MS4 Floatable Monitoring
Controlling Litter and Plastic Pollution in Prince William County, VA
Lessons Learned and Steps Going Forward

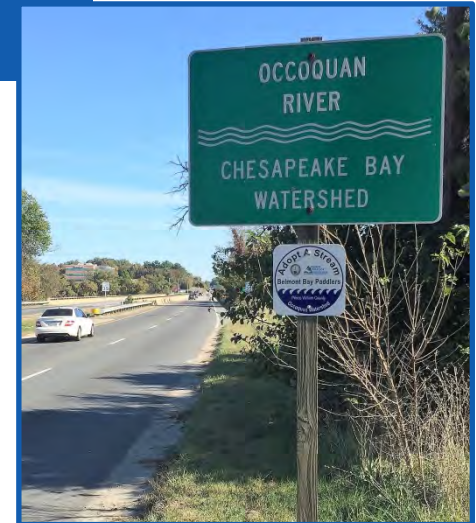Prince William County Watersheds and Subsheds

PRESENTATION BY:

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Prince William County Government

Watershed Management Branch

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Soil and Water Conservation District

PRINCE WILLIAM SOIL AND WATER CONSERVATION DISTRICT

OCCOQUAN RIVER

CHESAPEAKE BAY WATERSHED

MS4 (Municipal Separate Storm Sewer System) Permit

Authority To Control Stormwater Litter

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No.: VA0088595
Effective Date: December 17, 2014
Expiration Date: December 16, 2019

AUTHORIZATION TO DISCHARGE UNDER THE
VIRGINIA STORMWATER MANAGEMENT PROGRAM AND THE VIRGINIA STORMWATER MANAGEMENT ACT

Pursuant to the Clean Water Act as amended and the Virginia Stormwater Management Act and regulations adopted pursuant thereto, the following owner is authorized to discharge in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this state permit.

Language in County-wide MS4 Permit

- **1.c) Control the... dumping or disposal of materials other than stormwater (e.g. industrial and commercial wastes, trash... etc.) into the MS4 (Municipal Separate Storm Sewer System);**

MS4 Permit – Floatable Monitoring
Authority To Control Stormwater Litter
(Language in County-wide MS4 Permit)

- *B. Stormwater Management*
- *2. MS4 Program Implementation*
- *e) Illicit Discharges and Improper Disposal*
- 3) ...to implement a program to reduce the discharge of floatables in accordance with Part I.C.3.

- Part 1.C.3. Floatables Solids Monitoring... determine loading of floatables from the MS4 to streams... as follows:
  - a) ...five (5) monitoring sites located at MS4 outfalls and/or streams...
  - b) ...once per quarter...
  - c) ...count of floatables visually observed and length or area of sites assessed.

What we know

Typical pathway of urban stormwater litter:

FROM

- Retail parking lots

- Townhome parking lots

- Residential streets

TO

- Curb & gutter drainage systems

- SW ponds, streams and rivers

Going Forward with Partnerships

2019 GREEN COMMUNITY AWARD
BULL RUN WATERSHED PROTECTORS

- **Volunteer groups adopt ½ mile stream**
    - **3 cleanups in 1 year.**
    - **133 vols remove 7,560 lbs.**

- **Community awareness**
    - **HOAs, property/retail managers**

- **Engineering controls**
    - **Inlet guards in parking lot**
    - **Fencing for windblown litter**
    - **Outfall traps**

- **Other outreach**
    - **Litter prevention campaigns**
    - **4Rs: Recycle, Reuse, Reduce and Rethink (alternatives)**

MS4 Public Outreach Partnerships

2019 Cleanup Results

1,616 Volunteers

4,187 Volunteer Hours

35,947 Lbs (or 18 Tons) Litter and Junk Removed

Floatable Monitoring (FM) Program
How Initially Implemented

- **Site Selection Criteria**: 9 existing WQ monitoring sites and 3 GIS selected sites.

- **Site Assessment and Final Selection**:

- Access, site condition, upstream land use, contributing drainage acres

- Each metric scored on scale of 1 - 5 (5 most desirable, 1 least desirable)

- Five sites with highest average score selected as Floatable Monitoring Site

Assessment Scores At Top Five Sites

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

Floatable Monitoring (FM) Program:
How initially implemented

- **Pilot study:** Top two sites monitored monthly for four months.

- **Sampling Method:** Monitor minimum 100ft within the confines of the stream, and below the bank full mark of the channel.

- **Training:** Mixed with trained volunteers and paid staff.

- **Safety:** Assess proper gear, physical environment, harmful plants and animals, emergency contact , etc.

Floatable Monitoring July- Jan 2016

Figure 2. Floatable Monitoring from January-June 2017

FLoatable Monitoring Jan -June 2017

Initial Data Sheet

2017 – 2018 FM Data Analysis For Each Site

Figure 1. Floatable Monitoring from July – December 2017
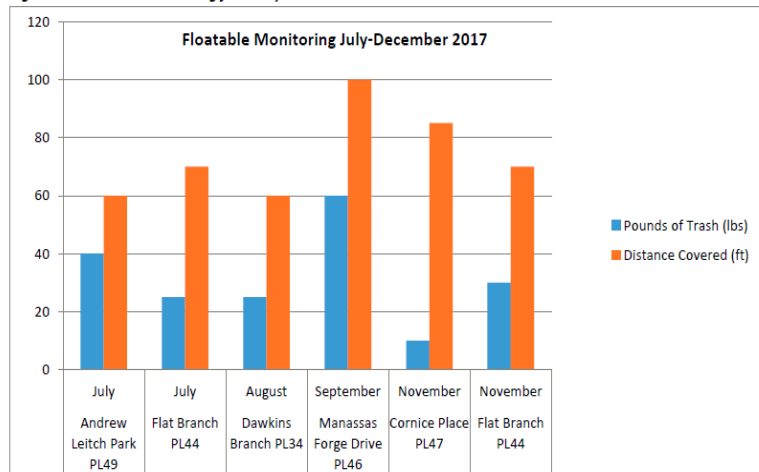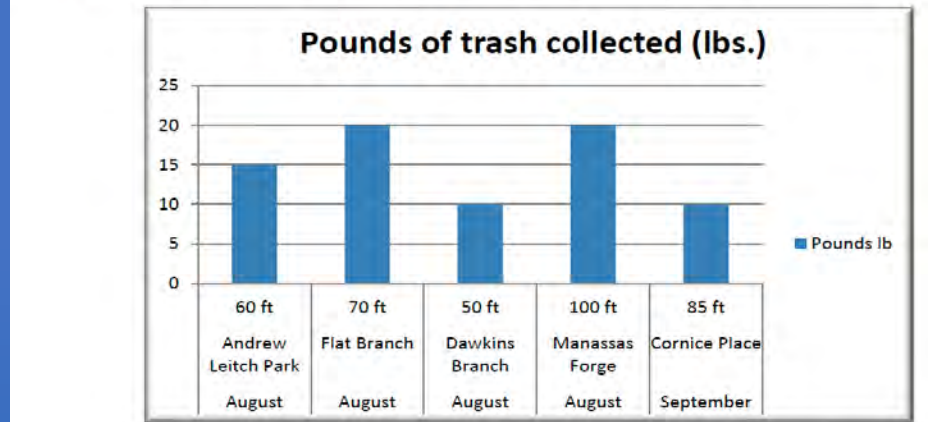

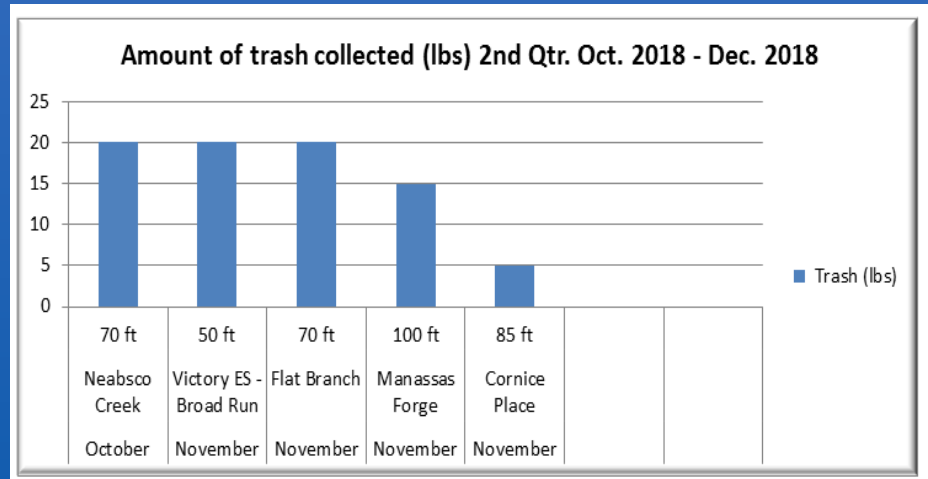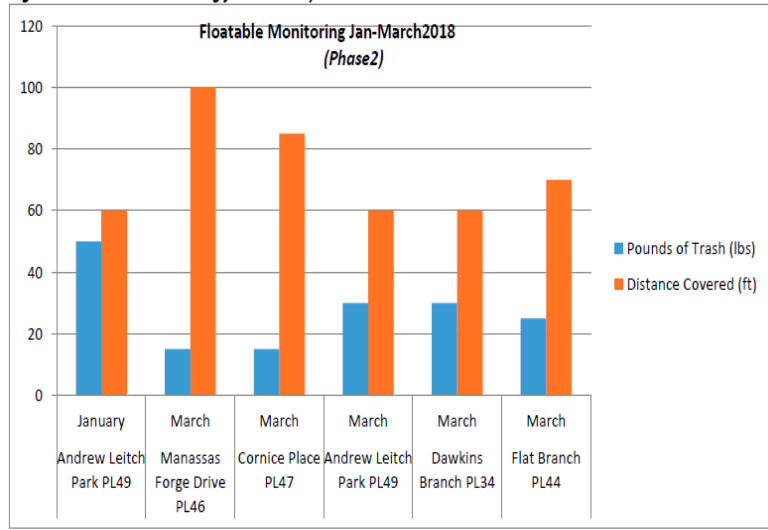Figure 2. Floatable Monitoring from January – March 2018
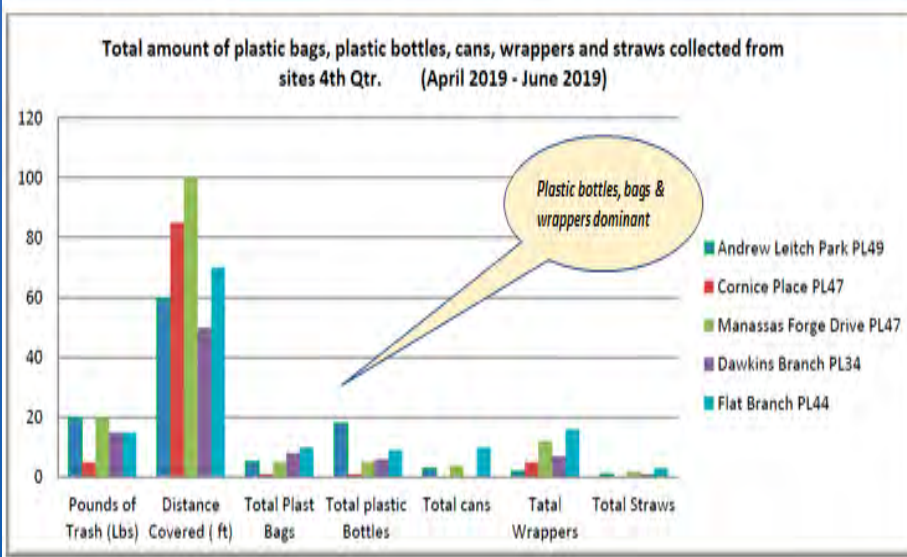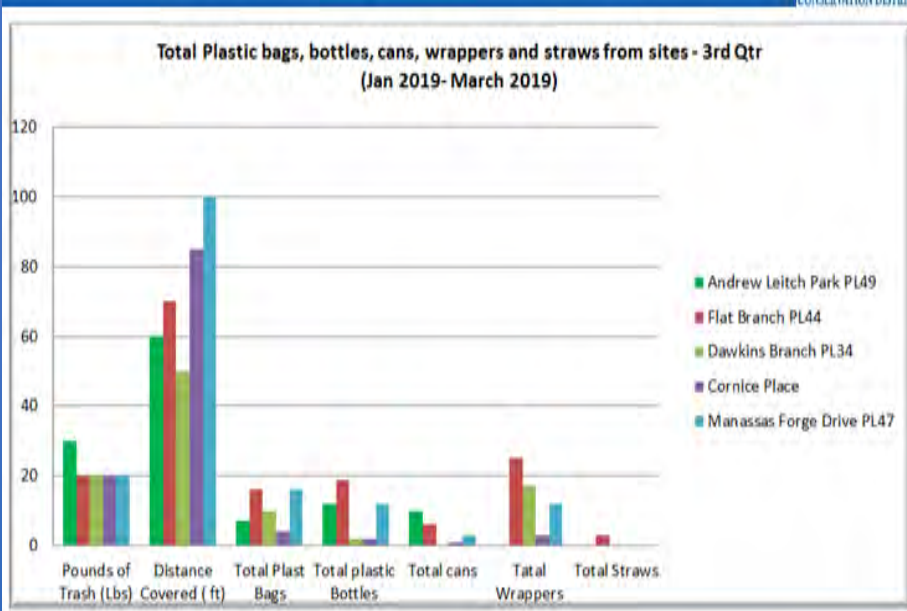

Figure 1. Floatable Monitoring July 2018 – September 2018

NOTE: Data collected in 2017-18 focused on weight (lbs.) and did not identify litter by waste stream.

Amount of trash collected (lbs) 2nd Qtr. Oct. 2018 - Dec. 2018

2019 FM Analysis Using New, Improved Data Sheet

Total Plastic bags, bottles, cans, wrappers and straws from sites - 3rd Qtr (Jan 2019- March 2019)

- Andrew Leitch Park PL49
- Flat Branch PL44
- Dawkins Branch PL34
- Cornice Place
- Manassas Forge Drive PL47

Total amount of plastic bags, plastic bottles, cans, wrappers and straws collected from sites 4th Qtr. (April 2019 - June 2019)

Plastic bottles, bags & wrappers dominant

- Andrew Leitch Park PL49
- Cornice Place PL47
- Manassas Forge Drive PL47
- Dawkins Branch PL34
- Flat Branch PL44

Prince William County Floatable Monitoring Program

Prince William Soil and Water Conservation District
8850 Rixlew Lane, Manassas, VA 20109, Ph.: 571-379-7514, Fax: 571-379-8305
Email: waterquality@pwswcd.org

PRINCE WILLIAM
SOIL AND WATER CONSERVATION DISTRICT

ID Major Sources Of Urban Stormwater Litter

Local watersheds developed before mid-1980s:

**Curb-gutter drainage systems
+ no BMP stormwater facilities
= large environmental impact in local waterways**

Local Example:
Neabsco drainage area 9,900 acres
Developed before the mid-1980s.
Flows to 500 acre estuary & Potomac River

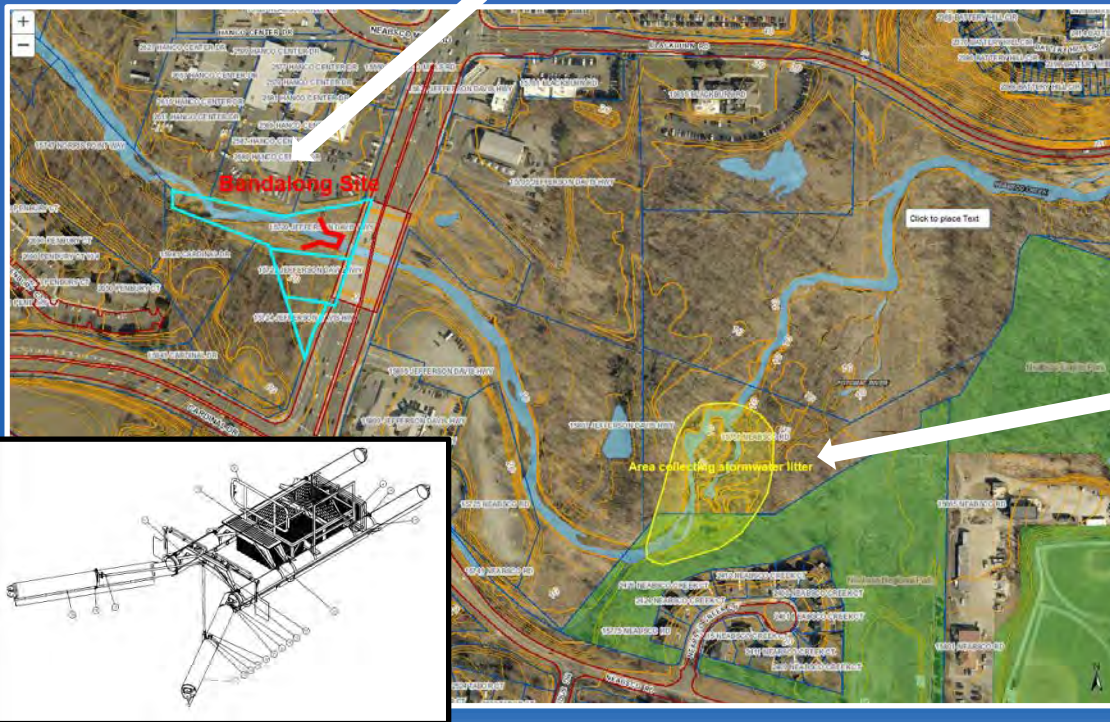**Neabsco Creek at Route 1
After Major 2005 Storm Event**

Project to Reduce Impact of Stormwater Litter
Engineering Site Assessment

Proposed site on public land

Cleanup Site:
Ten cleanups since 2011

Total # Vols	Avg Miles per Cleanup	Total Lbs Trash	Total # Tires
1259	1.05	60,439	335

Install in-stream litter collection, Bandalong System.

FLOATABLE MONITORING (FM) PROGRAM
Lessons Learned Going Forward
FOR STORMWTER LITTER REDUCTION

Reviewing FM Program for next MS4 Permit cycle (2020-2029)

- Analyzing 3 years FM data; 12+ years general stream/pond cleanup data.

- Apply SMART goals (Specific, Measurable, Attainable, Relevant, Timely)

    - Concluded that SMAT (4 of 5) met, but "Relevant" was not met.

    - GOAL: Obtain more "Relevant" FM data.

    - HOW: Improve FM criteria for more "Relevant" sites.

    - 1st - Identify major litter hot spots and sources in local watershed.

        - MS4 outfalls downstream of older retail, hi-density housing & schools.

    - 2nd - Select downstream sites where litter mostly contained.

        - Downstream stream bank or in-stream pond.

FLOATABLE MONITORING (FM) PROGRAM
Lessons Learned Going Forward
FOR STORMWTER LITTER REDUCTION

Reviewing FM Program for next MS4 Permit cycle (2020-2029)

- **GOAL: Select "Relevant" FM sites from five different sub-watersheds downstream of older retail/commercial, hi-density housing and schools.**

  - **Example: Stream w/ pond behind Potomac Mills in Neabsco watershed**

  - **Example: New FM site 100 ft. of Pond 555 dam embankment**

100 ft. →

← →

← **100 ft.**

Feb 4, 2020

Feb 4, 2020

FLOATABLE MONITORING (FM) PROGRAM
Lessons Learned Going Forward
FOR STORMWTER LITTER REDUCTION

Thank You… Questions?