

City of Harrisonburg Stormwater Advisory Committee Minutes: *Meeting No. 1* **February 5, 2013 5:00 – 7:00 p.m.**

Members in attendance: Dale Chesnut, Kathy Holm, William Jones, Jeff Kelble, Eldon Kurtz, William Latham, Daniel Michael, and Ted Byrd. JM Snell (absent).

Staff/Other in attendance: Thanh Dang, Carolyn Howard, Harsit Patel, Dan Ruble, Tom Hartman and Jennifer Nunez.

Introductions

The SWAC meeting was promptly called to order. A discussion about stormwater was facilitated by Carolyn Howard, of Draper Aden Associates. Carolyn instructed the Committee to use one word to describe what comes to mind regarding stormwater. The responses were as follows: fun, misunderstood, difficult, unfunded-mandate, infiltration, transportation, impact-fees, complicated, necessary, flooding, opportunity, health, watershed, challenge, and education.

A brief dialogue ensued, and members discussed aspects of the stormwater regulation in a Round Robin style format. It was mentioned that these regulations could be used as an opportunity to educate citizens about the cost of clean water, and subsequently how the City of Harrisonburg could potentially be an example that other municipalities could model after. Also, it was discussed how infrastructure for over 200 years has been built to “get rid” of stormwater, and now we must create a “mindset change” to accommodate for new regulations. Lastly, it was noted how the agricultural community has been “relearning” how to do business by shifting away from long held practices, and implementing Best Management Practices.

Expectations and Rules

Carolyn explained that the meetings would adhere to the specified beginning and end times, and that the SWAC will meet once a month for a period of about two years. It was decided that Robert’s Rules of Order will be observed once a Chairman is appointed by the Committee. A review of the Bylaws concluded, which led in to a discussion on the expectations and interests of the Committee.

It was stated that the Chairman (to be named later) will serve as the official liaison between the SWAC and members of the press. A general consensus was made regarding Committee members engaging in interviews with media. Committee members should reiterate during encounters with press that any particular opinion held by an individual/organization is not necessarily that of the City of Harrisonburg.

Carolyn posed the question “What are your thoughts and goals for this Committee?” The following comments followed: To realize there are steps to making recommendations; expertise and a way to be efficient so we can hit the ground running; this is a fledgling educational experience and unique opportunity; staff perspective and looking forward to different points of view; higher creativity can be the model for cutting edge solutions; Chesapeake Bay is a long way away, finding ways to bridge the gap; Blacksburg and Roanoke County have made strides in Best Management Practice areas.

Presentations

A PowerPoint presentation was delivered by Carolyn on the history of stormwater. (See Attachment A.)

Overview of City's Permit and Regulatory Requirements (MS4 & VSMP)

Schedule: Regulatory & Permit Deadlines

General Questions / Discussion

The City's Virginia Stormwater Management Program (VSMP) is managed by the City Engineer's Office at the Department of Planning & Community Development. The Municipal Separate Storm Sewer System (MS4) Permit is managed by the Department of Public Works.

Section 4 of the binders provided to Committee members includes a drainage map that shows areas of the City that drains into the Blacks Run, Sunset Heights Branch of the Cooks Creek, Smith Creek, and other waterways. There was discussion that Blacks Run has Total Maximum Daily Load (TMDL) and Implementation Plan (IP) that was completed around 2006, and that Smith Creek also has a TMDL and IP. However, only Smith Creek has a Waste Load Allocation (WLA). It was noted that the state has a goal of updating TMDLs every 5 years so the Blacks Run TMDL may be on the schedule for updating soon.

There was discussion that VSMP fees collected from developers do not cover the cost of administering the program.

Harrisonburg City Public Schools (HCPS) and Harrisonburg Electric Commission (HEC) are included under the City of Harrisonburg's MS4 General Permit and Public Works is coordinating with the schools and HEC similarly to coordination with other city departments.

The City and Draper Aden are reviewing and filling in gaps in the City's storm drainage system and outfall mapping data. The City's storm sewer system is connected intricately to James Madison University (JMU) and Virginia Department of Transportation (VDOT). The City and Draper Aden will be doing field investigations in Spring 2014.

Both JMU and VDOT have MS4 permits. It was asked if there was any benefit to going under one MS4 permit by cooperative agreement.

There was a discussion of opportunities to share project costs with JMU and dividing "credits" for the Chesapeake Bay TMDL special conditions of the MS4 permit.

Stormwater management facilities that are installed during development on private properties are required by VSMP to be inspected once every 5 years. Maintenance and inspections for privately owned BMPs are ensured by Maintenance Agreements signed during the site plan review. However, there is no mechanism currently in place for retroactive requirements for maintenance and inspection on old storm water management facilities. Stormwater management facilities on city properties are required by the MS4 permit to be inspected once a year.

Incentives for private property owners to install their own best management practices (BMPs) and storm water management facilities above what is required by VSMP can be accomplished through a reduced stormwater utility fee (if the city had a fee in place).

City staff has already started on development of public outreach and education campaigns to meet the MS4 permit requirements. The MS4 permit requires that a public outreach and education plan be developed by June 30, 2014 to begin implementation July 1, 2014. The City has selected three target issues for July 1, 2014-June 30, 2015 and they are: auto repair shops, restaurant waste management, and apartment complexes. The City will have the opportunity to select new target issues for future years.

City staff is also working on an Illicit Discharge Ordinance to meet requirements of the MS4 permit.

New VSMP regulations consider managed turf areas as potential pollutant sources. Roof runoff may be cleaner than turf.

In late 2013, with a grant and the help of the Center for Watershed Protection, City staff completed a Stormwater Retrofit Study on city owned lands. Retrofit opportunities identified in that study on a select number of public properties do not have enough pollutant reduction to meet the 5% WLA required for the first 5 year cycle of the MS4 permit (2013-2018). Staff recognizes that in order to meet WLA that improvements will need to be made by both public and private sectors.

Stream restorations are an opportunity to meet WLAs.

In addition to monetary costs of non-compliance (through penalties from VA DEQ or US EPA), an additional cost of non-compliance is increased flooding potential and impact on the economy through negatively impacted recreational and tourism opportunities.

If the City had a stormwater utility, the revenues collected can be used for many things to support stormwater management. However, revenues collected and how they are spent will need to be justified to the public. The level of service needed for operations to meet minimum compliance will need to be determined and what additional level of service is desired and can be funded. It was discussed that citizens will want to see where their money is going and the City should make a commitment to also address smaller projects through prioritization of different size projects.

There was discussion about the roundabout at Mt. Clinton Pike, Chicago Avenue, and Park Road, and that discussions between the City and Eastern Mennonite University have included stormwater management and the use of this project as a public education opportunity.

A Comprehensive Stormwater Management Plan for the City that lists project concepts and prioritizes them would be valuable toolbox of project ideas that would assist the city in obtaining grants for project implementation.

The Committee asked City staff to provide a cost per pound for removal of phosphorus. Costs vary depending on BMP used. Staff will share values at the next meeting.

There was discussion about mitigation banks and if there was an opportunity to sell credits gained by the City to be used as a revenue source. Staff believed that meeting the TMDL pollution diet will be difficult, and that any credits gained during the first 5 year MS4 permit cycle should be saved to apply towards credits during the second and third 5 year permit cycle.

There was a suggestion to invest money into water quality monitoring to measure success in the City. Volunteer groups could assist with monitoring. DEQ had collected monitoring data and city staff will check to see if DEQ is still collecting data. Monitoring is not an MS4 permit requirement and data collected from monitoring is not used to determine pollutant reduction credits in the Chesapeake Bay TMDL special conditions of the MS4 permit.

Thanh mentioned that the Department of Game & Inland Fisheries had done a fish shock in Blacks Run in about 2009 and found many more fish species in the creek than there used to be which is an indication of improved water quality.

Next Steps / Assignments

Assignments, such as Chairman and Vice-Chair, will be made by the Committee at the March SWAC meeting.

The Committee was asked to bring to the next meeting for discussion 2 or 3 drainage problem areas in the City.

The meeting was adjourned at 7:00pm.

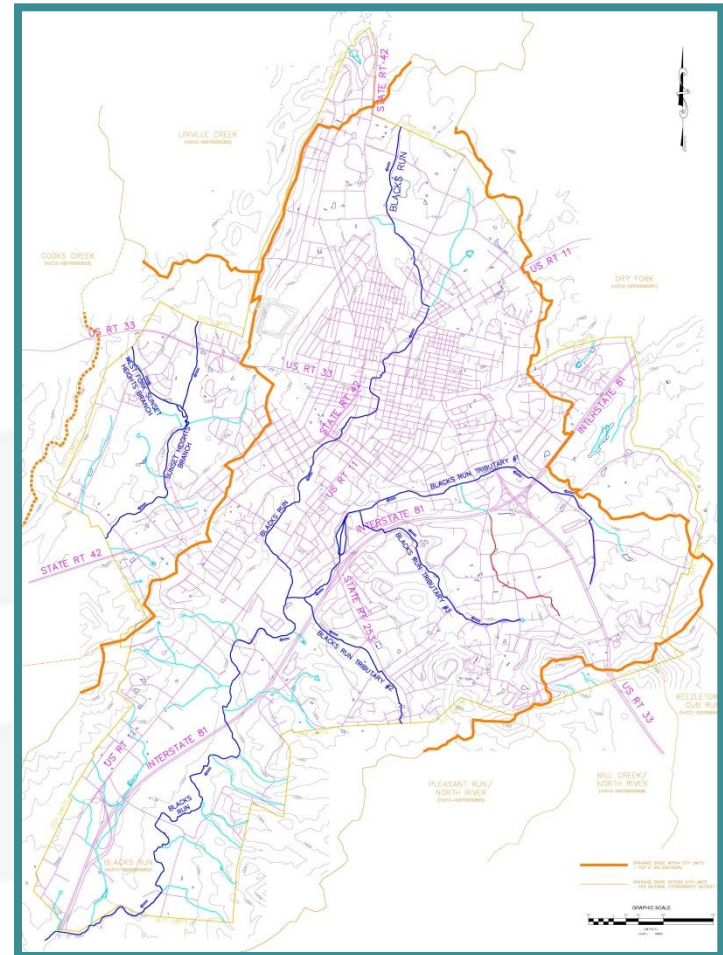
Next meeting will be on March 5, 2014, 5pm-7pm, at Harrisonburg Public Works, 320 East Mosby Road, Harrisonburg, VA 22801.

ATTACHMENT A: POWERPOINT PRESENTATION

A History of Stormwater Management and Overview of VSMP and MS4 Permit Requirements

City of Harrisonburg's Stormwater Program

A History of Stormwater Management and an Overview of VSMP and MS4 Permit Requirements



February 5, 2014

Stormwater Management

Why Do We Care?

- Flooding
 - ✓ Loss of Life & Property
- Water Quality
 - ✓ Public Health
 - ✓ Recreation
 - ✓ Biodiversity



www.sfgate.com – Oakland, CA



Fairfax County, VA
www.fairfaxcounty.gov



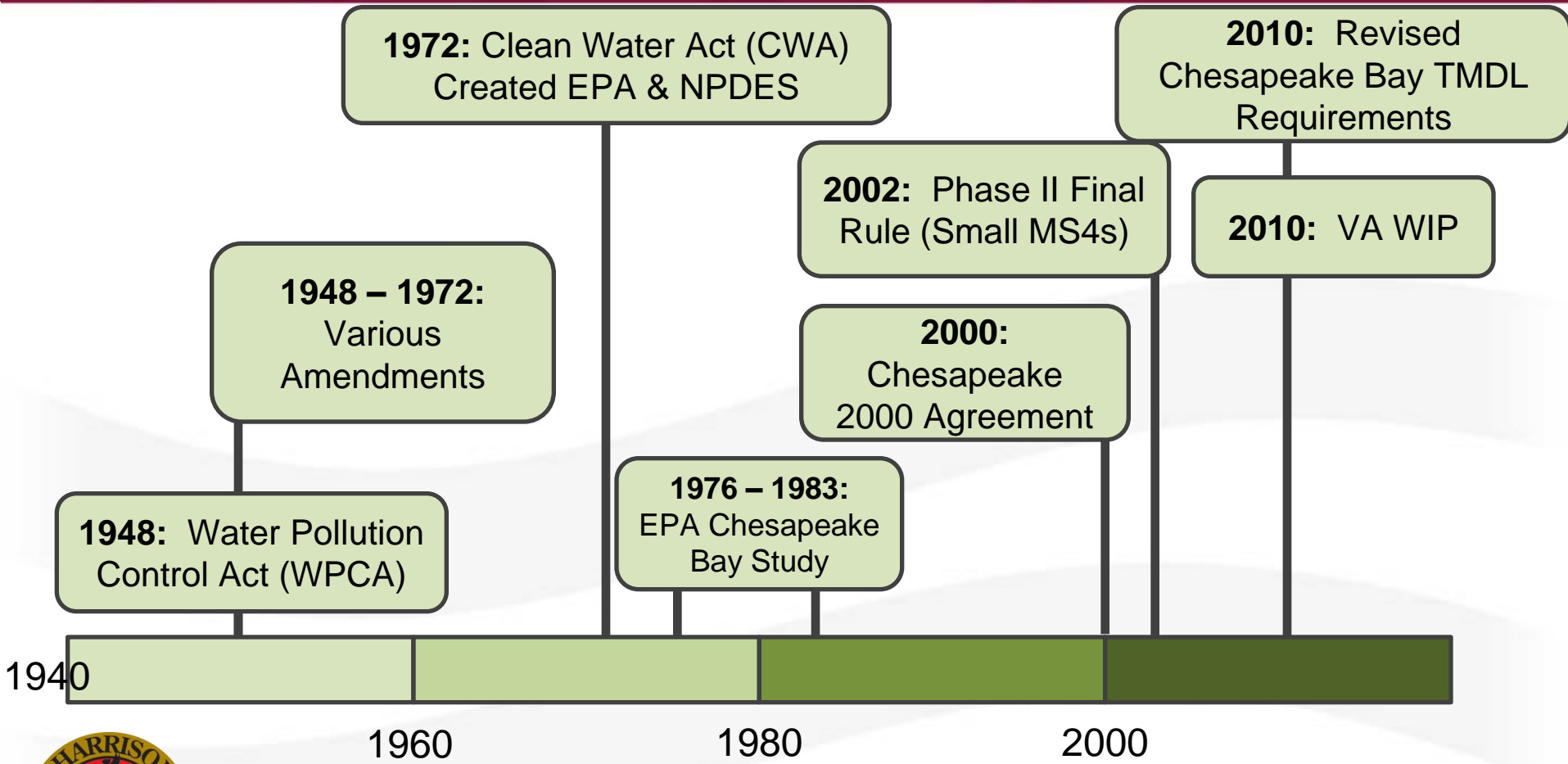
Stormwater Management How Did We Get Here?

The Perfect Storm





Stormwater Management Federal Legislation





Stormwater Management State Legislation

1973: VA Erosion & Sediment Control Law

1988: Chesapeake Bay Preservation Act (CBPA)

1989: VA Stormwater Management Act (Created VSMP)

2002: Small MS4 Permits Issued

2004 - 2006: Various Amendments

2011 - 2012: Revisions to VSMP & VA House Bill 1065

2013: New MS4 Permit

1970

1980

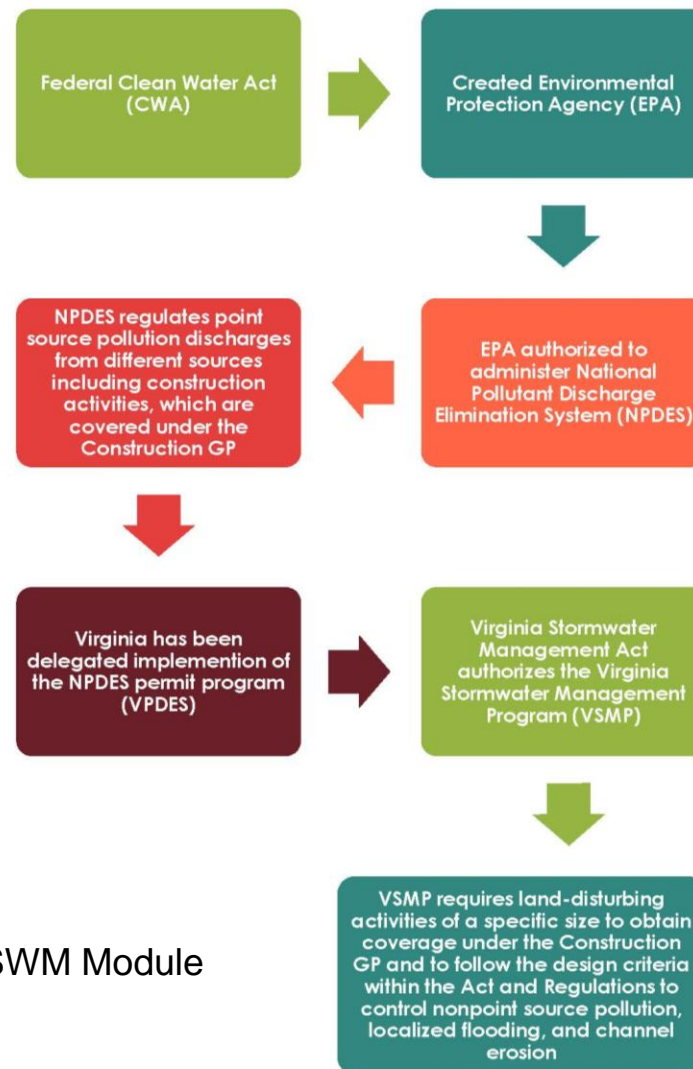
1990

2000

2010



Flow Chart of Authority



DEQ Basic SWM Module



Definitions

- VSMP = Virginia Stormwater Management Program
- SWM = Stormwater Management
- BMP = Best Management Practices
 - ✓ Bioretention
 - ✓ Permeable Pavers
 - ✓ Water Re-Use (Cisterns)
- LID = Low Impact Development

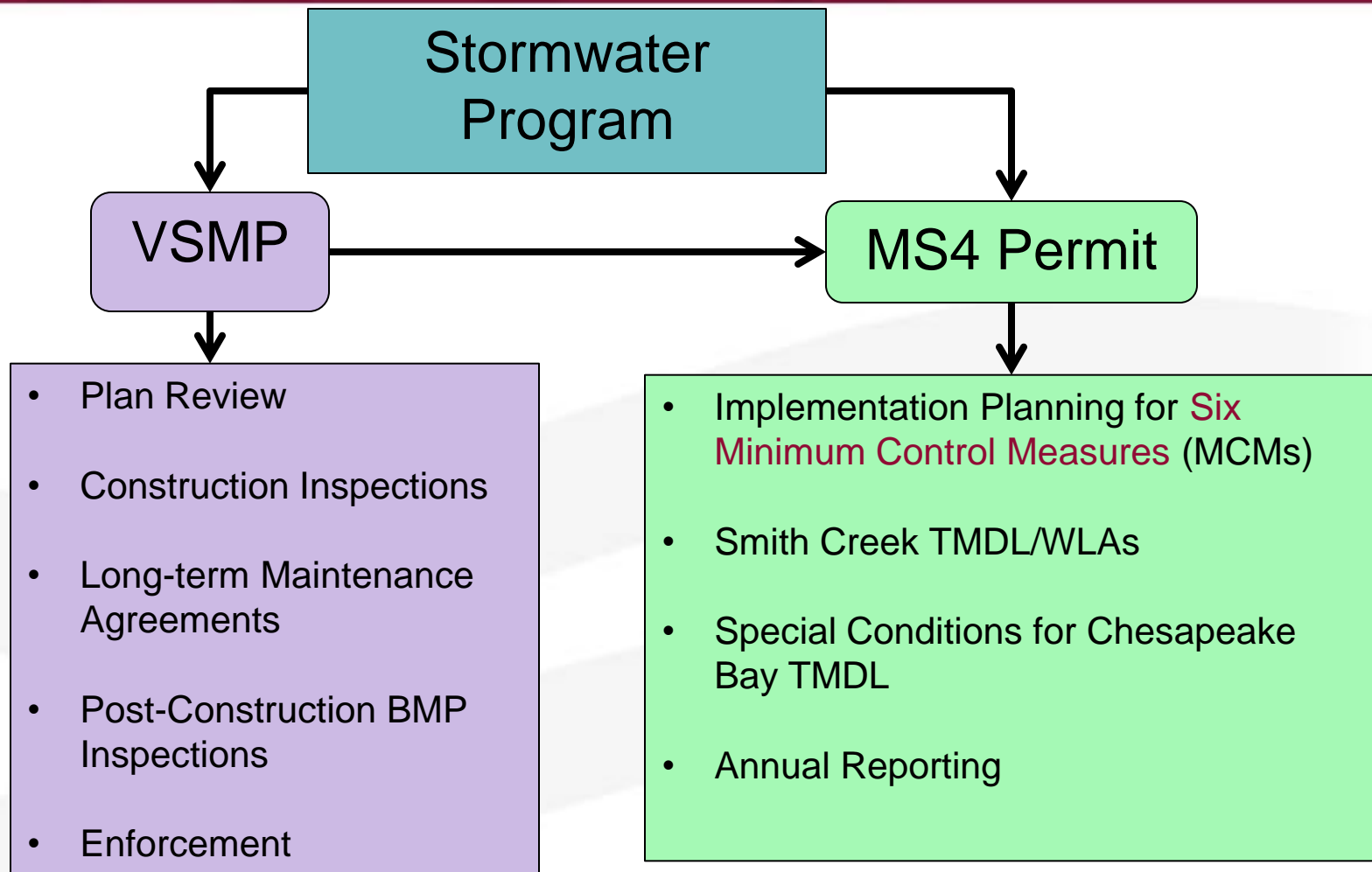


Definitions

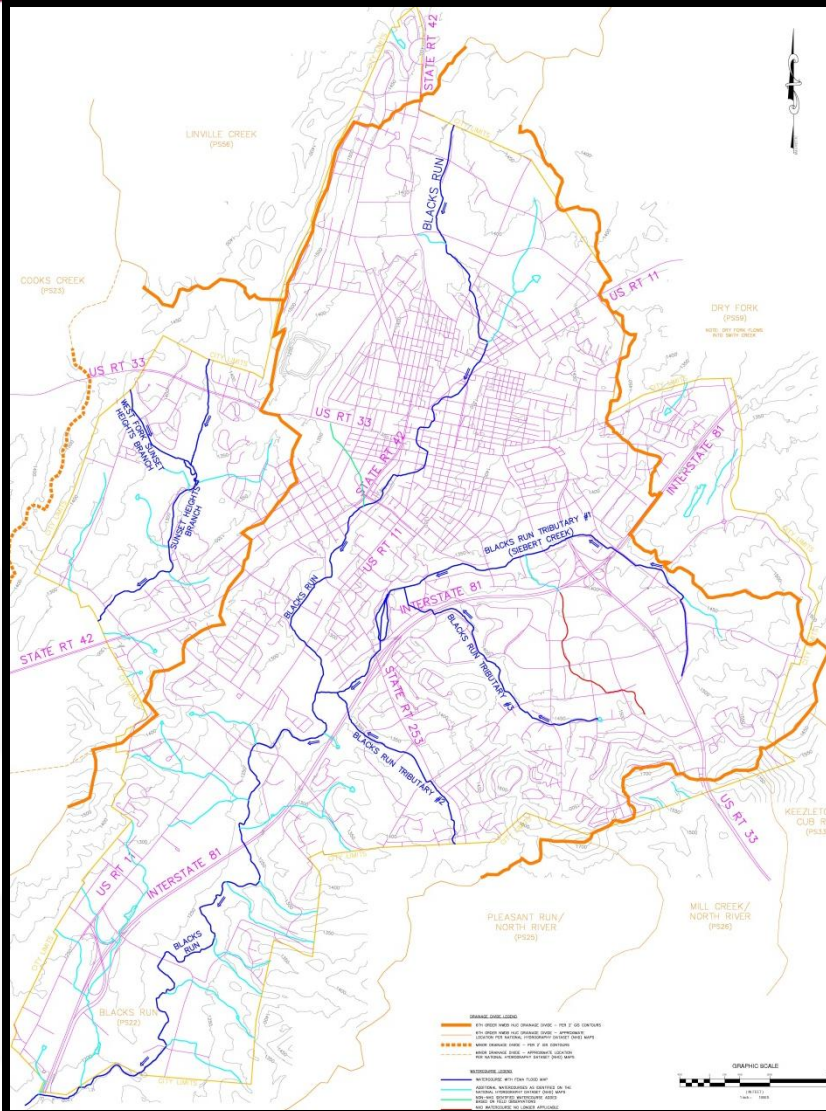
- MS4 = **M**unicipal **S**eparate **S**torm **S**ewer **S**ystem
- TMDL = **T**otal **M**aximum **D**aily **L**oads
 - ✓ Maximum “load” of pollutant a stream can assimilate
 - ✓ Allocation of specific pollutants deemed acceptable
 - ✓ Applies to all surface water bodies not just Chesapeake Bay
- WLA = **W**aste **L**oad **A**llocation



City of Harrisonburg's Stormwater Program



City of Harrisonburg's Stormwater Program



- Blacks Run
- Cooks Creek
- North River
 - ✓ Pleasant Run
 - ✓ Mill Creek
- Linville Creek
- Dry Fork
 - ✓ Smith Creek Tributary



Virginia Stormwater Management Program (VSMP)

- One Time
 - ✓ Plan Review
 - ✓ Construction Inspections
- In Perpetuity
 - ✓ Long-term Maintenance Agreements
 - ✓ Post-Construction BMP Inspections
 - ✓ Enforcement



MS4 Permit: General

- Two types of Permits:
 - ✓ Phase I (Large) – Individual Permit required for cities & urban counties starting in 1990
 - ✓ **Phase II (Small) – General Permit required for smaller public entities starting in 2003**
- “Urbanized Areas” as defined by US Census data
- General Permit revised every 5 years
- City of Harrisonburg Initial Permit - **2003**



MS4 Permit: Virginia Public Bodies

- Early 1990s - Large (Phase I) MS4 Permits
 - ✓ 11 Localities with Over 100,000 Population
- 2002 to 2008 - Small (Phase II) MS4 permits
 - ✓ 89 Localities, Colleges, State and Federal Facilities
- 2013 – 17 New MS4 Permit Notifications



MS4 Permit: Applicability

- Publicly Owned Areas and Storm Sewer Systems within the City discharging to surface waters of the Commonwealth or other MS4 systems – VDOT and JMU.



MS4 Permit: Six MCMs

1. Public Education & Outreach on Stormwater Impacts
2. Public Involvement & Participation
3. Illicit Discharge Detection & Elimination
4. Construction Site Stormwater Runoff Control
5. Post-construction Stormwater Management in New Development and Redevelopment
6. Pollution Prevention/Good Housekeeping for Municipal Operations



MS4 Permit: Six MCMs

1. Public Education & Outreach on Stormwater Impacts

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|---|--|--------------------------|--|
| 1 | Develop and Deliver Public Education & Outreach Plan to reach 20% of target audiences for 3 priority water quality issues annually. Requires public input and participation. *Example issues: Dog Waste, Duck Feeding, Auto Repair Shops, Encourage No Mow Zones | Expanded Requirement | 6/30/2014 |
| 2 | Report annually | Expanded Requirement | Immediately |



MS4 Permit: Six MCMs

2. Public Involvement & Participation

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|---|--|--------------------------|--|
| 3 | Maintain an updated MS4 Program Plan. Any required updates to MS4 Program Plan shall be completed at minimum once a year and shall be updated in conjunction with the Annual Report. Shall post copies of each MS4 Program Plan on webpage within 30 days of submittal of annual report. | Minimal Change | Immediately |
| 4 | Prior to reapplying for coverage, notify public and provide for receipt of public comment of proposed MS4 Program Plan | For next permit cycle | Later |
| 5 | Participate in four local activities annually and report annually (ex. Stream cleanups, hazardous waste cleanup days, meetings with watershed associations, environmental advisory committees, etc.) | Minimal Change | Immediately |



MS4 Permit: Six MCMs

3. Illicit Discharge Detection & Elimination

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|---|
| 6 | Maintain accurate storm sewer system map with location of all MS4 outfalls and points of discharges. | Expanded Requirement | 6/30/2015 |
| 7 | With map, database to include estimated MS4 acreage served for each outfall & point of discharge, and total acreage. | Expanded Requirement | 6/30/2015 |
| 8 | Notify downstream MS4 of any known physical connection. | Minimal Change | 6/30/2015 |
| 9 | Prohibit through ordinance or other legal mechanism non stormwater discharges into storm system. City should review ordinances. | Changes Required | 6/30/2014 |
| 10 | Develop, update, when appropriate, written procedures to detect, identify and minimize unauthorized non-stormwater discharges, including illegal dumping, to the MS4 including: written dry weather field screening methodologies to detect & eliminate illicit discharges to the MS4 that include field observations and field screening monitoring. | New Requirement | 6/30/2014 |
| 11 | Develop prioritized schedule for field screening (how many annually, and report annually) based on land use, historical illegal discharges, dumping or cross connections. | New Requirement | 6/30/2014 and updated after mapping completed |
| 12 | Determine minimum number for annual field screening of outfalls. | New Requirement | 6/30/2014 |



MS4 Permit: Six MCMs

3. Illicit Discharge Detection & Elimination

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|--|
| 13 | Conduct Field Screening Activities Annually | Minimal Change | Annually |
| 14 | Develop methodologies to collect general information for outfalls and points of discharges, such as time since last rain, quantity of last rain, site descriptions, estimated discharge rate, depth of water, visual observations (need to evaluate existing databases and update) & database to store data (See regulations for more detail) | Expanded Requirement | 6/30/2014 |
| 15 | Investigate illicit discharge/ pollution reports (includes tracking, assuming database is in place)... | Changes Required | Immediately |
| 16 | Develop written description of policies and procedures for when and how to use legal authorities | Expanded Requirement | 6/30/2014 |
| 17 | Develop mechanism to track all investigations, at min. date that illicit discharge observed and reported, results of investigation, following investigation, resolution, date closed. | Expanded Requirement | 6/30/2014 |
| 18 | Promote, publicize, and facilitate public reporting of illicit discharges. | Expanded Requirement | Immediately |
| 19 | Include all procedures developed above in MS4 Program Plan. (refer to regulations) | Expanded Requirement | 6/30/2014 |
| 20 | Complete annual report - List of written notifications, total number of outfalls screened, screening results, detail of follow ups, summary of each investigation, etc. | Expanded Requirement | Annually |



MS4 Permit: Six MCMs

4. Construction Site Stormwater Runoff Control



| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|--|
| 21 | Compliant with minimum standards of Erosion & Sediment Control regulations - includes inspection. | No Change | Immediately |
| 22 | Develop progressive compliance and enforcement strategy, and include strategy in MS4 Program Plan | Minimal Change | 6/30/2014 |
| 23 | Promote to the public a mechanism for receipt of complaints regarding regulated land disturbing activities and follow up. | Expanded Requirement | Immediately |
| 24 | Include in MS4 Program Plan: Description of legal authorities utilized to ensure compliance, Written plan review procedures and all associated documents utilized in plan review, written inspection procedures, roles and responsibilities of each of the operators departments, divisions, etc. involved in implementing MCM 4. | Expanded Requirement | 6/30/2014 |
| 25 | Include in each annual report: total number of regulated land disturbing activities, total disturbed acreage, total number of inspections, and summary of enforcement action. | Minimal Change | Immediately |



MS4 Permit: Six MCMs

5. Post-construction Stormwater Management in New Development and Redevelopment

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|-----------------------------|--|
| 26 | Implement Virginia Stormwater Management Program (VSMP) General Permit for Discharges from Construction activities as required. (A set of separate, but related regulations.) | Expanded Requirement | 7/1/2014 |
| 27 | Inspect, operate, and maintain verification of facilities not owned by the MS4 Operator: require long term operation & maintenance by owner via maintenance agreement and inspection schedule, operator (the city) to inspect all privately owned stormwater management facilities once every 5 years. Also need recordkeeping/ data management system. | Expanded & New Requirements | 6/30/2014 |
| 28 | Develop periodic inspections, homeowner education & outreach, etc. to promote long-term maintenance of stormwater control measures designed to treat stormwater runoff solely from individual residential lot (consider stormwater utility credits) | New Requirement | 6/30/2014 |
| 29 | For facilities owned by MS4 Operator, develop written inspection and maintenance procedures and implement. (Ex. City right of ways, Parks & rec, city owned properties, schools, HEC, etc.) and train city department staff on how to maintain BMPs | New Requirement | 6/30/2014 |
| 30 | Update MS4 Program Plan: list of legal authorities, written policies and procedures to ensure stormwater management facilities are designed and installed correctly, written policies and procedures for conducting inspections of privately and operator owned facilities, roles and responsibilities of operators departments, divisions, etc. | Expanded Requirements | 6/30/2014 |
| 31 | Develop stormwater management facility tracking and reporting database: facility type, location, address, lat/long, acres treated, breakdown of impervious/pervious, date brought online, date of last inspection, maintenance agreement, etc... for annual submission. | Expanded Requirements | 6/30/2014 |



MS4 Permit: Six MCMs

6. Pollution Prevention/Good Housekeeping for Municipal Operations

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|--|
| 32 | Develop and implement written procedures to prevent discharge from (i) daily operations such as road, street, and parking lot maintenance, (ii) equipment maintenance, and (iii) the application, storage, transport and disposal of pesticides, herbicides, and fertilizers. (see regulations for more details) | New Requirement | 6/30/2015 |
| 33 | Identify all municipal high priority facilities that have a high potential for discharging pollutants that are not covered under a separate VPDES permit or are expected to have exposure to precipitation: using, storing or cleaning machinery or equipment, materials or residues on the ground or in stormwater inlets from spill or leaks, materials or products during loading/unloading (salt, fill, dirt), materials or products stored outdoors, materials contained in open, deteriorated or leaking storage drums, barrels, tanks, etc.... | Expanded Requirements | 6/30/2014 |
| 34 | Develop and implement SWPPP which includes annual comprehensive site compliance evaluation and inspection & maintenance schedule for site specific source controls. (see regulations for more details) | New Requirement | Internal goals, all to be completed and implemented by 6/30/2018 |
| 35 | Report each discharge, release or spill within the SWPPP to include the following information: date of incident, material discharged, release, or spilled, quantity discharged, released or spilled. | New Requirement | 6/30/2014 |



MS4 Permit: Six MCMs

6. Pollution Prevention/Good Housekeeping for Municipal Operations

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|--|--------------------------|--|
| 36 | Identify all lands owned by MS4 operator where nutrients are applied to a contiguous area greater than 1 acre that are not regulated under S 10.1-104.4 of the Code of VA. | New Requirement | 6/30/2014 |
| 37 | Develop and implement Nutrient Management Plans on all required lands, within 24 months = 15% of identified acres covered by NMP, 36 months = 40%, 48 months = 75%, 60 months = 100%. | New Requirement | Internal goals, all to be completed and implemented by 6/30/2018 |
| 38 | Develop biennial training program for relevant employees in (a) recognition and reporting of illicit discharges, (b) good housekeeping and pollution prevention for road, street, and parking lot maintenance, good housekeeping and pollution prevention around maintenance and public works facilities, (c) recreational facilities. | Expanded Requirements | Develop by 6/30/2014, implement continuously |
| 39 | Ensure employees, contractors, etc. applying pesticides and herbicides are property trained and certified. | New Requirement | Immediately |
| 40 | Ensure employees and contractors employed as plan reviewers, inspectors, program admin, construction site operators, obtain appropriate certifications as required by VA E&S Control Regulations. | New Requirement | Immediately |
| 41 | Provide training for spill responses for all emergency response employees. | Expanded Requirements | Immediately |
| 42 | Maintain documentation on each training event, including training date, number of employees, objective of training for a period of 3 years following training event. | Expanded Requirements | 6/30/2014 |



MS4 Permit: TMDL Compliance & WLAs

- Current TMDLs for Blacks Run, Cooks Creek, Smith Creek, Mills Creek, Linville Creek, Cub Run, and the Chesapeake Bay
- WLAs for Smith Creek TMDL and Chesapeake Bay



MS4 Permit: Smith Creek TMDL/WLAs

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|--|
| 44 | Develop a list of legal authorities applicable to reducing pollutant identified in WLA | New Requirement | 6/30/2015 |
| 45 | Identify and maintain updated list of all additional management practices, control techniques, system design and engineering methods, beyond those in Section II.B that have been implemented as part of MS4 Program Plan. | New Requirement | 6/30/2015 |
| 46 | Enhance public education & outreach and employee training programs to promote elimination of pollutants identified in WLA | New Requirement | 6/30/2015 |
| 47 | Assess significant sources of pollutants from facilities owned or operated by MS4 operator that are not covered under separate VPDES permit and identify all municipal facilities that may be a significant source of identified pollutant. | New Requirement | 6/30/2015 |
| 48 | Develop and implement a method to assess TMDL Action Plans for effectiveness. Evaluation shall use any newly available information, water quality monitoring results, or modeling tools to estimate pollutant reductions. | New Requirement | 6/30/2015 |
| 49 | Annual reporting requirements | New Requirement | 6/30/2015 |



MS4 Permit: Chesapeake Bay TMDL

| | Task Description | New/Expanded Requirement | Task must be completed/ implemented by |
|----|---|--------------------------|--|
| 50 | Review of current MS4 program, Identify and new or modified legal authorities, means and methods to address discharge into MS4 from new sources, estimate of annual POC loads discharged from existing sources, determination of total pollutant load reductions necessary to reduce annual POC fro existing sources, mean and methods such as practices and retrofit programs utilized to meet required reductions, means and methods to offset increased loads from new sources initiating construction between July 1 - June 30, 2014 that disturb greater than 1 acre, means and methods to offset increased loads from grandfathered programs, address modification to TMDL or watershed implementation plan, estimate of expected costs to implement, opportunity for receipt of public comment, etc. | New Requirement | 90 days after 6/30/2015 |
| 51 | Implement TMDL Action Plan & Annual Reporting | New Requirement | 90 days after 6/30/2015 |

* Note: next permit cycle (2018-2023) shall reduce existing pollutant load by an additional 35% (or total 40%), and following cycle (2023-2028) shall reduce by an additional 60% (or total 100%).



Stormwater Program Costs

- Program Development
- Additional Staff
- Changes to Operational Procedures
- Total Annual Compliance Cost = ????

In Development...TBD

- Cost of Non-Compliance
 - ✓ Confinement in Jail
 - ✓ \$50,000 / day (max. civil penalty)
 - § [62.1-44.15:48](#). Code of Virginia



Stormwater Program Costs

- Cost of Non-Compliance

- ✓ DEQ Enforcement

- ✓ Confinement in Jail

- ✓ \$50,000 / day (max. civil penalty)

- » § [62.1-44.15:48](#). Code of Virginia

- ✓ USEPA Enforcement

- ✓ \$62,000 – Hampton (2013)

- ✓ \$80,000 – Newport News (2013)

- ✓ Henrico and Chesterfield Counties, Chesapeake



Stormwater Management Opportunities

- Mitigate Existing Flooding / Drainage Concerns
- Improve Water Quality in Blacks Run, Cooks Creek, Smith Creek, Mills Creek, Linville Creek, Cub Run, and, ultimately, the Chesapeake Bay
- Protect Drinking Water Sources



Questions & Answers



Draper Aden Associates
Engineering • Surveying • Environmental Services