

***Revisions to the
Delaware Sediment & Stormwater Regulations:
Why, What, How?***

***Public Workshop
June 16, 2011***

Why?

Tropical Storm Henri (2003) - Wikipedia, the free encyclopedia - Windows Internet Explorer

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Tropical Storm Henri (2003)

From Wikipedia, the free encyclopedia

This article is about the 2003 tropical storm. For other storms of the same name, see Hurricane Henri

Tropical Storm Henri was a tropical storm that formed in the 2003 Atlantic hurricane season. The eighth storm of the season, Henri was one of six tropical cyclones to hit the United States in the year. Henri formed from a tropical wave in the Gulf of Mexico in early September, and crossed over Florida as a tropical depression. Its remnants later moved into the Mid-Atlantic before dissipating completely.

Henri caused little damage as a tropical cyclone. In Florida, it dropped heavy rainfall, though damage was limited to minor flooding damage. In Delaware and Pennsylvania, damage was greater, where heavy rainfall damaged hundreds of houses and businesses. The resulting floods in Delaware were described as a 1 in 500 year event. The total damage by Henri along its path amounted to \$19.6 million (2003 USD, \$21.5 million 2009 USD), but no deaths were reported.

Contents [hide]

- Meteorological history
- Preparations
- Impact
 - Florida, Bahamas, and Bermuda
 - Mid-Atlantic
- Aftermath
- See also
- References

Meteorological history

[edit]

On August 22, a tropical wave moved off the coast of Africa, and it moved westward across the Atlantic Ocean and Caribbean Sea without developing significantly. On September 1 the wave axis entered the Gulf of Mexico, and upon doing so convection steadily organized around a low-level center of circulation. The system moved northward and developed into Tropical Depression Twelve on September 3 while located about 300 miles (480 kilometers) west of Tampa, Florida. Embedded within a slow mid-latitude trough, the depression moved eastward and strengthened into Tropical Storm Henri on September 5.^[1]



Storm path

Despite strong southwesterly vertical shear, Henri continued intensifying while moving eastward, and reached a peak strength of 60 mph (95 km/h) later on September 5. Shortly thereafter, though, the shear greatly weakened the storm, and it was downgraded to a tropical depression. Henri was not able to recover its intensity, and made landfall near Clearwater, Florida on September 6 as a 35 mph (55 km/h) tropical depression, and quickly crossed the state as it accelerated to the northeast.^[1] Despite initial predictions of re-intensification over open waters due to potentially lower shear,^[2] Henri failed to re-strengthen and degenerated into a remnant low pressure area on September 8 off the coast of North Carolina.^[1]

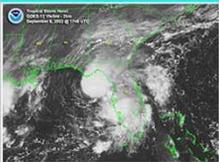
The broad and disorganized remnant low remained nearly stationary due to a ridge of high pressure to its north.^[1] Residual convection within the remnants of Henri remained disorganized, but forecasters kept watch for the potential for redevelopment.^[3] However, it moved inland near Cape Hatteras on September 12 without reorganizing.^[4] The remnants continued to the north and dissipated on September 17 over New England.^[5]

Preparations

The National Hurricane Center issued a Tropical Storm Warning from Englewood to Indian Pass, Florida while Henri was a tropical depression; however, warnings were discontinued by the time Henri made landfall.^[1] Flood warnings were issued across the state prior to the storm making landfall, with predictions of 5 to 10 inches (125 – 255 mm) of rainfall.^[6] As a result of the storm's approach, twelve shelters were placed on standby. Similarly, the Hurricane Shelter Information Hotline was placed on standby and ready to be activated within 10 minutes.^[7] Lee County officials declared a state of emergency. Their sand bags and sand were sent to Cedar Key, Yankeetown, and Indian in anticipation for storm surge and flooding.^[8]

Tropical Storm Henri

Tropical storm (SSH)



Tropical Storm Henri near peak intensity

Formed	September 3, 2003
Dissipated	September 8, 2003
Highest winds	60 mph (95 km/h) (1-minute sustained)
Lowest pressure	997 mbar (hPa; 29.44 inHg)
Fatalities	None reported
Damage	\$19.6 million (2003 USD) \$22.96 million (2009 USD)
Areas affected	Florida, Delaware, Pennsylvania
	Part of the 2003 Atlantic hurricane season



Remnants of Henri making landfall on North Carolina

Internet 100%

start Tropical Storm Henri (...)

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Governor Minner's Task Force on Surface Water Management

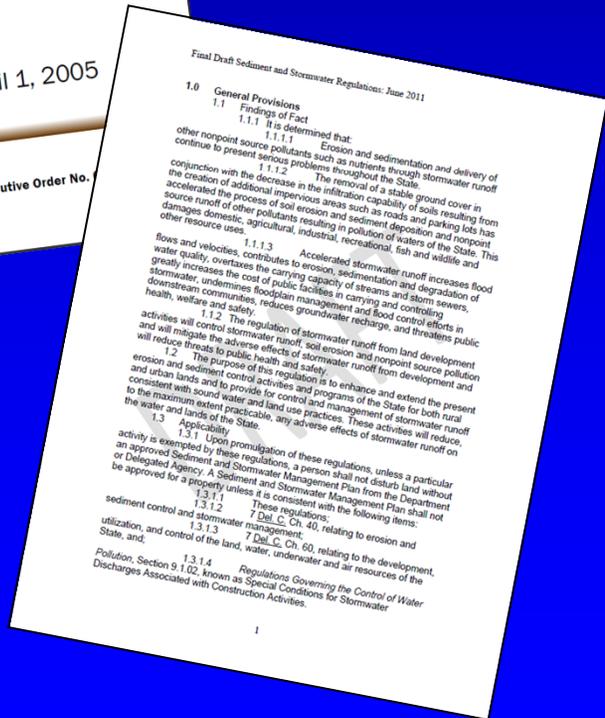
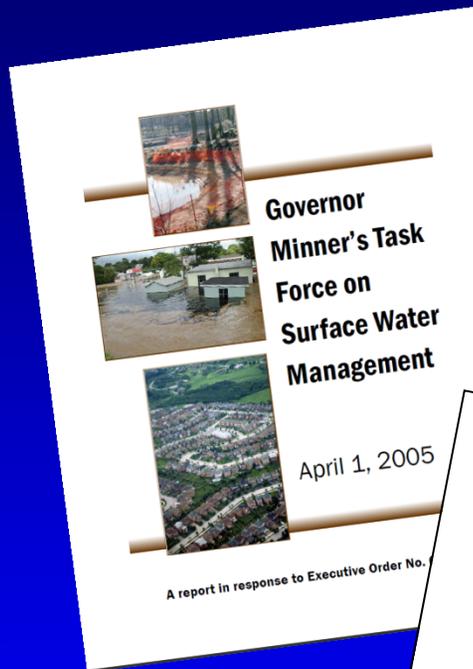
April 1, 2005

A report in response to Executive Order No. 62

“The current stormwater regulations do not adequately address volume management of stormwater. This program deficiency has been recently addressed by surrounding states with new program requirements. Increased emphasis on recharge and infiltration of stormwater where technically and environmentally feasible, has to be endorsed by changes to the existing body of law.”

- Gov. Task Force on Surface Water Management (2005)

In Summary:



- The Task Force for Surface Water Management identified **legitimate public health, safety and welfare concerns** associated with drainage and stormwater management.
- The proposed revisions to the Delaware Sediment and Stormwater Regulations represent the Department's efforts to address those concerns and recommendations through the State's regulatory authority.

What?

Guiding Principals

- Peak-based to Volume-based management
- Site-level to Watershed-level management
- Separate regulatory language from technical requirements
- Streamline plan review/approval process!

What?

Regulatory Revision Process

- Start Action Notice - SAN#2006-16
- Signed by Secretary Hughes
August 23, 2006

What?

Regulatory Revision Process

- Oversight provided by Regulatory Advisory Committee (RAC) IAW 7 Del. Ch. 40
- Supported by 6 Subcommittees
 - Technical Subcommittee
 - Planning & Land Use Subcommittee
 - Policies & Procedures Subcommittee
 - Urban Considerations Subcommittee
 - Maintenance Subcommittee
 - Economic Impacts Subcommittee

What?

Regulatory Revision Process

- Consulting Team:
 - Center for Watershed Protection (CWP)
 - Horsley Witten Group (HW)
 - Johnson, Mirmiran & Thompson (JMT)
- Provide technical support to staff

What?

Plan Review & Approval Process

- Current Regs
 - 3 Step Process as defined through policy
 - Pre-Application Meeting
 - Sediment & Stormwater Conceptual Plan
 - Sediment & Stormwater Construction Plan
- Proposed Regs
 - 3 Step Process as defined in Regulations
 - Step 1: Project Application Meeting
 - Step 2: Preliminary Sediment & Stormwater Plan
 - Step 3: Sediment & Stormwater Plan

What?

Erosion & Sediment Control

- Current Regs
 - Max. 20 ac. disturbance
 - “Best Available Technology” (BAT) adopted by reference to NPDES CGP
- Proposed Regs
 - Disturbance > 10 ac. requires engineered design based on 2-YR bare earth condition
 - BAT included in regulatory language

What?

Stormwater Management

- Current Regs
 - 4 Regulatory Storm Events
 - WQ (2" rainfall)
 - 2-YR
 - 10-YR
 - 100-YR
- Proposed Regs
 - 3 Regulatory Storm Events
 - 1-YR (Resource Protection Event - RPv)
 - 10-YR (Conveyance Event - Cv)
 - 100-YR (Flooding Event - Fv)

What?

Stormwater Quality Management

- Current Regs
 - 2” Rainfall event (~6 month freq.)
 - Preferential hierarchy based on Green Technology BMPs and extended detention
- Proposed Regs - RPs
 - Annualized runoff for all storms up to the 1-YR Storm event (~2.7” rainfall)
 - Runoff reduction performance standard

What?

Stormwater Quantity Management

- Current Regs
 - 2-YR, 10-YR, 100-YR (above C&D Canal)
 - Analyze pre-dev. and post-dev. conditions always
 - Match post-dev. peak discharge to pre-dev. peak discharge
 - Same management strategy for all sites
- Proposed Regs
 - 10-YR, 100-YR (State-wide)
 - Analyze pre-dev. conditions only as needed
 - Performance standard based on “no adverse impact”
 - Management options available depending on SAS results & location within watershed

What?

Options for Quantity Management

- Option 1
 - Standards-based
 - Unit Discharge (cfs/ac)

What?

Options for Quantity Management

- Option 1
 - Standards-based
 - Unit Discharge (cfs/ac)
- Option 2
 - Performance-based
 - Criteria based on:
 - hydrograph timing
 - channel stability
 - system capacity
 - H&H analysis required
 - 3 levels of increasing detail
 - Release vs. Detain?

What?

Redevelopment/Brownfields

- Current Regs
 - No distinction from new development
 - Anything less than full compliance requires variance
- Proposed Regs
 - Separate subsections in Regulations
 - Relaxed requirements for RPv
 - Approved remediation plan may meet compliance requirements

What? Waivers

- Current Regs
 - Specified in Regulations
- Proposed Regs
 - Replaced with alternative means for compliance through the criteria for each regulatory storm event

Alternative Compliance Example

- Current Regs
 - Section 3.0 Exemptions, Waivers & Variances
 - 3.2.2 A project may be eligible for a waiver or variance of stormwater management for water quantity control if the applicant can demonstrate that:
 - 3.2.2.1.....
 - 3.2.2.2 Provisions will be made or exist for a nonerosive conveyance system to tidewater by either a closed drainage system or by open channel flow that has adequate capacity to contain the runoff events being considered as a requirement of these regulations;

Alternative Compliance Example

- Proposed Regs
 - Section 5.3 Conveyance Event
 - 5.3.3 Compliance with this section may be accomplished through the following:
 - 5.3.3.1
 - 5.3.3.2
 - 5.3.3.3 Provisions will be made or exist for a nonerosive conveyance system to tidewater by either a closed drainage system or by open channel flow that has adequate capacity to convey the Cv;

What? Variances

- Current Regs
 - Element within Regulations
 - Process generally defined through policy at Delegated Agency level
- Proposed Regs
 - Element within Regulations
 - Formal process, including appeals procedure
 - Currently proposed at Department level

What? TMDLs

- Current Regs
 - Adopted by reference to Chap. 60
 - Load based on 2.0” rainfall event
- Proposed Regs
 - Adopted by regulation under Chap. 40
 - Load based on Resource Protection Event (RPv)

What?

Watershed Plans

- Current Regs
 - Designated Watersheds
 - External process endorsed by Department
 - Local implementation
- Proposed Regs
 - Watershed Master Plans
 - Internal process initiated by Department
 - Integrated into State program

What?

Stormwater Utility

- Current Regs
 - Enabled by Chap. 40
 - Prescriptive process
- Proposed Regs
 - Less prescriptive
 - More flexibility for local implementation

What?
Proposed Regulatory Language

1.0 General Provisions

1.3 Applicability

- Sediment and Stormwater Management Plan shall be consistent with:
 - *Delaware Sediment and Stormwater Regulations*
 - 7 Del. C. Chapter 40
 - 7 Del. C. Chapter 60
 - *Regulations Governing the Control of Water Pollution*
 - Section 9.1.02 Special Conditions for Stormwater Discharges Associated with Construction Activities

1.3.2 Plans Approved Prior to Effective Date

- Construction has not commenced:
 - After 3 years plans will expire.
New plan subject to revised regulations.
- Construction has commenced:
 - Expired plans may be extended under previous requirements
 - Extension granted no more than 90 days prior to expiration
 - Project expiration follows local sunset provisions

1.3.2.3 Commencement of Construction

- Construction of the approved Plan is visible
 - Structure and/or Infrastructure
 - Roads, Utilities, Stormwater Management
 - General earth moving is NOT considered commencement of construction



1.4 Exempt Activities

- Agricultural land management
- Land disturbance <5,000 square feet
 - Cumulative disturbances >5,000 sf not exempt
- Projects regulated for sediment and stormwater under other State or Federal laws
- Commercial forest harvesting
- Land application of biosolids and residuals

1.5 Variances

- Department will consider a variance if:
 - Not detrimental to environment
 - Goals of Regulations will be met
 - Literal interpretation of Regulations causes hardship
- Not applicable when an offset will apply
 - Meeting RPv or TMDL
- Process outlined in Technical Document

1.6 Fees and Financial Guarantees

- 1.6.1 Fees
 - Fee Schedules subject to State and/or local public notice requirements
- 1.6.2 Financial Guarantee
 - Provisions set locally after required public notice

1.7 Offset Provisions

- Applicable for full or partial compliance with RPv
 - Provisions set locally after required public notice
 - Department Fee-In-Lieu offset provision established in Technical Document

1.8 Legal Authority

- Promulgate regulations under both
7 Del. C. Ch. 40 and 7 Del. C. Ch. 60
 - Allow for enforcement under both

1.14 Technical Document

- All activities shall comply with:
 - Design criteria
 - Minimum standards
 - Department policy, procedures & guidelines
- All contained within Technical Document

2.0 Definitions

- Adequate Conveyance
- Adverse Impact
- Agricultural Structure
- Applicant
- As-Built Plans → Post Construction Verification Documents
- Brownfield
- Designated Watershed or Subwatershed *(from Law)*
- Detailed Plan
- Effective Imperviousness
- Final Stabilization

2.0 Definitions

- Licensed Professional in the State of Delaware
- Maintenance
- Maximum Extent Practicable
- Notice of Completion
- Offset
- Operation and Maintenance Plan
- Performance-Based Approach
- Redevelopment
- Runoff Reduction Practices
- Standard Plan
- Standards-Based Approach
- Stormwater Management *(from Law)*

3.0 Plan Approval Procedures and Requirements

3.1 Three Step Approval Process

- Step 1: project application meeting
- Step 2: preliminary Sediment & Stormwater Management Plan
- Step 3: final Sediment & Stormwater Management Plan
- Delegated Agencies may seek approval of a “functionally equivalent” process (9.1.2)

3.2 Project Application Meeting

- Submit Stormwater Assessment Study
- May be waived
 - Case-by-case basis
 - Waiver documented in writing
- Discussion & Agreement Items
 - “Concurred” by all attendees
 - Does not need to be signed before leaving the meeting
- Stormwater Assessment Report

Stormwater Assessment Report

- Assessment Items
 - Soils
 - Runoff Potential
 - Water Quality
 - Discharge Points
 - Sump Conditions
 - Offsite Drainage
 - Conveyance
- “Anticipated Engineering Effort”
 - Minor
 - Moderate
 - Significant

DRAFT

Stormwater Assessment Report

Project: _____

Owner/Developer: _____

Consultant: _____

<u>Assessment Item</u>	<u>Anticipated Engineering Effort</u>		
	<i>Minor</i>	<i>Moderate</i>	<i>Significant</i>
1. Soils - On-site soils have low permeability, high water table, or other limitations that could adversely affect adequate stormwater management for the proposed project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Runoff Potential - Change in land cover due to removal of trees, increases in impervious cover, etc. could adversely affect adequate stormwater management for the proposed project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Water Quality - Pollutant loadings associated with proposed project could adversely affect adequate stormwater management.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Sump Conditions - Existing topography of site creates depressional areas (closed 2' contours) where runoff tends to collect without direct discharge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Discharge Points - Areas where stormwater runoff leaves the site have limitations due to low gradient, backwater effects, lack of a defined channel or other hydraulic limitations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Off-Site Drainage - Areas draining into the site could adversely affect adequate stormwater management for the proposed project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Conveyance - Downstream conditions such as inadequate pipe or channel capacity could limit adequate drainage from the site.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mitigation under consideration for "Significant" ratings:

Over-management

Off-site improvements

Easement(s)

Reporting Agency: _____

Contact Person: _____

Date of Pre-Application Meeting: _____

3.3 Preliminary Sediment & Stormwater Management Plan

- Elements:
 - Preliminary Plans
 - Supporting hydrologic & hydraulic calculations
 - Schematic erosion & sediment control plan

3.4 Sediment and Stormwater Management Plan

- Elements
 - Construction Site SWM Plan
 - Post Construction SWM Plan
 - Final H&H computations
 - O & M Plan
 - Preliminary Record Plan

3.5 Review Procedures

- 3.5.6 - Projects in process when regs become effective
 - Subject to requirements in place when an administratively complete plan was first submitted
 - One year to gain approval under previous regulations
 - Policy document for first submittal step

3.6 Expiration of Plan Approval

- 3 years
- 3.6.3: Plans approved under previous regulations shall only be extended when construction has commenced prior to expiration of the plan approval.



3.7 Standard Plans

- Project Types:
 - Individual parcel construction
 - <1.0 acre disturbance
 - Tax Ditch maintenance
 - Minor linear disturbances
 - SWM facility maintenance
 - Agricultural structures



3.8 Plan Certifications

- Former language:
 - “qualified design professional”
- Revised language:
 - “Licensed Professional in the State of Delaware”

3.10 Operation & Maintenance Plans

- Preliminary O & M developed with original plan set
- Final O & M Plan prior to project completion
- O & M Plans do not expire

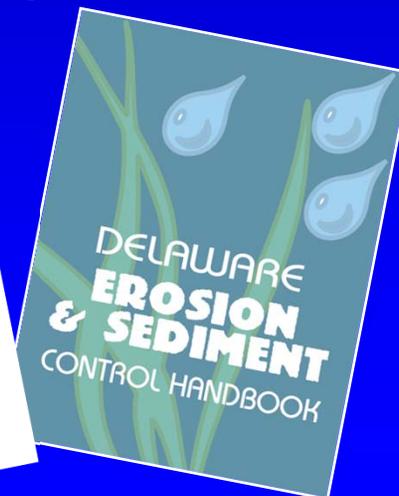
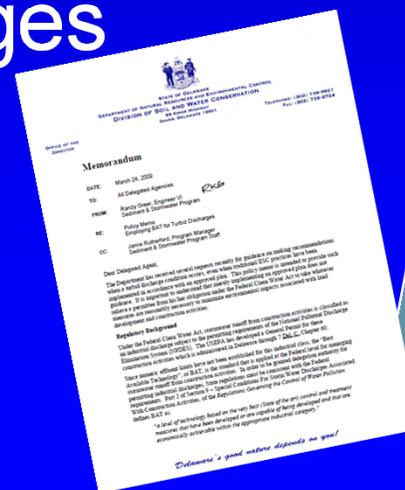
3.11 Post Construction Verification Documents

- “As-Builts”
- Submit within 60 days of completion
- Department or Delegated Agency policy

4.0 Performance Criteria for Construction Site SWM

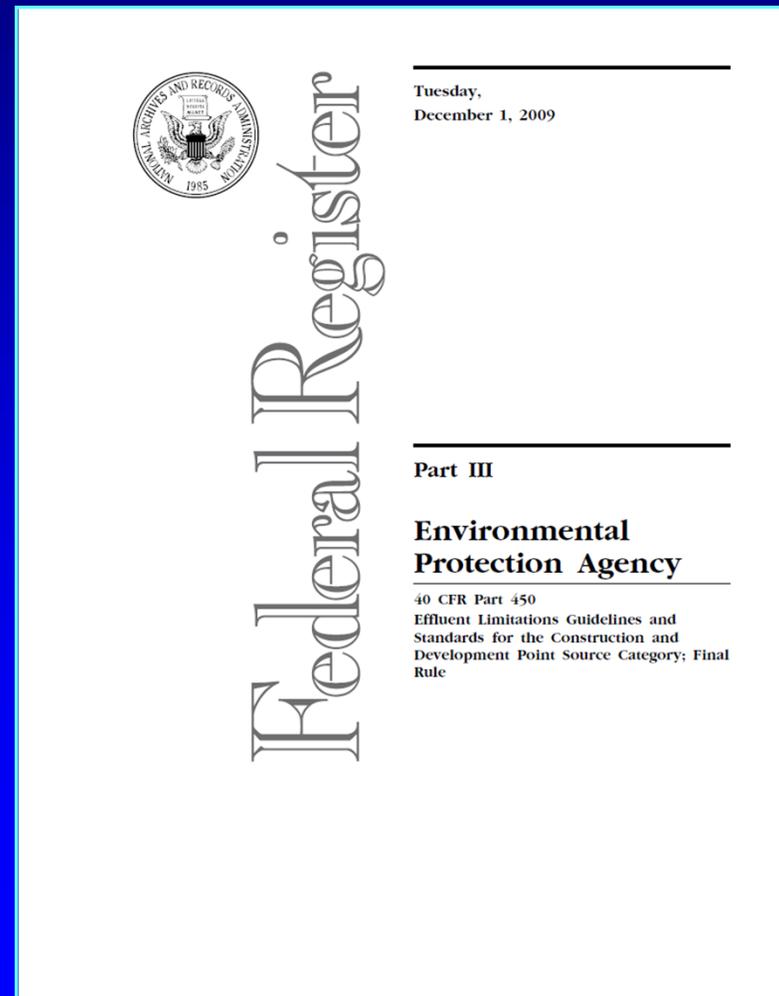
4.0 Performance Criteria for Construction Site Stormwater Management

- 4.1 Delaware Erosion and Sediment Control Handbook
- 4.2 Sequence of Construction
- 4.3 Best Available Technology for turbid discharges



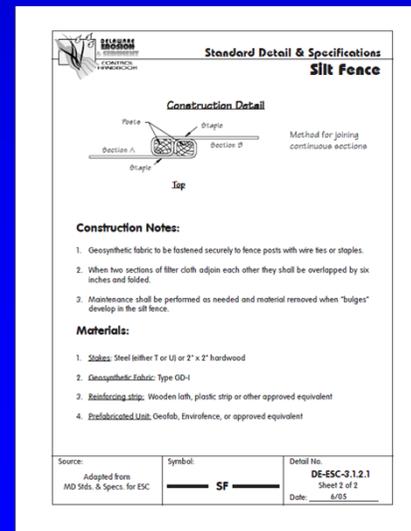
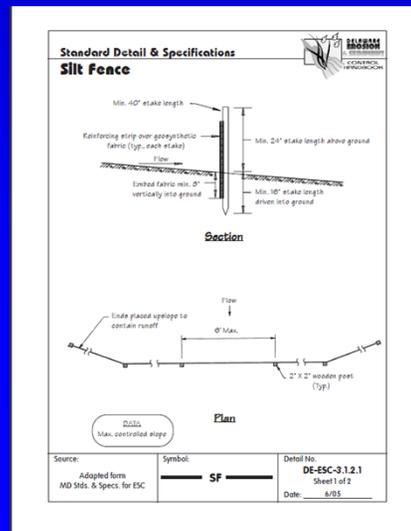
ELGs for Construction & Development Industry

- Required discharge monitoring
- Limit of Disturbance
 - Aug 2011: >20ac
 - Feb 2014: >10ac
- Up to 2-yr storm
- Numeric effluent limit = ~~280~~ ntu



4.4 Limits on Land Disturbance

- <10 acres = Standard Details
- >10 acres = Supporting computations
- 20 acre max disturbance to a discharge point



4.5 Stabilization

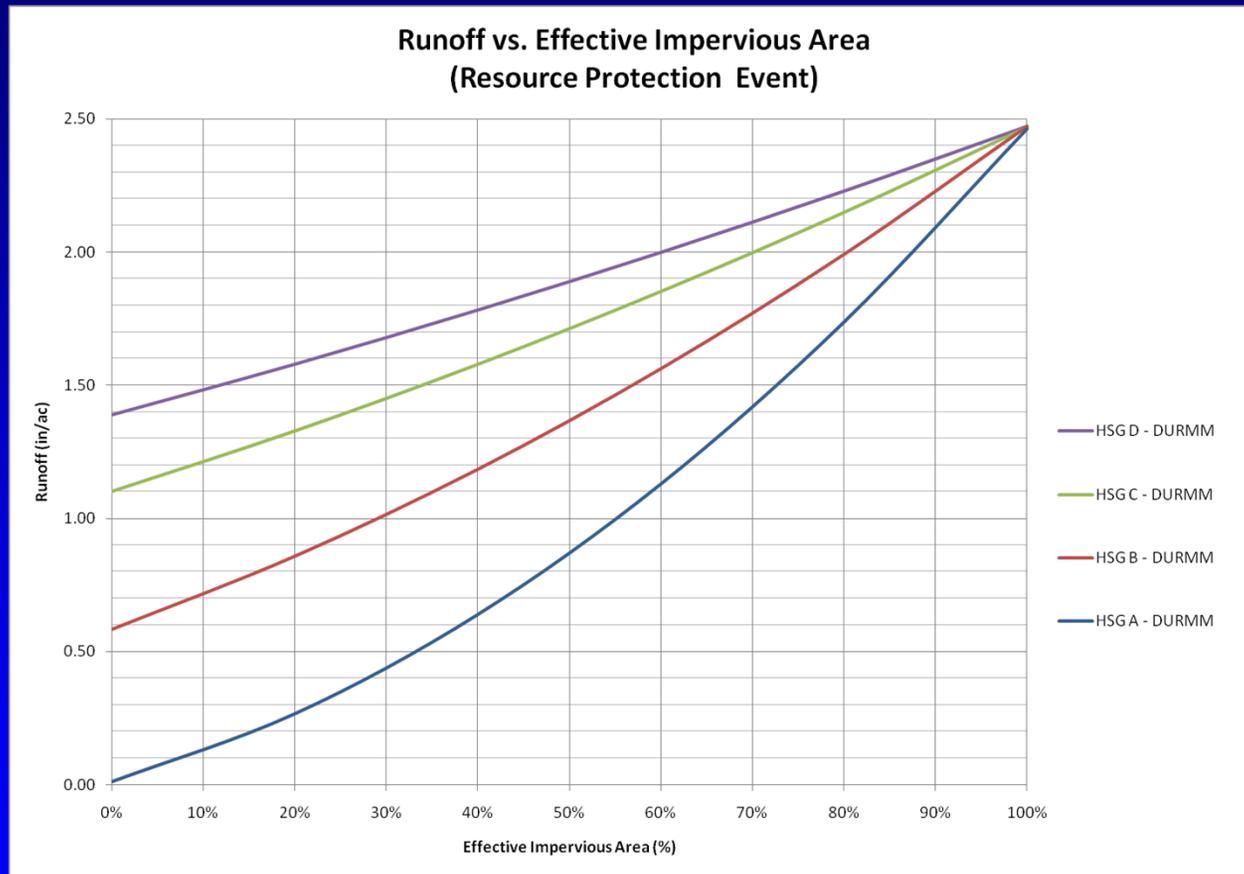
- 14 days “unless more restrictive Federal requirements apply”
- Documentation of soil testing and materials
- Reapplication of soil stabilization
- Notice of Completion after Final Stabilization

5.0 Performance Criteria for Post-Construction SWM

5.2 Resource Protection Event Criteria

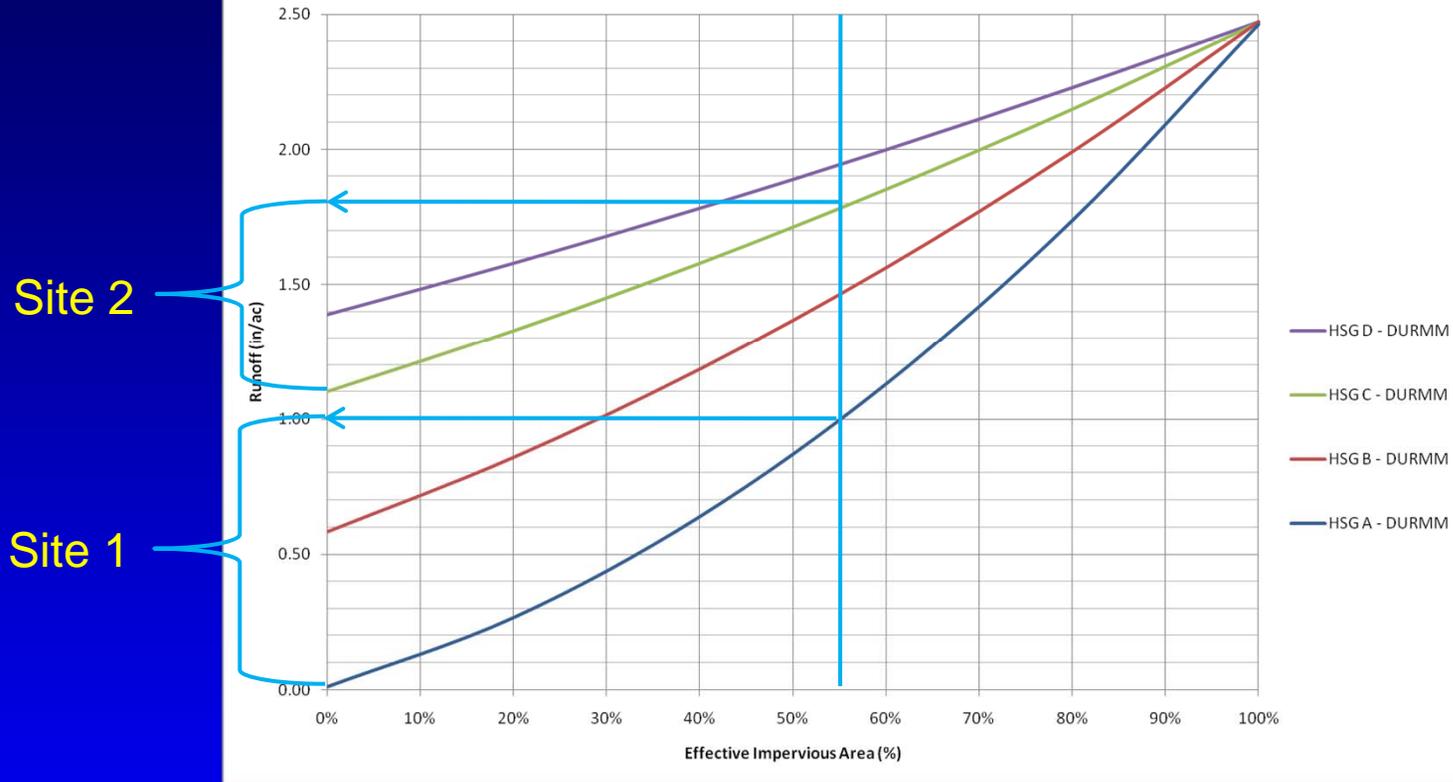
- Proposed Regs
 - Based on annualized runoff from 1-YR Storm event (~2.7" rainfall)
 - Considered equivalent to the 90th percentile **runoff** volume
 - Compliance based on the **effective imperviousness** of the post-developed condition within the **LOD**

Proposed Minimum RR for New Development



Equivalent 0% Effective Imperviousness in LOD

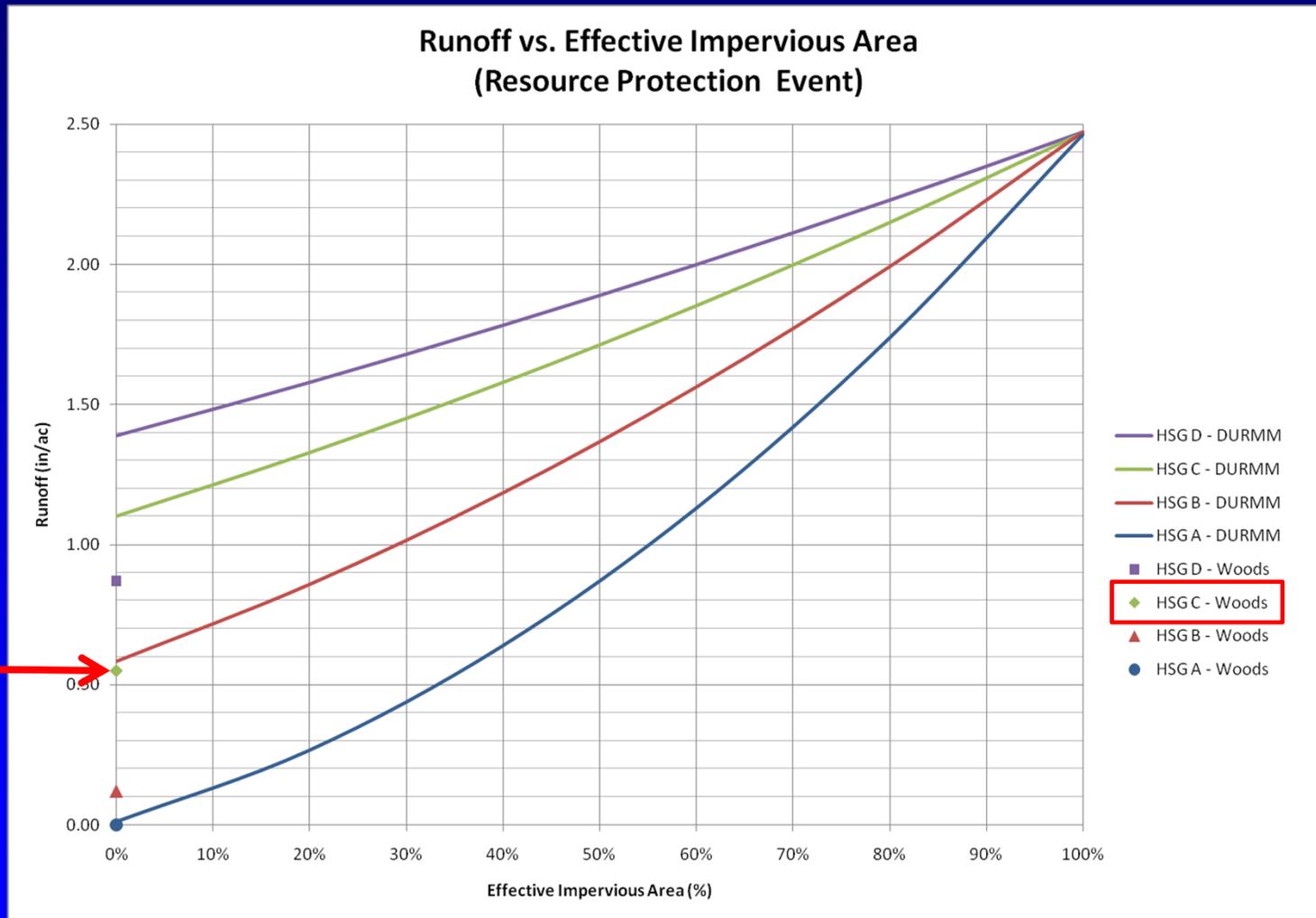
Runoff vs. Effective Impervious Area
(Resource Protection Event)



Site 1: 55% Impervious, HSG A Soil
 Runoff = 1.0"
 Minimum RR = 1.0" – 0" = 1.0" (100% Reduction)

Site 2: 55% Impervious, HSG C Soil
 Runoff 1.8"
 Minimum RR = 1.8" – 1.1" = 0.7" (38% Reduction)

Existing Woods/Meadow in LOD



5.2 Resource Protection Event Criteria

- Section 5.2.3.1: Runoff from disturbed areas that were wooded or meadow in the pre-developed condition shall be reduced using runoff reduction practices to an equivalent wooded condition.
- Section 5.2.3.2: All remaining disturbed areas shall employ runoff reduction practices to achieve an equivalent 0% effective imperviousness.

EPA Stormwater Initiatives

Proposed National Rulemaking to Strengthen the Stormwater Program | NPDES | US EPA - Windows Internet Explorer

U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

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Proposed National Rulemaking to Strengthen the Stormwater Program

EPA is announcing plans to initiate national rulemaking to establish a program to reduce stormwater discharges from new development and redevelopment and make other regulatory improvements to strengthen its stormwater program. This website provides information on two activities related to this proposed rulemaking:

- [Stakeholder Input on Proposed Rulemaking](#)
- [Information Collection Request \(ICR\) for Proposed Rulemaking](#)

Stakeholder Input on Proposed Rulemaking

EPA has issued a [Federal Register Notice \(PDF\)](#) (6 pp, 76K) seeking stakeholder input to help EPA shape a program to reduce stormwater impacts. Input will be provided through both written comments and during a series of public listening sessions. As described in the FR Notice, EPA seeks input on the following preliminary regulatory considerations:

- Expand the area subject to federal stormwater regulations
- Establish specific requirements to control stormwater discharges from new development and redevelopment
- Develop a single set of consistent stormwater requirements for all MS4s
- Require MS4s to address stormwater discharges in areas of existing development through retrofitting the sewer system or drainage area with improved stormwater control measures
- Explore specific stormwater provisions to protect sensitive areas

Written comments must be submitted on or before February 26, 2010 to the address specified in the Federal Register notice.

New! [Boston, MA Listening Session](#) - March 11, 2010, 10:00 am to 3:00 pm at EPA Region 1 Office

A new stormwater listening session has been scheduled for March 2010. EPA invites members of the public to give brief (3 minute) statements regarding stormwater rulemaking considerations including the five areas of preliminary consideration. Written comments may also be submitted in person at the listening session.

In order to provide adequate seating for those wishing to attend EPA's public listening sessions, interested individuals must register to attend by March 8, 2010. For individuals who cannot attend the listening session, EPA will make a conference call line available. The conference line will be "listen only," and sound quality cannot be guaranteed. Please contact [Amber Marriott](#) (amber.marriott@tetratech.com) for the conference call information.

Please Note: EPA will **not** be accepting comments (oral or written) on the Draft General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems in Massachusetts North Coastal Watersheds. EPA-Region 1 will hold a separate public hearing for the permit on March 18, 2010. For further information, please contact [Thelma Murphy](#) (murphy.thelma@epa.gov).

New! [EPA has made available a copy of EPA's presentation from the listening sessions \(PDF\)](#) (30 pp, 2.7MB).

In January 2010, EPA held five public listening sessions to allow the public to provide input on regulatory actions that EPA is considering. Brief oral comments (three minutes or less) were accepted at the sessions.

EPA held a "virtual" listening session as a Webcast on February 3, 2010 from 12:00 pm to 4:00 pm Eastern time. After a presentation from EPA, the Webcast allowed members of the public to call in and give brief (3 minute) statements. Audience members were able to listen to the webcast and all public statements using...

aka:
TMDLs!!!

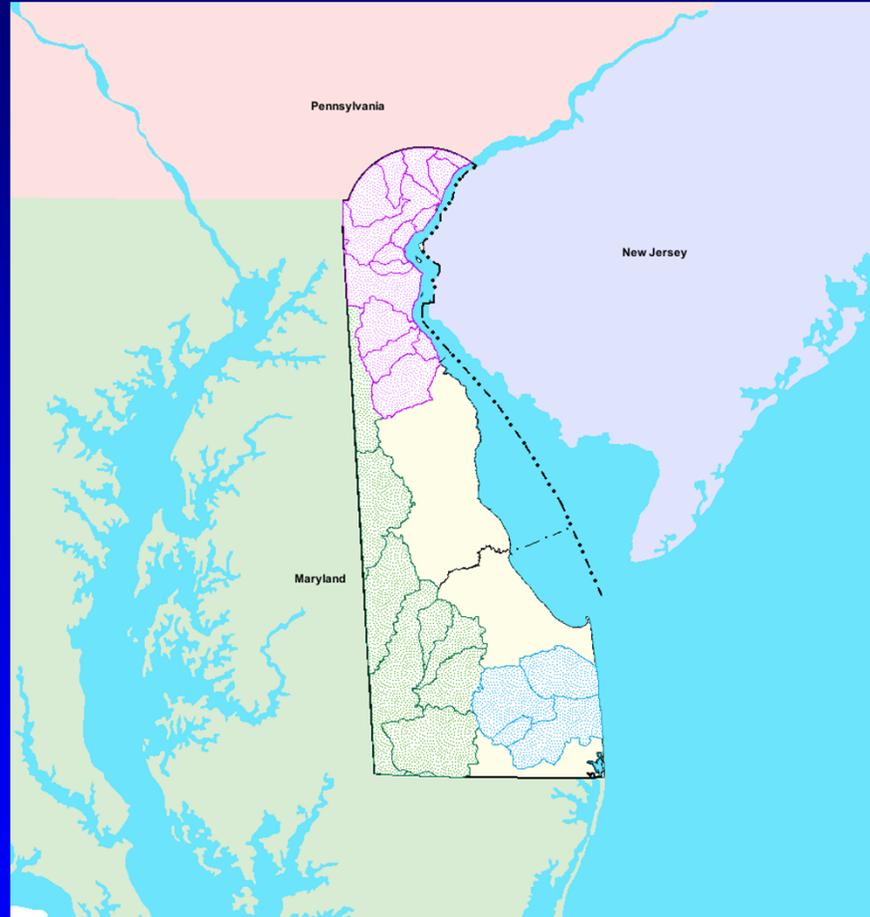
Executive Order 13508
Draft Strategy for
Protecting and Restoring
the Chesapeake Bay

November 9, 2009

Developed by the Federal Leadership Committee for the Chesapeake Bay



TMDLs*



*TN, TP & TSS managed with stormwater BMPs

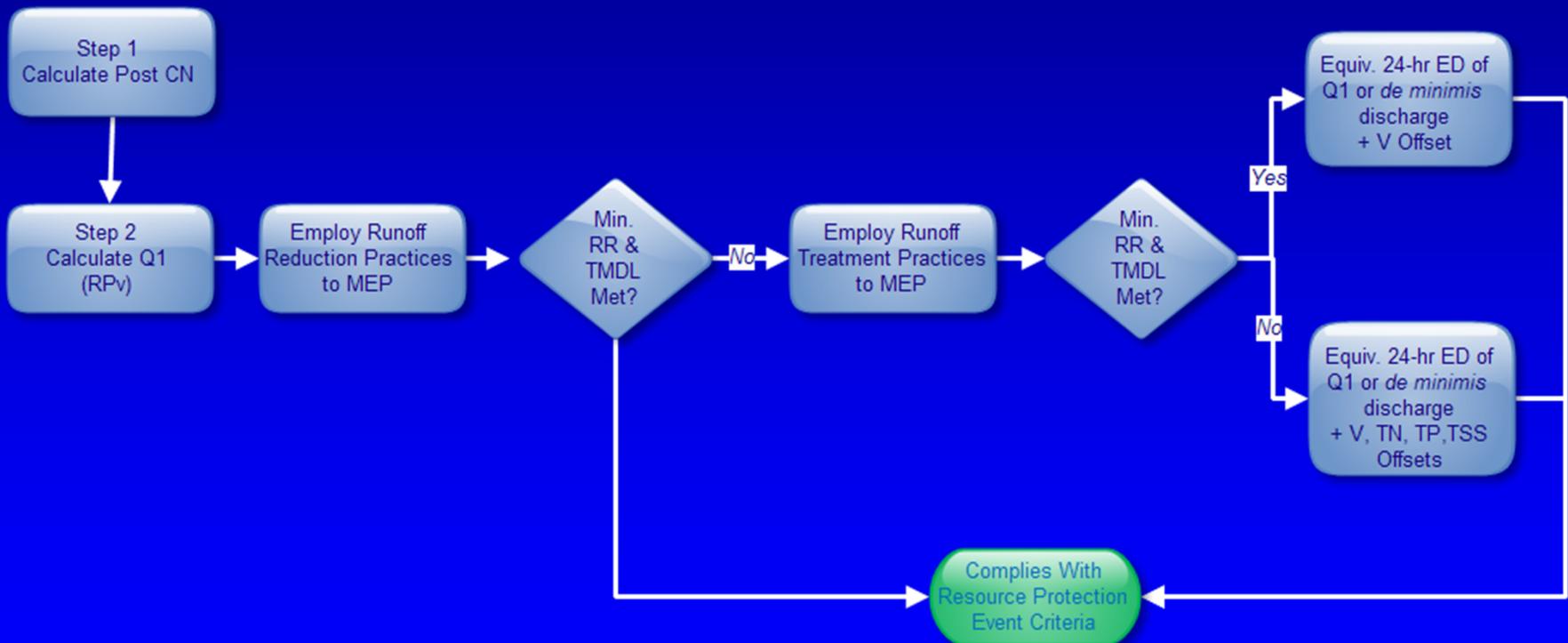
Section 5.0 Performance Criteria for Post-Construction Stormwater Management

- Section 5.2.3.3: Additional water quality treatment BMPs shall be provided if the runoff reduction requirements of Section 5.2.3 are not sufficient to meet Total Maximum Daily Load (TMDL) requirements for the receiving water.

Min. Reduction Not Feasible?

- Section 5.2.3.4: An **offset** shall be provided for any portion of the RPs that does not meet the minimum reduction requirements or that is not sufficient to meet TMDL requirements.

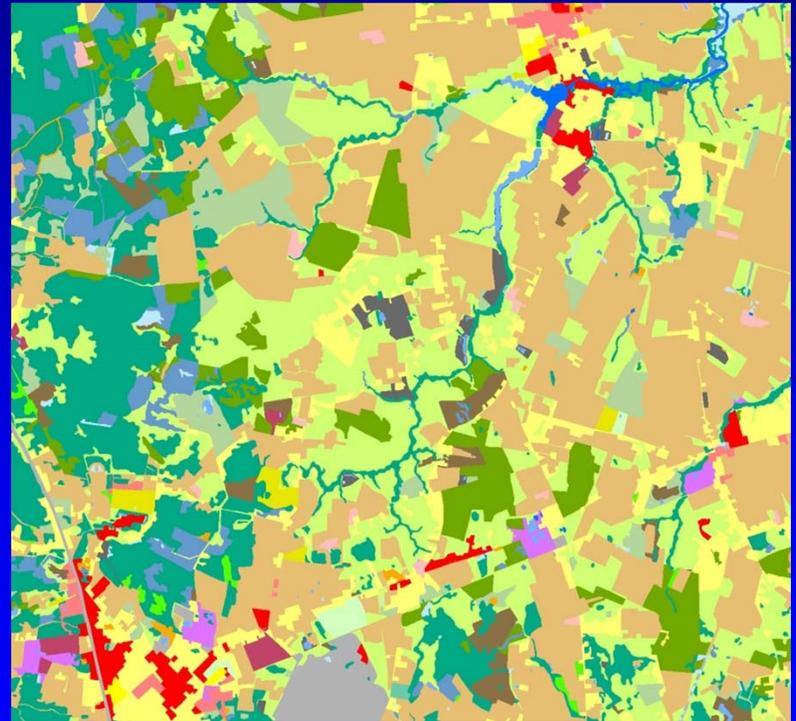
5.2 Resource Protection Event Criteria



5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

- Option 1
 - Standards-based
 - Unit Discharge
 - Based on 2007 LULC
 - Woodland/Meadow (HSG A)
 - » 10-YR: 0 cfs/ac
 - » 100-YR: 0.25 cfs/ac
 - Woodland/Meadow (HSG B,C,D)
 - » 10-YR: 0.375 cfs/ac
 - » 100-YR: 1.25 cfs/ac
 - Non-Woodland/Non-Meadow
 - » 10-YR: 0.75 cfs/ac
 - » 100-YR: 2.25 cfs/ac



- Sites with all “Minor” ratings on SAR are eligible

5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

- Option 2
 - Performance-based
 - Compliance based on “no adverse impact”
 - Analysis based on 3 increasing levels of detail
 - Level 1
 - Hydrologic modeling only
 - Point of Analysis at site only
 - Analyze post-developed condition only
 - Compliance based on site hydrograph peak compared to overall watershed hydrograph peak

5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

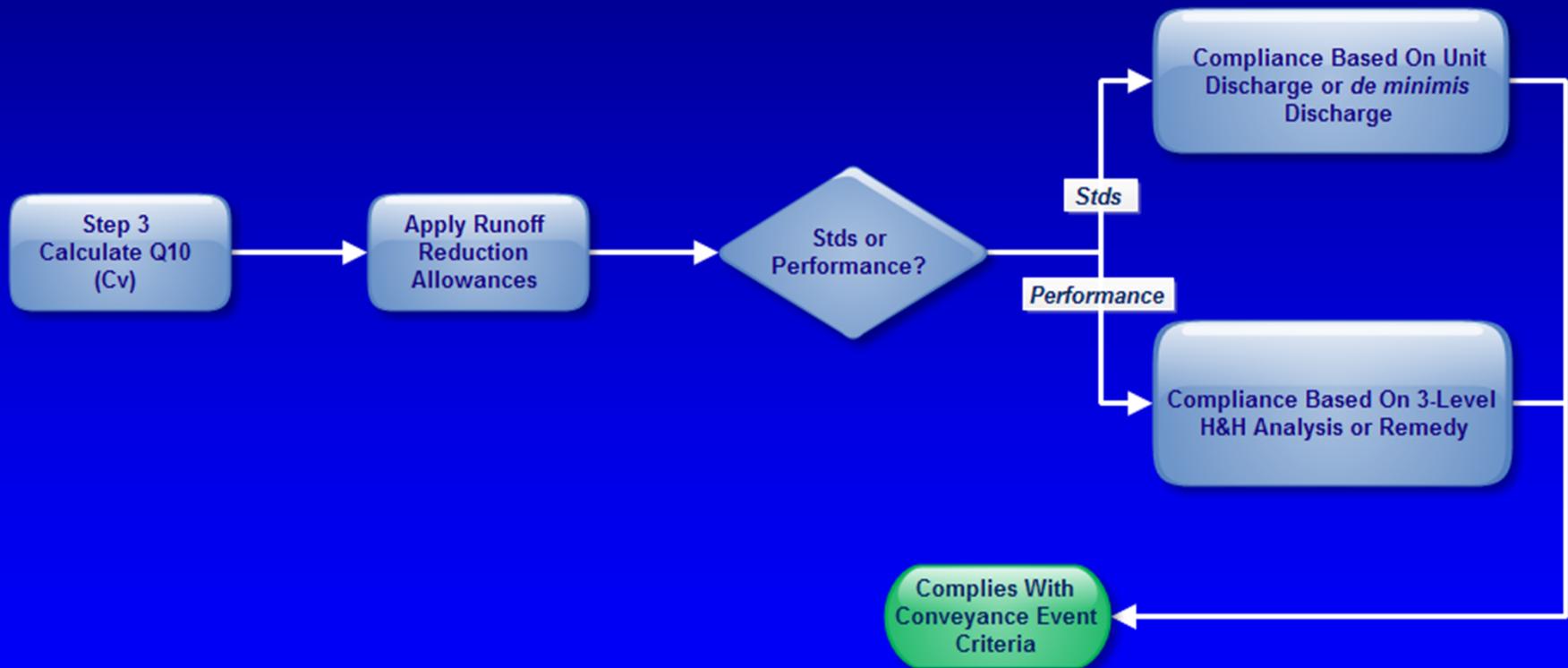
- Option 2 (cont.)
 - Level 2
 - Hydrologic modeling + steady flow hydraulic model
 - Point of Analysis at point downstream where site is less than 10% of total watershed
 - Analyze pre- and post-developed conditions
 - “No Adverse Impact”: less than 0.05’ increase in water surface elevations in channels and/or in headwater at hydraulic structures for all points of analysis; the area of inundation shall not encroach upon buildings or similar structures previously not impacted.
 - Level 3
 - Same as Level 2 except use of **unsteady** flow hydraulic model

5.3 Conveyance Event Criteria

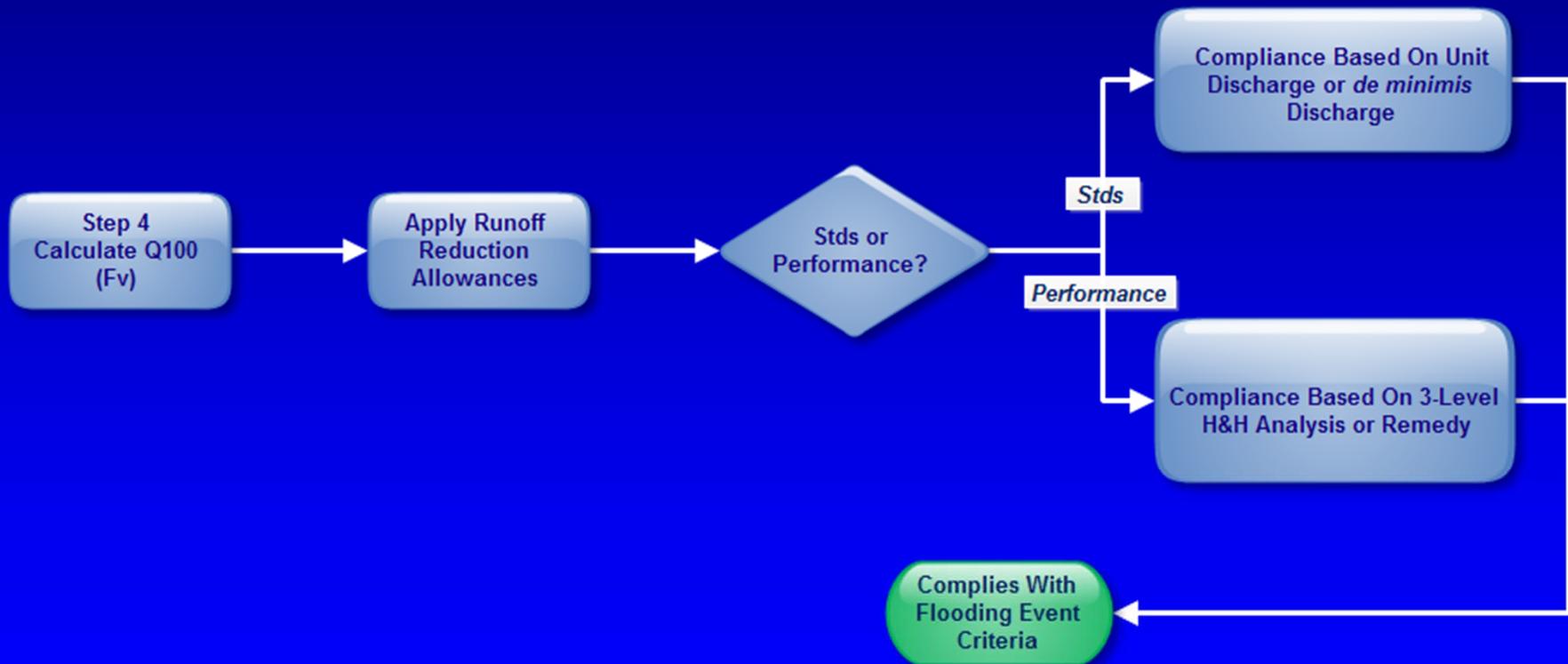
5.4 Flooding Event Criteria

- Option 2 (cont.)
 - If compliance can't be met as above, remedy must be provided
 - Options include over-management, downstream improvements, easements, etc.

5.3 Conveyance Event Criteria



5.4 Flooding Event Criteria



5.6 Redevelopment Criteria

- Proposed Regs
 - Infill considered more like new development, with the understanding that on-lot SWM may be necessary
 - Redevelopment & Brownfields may have reduced runoff reduction requirements

5.6 Redevelopment Criteria

The screenshot displays the EPA's National Pollutant Discharge Elimination System (NPDES) website. The main heading is "Proposed National Rulemaking to Strengthen the Stormwater Program". The page includes a navigation menu with categories like "Basic Information", "Municipal MS4s", and "Construction Activities". A sidebar on the left lists various environmental protection topics. The main content area features a "Stakeholder Input on Proposed Rulemaking" section, which includes a list of bullet points detailing the proposed changes, such as expanding the area subject to federal stormwater regulations and establishing specific requirements for new development and redevelopment. A "Recent Additions" sidebar on the right provides quick access to various resources. The bottom of the page shows a Windows taskbar with several open applications, including Microsoft Outlook, PowerPoint, and the current browser window.

U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

Recent Additions | Contact Us | Print Version | Search NPDES:

EPA Home > QW Home > QWM Home > NPDES Home >

NPDES Topics | Alphabetical Index | Glossary | About NPDES

Proposed National Rulemaking to Strengthen the Stormwater Program

EPA is announcing plans to initiate national rulemaking to establish a program to reduce stormwater discharges from new development and redevelopment and make other regulatory improvements to strengthen its stormwater program. This website provides information on two activities related to this proposed rulemaking:

- [Stakeholder Input on Proposed Rulemaking](#)
- [Information Collection Request \(ICR\) for Proposed Rulemaking](#)

Stakeholder Input on Proposed Rulemaking

EPA has issued a [Federal Register Notice \(PDF\)](#) (6 pp, 76K) seeking stakeholder input to help EPA shape a program to reduce stormwater impacts. Input will be provided through both written comments and during a series of public listening sessions. As described in the FR Notice, EPA seeks input on the following preliminary regulatory considerations:

- Expand the area subject to federal stormwater regulations
- Establish specific requirements to control stormwater discharges from new development and redevelopment
- Develop a single set of consistent stormwater requirements for all MS4s
- Require MS4s to address stormwater discharges in areas of existing development through retrofitting the sewer system or drainage area with improved stormwater control measures
- Explore specific stormwater provisions to protect sensitive areas

Written comments must be submitted on or before February 26, 2010 to the address specified in the Federal Register notice.

New! [Boston, MA Listening Session](#) - March 11, 2010, 10:00 am to 3:00 pm at EPA Region 1 Office

A new stormwater listening session has been scheduled for March 2010. EPA invites members of the public to give brief (3 minute) statements regarding stormwater rulemaking considerations including the five areas of preliminary consideration. Written comments may also be submitted in person at the listening session.

In order to provide adequate seating for those wishing to attend EPA's public listening sessions, interested individuals must register to attend by March 8, 2010. For individuals who cannot attend the listening session, EPA will make a conference call line available. The conference line will be "listen only," and sound quality cannot be guaranteed. Please contact [Amber Mariotti](mailto:Amber.Mariotti@tetratech.com) (amber.mariotti@tetratech.com) for the conference call information.

Please Note: EPA will **not** be accepting comments (oral or written) on the Draft General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems in Massachusetts North Coastal Watersheds. EPA-Region 1 will hold a separate public hearing for the permit on March 18, 2010. For further information, please contact [Thelma Murphy](mailto:Thelma.Murphy@epa.gov) (murphy.thelma@epa.gov).

New! [EPA has made available a copy of EPA's presentation from the listening sessions \(PDF\)](#) (30 pp, 2.7MB).

In January 2010, EPA held five public listening sessions to allow the public to provide input on regulatory actions that EPA is considering. Brief oral comments (three minutes or less) were accepted at the sessions.

EPA held a "virtual" listening session as a Webcast on February 3, 2010 from 12:00 pm to 4:00 pm Eastern time. After a presentation from EPA, the Webcast allowed members of the public to call in and give brief (3 minute) statements. Audience members were able to listen to the webcast and all public statements using

Stormwater Information

- Recent Additions
- FAQs
- Publications
- Regulations
- Training & Meetings
- Links
- Contacts

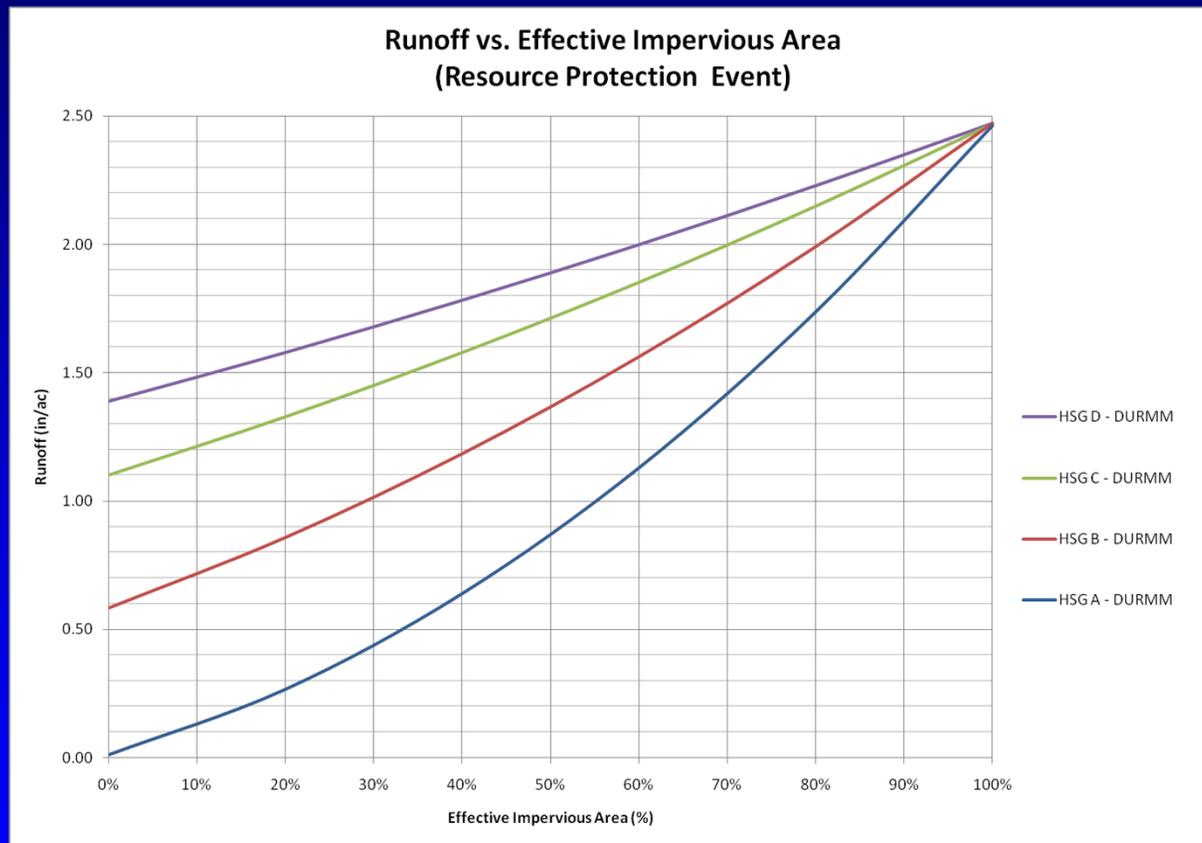
Sign Up For NPDES NEWS

Adobe Acrobat Reader
The documents on this site are best viewed with Acrobat 8.0

5.6 Redevelopment Criteria

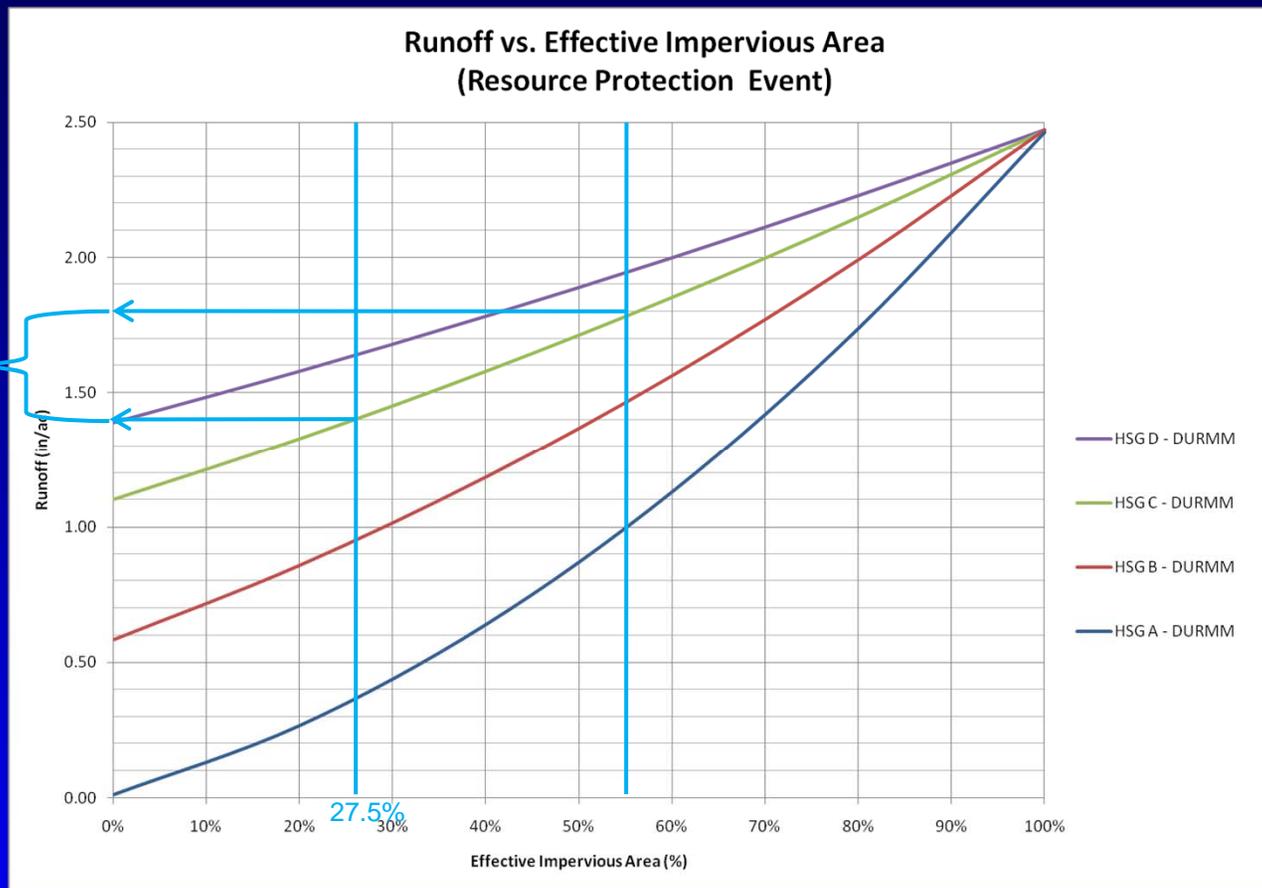
- 5.6.2 In the case of Brownfield development, a remediation plan approved by the Department may meet the stormwater management goals and intent of these regulation with prior consent and subsequent approval by the Department.

Proposed Minimum RR for Redevelopment



50% Reduction in **Existing Effective** Imperviousness*

Redev.
Site 2



Redev. Site 2: 55% Ex. Impervious, HSG C Soil, 55% Prop. Impervious
Runoff = 1.8"
Req'd Reduction in Effective Impervious = $55\% \times 0.5 = 27.5\%$
Minimum RR = $1.8'' - 1.4'' = 0.4''$ (22% Reduction)

5.6 Redevelopment Criteria

- 5.6.3.2 All remaining redeveloped areas shall employ runoff reduction practices to achieve a 50% reduction in the effective imperviousness based on the pre-developed condition. For those cases in which the minimum runoff reduction requirements are not met:

5.6 Redevelopment Criteria

- 5.6.3.2.1 The allowable discharge for any remaining runoff shall not exceed the equivalent 24-hr detention time of the RPv, and
- 5.6.3.2.2 An **offset** shall be provided for any portion of the RPv that does not meet the minimum runoff reduction requirements.

5.6 Redevelopment Criteria

- 5.6.4 Any redevelopment project that increases the rate, volume or duration of flow to a new or existing point of discharge during the **Conveyance Event** shall comply with the requirements of **Section 5.3**.

5.6 Redevelopment Criteria

- 5.6.5 Any redevelopment project that increases the rate, volume or duration of flow to a new or existing point of discharge during the **Flooding Event** shall comply with the requirements of **Section 5.4.**

6.0 Construction Review of Sediment & Stormwater Management Plan

Construction Review

- Minor changes to regulatory language from current regulations
 - “inspection” → “review”

6.1 Owner Responsibilities

- Implement approved plan
- NPDES responsibilities for monitoring
- Responsible personnel (Blue Card holder) required on site daily while any land disturbing activity is taking place
- Projects >20 acres requires a CCR

6.2 Contractor Training Program

- “Blue Card”
- 4-hour training
- Responsible Person in charge of land disturbance
- Must be on site daily during land disturbance

6.3 Certified Construction Reviewer

- Private reviewer hired by owner
- Construction Reviews
 - Weekly
 - After rainfall produces runoff
 - Stormwater system construction review
- Oversight by DE Registered P.E.
- 3 ½ - day course with exam
- Certification for 5 years

6.4 Department or Delegated Agency Reviews

- Regular reviews of construction
- Frequency based upon level of activity
- Documented with report

6.5 Required Construction Reviews and Notification Steps

- Pre-Construction Meeting
 - Required
 - Held on site
 - Another location may be approved on case-by-case basis
 - Dept. or Delegated Agency to determine when Standard Plans require pre con mtg

6.5.6 Notice of Completion

- Criteria
 - All items and conditions of S&S Plan are satisfied
 - Post construction verification documents
 - Operation and Maintenance Plan
 - Final Stabilization
 - Approved Record Plan showing easements and/or maintenance notes

7.0 Post Construction Maintenance of Permanent Stormwater Management Systems

7.1 Maintenance Responsibility

- Owner is responsible for maintenance
 - Transfers with a legal transfer of ownership and prior notice to Dept. or Delegated Agency
 - SWM system shall “run with the land”
 - Offer SWM system for dedication
- SMW system “proper function” defined within 7.1.2:
 - in accordance with the approved engineered design,
 - within the tolerances of the accepted post construction verification documents, and
 - in compliance with the regulations

7.2 Owner Responsibilities

- Frequency of regular maintenance reviews will be on O & M Plan
- Maintain in accordance with
 - Approved plan
 - O&M plan
 - Standard Guidelines
 - Delegated Agency directions
- Maintenance responsibilities may be shared

7.3 Maintenance Reviews

- Conducted by
 - Department
 - Delegated Agency
 - Duly authorized agent
- Document maintenance needs
- Specify timeframe for completion

8.0 Enforcement and Penalties

- Enforcement through 7 Del. C. Ch. 40 and Ch. 60.
- Delegated Agency referral to DNREC
 - Internal Compliance Assistance Policy
- Failure to comply
 - Criminal and civil penalties
 - Cease & desist order
 - Request no release of building permits

9.0 Delegation of Program Elements

- Delegation request to DNREC
- Three-year delegation
- Functional equivalency
- Alternative requirements
- 3rd party assistance
- Required Public Notice
 - Alternative requirements, offset program, fee schedule, etc.

10.0 Stormwater Utility

- Local ordinance
- Each user contributes based on the user's share of runoff
- Program components to be defined:
 - Program administration
 - Planning & engineering
 - Maintenance operations
 - Regulation & enforcement
 - Capital Construction

Questions?



Regulations = WHAT

Technical Document = HOW

Technical Document

- Information supports regulation language
- Public process with regulations
- Future changes will also go through public review process
- Completed portions posted on [DNREC Technical Document website](#)

Technical Document Articles

- **Article 1.** Sediment and Stormwater Program Background
- **Article 2.** Policies and Procedures
- **Article 3.** Plan Review & Approval
- **Article 4.** Construction Review & Compliance
- **Article 5.** Maintenance of Permanent Stormwater Management Systems

Article 1. Sediment and Stormwater Program Background

- Executive Summary
- Federal CWA requirements
 - CGP Program Delegation
 - NPDES CGP Guidance Document
- State Responsibilities
 - Interaction with other agencies

Article 2.

Policies and Procedures

2.01 Delegated Agencies

- Responsibilities
- Requests for Delegation and Delegation Review
- Program Changes
 - Public Notice requirements
 - Approval of the Department
- Failure to Implement Program
 - Process for removal of delegation

2.02 Plan Policies and Procedures

- Plan life – what happens after 3 years
- Plan revisions
 - Original approval date stands unless entire site is re-evaluated
- Grandfathering & Sunsetting
 - Interim condition policy being developed
- Tech Doc revisions require public notice
 - Process included

2.03 Fees & Financial Guarantees

- Delegated Agency has authority to
 - Charge fees to support program
 - Establish procedures to require a financial guarantee
- Public notice
 - Procedures included

2.04 Offset Provisions

- Types of Offsets
- CWP In-Lieu Fee Proposal
- Fee-In-Lieu Example
- Offset program subject to Department review and public notice

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Fee-In-Lieu Options

- Option 1
 - Common “currency” for all shortfalls
- Option 2
 - Different “currencies” for runoff volume, TN, TP, and TSS shortfalls

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Fee-In-Lieu Options

- Option 1
 - Common “currency” for all shortfalls
 - Equivalent to cost to treat runoff volume not managed
 - Based on land acquisition, construction, and maintenance costs for bioretention
 - Analysis was performed by Center for Watershed Protection using regional data
 - Fee = **\$23/cu.ft.** runoff volume

2.05 Regulatory Interpretation & Variances

- Local Review & Interpretation
- Department Review & Interpretation
- Professional Judgment Disputes
- Alternative Compliance Review Requests
- Variances & Appeals

Article 3. Plan Review & Approval

- 3.01 Goals & Objectives
- 3.02 Plan Review Process
- 3.03 Construction Site SWM
- 3.04 Post Construction SWM
- 3.05 General Plan Requirements
- 3.06 Sediment & Stormwater BMP Standards & Specifications

3.01 Goals & Objectives

- Project type considerations
 - Residential
 - Commercial
 - Industrial
 - Transportation
- Standard Plans
 - Criteria & Conditions
 - Applications
 - Templates

3.02 Plan Review Process

- Step 1 – Project Application Meeting
 - SAS Checklist
 - Project Application Meeting Discussion and Agreement Items
 - Stormwater Assessment Report
 - Workflow for Site Hydrologic Analysis
 - Example Project Application Package

3.02 Plan Review Process

- Step 2 – Preliminary S&S Plan
 - Preliminary S&S Plan Checklist
 - H&H analysis procedure
 - Workflow & Template for Level 1 analysis
 - Workflow for Level 2 analysis
 - Level 3 analysis to be added later
 - Example Schematic Plan
 - Example Unit Discharge comps

3.02 Plan Review Process (cont.)

- Step 2 – Preliminary S&S Plan
 - Example Preliminary S&S Plan Submittal
 - Residential
 - Commercial
 - Institutional
 - Redevelopment

3.02 Plan Review Process

- Step 3 – Sediment and Stormwater Plan
 - Sediment & Stormwater Plan Checklist
 - Common Look & Feel to be developed

3.03 Construction Site SWM

- BAT Policy
 - Turbid Discharges, use of PAM
 - Effluent Limitation Guidelines

3.04 Post Construction SWM

- Compliance Flow Chart
- Runoff Reduction Guidance
- Adjusted CN Methodology
- DURMM v.2 spreadsheet, Quick-Start Guide & User's Guide
- Approved H&H software
- Infiltration testing procedures
- Brownfields policy

3.05 General Plan Requirements

- Standard Notes
- Standard Details & Symbols
- Typical construction sequence
- Example Sediment and Stormwater Plan cover sheet

3.06 BMP Standards & Specs

- E & S Handbook (under revision)

Erosion & Sediment Control Handbook Revisions

- Design requirements for details limited to 10 acres of contributing area. If greater, supporting calculations need to be submitted.
- Eliminated Detail: Silt Fence Culvert Inlet Protection
- Revised Details: Temporary and Permanent Seeding Types and Methods

Erosion & Sediment Control Handbook Revisions

- New Details:
 - Compost Logs for Perimeter Control, Inlet Protection and Slope/Channel Interruption
 - Compost Blankets
 - Compost Sediment Basins
 - Flocculants and Soil Additives
 - Concrete Washout
 - Small Batch Plant
 - Stockpile
 - Limit of Disturbance

3.06 BMP Standards & Specs

- E & S Handbook (under revision)
- Pond Code 378
- Sand Filter Background & Detail
- Updated GTBMP Stds & Specs (under development by DNREC/CWP)

Article 4. Construction Review & Compliance

- Construction Review Guidelines
 - Pre construction meeting checklist
 - BMP Construction Checklists
 - Post construction verification document checklist
- Enforcement & Penalties
- Contractor Training Program
- Certified Construction Reviewer
- Project Completion
 - Project closeout procedure & checklist

Article 5. Maintenance of Permanent Stormwater Management Systems

- Standard Guidelines for Operation and Maintenance of Stormwater BMPs
- O&M Plan Review Checklist

Questions?



Training and Outreach

- Contract with Center for Watershed Protection
- Training offered to Delegated Agencies first
- Example plans being developed
- Circuit Rider Trainer for DURMMv.2

Timeline

- Summer 2011 – Technical Training Delegated Agencies; followed by training for consultants
- August 2011 – publish proposed reg in State Register
- September 14, 2011 – Public Hearing (date tentative)
- January 2012 - Effective

Written Comments

- Regulations and Technical Document on website:
 - <http://www.swc.dnrec.delaware.gov/Drainage/Pages/RegRevisions.aspx>
- Submit by June 30, 2011
- E-mail to Elaine.Webb@state.de.us