Virginia Stormwater Management Program New Regulation Implementation

Vanasse Hangen Brustlin, Inc.

PRESENTED BY

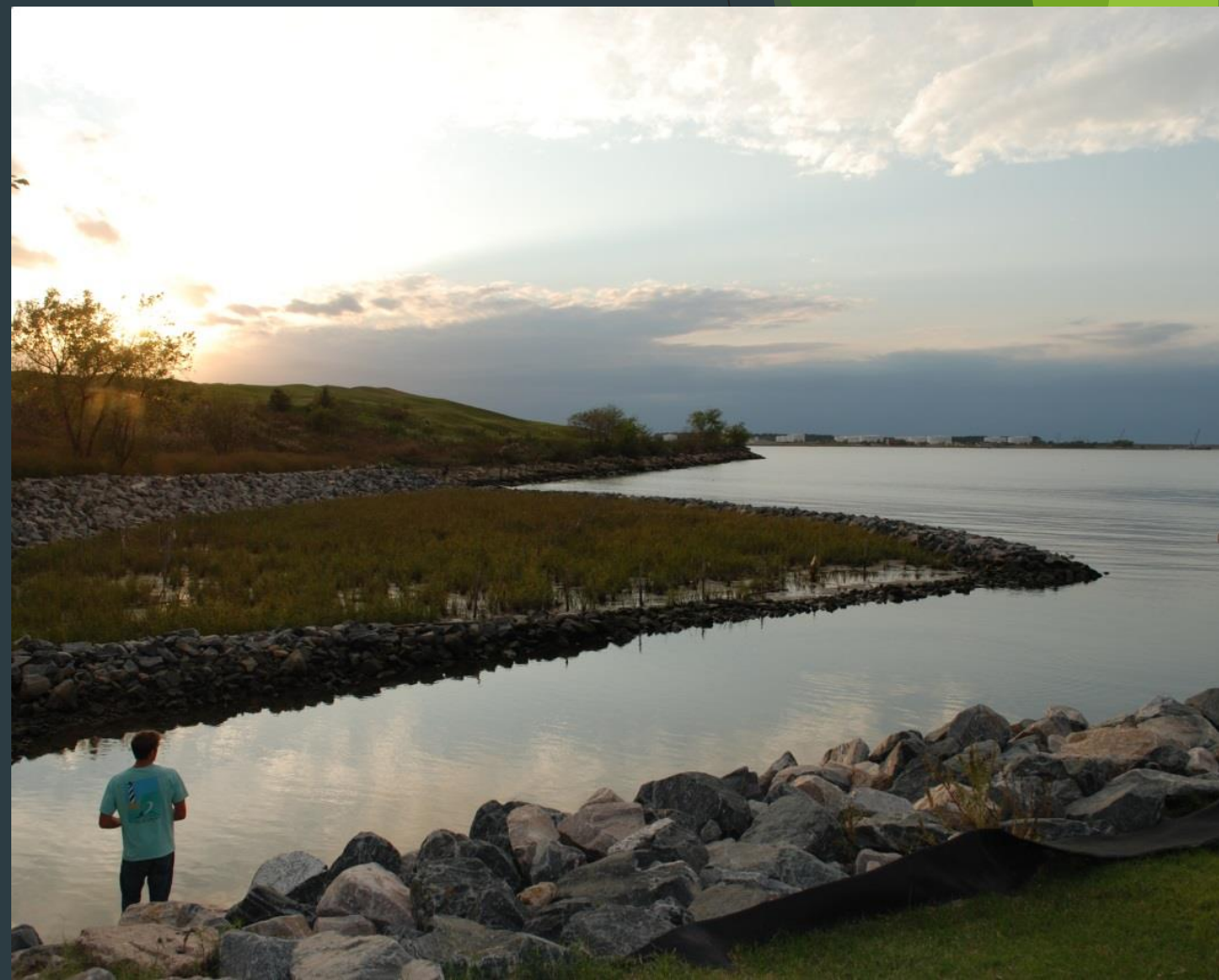
J.D. Hines, P.E.

VA Statewide Regulations
(EPA – Clean Water Act)

- **2004**
  DCR directed to develop new water quality and quantity standards
- **2005-2009**
  Development of new standards by DCR
- **2009**
  DCR introduced the Runoff Reduction Method (0.28lbs/yr)
- **2010-2011**
  EPA approved TMDL merged into new regulations (0.41lbs/yr)
- **July 1, 2013**
  Submit Draft VSMP programs to DEQ (no longer DCR)
- **July 1, 2014**
  Municipalities are required to have their adopted VSMP Program

Why Focus on the Chesapeake Bay?

- **19** major river basins and **150** total rivers drain to the Bay
- **64,000** square mile watershed and **4,000** square mile surface area
- It is very shallow



State Construction General Permit (CGP) Requirements

State CGP Requirements

- Fee submission (owner)
  - Base fee
  - Modification fee
  - Maintenance fee
- Approval of ESC plan
- SWPPP must be prepared prior to submission of CGP (contractor) – not submitted
- Now have 90 days to provide
- Expires on February 15th, 2017

Stormwater Pollution Prevention Plans (SWPPP)

Required Contents *(online examples available!)*

- Schedule
- Approved ESC Plan
- Approved SWM Plan/Calcs
- Pollution Prevention Plan
  - Dumpsters
  - Chemical/fuel storage
  - Equipment storage/maintenance
  - Washout station
- Specific Control measures for TMDL's
- Inspection Checklists

Erosion and Sediment Control Program

Inspections *(during construction)*

- Install perimeter controls immediately
- Once every two weeks (max)
- Once every 4 days (min)
- Maintenance
  - Small = 1 day corrective action
  - Large = 7 days corrective action
- Documentation! Take photos
- New certification required

Enforcement

- Verbal warning
- Notice of corrective action
- Notice to comply
- Stop work orders
- Civil penalty (NTE $32,500/day)
- Criminal penalty (15 yrs prison)

SWM Regulations | Old vs. New

Stormwater Technical Criteria		
Criteria	**Old Regs**	**New Regs**
Land Use	Impervious cover (IC) only	IC + Forest/Open Space + Managed Turf
Event	0.5 inches of Runoff from the IC only	1.0 inches of Rainfall from the whole site
New Design Criteria	Average land condition/ technology based	0.41 lbs./ac/yr Total Phosphorus (TP)
Redevelopment Criteria	10% reduction TP	<1 acre = 10% red. TP, >1 acre = 20% red. TP
Compliance Methodology	Simple Method	Runoff Reduction Method
Water Quantity	Varied	Criteria for: Manmade conveyance systems Restored conveyance systems Natural conveyance systems

Stormwater Management | Quality Control

Runoff Reduction Method

- Increased pollutant removal requirement (0.41lbs/yr ~14% Impervious)
- Water quality credit due to reduction in overall runoff as well as BMP treatment
- Assess woods, turf, and impervious surface in pre/post analysis
- Considers HSG (soil type)
- Water quality volume increase from 0.5” to 1”
- BMP in series now allowed
- Proprietary BMP’s being approved through 3rd party testing

Stormwater Management | Quality Control

VA BMP Clearinghouse

- Online resource for SWM/BMP
- Wider range of “tools”
  - LID
  - Permeable pavement
  - Cisterns
- Total phosphorus calculation
- Design criteria
- Typical details
- Regional adaptation (coastal plain)
- Construction and maintenance information

Post Construction SWM | Quantity Control

Flood Protection

- History of flooding during 10yr storm events
  - 10-yr capacity in channel; or
  - Hold to 10-yr pre
- No history of flooding during 10 yr storm events
  - 10-yr capacity in channel
- Study limits (1% rule)
  - Site area
  - Flow rate
  - Mapped floodplain

Post Construction SWM | Quantity Control

Channel Protection

- Natural conveyance systems
- Use energy balance equation
  - 1 year 24 hour storm

Post Construction SWM | Quantity Control

Channel Protection

- Man-made conveyance systems
- Shall convey the post development peak flow rate without causing erosion to the system (2-year 24-hour storm), or
- Treat as a natural system
  - Energy balance Equation

Post Construction SWM | Quantity Control

Channel Protection

- **Restored conveyance systems**
- Shall convey post development peak discharge consistent with the design criteria of the restored conveyance system, or
- Treat as a natural system
  - Energy balance equation

Stormwater Management | Quality Control

Channel Protection: Energy Balance Equation

$$Q_{post} \leq I.F. \times (Q_{pre} \times RV_{pre})/Rv_{post}$$

- Q_{pre} = Pre-development peak flow rate (cfs)
- RV_{pre} = Pre-development runoff volume (in.)
- Q_{post} = Post-development peak flow rate (cfs)
- RV_{post} = Post development runoff volume (in.)
- I.F. = Improvement factor (0.8 for sites>1 acre, 0.9 for sites < 1 acre

A.) … site's contributing drainage area is less than or equal to 1.0% of the total watershed, or

B.) … site's peak flow rate is less than or equal to 1.0% of the existing peak flow rate (based on a one-year 24 hour storm)

Post Construction SWM | Inspections

Inspections

- MS4 operator
  - At least once every 5 years
  - Signed and sealed!
- Owners/developers
  - At least once every 5 years
  - Signed and sealed!
  - Submitted to MS4 operator
- Audited by DEQ and EPA

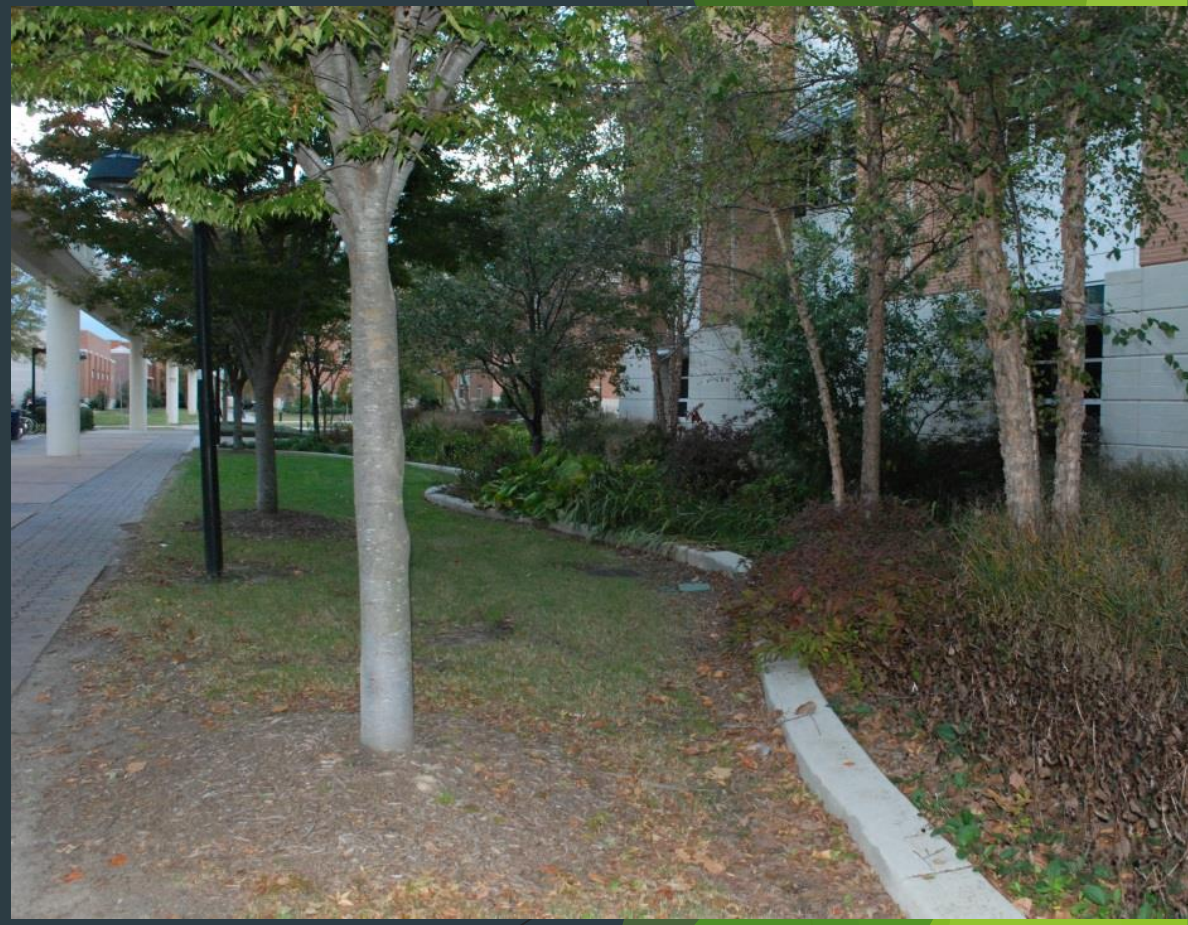
Some BMP Examples

Good and Bad

Dry detention basin | Reduced efficiency

Wet retention basin | Reduced efficiency

Bioretention filters/rain gardens



Wetland creation/restoration (careful)


Pervious pavers (not pervious concrete or asphalt)

Infiltration BMP failure

Water quality inlet | Good condition

Water quality inlet | Not so good condition

Not a great location for a greenhouse

Good BMP for chemical/material storage

End of Presentation

Questions?