

***Revisions to the
Delaware Sediment & Stormwater Regulations***

Public Hearing

March 1, 2012

DNREC R&R Bldg, Dover, DE

Chronology of Regulatory Development Process

Revisions to the
Delaware Sediment & Stormwater Regulations
Initial RAC Meeting
October 16, 2007

Q: “Why Is DNREC Doing This?”

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

W http://en.wikipedia.org/wiki/Tropical_Storm_Henri_(2003)

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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 2006 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]

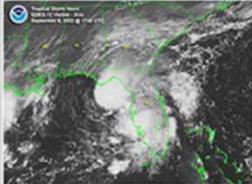
The broad and disorganized remnant low remained nearly stationary due to a ridge of high pressure to its north.^[1] Residual convection within the remnants of Henri remained disorganized, but forecasters kept watch for the potential for redevelopment.^[3] However, it moved inland near Cape Hatteras on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

Preparations [edit]

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] Levy County officials declared a state of emergency. These sand bags and sand were sent to Cedar Key, Yankeetown, and local in anticipation for storm surge and flooding.^[8]

Tropical Storm Henri

Tropical storm (SSH5)

 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

start Tropical Storm Henri (...)

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NEW CASTLE COUNTY, DELAWARE
The First County in the First State
PUBLIC SAFETY

Paul J. Sweeney
Public Safety Building

County Home | Site Help | Site search Go

Police | 911 Communications | Paramedics | Emergency Management

NEW CASTLE COUNTY DELAWARE EMERGENCY MANAGEMENT
NEW CASTLE COUNTY DELAWARE PARAMEDIC
NEW CASTLE COUNTY DELAWARE EMERGENCY COMMUNICATIONS
POLICE

Welcome to
New Castle County
Emergency Management

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“In the past four years NCC has been affected by three storm systems: Tropical Storm Henri (September 15, 2003), Tropical Storm Isabel (September 18, 2003) and Tropical Depression Jeanne (September 28, 2004). **Tropical Storm Henri caused widespread damage to the community of Glenville spurring the largest housing purchase by State and County governments in Delaware's history due to storm damage: 171 homes were purchased just 8 months after the storm struck.** Tropical Depression Jeanne spawned the first tornado New Castle County had seen in 15 years, ripping trees from the ground and severely damaging residential and business structures. Jeanne also initiated a buyout of the Newkirk Estates and Glendale communities. **All in all, State and County governments spent over \$34 million in two years to rectify storm damage.**”

Executive Order Number Sixty-Two **Establishing A Task Force On Surface Water Management**

WHEREAS, in recent years, several areas of the State have been subject to chronic flooding and drainage problems; and

WHEREAS, such flooding and related problems can threaten the health, safety and welfare of our State's citizens, can damage private property, and can impose substantial costs on State and local governments, in the form of emergency response activities, property damage and infrastructure improvements; and

WHEREAS, it is appropriate to coordinate efforts within the State to ensure the best use of resources in enhancing flood prevention and control efforts and to develop a comprehensive strategy to address drainage and stormwater management issues.

NOW, THEREFORE, I, RUTH ANN MINNER, by virtue of the authority vested in me as the Governor of the State of Delaware, do hereby declare and order as follows:

1. The Task Force on Surface Water Management is created. Members of the Task Force shall include representatives of State and local governments and persons with special expertise on the issues of drainage, flood control and water management. Members of the Task Force shall be appointed by the Governor and serve at the Governor's pleasure.
2. The Task Force is directed to:
 - a. Develop a statewide surface water management strategy to integrate drainage, flood control and stormwater management;
 - b. Explore potential costs and funding sources for implementing a statewide surface water management strategy;
 - c. Recommend appropriate changes to State or local laws, regulations and policies as appropriate;
 - d. Recommend a statewide organizational structure to coordinate surface water management strategies and to respond to citizen, community and county needs;
 - e. Integrate surface water management polices with federal and State clean water requirements; and
 - f. Recommend strategies to preserve and enhance aquifer recharge, community, local government and State open space use and implement green infrastructure policies and goals, where applicable.
3. The Task Force is directed to submit its recommendations to me not later than April 1, 2005.

Charge of the Task Force

2. The Task Force is directed to:
 - a. Develop a statewide surface water management strategy to integrate drainage, flood control and stormwater management;
 - b. Explore potential costs and funding sources for implementing a statewide surface water management strategy;
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Task Force membership

John Hughes, Secretary of DNREC, Chair
The Honorable Robert L. Venables, co-chair, Bond Bill Committee
The Honorable Roger P. Roy, co-chair, Bond Bill Committee
The Honorable David B. McBride, chair, Senate Natural Resources Committee
The Honorable Joseph W. Booth, chair, House Natural Resources Committee
The Honorable Christopher A. Coons, New Castle County Executive
The Honorable David Burris, President, Kent County Levy County
Jared Adkins, District Engineer, Kent County Conservation District
Charles Baker, General Manager, New Castle County Land Use
Jeffrey Bross, P.E., President, Duffield Associates
Eileen Butler, Environmental Advocate, Delaware Nature Society
Stephanie L. Hansen Esq., Richards Layton & Finger
Larry Ireland, District Manager, New Castle Conservation District
Edward Bender, District Engineer, Sussex County Conservation District
Kash Srinivasan, Commissioner of Public Works, City of Wilmington
Scott Koenig, Director of Public Works, City of Dover
Paul Morrill, City Manager, Delaware City
Paul Petrichenko, Asst. State Conservationist, Natural Resources Conservation Service
Ralph Reeb, Director of Planning, DeIDOT
Jeffrey Seemans, R.L.A., Land Resource Manager, Blenheim Homes
Gary Stabley, member, Lewes Board of Public Works
Robert Stickels, Administrator, Sussex County
John Talley, P.G., State Geologist, Delaware Geological Survey
Richard C. Woodin, P.E., Homebuilders Association of Delaware

Task Force Staff

Robert Baldwin, Director, Division of Soil and Water Conservation, DNREC
Frank J. Piorko, Environmental Program Administrator, Division of Soil and Water Conservation, DNREC
Kathy Osterhout, Administrative Specialist, Division of Soil and Water Conservation, DNREC
Lee Ann Walling, Environmental Policy Advisor, Office of the Governor
David Athey, Project Manager, URS Corporation, Wilmington
Bryan Pariseault, Project Engineer, URS Corporation, Wilmington



**Governor
Minner's Task
Force on
Surface Water
Management**

April 1, 2005

A report in response to Executive Order No. 62

Background

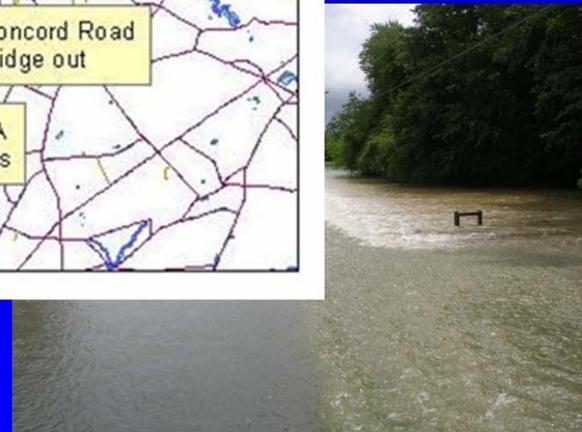
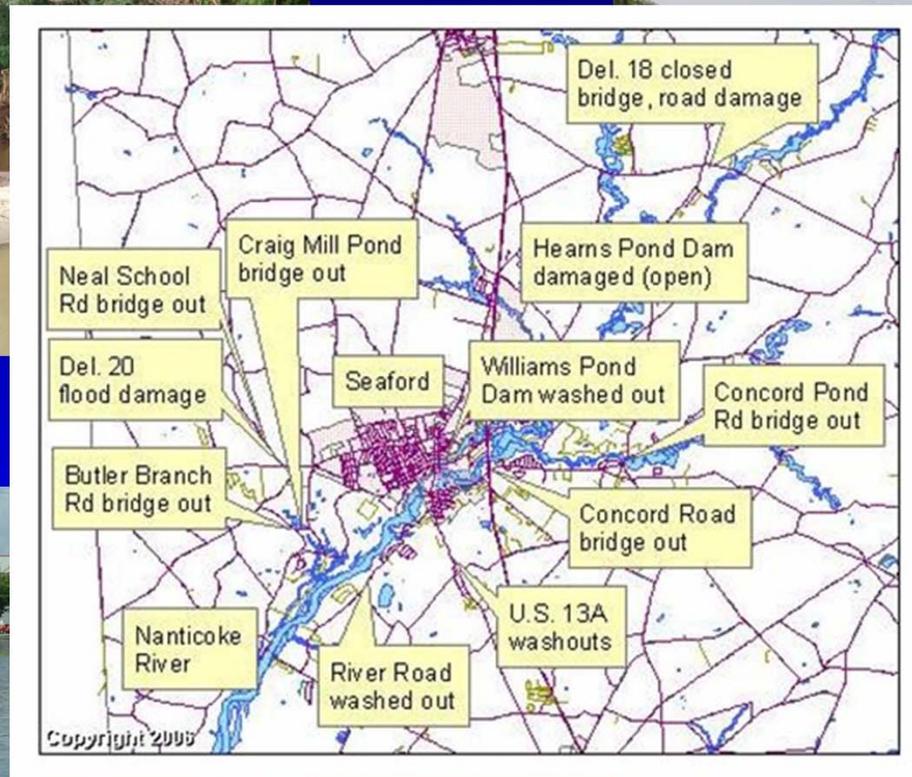
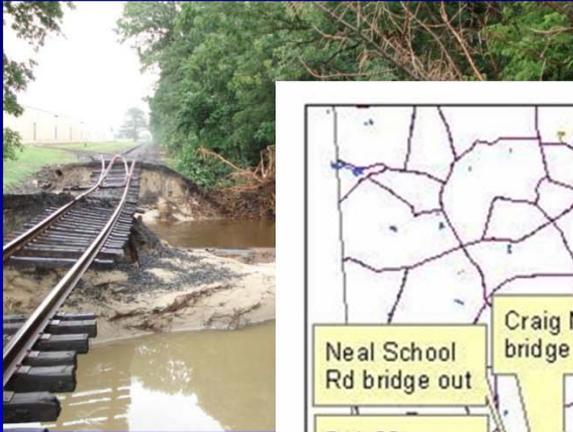
“The current stormwater regulations do not adequately address volume management of stormwater. This program deficiency has been recently addressed by surrounding states with new program requirements. Increased emphasis on recharge and infiltration of stormwater where technically and environmentally feasible,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

Background (*cont.*)

“While the 21st Century funds are an important funding source for providing individual drainage solutions, it is not sufficient to meet the long term needs identified by watershed evaluations and long term planning.”

Background (*cont.*)

“The Governor’s Task Force on Surface Water Management created by Executive Order 62 may provide the basis for the next iteration of future surface water management policy, regulatory changes and long term solutions to drainage, flood control and stormwater management in Delaware.”

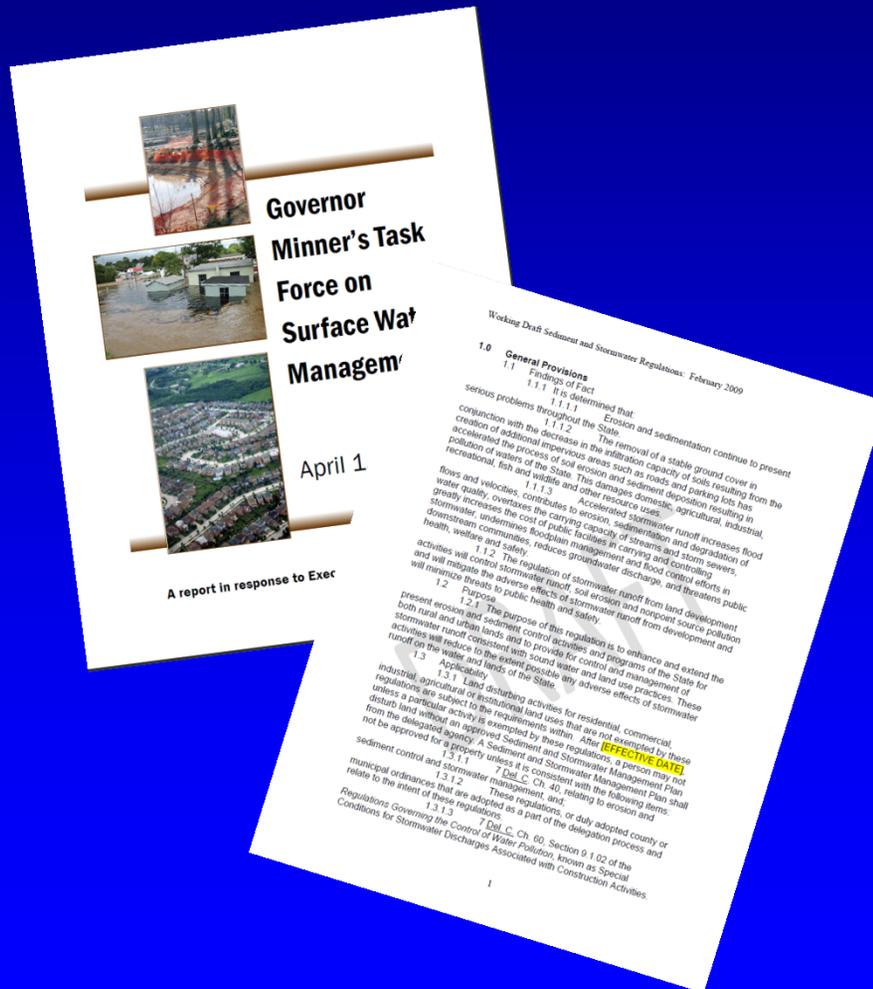


Q: “Why Is DNREC Doing This?”

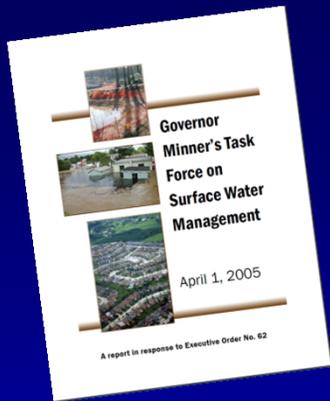
Short Answer:

“Because We Were Directed To!”

Better Answer:



- The Task Force for Surface Water Management identified legitimate public health, safety and welfare concerns associated with drainage and stormwater management.
- The Task Force recommended specific actions for improvement.
- The “Draft Sediment and Stormwater Regulations” represents the Department’s efforts to address those concerns and recommendations through the State’s regulatory authority.



Task Force on Surface Water Management

- Specific Recommendations for
Drainage & Stormwater Section

Recommendation #2 (approved 3/17/05)

A central response unit coordinated by DNREC in conjunction with county or municipal utilities should be created for handling public calls related to drainage, stormwater, and flood control. A new process and response procedure for addressing citizen complaints related to stormwater facilities and flooding needs to be established. Citizens should be provided with a single point of contact.

Drainage & SW Assistance “Hotline”



DRAINAGE & STORMWATER ASSISTANCE



DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF SOIL AND WATER CONSERVATION

Thousands of drainage and stormwater concerns are expressed each year in Delaware! An assistance program has been requested at the recommendation of the Governor's Surface Water Task Force to aid residents statewide with their unique drainage and stormwater concerns. Residents can call the number below or send an email to report their concerns when convenient. Once an individual's information has been logged into the system the concern will be assigned to the proper agency. If you are unsure of who to call this will allow you to have one central point of contact when seeking solutions to drainage and stormwater concerns!

ASSISTING DELAWARE RESIDENTS WITH MANY DRAINAGE AND STORMWATER CONCERNS:

- Water Runoff
- Standing Water
- Stormwater Ponds
- Tax Ditches
- Restoration Opportunities
- Stream Bank Stabilization
- Beaver Dams



DRAINAGE AND STORMWATER ASSISTANCE

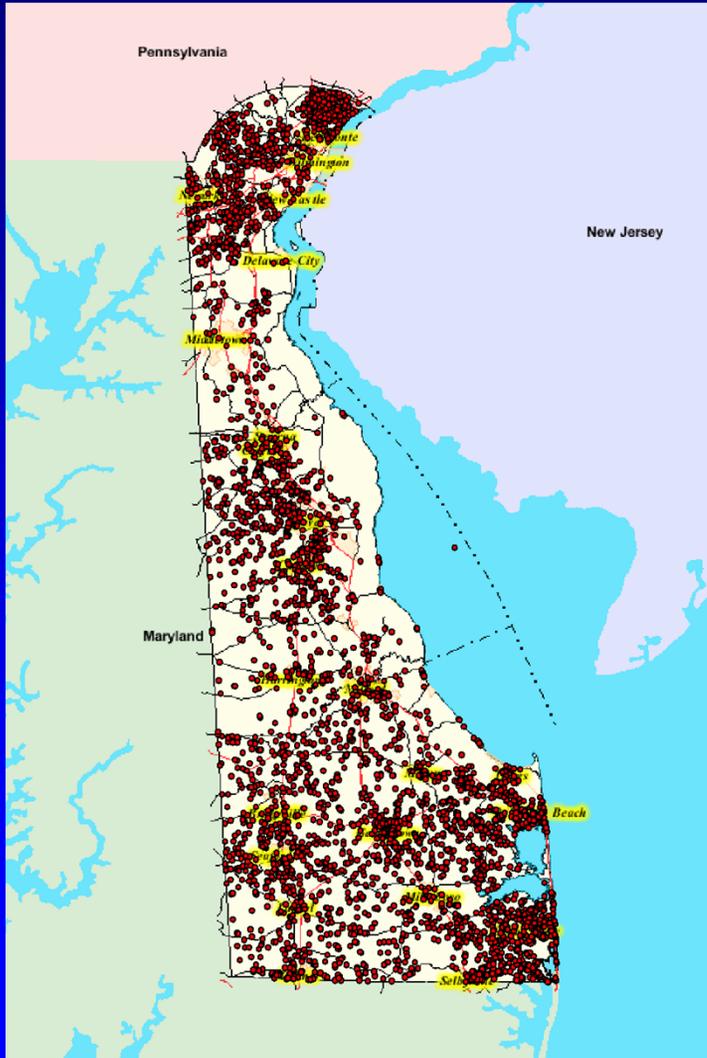
302-855-1955

DELAWARE HELP LINE (Toll Free):
1-800-464-4357

E-MAIL: DNREC_DRAINAGE@STATE.DE.US

STATE OF DELAWARE
DNREC
DIVISION OF SOIL AND WATER
CONSERVATION

Drainage & SW Assistance Database



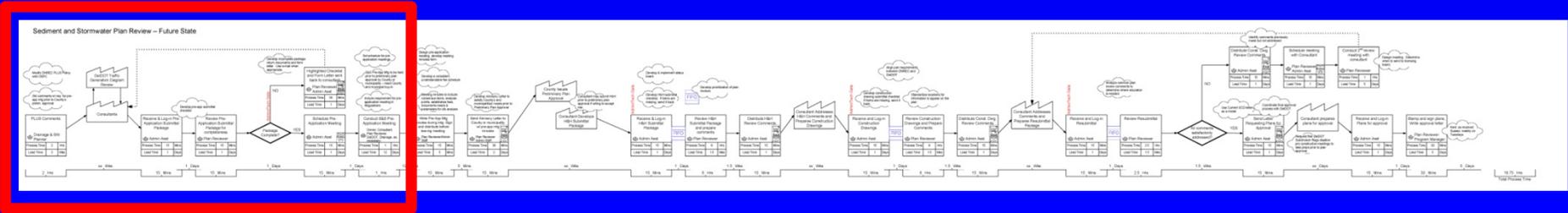
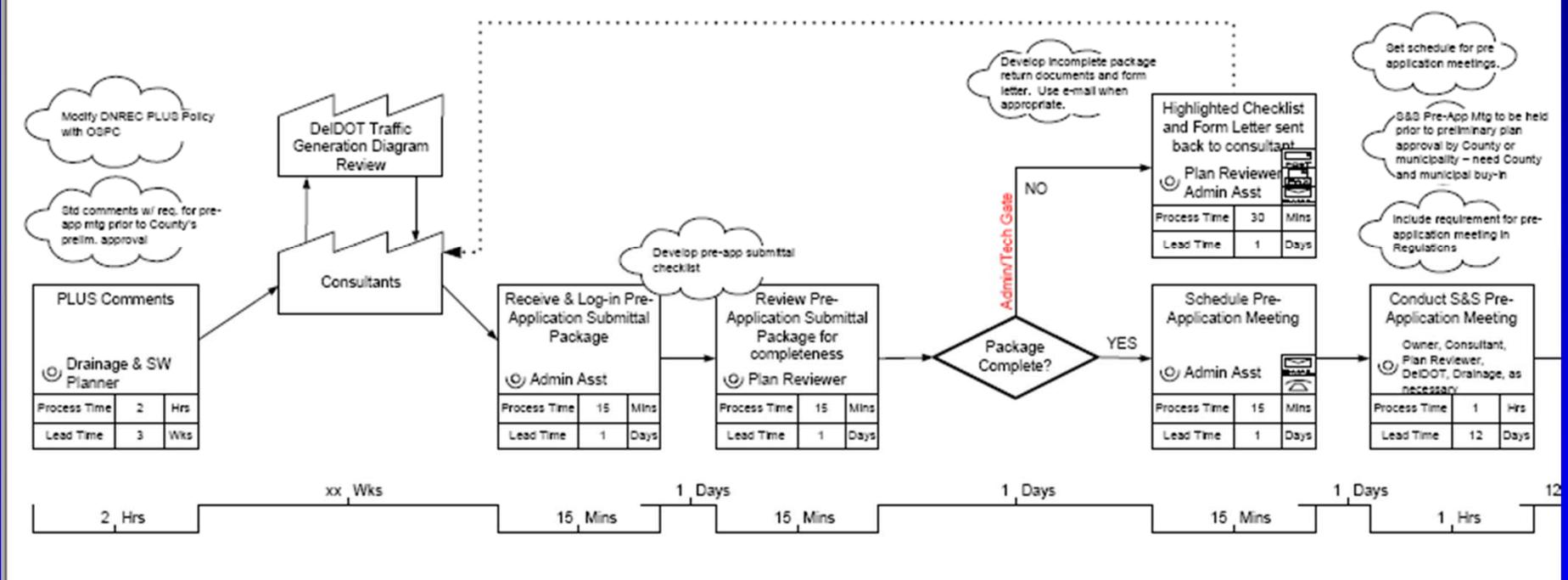
- System went live August, 2007
- Over 4,500 complaints logged into system to date

Recommendation #10B (approved 3/24/05)

A quality improvement process should be implemented within the State Sediment and Stormwater Program, including all delegated agencies, for the purpose of improving the quality of sediment and stormwater plans submitted for review and approval. The improvement process should identify all current impediments to quality plan submittal and efficient review as well as specific measures to improve the process. The measurable outcome is a reduction in the number of plan submittals prior to approval with the goal of initial plan submittals meeting all applicable requirements and standards.

S&S Plan Approval Process: Future State

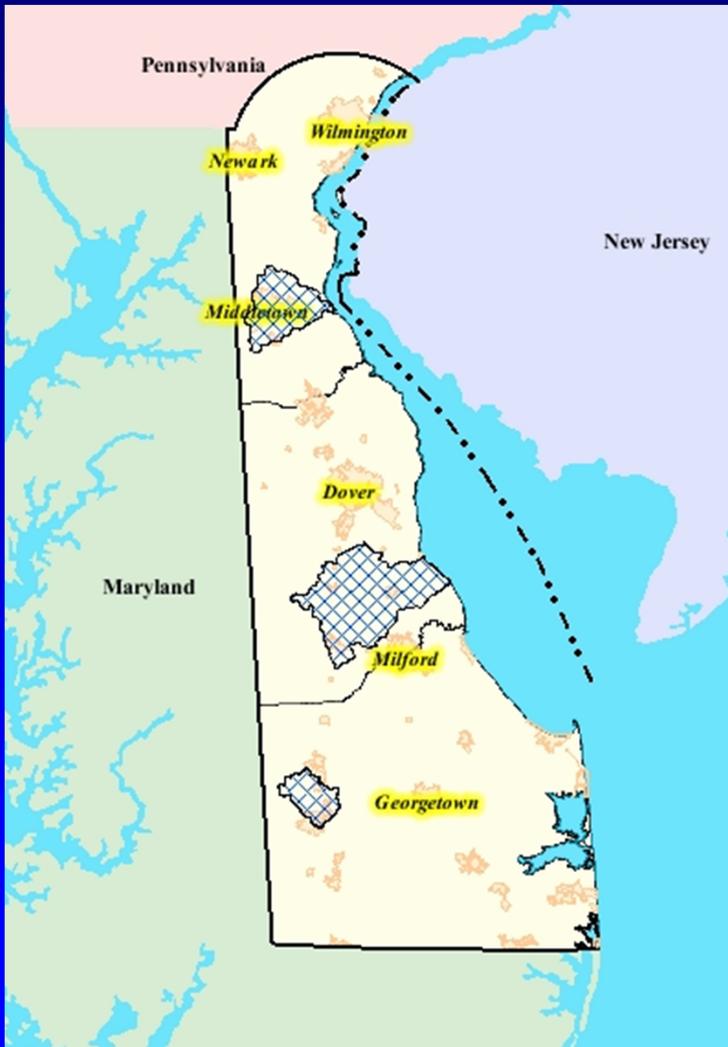
Sediment and Stormwater Plan Review – Future State



Recommendation #19A (approved 3/24/05)

Detailed watershed studies, managed by DNREC in consultation with the Surface Water Advisory Council and stormwater utilities, should be developed for highest priority watersheds in the State over the next five years with the goal of completing all watersheds within ten years.

Watershed Studies Funded by CWAC



- Appoquinimink WS
- Murderkill WS
- Portion of Nanticoke WS

Recommendation #25 (approved 3/24/05)

Aquifer recharge should be considered as part of the design, construction, operation, and maintenance of stormwater facilities.

Recharge of surface water in developed areas with impervious surfaces will result in reduction of overland runoff (surface water volume reduction), improved surface and ground-water quality, and increased base flows of streams.

Stormwater BMP Toolbox (c. 1990's)



- Ponds
- Infiltration
 - Basins
 - Trenches

Stormwater BMP Toolbox (c. 2000's)



- Ponds
- Infiltration
 - Basins
 - Trenches
- GTBMPs
 - Bioretention
 - Biofiltration swales
 - Filter strips

Stormwater BMP Toolbox (2012)



- Post-Construction SWM BMPs
 - 16 general categories
 - Variants within each category
 - **Total of 41 options!**

Recommendation #9 (approved 3/17/05)

“Design and engineering standards at the State level should be strengthened through a revision to the Sediment and Stormwater Regulations.

Minimum standards should address volume management, conveyance adequacy, pollutant loadings, floodplain management, strict standards for operation and maintenance of structures and management areas.”

Recommendation #9 (approved 3/17/05)

“Design and engineering standards at the State level should be strengthened through a revision to the Sediment and Stormwater Regulations.

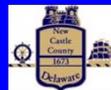
Minimum standards should address volume management, conveyance adequacy, pollutant loadings, floodplain management, strict standards for operation and maintenance of structures and management areas.”

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

Regulatory Advisory Committee

- ACEC-DE
- Board of Registered Landscape Architects
- Clean Water Advisory Council
- DE Association of Conservation Districts
- DE Association of Surveyors
- DE Contractors Association
- Dept. of Education
- Delaware Nature Society
- DeIDOT
- Dept. of Justice
- DNREC
 - Div. of Water
 - Div. of Watershed Stewardship
 - Office of the Secretary
- HBA/DE
- League of Local Governments
- County Governments:
 - New Castle
 - Kent
 - Sussex
- State Planning Office
- UD Water Resources Agency



Regulatory Revision Process

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

By the Numbers: Outreach

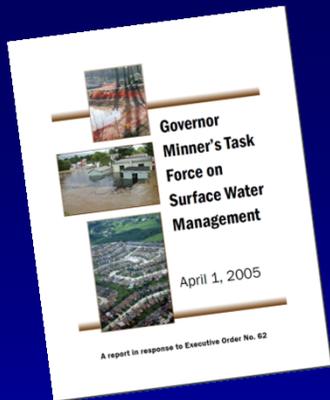
- RAC Meetings: 8
- Subcommittee Meetings: 37
(Technical Subcommittee: 20 meetings)
- Interested Parties: 223

By the Numbers: Comments

The screenshot shows a Microsoft Access database window titled "S&S Reg Revisions Comments Tracking - Database (Access 2007) - Microsoft Access". The table displayed is "Reg Revisions Comments Tracking" and contains the following data:

Reg Revisior	Date Comm	Section Number	Subsection	Commenter	Comment	Subcommitt	Comment Response	Response Di	Responder
Technical Docu	5/5/2011	Technical Document Article 4	4.05 - Project	Mike Sisteck, CI	The burden of sen		The Notice of Completion is the	5/27/2011	E. Webb
Apr 2011 3rd Dr	5/5/2011	General Comment		Mike Sisteck, CI	It is not felt that th		S.1.2 has been added in the Del	5/17/2011	E. Webb
Apr 2011 3rd Dr	5/5/2011	General Comment		Mike Sisteck, CI	There needs to be		There will be training offered to	6/3/2011	E. Webb
Apr 2011 3rd Dr	5/5/2011	General Comment		Mike Sisteck, CI	Will DNREC develc		Watershed plans would be dew	6/3/2011	E. Webb
Apr 2011 3rd Dr	5/5/2011	General Comment		Mike Sisteck, CI	Would the city hav		Technical document will specify	5/17/2011	E. Webb
Apr 2011 3rd Dr	5/5/2011	General Comment		Mike Sisteck, CI	It was discussed at		DNREC will discuss this option v	6/3/2011	R. Greer
Apr 2011 3rd Dr	5/6/2011	Section 1 General Provisions	1.3.2.2	Jared Adkins, K	Plans approved pri		This section has been updated t	5/17/2011	E. Webb
Apr 2011 3rd Dr	5/6/2011	Section 2 Definitions		Jared Adkins, K	"Final Stabilizati		The definition of final stabilizati	5/17/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 1	Article 1.02, p.:	Jessica Watson	General permit con		This section has been revised to	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 1	Article 1.02, p.:	Jessica Watson	Land development		TMDLs vary by watershed, but a	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 1	Article 1.03, p.:	Jessica Watson	"Furthermore, wh		Class V injection wells require i	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 1	Article 1.03, p.:	Jessica Watson	"When a new cons		Dept is developing an MOA with	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.01, p.:	Jessica Watson	"However, if the D		No county code gives DNREC au	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.01	Jessica Watson	"The Department r		Tech Doc 2.01 has been amende	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	Article 4.01	Jessica Watson	"A Responsible Pe		We have added daily oversight	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	Article 4.01	Jessica Watson	"If weekly site rev		The wording of this section has	6/3/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.02, p.:	Jessica Watson	Recommend modi		Addressed in Checklist on new	5/13/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.02, p.:	Jessica Watson	"In the absence of		DNREC can pursue enforcement	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.02, p.:	Jessica Watson	"Every project app		At this time the dates are specu	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.02, p.:	Jessica Watson	"Expiring Plans cor		DNREC will develop an "interim	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	Article 2.02, p.:	Jessica Watson	"Plans that have b		Reg language change to allow e	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 2	2.05 Professor	Jessica Watson	"When a design co		Wording of the professional jud	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	4.01 Site Const	Jessica Watson	"Once the delegat		Technical Document 4.01 has be	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	4.02 Enforcem	Jessica Watson	Compared to the o		The Technical Document is inte	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	4.03 Contractor	Jessica Watson	"The Blue Card Hol		Tech Doc 4.03 is revised to remc	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 4	4.04 CCR, 2nd p.	Jessica Watson	"I think the delegat		Sites 20 acres and greater have	5/27/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 5	5.01	Jessica Watson	Minimum Mainten		We ensure compliance with qui	5/26/2011	E. Webb
Technical Docu	5/6/2011	Technical Document Article 5	5.01	Jessica Watson	Std Guidelines for		Guidelines for O&M for BMPs w	5/26/2011	E. Webb
Apr 2011 3rd Dr	5/12/2011	Section 1 General Provisions	1.4	Mary Neutz, CI	"The City interprets		Depending on permit condition	6/3/2011	E. Webb
Apr 2011 3rd Dr	5/12/2011	Section 1 General Provisions	1.7.1	Mary Neutz, CI	"The City would like		Delegated Agencies would nee	6/3/2011	R. Greer
Apr 2011 3rd Dr	5/12/2011	Section 3 Plan Approval Procedures	3.5.1	Mary Neutz, CI	"The City is request		30 days will remain in the regul	5/17/2011	E. Webb
Apr 2011 3rd Dr	5/12/2011	Section 3 Plan Approval Procedures	3.8.4	Mary Neutz, CI	"Since projects can		Comment addressed in reg lang	5/17/2011	E. Webb
Apr 2011 3rd Dr	5/12/2011	Section 5 Post-Const SWM	5.1.4	Mary Neutz, CI	"The city interpret t		S.1.4 has been modified to incl	6/3/2011	E. Webb
Apr 2011 3rd Dr	5/12/2011	Section 5 Post-Const SWM	5.6.3.2	Mary Neutz, CI	"Due to the new me		To date, EPA has generally cons	6/3/2011	R. Greer
Technical Docu	5/12/2011	Technical Document Article 2	2.01 Delegated	Mary Neutz, CI	"Section 2.01 Deleg		This process is set up in absence	5/13/2011	E. Webb
Apr 2011 3rd Dr	5/10/2011	Section 1 General Provisions	1.4.2	Doug Hokuf, N	"Suggest clarifying t		A start date will not be added.	5/16/2011	E. Webb
Apr 2011 3rd Dr	5/10/2011	Section 2 Definitions		Doug Hokuf, N	"threatened public		In a situation where there is a c	5/16/2011	E. Webb
Apr 2011 3rd Dr	5/10/2011	Section 2 Definitions		Doug Hokuf, N	"Suggest eliminat		"permanent" has been remove	5/17/2011	E. Webb

- 700+ comments received and considered
- Tracked in a database
- Responses provided



History of Reg Revisions

- Governor's Task Force – April 2005
- RAC first meeting – October 2007
- Reg Revisions Outline – January 2008
- First Working Draft – February 2009
- Second Draft – May 2010
- Draft Technical Document – Sept 2010
- Third Draft – June 2011
- Register Draft and Final Tech Doc – February 2012



Scope of Regulation Revisions

- 5,000 sf disturbance threshold
 - unchanged
- No new groups to be regulated
- Modified compliance requirements
 - Post construction stormwater management

Effective Date

- 90 days after date of publication
 - Published May 11, 2012
 - Effective August 11, 2012
- Allows time for training

Training and Outreach

- Contract with Center for Watershed Protection; 4 training sessions
- Example plans prepared by consultants
- Circuit Rider Trainer for DURMMv.2
- Chesapeake Bay Program Partnership Training Grant
- Ongoing Training

Grandfathering – Plan Review

- Projects under review prior to effective date are grandfathered
 - Interim Guidance Document
 - Starting point different for each delegated agency
- One year from effective date to gain approval

Grandfathering – Approved Plans

- Plans expire 3 years after approval
- Plans may be extended within 90 days of expiration date
- Ongoing construction – plan may be extended under previous regulations

Grandfathering – Approved Plans

- Construction not commenced
 - plan may be extended for one additional 3-year period under previous regulations
- Regulations 1.3.2.1 will be updated

Exemptions, Variances & Waivers

- Incremental 5,000sf disturbances
- Ch. 60 Variance procedures
- Waivers eliminated
 - Compliance options offered



Offset Provisions

- Full or partial compliance with RPs
- Fee-in-lieu is one option
- Banking
- Offsite mitigation

Additional Regulation Provisions

- Enforcement
- Delegation of Program Elements



- Stormwater Utility

Technical Requirements

Guiding Principals

- Peak-based to Volume-based management
- Site-level to Watershed-level management
- Compliance options instead of “one size fits all” approach
- Separate regulatory language from technical requirements
- Streamline plan review/approval process

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

Standard Plans

- Project Types
 - Individual parcel construction
 - Minor linear disturbances
 - Tax Ditch maintenance
 - Stormwater facility maintenance
 - Ag structure construction
- More may be added



Standard Plans

- Standard conditions
 - Controls during construction
 - Stormwater management
- Applicability and criteria in Technical Document

Erosion and Sediment Control



Erosion and Sediment Control



Construction Site Stormwater Management

- Current Regs
 - Maximum 20-ac disturbance
- Proposed Regs
 - Greater than 20 acres requires engineered design based on 2-year bare earth condition



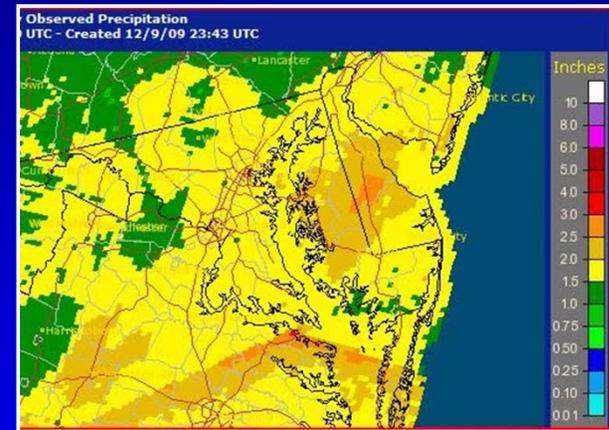
Construction Site Stormwater Management

- Turbid Discharges
 - Best Available Technology (BAT)
 - Numeric turbidity limits – *none at this time*
- Notice of Completion
 - Final Stabilization



Post Construction 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)

Stormwater Quality Management

- Current Regs
 - 2" Rainfall event (~6 month freq.)
 - Preferential hierarchy of BMPs
 - 80% reduction in TSS
- Proposed Regs - Resource Protection (RPv)
 - Annualized runoff for all storms up to the 1-YR Storm event (~2.7" rainfall)
 - Runoff reduction performance standard

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

Construction Review

- Self inspection owner requirement
- Construction reviews by Sediment & Stormwater Program staff
- Contractor Certification requirement remains
- Certified Construction Reviewer (CCR)
 - Required on sites >20ac

Maintenance

- Responsibility of owner
- In accordance with Operation & Maintenance Plan
 - Developed during plan approval process
 - Post Construction Verification Document (as-built) part of O&M Plan



Regulations = WHAT

Technical Document = HOW

Technical Document

- Information supports regulations:
 - Background information
 - Procedures
 - Checklists
 - Standards & Specifications
 - Examples

Technical Document

- Public review process
 - Concurrent with regulations
 - Accepting written comments until 3/5/12
 - Future changes will also go through public review process
- Posted on DNREC website

Technical_document - Windows Internet Explorer
 http://www.dnrec.delaware.gov/swc/Drainage/Pages/Technical_document.aspx

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- Environmental Navigator
- Environmental Navigator (Revised - Beta version)
- Loans, Grants, Cost-Share
- Macroalgae Harvesting
- Permits, Licenses, Approvals
- Restoration
- Information**
- Alphabetical Listing of Information
- Delaware Estuarine Research Reserve
- Regs/Laws
- Request for Qualifications

Drainage & Stormwater Section



Sediment & Stormwater Technical Document

This series of articles has been assembled as a technical document to support the revisions to the Delaware Sediment and Stormwater Regulations. The articles and appendices contain information, policies, procedures, checklists and examples to assist the regulated community in complying with the sediment and stormwater regulations.

The Department is currently accepting written comments on the Draft Technical Document. Submit written comments, referencing Article and page numbers, to Elaine.Webb@state.de.us no later than March 5, 2012.

DRAFT - Documents for review only

- [Article 1. Sediment and Stormwater Program Background](#)
- [Article 2. Policies and Procedures](#)
- [Article 3. Plan Review and Approval](#)
 - [3.01 Project Types](#)
 - [3.02 Plan Review Process - Detailed Plans](#)
 - [Appx. 3.02.1.5 Example Project Application Package "Broadkill Estates"](#)
 - [Appx. 3.02.2.7 Example Preliminary Sediment and Stormwater Plan Submittal Package](#)
 - [Appx. 3.02.2.7.1 Residential](#)
 - [Appx. 3.02.2.7.2 Commercial](#)
 - [Appx. 3.02.2.7.3 Institutional](#)
 - [Appx. 3.02.2.7.4 Redevelopment](#)
 - [3.03 Construction Site Stormwater Management](#)
 - [3.04 Post Construction Stormwater Management](#)
 - [Appx. 3.04.4 DURMM v.2 Spreadsheet](#) **NOTE: Please save a copy of this file to your computer before using it.**
 - [Appx. 3.04.5 DURMM v.2 Quick Start Guide](#)
 - [Appx. 3.04.6 DURMM v.2 User Guide](#)
 - [3.05 General Plan Requirements](#)
 - [3.06 Sediment and Stormwater BMP Standards and Specifications](#)
 - [Appx. 3.06.1 Delaware Erosion and Sediment Control Handbook](#)
 - [Appx. 3.06.2 Post Construction Stormwater BMP Standards and Specifications](#)
- [Article 4. Construction Review and Compliance](#)
- [Article 5. Maintenance of Permanent Stormwater Management Systems](#)



Trusted sites 100%

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

3.06 Sediment and Stormwater BMP Standards and Specs

- Delaware ESC Handbook - **REVISIONS**
- Post Construction Stormwater BMP Standards and Specifications - **NEW**

Delaware Erosion & Sediment Control Handbook

- New Details:
 - Compost Filter Logs
 - Flocculation
 - Concrete Washout
 - Concrete Mixing Operation

Compliance Options: SWM BMP Standards & Specs

- Infiltration
- Bioretention
- Permeable Pavement
- Vegetated Roofs
- Rainwater Harvesting
- Restoration Practices
- Rooftop Disconnection
- Vegetated Channels
- Sheet Flow to Open Space
- Detention Practices
- Filtering Practices
- Constructed Wetlands
- Wet Ponds
- Soil Amendments
- Proprietary Practices
- Source Controls

Economic Issues

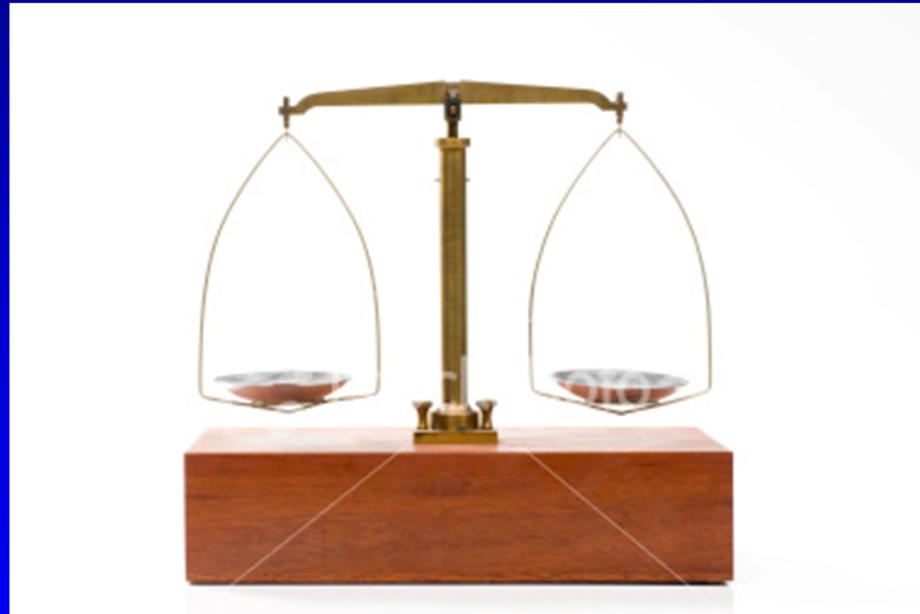
“Stormwater Economics 101”

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



The “Spring Scale” Theory of Regulatory Costs

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



The “Balance Scale” Theory of Regulatory Costs

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



The “Balance Scale” Theory of Regulatory Costs

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Adequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



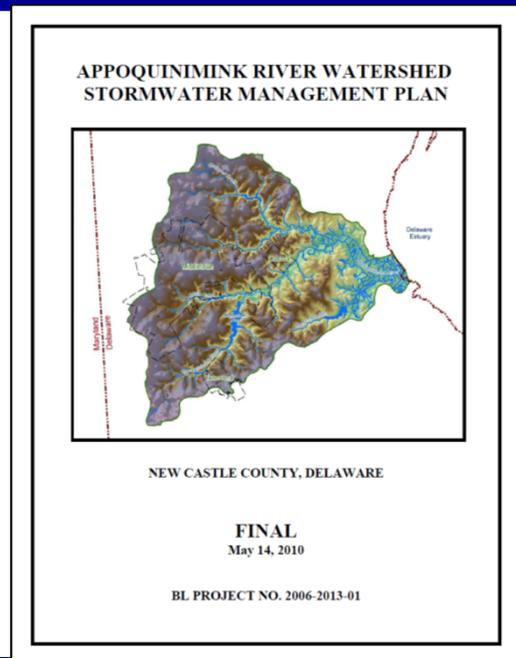
Inadequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



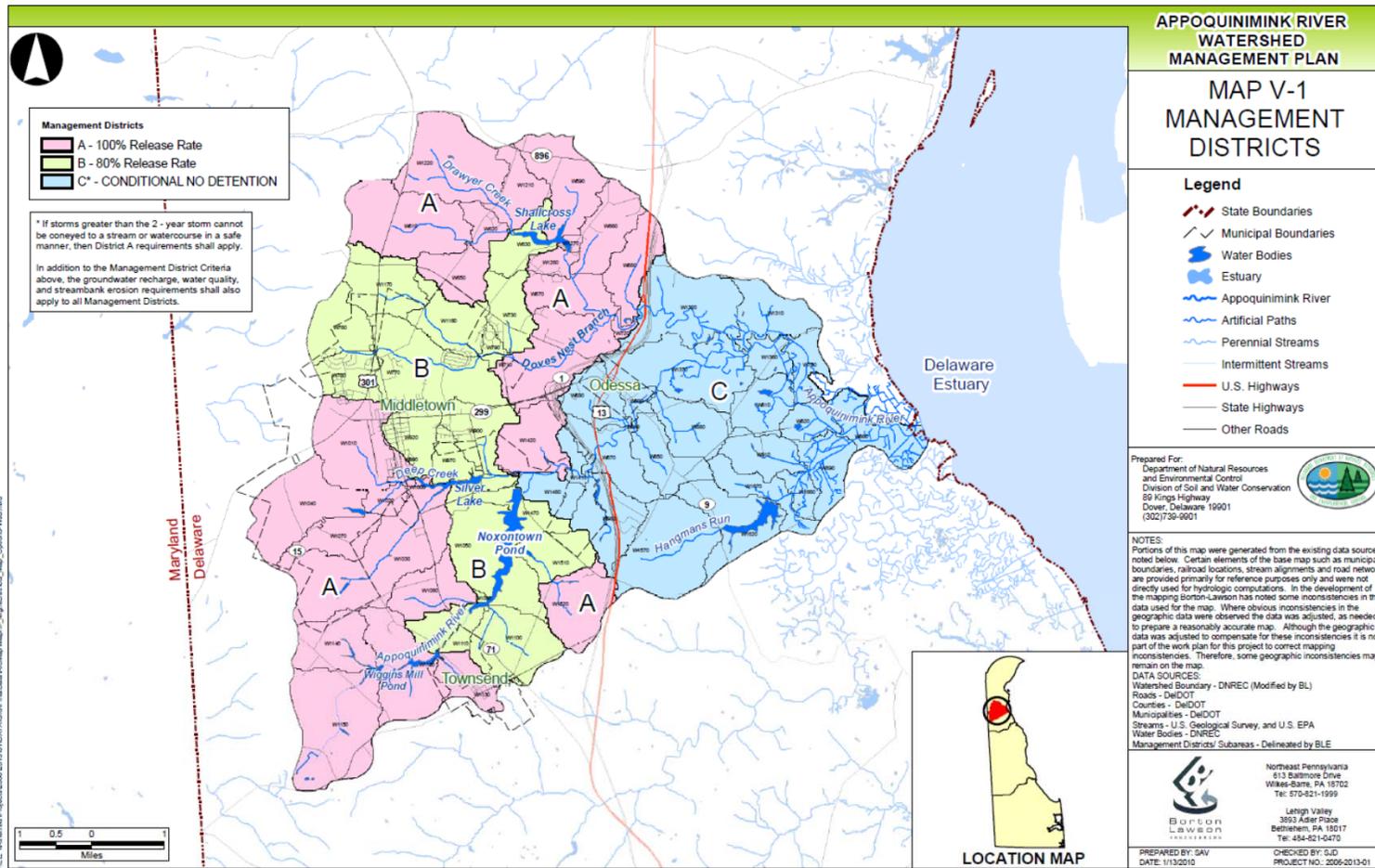
Inadequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101

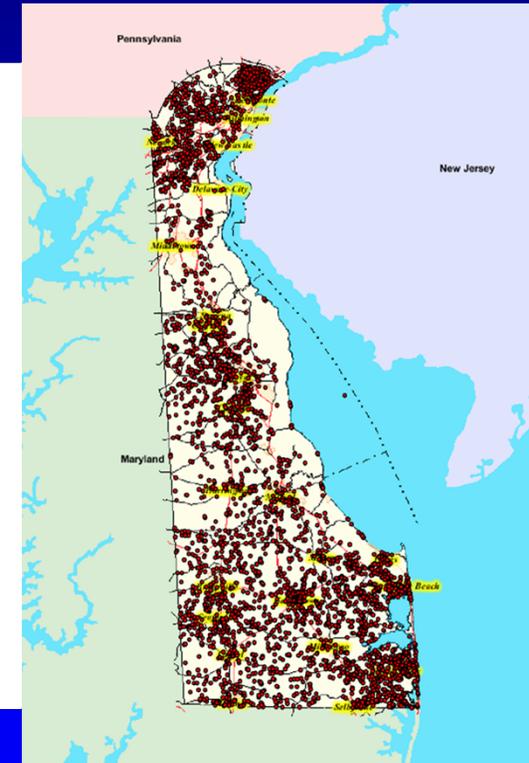


Inadequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



***Inadequate* Stormwater Management**

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



Inadequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



Inadequate Stormwater Management

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



Working Draft Sediment and Stormwater Regulations: February 2009

1.0 General Provisions

1.1 Findings of Fact

1.1.1 It is determined that erosion and sedimentation continue to present serious problems throughout the State.

1.1.1.1 Erosion and sedimentation continue to present serious problems throughout the State.

1.1.1.2 The removal of a stable ground cover in conjunction with the decrease in the infiltration capacity of soils resulting from the creation of additional impervious areas such as roads and parking lots has accelerated the process of soil erosion and sediment deposition resulting in pollution of waters of the State. This damages domestic, agricultural, industrial, recreational, fish and wildlife and other resource uses.

1.1.1.3 Accelerated stormwater runoff increases flood flows and velocities, contributes to erosion, sedimentation and degradation of water quality, overtaxes the carrying capacity of streams and storm sewers, greatly increases the cost of public facilities in carrying and controlling stormwater, undermines floodplain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health, welfare and safety.

1.1.2 The regulation of stormwater runoff from land development activities will control stormwater runoff, soil erosion and nonpoint source pollution and will mitigate the adverse effects of stormwater runoff from development and will minimize threats to public health and safety.

1.2 Purpose

1.2.1 The purpose of this regulation is to enhance and extend the present erosion and sediment control activities and programs of the State for both rural and urban lands and to provide for control and management of stormwater runoff consistent with sound water and land use practices. These activities will reduce to the extent possible any adverse effects of stormwater runoff on the water and lands of the State.

1.3 Applicability

1.3.1 Land disturbing activities for residential, commercial, industrial, agricultural or institutional land uses that are not exempted by these regulations are subject to the requirements within. After **[EFFECTIVE DATE]** unless a particular activity is exempted by these regulations, a person may not disturb land without an approved Sediment and Stormwater Management Plan from the delegated agency. A Sediment and Stormwater Management Plan shall not be approved for a property unless it is consistent with the following items.

1.3.1.1 7 Del.C. Ch. 40, relating to erosion and sediment control and stormwater management, and;

1.3.1.2 These regulations, or duly adopted county or municipal ordinances that are adopted as a part of the delegation process and relate to the intent of these regulations.

1.3.1.3 7 Del.C. Ch. 60, Section 91.02 of the Regulations Governing the Control of Water Pollution, known as Special Conditions for Stormwater Discharges Associated with Construction Activities.

Adequate Stormwater Management

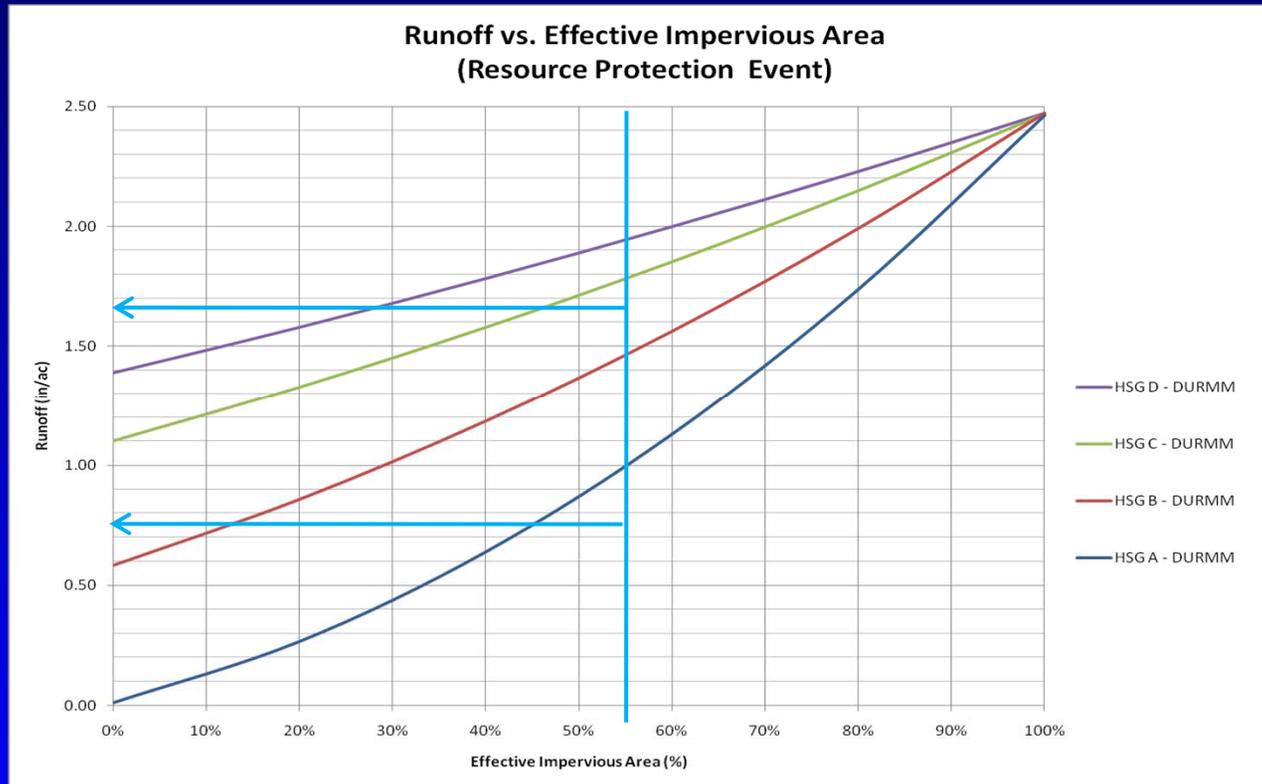
Summary

Compliance Criteria

Problems with a Total Runoff Reduction Standard

Site 2

Site 1



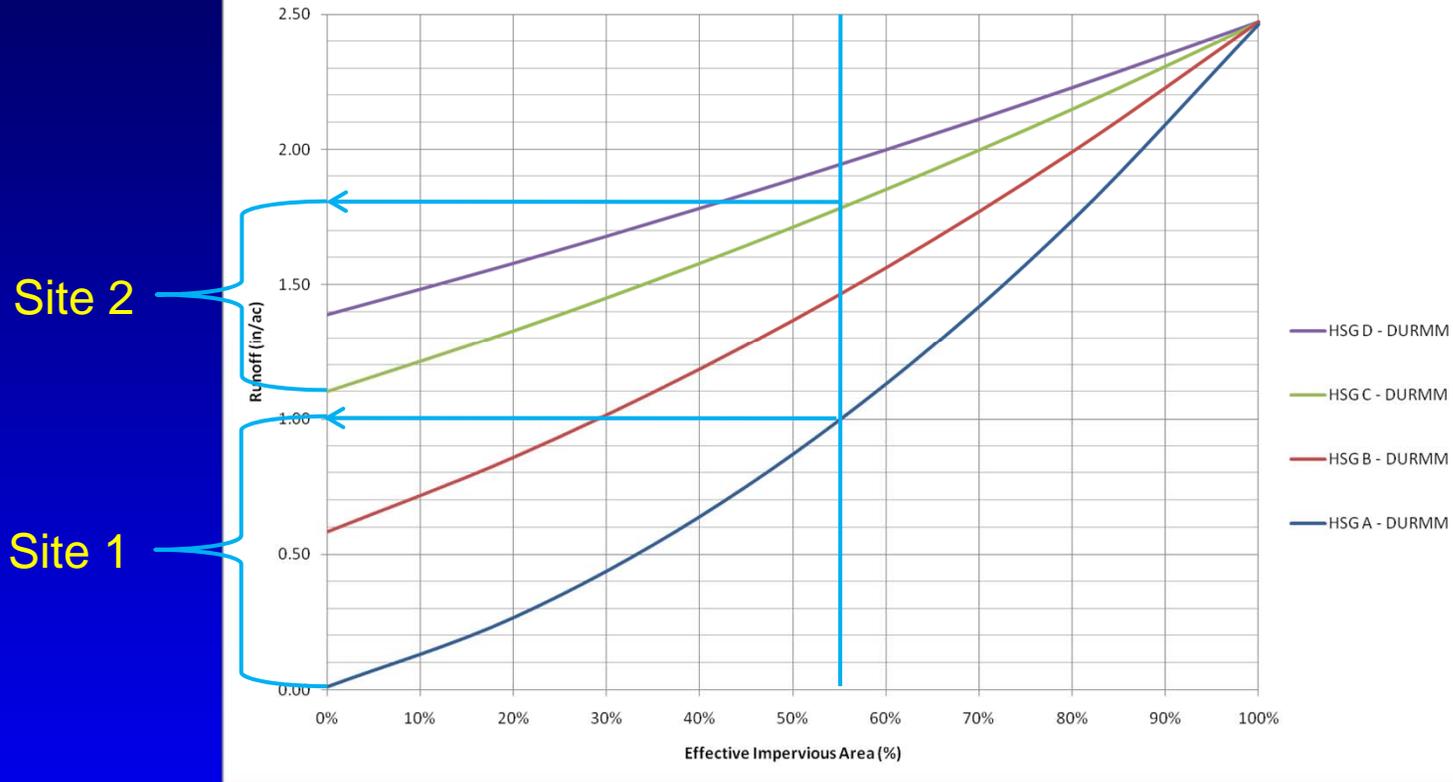
Site 1: 55% Impervious, HSG A Soil
Runoff = 1.0"

Site 2: 55% Impervious, HSG C Soil
Runoff 1.8"

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**.

Runoff vs. Effective Impervious Area
(Resource Protection Event)

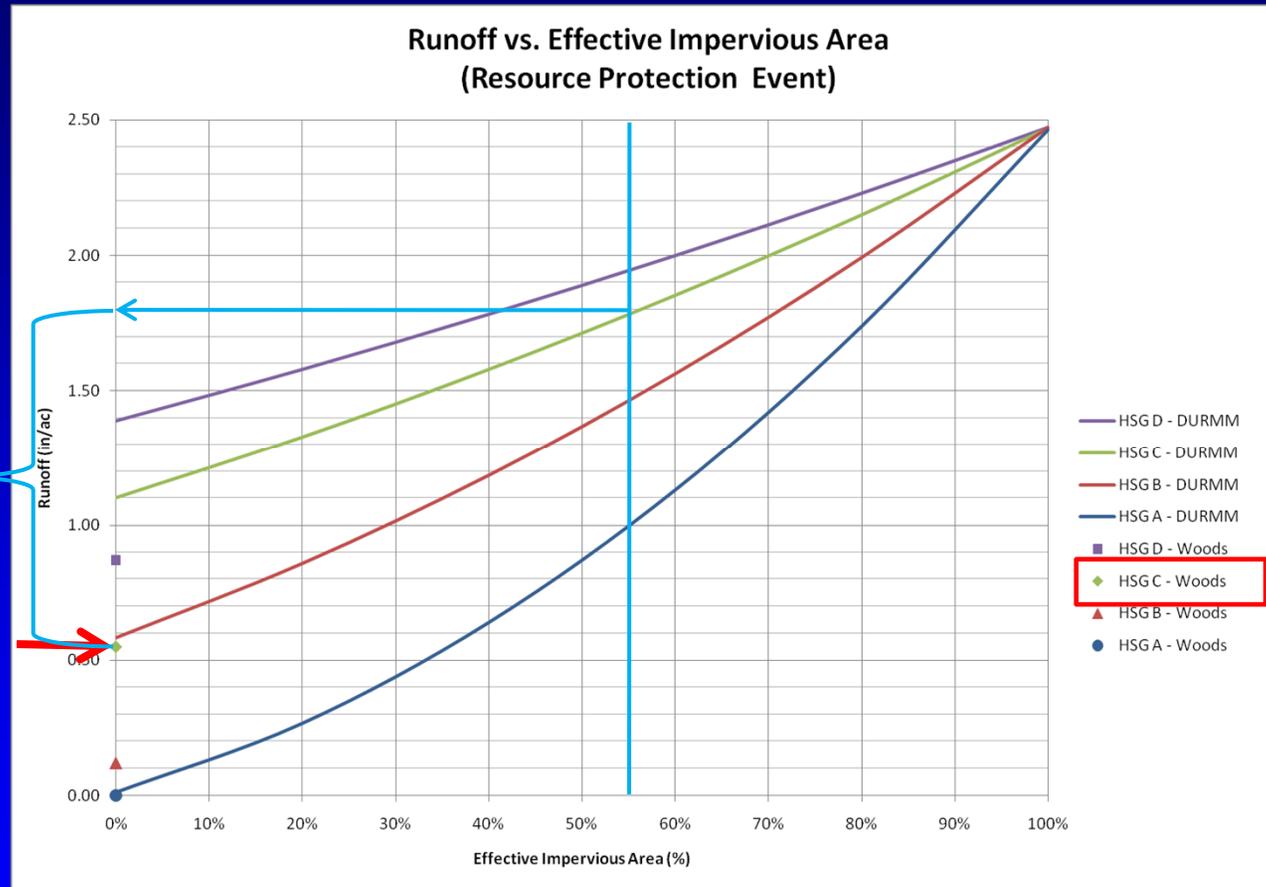


Site 1: 55% Impervious, HSG A Soil
Runoff = 1.0"
Minimum RR = 1.0" – 0" = 1.0" (100% Reduction)

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

Site 2



Site 2: 55% Impervious, HSG C Soil

Runoff 1.8"

Minimum RR = $1.8'' - 0.55'' = 1.25''$ (70% Reduction)

Proposed Minimum RR for **New** Development

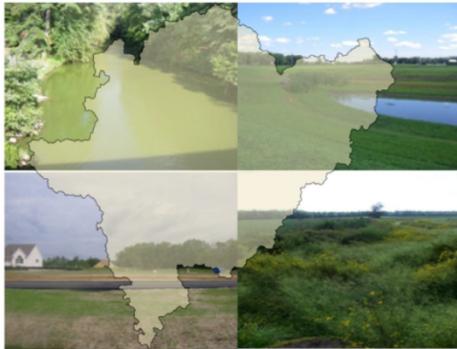
1/4 ac.
Lots

% Imp	Req. Runoff Reduction for 0% Effective Imp.(in)			
	HSG A	HSG B	HSG C	HSG D
10%	0.15	0.13	0.11	0.09
20%	0.27	0.27	0.23	0.19
30%	0.43	0.43	0.35	0.29
40%	0.62	0.60	0.48	0.39
50%	0.85	0.78	0.61	0.50
60%	1.10	0.97	0.75	0.61
70%	1.39	1.18	0.90	0.72
80%	1.71	1.40	1.05	0.83
90%	2.06	1.63	1.20	0.95
100%	2.45	1.88	1.36	1.07

Equivalent 0% Effective Imperviousness in LOD

Proposed Minimum RR for **New** Development

MURDERKILL WATERSHED MANAGEMENT PLAN



The Delaware Department of
Natural Resources and
Environmental Control



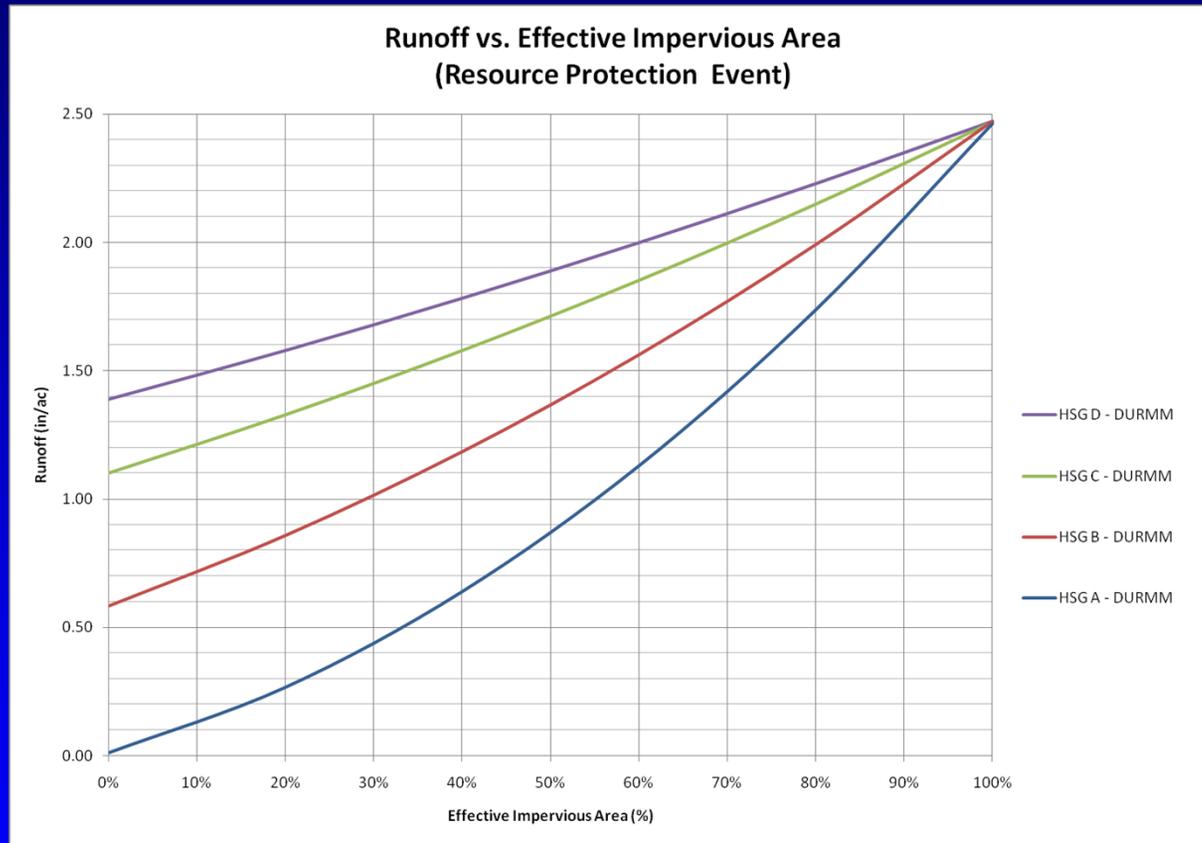
December 2011

URS

URS Corporation
12420 Milestone Center Drive, Suite 150
Germantown, Maryland 20876

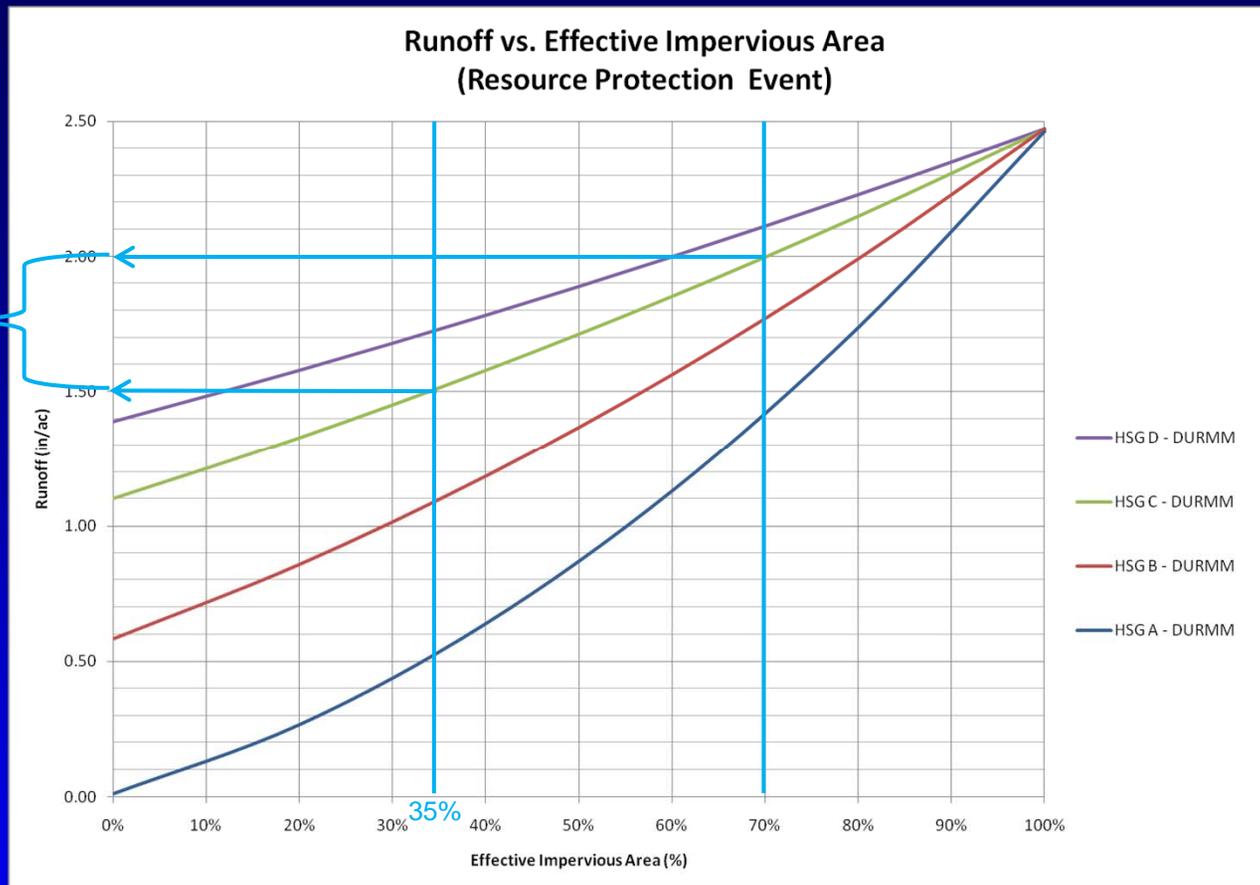
- “The criterion of implementing stormwater management features to achieve **0% effective imperviousness** seems to be an effective regulation.”
- “By requiring the post-development hydrology to mimic conditions for open space land use, **flow rates could be reduced** in developing subwatersheds.”

Proposed Minimum RR for Redevelopment



50% Reduction in **Existing Effective** Imperviousness

Redev.
Site RR

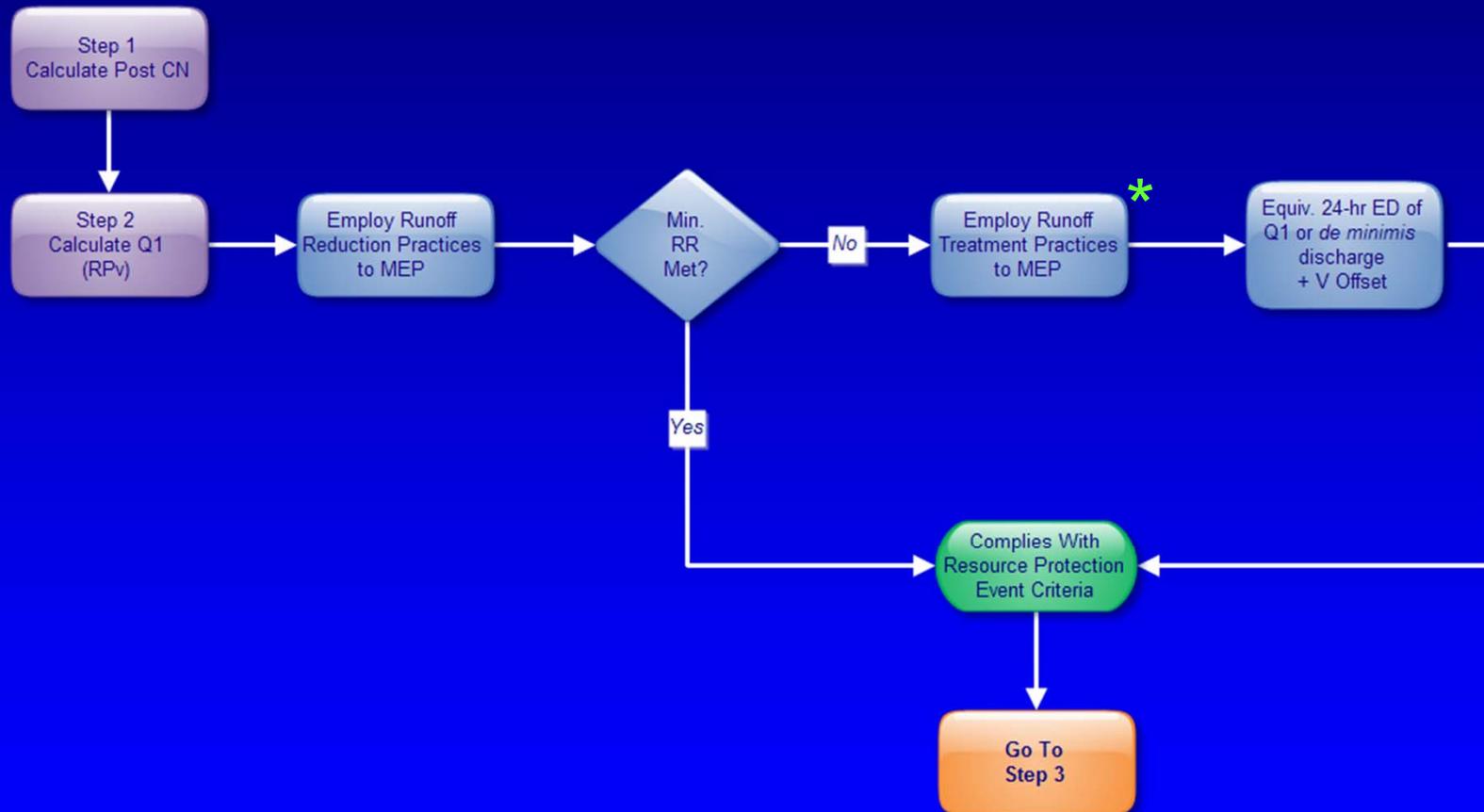


Redevelopment Site: 70% Ex. Effective Imperviousness, HSG C Soil
Runoff = 2.0"
Redeveloped Effective Imperviousness = 0.5 (70%) = 35%
Maximum Allowable Runoff for Compliance = 1.50"

5.6 Redevelopment Criteria

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

5.2 Resource Protection Event Compliance



*Treatment practice credit toward offset

5.2 Resource Protection Event Criteria

- *5.2.3.2.2 An **offset** shall be provided for the portion of the RPr that does not meet the minimum runoff reduction requirements.*

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



OFFSETS

- Banking
- Trading
- Off-Site Projects
- Monetary Compensation

Monetary Compensation Option

- Equivalent to cost to treat runoff volume **not managed** on-site
- Based on **construction and maintenance costs for bioretention** using regional data
- **Does not include** site assessment, engineering/design, and permit acquisition costs
- Compensation = **\$23/cu.ft.** runoff volume not managed
- To be implemented through a “fee-in-lieu”

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



The “Spring Scale” Theory of a Fee-In-Lieu

Proposed Revisions to Delaware Sediment & Stormwater Regulations: Stormwater Economics 101



The "Balance Scale" Theory of the Fee-In-Lieu Option

Overall Objectives for Offsets

- The offset will be used to **mitigate the negative impacts** associated with urban stormwater runoff at the watershed level.
- Potential uses should be **prioritized based on their benefits** at the watershed level.

Potential Offsets

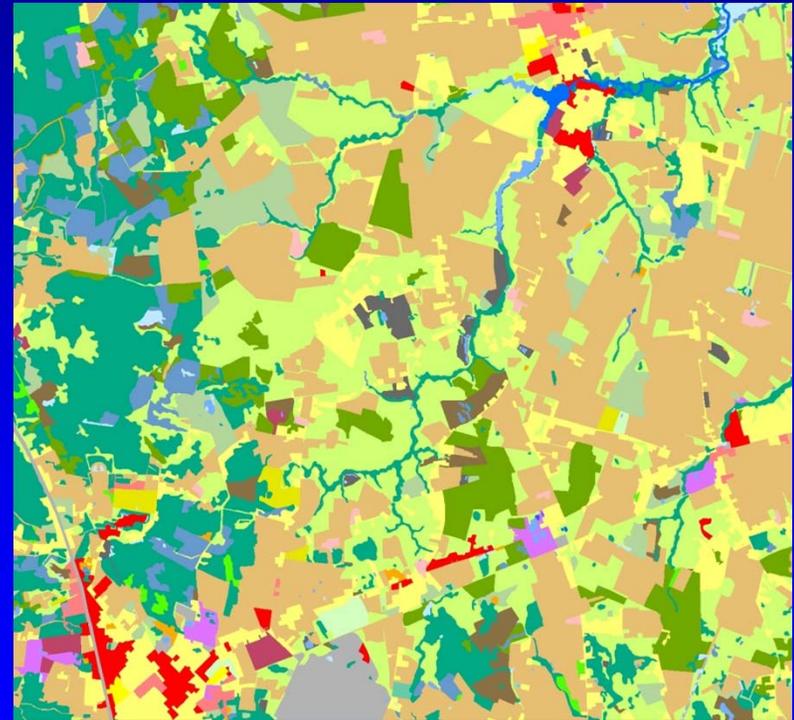


- Implement recommendations of Watershed Management Plans
- Stormwater BMP retrofit projects
- Stream restoration projects
- Regional facilities
- Volume/Nutrient reductions from other sources
- Others????

5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

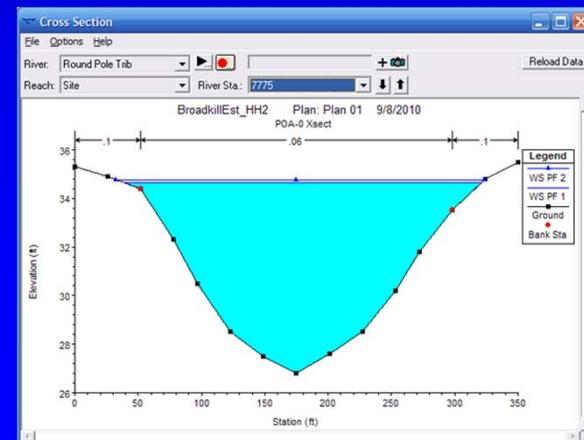
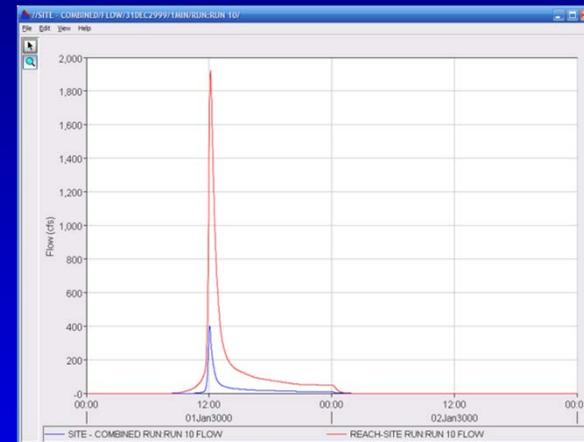
- Option 1
 - Standards-based
 - Unit Discharge (cfs/ac)



5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

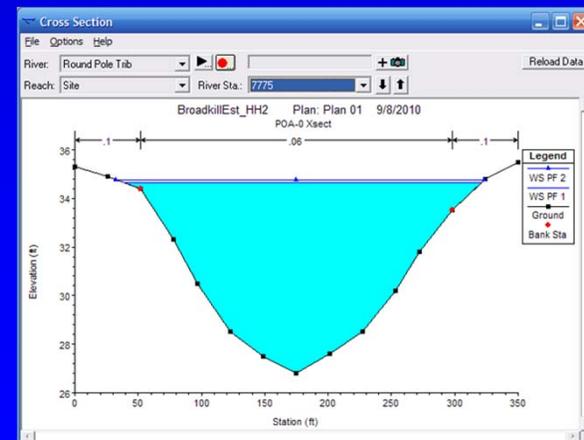
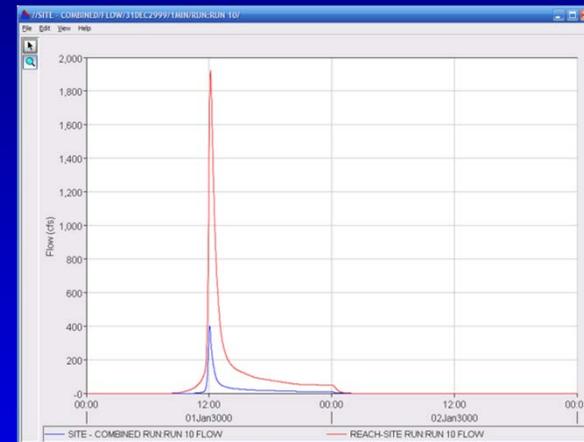
- Option 1
 - Standards-based
 - Unit Discharge (cfs/ac)
- Option 2
 - Performance-based
 - **“No Adverse Impact”**
 - Criteria based on:
 - hydrograph timing
 - channel stability
 - system capacity
 - H&H analysis required
 - 3 levels of increasing detail



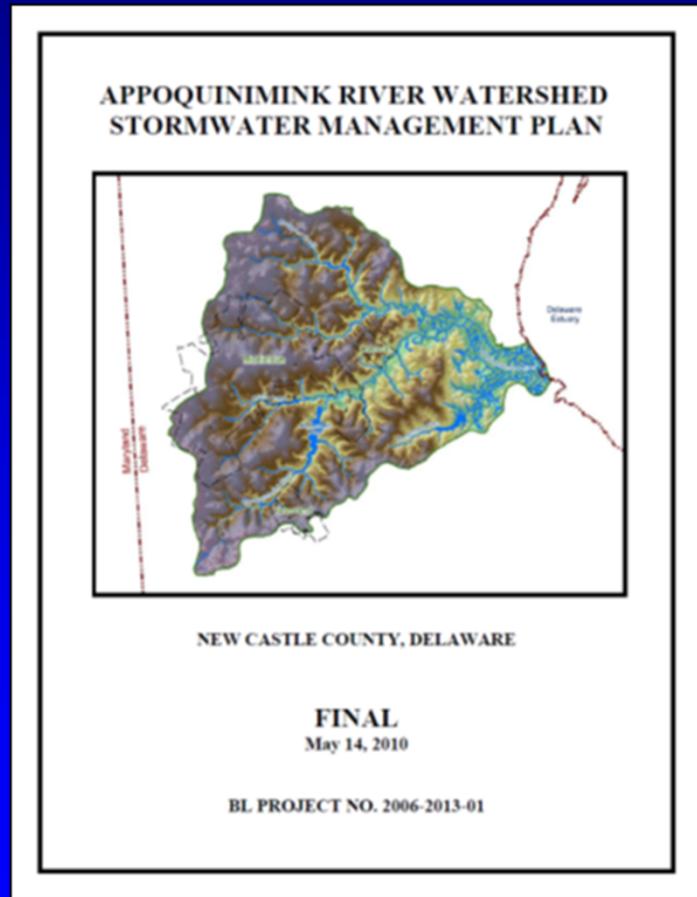
5.3 Conveyance Event Criteria

5.4 Flooding Event Criteria

- Level 1 – “No Adverse Impact”
 - Project hydrograph is less than and occurs before the upstream watershed hydrograph
- Level 2 – “No Adverse Impact”
 - Post-developed peak discharge and runoff volume is no greater than pre-developed condition; or
 - Downstream water surface does not increase by more than 0.1’ (1.2”) and no increase in area of inundation
- Level 3 – “No Adverse Impact”
 - Downstream water surface does not increase by more than 0.1’ (1.2”) and no increase in area of inundation



Sustainability



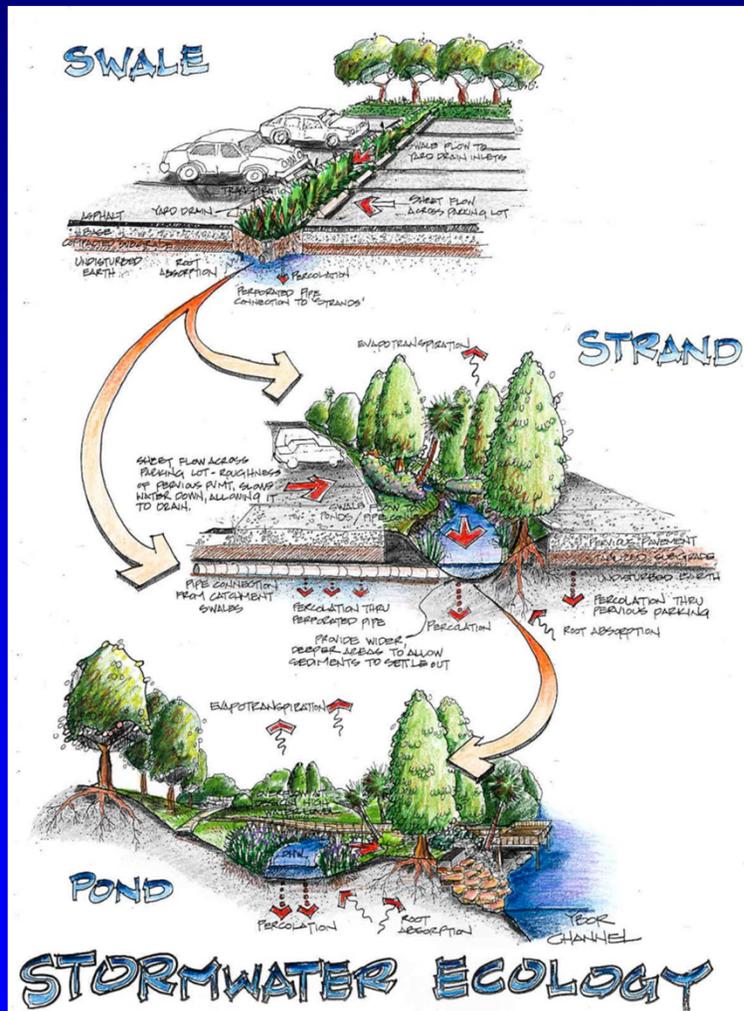
- Current S&S regulations **will not fulfill the goals** of the LAW in the long term

Sustainability



- Current S&S regulations **will not fulfill the goals** of the LAW in the long term
- Public sector **does not have the resources** to address impacts caused by inadequate SWM

Sustainability



- Current S&S regulations **will not fulfill the goals** of the LAW in the long term
- Public sector **does not have the resources** to address impacts caused by inadequate SWM
- Mimicking natural watershed hydrology through **volume management** represents the BAT for minimizing impacts created by impervious surfaces

Sustainability



- Current S&S regulations **will not fulfill the goals** of the LAW in the long term
- Public sector **does not have the resources** to address impacts caused by inadequate SWM
- Mimicking natural watershed hydrology through **volume management** represents the BAT for minimizing impacts created by impervious surfaces
- **It's "Do-able" Now!**

Sustainability

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Green Development

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Green Development

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Stormwater & Wastewater Issues (go to item)
Learn more about the resources available in the regulatory arena for developers faced with issues regarding water sources and water quality.

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Green Development Events & Courses (1 item)
Stay informed! Consider one of the courses and/or meetings offered on this topic.

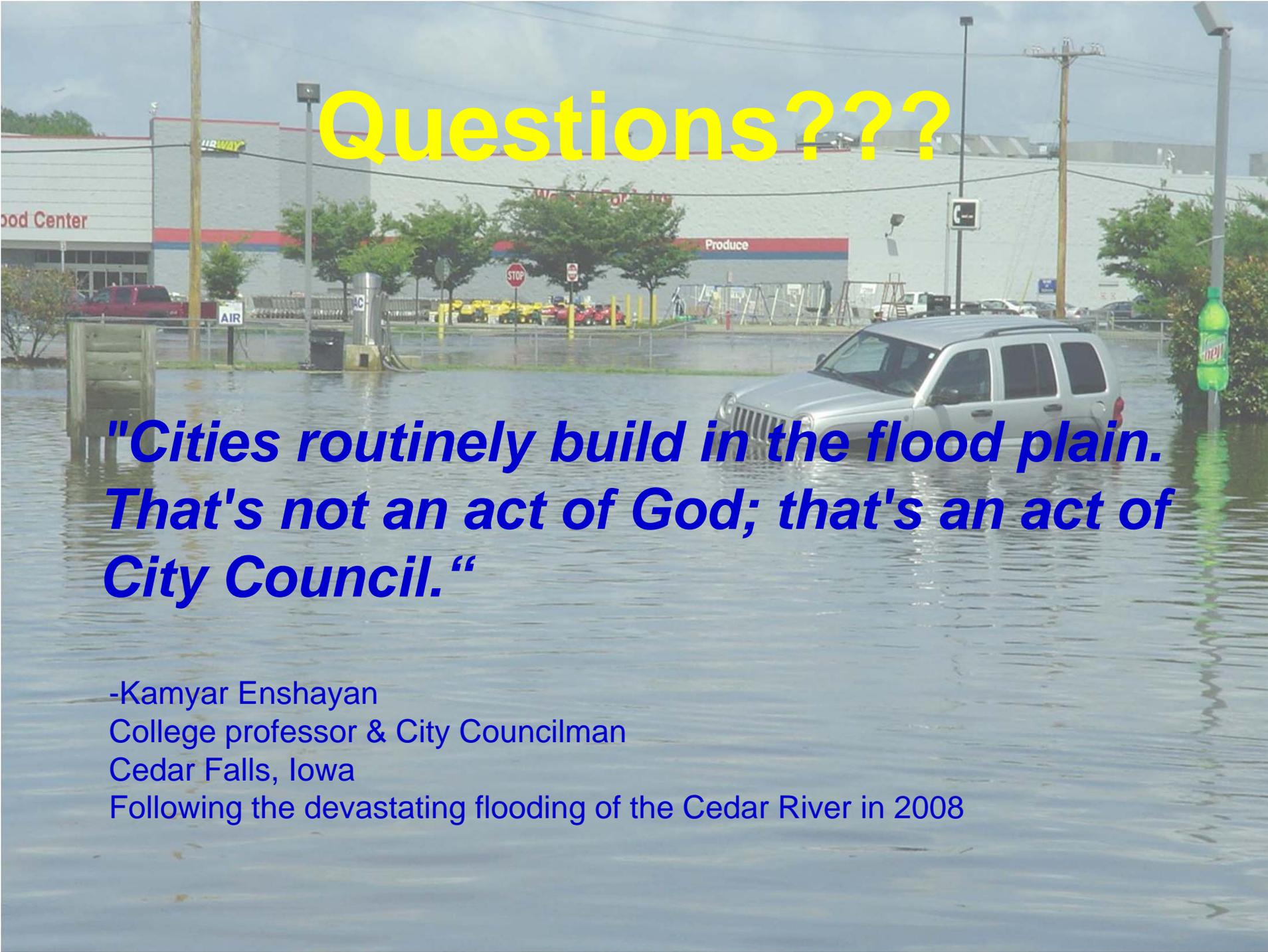
National Green Building Standard Commentary

Get a copy of the National Green Building Standard Commentary, the companion publication to the ANSI-approved National Green Building Standard. The Commentary allows readers to better navigate the Standard. Each chapter breaks down the different components found in the Standard, allowing builders and remodelers to learn the best way to build green in their communities. Available at BuilderBooks.com.

Done

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Questions???

***"Cities routinely build in the flood plain.
That's not an act of God; that's an act of
City Council."***

-Kamyar Enshayan

College professor & City Councilman

Cedar Falls, Iowa

Following the devastating flooding of the Cedar River in 2008