopoda									
Amphipoda					Diptera				
Decapoda									
Ephemeroptera					Gastropoda				
					Pelecypoda				
Plecoptera									
					Other				
Trichoptera									
Hemiptera									

Taxonomic certainty rating (TCR) 1-5: 1=most certain, 5=least certain. If rating is 3-5, give reason (e.g., missing gills). LS= life stage: I = immature; P = pupa; A = adult TI = Taxonomists initials

Total No. Organisms _____

Total No. Taxa _____

BENTHIC MACROINVERTEBRATE LABORATORY BENCH SHEET (BACK)

<p>SUBSAMPLING/SORTING INFORMATION</p> <p>Sorter _____</p> <p>Date _____</p>	<p>Number of grids picked: _____</p> <p>Time expenditure _____ No. of organisms _____</p> <p>Indicate the presence of large or obviously abundant organisms:</p> <p>_____</p> <hr/> <p>QC: <input type="checkbox"/> YES <input type="checkbox"/> NO QC Checker _____</p> <div style="text-align: center;"> $\begin{matrix} \# \text{ organisms} \\ \text{originally sorted} \end{matrix} \div \left(\begin{matrix} \# \text{ organisms} \\ \text{recovered by} \\ \text{checker} \end{matrix} + \begin{matrix} \# \text{ organisms} \\ \text{originally sorted} \end{matrix} \right) = \begin{matrix} \% \text{ sorting} \\ \text{efficiency} \end{matrix}$ <div style="display: flex; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; width: 50px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 20px;">÷</div> <div style="border: 1px solid black; width: 50px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 20px;">+</div> <div style="border: 1px solid black; width: 50px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> <div style="font-size: 20px;">)</div> <div style="font-size: 20px;">=</div> <div style="border: 1px solid black; width: 50px; height: 20px; display: flex; align-items: center; justify-content: center;"> </div> </div> <p>≥90%, sample passes _____</p> <p><90%, sample fails, action taken _____</p> </div>
<p>TAXONOMY</p> <p>ID _____</p> <p>Date _____</p>	<p>Explain TCR ratings of 3-5:</p> <p>_____</p> <p>Other Comments (e.g. condition of specimens):</p> <p>_____</p> <hr/> <p>QC: <input type="checkbox"/> YES <input type="checkbox"/> NO QC Checker _____</p> <div style="display: flex; justify-content: space-between;"> <div>Organism recognition</div> <div><input type="checkbox"/> pass</div> <div><input type="checkbox"/> fail</div> </div> <div style="display: flex; justify-content: space-between;"> <div>Verification complete</div> <div><input type="checkbox"/> YES</div> <div><input type="checkbox"/> NO</div> </div>

General Comments (use this space to add additional comments):

To: Robert Jocz, Environmental Engineer, Prince William County
 From: Lynne Mowery, Amec Foster Wheeler
 Cc:
 Date: 2/5/16
 Re: Site Reconnaissance Technical Memorandum

Prince William County (County) is required to conduct biological stream monitoring through Section I.C.1 of its MS4 permit, dated December 17, 2014. The permit requires the County to monitor five stream sites twice per year using an approach based on ‘USEPA’s Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers’ (RBP). The monitoring shall include an assessment of the benthic macroinvertebrate community and habitat assessment.

The County has selected five sites for biological monitoring that correspond to the locations of its stream monitoring program:

- A. Cow Branch at Mellot Road
- B. Neabsco Creek at Delaney Road
- C. Purcell Branch at Purcell Road
- D. Dawkins Branch at Wellington Road
- E. Little Bull Run at Catharpin Road

Amec Foster Wheeler staff conducted site reconnaissance visits during the week of 12/14/15, and selected five sampling locations pending County approval. Prior to conducting site visits, Amec Foster Wheeler developed a site evaluation protocol based on the RBP. This protocol incorporates three components used to characterize water quality within a watershed: (1) physical and chemical data, (2) habitat assessment, and (3) benthic macroinvertebrate collection. These initial reconnaissance visits focused on the first two components since they are indicative of a stream reach’s suitability for supporting a diverse aquatic community.

Amec Foster Wheeler completed a desktop analysis of the five proposed sites prior to conducting site reconnaissance. This included delineating total catchment area draining to each stream branch, characterizing the surrounding land use, and identifying potential ‘problem areas’ along each stream reach that could be the result of tributaries and stormwater outfalls.

Before conducting a habitat evaluation at each site, site investigators identified a stream reach located greater than 100 meters upstream from road crossings or major tributaries that contained a variety of habitat types. Site evaluations involved recording representative measurements of physical channel characteristics (width, depth, velocity) and completing a ‘baseline’ habitat assessment *according to RBP Appendix A-1: Habitat Assessment and Physicochemical Characterization Field Data Sheets*. These habitat assessments are designed to allow an assessor to objectively score each stream on a number of parameters (e.g. bank stability, velocity/depth regime, channel alteration, etc.) which evaluate the stream’s suitability to support a diverse aquatic community representative of water quality throughout its contributing catchment. These baseline analyses were compiled within Amec Foster Wheeler’s database and will inform future water quality investigations at these monitoring sites.

Suitable monitoring reaches spanning greater than 100 meters were identified at each of the County-recommended sites, though Amec Foster Wheeler has offered alternative initial sampling points due to field observations of contributing features surrounding the stream within the upstream, downstream, or riparian areas.

Appendix A: Site Recommendations

Location	Little Bull Run; Gainesville (sampled 12/14)
Accessibility	Via roadway, wide shoulder at crossing.
Surrounding Landscape	High density development and golf courses immediately surrounding site. Upstream representative reach is heavily forested.
Instream Conditions	Sanitary sewer crossing immediately upstream of bridge creates a backwater effect. Upstream reach has good mix of riffles and runs.
Recommended Site	Upstream from bridge and sewer crossing backwater.
Other	Potential illicit discharge – foamy deposit observed.

Location	Dawkins Branch; Manassas (sampled 12/14)
Accessibility	Via roadway, pull off point to gated entry. Site has been used for illegal dumping (TV and refuse observed).
Surrounding Landscape	Surrounding industrial/commercial land use. Construction contractor storage site downstream of representative reach where silt fence appears to be only partially effective.
Instream Conditions	Beaver dam upstream of representative reach which acts as additional in-line detention. Dam is susceptible to overtopping and breaching during larger storm events. Downstream reach is starved of sediment during periods of lower flow due to the trapping efficiency of the beaver dam. Additional flow impediments downstream such as LWD in channel.
Recommended Site	Downstream from beaver dam. May be subject to influence from large sediment slug flows following dam rupture.
Other	Unmapped outfall discovered downstream from representative reach, unknown contribution from surrounding development.

Location	Purcell Branch; Manassas (sampled 12/16)
Accessibility	Via roadway, wide shoulder after bridge.
Surrounding Landscape	Old agricultural fencing is evidence of previous land usage as pasture. Surrounding watershed contains low density development and forested areas.
Instream Conditions	Banks are severely incised (>2m) at first bend, apparently resulting from stormwater drainage from residential development outfall. Old silt fencing visible along bank. Long, deep run lies upstream, containing significant leaf pack and numerous fish. Suitable stretch identified upstream from deeper run, with mixture of riffles, runs, and pools.
Recommended Site	Representative reach lies ~1/4 mile upstream from county-recommended site, but other reaches do not capture habitat diversity.
Other	Some stormwater outfalls downstream of recommended site, but site is >100m from potential mixing points.

Location	Neabsco Creek; Dale City / Woodbridge (sampled 12/16)
Accessibility	Accessed via trail at end of Savannah Drive, limited public parking available.
Surrounding Landscape	Watershed contains highest proportion of forested to developed area.
Instream Conditions	Well forested riparian border provides ideal bank conditions, and best-observed habitat variability. Furthest downstream reach has a sanitary sewer crossing creating a backwater area, also fed by heavily incised urban stream and the accompanying sediment. Little to no fish observed in reach despite habitat variability, likely due to presence of sewer crossing acting as migration barrier
Recommended Site	Upstream from backwater area.
Other	Insignificant contributions from outfalls running down into stream valley.

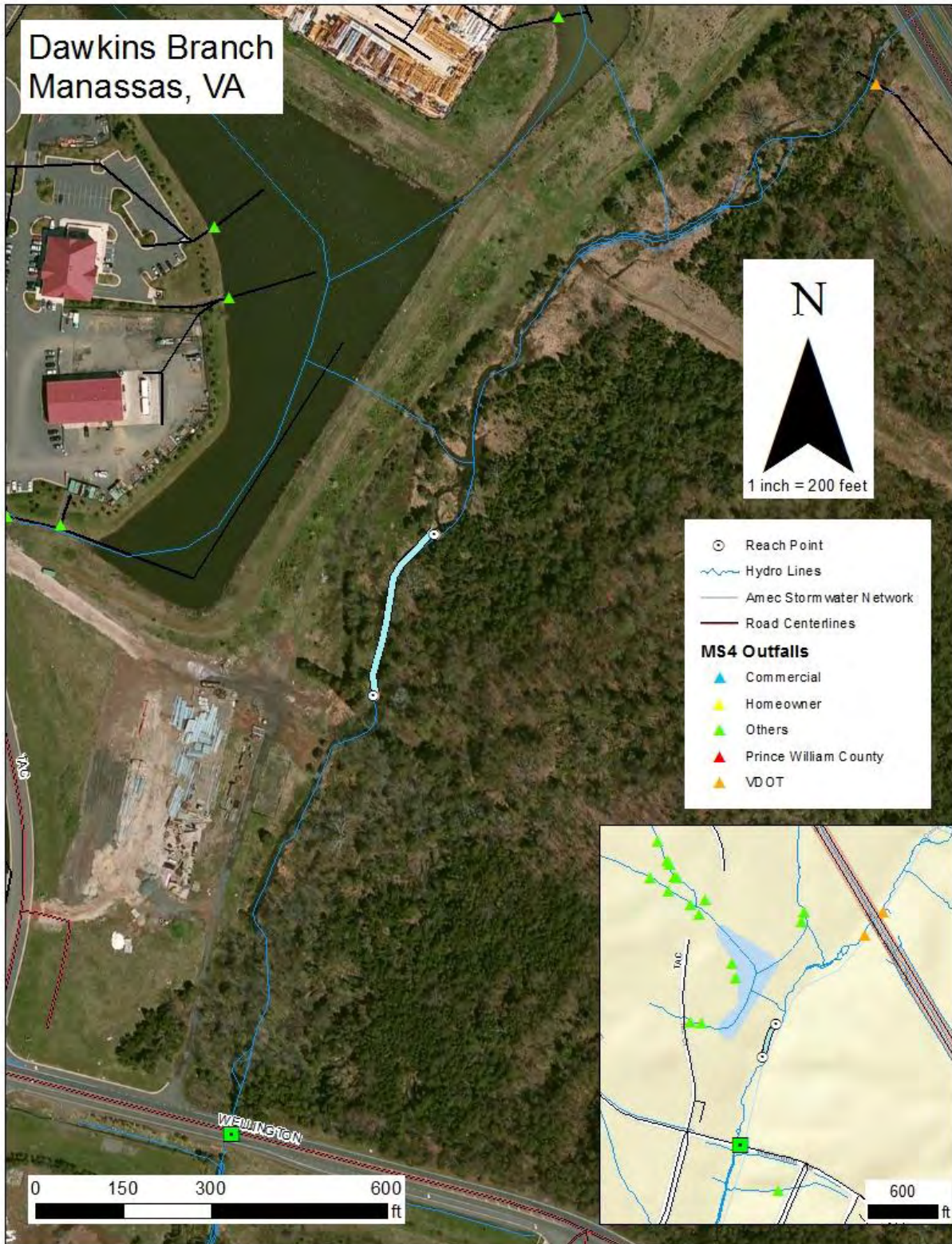
Location	Cow Branch; Woodbridge (sampled 12/16)
Accessibility	Mellot Road is private drive, but property owner indicated we had permission. Future notification is recommended.
Surrounding Landscape	Rapidly developed high-density housing contributes high volume and intensity of stormwater runoff.
Instream Conditions	Evidence of heavy bank armoring using VDOT CLASS I & II riprap along majority of branch between Opitz Blvd. and Jefferson Davis Hwy. Heavily armored banks, denuded riparian area upstream from bridge at Mellot Rd. Stormwater outfall proximity is unfavorable to benthic macroinvertebrate sampling. Habitat downstream of bridge is more suitable, with a mature forested riparian area.
Recommended Site	~200m downstream from bridge provides adequate habitat variety, although macroinvertebrate population likely to be smaller due to recent restoration efforts.
Other	Has any benthic monitoring of the recommended reach been conducted before or after recent stream restoration?

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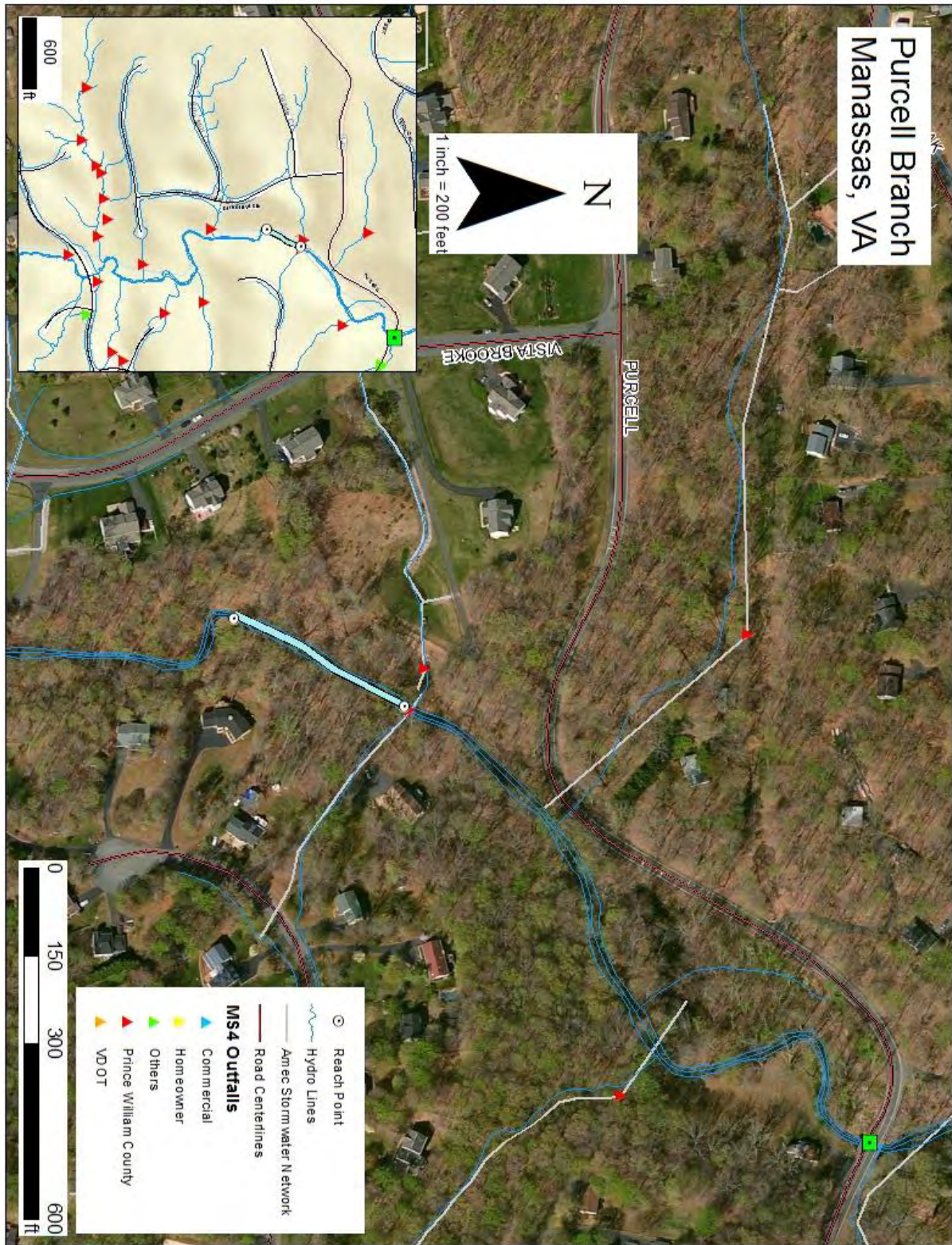
Appendix B: Site Maps



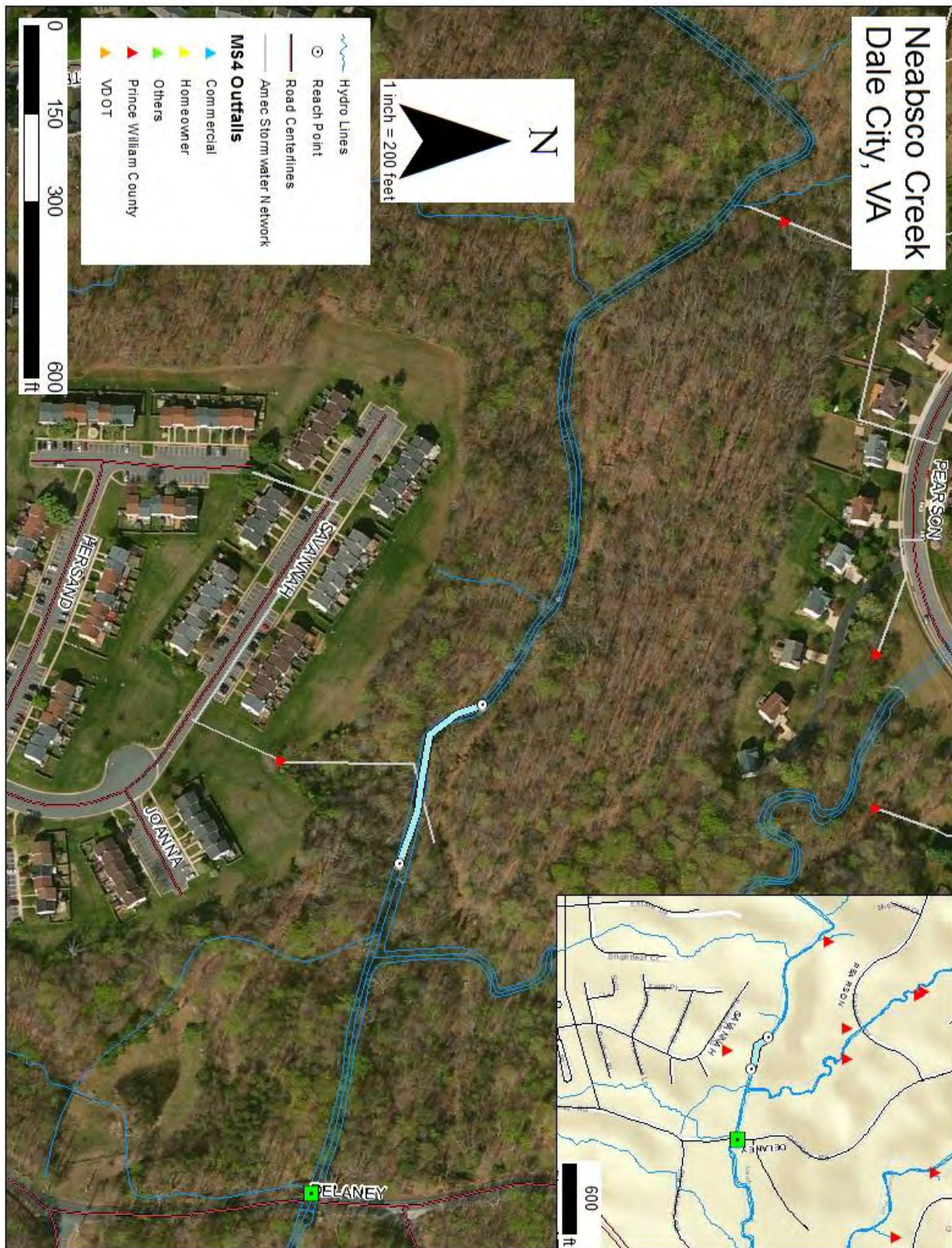
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Appendix C: Site Photos

Little Bull Run



Figure 1: Backwater area created by sanitary sewer crossing. Sampling reach lies upstream.



Figure 2: Looking upstream at beginning of sampling reach along the riffle consisting of larger gravel, cobble, and bedrock.



Figure 3: Looking downstream near beginning of sampling reach along the riffle containing large gravel, cobble, and bedrock.

Dawkins Branch



Figure 4: Large woody debris downstream from sampling reach.



Figure 5: Looking upstream near beginning of sampling reach.



Figure 6: Upstream from initial sampling point.



Figure 7: Looking downstream towards Figure 6.



Figure 8: Construction contractor storage site adjacent to stream reach. Site was contributing noticeable amount of silt to stream.

Purcell Branch



Figure 9: Stream bank incision >6 feet (vertical instability) from bed. Photo was taken downstream from sampling reach.



Figure 10: Upstream view of large pool filled with leaf pack. Photo was taken downstream of sampling reach.



Figure 11: Past leaf-packed pool, looking upstream towards initial sampling point.



Figure 12: Bank incision upstream of sampling reach. Suspected cause of incision is boulder creating flow redirection and backwater eddies, located behind photographer, impeding flow during high energy events.



Figure 13: Upstream view about 75 meters from initial sampling point.



Figure 14: Looking downstream through sampling reach from approx. same location as Figure 13.

Cow Branch



Figure 15: Looking downstream from most recent bed and bank armoring. Sampling reach lies downstream from where photo location.



Figure 16: Technician standing at initial sampling point. Jefferson Davis Hwy. lies in the background.



Figure 17: Brief inspection of benthic macroinvertebrate habitat upstream from initial sampling point.

Benthic Macroinvertebrate Population and Water Quality Monitoring Report

Spring 2016

Prepared for:



Prince William County Department of Public Works
Virginia

Prepared by:

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August 24, 2016

Project No. 151270003

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APPENDICES

Appendix A	Site Data Sheets
Appendix B	Water Quality Laboratory Results
Appendix C	Benthic Macroinvertebrate Laboratory Results

LIST OF ACRONYMS

Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
BI	Biotic Index
°C	Degrees Celsius
CWA	Clean Water Act
DO	Dissolved Oxygen
<i>E. coli</i>	<i>Escherichia coli</i>
EPT	Ephemeroptera/Plecoptera/Tricoptera
m	Meter
mg/L	Milligrams per Liter
µS/cm	Microsiemens per Centimeter
MPN/100mL	Most Probable Number of Coliform per 100 Milliliters
m/s	Meters per Second
MS4	Municipal Separate Storm Sewer System
NTU	Nephelometric Turbidity Units
PMA	Percent Model Affinity
RBP	USEPA Rapid Bioassessment Protocol
Sampling Plan	Draft Sampling Plan for Benthic Macroinvertebrate Population and Water Quality Monitoring
SU	Standard Units
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VSCI	Virginia Stream Condition Index
VSMP	Virginia Stormwater Management Program

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to provide this report of ongoing benthic macroinvertebrate sampling for compliance with the requirements of the Virginia Stormwater Management Program (VSMP) Permit, Municipal Separate Storm Sewer System (MS4) Permit Number VA0088595, issued by the Virginia Department of Environmental Quality (VDEQ) to Prince William County, Virginia. This report discusses the 2016 spring sampling event, conducted in accordance with the *Draft Sampling Plan for Benthic Macroinvertebrate Population and Water Quality Monitoring* (Sampling Plan) (Amec Foster Wheeler 2015). This report provides detailed descriptions of the sampling and analysis activities conducted for the 2016 spring event, as well as the water quality analytical results and benthic macroinvertebrate results. In addition, this report provides a baseline for future comparative analysis. These results represent initial sampling, and will serve as a benchmark for evaluation at each station for subsequent sampling events.

1.1 BACKGROUND

The U.S. Environmental Protection Agency (USEPA) delegated the authority to implement Section 402 of the Clean Water Act (CWA) to the Commonwealth of Virginia on March 31, 1975. Subsequently, Section 62.1-44.15:25 of the Virginia Stormwater Management Act authorizes VDEQ to issue, deny, amend, revoke, terminate, and enforce permits for the control of stormwater discharges from MS4s. The VSMP Permit Number VA0088595 authorizes point source discharges of stormwater runoff and certain non-stormwater discharges from the MS4 operated or owned by Prince William County. Part I.C of the VSMP permit outlines the monitoring requirements guided by Section 9VAC25-870-380 C.2.c.(4) of the VSMP regulations. As stipulated in the permit, benthic macroinvertebrate and surface water monitoring is conducted at five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch (Figures 1-5).

1.2 PURPOSE

The purpose of this sampling report is to provide baseline data that will be used to comply with the biological stream (Part I.C.1) and in-stream monitoring (Part I.C.2) requirements outlined in Prince William County's permit. The specific objectives are to gather sufficient data to evaluate, and subsequently demonstrate, the effectiveness of upstream best management practices.

2.0 METHODS

Sample collection occurred from April 12 to 14, 2016, in accordance with the Sampling Plan (Amec Foster Wheeler 2015). Benthic macroinvertebrate and surface water samples were collected by Amec Foster Wheeler personnel from five locations in Prince William County: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch (Figures 1-5). The field team prepared Physical Characterization/Water Quality Field Data Sheets and Habitat Assessment Field Data Sheets for High Gradient Streams, as specified in USEPA Rapid Bioassessment Protocol (RBP) (Barbour et al. 1999; Appendix A). In-situ water quality data were collected using a YSI 556 water quality meter for dissolved oxygen (DO), pH, conductivity, and temperature. Turbidity was measured using a Lamotte 2020e meter.

Approximate stream width, water depth, transparency (as measured with a Secchi disk), and water velocity were measured. Water velocity was measured with a Marsh-McBirney Flo-Mate current meter. Upstream and downstream photographs were also taken for each site (Appendix A). Grab water samples were collected for ammonia, *Escherichia coli* (*E. coli*), nitrate/nitrite, orthophosphate, total Kjeldahl nitrogen (TKN), total nitrogen, total phosphorus, and total suspended solids (TSS).

Benthic sampling was conducted in accordance with the Sampling Plan. The multiple habitat sampling method was used for each of the sites, consisting of a total of 20 jabs or kicks, taken from each major habitat type in the reach. Benthic macroinvertebrate samples were placed on ice in coolers and shipped overnight to Amec Foster Wheeler's benthic macroinvertebrate laboratory in Gainesville, Florida. The laboratory sorted, mounted, identified, enumerated, evaluated, and classified benthic macroinvertebrates according to Section 7.2 of the RBP (Barbour et al. 1999). Eight metrics were calculated including the Biotic Index (BI) from Hilsenhoff (1987); the Percent Model Affinity (PMA) from Novak and Bode (1992); and the Virginia Stream Condition Index (VSCI) using guidance from TetraTech (2003) and VDEQ (2008).

3.0 RESULTS

Sampling was conducted from April 12 to 14, 2016 in accordance with the Sampling Plan and is summarized in the following sections. As these results represent initial (first year) results from sampling, the analysis will serve as a comparison baseline at each station for subsequent sampling events.

3.1 FIELD CONDITION AND PARAMETER RESULTS

Parameters measured in the field during the spring sampling event at the five sites are summarized in the Table 1 below.

Assessing physical habitat quality is an integral component of the final evaluation of impairment. The RBP matrix used to assess habitat quality is based on 10 visual physical characteristics of the waterbody and surrounding land, particularly the catchment of the site under investigation. The habitat parameters evaluated are related to overall aquatic life use and are a potential source of limitation to the aquatic biota; the scoring of each of these characteristics is included as page 4 of the site datasheets in Appendix A, while score totals and the resulting condition categories are summarized in Table 1. The RBP defines the following condition categories based on the physical habitat characterization scores, in an effort to determine the ability of the habitat to support an optimal biological community:

151-200	Optimal	The physical habitat present meets natural expectations, and is capable of supporting an optimal benthic community.
101-150	Suboptimal	Physical habitat is less than desirable, but satisfies expectations under most circumstances to support a benthic community.
51-100	Marginal	Physical habitat has moderate levels of degradation, with a severity at frequent intervals throughout the reach, which limit the capability of supporting a benthic community.
0-50	Poor	Physical habitat has been substantially altered with severe degradation to characteristics that would support a benthic community.

RBP physical habitat assessment scores ranged from 94 (Cow Branch) to 134 (Neabsco Creek). The scores indicated that four of the five sites had suboptimal habitat for supporting benthic communities, while Cow Branch habitat that was marginal for supporting a benthic community.

Water quality is also an integral component of stream evaluation and the ability of a stream to support biological communities. Surface waters should meet Virginia's Water Quality Standards, as outlined in Section 9VAC25-260. However, these standards represent limits not to be exceeded. For a general comparison, the following bullets summarize typical conditions for piedmont streams.

- A pH range of 6.5 to 8.0 is optimal for most organisms, as a pH outside this range reduces the diversity in the stream because it stresses the physiological systems of most organisms and can reduce reproduction.
- Distilled water has conductivity in the range of 0.5 to 3 microsiemens per centimeter ($\mu\text{S}/\text{cm}$). The conductivity of streams generally range from 0 to 1500 $\mu\text{S}/\text{cm}$, while studies of inland fresh waters indicate that streams supporting mixed fisheries have a range between 50 and 500 $\mu\text{S}/\text{cm}$.
- Temperature affects feeding, reproduction and metabolism of aquatic animals. A week or two of high temperatures may make a stream unsuitable for sensitive aquatic organisms; the maximum temperature of nontidal (piedmont) streams should not exceed 32°C.
- DO is an important measure of stream water quality, as aquatic organisms need DO to live. DO in the water varies greatly with stream characteristics, temperature, and time, but a minimal DO level of 5 milligrams per liter (mg/L) is usually required to maintain healthy growth and activity.
- Turbidity is a measure of water clarity, and though Virginia water quality standards do not include guidelines for turbidity, as a general guide, water begins to appear cloudy when the turbidity is greater than 5 nephelometric turbidity units (NTU).

As shown in Table 1, the physical water quality characteristics of the five sites meet the typical water quality conditions described above, with the exception of pH at Cow Branch; however, this pH meets Virginia’s Water Quality Standards.

Table 1. Spring 2016 Field Condition and Parameter Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
RBP Habitat Assessment/ Characterization Score	--	94	126	120	134	103
RBP Habitat Condition Category	--	Marginal	Suboptimal	Suboptimal	Suboptimal	Suboptimal
pH	SU	6.19	8.00	7.63	7.00	7.57
Conductivity	$\mu\text{S}/\text{cm}$	454	736	612	187	187
Temperature	°C	10.01	16.43	13.72	11.69	15.62
DO	mg/L	12.00	11.78	9.37	12.51	12.11
Turbidity	NTU	1.14	4.57	NA	2.76	2.66
Water Depth	m	0.14	0.13	0.23	0.24	0.13
Secchi Depth	m	0.14	0.13	0.23	0.24	0.13
Reach Length	m	100	100	100	100	100
Reach Width	m	3.73	3.96	6.55	5.74	5.94
Surface Velocity	m/s	0.13	0.45	0.20	0.16	0.26

NA = not available, value was not recorded

-- = not applicable

SU = standard unit

°C = degrees Celsius

m = meter

m/s = meters per second

3.2 WATER QUALITY LABORATORY RESULTS

Water samples were analyzed for ammonia, *E. coli*, nitrate/nitrite, orthophosphate, TKN, total nitrogen, total phosphorus, and TSS. The results are summarized in Table 2 below, and provided in the June 6, 2016 chemical analysis report (Appendix B).

As mentioned in the previous section, water quality is an integral component of stream evaluation and the ability of a stream to support biological communities. Surface waters should meet Virginia's Water Quality Standards, as outlined in Section 9VAC25-260. However, these standards represent limits, not to be exceeded. For a general comparison, the following bullets summarize typical conditions for piedmont streams.

- Ammonia is toxic to fish and other types of aquatic life. Ammonia's toxicity depends on both the temperature and pH of the water, but chronic levels above 3.0 mg/L violate water quality standards.
- *E. coli* can be used as an indicator of stream impairment from sewage and animal waste. The Virginia Water Quality Standard is 126 most probable number of coliform per 100 milliliters (MPN/100mL).
- Nitrate stimulates plant growth, and excessive plant growth can impact DO levels. Streams in areas with little human impact have less than 0.6 mg/L nitrate, while the Virginia Water Quality Standard is 10 mg/L.
- Phosphates act as a nutrient for plant growth similar to nitrate. Streams in areas with little human impact have less than 0.1 mg/L. There is no Virginia Water Quality Standard for phosphate.
- TKN is the sum of organic nitrogen, ammonia, and ammonium. Though there is no Virginia Water Quality Standard for TKN, it can be used as an indicator for stream impairment.
- There are no Virginia Water Quality standards for total phosphorus or nitrogen. However, total phosphorus levels higher than 0.1 mg/L may stimulate plant growth sufficiently to surpass natural rates. Levels in excess of 0.1 mg/L indicate a potential human source such as industrial soaps, sewage, fertilizers, disturbance of soil, animal waste, or industrial effluent.
- TSS, similar to turbidity, is a quantitative method to measure sediment and other particles found in surface water. Though there is no Virginia Water Quality Standard for TSS, it can be used as an indicator for erosion and sedimentation.

As shown in Table 2, the water quality results for the five sites meet the typical water quality conditions described above, with the exception of potentially elevated levels of total nitrogen and phosphorus.

Table 2. Spring 2016 Water Quality Results.

Parameter	Units	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Ammonia	mg/L	0.08	0.03	0.02	0.02	0.02
<i>E. coli</i>	MPN/100mL	55.7	62.4	76.70	29.9	52
Nitrate+Nitrite	mg/L	0.43	0.04	0.29	0.11	0.3
Orthophosphate	mg/L	<0.01	0.01	0.01	<0.01	<0.01
TKN	mg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total Nitrogen	mg/L	0.63	0.37	0.63	0.29	0.47
Total Phosphorus	mg/L	<0.01	0.02	0.01	<0.01	<0.01
TSS	mg/L	<1.0	2.5	<1.0	<1.0	2.8

< = not detected at the associated reporting limit

3.3 BENTHIC MACROINVERTEBRATE RESULTS

Terms such as “tolerant” and “intolerant” taxa are used to describe benthic communities in this document without the negative or positive lay connotations of such language. Tolerant taxa are benthic species adapted to survive in a broad range of environmental conditions, whereas intolerant taxa are adapted to more limited range of environmental conditions. The term “impairment” has a negative connotation with its lay usage; in this document, the term is used to describe the nature and composition of a benthic community. The scientific “impairment” conditions are classified into four categories:

No Impairment	Similar to the reference conditions; the benthic community is of excellent quality.
Slight Impairment	Sustaining a diverse and abundant benthic community with some intolerant taxa; the benthic community is of good quality.
Moderate Impairment	Not having a highly diverse and abundant community, but having taxa present in several major groups, generally a few intolerant taxa and one taxa being dominant; the community has been impacted.
Severe Impairment	Few, if any, benthic invertebrate taxa are present, all tolerant taxa, low diversity, and often one taxa is very abundant; the benthic community has been severely impacted.

Amec Foster Wheeler’s laboratory sorted and identified the organisms in the benthic macroinvertebrate samples and provided a report dated July 30, 2016 (Appendix C). The results of the sampling are provided in the Table 3 below and summarized in this section.

Table 3. Spring 2016 Benthic Macroinvertebrate Results.

Metric	Cow Branch	Dawkins Branch	Little Bull Run	Neabsco Creek	Purcell Branch
Taxa Richness	17	20	23	23	27
Abundance	250	211	246	225	251
EPT Index	2	1	5	4	9
EPT/EPT+Chironomidae	0.02	0.03	0.07	0.05	0.15
Percent Dominant Taxon	50.00	45.50	33.74	62.22	53.78
Percent Chironomidae	82.00	52.13	78.46	92.89	78.49
BI	5.75	5.86	5.34	5.05	4.57
BI Category	Fair	Fair	Good	Good	Good
PMA	29.40	45.43	40.12	27.11	39.72
PMA Category	Severely Impacted	Moderately Impacted	Moderately Impacted	Severely Impacted	Moderately Impacted
VSCI	27.85	35.67	39.29	32.96	46.40
VSCI Category	Severe Stress	Severe Stress	Severe Stress	Severe Stress	Stress

EPT = Ephemeroptera, Plecoptera, and Tricoptera

A total of 61 taxa were identified from the spring samples. Among the five sites, taxa richness ranged from 17 to 27, while abundance ranged from 211 to 251. This metric indicated no impairment for the samples.

EPT taxa ranged from 1 to 9 among the sites. This metric indicated no impairment for Little Bull Run and Purcell Branch; however, Cow Branch showed moderate impairment, Dawkins Branch showed severe impairment, and Neabsco Creek showed slight impairment. In addition, the ratio of EPT to EPT and Chironomidae indicated severe impairment to the benthic community at each of the sampling sites.

The percentage of the top taxa ranged from 33.74% to 62.22%. Percentage of the top two taxa combined, which is a VSCI metric, ranged from 53.66% to 70.22%, indicating no impairment. The percentage of Chironomidae showed moderate impairment for Cow Branch, Little Bull Run, and Purcell Branch, severe impairment for Neabsco Creek, and no impairment for Dawkins Branch. The biological scores for the percentage of scrapers showed severe impairment for four of the sampling sites, with the exception of Dawkins Branch, which showed moderate impairment.

The BI ranged from 4.57 to 5.86 for the sites, with corresponding BI Category scores of “fair” for Cow Branch and Dawkins Branch, and “good” for Little Bull Run, Neabsco Creek, and Purcell Branch. The PMA ranged from 27.11 to 45.43 for the sites, with corresponding PMA Category scores of “moderately impacted” for Dawkins Branch, Little Bull Run, and Purcell Branch, and “severely impacted” for Cow Branch and Neabsco Creek.

Results from the calculation of the VSCI for the individual sample sites ranged from 27.85 (Cow Branch) to 46.40 (Purcell Branch), with an average VSCI score of 36.43 among the sites. This corresponds to “severe stress” stream quality conditions under the VSCI assessment, though Purcell Branch did indicate a “stress” stream quality condition.

4.0 SUMMARY AND CONCLUSIONS

Measured field and laboratory water quality parameters are generally within the normal ranges for shallow, cool, turbulent, piedmont Virginia streams, and meet Virginia's Water Quality Standards, as outlined in Section 3. Though there were potentially elevated total phosphorus and nitrogen results, water quality does not indicate potential impairment based on the spring 2016 sampling. However, the physical habitat assessments and biological evaluations indicated impaired habitats and stressed benthic macroinvertebrate communities.

The RBP physical habitat assessments that will be used as a baseline for subsequent monitoring indicated suboptimal habitats at all the sites, with the exception of Cow Branch, which indicated marginal habitats. The "suboptimal" category indicates that the habitat criteria are less than desirable, but that the criteria satisfy expectations under most circumstances; the "marginal" category indicates a moderate level of degradation, with severity at frequent intervals throughout the reach that do not satisfy expectations.

Though the "suboptimal" habitat assessment rating indicated that four of the sites could support satisfactory benthic invertebrate communities under most circumstances, the benthic invertebrate community measures showed that there was moderate to severe impairment to the benthos at all five sites, closer in agreement with the "marginal" category that was received for Cow Branch. The results specified that though habitat assessments indicated the possibility of normal benthic communities at four of the five sites, the benthic communities present were found to be under stress or severe stress for all five sites. Based on the biological scores, the habitat assessment and benthic community evaluations indicate impaired habitats and impaired benthic macroinvertebrate communities at the five sampling locations in Prince William County.

As this report represents baseline data, no stream condition changes have been observed at this time. The findings from subsequent studies, both fall and spring, will provide monitoring data to indicate the changes in stream condition of the five sites designated for Prince William County MS4 monitoring over time. Future reports will include comparative analysis performed on a station-by-station basis.

5.0 REFERENCES

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- TetraTech, 2003. A Stream Condition Index for Virginia Non-Coastal Streams. Owings Mill, MD. September 2003.
- VDEQ, 2008. Biological Monitoring Program Quality Assurance Project Plan for Wadeable Streams and Rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, VA. August 2008.

FIGURES

Figure 1.
Cow Branch Sampling Location
Woodbridge, VA

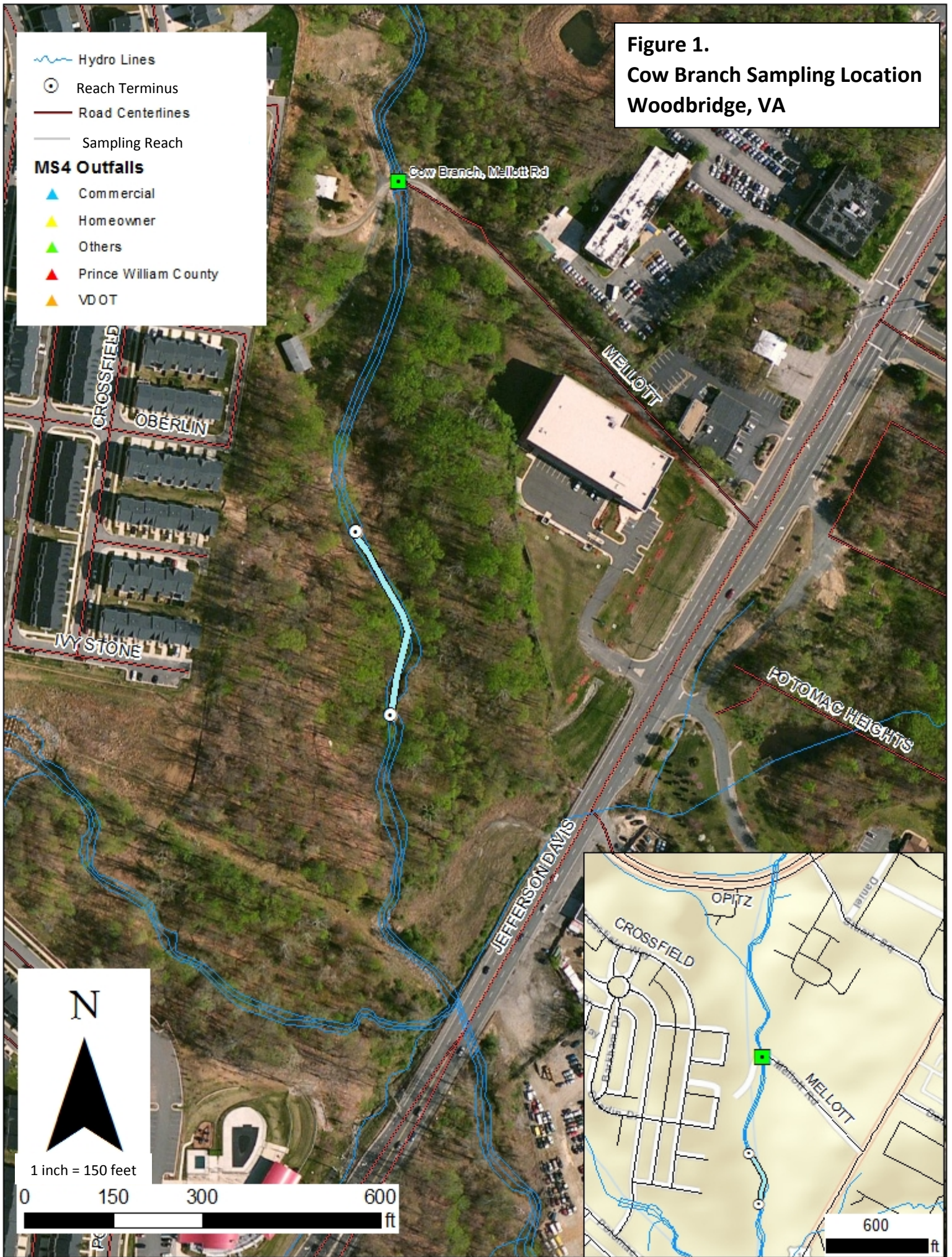


Figure 2.
Dawkins Branch Sampling Location
Manassas, VA

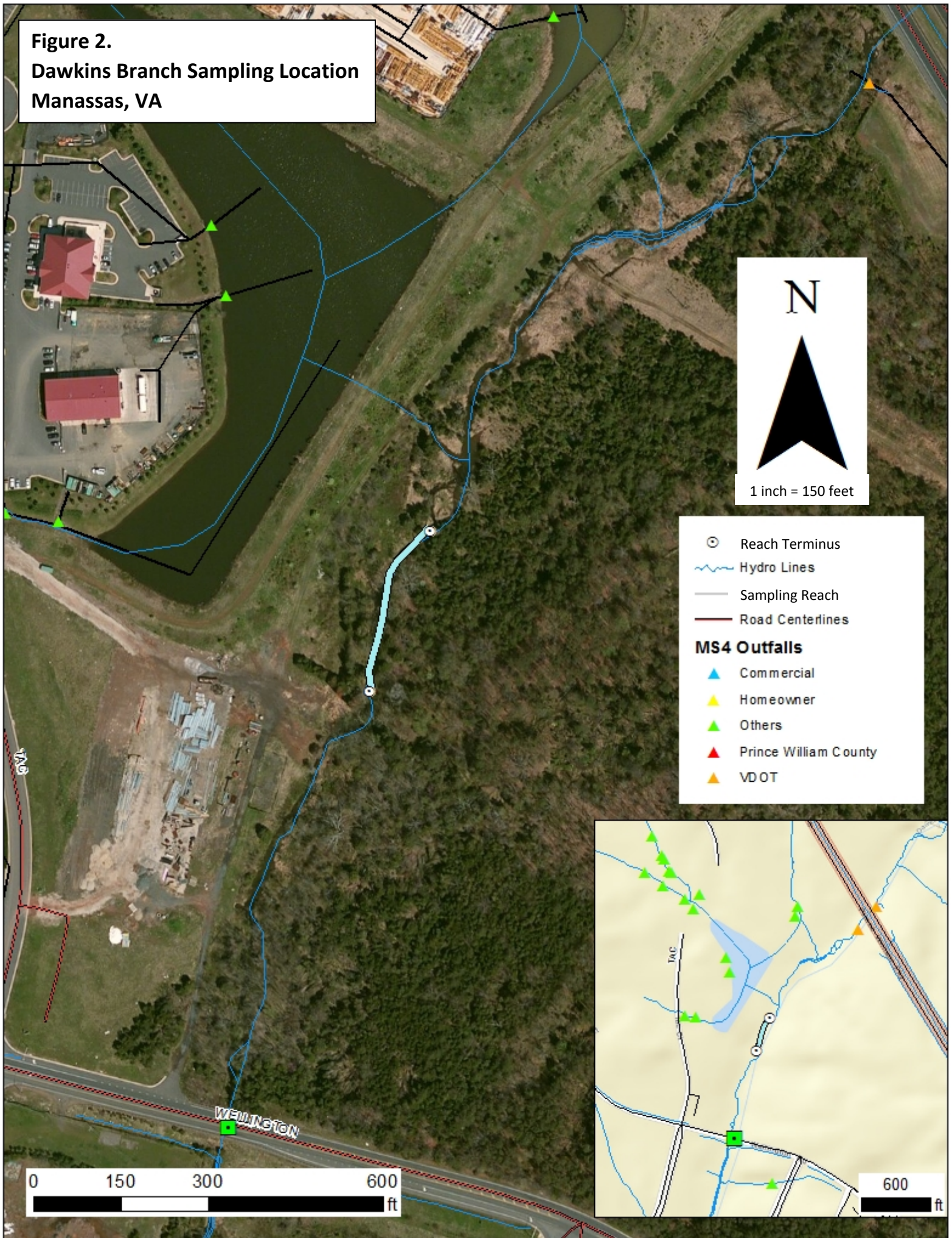


Figure 3.
Little Bull Run Sampling Location
Gainesville, VA

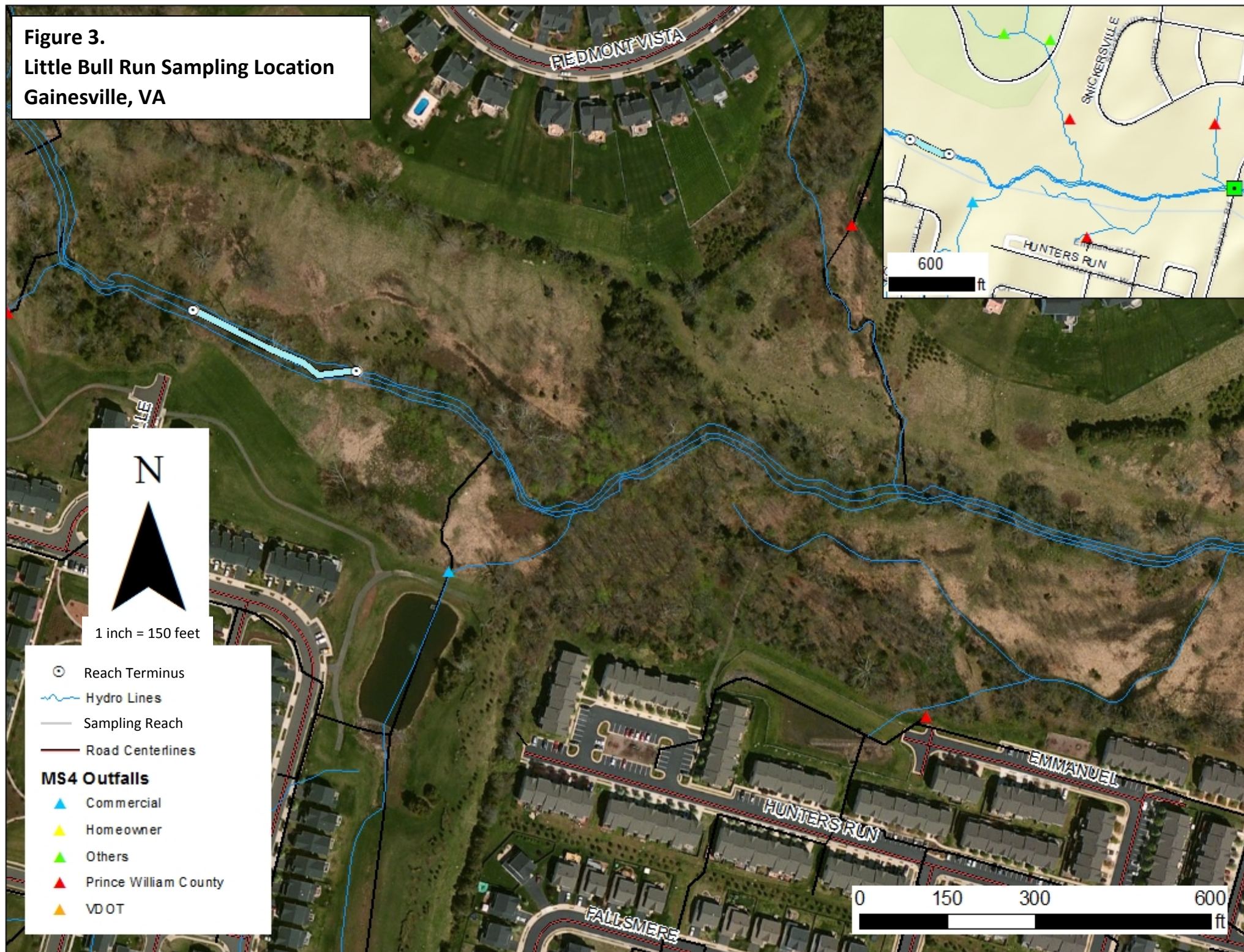


Figure 4.
Neabsco Creek Sampling Location
Dale City, VA

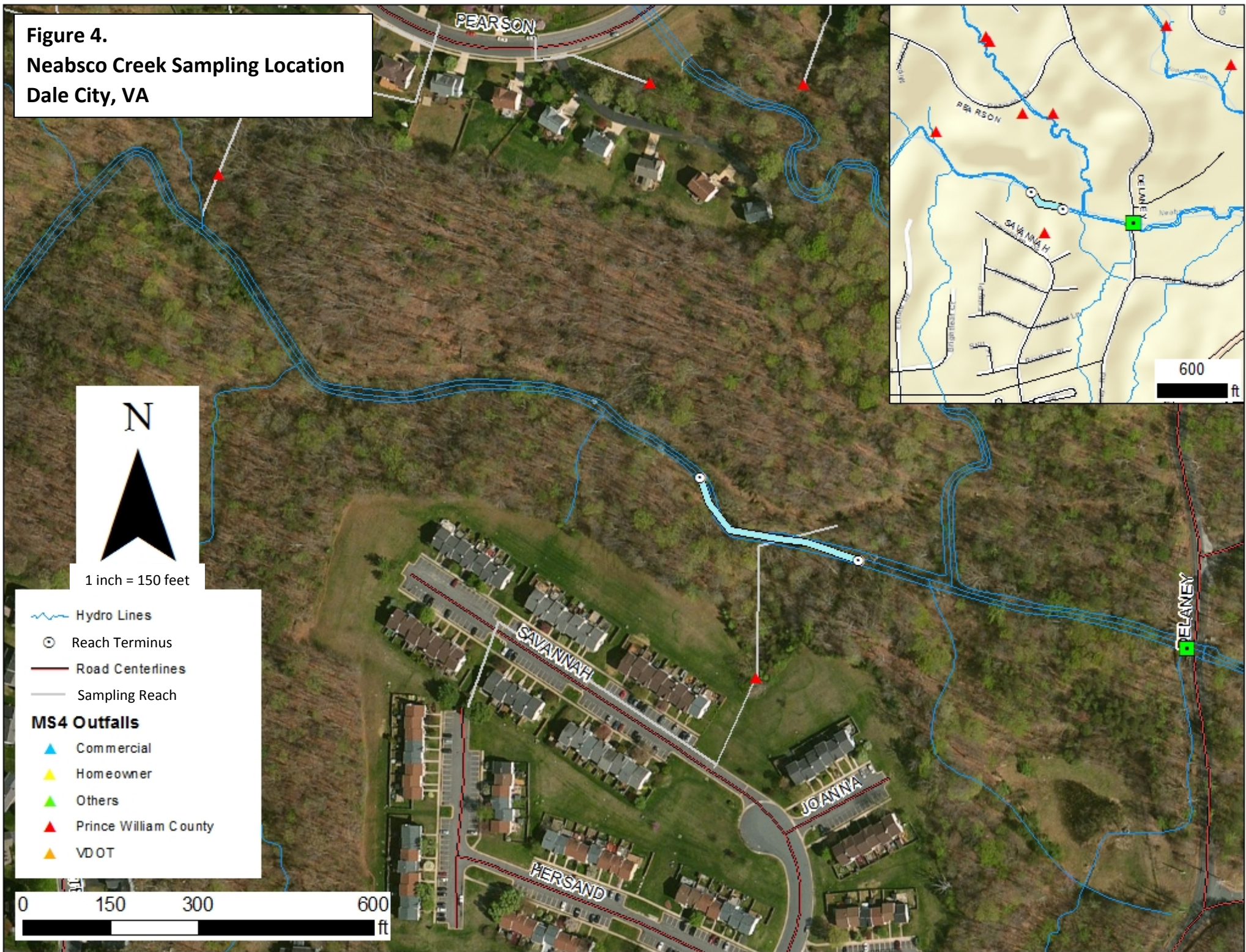
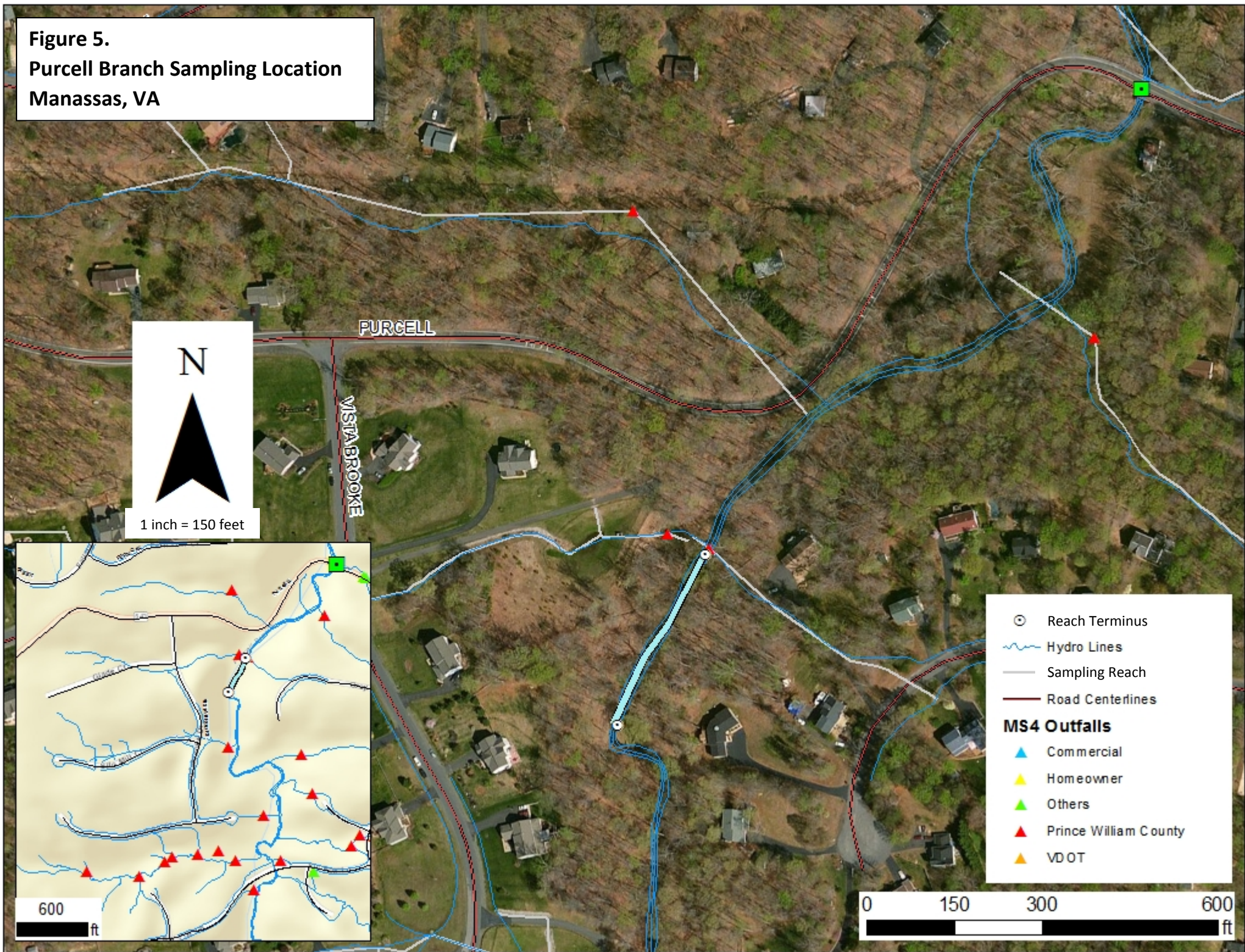


Figure 5.
Purcell Branch Sampling Location
Manassas, VA



APPENDIX A
SITE DATA SHEETS

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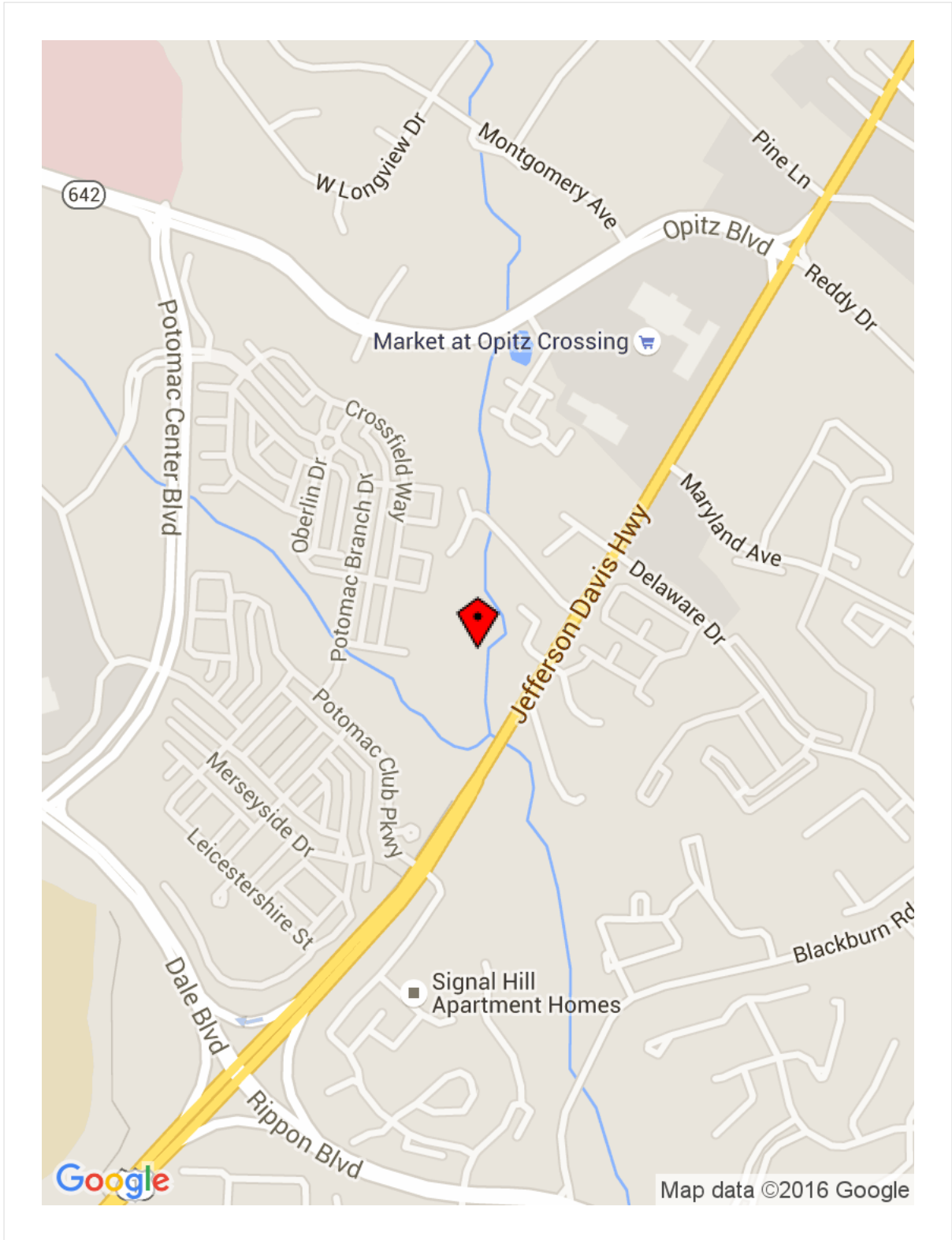
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F-D5 F-5 B'J9; 9H5 HCB
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9 d]Zi bU'Gi VgfhUH' #5 j U]UW'Y'7 cj Yf	FF
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GYX]a Ybh8 Ydcg]hcb	FF
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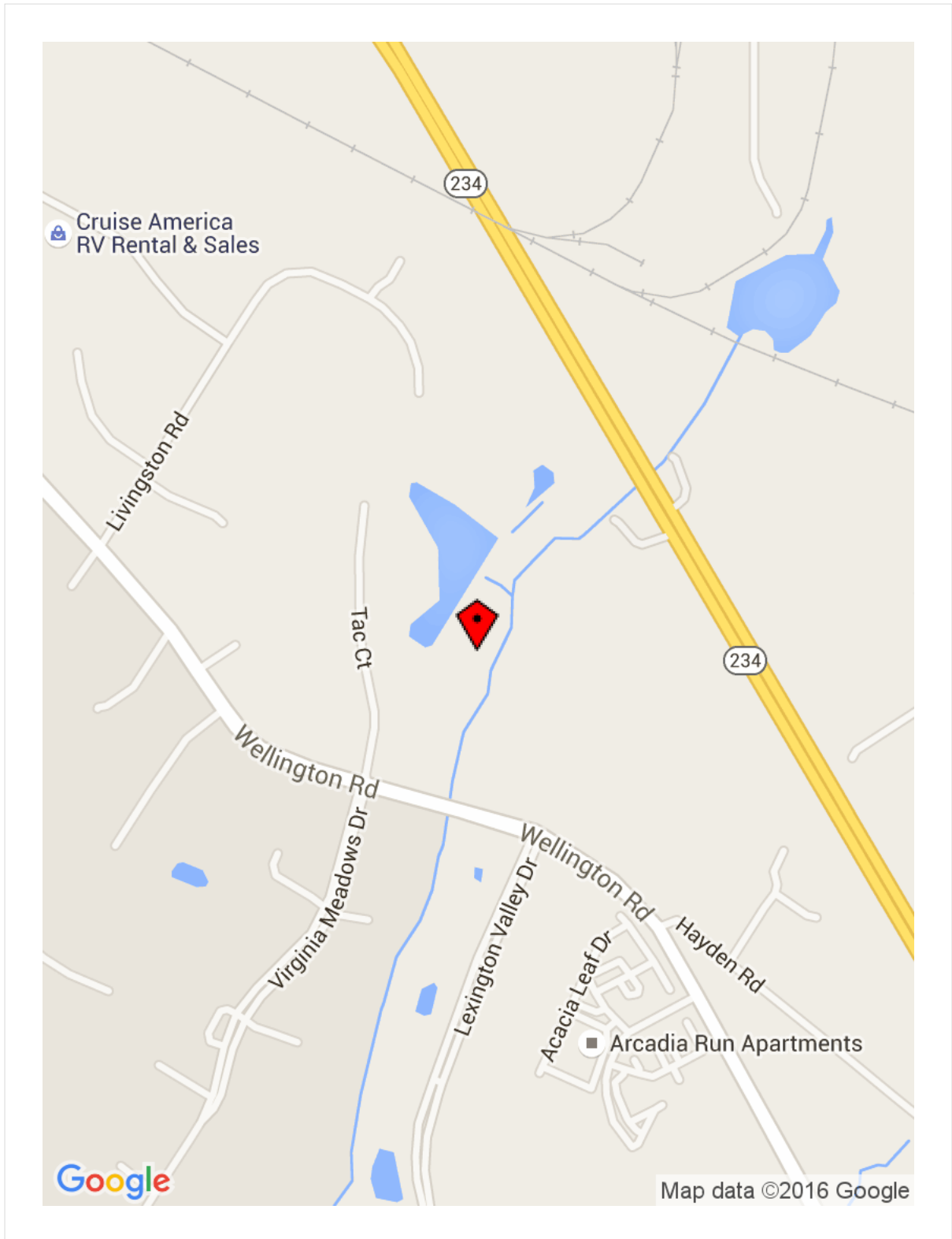
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John P. Kelly

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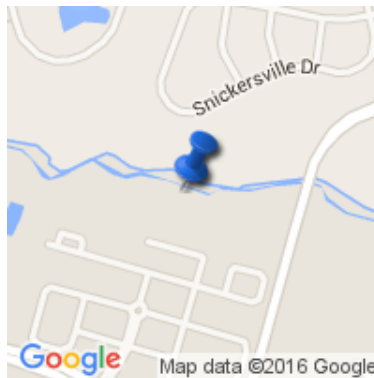


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F-D5 F-5 B'J9; 9H5 HCB
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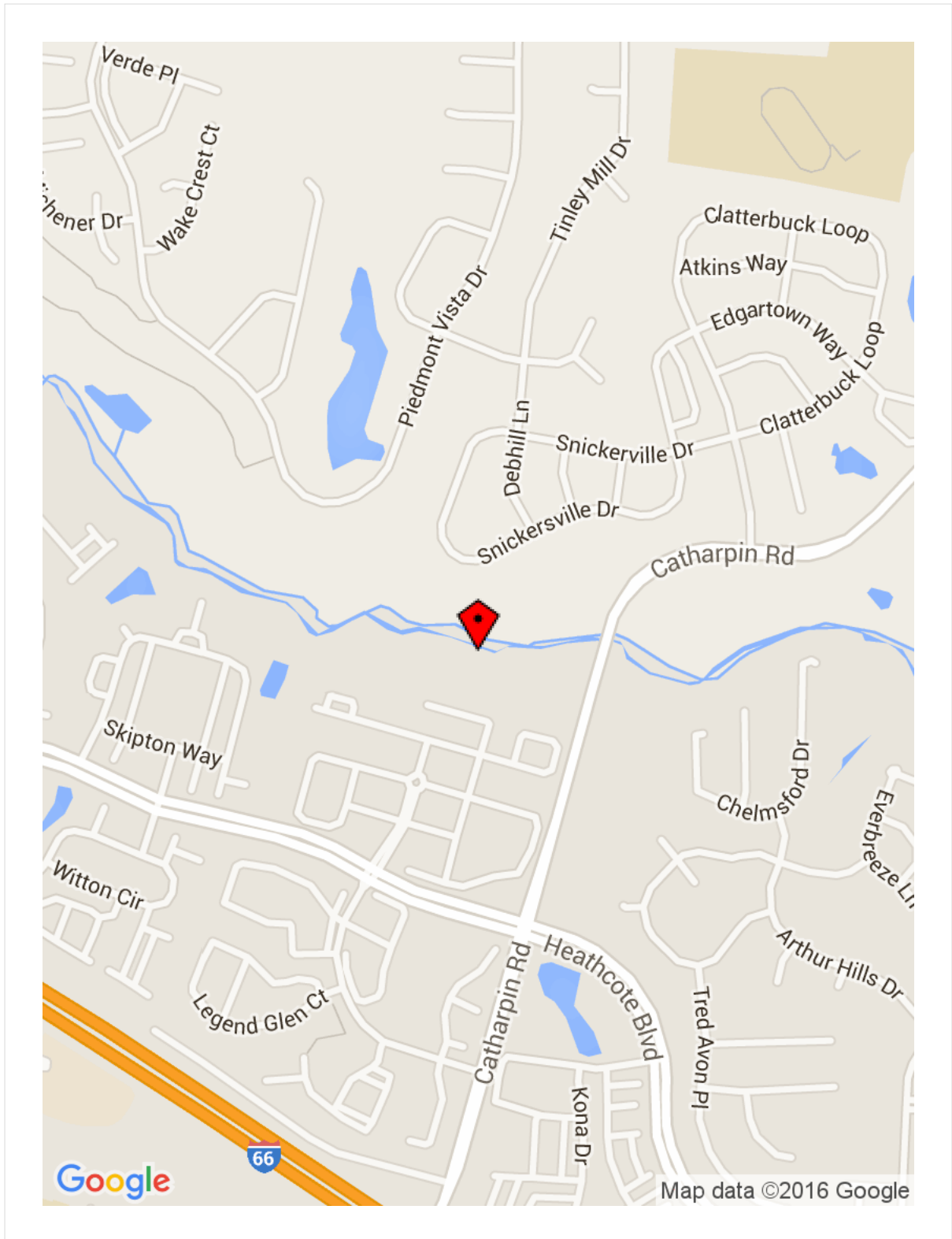
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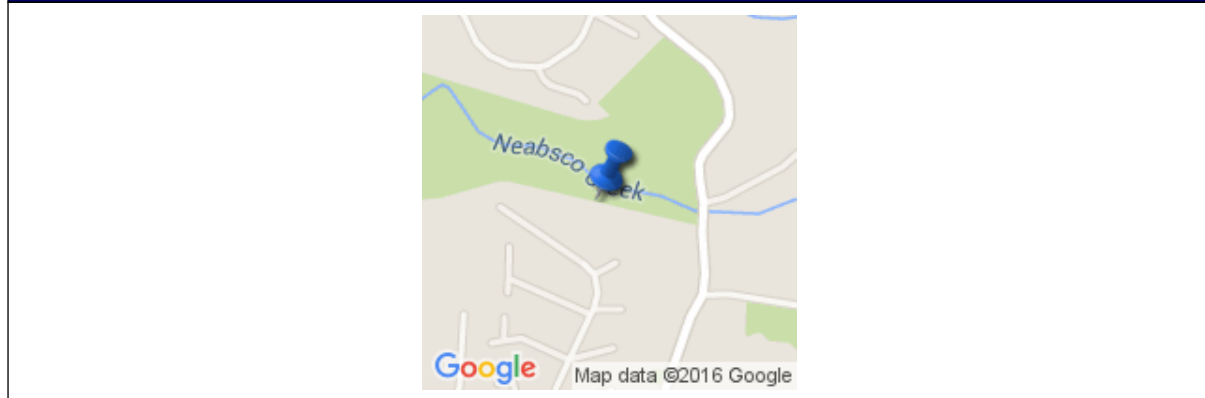


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Water Surface Oils

- Slick
- Sheen
- Globs
- Flecks
- None
- Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		15.0
Boulder	>256 mm (10")	45.0
Cobble	64 - 256 mm (2.5" - 10")	25.0
Gravel	2 - 64 mm (0.1" - 2.5")	5.0
Sand	0.06 - 2 mm (gritty)	10.0
Silt	0.004 - 0.06 mm	
Clay	(slick)	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	16
Embeddedness	14
Velocity / Depth Regime	10
Sediment Deposition	15
Channel Flow Status	10

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	13
Frequency of Riffles (or Bends)	16
Bank Stability (LEFT BANK)	7
Bank Stability (RIGHT BANK)	7
Vegetative Protection (LEFT BANK)	5
Vegetative Protection (RIGHT BANK)	5
Riparian Vegetative Zone Width (LEFT BANK)	6
Riparian Vegetative Zone Width (RIGHT BANK)	10

Field Photography

Image 1



Caption for Image 1

Upstream. Riffle in foreground marks sampling point.

Image 2



Caption for Image 2

Downstream, sampling point at beginning or reach in foreground.

Image 3



Caption for Image 3

Upstream, slightly more than mid way through reach

Image 4



Caption for Image 4

Downstream slightly above midway through reach

Report completed by:

Ben Green

Signature

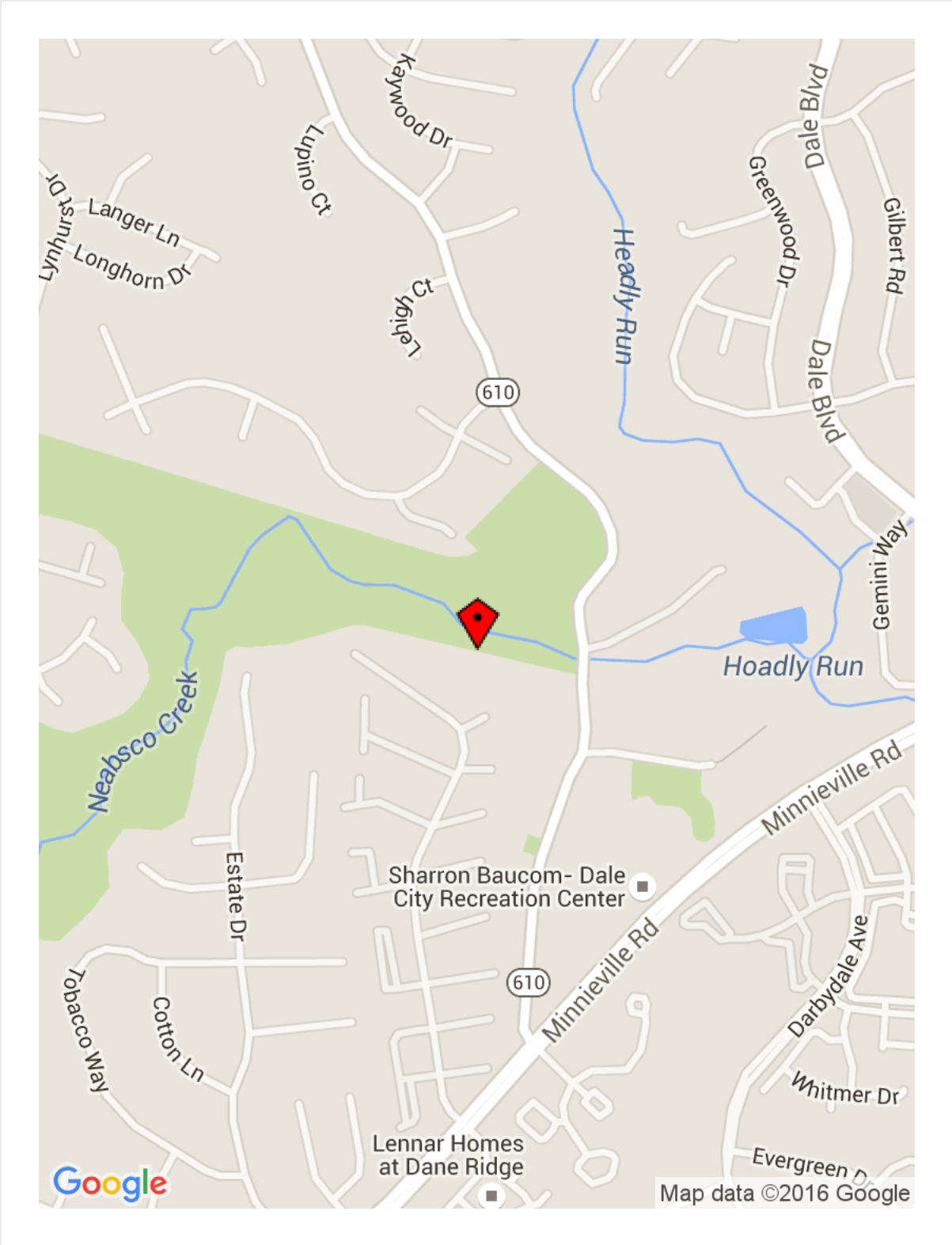
A handwritten signature consisting of the letters 'B' and 'G' in a cursive, stylized font.

Signature Date/Time

04/13/2016 01:05:43 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map

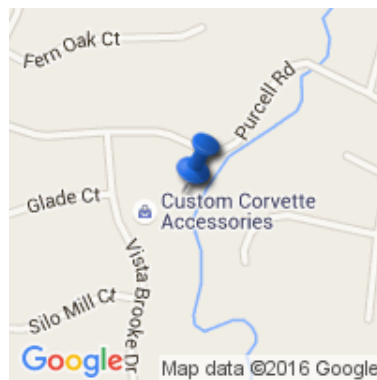


Prince William Biological Monitoring Form



Stream Name	Purcell Branch
Location	Dale City
River Basin	Potomac
Investigators	Ben Green and John Miller
Date	04/13/2016
Time	05:38:23 PM GMT-04:00
Reason for Survey	PWC biomonitoring
Weather Conditions	Clear / Sunny

GPS location



RIPARIAN VEGETATION
(18 meter buffer)

Dominant Type	Trees
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INSTREAM FEATURES

Est. Stream Width (m)	5.94
Est. Stream Depth (m)	0.1H
Surface Velocity (m/sec at thalweg)	0.26
Canopy Cover	Partly shaded
High Water Mark (m)	1.118
Channelized	<input type="radio"/> Yes <input checked="" type="radio"/> No
Dam Present	<input type="radio"/> Yes <input checked="" type="radio"/> No

Proportion of Reach by Stream Morphology Types

Riffle (%)	35
Run (%)	55
Pool (%)	10

AQUATIC VEGETATION

Dominant Type	Attached Algae
Portion of reach with aquatic veg	10

WATER QUALITY

Temperature	15.62
Specific Conductance	0.187
Dissolved Oxygen	12.11
pH	7.57
Turbidity	2.66
WQ Instrument Used	YSI 556
Water Odors	<input checked="" type="checkbox"/> Normal / None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other

Water Surface Oils

- Slick
- Sheen
- Globs
- Flecks
- None
- Other

Inorganic Substrate Components
(should add up to 100%)

Substrate Type	Diameter	% Composition in sampling reach
Bedrock		30.0
Boulder	>256 mm (10")	15.0
Cobble	64 - 256 mm (2.5" - 10")	20.0
Gravel	2 - 64 mm (0.1" - 2.5")	10.0
Sand	0.06 - 2 mm (gritty)	25.0
Silt	0.004 - 0.06 mm	
Clay	(slick)	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category
Epifaunal Substrate / Available Cover	7
Embeddedness	9
Velocity / Depth Regime	8
Sediment Deposition	10
Channel Flow Status	8

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category
Channel Alteration	12
Frequency of Riffles (or Bends)	9
Bank Stability (LEFT BANK)	6
Bank Stability (RIGHT BANK)	5
Vegetative Protection (LEFT BANK)	7
Vegetative Protection (RIGHT BANK)	6
Riparian Vegetative Zone Width (LEFT BANK)	10
Riparian Vegetative Zone Width (RIGHT BANK)	6

Field Photography

Image 1



Caption for Image 1

Upstream from staked beginning point

Image 2



Caption for Image 2

Downstream from staked beginning point.

Image 3



Caption for Image 3

Middle of reach facing downstream

Image 4



Caption for Image 4

Upstream survey bar

Report completed by:

John Miller

Signature

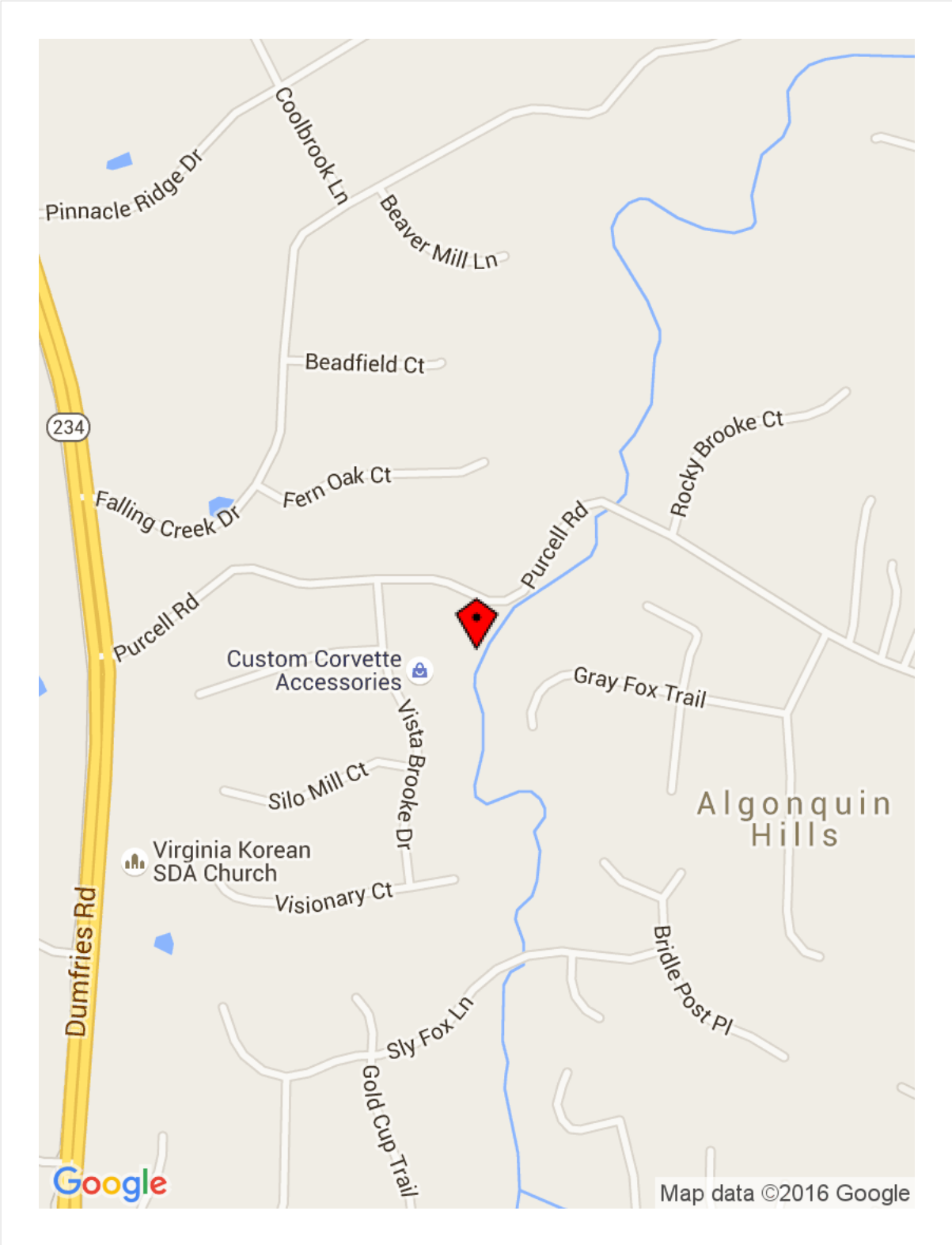
A handwritten signature in black ink that reads "John Miller". The signature is written in a cursive style with a large initial "J" and "M".

Signature Date/Time

04/13/2016 04:23:08 PM GMT-04:00

Please use the upper-right menu to "Save as complete and exit" to place this finalized form in the upload queue.

Location Map



APPENDIX B
WATER QUALITY LABORATORY RESULTS

Occoquan Watershed Monitoring Laboratory

9408 Prince William St.
Manassas, VA 20110
Tel: (703) 361-5606

Virginia Laboratory ID: 460026

Att: Mr. Benjamin Green
Amec Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Analysis Report

Report #20160810

Description	Sample Date	Sample ID	Result	Unit	Reporting Limit	Method	Analysis Date
Ammonia as N	4/12/2016	16-0621 PC30	0.03	mg/L	0.01	SM4500-NH3 G	4/19/2016
E. coli	4/12/2016	16-0621 PC30	62.4	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/12/2016
Nitrate+nitrite as N	4/12/2016	16-0621 PC30	0.04	mg/L	0.01	SM4500-NO3-F	4/19/2016
Orthophosphate as P	4/12/2016	16-0621 PC30	0.01	mg/L	0.01	SM4500-P F	4/19/2016
Total Kjeldahl Nitrogen	4/12/2016	16-0621 PC30	<0.50	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/12/2016	16-0621 PC30	0.02	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/12/2016	16-0621 PC30	2.5	mg/L	1.0	SM2540D	4/14/2016
Ammonia as N	4/12/2016	16-0622 PC90	0.02	mg/L	0.01	SM4500-NH3 G	4/19/2016
E. coli	4/12/2016	16-0622 PC90	76.7	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/12/2016
Nitrate+nitrite as N	4/12/2016	16-0622 PC90	0.29	mg/L	0.01	SM4500-NO3-F	4/19/2016
Orthophosphate as P	4/12/2016	16-0622 PC90	0.01	mg/L	0.01	SM4500-P F	4/19/2016
Total Kjeldahl Nitrogen	4/12/2016	16-0622 PC90	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/12/2016	16-0622 PC90	0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/12/2016	16-0622 PC90	<1.0	mg/L	1.0	SM2540D	4/14/2016
Ammonia as N	4/13/2016	16-0705 PC10	0.02	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/13/2016	16-0705 PC10	52.0	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/13/2016
Nitrate+nitrite as N	4/13/2016	16-0705 PC10	0.30	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/13/2016	16-0705 PC10	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/13/2016	16-0705 PC10	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/13/2016	16-0705 PC10	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/13/2016	16-0705 PC10	2.8	mg/L	1.0	SM2540D	4/14/2016
Ammonia as N	4/13/2016	16-0706 PC60	0.02	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/13/2016	16-0706 PC60	29.9	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/13/2016
Nitrate+nitrite as N	4/13/2016	16-0706 PC60	0.11	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/13/2016	16-0706 PC60	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/13/2016	16-0706 PC60	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/13/2016	16-0706 PC60	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/13/2016	16-0706 PC60	<1.0	mg/L	1.0	SM2540D	4/14/2016
Ammonia as N	4/14/2016	16-0707 PC20	0.08	mg/L	0.01	SM4500-NH3 G	4/28/2016
E. coli	4/14/2016	16-0707 PC20	55.7	MPN/100mL	1.80	SM9221 B(LT)E(EC)C MPN	4/14/2016
Nitrate+nitrite as N	4/14/2016	16-0707 PC20	0.43	mg/L	0.01	SM4500-NO3-F	4/28/2016
Orthophosphate as P	4/14/2016	16-0707 PC20	<0.01	mg/L	0.01	SM4500-P F	4/28/2016
Total Kjeldahl Nitrogen	4/14/2016	16-0707 PC20	<0.5	mg/L	0.50	Lachat 10-107-06-2D	4/21/2016
Total Phosphorus	4/14/2016	16-0707 PC20	<0.01	mg/L	0.01	SM4500-P F, 4500-P J	5/10/2016
Total Suspended Solids	4/14/2016	16-0707 PC20	<1.0	mg/L	1.0	SM2540D	4/14/2016

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:
Dongmei Wang
Laboratory Supervisor

Occoquan Watershed Monitoring Laboratory

9408 Prince William St.
 Manassas, VA 20110
 Tel: (703) 361-5606

Virginia Laboratory ID: 460026

Att: Mr. Benjamin Green
 Amec Foster Wheeler Environment & Infrastructure, Inc.
 14424 Albemarle Point Place, Suite 115
 Chantilly, VA 20151

Analysis Report

Report #20160810

Description	Blank	LCS, %R	Duplicate, RPD	Spike, %R	Matrix Spike, %R	Method	Analysis Date
Ammonia as N	0.005	107	n.a.	104	107	SM4500-NH3 G	4/19/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
E. coli	n.a.	n.a.	0	n.a.	n.a.	SM9221 B(LT)E(EC)C MPN	4/12/2016
Accepted Range			n.a.				
Nitrate+nitrite as N	0.005	96	n.a.	103	104	SM4500-NO3-F	4/19/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Orthophosphate as P	0.006	99	n.a.	93	91	SM4500-P F	4/19/2016
Accepted Range	-0.01~0.01	100±10		100±10	100±10		
Total Kjeldahl Nitrogen	n.a.	n.a.	n.a.	n.a.	n.a.	Lachat 10-107-06-2D	4/21/2016
Accepted Range							
Total Phosphorus	-0.004	99	0	104	n.a.	SM4500-P F, 4500-P J	5/10/2016
Accepted Range	-0.01~0.01	100±10	±10	100±10	100±10		
Total Suspended Solids	-0.10	n.a.	3	n.a.	n.a.	SM2540D	4/14/2016
Accepted Range	-1.0~1.0		±20				

n.a.= not applicable

Note: TKN samples were contracted to NELAC certified lab at Prince William County Service Authority

Prepared by:
 Dongmei Wang
 Laboratory Supervisor

APPENDIX C
BENTHIC MACROINVERTEBRATE LABORATORY RESULTS

June 30, 2016



Mr. Ben Green
Amec Foster Wheeler
14424 Albemarle Point Place, Suite 115
Chantilly, VA 20151

Subject: Prince William County Multiple Habitat Sampling Method Report
Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, Purcell Branch
Amec Foster Wheeler Project No.: 151270003

Dear Mr. Green:

Amec Foster Wheeler (Gainesville office), Environment & Infrastructure, Inc. (Amec Foster Wheeler) completed benthic macroinvertebrate determinations for samples collected by Amec Foster Wheeler (Chantilly office), in April 2016. Amec Foster Wheeler received a total of five samples, from the following locations: Cow Branch, Dawkins Branch, Little Bull Run, Neabsco Creek, and Purcell Branch. The results of these taxonomic analyses are presented in this report.

Multiple Habitat Sampling Method

Methods and Procedures

All samples collected by Amec Foster Wheeler, Chantilly office, in April 2016, were received by Amec Foster Wheeler taxonomy laboratory at Gainesville, Florida, where they were logged in and processed. The samples were sorted (i.e. organisms removed from debris) and organisms were identified and enumerated by a qualified taxonomist according to Section 7.2 of the U.S. Environmental Protection Agency's (USEPA) "*Rapid Bioassessment Protocol for Use in Wadeable Streams and Rivers*" (RBP) (Barbour *et al.*, 1999). Eight metrics were calculated including the Biotic Index, using guidance from Hilsenhoff (1987); the Percent Model Affinity (PMA), using guidance from Novak and Bode (1992); and the Virginia Stream Condition Index, using guidance from Virginia Department of Environmental Quality (2008). The scraper taxa and tolerance values were identified according to life history information from RBP (Barbour *et al.*, 1999); "*An Introduction to the Aquatic Insects of North America*" (Merritt *et al.*, 2008); "*Quality System Standard Operating Procedure for Macrovertebrate Stream Surveys*" (Tennessee Department of Environment and Conservation, 2011); and "*Standard Operating Procedures for the Collection and Analysis of Benthic Macroinvertebrates*" (North Carolina Department of Environmental Quality, 2016). Quality assurance and quality control checks were conducted according to the EPA RBP on Laboratory Quality Control for Macroinvertebrate Taxonomic Identification (Barbour *et al.*, 1999). Quality assurance/quality control requirements for sample picking and taxonomic identification were conducted by an Amec Foster Wheeler senior taxonomist.

Benthic Macroinvertebrate Results

The benthic invertebrate community data were used to generate metrics outlined in the Amec Foster Wheeler draft sampling plan. The Multiple Habitat Sampling assessments conducted at the five locations are summarized below in **Table 1**.

Correspondence:
Amec Foster Wheeler
404 SW 140th Terrace
Newberry, Florida
USA 32669-3000
Tel + 1 352 332 3318
Fax + 1 352 333 6622

Table 1. Summary of Results of Multiple Habitat Samples

Metrics	Site Locations				
	COW-414B	DK-412B	LB-412B	NB-413B	PB-413B
Taxa Richness	17	20	23	23	27
Abundance	250	211	246	225	251
EPT Index	2	1	5	4	9
EPT/EPT + Chironomidae Ratio	0.02	0.03	0.07	0.05	0.15
Percent Dominant Taxon	50.00	45.50	33.74	62.22	53.78
Percent Chironomidae	82.00	52.13	78.46	92.89	78.49
Biotic Index (BI)	5.75	5.86	5.34	5.05	4.57
Biotic Index (BI) Category	Fair	Fair	Good	Good	Good
Percent Model Affinity (PMA)	29.40	45.43	40.12	27.11	39.72
Percent Model Affinity (PMA) Category	Severely Impacted	Moderately Impacted	Moderately Impacted	Severely Impacted	Moderately Impacted
VSCI	27.85	35.67	39.29	32.96	46.40

Source: Amec Foster Wheeler, 2016

Prepared by: RJM

Checked by: JSD

Taxonomic identifications and abundances of the benthic invertebrates and metric calculations for each sample are included in Attachment 1. References are listed in Attachment 2.

Closing

We appreciate the opportunity to provide ecological services to you and Amec Foster Wheeler, Chantilly office. Please do not hesitate to contact me if you have questions, or need to request further information. You can reach me by phone at (352) 333-3634, or via email at shannon.mcmorrow@amecfw.com.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.



Shannon McMorrow
 Project Manager
 Direct Tel: + 1 352 333 3634
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Katherine Y. Deliz Quiñones PhD
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 E-mail: katherine.deliz@amecfw.com

Attachments:

- Attachment 1: Tabulated Data
- Attachment 2: References

**Attachment 1
Tabulated Data**

Multiple Habitat Sampling
 Samples Collected 04/2016
 Project #: 151270003

Metrics	Site Locations				
	COW-414B	DK-412B	LB-412B	NB-413B	PB-413B
Taxa Richness	17	20	23	23	27
Abundance	250	211	246	225	251
EPT Index	2	1	5	4	9
EPT/EPT + Chironomidae Ratio	0.02	0.03	0.07	0.05	0.15
Percent Dominant Taxon	50.00	45.50	33.74	62.22	53.78
Percent Chironomidae	82.00	52.13	78.46	92.89	78.49
Biotic Index (BI)	5.75	5.86	5.34	5.05	4.57
Biotic Index (BI) Category	Fair	Fair	Good	Good	Good
Percent Model Affinity (PMA)	29.40	45.43	40.12	27.11	39.72
Percent Model Affinity (PMA) Category	Severely Impacted	Moderately Impacted	Moderately Impacted	Severely Impacted	Moderately Impacted
VSCI	27.85	35.67	39.29	32.96	46.40

Cow Branch
 Multiple Habitat Sampling
 Samples Collected 04/14/2016
 Project #: 151270003

Results for COW-414B

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Nemertea	Enopla	Hoplonemertea	Tetrastemmatidae	Prostoma spp.	1						6.6	0.03			1			
Annelida	Clitellata			Oligochaeta spp.	2						5	0.04		2				
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	3						6.1	0.07		3				
Annelida	Clitellata	Tubificida	Naididae	Nais variabilis	29						8.7	1.01		29				
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	3			3			6.6	0.08						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	1			1			3.4	0.01						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	2				2		6	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	11				11		9.3	0.41						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum scalaenum group	5				5		8.5	0.17						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	8				8		8.7	0.28						
Arthropoda	Insecta	Diptera	Chironomidae	Dicrotendipes spp.	1				1		7.2	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Larsia spp.	9				9		6.5	0.23						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella spp.	44				44		6.4	1.13						44
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	125				125	125	4.1	2.05						125
Arthropoda	Insecta	Diptera	Simuliidae	Simuliidae spp.	3						6	0.07			3			
Arthropoda	Insecta	Diptera	Empididae	Hemerodromia spp.	2						6	0.05			2			
Arthropoda	Insecta	Heteroptera	Gerridae	Trepobates spp.	1						10	0.04			1			

Percent Model Affinity	Difference from Model %
Model % Ephemeroptera	40
Model % Plecoptera	5
Model % Trichoptera	10
Model % Chironomidae	20
Model % Coleoptera	10
Model % Oligochaeta	5
Model % Other	10
Sum of Difference	141.20
Sum of Difference * 0.5	70.60
Percent Model Affinity	
100 - (Sum of Difference * 0.5)	29.40
Percent Model Affinity Category	Severely Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	17	77.27	77.27
Total Abundance	250		
% Ephemeroptera	0.00	0.00	0.00
% Plecoptera	0.00		
% Trichoptera	1.60		
% Chironomidae	82.00	18.00	18.00
% Dominant Taxon	50.00		
Biotic Index	5.75	62.55	62.55
% Coleoptera	0.00		
% Oligochaeta	13.60		
% Other	2.80		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa			
Taxa	67.60	46.82	46.82
EPT Index	2	18.18	18.18
EPT/EPT + Chironomidae Ratio	0.02		

Hilsenhoff Biotic Index Category	Fair
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Final VSCI score	27.85
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Dawkins Branch
 Multiple Habitat Sampling
 Samples Collected 04/12/2016
 Project #: 151270003

Results for DK-412B

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	3						6.1	0.09		3				
Annelida	Clitellata	Tubificida	Naididae	Nais communis	40						8.7	1.65		40				40
Annelida	Clitellata	Tubificida	Naididae	Nais pardalis	4						8.7	0.16		4				
Annelida	Clitellata	Tubificida	Naididae	Slavina appendiculata	6						8.4	0.24		6				
Mollusca	Bivalvia	Veneroidea	Corbiculidae	Corbicula spp.	2						6.12	0.06			2			
Arthropoda	Malacostraca	Amphipoda	Dogielinotidae	Hyalella azteca sp. complex	1						7.2	0.03			1			
Arthropoda	Insecta	Ephemeroptera	Caenidae	Caenis spp.	3	3					6.8	0.10						
Arthropoda	Insecta	Odonata	Coenagrionidae	Argia spp.	3						8.3	0.12			3			
Arthropoda	Insecta	Odonata	Libellulidae	Libellulidae spp.	1						9	0.04			1			
Arthropoda	Insecta	Coleoptera	Elmidae	Dubiraphia spp.	1						5.5	0.03	1					
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	25						5.6	0.66	25					25
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	1				1		9.3	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	1				1		6.6	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum flavum	5				5		5.7	0.14						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus spp.	1				1		6.5	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Stenochironomus spp.	1				1		6.3	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	5				5		8	0.19						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	96				96	96	4.1	1.87						96
Arthropoda	Insecta	Diptera	Dolichopodidae	Dolichopodidae spp.	1						9.7	0.05			1			
Arthropoda	Insecta	Diptera	Simuliidae	Simuliidae spp.	11						6	0.31			11			

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	38.58
Model % Plecoptera	5	5.00
Model % Trichoptera	10	10.00
Model % Chironomidae	20	32.13
Model % Coleoptera	10	2.32
Model % Oligochaeta	5	20.12
Model % Other	10	1.00
Sum of Difference		109.15
Sum of Difference * 0.5		54.57
Percent Model Affinity 100 - (Sum of Difference * 0.5)		45.43
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	20	90.91	90.91
Total Abundance	211		
% Ephemeroptera	1.42	2.32	2.32
% Plecoptera	0.00		
% Trichoptera	0.00		
% Chironomidae	52.13	47.87	47.87
% Dominant Taxon	45.50		
Biotic Index	5.86	60.83	60.83
% Coleoptera	12.32		
% Oligochaeta	25.12		
% Other	9.00		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	11.85	22.96	22.96
% Top 2 Dominant Taxa	64.45	51.37	51.37
EPT Index	1	9.09	9.09
EPT/EPT + Chironomidae Ratio	0.03		

Hilsenhoff Biotic Index Category	Fair
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Final VSCI score	35.67
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Little Bull Run
 Multiple Habitat Sampling
 Samples Collected 04/12/2016
 Project #: 151270003

Results for LB-412B

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Tubificinae spp.	3						6.1	0.07		3				
Mollusca	Bivalvia	Veneroida	Corbiculidae	Corbicula spp.	9						6.12	0.22			9			
Arthropoda	Insecta	Ephemeroptera	Caenidae	Caenis spp.	10	10					6.8	0.28						
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	2	2					4	0.03						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Maccaffertium spp.	1	1					3.15	0.01					1	
Arthropoda	Insecta	Odonata	Coenagrionidae	Argia spp.	1						8.3	0.03			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsyche spp.	1				1		4	0.02						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Hydroptila spp.	1				1		6.5	0.03						
Arthropoda	Insecta	Coleoptera	Elmidae	Dubiraphia spp.	6						5.5	0.13	6					
Arthropoda	Insecta	Coleoptera	Elmidae	Microcyloepus spp.	9						4	0.15	9					
Arthropoda	Insecta	Coleoptera	Psephenidae	Ectopria spp.	3						5	0.06	3				3	
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	2				2		9.3	0.08						
Arthropoda	Insecta	Diptera	Chironomidae	Cladotanytarsus spp.	1				1		4	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	18				18		6.6	0.48						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	3				3		8.7	0.11						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum aviceps	15				15		3.6	0.22						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus spp.	2				2		6.5	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Tribelos fuscicorne	2				2		5.1	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Dicrotendipes spp.	49				49		7.2	1.43						49
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella spp.	1				1		6.4	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Paratendipes albimanus	17				17		4.3	0.30						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladus	83				83	83	4.1	1.38						83
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae spp.	7						5.7	0.16						

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	34.72
Model % Plecoptera	5	5.00
Model % Trichoptera	10	9.19
Model % Chironomidae	20	58.46
Model % Coleoptera	10	2.68
Model % Oligochaeta	5	3.78
Model % Other	10	5.93
Sum of Difference		119.76
Sum of Difference * 0.5		59.88
Percent Model Affinity 100 - (Sum of Difference * 0.5)		40.12
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	23	104.55	100.00
Total Abundance	246		
% Ephemeroptera	5.28	8.62	8.62
% Plecoptera	0.00		
% Trichoptera	0.81		
% Chironomidae	78.46	21.54	21.54
% Dominant Taxon	33.74		
Biotic Index	5.34	68.60	68.60
% Coleoptera	7.32		
% Oligochaeta	1.22		
% Other	4.07		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	1.63	3.15	3.15
% Top 2 Dominant Taxa	53.66	66.97	66.97
EPT Index	5	45.45	45.45
EPT/EPT + Chironomidae Ratio	0.07		

Hilsenhoff Biotic Index Category	Good
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Final VSCI score	39.29
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Neabsco Creek
 Multiple Habitat Sampling
 Samples Collected 04/13/2016
 Project #: 151270003

Results for NB-413B

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Annelida	Clitellata	Tubificida	Naididae	Nais pardalis	1						8.7	0.04		1				
Annelida	Clitellata	Enchytraeida	Enchytraeidae	Enchytraeidae spp.	1						10	0.04		1				
Mollusca	Gastropoda	Hygrophila	Planorbidae	Planorbella spp.	1						6	0.03			1			
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	5	5					4	0.09						
Arthropoda	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes albilineatus	1	1					5	0.02						
Arthropoda	Insecta	Odonata	Libellulidae	Libellulidae spp.	1						9	0.04			1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	3				3		6.6	0.09						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	1				1		3.4	0.02						
Arthropoda	Insecta	Coleoptera	Elmidae	Ancyronyx spp.	2						6.49	0.06	2					
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	4				4		6	0.11						
Arthropoda	Insecta	Diptera	Chironomidae	Chironomus spp.	18				18		9.3	0.74						18
Arthropoda	Insecta	Diptera	Chironomidae	Cladotanytarsus spp.	1				1		4	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	3				3		6.6	0.09						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	2				2		8.7	0.08						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum aviceps	13				13		3.6	0.21						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus spp.	5				5		6.5	0.14						
Arthropoda	Insecta	Diptera	Chironomidae	Ablabesmyia mallochii	1				1		7.4	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Dicrotendipes spp.	4				4		7.2	0.13						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella spp.	6				6		6.4	0.17						
Arthropoda	Insecta	Diptera	Chironomidae	Paratanytarsus spp.	6				6		8	0.21						
Arthropoda	Insecta	Diptera	Chironomidae	Paratendipes albimanus	1				1		4.3	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	140				140	140	4.1	2.55						140
Arthropoda	Insecta	Diptera	Chironomidae	Brillia spp.	5				5		5.7	0.13						

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	37.33
Model % Plecoptera	5	5.00
Model % Trichoptera	10	8.22
Model % Chironomidae	20	72.89
Model % Coleoptera	10	9.11
Model % Oligochaeta	5	4.11
Model % Other	10	9.11
Sum of Difference		145.78
Sum of Difference * 0.5		72.89
Percent Model Affinity 100 - (Sum of Difference * 0.5)		27.11
Percent Model Affinity Category		Severely Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	23	104.55	100.00
Total Abundance	225		
% Ephemeroptera	2.67	4.35	4.35
% Plecoptera	0.00		
% Trichoptera	1.78		
% Chironomidae	92.89	7.11	7.11
% Dominant Taxon	62.22		
Biotic Index	5.05	72.80	72.80
% Coleoptera	0.89		
% Oligochaeta	0.89		
% Other	0.89		
% Plecoptera + Trichoptera (less Hydropsychidae)	0.00	0.00	0.00
% Scrapers	0.00	0.00	0.00
% Top 2 Dominant Taxa	70.22	43.03	43.03
EPT Index	4	36.36	36.36
EPT/EPT + Chironomidae Ratio	0.05		

Hilsenhoff Biotic Index Category	Good
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Final VSCI score	32.96
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Purcell Branch
 Multiple Habitat Sampling
 Samples Collected 04/13/2016
 Project #: 151270003

Results for PB-413B

Phylum	Class	Order	Family	Taxa	Raw Abundance	Ephemeroptera	Plecoptera	Trichoptera	Chironomidae	Dominant Taxon	Tolerance Values	Tolerance Values * Individual Abundance/Total Abundance	Coleoptera	Oligochaeta	Other	Plecoptera & Trichoptera (less Hydropsychidae)	Scrapers	Top 2 Dominant Taxa
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae spp.	9	9					4	0.14						
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Maccaffertium spp.	6	6					3.15	0.08					6	
Arthropoda	Insecta	Ephemeroptera	Leptohyphidae	Tricorythodes albilineatus	1	1					5	0.02						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Cheumatopsyche spp.	9			9			6.6	0.24						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Macrostemum spp.	1			1			3.4	0.01						
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Hydroptila spp.	1			1			6.5	0.03				1		
Arthropoda	Insecta	Trichoptera	Philopotamidae	Chimarra spp.	6			6			3.3	0.08				6		
Arthropoda	Insecta	Trichoptera	Limnephilidae	Ironoquia spp.	1			1			7.78	0.03				1		
Arthropoda	Insecta	Coleoptera	Elmidae	Stenelmis spp.	10						5.6	0.22	10				10	
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae spp.	3				3		6	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	Cladotanytarsus spp.	1				1		4	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Tanytarsus spp.	2				2		6.6	0.05						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum halterale group	1				1		7.4	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum illinoense group	1				1		8.7	0.03						
Arthropoda	Insecta	Diptera	Chironomidae	Polypedilum aviceps	5				5		3.6	0.07						
Arthropoda	Insecta	Diptera	Chironomidae	Rheotanytarsus spp.	4				4		6.5	0.10						
Arthropoda	Insecta	Diptera	Chironomidae	Thienemanniella xena	20				20		8	0.64						20
Arthropoda	Insecta	Diptera	Chironomidae	Labrundinia spp.	1				1		6.2	0.02						
Arthropoda	Insecta	Diptera	Chironomidae	Parametriocnemus spp.	135				135	135	3.9	2.10						135
Arthropoda	Insecta	Diptera	Chironomidae	Cricotopus or Orthocladius	18				18		4.1	0.29						
Arthropoda	Insecta	Diptera	Chironomidae	Potthastia spp.	5				5		2	0.04						
Arthropoda	Insecta	Diptera	Chironomidae	Rheopelopia spp.	1				1		0.3	0.00						
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae spp.	1						5.7	0.02						
Arthropoda	Insecta	Diptera	Ceratopogonidae	Atrichopogon spp.	1						6.1	0.02						
Arthropoda	Insecta	Diptera	Simuliidae	Simuliidae spp.	3						6	0.07						
Arthropoda	Insecta	Diptera	Tabanidae	Tabanidae spp.	4						8	0.13						
Arthropoda	Insecta	Plecoptera	Leuctridae	Leuctra spp.	1		1				1.5	0.01				1		

Percent Model Affinity		Difference from Model %
Model % Ephemeroptera	40	33.63
Model % Plecoptera	5	4.60
Model % Trichoptera	10	2.83
Model % Chironomidae	20	58.49
Model % Coleoptera	10	6.02
Model % Oligochaeta	5	5.00
Model % Other	10	10.00
Sum of Difference		120.56
Sum of Difference * 0.5		60.28
Percent Model Affinity 100 - (Sum of Difference * 0.5)		39.72
Percent Model Affinity Category		Moderately Impacted

	Value	VSCI metrics	Adjusted VSCI metrics
Species Richness	27	122.73	100.00
Total Abundance	251		
% Ephemeroptera	6.37	10.40	10.40
% Plecoptera	0.40		
% Trichoptera	7.17		
% Chironomidae	78.49	21.51	21.51
% Dominant Taxon	53.78		
Biotic Index	4.57	79.79	79.79
% Coleoptera	3.98		
% Oligochaeta	0.00		
% Other	0.00		
% Plecoptera + Trichoptera (less Hydropsychidae)	3.59	10.07	10.07
% Scrapers	6.37	12.35	12.35
% Top 2 Dominant Taxa	61.75	55.27	55.27
EPT Index	9	81.82	81.82
EPT/EPT + Chironomidae Ratio	0.15		

Hilsenhoff Biotic Index Category	Good
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Final VSCI score	46.40
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**Attachment 2
References**

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- Virginia Department of Environmental Quality. 2008. Biological monitoring program: quality assurance project plan for wadeable streams and rivers. Division of Water Quality, Office of Water Quality Monitoring and Assessment Programs, Richmond, VA.
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QA Form Number: 063M
Page 1 of 1

Project Reference: <u>PWC Bio monitoring</u>		Project No.							
Sampler: <u>B. Green & Miller</u>	Phone: <u>630-536-6317</u>	Fax: <u></u>							
Project Location (city, county, state) <u>Princess Anne Wm, VA</u>		Client Proj. Mgr. <u>Bobby Saiz</u>							
Client Name: <u>Prince William Co.</u>		Client Address:							
DATE	SAMPLE	PRESERVATIVE	GRAB	COMP	Sample Identification	Matrix Type	Number of Containers Submitted	Test Requested	Remarks
4/12	None			X	LB-412B	Bare Sediment			
4/12	None			X	DK-412B	Bare Sediment		Macrobenthic softbodies	
						Vegetation			
						Vegetation			
						Bare Water			
						Water/Vegetation			
						Sediment/Vegetation			
						Algae			
						Macroinvertebrate		X	
						Ichthyoplankton		X	
						Other			

Relinquished By: (Signature) <u>Bobby Saiz</u>	Date: <u>4/12</u>	Time: <u>17:30</u>	Received By: (Signature) <u>Fed Ex</u>	Date: <u>4/12</u>	Time: <u>17:30</u>
Received By: (Signature) <u>[Signature]</u>	Date: <u>4/13</u>	Time: <u>10:30</u>	Relinquished By: (Signature) <u>[Signature]</u>	Date: <u>4/12</u>	Time: <u>17:30</u>
Received for Laboratory By: (Signature) <u>[Signature]</u>	Date: <u>4/13</u>	Time: <u>10:30</u>	Custody Intact	Remarks	Time



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QA Form Number: 063M
Page _____ of _____

Project Reference: <i>Prince Wm. Brownfields</i>	Project No.: <i>1512.70003</i>	Matrix Type	Number of Containers Submitted	Test Requested	Remarks				
Sampler: <i>B. Green & J. Miller</i>	Phone: <i>830-536-6317</i>					Other			
Project Location (city, county, state): <i>Manassas, Prince Wm., VA</i>	Fax:					Ichthyoplankton			
Client Name: <i>Prince Wm. Co.</i>	Client Proj. Mgr.: <i>Lynne Manners</i>	Macroinvertebrate	<i>x</i>	<i>Macroinst. TD Macroinverteb. TD</i>					
Client Address:		Algae	<i>x</i>						
		Sediment/Vegetation							
		Water/Vegetation							
		Bare Water							
		Vegetation							
		Bare Sediment							

DATE	PRESERVATIVE	GRAB	COMP	Sample Identification
<i>4/13</i>	<i>None</i>	<i>x</i>		<i>NB-413 B</i>
<i>4/13</i>	<i>None</i>	<i>x</i>		<i>PB-413 B</i>

Relinquished By (Signature): <i>[Signature]</i>	Received By (Signature): <i>Fed Ex</i>	Date: <i>4/13</i>	Time: <i>17:30</i>	Date: <i>4/13</i>	Time: <i>17:30</i>
Relinquished By (Signature): <i>[Signature]</i>	Relinquished By (Signature):	Date: <i>4/14</i>	Time: <i>11:30</i>	Date:	Time:
Received for Laboratory By (Signature): <i>[Signature]</i>	Custody Intact	Remarks			

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151278003.0002

Client: Prince William County - AWC FW

Sample Identification Number: COW-4148 (Include Aliquot ID) Sample Collection Date: ~~4-13-16~~ 4-14-16

Picked Initial/Date: NEJ / 4-21-16 # of Squares: Tray 1 5 / 24, Tray 2 /

Picking QA/QC Initial/Date Sorting Efficiency(a): Identification Initial/Date: RJM / 4-25-16

Total Organisms: Total Taxa: Identification QA/QC? (Initial/Date)

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
III	<i>Chironomopsycha</i> sp.	1	<i>Dicrotendipes</i> sp.
I	<i>Macrostemum</i> sp.	5	<i>Polypedilum scabenum</i> sp.
II	<i>Hemodromia</i> sp.	III	<i>Simuliidae</i>
II	<i>Chironomidae</i> sp. <i>tartar</i> pupa		
I	<i>Trepobates</i> sp.		
125	<i>Cricatopus/Octocledius</i> sp.		
II	<i>Chironomus</i> sp.		
78	<i>Polypedilum illinoense</i> sp.		
9	<i>Larsia</i> sp.		
44	<i>Thienemannella</i> sp.		

(a) Sorting efficiency is calculated as (Total Orgs- QC Orgs)/(Total Orgs) x 100

(b) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Entered in database date

Database QAed date

Diptera/Worms Identification Data Form

Project number: ~~0032~~

Client: ~~PRWA~~ ^{AMEC FW - Prince William County}

Sample Identification Number: COW-414B (one sample per form) Sample Collection Date: 14 Apr 2016

Sample Type: _____ Total Slide #: 3 Total Diptera: 35 Identification Date: 18 May 2016 Squares Picked 5/24

Org #	Taxonomic Identification	Split Factor	Org #	Taxonomic Identification	Split Factor
1	<i>Prostoma</i> sp. - VIAL				
2	<i>Oligochaeta</i> sp. - megadrile - VIAL				
29	<i>Nais variabilis</i> - ^{hairs & pectinate} _{needles observed in some}				
3	<i>Tubificinae</i> sp. - Immature				

(*) Star any organisms for voucher collection
Entered in database _____ date _____
Database QAed _____ date _____

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151270003.0002

Client: Amec FW - Prince William Co

Sample Identification Number: DK-412B (Include Aliquot ID) Sample Collection Date: 4-12-16

Picked Initial/Date VM/4-14-16 # of Squares: Tray 1 1 / 24, Tray 2 /

Picking QA/QC Initial/Date RM/4-15-16 Sorting Efficiency(a): Identification Initial/Date: RM/4-15-16

Total Organisms: Total Taxa: Identification QA/QC? (Initial/Date) SEM/16 Aug 2016

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
11	Simuliidae	5	Polypedilum flavum
1	Hyalella azteca	1	Rheotanytarsus sp.
1	Dubiraphia sp.	1	Chironomus sp.
11	Stenelmis sp.	5	Thienemanniella xena
11	Caenys sp.	1	Tanytarsus sp.
11	Argia sp.	1	Stenocheironomus sp.
1	Libellulidae		
11	Corbicula sp.		
1	Dolichopodidae		
96	Cricotopus / O. macleodii sp.		

(a) Sorting efficiency is calculated as (Total Orgs - QC Orgs)/(Total Orgs) x 100

(b) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

Entered in database date

Database QAed date

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Diptera: 121 Worms: 64

Diptera/Worms Identification Data Form

Project number: ~~0005~~

Client: ~~STRAW~~ Amec FW - Prince William County

Sample Identification Number: DK-412B (one sample per form) Sample Collection Date: 12 Apr 2016

Sample Type: _____ Total Slide #: 5 Total Diptera: 53 Identification Date: 18 May 2016 Squares Picked 1/24

Org #	Taxonomic Identification	Split Factor	Org #	Taxonomic Identification	Split Factor
40	<i>Nais communis</i>				
4	<i>Nais parvialis</i>				
6	<i>Stavina appendiculata</i>				
3	<i>Tubificinae sp. - Immature</i>				
			1	Diptera to ID	

(*) Star any organisms for voucher collection
Entered in database _____ date _____
Database QAed _____ date _____

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151270003.0002

Client: AMEC FW VA - Prince William Co

Sample Identification Number: LR-412B (Include Aliquot ID) Sample Collection Date: 4-12-16

Picked Initial/Date NP/4-13-16 # of Squares: Tray 1 2 / 16, Tray 2 /

Picking QA/QC Initial/Date ESM 4-14-16 Sorting Efficiency(a): 99% Identification Initial/Date: R/m/ 4-14-16

Total Organisms: Total Taxa: Identification QA/QC? (Initial/Date)

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
147 (9)	Corbicula sp.	1	Argia sp.
147 II	Ceratopogonidae	49	Dicrotendipes sp.
147 III	Microcyllopus sp. (1-Adult)	3	Polypedilum illinoense sp.
III	Ectopria sp.	17	Paratendipes sp. albimanus
147 I	Dubioflea sp.	83	Cricotopus / Oithona cladius sp.
147 IV	Caenis sp.	18	Tanytarsus sp.
II	Pachidae	2	Tribelos fuscicoline
I	Macleodites sp.	3	Paratendipes albimanus
I	Hydropsyche sp.	2	Chironomus sp.
I	Hydrophila sp.	15	Polypedilum aviceps

(a) Sorting efficiency is calculated as (Total Orgs - QC Orgs)/(Total Orgs) x 100

(b) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

Entered in database date

Database QAed date

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Diptera: 191 Worms: 7

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151210003.0002

Client: Amec FW VA-Prince William Co

Sample Identification Number: LB-412B (Include Aliquot ID) Sample Collection Date: 4-12-2016

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
1	<i>Thienemannella</i> sp.		
1	<i>Cladonycterus</i> sp.		
2	<i>Rheotanytarsus</i> sp.		

(a) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

Entered in database _____ date _____

Database QAed _____ date _____

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Diptera/Worms Identification Data Form

Project number: ~~600397~~

Client: ~~SIRWMD~~ *AMEC/EI - Prince W. Julian County*

Sample Identification Number: LB-412B (one sample per form) Sample Collection Date: 12 Apr 2016

Sample Type: _____ Total Slide #: 1 Total Diptera: 3 Identification Date: 13 May 2016 Squares Picked 2/16

Org #	Taxonomic Identification	Split Factor	Org #	Taxonomic Identification	Split Factor
3	<i>Tubificidae sp. - Immature</i>				

(*) Star any organisms for voucher collection
Entered in database _____ date _____
Database QAed _____ date _____

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151270003.0002

Client: Prince William County - Aneel FWVA

Sample Identification Number: NB-413-B (Include Aliquot ID) Sample Collection Date: 4-13-16

Picked Initial/Date NP/4-14-15 # of Squares: Tray 1 3 / 24, Tray 2 /

Picking QA/QC Initial/Date pm/4-21-16 Sorting Efficiency(a): 97% Identification Initial/Date: pm 4-21-16

Total Organisms: Total Taxa: Identification QA/QC? (Initial/Date)

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
III ③	Chironomus psyches sp.	140	Cricotopus / Orctocledius sp.
I	Macrostemum sp.	4	Dicodendipes sp.
I	Planorbella sp.	3	Tanytarsus sp.
III	Chironomidae pupa	13	Polypedilum anceps
III	Baetidae	18	Chironomus sp.
I	Tricorynodes albolineatus		Dicodendipes pm
I	Libellulidae (immature)	1	Paratendipes albimanus
II	Ancyronyx sp.	2	Polypedilum illinoense sp.
6	Paratanytarsus sp.	5	Briffa sp.
6	Thienemanniella sp.	pm 81	Ablabesmyia mallochii

(a) Sorting efficiency is calculated as (Total Orgs - QC Orgs) / (Total Orgs) x 100

(b) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Entered in database date

Database QAed date

AMEC Environment and Infrastructure, Inc.
Newberry, Florida

Invertebrate Sampling Analysis

Macroinvertebrate Sample Picking and Sorting Data Form *Amec FW VA - Prince William Co.*

Project number: 151270003.0002

Client:

Sample Identification Number: NB-413B (Include Aliquot ID) Sample Collection Date: 4-13-2016

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
HTT 1 (5)	Rheotanytarsus sp.		
1	Cladotanytarsus sp.		

(a) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

Entered in database _____ date _____

Database QAed _____ date _____

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Diptera/Worms Identification Data Form

Project number: ~~100397~~

Client: ~~SRWMD~~ *AMEC EW - Prince William County*

Sample Identification Number: NB-413B (one sample per form) Sample Collection Date: 13 Apr 2016

Sample Type: _____ Total Slide #: 1 Total Diptera: 2 Identification Date: 13 May 2016 Squares Picked 3 / 24

Org #	Taxonomic Identification	Split Factor	Org #	Taxonomic Identification	Split Factor
1	<i>Nais pardalis</i>				
1	<i>Enchytraeidae sp.</i>				
			1	Diptera to ID	

(*) Star any organisms for voucher collection
Entered in database _____ date _____
Database QAed _____ date _____

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151270003.0002

Client: Prince William County - Amec FW VA

Sample Identification Number: PB-413B (Include Aliquot ID) Sample Collection Date: ~~4-13-15~~ 4-13-16 NP 6/8/16

Picked Initial/Date VM / 4-15-16 # of Squares: Tray 1 3 / 24, Tray 2 /

Picking QA/QC Initial/Date PM / 4-15-16 Sorting Efficiency(a): 100% Identification Initial/Date: 4-21-16 / PM

Total Organisms: Total Taxa: Identification QA/QC? (Initial/Date)

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
I	Ceratopogonidae	I	Ironogua sp
I	Atrichopogon sp.	IIII	Maccasterhum sp.
IIII	Simuliidae	IIIIIIII	Rachidae
IIII	Chironomidae pupa	I	Tricorythodes albilineatus
IIII	Tabanidae pupa	I	Leuctra sp
IIII	Stenelmis sp	II	Cicutoxus/Ormoscladius sp. a
IIII	Chironomus sp	5	Polypedilum avicrips
IIII	Chironomopsycha sp	135	Chironomus/Ormoscladius sp. b PM parametopencrabs sp.
I	Maccostemum sp.	5	Pott hastia sp.
I	Hydroptilic sp.	I	Rheopelopia sp.

(a) Sorting efficiency is calculated as (Total Orgs- QC Orgs)/(Total Orgs) x 100

(b) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Entered in database _____ date _____

Database QAed _____ date _____

Macroinvertebrate Sample Picking and Sorting Data Form

Project number: 151270003.0002

Client: Prince William County -
AMEC F/W VA

Sample Identification Number: PB-413 B (Include Aliquot ID) Sample Collection Date: 4-13-2016

Number of Organisms by Sort (b)	Taxonomic Identification, if known	Number of Organisms by Sort (b)	Taxonomic Identification, if known
20	<i>Thienemannella xena</i>		
1	<i>Polydora halleri</i> sp.		
4	<i>Rhectanysus</i> sp.		
1	<i>Cladotanytarsus</i> sp.		
2	<i>Tanytarsus</i> sp.		
1	<i>Labrundinea</i> sp.		
1	<i>Polydora illinoense</i> sp.		

(a) 200 organisms per Sample (Sample Identification Number) is goal

(*) Star any organisms removed for voucher collection

COMMENTS (other organisms not identified; for example, 10 fish, 2 shrimp):

Entered in database _____ date _____

Database QAed _____ date _____

Diptera/Worms Identification Data Form

Project number:

Client: AMEC EW - Prince William County

Sample Identification Number: PB-413B (one sample per form) Sample Collection Date: 13 Apr 2016

Sample Type: Total Slide #: 1 Total Diptera: 5 Identification Date: 13 May 2016 Squares Picked 3/24

Org #	Taxonomic Identification	Split Factor	Org #	Taxonomic Identification	Split Factor
2	<i>Oligochaeta</i> sp. - megadriles - VIAC				
1	<i>Haplotaxis</i> cf. <i>gordiioides</i> - *				
1	<i>Nais</i> <i>pardalis</i>				
1	<i>Tubificinae</i> sp. - Immature				

(*) Star any organisms for voucher collection
Entered in database _____ date _____
Database QAed _____ date _____

Appendix 2 – In-Stream Monitoring

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Appendix 3 – Floatables and Solids Monitoring



Prince William County

Floatables Monitoring Program

Permit No.
VA0088595

Prince William County Department of Public Works
Watershed Management Branch
5 County Complex Court, Suite 170
Prince William, Virginia 22192

5/1/2016

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I. Introduction

Prince William County is dedicated to Program providing its citizens with the healthiest environment possible. It is with this goal the County establishes programs aimed at reducing pollutant impacts from heavily urbanized and industrialized areas. Non-point source pollution from urban and industrial areas within the County is a great concern due to its potential to impact water quality. Pollutants are transported from these areas during rain events and often deposited untreated into nearby streams and rivers. To mitigate this issue, the Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VA-DEQ) have instituted programs aimed at reducing the potential impact of pollutants from urban areas. Goes into

Under the Virginia Pollutant Discharge Elimination System Permit Program (VPDS) and Virginia Stormwater Management Program (VSMP) permits are issued aimed at reducing pollution runoff from industrial and urban areas containing Municipal Separate Storm Sewers Systems or MS-4s. These systems transport water from urbanized areas to streams and rivers and are a major concern of point and non-point source pollution. Discharges from MS4s are regulated under the Virginia Stormwater Management Act and Clean Water Act (CWA) through permits issued by DEQ and the EPA. Through this program, Prince William County maintains a Phase 1 VSMP MS-4 permit (Permit No. VA0088595).

Through its VSMP permit, the County is required to monitor floatables from areas suspected to be contributing excess levels of trash and refuse to its MS-4 by implementing a Floatables Monitoring Program. Unlike the Dry Weather Monitoring Program and Wet Weather Screening Program, the Floatables Monitoring Program is aimed at assessing trash loadings to streams. Using information obtained through this program, the County is to then develop strategies to reduce refuse load from these areas. The County's MS-4 permit, issued on December 17th, 2014, outlines requirements for the Floatables Monitoring Program as follows:

3. Floatables Solids Monitoring

No later than 24 months after the effective date of the permit, the permittee shall develop and implement a floatables monitoring program. The intent of the monitoring program is to determine the loading of floatables from the MS4 to streams within the county. The permittee will implement the floatables monitoring program as follows:

- a) Monitoring shall be conducted at five (5) monitoring sites located at MS4 outfalls and/or streams receiving discharges from the MS4.
- b) Monitoring shall be conducted once per quarter after program implementation.
- c) The monitoring program shall include the count of floatables visually observed and length or area of sites assessed.

This program manual describes the methods and procedures for Prince William County's Floatables Monitoring Program. All procedures are subject to modification as program feasibility and applicability are assessed during program implementation. All program modifications will be noted as part of the County's Program Plan.

II. Site Selection

a. Initial Locations and Site Screening

i. Methods and Results

Initial site locations were provided by the Prince William County Soil and Water Conservation District (PWCSWCD) from a list of sites currently monitored under its stream stewards program. These nine sites were selected as the starting point during site screening since the PWCSWCD currently visits these sites on a quarterly basis, and Floatables monitoring could straightforwardly be incorporated with the stream stewards program.

Three additional sites were identified using GIS in the need to incorporate a more diverse set of land uses in the floatables analysis, as the sites monitored by PWCSWCD were located in mostly residential areas. These sites were located by making an overall observation of the County's service area and the location of its regulated outfalls in relation to areas with diverse land uses. The first supplementary site was located off of Liberia Avenue, near the intersection of Liberia and route 294. This site includes discharge from an upstream commercial area. The second additional site is located on flat branch near the intersection of Sudley Road and Goodwin Drive. This site incorporates an area with a high degree of impervious surfaces and includes drainage from commercial and industrial land uses. Finally the third additional site is located on Cornice Place off of Old Bridge Road. This area drains from a smaller shopping center, and would be a good opportunity to see how BMPs applied in that shopping center can effect floatables numbers downstream.

b. Selection of final sampling sites

i. Methods

Sites identified during initial site screening were visited and scored according to a set of metrics. These metrics were adopted in order to identify optimal locations for floatables monitoring. Metrics incorporated elements analyzing the quality of upstream conditions, land uses, safety and access of the site, size of contributing drainage systems, and opportunity to reduce floatable sources. Each metric was scored on a scale of 1-5 with a score of 5 being the most desirable, and 1 being the least. The total score for each site was calculated by averaging the scores from each metric for the site. Sites with the highest average score were the most desirable for use in the floatables monitoring program.

Within each site, a sampling area will be selected. This sampling area will outline where volunteers or staff are to assess floatables. This sampling site will be selected during the first sampling period, and will encompass the area where the most floatables are identified.

ii. Results

All 12 sites were analyzed for use in the program. The score results from each site are located in Table 1 below.

Table 1: Site Assessment Scores

Site	Score
Site 7: Neabsco Creek, Andrew Leitch Park	3.6
Site 10: Liberia and 294	3.6
Site 3: Dawkins Branch, Victory Elementary	3.4

Site 11: Flat Branch	3.4
Site 12: Cornice Place and Old Bridge Road	3.2
Site 4: Dewey's Creek, Wayside Drive	3.2
Site 9: Powell's Creek, Monclair	3.0
Site 6: Hooe's Run, Springwood Drive	2.6
Site 5: Hooe's Run, Castile Court	2.6
Site 2: Catharpin Creek, James Long Park	2.6
Site 8: Neabsco Creek, Cloverdale Park	2.4
Site 1: Bull Run, Ben Lomond Park	0

Site scores varied from 3.6 to 0. Site 1 was disqualified due to a lack of MS-4 outfalls discharging into the stream segment. Sites that ranked the highest typically had a mix of contributing land uses and highly accessible, countable, and identifiable sources of floatables within the stream segment. Sites typically had one to three regulated outfalls discharging to the stream, and had medium to small contributing drainage areas. The top 5 sites are selected for the program, with the top 2 sites used for the pilot study. Completed site assessment sheets are available in Appendix A.

c. Site Rotation

Sites will be rotated from monitoring cycle if it is determined that the site does not perform as expected. This can occur for several reasons such as, if the site does not receive sufficient trash counts, if access to the site becomes too dangerous for staff to safely perform monitoring, or if activities occur on site that render monitoring impractical such as a stream restoration or redevelopment projects. Sites must remain in the program for at least one year before being replaced by another site, unless circumstances arise that prevent monitoring from occurring.

Replacement sites will be selected in the same method as described above in section b. New candidate sites will be selected from the list of sites that were not selected in the initial site selection procedure and from suggestions from County Staff.

III. Field Procedures

a. Pilot Program

i. Methods

To test and refine monitoring program procedures as well as assess staff effectiveness in monitoring efforts, the Floatables Monitoring Program will first operate under a pilot program. The pilot program will conduct monitoring at two sites for four sampling periods. In order to proceed with main sampling program in a reasonable timeframe, the pilot monitoring will take place at an accelerated schedule. Instead of sampling once per quarter, monitoring will be conducted once per month. Factors such as sampling procedures, sampling site characteristics, safety measures, and monitoring forms will be evaluated during this time. The pilot program will last a total of 4 months before the main monitoring program begins.

ii. Results

Pilot Program results will be included at the end of the pilot study for the program.

b. Training

Sampling will be performed with a mix of paid staff and volunteers. In order to maintain consistency in the program in the event that different groups of people sample different sites, or different groups of people sample from each sampling period to the next, training must take place. Staff will be responsible for reading and understanding the methods presented in this manual, and relaying that information to volunteers. Staff will be directed to either be present during all sampling events, or at the very least be present for the first sampling event a volunteer participates in. Important concepts to place emphasis on when training volunteers are bankfull depth, the location of site markers, and the layout of the sampling form. A sampling manual shall be provided to each volunteer performing monitoring and each inspection sheet will include instructions and a detailed list of site locations. Volunteers can be directed to contact PWC staff if needed.

c. Sampling Methods

Sampling will be consistent across all sites. As referenced in section II.b, a sampling area will be selected within each monitoring site. The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel, as described in figure 1 below. Observations will be recorded on the form presented in section IV.a. Data sheets will be provided to the County at the end of each monitoring year and kept within the County's Floatables monitoring manual in Appendix B.

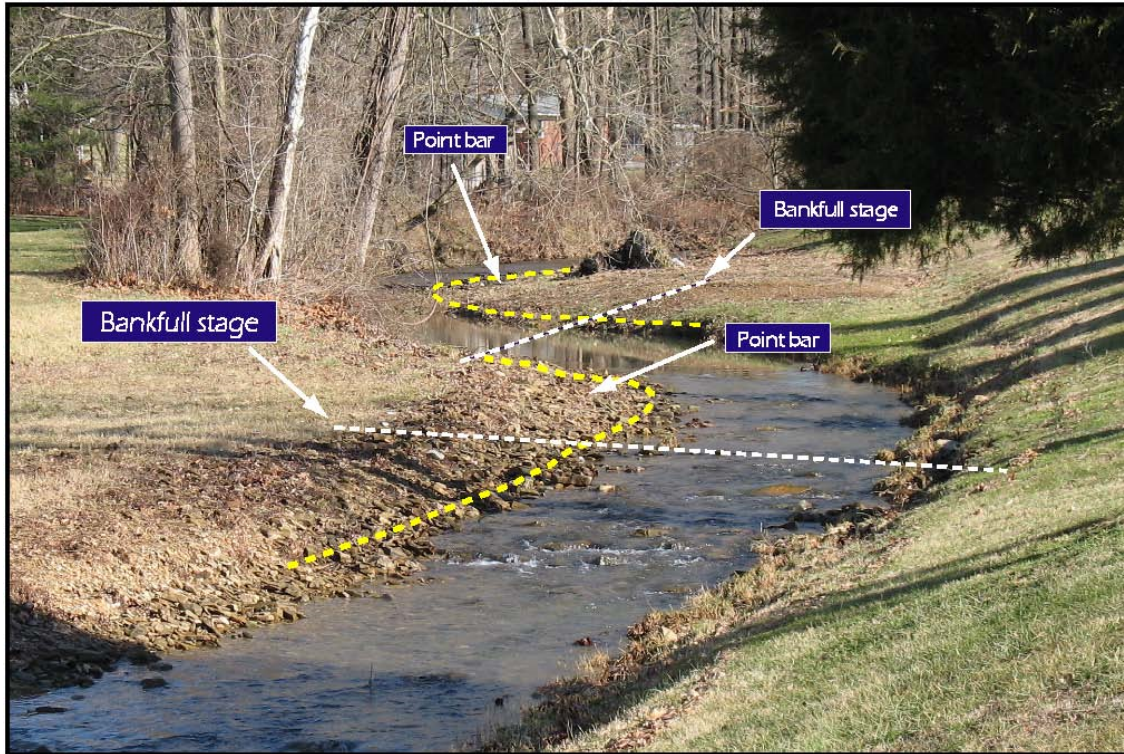


Figure 1. Bankfull Diagram, Credit Indiana FDH

d. Safety

Safety an important goal of the floatables monitoring program. When performing monitoring, staff should be equipped with proper footwear and clothing. This includes at a minimum closed toed shoes. Staff are recommended to also wear long sleeved shirts and pants, as well as waterproof gaiters or shoes in the event entering the stream is necessary. Staff should avoid accessing areas with high slopes and steep drop-offs.

The accessibility and safety of monitoring sites are incorporated in the site analysis used to determine sampling sites. Within sampling sites, sampling areas are identified that incorporate safe access and easy visibility for monitoring. Health and safety responsibility and accountability involves every employee. Some additional measures that should be followed or noticed includes:

- 1) Bring cell phone on all field site visits.
- 2) Exercise caution when encountering any wildlife and hazardous plants. In addition, many outfalls are located in remote areas that may be near gathering places for homeless or transient individuals. Do not enter a potentially hostile area.
- 3) Use common sense during electrical storms and/or when severe conditions (e.g., high wind, hail) develop. The safety of field staff overrides all other considerations.
- 4) Storm sewers contain a variety of water-borne bacteria and other harmful chemicals. Wash hands or use anti-bacterial wipes or hand gels liberally, especially prior to lunch breaks, etc.

i. DANGEROUS FLORA AND FAUNA

During the course of field activities, employees may come in contact with a wide range of dangerous or toxic animals and plants. Dangerous animals may include: black widow and brown recluse spiders; fire ants; mosquitoes and biting flies; bees, wasps and hornets; ticks and chiggers; microbial organisms (e.g., found in water, soil, and air and on carrier/host organisms); rabid mammals; and poisonous snakes. Dangerous plants may include: thorny plants; poison ivy, oak, and sumac; and molds, mildews, and fungi (which may cause allergic reactions). Contact with these organisms can cause effects from simple discomfort (such as from thorny bush scratches) to severe allergic reactions and possibly death. If interactions do occur, take appropriate actions related to specific interaction and individual response to interaction.

ii. WEATHER-RELATED HAZARDS

Weather-related hazards include the potential for heat or cold stress, electrical storms, treacherous weather-related working conditions, high winds, and limited visibility. These hazards correlate with the season in which site activities occur. In the event of adverse weather conditions, the Field Team Leader will determine if work can continue without endangering the health and safety of site personnel.

iii. HEAT STRESS

Heat stress is a significant potential hazard during the warmer months. Heat stress manifests itself as one of three conditions: heat cramps, heat exhaustion, or heat stroke. Heat cramps are brought about by a prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, triggering painful muscle cramps.

iv. COLD STRESS

Cold stress is a danger at low temperatures and when the wind chill factor is low. Cold stress is generally described as a local cooling (frost nip, frost bite, and freezing) or a general cooling (hypothermia). Personnel working outdoors in temperatures at or below freezing may be subject to local cooling. Areas of the body that have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. General cooling (hypothermia) occurs when exposure to cold reduces body temperature. With prolonged exposure, the body becomes unable to maintain its proper internal temperature. Without treatment, hypothermia will lead to stupor, collapse, and death. Prevention of cold stress is a function of whole body protection. Adequate insulated clothing will be worn when the air temperature drops below 50 °F. Reduced work periods may be necessary in extreme conditions to allow adequate periods in a warm area.

IV. Documentation
a. Forms

There are two types of data acquisition forms used in the program, the site identification/evaluation form, and the field inspection form. The site identification/evaluation form is used during the site selection process to evaluate potential sampling sites. It will also be used whenever new potential sites are evaluated for inclusion into the program. This form uses a set of metrics to score and average to generate a quantitative comparison between candidate sites. An example of the Site identification form can be seen in figure 2 below:

Site #: Site Description

Site Map

Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Figure 2: Site Identification Form

Field inspection forms are completed during each inspection. They incorporate information on the date, time, weather conditions, and site number of the inspection, Information on the person/group performing the inspection, and information on the floatables found on site. Each inspection from includes the basic sampling methods, and breaks down each floatable type typically observed in the field. An example of the field inspection form can be seen in figure 3 below:

Prince William County Floatables Monitoring Field Inspection Form

Location:	Date:	Time:
Name:		Weather Conditions:

The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type observed. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel.

Plastic Bags:	
Plastic Bottles:	
Snack bags or wrappers:	
Aluminum Cans:	
Oil containers:	
Cardboard:	
Styrofoam:	
Other:	

Signature: _____ Date: _____

Figure 3: Field Inspection Form

b. Documentation and trends analysis

Data gathered in the field will be organized using an excel database provided by Prince William County. This database incorporates all site characteristics and inspections and allows for the easy identification of continued trends within each sampling site.

Each site has its own sheet within the database. Each sheet contains easily identifiable areas to enter data gathered from the field. Each site is identified at the top of the sheet along with a description of the site location. This database will be the main form of data transfer between monitoring staff and PWC.

V. Future Program Goals

a. Trash Mitigation plans

As data is gathered at sampling sites, an effort to help reduce the amount of floatables entering the streams will be developed. Using data gathered on floatables entering the stream segments, a determination of their source will be made. Efforts will then be undertaken in the surrounding drainage areas to reduce the amount of the floatables identified in the stream reaches.

These mitigation plans will focus on efforts such as ensuring recycling and trash bins have lids, enhancing trash storage, enforcing and promoting current recycling standards, promoting trash pickup events, encouraging street sweeping efforts in commercial areas, and other methods. An assessment on the effectiveness of these efforts can then be made, with the possibility of expanding mitigation plans to other parts of the County.

b. Adapting to changing MS-4 Regulations

As the program continues throughout the length of the County's current MS-4 permit, the County will monitor trends related to future requirements within the MS-4 program. This could lead to changes in the floatables monitoring program. Since the permit requirements can only be changed during permit issuance, current program goals and methods will remain constant throughout each permit period (5 years). As the timeline advances towards the County receiving a new MS-4 permit, potential changes to the program will be observed and incorporated into the next monitoring period.

APPENDIX A – Site Identification Forms

Site 1: Bull Run, Ben Lomond Park



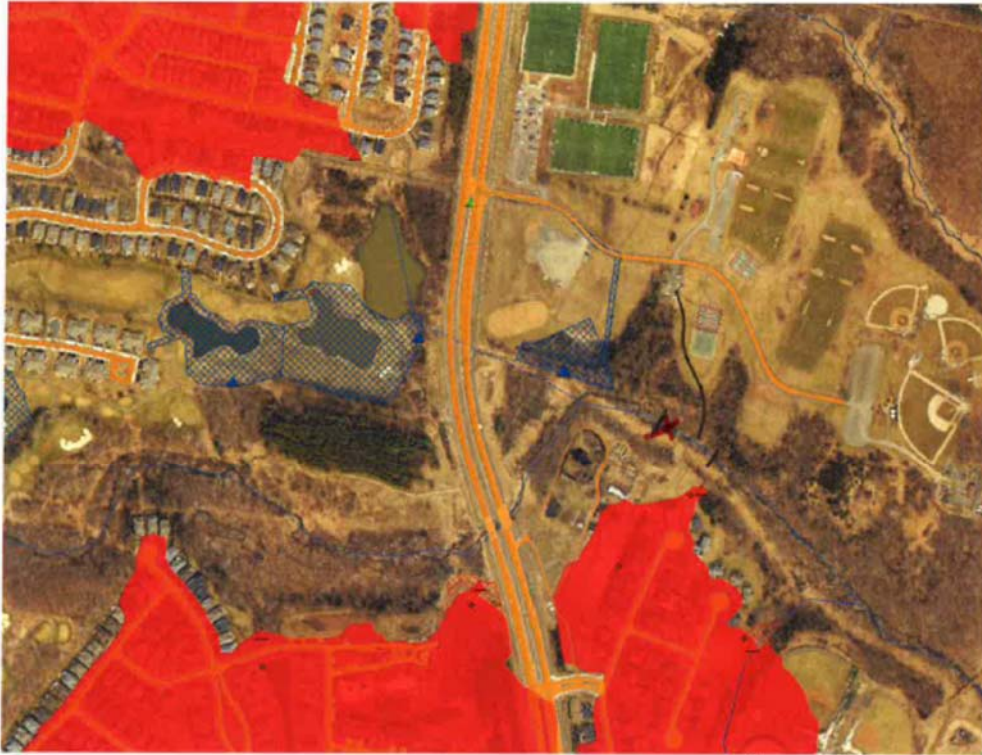
Quality of upstream MS-4 outfalls: No quality upstream outfalls [0]
Upstream land uses: Residential, some commercial [2]
Opportunity to reduce floatables sources: _____ []
Access and feasibility: _____ []
Size of contributing drainage area(s): Large >10ac [3]

Notes:

No MS-4 outfalls eliminates this site from the floatables monitoring program.

Site Score: 0

Site 2: Catharpin Creek, James Long Park



Quality of upstream MS-4 outfalls: Mostly Nonpoint, One MS-4 outfall (1)

Upstream land uses: Residential, Large lot, Sports Complex (2)

Opportunity to reduce floatables sources: Not much trash present (1)

Access and feasibility: Very easy access, ~~limited~~ easy mobility lot, #5

Size of contributing drainage area(s): Small-Med (4)

Notes:

Access easily available from library parking lot. Site is degraded by
lack of floatable input, Not many MS-4 outfalls nearby, Little Nonpoint
Sources. Site good for monitoring, Bad for trend analysis

Site Score: 2.6

Site 3: Dawkins Branch, Victory Elementary School



Quality of upstream MS-4 outfalls: 2 Quality outfalls [2]

Upstream land uses: Residential, Schools, Roadway [3]

Opportunity to reduce floatables sources: Some floatables, limited But excessive sources [4]

Access and feasibility: Path allows easy access, Lotow access good [5]

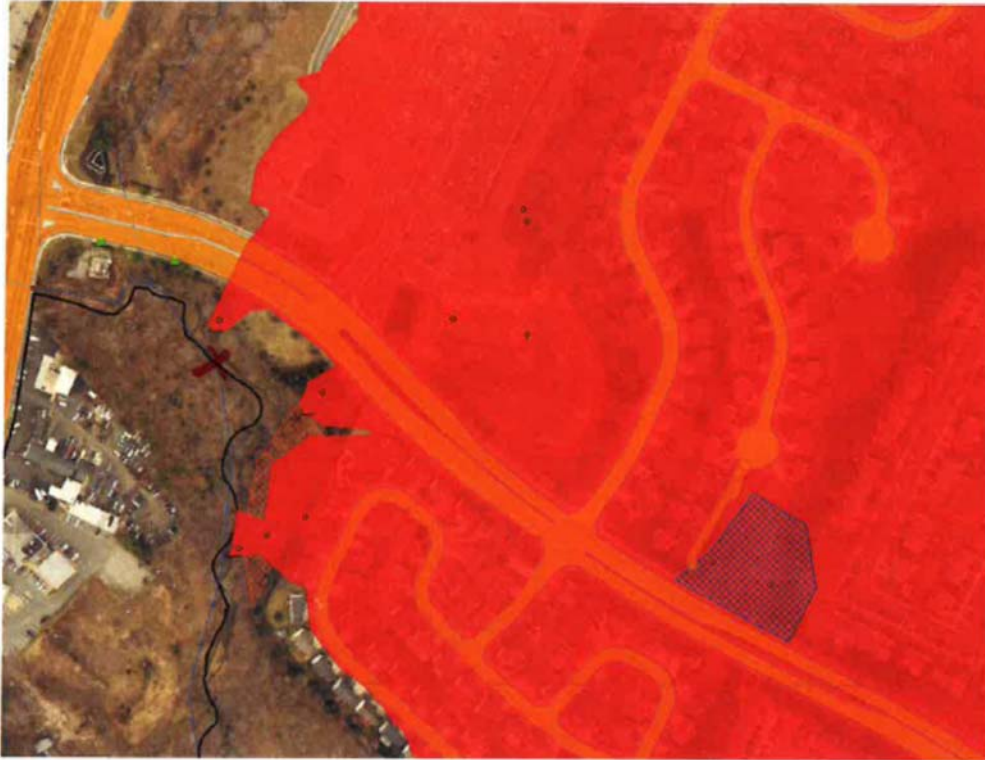
Size of contributing drainage area(s): Med. large [3]

Notes:

Good open area for monitoring. Outreach can be isolated to single residential area. Not many floatables present when site inspection occurred

Site Score: 3.4

Site 4: Dewey's Creek, Wayside Drive



Quality of upstream MS-4 outfalls: One gravity outfall [3]

Upstream land uses: Residential, Commercial, Roadway [4]

Opportunity to reduce floatables sources: Large amount of trash [3]

Trash Source from Streambank

Access and feasibility: Available parking, easy access [3]

Size of contributing drainage area(s): Large [3]

Notes:

Stream will undergo Restoration project in coming years. May Complicate Monitoring efforts [fall 2016]. Could be good pilot site

Site Score: ~~4.0~~ 3.2

Site 5: Hooes Run, Castile Court



Quality of upstream MS-4 outfalls: 2-3 quality outfalls [3]
Upstream land uses: Residential, [2]
Opportunity to reduce floatables sources: good amount of trash identifiable sources [4]
Access and feasibility: Neighborhood w/ little parking, hill difficult [2]
Size of contributing drainage area(s): Medium [2]

Notes:

good opportunity to reduce floatables, Access may be difficult, Steep Slopes
Down to Stream, and Stream has high steep banks.

Site Score: 2.6

Site 6: Hooes Run, Springwood Drive



- Quality of upstream MS-4 outfalls: 3 quality outfalls [3]
Upstream land uses: Residential [2]
Opportunity to reduce floatables sources: little to no trash [2]
Access and feasibility: hilly area to descend, path helps access [3]
Size of contributing drainage area(s): med-large [3]

Notes:

larger stream, access good, but roads may vary according to
where along road sampling occurs. very little trash in stream.

Site Score: 7.6

Site 7: Neabsco Creek, Andrew Leitch Park



Quality of upstream MS-4 outfalls: 2 quality outfalls [2]
Upstream land uses: Residential Small lot [3]
Opportunity to reduce floatables sources: Low numbers of floatables [4]
Access and feasibility: good access, Too few inputs good isolated inputs [5]
Size of contributing drainage area(s): Small - Mid [4]

Notes:

Many potential sampling sites, not much trash found in stream, access is good. Stream size is good. fairly simple area to reduce floatables.

Site Score: 3.6

Site 8: Neabsco Creek, Cloverdale Park



Quality of upstream MS-4 outfalls: 2-3 quality [3]
Upstream land uses: Residential [2]
Opportunity to reduce floatables sources: would be difficult to ID sources, little amount of trash [2]
Access and feasibility: long way from parking, wide deep channel [2]
Size of contributing drainage area(s): Med-Large [3]

Notes:

wide stream makes it difficult for monitoring efforts.

Site Score: 2.4

Site 9: Powells Creek, Monclair



Quality of upstream MS-4 outfalls: 1-2 quality outfalls [2]
Upstream land uses: Residential [2]
Opportunity to reduce floatables sources: ~~Some trash, difficult to determine~~ [2] Identifiably sources (3)
Access and feasibility: ~~large distance from parking, access through lots~~ Some trash easy access (4)
Size of contributing drainage area(s): Small - not [4]

Notes:

Trash present as part of Prior Stream Restoration project which must be removed from analysis. wide but shallow stream that receives high flows.

Site Score: 3.0

Site 10:



- Quality of upstream MS-4 outfalls: Many upstream outfalls [4]
- Upstream land uses: Commercial/residential [4]
- Opportunity to reduce floatables sources: Some [3]
- Access and feasibility: Fence impedes Access, Lection before stream area [3]
- Size of contributing drainage area(s): Small-med [4]

Notes:

No current sampling site. Inaccessible through private property. Mostly residential. Need access to BML. But site can be located before fenced off area. leaves identifiable input drainage areas. floatables are few, but have potential for more.

Site Score: 3.6

Site 11: Flat Branch

2



- Quality of upstream MS-4 outfalls: Many [4]
- Upstream land uses: Commercial/Residential [4]
- Opportunity to reduce floatables sources: Sufficient floatables [4]
- Access and feasibility: Ingress/Egress through private property [3] (Lateral access good)
- Size of contributing drainage area(s): Large [2]

Notes:

No current sampling site. Ingress/Egress through private property. Sufficient floatables exist, but may not be attributed to MS-4 outfalls. Transported from upstream

Site Score: 3.4

Site 12:



- Quality of upstream MS-4 outfalls: Many [4]
Upstream land uses: Commercial / Residential [4]
Opportunity to reduce floatables sources: Good amount of floatables [4]
Access and feasibility: Small stream, easy access from Roadway [3]
Size of contributing drainage area(s): Very Large [1]

Notes:

No current sampling site. Small stream with good floatable #'s. easy access
May be able to discern source of floatables for Res/Com sources

Site Score: 3.2

APPENDIX B – Field Inspection Forms

Forms will be added to this section upon completion

Floatables Monitoring Site Selection Data Sheets

The initial candidate Floatables Monitoring Program site locations were provided by PWCSWCD as part of their stream stewards program. These sites were first screened to include those who receive discharges from MS-4 Regulated Outfalls. Potential alternative sites are included as suggestions from PWC as additional sampling locations. These sites allow for a wider range of land uses to be included in the Floatables program analysis. Other sites will be considered upon discussion with stakeholders and County Staff if needed. These sites will be added at the end of this analysis document.

Maps are to be marked with important locations such as:

- Estimated Stream Stewards sampling location
- Ingress-egress for monitoring staff
- Potential sampling locations
- Trash hotspots
- Regulated outfall Locations
- Any dangerous or suspicious areas
- Other areas of interest

Scoring is determined by averaging the score from each individual scoring category. The score in each scoring category is selected from a scale of 1 to 5, with a score of 1 representing a least favored outcome, and a score of 5 representing a most desired outcome. If any qualifications are not met (i.e. a score of 0 is recorded for a site) then the site is disqualified from being used as a final site. The top 5 sites will be selected for the Floatables Monitoring Program.

Site 1: Bull Run, Ben Lomond Park

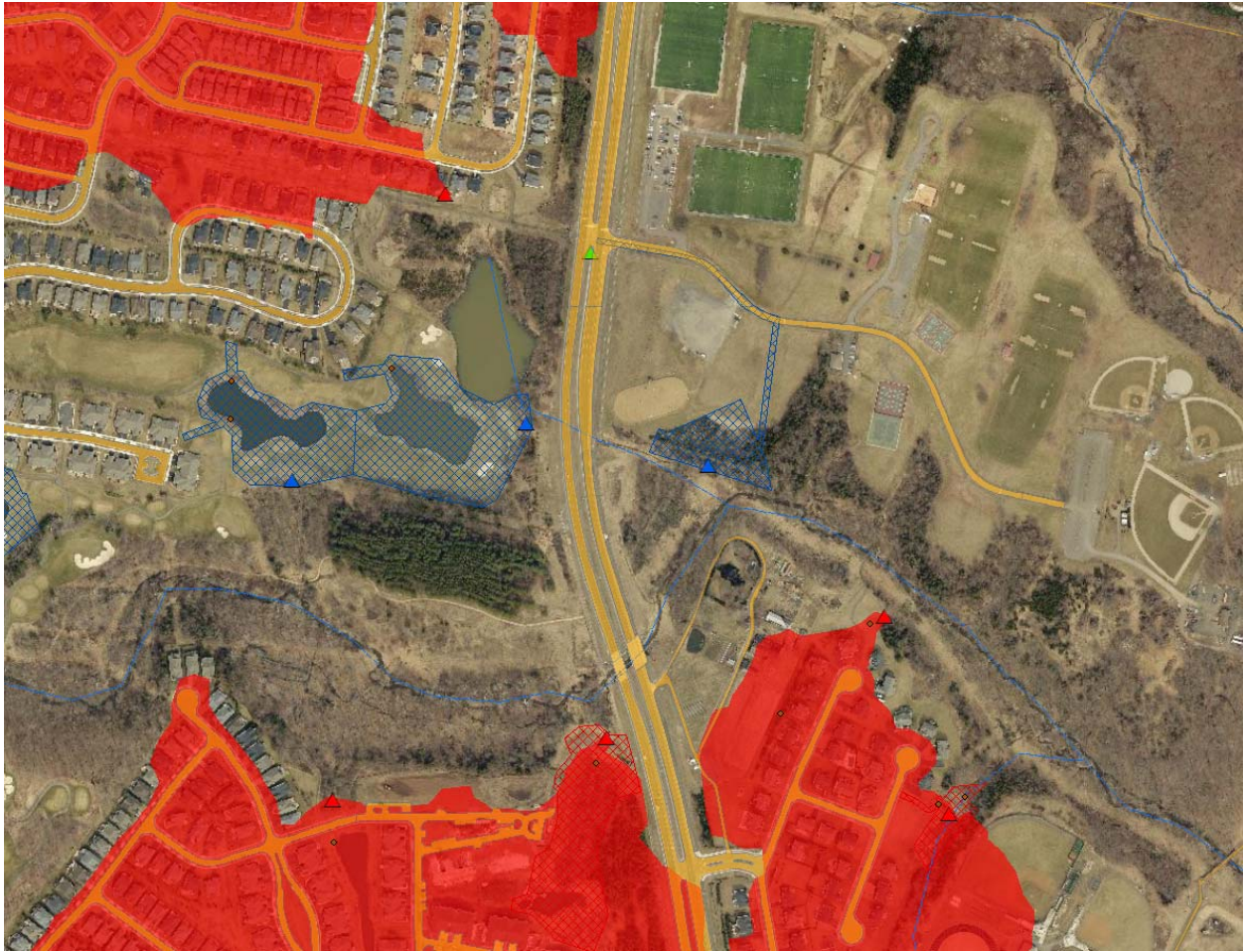


- Quality of upstream MS-4 outfalls: _____ []
- Upstream land uses: _____ []
- Opportunity to reduce floatables sources: _____ []
- Access and feasibility: _____ []
- Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 2: Catharpin Creek, James Long Park



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

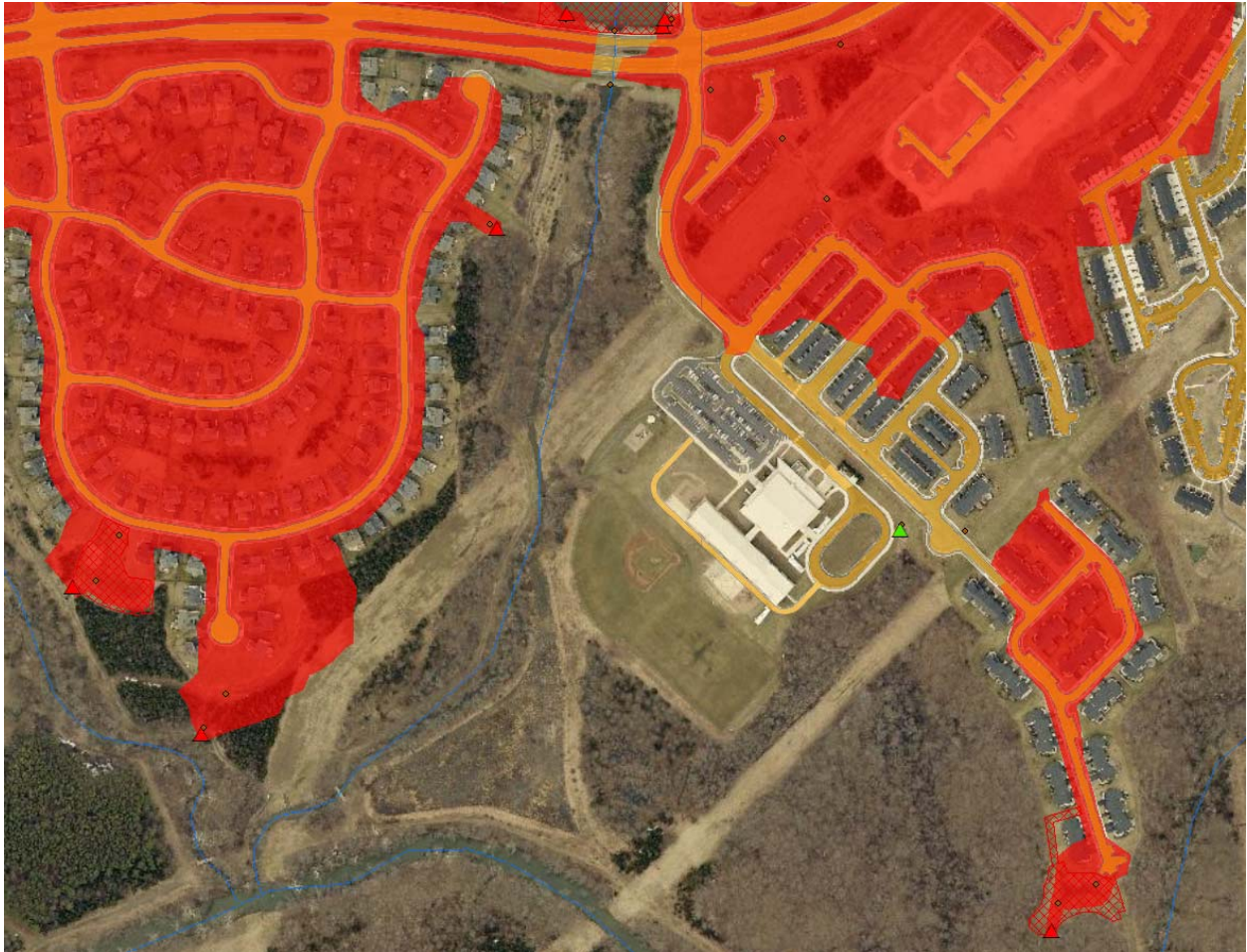
Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 3: Dawkins Branch, Victory Elementary School



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 4: Dewey's Creek, Wayside Drive



- Quality of upstream MS-4 outfalls: _____ []
- Upstream land uses: _____ []
- Opportunity to reduce floatables sources: _____ []
- Access and feasibility: _____ []
- Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 5: Hooes Run, Castile Court



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

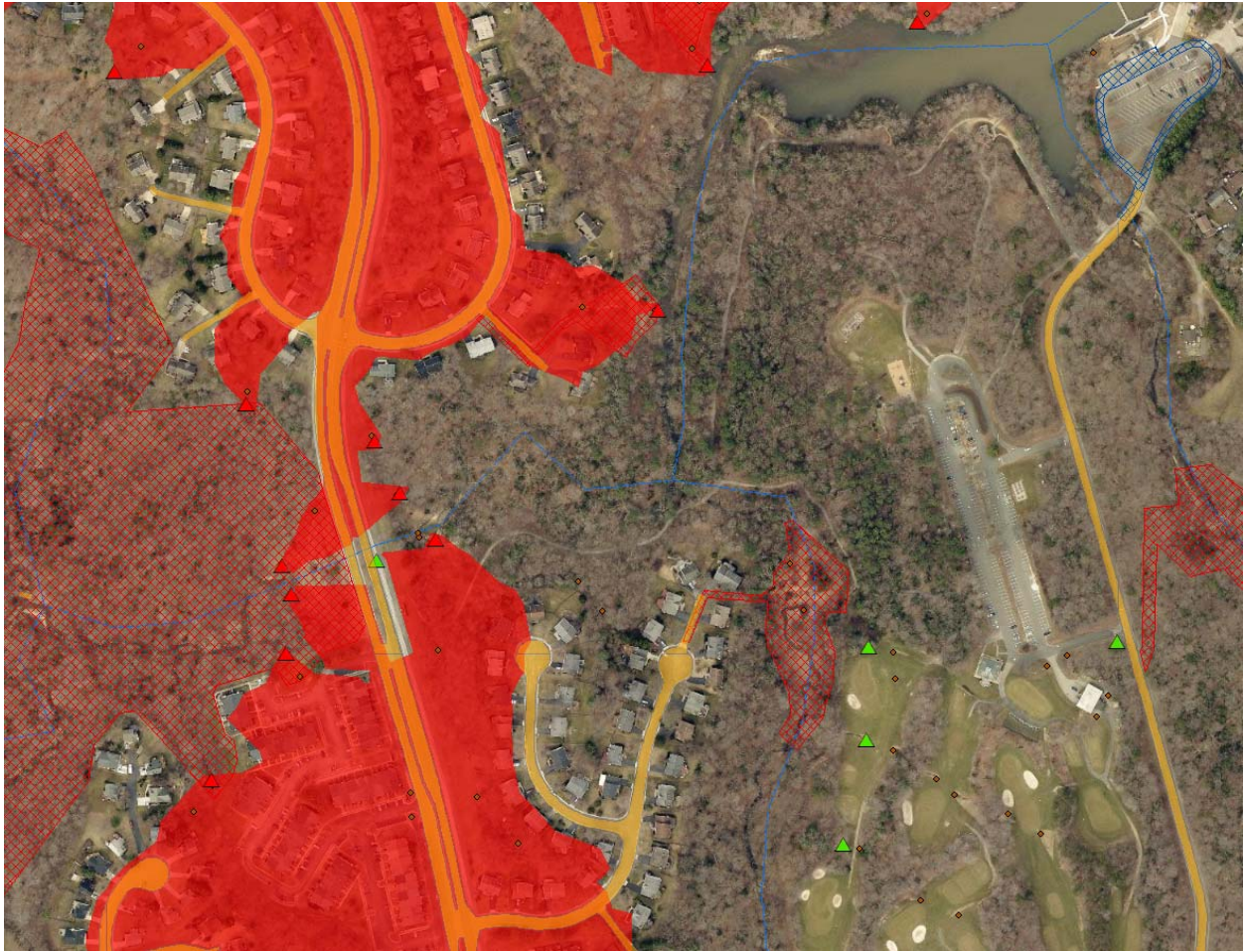
Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 6: Hooes Run, Springwood Drive



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

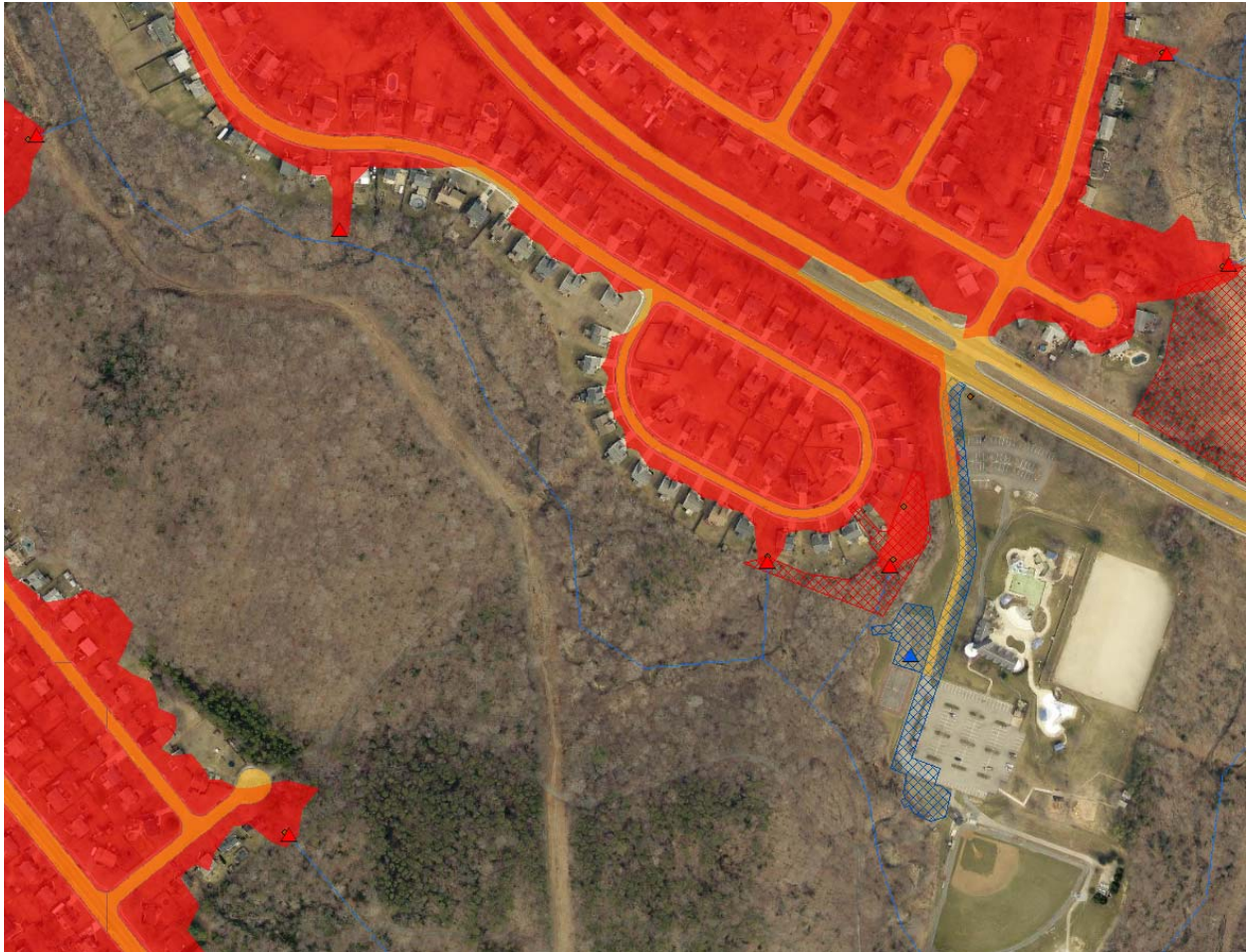
Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 7: Neabsco Creek, Andrew Leitch Park



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 8: Neabsco Creek, Cloverdale Park



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 9: Powells Creek, Monclair

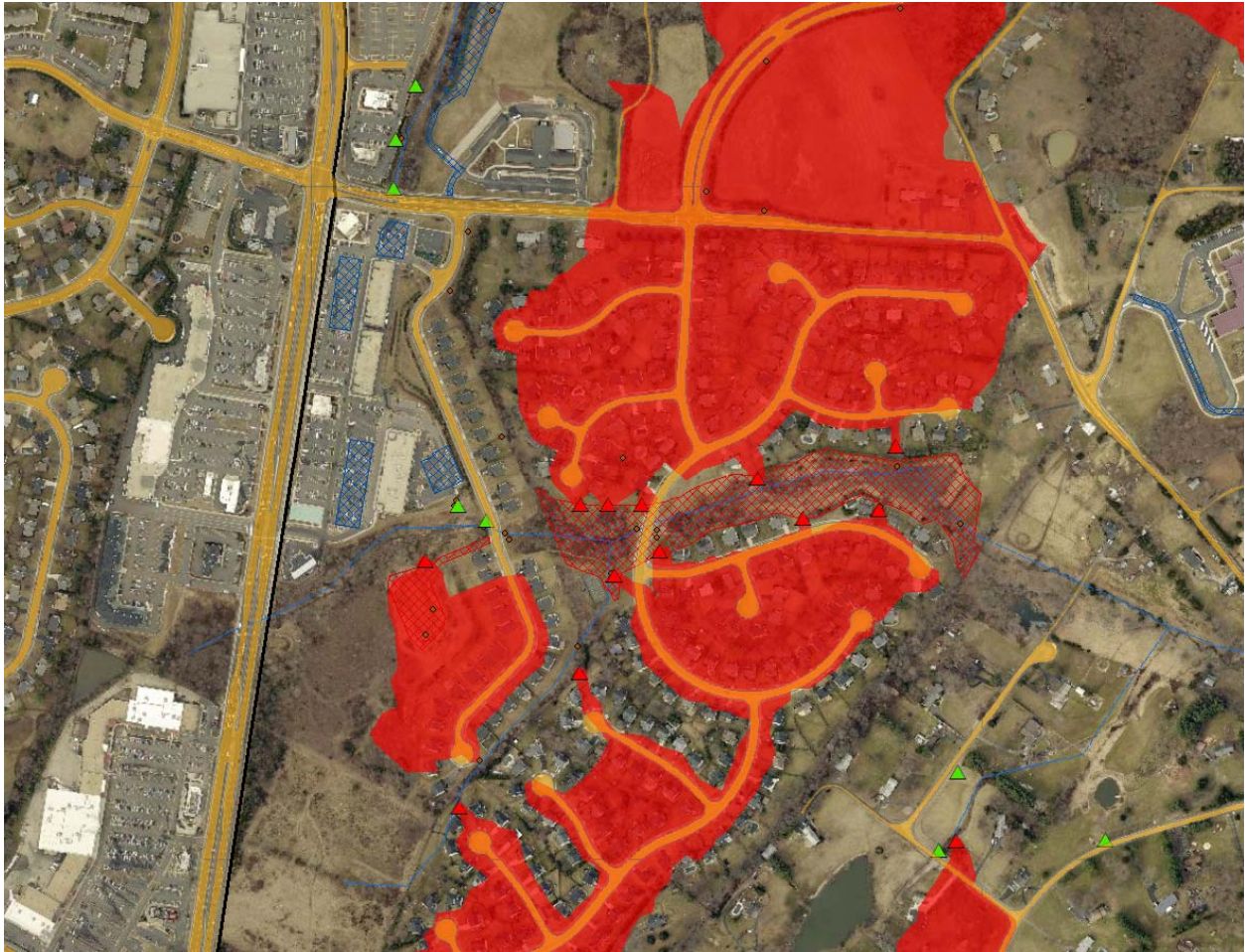


- Quality of upstream MS-4 outfalls: _____ []
- Upstream land uses: _____ []
- Opportunity to reduce floatables sources: _____ []
- Access and feasibility: _____ []
- Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 10:



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

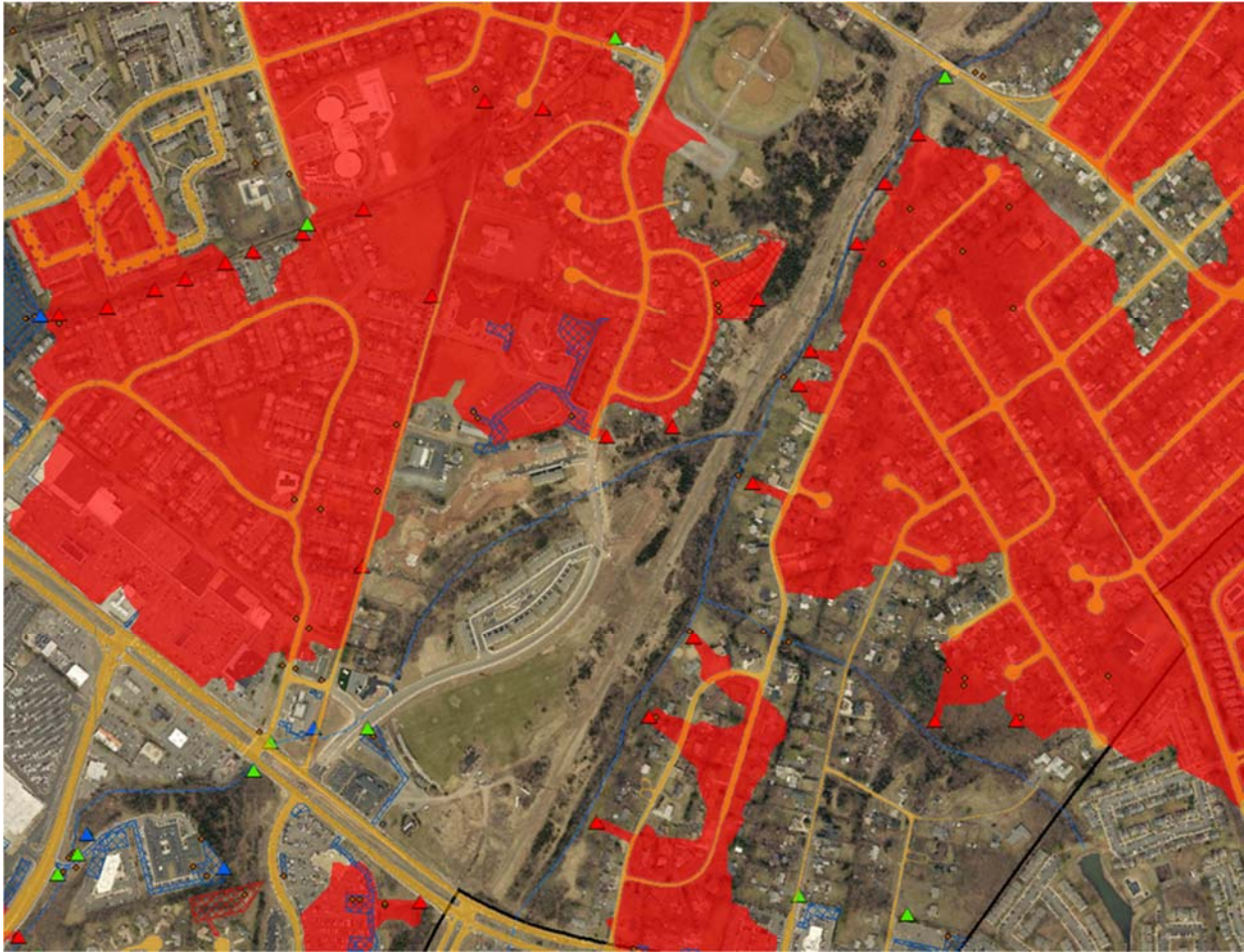
Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 11:



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Site 12:



Quality of upstream MS-4 outfalls: _____ []

Upstream land uses: _____ []

Opportunity to reduce floatables sources: _____ []

Access and feasibility: _____ []

Size of contributing drainage area(s): _____ []

Notes:

Site Score: _____

Prince William County Floatables Monitoring Field Inspection Form

Location:	Date:	Time:
Name:		Weather Conditions:

The sampling area will be identified on site with simple wooden stakes. The stakes will be labeled to indicate the direction to follow when sampling and also indicate the bankfull height of the stream. If a distinct sampling direction is not indicated, it will be assumed sampling will take place in the direction of stream flow. The distance between stakes will be approximately 100 ft. Floatables monitoring staff will walk the length of the sampling area counting the type and amount of each floatable type observed. Refuse will be considered a floatable eligible to be counted if it is above the water line, within the confines of the stream, and below the bankfull mark of the channel.

Plastic Bags:	
Plastic Bottles:	
Snack bags or wrappers:	
Aluminum Cans:	
Oil containers:	
Cardboard:	
Styrofoam:	
Other:	

Signature: _____

Date: _____

Appendix 4 – Structural and Source Controls

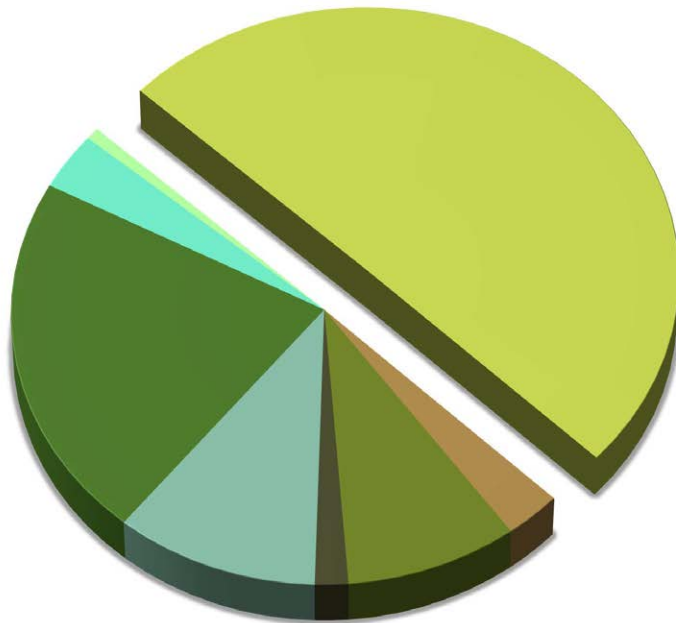
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Appendix III – Administrative and Programmatic

Public Works

Mission Statement <http://www.pwcgov.org/government/dept/budget/Pages/Community-Development.aspx>

The Prince William County Department of Public Works does the right thing for the community by creating and sustaining the best environment in which to live, work and play. We protect and improve our natural and historic resources, adopt and enforce codes and regulations and build and maintain the infrastructure needed for employees to serve our community.



Community Development Expenditure Budget:
\$162,905,334

Expenditure Budget:
\$81,863,038

50.3% of Community Development

Programs:

- Director's Office: \$720,936
- Historic Preservation: \$1,425,258
- Stormwater Infrastructure Management: \$3,302,756
- Site Development: \$3,299,188
- Watershed Improvement: \$4,594,931
- Fleet Management: \$11,609,594
- Facilities Construction Management: \$119,149
- Sign Shop: \$205,435
- Small Project Construction: \$2,058,102
- Mosquito & Forest Pest Management: \$1,808,077
- Solid Waste: \$24,948,454
- Buildings & Grounds: \$11,167,356
- Property Management: \$12,312,610
- Neighborhood Services: \$4,085,882
- Service Districts (Bull Run & Lake Jackson): \$365,311

Mandates

There are state mandates for public records management and preservation, and to maintain existing street name signs. Public Works provides these mandated services. Public Works is liaison to the state mandated Chesapeake Bay Preservation Area Review and Wetlands Boards. The Board of County Supervisors has enacted additional local mandates for which Public Works has responsibility.

State Code: [Chapter 7](#), Virginia Public Records Act; Highways, Bridges and Ferries, [33.2-328](#), Wetland Board, [28.2-1303](#), Chesapeake Bay Preservation Area Review Board, [Title 9](#), Virginia Administrative Code, [62.1-44.15:24](#)

County Code: Chapter 2 ([Wetlands Areas; Coastal Primary Sand Dunes & Beaches Zoning Ordinance; Historical Commission](#)), Chapter 3 ([Amusements](#)), Chapter 5 ([Building Maintenance Code](#)), Chapter 12 ([Massage Establishments](#)), Chapter 13-320.1 ([Designation of watercraft, boat trailer, motor home, and camping trailer "restricted parking" zones](#)), Chapter 14 ([Noise](#)), Chapter 16-56 ([Graffiti Prevention and Removal](#)), Chapter 22 ([Refuse](#)), Chapter 23 ([Public Sanitary Sewers](#)), Chapter 23.2 ([Stormwater Management](#)), Chapter 25 ([Subdivisions - Minimum Requirements](#)), Chapter 29 ([Weeds & Grass](#)), Chapter 32 ([Zoning](#)), Chapter 33 ([Expedited Land Development Plan Review](#))

Public Works

Expenditure & Revenue Summary



Expenditure by Program	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed	% Change Adopt16/ Proposed17
1 Director's Office	\$1,433,949	\$1,279,245	\$1,314,440	\$698,136	\$720,936	3.27%
2 Historic Preservation	\$1,437,429	\$1,451,620	\$1,471,991	\$1,418,429	\$1,425,258	0.48%
3 Stormwater Infrastructure Management	\$8,211,116	\$8,716,141	\$2,985,878	\$2,942,359	\$3,302,756	12.25%
4 Site Development	\$0	\$82,979	\$3,131,249	\$3,382,599	\$3,299,188	(2.47%)
5 Watershed Improvement	\$0	\$243	\$3,123,486	\$4,434,386	\$4,594,931	3.62%
6 Fleet Management	\$10,136,244	\$10,391,824	\$10,231,551	\$11,689,920	\$11,609,594	(0.69%)
7 Facilities Construction Management	\$58,470	\$197,895	\$1,551	\$119,156	\$119,149	(0.01%)
8 Sign Shop	\$244,810	\$230,756	\$231,381	\$181,082	\$205,435	13.45%
9 Small Project Construction	\$3,015,250	\$2,048,951	\$1,599,435	\$1,860,051	\$2,058,102	10.65%
10 Mosquito & Forest Pest Management	\$1,396,279	\$1,503,026	\$1,417,367	\$1,769,138	\$1,808,077	2.20%
11 Solid Waste	\$17,962,340	\$19,269,885	\$19,256,939	\$20,246,749	\$24,948,454	23.22%
12 Buildings & Grounds	\$9,634,426	\$10,736,120	\$10,479,664	\$10,327,940	\$11,167,356	8.13%
13 Property Management	\$11,233,841	\$10,787,030	\$10,991,448	\$11,365,486	\$12,312,610	8.33%
14 Neighborhood Services	\$3,312,784	\$3,254,636	\$3,450,579	\$3,837,839	\$4,085,882	6.46%
15 Service Districts (Bull Run & Lake Jackson)	\$358,840	\$462,222	\$336,990	\$365,311	\$365,311	0.00%
Total Expenditures	\$68,435,778	\$70,412,571	\$70,023,949	\$74,638,581	\$82,023,038	9.89%

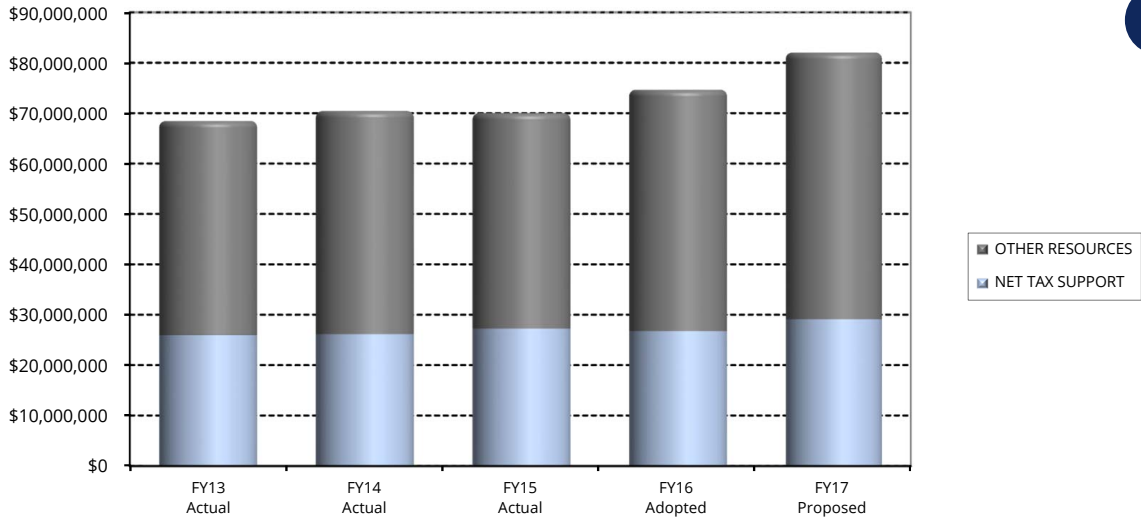
Expenditure by Classification

1 Personal Services	\$18,065,424	\$18,674,308	\$19,095,819	\$20,179,168	\$20,943,624	3.79%
2 Fringe Benefits	\$6,516,792	\$6,521,293	\$6,114,896	\$7,024,048	\$6,998,629	(0.36%)
3 Contractual Services	\$9,218,162	\$11,066,409	\$10,594,637	\$11,897,089	\$13,761,735	15.67%
4 Internal Services	\$3,081,607	\$2,986,634	\$3,803,399	\$2,701,730	\$2,780,723	2.92%
5 Purchase Goods & Supplies	\$13,478,666	\$11,574,683	\$11,328,794	\$15,322,085	\$14,609,678	(4.65%)
6 Debt Maintenance	\$297,314	(\$35)	\$0	\$0	\$0	—
7 Depreciation	\$3,342,356	\$3,171,757	\$4,433,516	\$1,007,569	\$1,007,569	0.00%
8 Amortization	\$1,748,550	\$3,774,243	\$2,386,372	\$1,755,699	\$1,755,699	0.00%
9 Capital Outlay	\$2,314,194	\$2,658,020	\$2,552,188	\$6,986,263	\$11,929,994	70.76%
10 Leases & Rentals	\$6,293,748	\$6,247,571	\$6,452,339	\$6,806,411	\$6,959,789	2.25%
11 Recovered Costs/Budgeted Savings	(\$646,633)	(\$829,535)	(\$997,515)	(\$3,522,700)	(\$3,570,217)	1.35%
12 Transfers	\$4,725,599	\$4,567,221	\$4,259,504	\$4,481,219	\$4,845,816	8.14%
Total Expenditures	\$68,435,778	\$70,412,571	\$70,023,949	\$74,638,581	\$82,023,038	9.89%

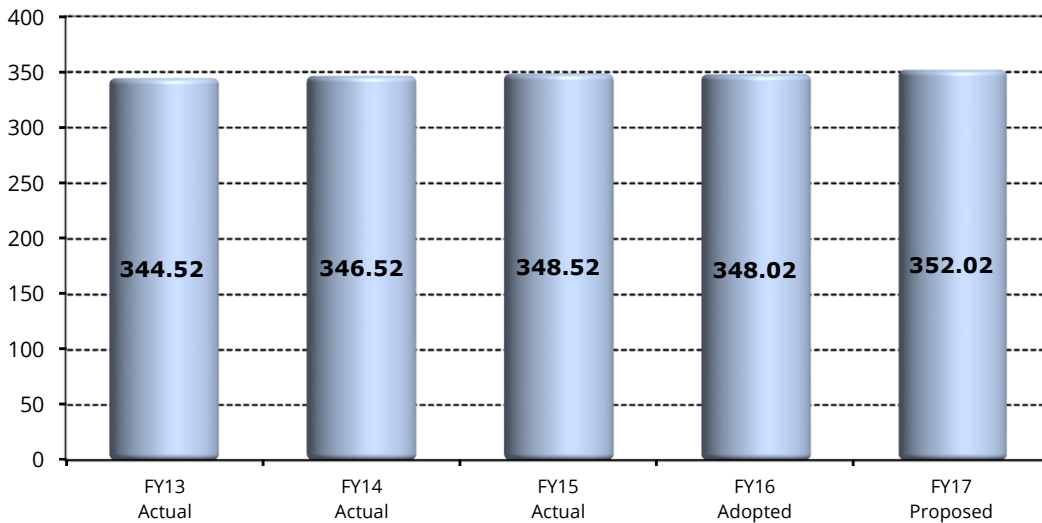
Funding Sources

1 General Property Taxes	\$1,474,561	\$1,540,997	\$1,599,105	\$1,714,771	\$1,794,771	4.67%
2 Permits, Privilege Fees & Regulatory License	\$2,112,441	\$1,901,782	\$2,297,479	\$2,546,327	\$2,407,996	(5.43%)
3 Fines & Forfeitures	\$6,000	\$1,163	\$570	\$0	\$0	—
4 Revenue From Use of Money & Property	\$584,946	\$1,761,543	\$1,735,851	\$1,957,067	\$1,989,190	1.64%
5 Charges for Services	\$35,773,031	\$35,346,122	\$36,322,119	\$37,044,787	\$37,338,895	0.79%
6 Miscellaneous Revenue	\$87,116	\$145,166	\$259,314	\$140,000	\$243,000	73.57%
7 Revenue From Other Localities	\$0	\$56,997	\$2,839	\$0	\$0	—
8 Revenue From Commonwealth	\$482,738	\$480,227	\$1,295,388	\$552,728	\$552,728	0.00%
9 Revenue From Federal Government	\$34,126	\$267,260	\$267,260	\$330,000	\$330,000	0.00%
10 Non-Revenue Receipts	\$331,502	\$157,526	\$223,397	\$239,700	\$173,700	(27.53%)
11 Transfers	\$5,178,335	\$10,067,561	\$2,212,371	\$2,514,702	\$2,023,447	(19.54%)
12 Non-General Fund Adjustments	(\$3,561,191)	(\$7,444,974)	(\$3,424,241)	\$856,177	\$6,068,705	608.81%
Total Designated Funding Sources	\$42,503,604	\$44,281,371	\$42,791,452	\$47,896,259	\$52,922,432	10.49%
Net General Tax Support	\$25,932,174	\$26,131,200	\$27,232,497	\$26,742,322	\$29,100,607	8.82%
Net General Tax Support	37.89%	37.11%	38.89%	35.83%	35.48%	

Public Works



Expenditure History



Staff History

	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
1 Director's Office	6.77	6.77	5.77	5.77	5.77
2 Historic Preservation	14.55	14.55	14.55	14.55	14.55
3 Stormwater Infrastructure Management	57.83	60.90	24.97	23.75	25.15
4 Site Development	0.00	0.00	25.71	27.70	27.79
5 Watershed Improvement	0.00	0.00	11.93	11.27	11.28
6 Fleet Management	35.15	35.15	35.15	35.15	35.15
7 Facilities Construction Management	8.50	8.50	9.50	9.50	9.50
8 Sign Shop	3.84	3.84	4.12	4.03	4.12
9 Small Project Construction	17.34	17.20	15.11	14.98	14.39
10 Mosquito & Forest Pest Management	13.74	13.81	13.91	14.02	14.02
11 Solid Waste	59.72	59.72	59.72	60.72	60.72
12 Buildings & Grounds	72.97	72.97	74.97	73.47	76.47
13 Property Management	16.00	16.00	16.00	16.00	16.00
14 Neighborhood Services	38.11	37.11	37.11	37.11	37.11
15 Service Districts (Bull Run & Lake Jackson)	0.00	0.00	0.00	0.00	0.00
Full-Time Equivalent (FTE) Total	344.52	346.52	348.52	348.02	352.02

Staff By Program

Future Outlook

Office Space - Many County facilities are currently at capacity. In particular, three of the larger County facilities – the Judicial Center, Sudley North and Ferlazzo buildings – have faced increasing space shortages for several years. In recent years these space shortages have led to expansions into leased space and sharing of existing County space with other agencies. Additional leased or owned space will be needed to accommodate future growth. In particular, the Human Resources office is anticipating staff increases that will necessitate additional space and a permanent office location is needed for the Brentsville District Supervisor.

Security - Facility Security continues to be an increasing concern for the safety of staff and protection of property. In FY13, Public Works created a new Security activity within its budget to better track the true costs of securing facilities. This budget had previously been within the facilities management budget. The Public Works security budget manages facility access security systems and after hour security forces. Over the years, the complexity and volume of the security systems has grown exponentially. Also, the addition of more leased space, the recent opening of two new community libraries, and the future addition of the Central Police Station have and will continue to impact workloads. Costs to maintain, re-program and repair these systems also continue to grow steadily due to increased demands and expectations. Public Works is preparing a detailed request for the Fiscal Year 2018 Budget process to request additional resources to address the increased workloads.

New Fleet Facility - Fleet Management's maintenance facility is centrally located in the County. In the future additional staff and maintenance facilities will be necessary at the current location or in the eastern and western parts of the County. The additional space and staff are needed to support the annually increasing public safety fleet. Furthermore, this additional space needs to have dedicated staff and heavy equipment bays for servicing large apparatuses like ambulances, fire trucks and specialized police equipment. Ideally a fleet facility should have 1.5 bays per mechanic; the current fleet facility has only one bay per mechanic and only one area to service large apparatus.

Water Quality Improvement Mandates - Environmental Services is concerned about the ever increasing federal and state requirements for Chesapeake Bay Restoration and Total Maximum Daily Loads (TMDL) reductions for water quality improvements. Such large pollutant reductions will be very difficult to achieve without strict adherence to new stormwater regulations as well as increased spending and stormwater management (SWM) fee increases on the citizens and commercial property owners of the County.

General Overview

A. Internal Service Fund - The County annually allocates all technology costs to agencies through an ISF, using the approved cost basis for each technology activity. Technology activities include phone, radio and computer support, business system support, GIS, web services, capital equipment replacement and administration. In FY17 the Public Works technology budget increases by \$35,756 to \$908,977.

Public Works

B. Indirect Cost Transfer Increase - Indirect costs are expenditures charged by one part of the County government for services rendered by another part of the County government. In Public Works, there are several fee-supported programs which must reimburse the general fund for the cost of office space, utilities and other basic agency support. The indirect cost transfer amounts are listed in the table below:

Indirect Cost Transfer			
	FY16 Adopted	FY17 Proposed	Change
Solid Waste	\$940,121	\$1,164,019	\$223,898
Mosquito & Forest Pest Management	\$185,384	\$212,379	\$26,995
Stormwater/Watershed Management	\$467,974	\$591,647	\$123,673
Total Public Works Indirect Cost Transfer	\$1,593,479	\$1,968,045	\$374,566

- C. Fuel Savings** - The Fleet fuel budget is reduced \$800,000 in FY17 based on lower fuel prices nationwide.
- D. Building & Grounds Contract Increases** - Buildings & Grounds is responsible for custodial services in County owned facilities. The custodial contract costs are increasing \$25,000 in FY17. An additional \$118,925 is being budgeted for pest control services. These contract increases are being funded via a shift from the FY17 fuel savings.
- E. One-Time Reductions** - Approximately \$3.2 million was removed from the Solid Waste FY17 budget for one-time, non-recurring items approved in FY16.
- F. Shift from County Print Shop for Printing Services** - In FY16, the Print Shop was converted to a cost recovered activity. The only thing not billed to customers in FY16 was a \$228,000 allocation used by certain departments for recurring print jobs. In FY17, the entire activity will be cost recovered so the \$228,000 allocation will be shifted to those departments. As a result, the Public Works printing services budget will increase \$13,327 in FY17. There is a corresponding decrease in the Public Works Print Shop activity budget.
- G. Non-General Fund Uses and Contributions** - This amount is included to show adjustments to fund balances for non-general fund activities in order to calculate the net general tax support for Public Works.

Non-General Fund Adjustments To Fund Balance (Required to Calculate the Net General Tax Support)							
	FY13 Actual	FY14 Actual	FY15 Actual	FY15 Ending Fund Balance as of 6/30/15	FY16 Adopted	FY17 Proposed	% Change Adopt FY15/ Proposed FY17
Mosquito & Forest Pest Management Fund Balance (Increase)/Use of	\$320,569	\$284,790	\$118,641	\$2,182,428	\$386,154	\$341,593	(11.54%)
Stormwater Management Fund Balance (Increase)/Use of	(\$701,886)	(\$667,494)	(\$1,214,622)	\$4,692,858	\$46,030	\$123,226	167.71%
VSMF Fund Balance (Increase) / Use of	\$0	\$0	(\$692,883)	\$692,883	\$385,747	\$249,220	(35.39%)
Site Development Fund Balance (Increase) / Use of	(\$769,621)	(\$369,038)	(\$622,306)	\$3,482,707	(\$759,550)	(\$148,860)	(80.40%)
*Fleet Management Fund Balance (Increase)/Use of	(\$33,523)	\$112,771	\$2,577	\$209,943	\$0	(\$0)	—
Innovation Clearing & Mowing Fund Balance (Increase)/Use of	\$0	\$0	\$15,450	\$663,457	\$0	\$40,000	—
Service Districts Fund Balance (Increase)/Use of	(\$101,796)	\$58,683	(\$18,192)	\$341,677	\$24	\$24	0.00%
*Small Project Construction Fund Balance (Increase)/Use of	\$168,172	\$135,662	(\$21,852)	\$1,436,591	(\$7,457)	\$190,593	(2655.90%)
*Solid Waste Fund Balance (Increase)/Use of	(\$2,443,105)	(\$7,000,348)	(\$991,054)	\$39,494,786	\$805,229	\$5,272,934	554.84%
Total Non-General Fund Adjustments	(\$3,561,191)	(\$7,444,974)	(\$3,424,241)	\$53,197,330	\$856,177	\$6,068,729	608.82%

* Effective FY15, per GASB Statement No.68 Accounting and Financial Reporting for Pensions, pension liabilities must be reported which impacts the net position or fund balance.

Public Works

H. Site Inspections Funding Shift and Expenditure Reductions – Since 2010, funding for the site inspections activity was split between the stormwater management fee and land development fees. In FY17, more of the funding for site inspections will be shifted to development fees and VSMP. Development fees will fund 60%, VSMP fees will fund 20% and the stormwater management fee will fund the remaining 20% of Site Development. The stormwater management fee will continue to fund federal and state mandated activities for Chesapeake Bay TMDL reductions and water quality improvements. In addition to the reallocation of funding sources, the overall activity budget was reduced by \$105,000, including \$69,000 for one-time vehicle purchases.

I. Compensation Increase - Compensation adjustments totaling \$381,474 are made to support the following changes:

Benefits:

- 5.00% Retiree Health Credit;
- 0.03% Long Term Disability Insurance for VRS Hybrid Plan employees;
- -0.01% Group Life Insurance;
- -1.00% VRS Plan 1 Savings; and
- -1.75% VRS employer rate;

Salaries:

- 3.00% Pay for Performance; and
- 1.00% Salary adjustment to offset the required VRS contribution by Plan 1 and some Plan 2 employees.

Additional detail concerning these adjustments can be found in the Unclassified Administrative section of Non-Departmental.

Program Summary

Director's Office

Provide overall leadership and management oversight for all Public Works activities. Review all major policy issues, financial transactions, BOCS reports, County Executive generated tracker reports and interface with executive management and the citizens of Prince William County on complex issues within the department.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Key department program measures met	100%	77%	62%	80%	70%
Public Works DART Score (Days Away, Restricted or Transferred)	4.9	8.1	3.0	4.5	4.5

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Leadership & Management	\$1,434	\$1,279	\$1,314	\$698	\$721
BOCS agenda items	50	42	68	45	54

Public Works

Historic Preservation

Manage the capital funding (through grants and capital program), design, restoration and preservation of all County-owned historic sites. Engage in historic collections management. Support the work plan developed by the Historic Preservation Foundation. Manage the daily operations of County historic sites, including the site specific volunteers, assist with collections and ensure the protection of the resources. Manage rentals, educational outreach, special events and programming of all County-owned historic sites.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Customer satisfaction with visit to historic site	97%	95%	96%	95%	95%
Volunteer hours value	\$116,114	\$212,186	\$106,580	\$150,000	\$150,000
Revenue recovery rate	10.0%	4.9%	4.1%	7.0%	5.0%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Preservation	\$623	\$670	\$373	\$393	\$364
Annual average hours of service per long term volunteer	40	57	41	55	50
Archeological collections donated to the County	15	5	11	9	9
Management & Events Programming	\$814	\$782	\$622	\$609	\$585
Programs at historic sites	1,076	1,212	768	1,200	850
FTE equivalent of volunteer hours contributed	3	6	3	4	4
Visitors to historic sites	45,357	53,708	70,892	56,000	77,000
Maintenance & Construction	—	—	\$477	\$417	\$476
Work orders for historic buildings and grounds	—	172	137	170	150
Construction, restoration and renovation projects	—	4	3	3	3

A. Budget Initiatives

1. Reduce Transient Occupancy Tax Revenue

Expenditure	\$0
Revenue	(\$301,739)
General Fund Impact	\$301,739
FTE Positions	0.00

- a. **Description** - Transient Occupancy Tax (TOT) revenue is no longer sufficient to support the entire Historic Preservation program and the operating transfer to the Convention Visitors

Public Works

Bureau. In FY17, \$301,739 of general fund tax support will be used to offset the reduction in TOT revenue.

b. Service Level Impacts - Existing service levels are maintained.

Stormwater Infrastructure Inspections and Maintenance

Ensure that the County's stormwater infrastructure is in compliance with environmental regulations, standards and policies including County standards, the Chesapeake Bay TMDL and the County's MS4 permit. The program consists of the inspection of existing infrastructure, such as storm drain inlets, storm sewers and stormwater management facilities within County easements, as well as major maintenance of County-maintained facilities.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Drainage assistance requests responded to within 5 business days	90%	96%	97%	90%	90%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Stormwater Management Infrastructure Inspection	—	—	\$871	\$873	\$701
County-maintained facilities inspected and/or re-inspected	1,456	1,449	843	1,400	875
Privately-maintained facilities inspected and/or re-inspected	276	312	375	250	200
Miles of drainage systems inspected	627	804	634	650	150
Stormwater Management Infrastructure Maintenance	—	—	\$2,115	\$2,069	\$2,601
Major maintenance cases completed/closed within 30 business days	65	110	145	—	—
Major maintenance cases completed/closed	183	138	191	130	150

A. Budget Initiatives

1. Add One Field Supervisor for Drainage Maintenance and Inspections

Expenditure	\$110,893
Revenue	\$110,893
General Fund Impact	\$0
FTE Positions	1.00

a. Description - A recent division reorganization created one drainage-related function for the maintenance of all publicly maintained pipes, ponds, inlets and other stormwater infrastructure.

Public Works

The maintenance and inspection duties are now separated into two distinct groups. This reorganization shifted five employees from the inspection function to the maintenance function. Currently there is one supervisor for both functions. The high span of control in addition to the increase in public stormwater infrastructure and corresponding maintenance responsibilities has made supervision and the performance of drainage-related maintenance duties very difficult for one person to oversee and manage. An additional Field Supervisor position is needed to handle the increased work load and reduce the span of control for the one existing supervisor.

b. **Service Level Impacts** - The additional supervisor will have the following service level impacts:

- **Number of citizen drainage maintenance cases responded to within 3 days**

<i>FY17 w/o Addition</i>		123
<i>FY17 w/ Addition</i>		183

- **SWM ponds major maintenance work closed within 30 days**

<i>FY17 w/o Addition</i>		62
<i>FY17 w/ Addition</i>		93

Site Development

Review multiple levels of land development plans and inspection of construction sites, to ensure compliance with environmental regulations, standards and policies related to stormwater management, best management practices, erosion and sediment control, resource protection areas, floodplains and geotechnical.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Site development plan submissions reviewed within standards set by the County's Administrative Procedures Manual (APM)	100%	100%	100%	100%	100%
Lot grading plan submissions reviewed within 10 business days	100%	100%	100%	100%	100%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Plan Review	—	\$0	\$1,503	\$1,470	\$1,591
Site development plan submissions reviewed	554	540	495	550	500
Lot grading lots reviewed	1,115	1,169	1,140	1,100	1,100
Site Inspections	—	\$83	\$1,629	\$1,912	\$1,709
Virginia Stormwater Management Program (VSMP) and erosion and sediment control inspections	23,296	23,681	18,285	22,000	20,000

A. Budget Initiatives

1. Site Development Revenue Adjustment

Expenditure	\$0
Revenue	(\$140,809)
General Fund Impact	\$0
FTE Positions	0.00

a. Description - This is the net impact to revenue based on adjustments in both the Plan Review and Site Inspections activity. The revenue adjustments are based on updated projections and current activity levels in each area.

b. Service Level Impacts - Existing service levels are maintained.

2. Add Security Cameras to the Cash Handling Areas

Expenditure	\$5,720
Revenue	\$5,720
General Fund Impact	\$0
FTE Positions	0.00

a. Description - Add security cameras to the cash collection areas in the Environmental Services Division Suite in the Development Services Building to correct deficiencies noted during the recent internal audit of county cash collection handling practices. This is a one-time cost.

b. Service Level Impacts - Comply with county cash collection policies and minimize risks associated with cash collections.

Watershed Improvement

Ensure that the water quality of streams within each of the County's watersheds is in compliance with environmental regulations, standards and policies including the Chesapeake Bay TMDL and the County's MS4 permit. The focus of this program is to address water quality issues associated with illicit pollution discharges into the storm drainage system, discharge of pollutants from industrial activities, sediment release associated with stream erosion, and the reduction of nitrogen, phosphorous and sediment loads from stormwater runoff. The program includes the assessment of streams and other natural resources within each watershed, identification of problem areas, and implementation of water quality improvements. In addition, environmental education, outreach and technical assistance to citizens, both in urban areas as well as within the agricultural community, are components of this program.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Industrial or high risk inspections conducted	9	25	60	10	80
Linear feet of stream restorations completed	2,050	1,100	1,100	2,500	2,500

Public Works

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Watershed Monitoring	—	\$0	\$2,728	\$3,810	\$4,160
Linear feet of stream assessments completed	63,250	94,302	67,457	50,000	60,000
Dry weather outfalls monitored and inspected	156	513	1,366	500	1,000
Watershed Improvements	—	—	\$395	\$625	\$435
Pounds of phosphorous reduction achieved with BMP retrofits	—	NR	12	20	—
Pounds of phosphorus reduction achieved	—	—	—	—	50

A. Budget Reductions

1. Eliminate Fee for Potomac Watershed Roundtable

Expenditure	(\$1,500)
Revenue	\$0
General Fund Impact	\$0
FTE Positions	0.00

a. Description - The County no longer participates in the Potomac Watershed Roundtable, a regional forum to promote collaboration on environmental concerns, especially water issues. There is no impact to the general fund.

b. Service Level Impacts - Existing service levels are maintained.

B. Budget Initiatives

1. Update Countywide Floodplain Mapping

Expenditure	\$300,000
Revenue	\$300,000
General Fund Impact	\$0
FTE Positions	0.00

a. Description - The County's current floodplain maps prepared by FEMA (effective 1995) were based on the County's land use in the early 1990s. In the last 25 years there has been significant development in the County's watersheds, leading to an increase in stream flows. The floodplain maps prepared with old land use maps may not represent true risk to the public and property from flooding. Updates to floodplain maps based on updated topographic maps and stream flows will help establish new floodplain boundaries to better protect properties.

b. Service Level Impacts - Existing service levels are maintained.

Public Works

2. Stormwater Management Revenue Adjustment and Fee Increase

Expenditure	\$0
Revenue	\$212,000
General Fund Impact	\$0
FTE Positions	0.00

a. Description - A 3% increase to the Stormwater Management Fee is requested to support stormwater requirements and to address increasing and aging stormwater infrastructure. Program demands are in the areas of stream assessments and restorations, best management practice retrofits of residential stormwater management facilities, development of sub-watershed management plans, additional dam safety program requirements, drainage systems maintenance and increased requirements of the County's new MS4 permit.

b. Service Level Impacts - Existing service levels are maintained.

3. Occoquan Watershed Management Program Contribution Increase

Expenditure	\$5,227
Revenue	\$5,227
General Fund Impact	\$0
FTE Positions	0.00

a. Description - Prince William County is part of the Northern Virginia Regional Commission. In addition to the general contribution there is a \$41,765 contribution to the Occoquan Watershed Management Program that is funded by Stormwater Management fees. This is a \$5,227 increase over FY16.

b. Service Level Impacts - Existing service levels are maintained.

Fleet Management

Provide county vehicle maintenance and county vehicle replacement. Provide fuel, repairs and maintenance to the County's vehicles and equipment in an efficient and cost effective manner and minimize downtime due to breakdowns or other unscheduled maintenance. Replace County vehicles at the optimum point in the vehicle life cycle, maximizing cost-effectiveness and vehicle safety and reliability.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Cost per mile - light duty public safety vehicles	\$0.25	\$0.26	\$0.25	\$0.28	\$0.28
Cost per mile - light duty non-public safety vehicles	\$0.34	\$0.35	\$0.34	\$0.34	\$0.34
Work orders that are scheduled maintenance	58%	58%	57%	58%	58%
Availability of public service light duty vehicles	95%	90%	91%	92%	92%
Public Safety vehicles due or overdue for replacement	10%	14%	10%	<8%	<8%

Public Works

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
County Vehicle Maintenance	\$7,703	\$7,745	\$7,425	\$9,065	\$8,847
Vehicles maintained (<10,000 lbs. gross vehicle weight)	1,087	1,124	1,153	1,143	1,145
Heavy equipment maintained (>10,000 lbs. gross vehicle weight)	207	226	227	225	225
Work orders	7,040	7,390	8,293	7,333	7,500
County Vehicle Replacement	\$2,433	\$2,646	\$2,806	\$2,625	\$2,763
General fund vehicles purchased	119	109	96	95	95

A. Budget Initiatives

1. Vehicle Replacement Budget Increase

Expenditure	\$137,984
Revenue	\$10,484
General Fund Impact	\$127,500
FTE Positions	0.00

a. Description - This initiative supports future vehicle replacement for Police vehicles being purchased in FY17 (\$127,000). In FY16, Public Works Fleet Program incorporated Adult Detention Center (ADC) vehicles into their replacement cycle so an additional \$10,484 is being added to the fleet budget supported by revenue from the ADC fund.

b. Service Level Impacts - Existing service levels are maintained.

Facilities Construction Management

Support the Capital Improvement Program (CIP) by developing budgets and managing the design and construction of County facilities. The majority of expenditure costs in this activity are recovered from capital projects.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Customers satisfied with overall project management	100%	90%	90%	90%	90%
CIP construction change order difference from original contracted amount	—	5%	3%	<10%	<5%
CIP construction change orders based on user requested changes/scope difference from total change order costs	—	4%	1%	<10%	<7%

Public Works

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
County Facility Construction	\$58	\$198	\$2	\$119	\$119
Total CIP projects	7	9	9	8	8
Total non-CIP projects	7	5	2	4	0

Sign Shop

The Sign Shop inspects, fabricates, installs and maintains all street name signs as mandated by the Virginia Code § [33.2-328](#), the Code of Ordinances, County of Prince William Section 24-3 and the County's Design and Construction Standards Manual (DCSM) Section 604.06. In addition, the program produces high quality graphics for County vehicles and creates custom-designed original graphic designs for interior and exterior signs, banners, posters and displays for County agencies, outside jurisdictions and developers.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Street name signs replaced within 7 days of inspection	94%	83%	71%	95%	85%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Street Name Signs	\$245	\$209	\$219	\$181	\$205
Streets requiring street name signs	9,350	9,450	9,483	9,650	9,600
Street name signs fabricated for maintenance	760	664	485	700	600
Signs and Graphics	—	\$22	\$12	\$0	\$0
Signs and graphics fabricated for revenue	10,892	13,648	12,049	11,000	11,000
Sign and graphic jobs completed	625	569	631	625	650

Small Project Construction

Provide support for a variety of County projects including stormwater maintenance, stream restorations, drainage improvements, parks and transportation improvements.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Community improvement projects completed within 10% of estimated cost	91%	91%	96%	95%	95%
Community improvement projects completed on time	93%	96%	99%	95%	—

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Small Community Improvement Construction	\$3,118	\$2,263	\$1,599	\$1,860	\$2,058
Community improvement projects completed	46	57	81	50	50

A. Budget Initiatives

1. Replace an Excavator

Expenditure	\$230,000
Revenue	\$0
General Fund Impact	\$0
FTE Positions	0.00

a. Description - The current excavator was purchased in 2001, with an estimated 10-year service life. It has continued to perform for 15 years; however, the hydraulic pump is wearing out and the machine no longer performs to specifications. In addition, the engine does not meet the new Tier 4 diesel emission requirements that have been implemented over the past 10 years. The construction crew fund balance is the source of funds for this purchase. There is no general fund impact.

b. Service Level Impacts - Existing service levels are maintained.

Mosquito & Forest Pest Management

Survey, reduce and control mosquitoes and certain forest pest populations. Program objectives include minimizing mosquito-transmitted disease by reducing mosquito populations and breeding sites, minimizing tree defoliation and mortality caused by the gypsy moth and fall cankerworm, conducting surveillance and outreach for Emerald Ash Borer, Asian Longhorned Beetle, Thousand Cankers Disease, Sudden Oak Death and Oak Splendour Beetle and minimizing adverse environmental and human health impacts resulting from the treatment of these pests.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Mosquito traps identified within 48 hours	—	—	98%	95%	98%
Gypsy moth egg mass surveys done by November 1st	—	—	97%	90%	95%
Citizen site visit requests responded to within 24 hours	97%	97%	89%	98%	95%

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Mosquito/Forest Pest Monitoring	\$827	\$685	\$850	\$929	\$984
Larval mosquito habitat inspections	4,265	4,053	5,840	4,000	5,000
Reduction and Response	\$569	\$818	\$568	\$840	\$824
Mosquito larvicide applications	1,549	2,278	1,474	2,000	1,500

A. Budget Initiatives

1. Mosquito & Forest Pest Revenue Increase

Expenditure	\$0
Revenue	\$83,500
General Fund Impact	\$0
FTE Positions	0.00

a. Description - This initiative increases the revenue generated from the Mosquito & Forest Pest Levy by \$80,000 for a total of \$1,436,484. Interest income is also increasing \$3,500.

b. Service Level Impacts - Existing service levels are maintained.

Public Works

Solid Waste

Provide solid waste management services to all citizens, institutions and businesses of Prince William County. Facilities and programs promote waste reduction and recycling, and efficiently receive and process all acceptable household and commercial wastes generated within the geographical boundaries of Prince William County, including the towns of Dumfries, Haymarket, Occoquan and Quantico. Processing of the waste will meet or exceed all applicable federal, state and local regulations.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Refuse recycled	41%	41%	41%	42%	43%
Tons of refuse processed	320,058	349,276	403,080	350,000	350,000

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Solid Waste Management & Administration	\$5,010	\$4,868	\$5,918	\$6,401	\$5,213
Non-residential accounts processed	3,914	4,014	4,139	4,000	4,000
Appeals completed within 30 days	100%	100%	100%	>99%	>99%
Yard Waste Composting	\$3,323	\$2,851	\$2,865	\$3,642	\$3,596
Tons of County yard waste diverted from waste stream	22,174	19,016	17,324	22,000	22,000
Solid Waste Facilities Operation	\$8,960	\$10,741	\$9,378	\$8,881	\$7,716
Refuse trucks inspected	4,401	4,087	4,311	4,000	4,000
Pounds of Household Hazardous Waste and eWaste collected	1,474,520	1,499,700	1,703,120	1,600,000	1,700,000
Citizens trips to Solid Waste facilities	479,695	486,199	511,225	500,000	515,000
Recyclable Materials Collected, Processed & Marketed	\$669	\$635	\$860	\$1,122	\$1,118
Tons of recyclables processed by County and marketed *	13,174	12,721	10,227	13,000	10,500
Revenue generated from sale of recyclables	\$562	\$594	\$576	\$600	\$500
Capital Projects	—	\$175	\$236	\$200	\$7,305
CIP projects completed within budget	100%	100%	80%	100%	—
CIP construction change order difference from original contracted amount	NA	NA	NA	—	<10%

* Beginning in FY15, this calculation includes scrap metal, oil and antifreeze.

A. Budget Reductions

1. Eliminate Security Guard Position and Add Contractual Security Services

Expenditure	(\$10,716)
Revenue	\$0
General Fund Impact	\$0
FTE Positions	(1.00)

a. Description - This initiative will eliminate the vacant Security Officer position in the Solid Waste program which results in approximately \$70,000 in savings. However, an additional \$60,000 is being added to the current contractual security services budget of \$80,000 so necessary security services can continue to be provided during all non-operational hours.

b. Service Level Impacts - Existing service levels are maintained.

B. Budget Initiatives

1. Increase Solid Waste Vehicle and Equipment Replacement Budget

Expenditure	\$305,000
Revenue	\$0
General Fund Impact	\$0
FTE Positions	0.00

a. Description - This initiative funds the scheduled replacement of solid waste equipment. Certain machines and vehicles are scheduled for replacement in FY17 and are fully supported by existing revenue from the solid waste fee. The equipment being replaced includes a pickup trailer (\$35,000), a roll-off truck (\$165,000), and seven recycling trailers (\$105,000).

b. Service Level Impacts - Existing service levels are maintained.

2. Electronics Recycling Program

Expenditure	\$100,000
Revenue	\$0
General Fund Impact	\$0
FTE Positions	0.00

a. Description - This initiative provides additional funding for the recycling of electronics, a special waste collected as part of the household hazardous waste program. The household hazardous waste activity receives approximately 1.7 million pounds each year (a 30% increase over FY15), including electronic waste such as CRT monitors and televisions. This cost is fully funded by existing solid waste fee revenue.

b. Service Level Impacts - Existing service levels are maintained.

3. Add One Accounting Services Coordinator Position

Expenditure	\$76,487
Revenue	\$0
General Fund Impact	\$0
FTE Positions	1.00

Public Works

a. Description - This position is needed to alleviate some of the administrative tasks being performed by the Program Managers and the Management & Fiscal Analyst II. Presently these tasks are taking away from efforts to expand and improve program results. For example, the solid waste fee database is now being reviewed and maintained (both non-residential and residential) by the Management & Fiscal Analyst II. In prior years it was a component of the real estate assessment system.

b. Service Level Impacts - The service level impacts are the following:

- **Refuse Recycled**

FY17 w/o Addition | 42%

FY17 w/ Addition | 43%

- **Tons of County Yard Waste diverted from waste stream**

FY17 w/o Addition | 20,000

FY17 w/ Addition | 22,000

4. Revenue Adjustment

Expenditure	\$0
Revenue	\$300,000
General Fund Impact	\$0
FTE Positions	0.00

a. Description - This adjusts the solid waste revenue budget by 2% due to commercial and residential growth. The Solid Waste fee remains unchanged.

b. Service Level Impacts - Existing service levels are maintained.

Buildings & Grounds

Provide building maintenance services to over 125 owned facilities and selected leased properties; landscaping, grounds maintenance, paving repair and installation, and moving services; custodial services for over one million square feet; and mail and printing services supporting the needs of the County government. Provide 24/7 operation and responsive emergency support to address natural or manmade disasters. Snow removal to keep the County functional is a major effort. Our work is done with an efficient combination of in-house and contract staff.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Cost per square foot for custodial services	\$2.31	\$2.38	\$2.29	\$2.42	\$2.36
Routine maintenance work requests completed within ten (10) working days	—	70%	76%	70%	73%
Cost per square foot for building maintenance program service	\$3.06	\$2.73	\$2.74	\$2.89	\$2.82
Printing jobs completed on time	—	87%	87%	91%	89%
Routine grounds maintenance requests completed within ten (10) working days	—	95%	87%	96%	92%

Public Works

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Building Maintenance	\$4,399	\$5,301	\$4,841	\$4,798	\$5,043
Work orders	5,072	6,194	5,000	6,200	5,600
Grounds Maintenance	\$1,123	\$1,169	\$1,198	\$1,241	\$1,773
Grounds work requests	798	789	797	776	787
Custodial Services	\$2,475	\$2,541	\$2,576	\$2,900	\$2,959
Square footage maintained	1,068,964	1,525,671	1,124,748	1,525,671	1,124,748
Graphics Arts & Print Shop	\$679	\$638	\$633	\$228	\$0
Copies produced in-house	7.2M	8.1M	8.1M	7.2M	7.6M
Printing jobs completed	1,241	1,074	2,223	1,241	1,732
Mail Room and Courier Service	\$246	\$295	\$335	\$382	\$397
Total pieces of mail handled	1.3M	1.3M	1.3M	1.4M	1.4M
Security	\$713	\$793	\$897	\$779	\$995
Citizen meetings supported by guard service	95%	96%	97%	92%	95%
Alarms and access devices work orders	—	1,063	788	1,100	944

A. Budget Initiatives

1. Major Repair of the Water Tower at Public Safety Training Center (PSTC)

Expenditure	\$500,000
Revenue	\$0
General Fund Impact	\$500,000
FTE Positions	0.00

- a. **Description** - A County-owned 300,000 gallon elevated water tank located at the PSTC supports the water system of the complex. The tower is owned by the County but maintained by the Service Authority, which has responsibility to perform annual inspections and conduct periodic rehabilitation. The rehabilitation efforts include repairs to welds, strip and repaint surfaces, and meet OSHA requirements. The rehab work that is currently required will be completed in 120 days. It will be completed by the Service Authority and contract support. One-time funding is provided by the general fund.
- b. **Service Level Impacts** - The work contributes to the continued operation of the water system supporting the public safety training academy, the driver education facility, the burn facility and other facilities in the complex.

Public Works

2. Additional Support for New Courthouse Security System

Expenditure	\$218,467
Revenue	\$0
General Fund Impact	\$218,467
FTE Positions	2.00

- a. **Description** - The Proposed FY17 CIP includes a \$4.3M Courthouse Security System Replacement project. Two FTE are being added in the Security activity to manage the new system and perform preventive maintenance. Since this is a secure facility, direct supervision is required over any contractors working on the new system. The FY17 costs include \$47,620 for contractor support and software licensing. In FY18, these costs are estimated to be \$200,000 annually. FY17 also includes a one-time vehicle budget of \$27,873.
- b. **Service Level Impacts** - Existing service levels are maintained. The current system is maintained by the Sheriff's Office but the new system will be maintained by Buildings & Grounds.

3. Add One Maintenance Mechanic for Central District Police Station

Expenditure	\$133,147
Revenue	\$0
General Fund Impact	\$133,147
FTE Positions	1.00

- a. **Description** - The Central District Police Station is a new 50,000 square foot facility scheduled to be completed in FY17. A maintenance mechanic is needed to support the 24/7 facility. The position will maintain the HVAC system, security devices and other facility needs.
- b. **Service Level Impacts** - The new facility will receive the same level of service from Buildings & Grounds as all other 24/7 County-owned buildings.

Property Management

Provide a wide array of internal county services including space planning, agency moves, furniture purchasing and management of surplus furniture items. Manage the leases of county buildings and the utility payments and energy usage monitoring of both owned and leased properties. Manage the County's Records Center in accordance with the mandated Library of Virginia retention standards.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Customers satisfied with overall project management	98%	99%	97%	98%	98%
Average cost per square foot of leased space	\$16.74	\$18.79	\$19.07	\$19.89	\$19.93
Cost avoidance realized by redeploying surplus items	\$184,079	\$191,143	\$140,349	\$180,000	\$150,000

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Property Management	\$2,222	\$1,469	\$1,562	\$1,727	\$2,379
Projects completed	327	240	215	250	250
Energy Management	\$2,983	\$3,082	\$2,982	\$2,901	\$3,025
Annual facility electric cost per square foot	\$1.67	\$1.71	NA	—	—
Annual facility electrical usage - KWH per square foot	19	20	19	20	19
Real Estate	\$5,910	\$6,115	\$6,318	\$6,597	\$6,750
Commercial square feet leased	323,094	317,814	324,309	324,309	328,509
Records Management	\$120	\$121	\$129	\$141	\$159
Boxes delivered/picked up	4,497	5,292	7,723	4,500	5,000
Records checked in/checked out (<i>revised method</i>)	—	7,996	8,270	7,000	8,000

A. Budget Initiatives

1. Major Furniture Replacement & Space Reconfiguration

Expenditure	\$500,000
Revenue	\$0
General Fund Impact	\$500,000
FTE Positions	0.00

- a. **Description** - This initiative provides funding to replace systems furniture in phases throughout the county but the primary focus will be at Sudley North, Ferlazzo, Garfield Police Station and Chinn Library. Most of this furniture is 20 to 30 years old and it is difficult to find replacement parts.
- b. **Service Level Impacts** - Replacing the furniture and reconfiguring spaces in phases will minimize disruption to customers, clients and employees.

2. Lease Escalation Costs

Expenditure	\$145,000
Revenue	\$0
General Fund Impact	\$145,000
FTE Positions	0.00

- a. **Description** - This initiative provides funding for lease escalation costs relating to existing leased space throughout the County.
- b. **Service Level Impacts** - Existing service levels are maintained.

Public Works

3. Utility Cost Increases

Expenditure	\$86,500
Revenue	\$0
General Fund Impact	\$86,500
FTE Positions	0.00

a. Description - This initiative provides additional funding for utility costs at existing facilities (\$58,000) and the new Central District Police Station (\$28,500). The station is scheduled to be completed in FY17. With occupancy occurring in August 2017, the FY18 annual utility costs for Central District Police Station are expected to be approximately \$170,000.

b. Service Level Impacts - Existing service levels are maintained.

Neighborhood Services

Provide a safe, clean and healthy community through education, community support and property code enforcement. Provide programs that teach residents and business owners how to properly maintain their properties, and work with neighborhood leaders to enforce property codes that go to the heart of the County's quality of life. Stimulate volunteer efforts across the County that empower citizens to clean trash and litter from common areas, waterways and the County's major roadways, to remove graffiti and other community maintenance issues in and around neighborhoods and to address other challenges by working together.

Key Measures	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Founded current year Property Code Enforcement cases resolved or moved to court action within 100 days	96%	95%	98%	94%	96%
Average litter rating for designated County roads (Note: one represents no visible trash and five represents a trash dumping site)	1.39	1.72	1.50	1.45	1.50
First inspection of complaint within five days	86%	91%	75%	86%	—
First inspection of complaint within seven working days	97%	97%	NA	—	83%
Average time to resolve cases (calendar days)	30	45	22	35	35

Public Works

Program Activities & Workload Measures (Dollar amounts expressed in thousands)	FY13 Actual	FY14 Actual	FY15 Actual	FY16 Adopted	FY17 Proposed
Litter Control	\$672	\$695	\$680	\$792	\$801
Tons of trash removed by County Litter Crew	174	143	195	170	170
Illegal signs removed from State right-of-way	10,938	10,764	13,178	12,500	12,500
Landscaping	\$322	\$288	\$321	\$387	\$547
Landscaping areas maintained	38	42	44	43	44
Acres of medians and rights-of-way maintained	23	29	234	≥ 234	234
Property Code Enforcement	\$2,319	\$2,272	\$2,450	\$2,658	\$2,738
Total cases resolved	4,608	4,773	4,357	4,600	4,600
Total inspections conducted	11,505	11,497	11,500	11,000	11,000