

Stormwater BMP/Technical Advisory Update



Mike Randall

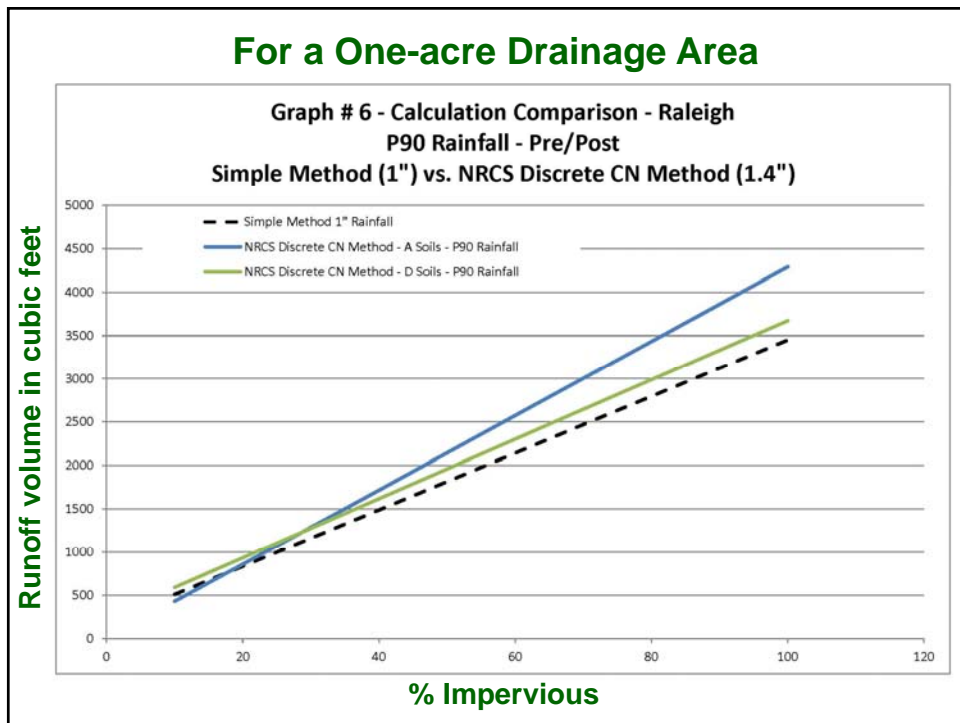
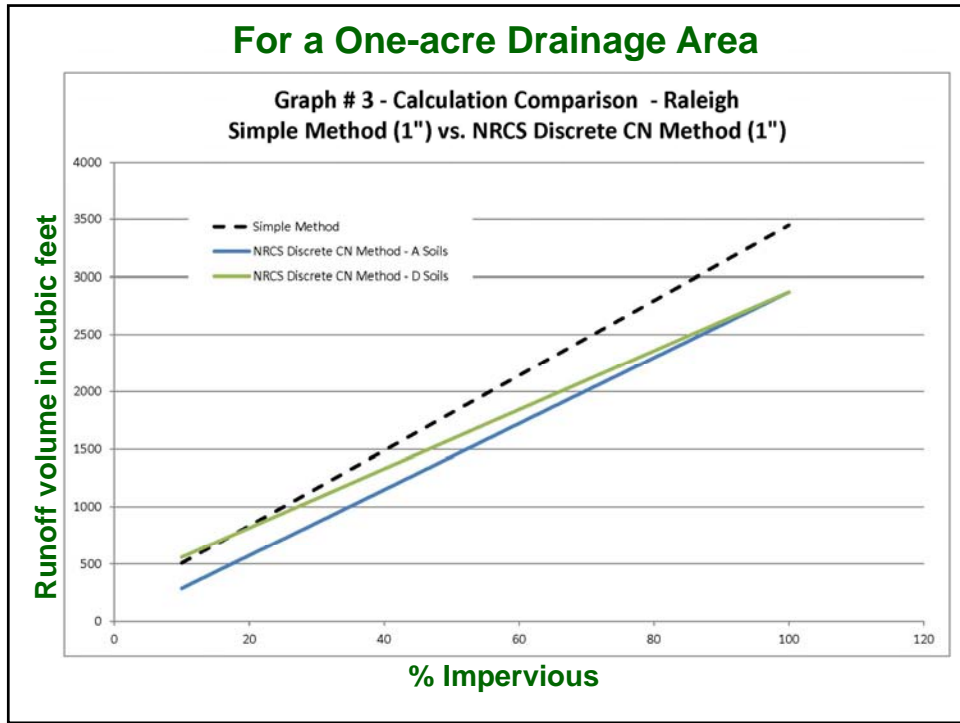
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Encourage Volume Matching

- **Volume matching (LID) to be voluntary**
- **Updated BMP credits based on soil types and infiltration rates**
- **Provide cost effective alternatives for developers**
 - Disconnected surfaces and overland flow
 - Rainwater harvesting
- **Develop tools to simplify the permit process**
- **Allow Discrete CN Method in lieu of mandating the Simple Method**

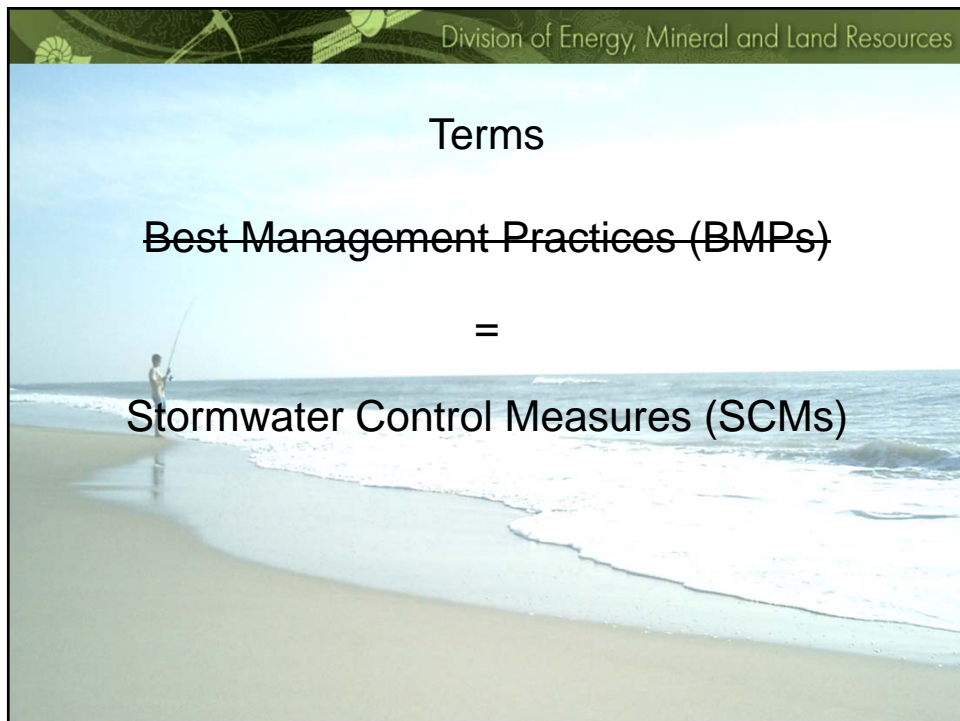




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Minimum Design Criteria Update:
How they Change Design of
Stormwater Control Measures (SCMs)

Prepared by Annette Lucas, PE
Presented by Mike Randall
NC Division of Energy, Mineral and Land Resources
Stormwater Program



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Terms

~~Best Management Practices (BMPs)~~

=

Stormwater Control Measures (SCMs)

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SL 2013-82 (H480) requirements

DENR shall convene stakeholders to:

1. Develop MDC that encompass all requirements for SCMs.
Deadline for DENR to submit to ERC: Feb. 1, 2015.
2. Develop a fast-track permitting process – no technical review when all SCMs comply with all MDC & the permit application is prepared by a qualified individual.
Deadline for rule adoption: July 1, 2016.

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MDC apply to all measures regardless of:

Geographical location, stormwater program
or fast-track or regular review process.

Legend

Site Specific Management Plan(s)	ORW
NPDES Phase I & II MS4	HQW
Phase II	Water Supply Watersheds
SA Waters	Jordan Reservoir Watershed
Randleman Watersheds	Phase II Tipped Counties (Post-Construction)
Neuse NSW Stormwater Program	Coastal Counties - Geographic
Tar-Pam NSW Stormwater Program	Impervious Parking Legislation Applies

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MDC compared to current BMP Manual

- More flexible
- Updated
- More autonomy for designer
- Simpler
- Less costly to design & build
- More consistent from SCM to SCM

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Wet Ponds

Infiltration Systems

Sand Filters

Stormwater Wetlands

Bioretention Cells

Wet ponds: The vegetated shelf is reduced from 10 to 6 feet in width.



Wet ponds: May be sized using the Hydraulic Retention Time method (or SA/DA tables)

SA/DA Tables:

Surface area of pond based on the drainage area size, % BUA and pond depth.

Table 10-1
Surface Area to Drainage Area Ratio for Permanent Pool Sizing to Achieve 85 Percent TSS
Pollutant Removal Efficiency in the Mountain and Piedmont Regions, Adapted from Driscoll, 1986

Percent Impervious Cover	Permanent Pool Average Depth (ft)						
	3.0	4.0	5.0	6.0	7.0	8.0	9.0
10%	0.59	0.49	0.43	0.35	0.31	0.29	0.26
20%	0.97	0.79	0.70	0.59	0.51	0.46	0.44
30%	1.34	1.08	0.97	0.83	0.70	0.64	0.62
40%	1.73	1.43	1.25	1.05	0.90	0.82	0.77
50%	2.06	1.73	1.50	1.30	1.09	1.00	0.92
60%	2.40	2.03	1.71	1.51	1.29	1.18	1.10
70%	2.88	2.40	2.07	1.79	1.54	1.35	1.26
80%	3.36	2.78	2.38	2.10	1.86	1.60	1.42
90%	3.74	3.10	2.66	2.34	2.11	1.83	1.67

Table 10-2
Surface Area to Drainage Area Ratio for Permanent Pool Sizing to Achieve 85 Percent TSS
Pollutant Removal Efficiency in the Coastal Region, Adapted from Driscoll, 1986

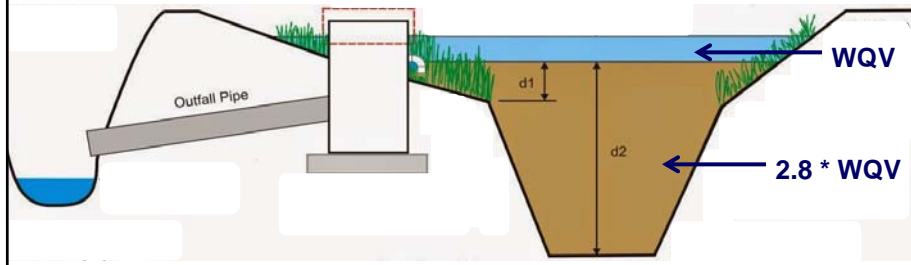
Percent Impervious Cover	Permanent Pool Average Depth (ft)									
	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5'
10%	0.9	0.8	0.7	0.6	0.5	0	0	0	0	0
20%	1.7	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5
30%	2.5	2.2	1.9	1.8	1.6	1.5	1.3	1.2	1.0	0.9
40%	3.4	3.0	2.6	2.4	2.1	1.9	1.6	1.4	1.1	1.0
50%	4.2	3.7	3.3	3.0	2.7	2.4	2.1	1.8	1.5	1.3
60%	5.0	4.5	3.8	3.5	3.2	2.9	2.6	2.3	2.0	1.6
70%	6.0	5.2	4.5	4.1	3.7	3.3	2.9	2.5	2.1	1.8
80%	6.8	6.0	5.2	4.7	4.2	3.7	3.2	2.7	2.2	2.0
90%	7.5	6.5	5.8	5.3	4.8	4.3	3.8	3.3	2.8	2.3
100%	8.2	7.4	6.8	6.2	5.6	5.0	4.4	3.8	3.2	2.6

Wet ponds: May be sized using the Hydraulic Retention Time method (or SA/DA tables)

$$V_{pp} = \frac{HRT}{5} * WQV$$

Where: V_{pp} = Permanent pool volume (cu ft)
 HRT = 14 days (hydraulic residence time)
 WQV = Water quality volume (cu ft)

Volume of pond 2.8 time the WQV.



Wet ponds no longer require a level spreader-vegetated filter strip at the outlet.



This means 85% TSS removal ponds are no longer relevant.

Infiltration systems shall dewater within 72 hours based on a soil investigation.



Infiltration systems no longer require a flow splitting device.




Infiltration systems: Drainage area no longer limited to 2 acre-inches.



Stormwater wetlands: ponding depth has been increased from 12 to 15 inches.



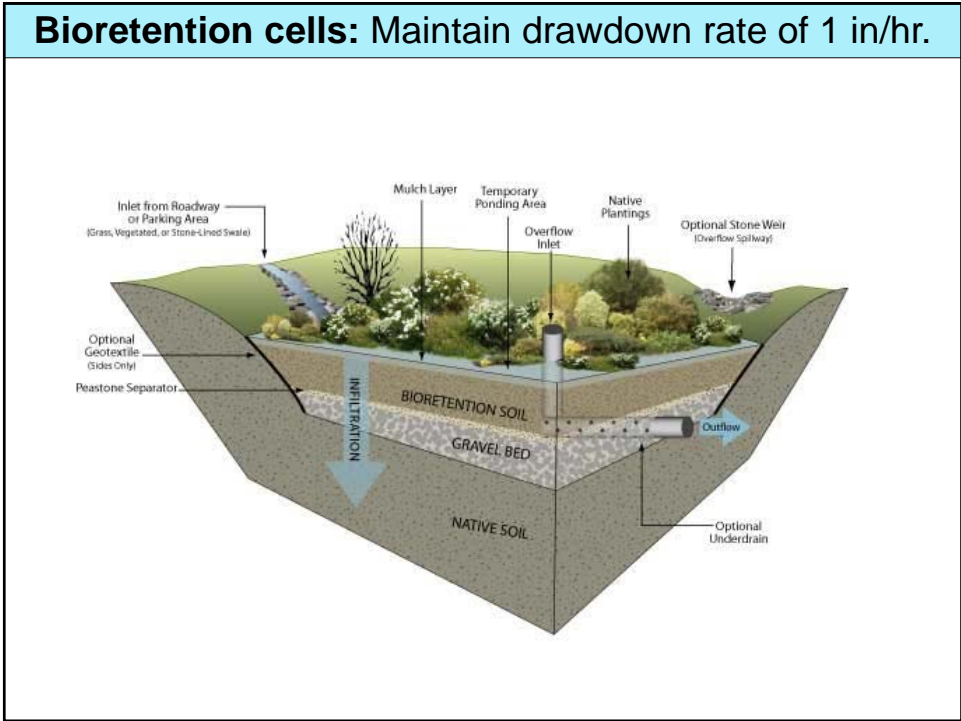
Stormwater wetlands: the first 12" depth of the soil shall be adjusted if necessary to promote plant growth.

NCDM Agronomic Division 4500 Reedy Creek Road Raleigh, NC 27607-6465 (919) 733-2655										Report No: 02259												
Gross: Educational Sample-Swine Waste										Copies to: County Extension Director												
4500 Reedy Creek Rd. Raleigh, NC 27607										Farm:												
 Soil Test Report																						
1725-96 SERVING N.C. CITIZENS FOR OVER 50 YEARS																						
Agronomist Comments:										C - 12												
Field Information		Applied Lime		Recommendations																		
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note							
NH1	Bahiagrass				1st Crop: Berm Hay/Pas.E	1.77	60-80	90-110	40-60	0	0	0	0	0	12							
					2nd Crop: Berm Hay/Pas.M	0	180-220	80-100	120-140	0	0	0	0	0	12							
Test Results																						
Soil Class	HM%	W/V	CRC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-Al (1)	Mn-Al (2)	Zn-I	Zn-Al	Cu-I	S-I	SS-I	NH-N	NH-N	Nu	
ME1	0.41	0.84	3.8	55.0	1.8	4.5	21	44	34.0	13.0	2089	1265	1265	48	48	77	78	24				0.1
Field Information																						
Field Information		Applied Lime		Recommendations																		
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note							
W2	Bahiagrass				1st Crop: Berm Hay/Pas.E	1.27	60-80	0	0-20	0	0	0	0	0	12							
					2nd Crop: Alfalfa, E	0	10-30	0	50-70	0	0	0	3	0	12							
Test Results																						
Soil Class	HM%	W/V	CRC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-Al (1)	Mn-Al (2)	Zn-I	Zn-Al	Cu-I	S-I	SS-I	NH-N	NH-N	Nu	
ME1	0.36	0.82	3.8	66.0	1.5	4.9	67.0	71	44.0	13.0	2353	1421	1421	68.3	68.3	149.3	60	17				0.1



Bioretention cells: 75-85% medium to coarse washed sand & no mechanical compaction.





Bioretention cells: Must provide internal water storage unless in-situ soil infiltration rate > 2 in/hr.



Sand filters: Sand media shall meet ASTM C33.



Sand filters: maintain media at a drawdown rate of at least two inches per hour at the sand surface.



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When can we begin using the MDC?



Public Notice of the MDC: March 12, 2015

1. Request for Public Comment by June 12, 2015.
2. Option to Begin Using the MDC Immediately under the “alternative design” provisions of 15A NCAC 2H .1008(h).

Next: The fast-track process



Session Law on fast-track permitting

The EMC shall adopt a fast-track permitting rule no later than July 1, 2016. The rule shall provide processes for:

- Permit application, review, and determination.
- Ensuring compliance with the MDC.
- Specifying the types of professionals that are qualified to prepare a fast-track permit application.
- Establishing the liability of a professional who prepares a fast-track permit application that fails to comply with the MDCs.

Possible Rule-Making Schedule

The fast-track rule must be adopted no later than May 2016.

Jul 8, 2015	WQC approves rule text
Jul - Oct 2015	DEMLR develops fiscal note
Nov 1, 2015	OSBM certifies fiscal note
Nov 12, 2015	WQC / EMC approves rule & fiscal note
Nov 20, 2015	DEMLR's files rule & fiscal note in Register
Dec 15, 2015	Comment period begins (hearing after 12/29)
Feb 16, 2016	Comment period ends
May 2016	WQC / EMC adopts rule



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 - HQW & ORW
 - USMP
 - Training

Minimum Design Criteria Team

The purpose of the Minimum Design Criteria (MDC) Team is to meet the regulatory requirements associated with [Session Law 2013-82 \(House Bill 480\)](#), which requires DENR to convene a stakeholder team that includes industry experts, engineers, environmental consultants, university faculty and other stakeholders.

The law tasks the MDC Team with the following:

1. To consult with DENR in developing MDCs that encompass all requirements for siting, design, construction and maintenance of stormwater BMPs. The MDC shall be developed with the goal of generating state stormwater permits that comply with water quality standards. DENR shall submit its recommendations to the Environmental Review Commission by February 1, 2015.
2. To consult with the N.C. Environmental Management Commission (EMC) in developing a fast-track permitting process for issuing state stormwater permits without a technical review when all BMPs comply with all MDCs and the permit application is prepared by a qualified individual. The EMC shall adopt a fast-track permitting rule by July 1, 2016.

The MDC Team has met once a month since March 2014. The table below includes the materials MDC Team members need to prepare for meetings as well as meeting minutes.

MDC Team work products include:

- [MDC to Date 1-27-15](#)
- [Final MDC Team Charter](#)
- [MDC Designation Process](#)



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Thank you to the MDC Team!

Marc Houle, PE	Robert Patterson, PE
Cameron Moore	Mike MacIntyre, PE
Ronald Horvath, PE	Todd Miller
Tim Clinkscales, PE	Peter Raab
Hunter Freeman, PE	Larry Ragland, RLA, ASLA
Mike Gallant, PE	Bill Hunt, PhD, PE
Tom Murray, PE	Eban Bean, PhD, PE
JD Solomon, PE	Brian Lipscomb, PE
Rob Weintraub	Joe Hinton, LSS
Jonathan Bivens, PE	Boyd Devane
Derek Pielech, PE	Bradley Bennett
Virginia Spillman, PE	Linda Lewis

A photograph of a person fishing on a sandy beach. The person is standing in the shallow surf, holding a fishing rod. The waves are breaking onto the shore, creating white foam. The sky is clear and blue. The overall scene is peaceful and scenic.

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