Summary of State Post Construction Stormwater Standards

Office of Water
Office of Wastewater Management
Water Permits Division

Updated July 2016

This document summarizes post-construction standards for stormwater discharges from newly developed and redeveloped sites for all 50 states and the District of Columbia.

Aspects of each state's post-construction program are summarized in the introductory table. There are three types of performance standard[1] for stormwater discharges from newly developed sites identified as a numeric volume-based/retention standard, treatment standard or a narrative standard. Volume-based or retention standards typically require the use of infiltration, evapotranspiration or harvest practices to control a specified volume of stormwater on-site and are usually expressed as a volume of rainfall, a percentile storm event or a groundwater recharge volume. Treatment standards typically specify an amount of pollutant to be managed (e.g., 80% TSS removal). Exceptions to meeting the standards on sites are described. The state's standard for redeveloped sites is also included. Overall, 28 states and DC and PR have some type of retention standard, 10 states have a treatment only standard (with no retention requirements) and 12 states only have a narrative standard.

Some states apply their standards statewide to all newly developed and redeveloped sites of a certain size threshold (indicated in the table as "statewide"). Other states apply their standard only to sites in regulated Phase I and Phase II Municipal Separate Storm Sewer System areas (indicated as "MS4s", or "Phase I MS4s") or certain sensitive areas (i.e. "wetland areas or coastal areas"). The regulatory source of the standard is indicated in parentheses such as State Regulation, Construction General Permit (CGP), Phase I MS4 permit or Phase II MS4 permit. The size threshold of the newly or redeveloped site to which the standard applies (typically one acre of disturbed area) is also indicated.

A full summary of each state's post construction program is described in the body of the document in a consistent format. Additional information on special criteria, offset or mitigation options, inspection and maintenance requirements and definitions is included. Links to the sources of information including regulations, design manuals, or other information published by each program are included as of July 2016. This document will be updated periodically as states updated their performance standards.

For comments or corrections contact:
Holly Galavotti
US Environmental Protection Agency
Galavotti.Holly@epa.gov

[1] Channel protection and flood controls standards are also described for each state in the body of the document.

ABBREVIATIONS

CGP	Construction General Permit
IC	Impervious Cover
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
RR	Runoff Reduction
SF	Square Feet
TP	Total Phosphorus
TSS	Total Suspended Solids
WQv	Water Quality Volume

Table 1. State Post Construction Stormwater Standards

Click on State Name for Full Summary

EPA Region	Program	Where required?	Size Threshold	Performance Standards for New Development			Redevelopment Standard
				Volume-based/ Retention Standard	Treatment Standard	Exception	
1	Connecticut	Statewide (CGP)	1 acre disturbed area	Retain 1 inch	Reduce the average annual TSS loadings by 80% (assumed met by retention standard).		For sites >40% effective IC, retain 0.5 inch and treat remaining 0.5 inch
1	Maine	MS4s (State regulation)	1 acre disturbed area		Treat 1" times impervious area plus 0.4 times pervious area		No increase in current stormwater runoff
1	Massachusetts	MS4s (Phase II permit)	1 acre disturbed area	Retain 1 inch multiplied by the impervious area and/or meet treatment standard	Remove 90% TSS AND 60% TP generated from the impervious area		Retain 0.8 inch multiplied by the impervious area and/or remove 80% TSS AND 50% TP generated from the impervious area
1	New Hampshire	MS4s (State regulation)	1 acre disturbed area / 100,000 sf outside MS4s	Narrative standard			
1	Rhode Island	MS4s (Phase II permit)	1 acre disturbed area		Capture and treat WQv equivalent to 1.2" rainfall runoff	WQv requirement may be waived or reduced by applying disconnection-based LID practices	Same as new development if <40% IC; >40% IC then reduce IC by 50% or water quality and recharge for 50% of area
1	Vermont	State-wide (State regulation)	1 acre development, redevelopment and/or increased impervious cover	Capture 90% annual storms	80% TSS and 40% TP removal	WQv may be reduced where non-structural practices are employed.	Reduce IC by 20% or treat 20% of WQv
2	New Jersey	State-wide (State regulation)	1 acre disturbed area or increase IC by ≥ 0.25 acres	Maintain groundwater recharge volume or infiltrate runoff for 2-year storm (post development volume to predevelopment volume)	80% TSS reduction		50% TSS reduction or equivalent to existing BMP; 80% TSS removal to new IC
2	New York	State-wide (CGP)	1 acre disturbed area	Runoff Reduction (RR) for post-development volume (0.8" – 1.2") to replicate pre-development hydrology	Remaining WQv not retained must be treated	Single family homes less than 5 acre disturbance	Same as new development but if not possible IC reduced by 25%, and/or 25% WQv treated
2	Puerto Rico	MS4s (Phase II permit)	1 acre disturbed area	If practicable, retain 1 inch			
3	Delaware	State-wide (State regulation)	5,000 sf disturbed area	RR for Resource Protection Event (1-year) (post-development runoff volume to predevelopment volume) or 0% effective IC	Remaining WQv not retained must be treated	RR practices should be employed to the MEP.	RR to achieve 30% reduction in effective impervious area from existing conditions

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				Volume-based/ Retention Standard	Treatment Standard	Exception	
3	Maryland	State-wide (State regulation)	5,000 sf disturbed area	Runoff Reduction using Environmental Site Design required for treatment, and to the MEP for 1-year storm.	Manage 0.9" / 1" of rainfall		Same as new development if <40% IC, for >40% IC, volume control (ESD to the MEP) required for 50% of existing imperviousness, or reduce impervious area by 50%, or combination; no channel protection for existing imperviousness
3	Pennsylvania	State-wide (State regulation)	1 acre disturbed area	For sites <1 acre; remove 1" of runoff from IC. All sites: No post development runoff volume increase for the 2-year storm	85% reduction TSS and TP; 50% reduction in NO3-N		Same as new development; modeling guidance for pre-development IC
3	District of Columbia	District-wide (Phase I permit)	5,000 sf of land disturbance	1.2 inches (90th percentile storm)	0.3-0.5 inch treatment (Guidance)		
3	Virginia	State-wide (State regulation)	1 acre or 2,500 sf in Chesapeake Bay Preservation Area		New Development: Shall not exceed 0.41 lbs P/acre/yr		20% (sites >1 acre) 10% (sites ≤1 acre) P reduction from existing condition
3	West Virginia	MS4s (Phase II permit)	1 acre disturbed area	Keep and manage on site 1" rainfall from 24-hour storm			0.2" reduction of 1" on site retention standard and additional 0.2" reductions exist
4	Alabama	MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
4	Florida	State-wide (State regulation)	4,000 sf impervious area	Must meet predevelopment volume in closed basins only	Varies by Water Management District – from first ½ inch runoff to 1.25 times percent imperviousness plus an additional one half inch of runoff for online retention systems		Same as new development
4	Georgia	MS4s (Phase II permit)	1 acre disturbed area		Treat runoff from 85% of storms (1.2" rainfall)		Same as new development
4	Kentucky	MS4s (Phase II permit)	1 acre disturbed area		Manage 80th percentile precipitation event runoff (0.75")[2]		Same as new development

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4	Mississippi	MS4s (Phase II permit)	1 acre disturbed area	Develop site designs and require measures that infiltrate, evapotranspirate, harvest and/or use first inch of rainfall			Same as new development
4	North Carolina	In 20 coastal counties; water supply watersheds, nutrient sensitive waters, Outstanding National Resource Waters (State regulation)	1 acre disturbed area; Coastal-Non residential: 10,000 sf IC; Residential w/in ½ mile shellfish waters: 10,000 sf IC (other variations for specific programs)		Non-coastal: 1" rainfall; Coastal: 1.5" rainfall or vol. diff. of 1-yr, 24-hr rainfall post-predevelopment	Low density or redevelopment	No treatment required if no net increase in built upon area and provide equal or better stormwater control as previous development
4	South Carolina	MS4s (State regulation)	1 acre disturbed area	1,000 ft from shellfish waters, retain 1.5" of rainfall	Volume control varies by practice		Same as new development
4	Tennessee	MS4s (Phase I/II permits)	1 acre disturbed area	Infiltrate, evapotranspire, harvest, or use first 1" of rainfall		If retention standard cannot be met, 80% TSS removal standard applied to remaining volume	Same as new development
5	Illinois	MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
5	Indiana	MS4s (State regulation)	1 acre disturbed area		Phase I only: Treat runoff from first 1" of precipitation		Same as new development
5	Michigan	MS4s (Phase I/II permits)	1 acre disturbed area	Post-construction rate and volume to not exceed pre-development for all storms up to 2-yr, 24-hr storm	Treat first inch runoff or 90% of all runoff-producing storms (to reduce TSS load by 80% or concentration less than 80 mg/L)		Same as new development
5	Minnesota	State-wide (CGP)	1 acre disturbed area	1 inch retention on-site	No net increase of TSS or TP		Reduce IC and/or implement stormwater management practices
5	Ohio	State-wide (CGP)	1 acre disturbed area		Treat WQv equivalent to 0.75" rainfall runoff volume		20% WQv treatment and/or 20% IC reduction
		Big Darby Creek Watershed (Big Darby CGP)	1 acre disturbed area	Post-development groundwater recharge equal to pre-development groundwater recharge			

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5	Wisconsin	State-wide (State regulation)	1 acre disturbed area	Infiltrate runoff to achieve 60–90% of predevelopment volume based on IC level	80% TSS reduction	Size of infiltration area is limited to 1%–2% of site area.	40% TSS reduction from parking areas and roads or MEP
6	Arkansas	MS4s (Phase II permit)	1 acre disturbed area		"Goal" of 80% removal of TSS		Same as new development
		MS4 (Little Rock - Phase I permit)	1 acre disturbed area	Narrative standard			
6	Louisiana	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
6	New Mexico	MS4s (Middle Rio Grande MS4 permit)	1 acre disturbed area	Capture 90th percentile rainfall event			
		MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
6	Oklahoma	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
6	Texas	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
7	Iowa	MS4s (Manual)	1 acre disturbed area	Narrative standard			
7	Kansas	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
7	Missouri	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
7	Nebraska	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
8	Colorado	MS4s (Phase I/II permits)	1 acre disturbed area	Infiltrate WQ control volume (80th percentile storm event)	Treat 80th percentile storm event or reduce TSS to 30 mg/L or less		
8	Montana	MS4s (Phase II permit)	1 acre disturbed area	Infiltrate, evapotranspire, or capture for reuse runoff from first 0.5"			Same as new development
8	North Dakota	MS4s (Phase II permit)	1 acre disturbed area		Treat 0.5" runoff from IC		Same as new development
8	South Dakota	MS4s (Phase I/II permits)	1 acre disturbed area	Narrative standard			
8	Utah	MS4s (Phase I/II permits)	1 acre disturbed area	Retain on-site the 90th percentile storm event		Infeasibility Demonstration	Same as new development

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8	Wyoming	MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
9	Arizona	MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
		MS4s (Phase I Permits)	1 acre disturbed area	Detain on-site the 100-year, 2 hour storm event			
9	California	Statewide (CGP, Phase I/II permits)	5,000 sf IC	Retain volume from 85th percentile storm event		Biofiltration may be used if retention is infeasible	Local program defined
9	Hawaii	MS4s (Honolulu Phase I permit)	1 acre disturbed area	Retain on-site 1 inch storm			
		MS4s (Phase II permit)	1 acre disturbed area	Narrative standard			
9	Nevada	MS4s (Phase I/II permits)	1 acre disturbed area		80% annual runoff volume treatment	Treatment volume may be locally determined based on historical records	Same as new development
10	Alaska	MS4s (Anchorage Phase I permit)	1 acre disturbed area	Retain first 0.52 inches of rainfall from 24 hr event preceded by 48 hrs of no precip.			Same as new development
		MS4s (Phase II)	1 acre disturbed area	Narrative standard			
10	Idaho	MS4s (Boise Phase I permit)	5,000 sf	Retain first 0.6 inch rainfall			
		MS4s (Phase II)	1 acre disturbed area	Narrative standard			
10	Oregon	MS4s (Phase I permit)	1 acre disturbed area	80% average annual runoff volume reduction			Capture and treat 80% annual average runoff
		MS4s (Phase II)	1 acre disturbed area	Narrative standard			
10	Washington	MS4s (Phase I/II permits)	2000 sf of new and/or replaced IC or 7000 sf disturbed area	Infiltrate, disperse, and retain onsite to Maximum Extent Practicable (MEP)	Volume predicted from 6 month 24 hr storm OR 91st percentile 24 hr runoff volume indicated by continuous runoff model. Max flow rate where 91% of runoff volume (determined by model) will be treated		Same as new development when size threshold is met.

Program Name: Connecticut DEP Stormwater Management Program

Program Status: State NPDES Regulations, Phase II MS4 General Permit (2016), Construction General Permit (2013), Connecticut Stormwater Quality Manual (2004)

Regulatory Authority: Construction General Permit Section 5(b)(2)(C)(i) requires runoff reduction practices. Phase II MS4 general permit contains a specific stormwater standard (1 inch retention) for discharges located less than 500 feet from a tidal wetland that is not a fresh-tidal wetland (Section 5 of small MS4 permit), but contains a narrative standard for all other sites. Stormwater Quality Manual, which contains the stormwater standard described below, is non-regulatory (Section 1.4 of Manual).

Standard source: Connecticut Stormwater Quality Manual (non-regulatory)

Website references:
Connecticut DEP Stormwater Website
http://www.ct.gov/dep/cwp/view.asp?A=2721&Q=325702

2016 General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (effective July 1, 2017):
http://www.ct.gov/deep/lib/deep/Permits_and_Licenses/Water_Discharge_General_Permits/MS4_gp.pdf

2013 General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ("Construction General Permit"):
http://www.ct.gov/deep/cwp/view.asp?a=2721&q=558612&DEEPNav_GID=1654

2004 Connecticut Stormwater Quality Manual:
http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325704

Regulations:
http://www.ct.gov/deep/lib/deep/regulations/22a/22a-430-3and4.pdf

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4 or directly to waters of the State.

Limited geographic area where standards apply: Statewide

Significant exemptions: Indian lands are exempt.

Post-Construction Standards for New Development: The following standards are described in the Construction General Permit and Phase II MS4 permit, as well as the Stormwater Quality Manual.

On-Site Retention/Volume Control:

- For redevelopment of sites that are currently 40% or more directly connected impervious area, retain on-site half the water quality volume (1/2 inch). (MS4 General Permit, p. 27)
- For all new development or for redevelopment with less than 40% DCIA, capture and treat the water quality volume of runoff generated by one inch of rainfall. (Construction General Permit Section 5(b)(2)(C)(i)(b); MS4 permit; Manual, p. 7-3)

- If the permittee initiates, creates, or originates a discharge of stormwater which is located less than 500 feet from a tidal wetland that is not a fresh-tidal wetland, such discharge shall flow through a system designed to retain the volume of stormwater runoff generated by 1 inch of rainfall on the watershed for that system. (MS4 Permit, p. 17)
- The Water Quality Flow (WQF), which is the peak discharge from the 1 inch storm, may be used in some conveyance-based practices instead. (Manual, p. 7-3)

Treatment Requirement:
Reduce the average annual TSS loadings by 80 %. (Manual, p. 3-2) (Assumed to be achieved by water quality volume control standards)

Channel protection requirement:
Control the 2-yr, 24-hour post-development peak flow rate to 50 percent of the 2-yr, 24-hr pre-development level or to the 1-yr, 24-hr pre-development level. (Manual, p. 7-9)

Flood control requirement:
- Design the conveyance system leading to, from, and through stormwater management facilities based on the 10-year, 24-hour storm. (Manual, 7-10)
- Control the post-development peak discharge rates from the 10-, 25-, and 100-year storms to the corresponding pre-development peak discharge rates, as required by the local review authority. (Manual, 7-10)

Redevelopment standard: For sites currently with an effective impervious cover of 40% or more, retain on-site half the water quality volume (1/2 inch of rainfall) and provide additional treatment without retention for up to the full water quality volume (Construction General Permit Section 5(b)(2)(C)(i)(a)).

Special criteria:
High Quality Waters — High quality receiving waters and sites with the highest potential for significant pollutant loadings, reduce post-development pollutant loadings so that average annual post-development loadings do not exceed pre-development loadings (i.e., no net increase) (Manual p. 3-7).

Tidal Wetlands — Retain on-site the volume of runoff generated by the first 1inch of rainfall from areas adjacent to or within 500 feet of tidal salt marshes and estuarine waters (Manual, P 3-7).

Groundwater Recharge — Maintain pre-development annual groundwater recharge volume to the maximum extent practicable through the use of infiltration measures (Manual, p. 7-3)

Offset/mitigation: N/A

Compliance: Compliance through construction general permit.

Inspection & Maintenance/O&M: Stormwater management plans should describe the procedures, including routine and non-routine maintenance, that are necessary to maintain treatment practices, including vegetation, in good and effective operating conditions. Detailed inspection and maintenance requirements/tasks include: Inspection and maintenance schedules; Parties legally responsible for maintenance (name, address, and telephone number); Provisions for financing of operation and maintenance activities; As-built plans of completed structures; Letter of compliance from the designer; post-construction documentation to demonstrate; compliance with maintenance activities. (Manual, p. 9-7)

Does development on agricultural land qualify as redevelopment? N/A

Definition of Impervious surface: None

Definition of New Development: None

Definition of Predevelopment: None

Definition of Redevelopment: None

Stormwater Program Summary – Maine

Program Name: Maine DEP Stormwater Program

Program Status: Existing Regulations Effective 1997, Updated December 27, 2006; Three MS4 General Permits Effective July 1, 2013.

- State Stormwater Management Law: 38 MRSA § 420-D; and Regulation: Chapter 500 & Chapter 502;
- Maine Pollutant Discharge Elimination System MS4 Permit: Permit Nos. MER041000 [Small MS4], MER043000 [Transportation], & MER042000 [State/Federal].

Regulatory Authority: The Stormwater Management Law only applies in organized municipalities, not unorganized townships which occupy about ½ of the state – they are covered by the Land Use Regulation Commission whose stormwater recommendations follow those of ME DEP.

Standard Source: Stormwater Management Regulations, Chapter 500

Website references:
Maine DEP Stormwater Program website
http://www.maine.gov/dep/blwq/docstand/stormwater/index.htm

Stormwater Management Regulations Chapter 500
http://www.maine.gov/dep/land/stormwater/storm.html

Stormwater Management Regulations Chapter 502 (lakes most at risk from new development, and urban impaired streams)
http://www.maine.gov/dep/land/stormwater/storm.html

General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MER041000)
http://www.maine.gov/dep/water/wd/ms4/2013_Municipal_MS4_GP.pdf

General Permit for the Discharge of Stormwater from Maine Department of Transportation and Maine Turnpike Authority Municipal Separate Storm Sewer Systems (MER043000)
http://www.maine.gov/dep/water/wd/ms4/2013_Transportation_MS4_GP.pdf

General Permit for the Discharge of Stormwater from State or Federally Owned Municipal Separate Storm Sewer Systems (MER042000)
http://www.maine.gov/dep/water/wd/ms4/2013_State-Fed_Facility_MS4_GP.pdf

Stormwater Best Management Practices Manual (guidance)
(http://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html)

- Volume I. Stormwater Management Manual
- Volume II. Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development
- Volume III. BMP Technical Design Manual

Size Threshold: A project disturbing one acre or more. Additional thresholds of impervious cover and developed area requires compliance with one or more of the post-construction standards (Chapter 500.4.A)

Limited geographic area where standards apply: The Stormwater Management Law only applies in organized municipalities, not unorganized townships which occupy about ½ of the state. Unorganized townships are covered by the Land Use Regulation Commission whose stormwater recommendations follow those of ME DEP.

Significant exemptions: Certain exemptions apply (See Chapter 500.4.B.(3))

Post-Construction Standards for New Development:
On-Site Retention/Volume Control: N/A

Treatment requirement:
General Standard:

- 20,000 square feet or more of impervious area, or 5 acres or more of developed area, in the direct watershed of an urban impaired stream (listed in Chapter 502);
- One acre or more of impervious area, or 5 acres or more of developed area, in any other stream, coastal, or wetland watershed.
    - Traditional BMPs wet ponds, Filters, Infiltration, and other practices provided in the BMP Manual sized to treat a runoff volume equal to 1-inch times impervious area plus 0.4-inch times the developed pervious area.
    - LID practices are encouraged.

(Chapter 500, Sec. 4(C), p. 7-8)

Phosphorus Standard: Applicable in lake watersheds:

- Allowable per acre phosphorus allocation for designated watersheds serving “at risk” lakes.
- A list of designated Lakes and watersheds is provided by MDEP, and the corresponding phosphorus allocation as determined by MDEP. (Chapter 500, Sec. 4(C), p. 7-8)

Channel protection requirement:
Urban Impaired Stream Standard:

Apply in addition to Basic, General, and Phosphorus Standards when:

- located within the direct watershed of urban impaired stream or stream segment listed in chapter 502;
- Impervious area ≥3 acres
- Developed area ≥ 20 acres
    - Urban Impaired Stream Standard: A project in the direct watershed of an urban impaired stream must pay a compensation fee or mitigate project impacts by treating, reducing or eliminating an off-site or on-site pre-development impervious stormwater source as described in Section 6(A). (Chapter 500, Sec. 4(B)(2), p. 5 & Sec. 6(A) p.13).

Flood control requirement:

- Impervious area ≥ 20 acres; or developed area ≥ 20 acres, or requires review pursuant to the Site

    - Applies in addition to the basic standards, general standards, phosphorus standards and urban impaired stream standards;
    - Stormwater management systems must detain, retain, or infiltrate stormwater such that post developed peak flows from the 2-year, 10-year, and 25-year 24-hour storm frequencies do not exceed the pre-developed peak flows. (Chapter 500, Sec. 4 (E)(1), p. 8).

Redevelopment standard:
Redevelopment of an existing impervious area is not required to meet the General Standard or the urban impaired stream standard provided the department determines that the new use of the existing impervious area is not likely to increase stormwater impacts in the proposed project's stormwater runoff beyond the levels already present in the runoff from the existing impervious area (Chapter 500, Sec. 4(D)(3), p. 8).

Special criteria: *Discharge to Freshwater or Coastal Wetlands*: Stormwater standards for the waterbody must be met before the stormwater enters a wetland. Wetlands must receive stormwater in the same manner as before the project unless otherwise approved or required by the department.

Offset /mitigation: (Compensation Fees and Mitigation Credits)
Offsite mitigation and/or fees may be allowed for:

- General Standard Requirements (Chapter 500, Sec. 6 (B)(1), p. 14).
- Urban Impaired Stream Standard Requirements (Chapter 500, Sec. 4(D)(2), p. 8); and
- Phosphorus Standard Requirements (Chapter 500, Sec. 6(C), p. 15).

Compliance: Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify to the DEP that (1) all aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the facilities and (2) the stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department, and the maintenance log is being maintained (Chapter 500, Sec. 10(A)(9), p. 25).

Inspection & Maintenance/O&M: The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the department (Chapter 500, Sec. 10(A)(8), p. 25).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: The total area of a parcel that consists of buildings and associated constructed facilities or areas that will be covered with a low-permeability material, such as asphalt or concrete, and areas such as gravel roads and unpaved parking areas that will be compacted through design or use to reduce their permeability. A natural or man-made waterbody is not considered an impervious area, but is treated as an immediate runoff surface in curve number calculations (Chapter 500 (3)(K), p. 2).

Definition of predevelopment: An impervious or developed area created prior to the effective date of the Stormwater Management Law for a stormwater project, or the effective date of the jurisdictional threshold under which a development is licensed for a Site Law development (Chapter 500 (3)(U), p. 3).

Definition of new development: All land areas that are stripped, graded, grubbed, filled, or excavated at any time during the site preparation or removing vegetation for, or construction of, a project (definition of "Disturbed area") excluding area that within one calendar year of being disturbed is returned to a condition with the same drainage pattern that existed prior to the disturbance and is revegetated, provided the area is not mowed more than once per year (Chapter 500 (3)(D), p. 1).

Definition of redevelopment: An activity undertaken to redevelop property in which the new developed area, not including maintenance, is located within the same footprint as the existing developed area. Redevelopment projects do not include such activities as exterior remodeling (*MER041000, p.5)*.

Additional references:
Land Use Regulation Commission:
http://www.maine.gov/doc/lurc/

Stormwater Program Summary – Massachusetts

Program Name: Massachusetts NPDES Stormwater Program

Program Status:

- Existing MS4 Program Stormwater Program: Small MS4 Permit General Permits issued April 4, 2016
- Wetlands Protection Act, M.G.L. c. 131, § 40; and Regulation, 310 C.M.R. 10.00
- Massachusetts Clean Waters Act, M.G.L .c. 21, §§ 26-53, and Regulation 314 CMR 9.00.

Regulatory Authority: U.S. EPA NPDES MA MS4 permits cover small municipal separate storm sewer systems (MS4s) located in the Commonwealth of Massachusetts:

- Traditional Cities and Towns (NPDES Permit No. MAR041000)
- State, federal, county and other publicly owned properties (Non-traditional) (MAR042000)
- State transportation agencies (except for MassDOT-Highway Division) (MAR043000)

Standard sources:

- Small MS4 Permit General Permit issued April 4, 2016
- Massachusetts Stormwater Handbook is a comprehensive guide to the Stormwater Standards set forth in the Wetlands regulations, 310 CMR 10.00 and 401 regulations, 314 CMR 9.00 (January 2008).

Massachusetts Stormwater Standards

- State stormwater requirements: enforced only in wetland resource areas and buffer zones through Mass. Wetlands Protection and 401 regulations (about 12% of the State).
- Standards apply to new development and redevelopment only within wetlands jurisdictional areas and adjacent 100-foot buffer zone.
- Standards do not apply to existing stormwater discharges, or new development and redevelopment located outside of wetland resource areas, unless and until they alter a wetland resource area. The burden is on local town or MassDEP to prove that an existing stormwater discharge altered a wetland.
- Adopted as part of the state Wetlands and 401 Regulations in 2008, previously enforced through a policy issued by MassDEP in 1996
- Towns may adopt Standards locally

Website references:
Small MS4 Permit General Permits issued April 4, 2016
https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp.pdf

Massachusetts Stormwater
http://www.mass.gov/dep/water/wastewater/stormwat.htm

The Wetlands Protection Act Regulations
http://www.mass.gov/eea/docs/dep/service/regulations/310cmr10a.pdf

Surface Water Quality Standards
http://www.mass.gov/dep/service/regulations/314cmr04.pdf

Surface Water Discharge Permit Program
http://www.mass.gov/eea/docs/dep/service/regulations/314cmr03.pdf

Massachusetts Stormwater Handbook
http://www.mass.gov/eea/agencies/massdep/water/regulations/massachusetts-stormwater-handbook.html

Size Threshold:

- For the small MS4 permits: 1-acre land disturbance including sites less than one acre if the site is part of a larger common plan of development or redevelopment which disturbs one or more acre.
- For the Mass. Wetlands Protection and 401 regulations: No regulatory size threshold – all new development and redevelopment within wetland resource area or buffer zone are required to comply with Stormwater Standards (except for single family house projects not part of a pattern of common development)

Limited geographic area where standards apply:

- MA MS4 Permits: Applies in regulated MS4s
- Mass. Wetlands Protection and 401 regulations: Standards only apply to new development and redevelopment within wetland resource areas and their buffer areas
- Towns may apply Standards to other areas at local option

MA small MS4 Permits

Post-Construction Standards for New Development: Low Impact Development (LID) site planning and design strategies must be used to the maximum extent feasible.

On-Site Retention/Volume Control: Retain the volume of runoff equivalent to, or greater than, one (1.0) inch multiplied by the total post-construction impervious surface area on the site AND/OR the following treatment standard.

Treatment standard: Remove 90% of the average annual load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 60% of the average annual load of Total Phosphorus (TP) generated from the total post-construction impervious surface area on the site (the required removal percentage is not required for each storm, it is the average removal over a year that is required). Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1, where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

Recharge groundwater in accordance with Massachusetts Stormwater Handbook Standard 3: Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices and good operation and maintenance. At a minimum, the annual recharge from the post development site shall approximate the annual recharge from the pre-development conditions based on soil type. (310 C.M.R. 10.00; Handbook, Volume 1, Chapter 1, Standard 3, p. 1).

Channel protection requirement: Stormwater management systems on new development sites shall be designed to not allow new stormwater conveyances to discharge untreated stormwater in accordance with Massachusetts Stormwater Handbook Standard 1: No new stormwater conveyances (*e.g*. outfalls) may cause erosion in wetlands or waters of the Commonwealth (Handbook, Volume 1, Chapter 1, Standard 1, p. 1).

Flood control requirement: Control peak runoff rates in accordance with Massachusetts Stormwater Handbook Standard 2: Peak rate control for runoff from the 2-year and 10-year 24-hour storms, and if increased off-site flooding will result from peak discharges from the 100-year 24-hour storm (Handbook, Volume 1, Chapter 1, Standard 2, p. 1).

Redevelopment standard:
On-Site Retention/Volume control: Retain the volume of runoff equivalent to, or greater than, 0.80 inch multiplied by the total post-construction impervious surface area on the site AND/OR the following redevelopment treatment standard.

Redevelopment Treatment standard: Remove 80% of the average annual post-construction load of Total Suspended Solids (TSS) generated from the total post-construction impervious area on the site AND 50% of the average annual load of Total Phosphorus (TP) generated from the total post construction impervious surface area on the site. Pollutant removal shall be calculated consistent with EPA Region 1's BMP Performance Extrapolation Tool or other BMP performance evaluation tool provided by EPA Region 1 where available. If EPA Region 1 tools do not address the planned or installed BMP performance any federally or State approved BMP design guidance or performance standards (e.g. State stormwater handbooks and design guidance manuals) may be used to calculate BMP performance.

Redevelopment activities that are exclusively limited to maintenance and improvement of existing roadways, (including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects) shall improve existing conditions where feasible and are exempt the redevelopment standards. Roadway widening or improvements that increase the amount of impervious area on the redevelopment site by greater than or equal to a single lane width shall meet the redevelopment standards.

Special criteria:
- The design of treatment and infiltration practices should follow the guidance in Volume 2 of the Massachusetts Stormwater Handbook, as amended, or other federally or State approved BMP design guidance.
- Eliminate or reduce the discharge of pollutants from land uses with higher pollutant loads as defined in the Massachusetts Stormwater Handbook in accordance with Massachusetts Stormwater Handbook Standard 5
- Protect Zone II or Interim Wellhead Protection Areas of public water supplies in accordance with Massachusetts Stormwater Handbook Standard 6

Offset/mitigation: Stormwater management systems on redevelopment sites may utilize offsite mitigation within the same USGS HUC10 as the redevelopment site to meet the equivalent retention or pollutant removal requirements.

Compliance:

- As-built drawings are required 2 years after completion of construction projects. The as-built drawings must depict all on site controls, both structural and non-structural, designed to manage the stormwater associated with the completed site (post construction stormwater management).
- The new development/redevelopment program shall have procedures to ensure adequate long-term operation and maintenance of stormwater management practices that are put in place after the completion of a construction project. These procedures may include the use of dedicated funds or escrow accounts for development projects or the acceptance of ownership by the permittee of all privately owned BMPs. These procedures may also include the development of maintenance contracts between the owner of the BMP and the permittee. Alternatively, these procedures may include the submission of an annual certification documenting the work that has been done over the last 12 months to properly operate and maintain the stormwater control measures. The procedures to require submission of as-built drawings and ensure long term operation and maintenance shall be a part of the SWMP. The permittee shall report in the annual report on the measures that the permittee has utilized to meet this requirement.
- A report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover is required within 4 years of the effective date of the small MS4 permit (April 2020). This assessment shall be used to provide information to allow the permittee to determine if changes to design standards for streets and parking lots can be made to support low impact design options. If the assessment indicates that changes can be made, the assessment shall include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The local planning board and local transportation board should be involved in this assessment. This assessment shall be part of the SWMP. The permittee shall report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.
- A report assessing existing local regulations to determine the feasibility of making, at a minimum, the following practices allowable when appropriate site conditions exist within 4 years from the effective date of the small MS4 permit (April 2020):
    i. Green roofs;
    ii. Infiltration practices such as rain gardens, curb extensions, planter gardens, porous and pervious pavements, and other designs to manage stormwater using landscaping and structured or augmented soils; and
    iii. Water harvesting devices such as rain barrels and cisterns, and the use of stormwater for non-potable uses.

The assessment should indicate if the practices are allowed in the MS4 jurisdiction and under what circumstances are they allowed. If the practices are not allowed, the permittee shall determine what hinders the use of these practices, what changes in local regulations may be made to make them allowable, and provide a schedule for implementation of recommendations. The permittee shall implement all recommendations, in accordance with the schedules, contained in the assessment. The permittee shall report in each annual report on its findings and progress towards making the practices allowable. (Information available at: https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/AddressingBarrier2LID.pdf and http://www.mapc.org/resources/low-impact-dev-toolkit/local-codes-lid)

- Identification a minimum of 5 permittee-owned properties that could potentially be modified or retrofitted with BMPs designed to reduce the frequency, volume, and pollutant loads of stormwater discharges to and from its MS4 through the reduction of impervious area. This work must occur within 4 years from the effective date of the small MS4 permit (April 2020). Properties and infrastructure for consideration shall include those with the potential for reduction of on-site impervious area (IA) as well as those that could provide reduction of off-site IA. At a minimum, the permittee shall consider municipal properties with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be modified or retrofitted. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified or retrofitted to provide reduction in frequency, volume or pollutant loads of such discharges through reduction of impervious cover.
    - In determining the potential for modifying or retrofitting particular properties, the permittee shall consider factors such as access for maintenance purposes; subsurface geology; depth to water table; proximity to aquifers and subsurface infrastructure including sanitary sewers and septic systems; and opportunities for public use and education. In determining its priority ranking, the permittee shall consider factors such as schedules for planned capital improvements to storm and sanitary sewer infrastructure and paving projects; current storm sewer level of service; and control of discharges to water quality limited waters, first or second order streams, public swimming beaches, drinking water supply sources and shellfish growing areas.
    - Additional permittee owned sites and infrastructure that could be retrofitted shall be identified beginning with the fifth year annual report and in each subsequent annual report, such that the permittee maintains a minimum of 5 sites in their inventory, until such a time as when the permittee has less than 5 sites remaining. In addition, the permittee shall report on all properties that have been modified or retrofitted with BMPs to mitigate IA that were inventoried in accordance with this part. The permittee may also include in its annual report non-MS4 owned property that has been modified or retrofitted with BMPs to mitigate IA.

Inspection & Maintenance/O&M: Implement long term maintenance practices in accordance with Massachusetts Stormwater Handbook Standard 9: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed (Handbook, Volume 1, Chapter 1, Standard 9, p. 2).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: - Any surface that prevents or significantly impedes the infiltration of water into the underlying soil. This can include but is not limited to: roads, driveways, parking areas and other areas created using non porous material; buildings, rooftops, structures, artificial turf and compacted gravel or soil.

Definition of predevelopment: N/A

Definition of new development: any construction activities or land alteration resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) on an area that has not previously been developed to include impervious cover. (Source: MA Small MS4 Permit: https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp.pdf

Definition of redevelopment: any construction, land alteration, or improvement of impervious surfaces resulting in total earth disturbances equal to or greater than 1 acre (or activities that are part of a larger common plan of development disturbing greater than 1 acre) that does not meet the definition of new development. (Source: MA Small MS4 Permit: https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp.pdf.

Stormwater Program Summary – New Hampshire

Program Name: New Hampshire Stormwater Program

Program Status: Existing MS4 Stormwater Program (administered by EPA in New Hampshire). Permits originally issued March 2003, current draft permit has not been reissued and the 2003 Small MS4 General Permit remains in effect. Latest status is available at http://www.epa.gov/region1/npdes/stormwater/MS4_2013_NH.html. The Stormwater Manual provides recommended sizing criteria for application by developers and municipalities on all projects.

- New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain.

Standard source: Chapter Env-Wq 1500 Alteration of Terrain, Sections 1507 and 1508; New Hampshire Stormwater Manual.

Website reference:
New Hampshire Stormwater Program
http://des.nh.gov/organization/divisions/water/stormwater/index.htm

EPA Region 1 Stormwater Program
http://www.epa.gov/region1/npdes/stormwater/index.html

Draft Small Municipal Separate Storm Sewer Systems (MS4s) General Permit
http://www.epa.gov/region1/npdes/stormwater/MS4_2013_NH.html

New Hampshire Stormwater Manual
http://des.nh.gov/organization/divisions/water/stormwater/manual.htm

New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain.
http://des.nh.gov/organization/commissioner/legal/rules/index.htm#envwq1500

Size Threshold: Phase II MS4 general permit: projects disturbing one acre or greater and projects less than one acre if the project is part of a larger common plan of development or redevelopment which disturbs one or more acres.

Alteration of Terrain (AoT) permits are required whenever a project involves earth moving operations, such as industrial, commercial, and residential developments as well as sand pits, gravel pits, and rock quarries that proposes to disturb more than 100,000 square feet of contiguous terrain (50,000 square feet, if any portion of the project is within the protected shoreland), or disturbs an area having a grade of 25 percent or greater within 50 feet of any surface water. In addition to these larger disturbances, the AoT Permit by Rule applies to smaller sites. (New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain)

Limited geographic area where standards apply: Alteration of Terrain Permits apply to activities in or on the border of the surface waters of the state that significantly alter the characteristics of the terrain, in such a manner as to impede the natural runoff or create an unnatural runoff.

NPDES permit requirements are applied only in regulated MS4 areas as designated in the permit.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control
None.

Treatment requirement:
Stormwater treatment requirements for specific practices are described Env-Wq 1508.03 through Env-Wq 1508.09. (New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain. Section 1507.03. Stormwater Treatment Requirements.)

Channel protection requirement:
Off-site flows shall meet one of the following criteria:

(1) If the 2 year, 24-hour post-development storm volume has not increased over the predevelopment volume, then the 2-year, 24-hour post-development peak flow rate shall be equal to or less than the 2-year, 24-hour pre-development peak flow rate; and
    a. The 2 year, 24-hour post-development storm volume, directed to the nearest water body has not increased over the pre-development volume by more than 0.1 acre-feet;
    b. The 2-year, 24-hour post-development peak flow rate directed to the nearest water body is less than 2 cfs; or
    c. The area directly discharges into a fourth order or greater river, a pond or lake greater than 10 acres, or tidal water;

(2) The 2-year, 24-hour post-development peak flow rate shall be less than or equal to 50 percent of the 2-year, 24-hour pre-development peak flow rate; or

(3) The 2-year, 24-hour post-development peak flow rate shall be less than or equal to the 1-year, 24-hour pre-development peak flow rate.

(New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain. Section 1507.05. Channel Protection Requirements.)

Flood control requirement:
The 10-year, 24-hour post-development peak flow rate should not exceed the 10-year, 24-hour pre-development peak flow rate for all flows leaving the site; The 50-year, 24-hour post-development peak flow rate should not exceed the 50-year, 24-hour pre-development peak flow rate for all flows leaving the site; The project should provide supporting information showing that there is no impact to properties as a result of developing within the100-year floodplain; (New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain. Section 1507.06. Peak Runoff Control Requirements.)

Redevelopment standard: N/A

Special criteria:
Recharge
AoT applicants must capture and infiltrate groundwater recharge volume which varies based on hydrologic soil group (from 0.4 inches to no recharge for group D soils. (New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain. Section 1507.04. Groundwater Recharge Requirements.)

Offset /mitigation: None indicated

Compliance: Compliance with the NPDES permit is achieved through submission of annual reports by the MS4. Compliance with Alteration of Terrain permits is through inspection during projects.

Inspection & Maintenance/O&M: The Alteration of Terrain regulations require the development of an Inspection and Maintenance (I&M) Manual for stormwater management systems, identifying responsible parties for implementing the required maintenance activities, detailing the activities that are necessary, and documenting the implementation of the activities. (New Hampshire Code of Administrative Rules, Chapter Env-Wq 1500 Alteration of Terrain. Section 1507.08. Long-Term Maintenance.)

Does development on agricultural land qualify as redevelopment? Not indicated.

Definition of impervious surface: Env-Wq 1502.28 “Impervious cover” means a structure or a land surface with a low capacity for infiltration, including but not limited to pavement, roofs, roadways, and compacted soils with a curve number of 98 or greater.

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Additional references:
DES Alteration of Terrain (AoT) Bureau
http://des.nh.gov/organization/divisions/water/aot/index.htm

Stormwater Program Summary – Rhode Island

Program Name: Rhode Island Pollutant Discharge Elimination System (RIPDES) Storm Water Program

Program Status: NPDES Permit RIR040000 and state regulation: RIPDES Rule 31(a)(5)(i)(A-J) Existing Regulations, Rhode Island Stormwater Design and Installation Standards Manual (manual p. 1-3)

Regulatory Authority: RIPDES Rule 31(a)(5)(i)(A-J)

Standard source: Rhode Island Stormwater Design and Installation Standards Manual, 2015

Website references:
Rhode Island Stormwater Website
http://www.dem.ri.gov/programs/water/permits/ripdes/stormwater/

Manual:
http://www.dem.ri.gov/pubs/regs/regs/water/swmanual15.pdf

Regulations:
http://www.dem.ri.gov/pubs/regs/regs/water/ripdes03.pdf

MS4 General Permit:
http://www.dem.ri.gov/pubs/regs/regs/water/ms4final.pdf

Fact Sheet:
http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/pdfs/impguide.pdf

Size Threshold: In the MS4: projects that disturb greater than or equal to one (1) acre, including projects less than one (1) acre that are part of a larger common plan of development or sale that discharge into the MS4 (Rhode Island MS4 General Permit, p. 19).

Limited geographic area where standards apply: Only in regulated MS4 areas.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-site Retention/Volume Control*:* N/A

Treatment Requirement:
Structural (designed) post-construction storm water treatment practices must be sized to capture and treat the water quality (WQv), equivalent to the runoff associated with the first 1.2 inches of rainfall over the impervious surface (which is assumed to equal 1" of runoff) and shall be determined according to the following equation: WQv = (1") (I) / 12 (Manual 3.3.3 p. 3-14)

Note: The water quality volume requirement may be waived or reduced by applying disconnection-based LID practices (Manual 4.6.1)

Structural BMPs are generally required to achieve the following minimum average pollutant removal efficiencies: 85% removal of total suspended solids (TSS), 60% removal of pathogens, 30% removal of total phosphorus (TP) for discharges to freshwater systems, and 30% removal of total nitrogen (TN) (Manual 3.2.3, p. 3-3)

Channel Protection Requirement:
The channel protection volume (CPv) requirement is the 24-hour extended detention of the post-development runoff volume from the 1-year, 24-hour Type III design storm event. If a stormwater discharge is proposed within 200 feet of streams and any contiguous natural or vegetated wetlands in watersheds draining to cold-water fisheries, surface detention practices are prohibited (underground detention or infiltration practices will be required). (Manual 3.3.4 p. 3-17)

Flood Protection Requirement:
Peak flow attenuation is required for the 10-year and 100-year, 24-hour Type III design storm events. (Manual 3.3.5, p. 3-18)

Redevelopment standard:
For sites with less than 40% existing impervious surface coverage, the stormwater management requirements for redevelopment will be the same as for new development. The applicant, however, can meet those requirements either on-site or at an approved off-site location within the same watershed provided the applicant satisfactorily demonstrates that impervious area reduction, LID strategies, and/or structural BMPs have been implemented on-site to the maximum extent practicable.

For redevelopment sites with 40% or more existing impervious surface coverage, stormwater quality and recharge shall be managed for in accordance with one or more of the following techniques: reduce existing impervious area by at least 50% of the redevelopment area; or implement other LID techniques to the maximum extent practicable to provide water quality and recharge management for at least 50% of the redevelopment area; or use on-site structural BMPs to provide water quality and recharge management for at least 50% of redevelopment area; or any combination of impervious area reduction, other LID techniques, or on-site structural BMPs for at least 50% of redevelopment area. (Manual 3.2.6, p. 3-4)

> *Note: If none of the above options are practical in terms of water quality management, alternatives may be proposed that would achieve an equivalent pollutant reduction by using a combination of other types of BMPs and strategies, including treating 100% of the redevelopment area by BMPs with a lesser pollutant removal efficiency.*

Special criteria:
Groundwater Recharge Requirement:
Recharge requirements are based on hydrologic soil group. The recharge volume is considered as part of the total water quality volume that must be provided at a site (i.e., Rev is contained within WQv) and must be achieved by disconnection of impervious areas, a structural practice, or a combination of the two (Manual 3.3.2 p. 3-11).

> *Note: The groundwater recharge requirement may be waived or reduced by applying the LID Stormwater Credit*

Water Quality Flow Requirement:
Stormwater treatment practices in this manual sized based the WQv require the design of flow diversion structures for off-line stormwater treatment practices to bypass flows greater than the WQf. The WQf shall be calculated using the WQv and a modified curve number (CN) for small storm events. (Manual 3.3.3.2, p. 3-16)

Offset /mitigation:
LID Stormwater Credit:
For redevelopment sites, off-site structural BMPs to provide water quality and recharge management for an area equal to or greater than 50% of redevelopment areas may be used to meet the water quality requirements provided that the applicant satisfactorily demonstrates that impervious area reduction, LID strategies, and/or on-site structural BMPs have been implemented to the maximum extent practicable. An approved off-site location must be identified, the specific management measures identified, and an implementation schedule developed in accordance with local review and with DEM/CRMC concurrence, as appropriate. The applicant must also demonstrate that there are no downstream drainage or flooding impacts as a result of not providing on-site management for large storm events.

Compliance: MS4s must develop an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects, that includes nonstructural and structural BMPs, as well as their installation and operations and maintenance (O&M), and sanctions to ensure compliance, to the extent allowable under State and local law. (Rhode Island MS4 General Permit, p.19)

Inspection & Maintenance/O&M: The MS4 must develop procedures to ensure adequate long term operation and maintenance of BMPs and procedures for coordination of local and State post-construction storm water management in new and redevelopment permitting and referrals for enforcement actions. (Rhode Island MS4 General Permit, p.19)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: Those surfaces that cannot effectively infiltrate rainfall consisting of surfaces such as building rooftops, pavement, sidewalks, driveways, compacted gravel (e.g., driveways and parking lots) (Manual, glossary-8).

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: Any construction, alteration, or improvement that disturbs a total of 10,000 square feet or more of existing impervious area where the existing land use is commercial, industrial, institutional, governmental, recreational, or multifamily residential. (Manual Glossaary-11)

Stormwater Program Summary – Vermont

Program Name: Vermont State Stormwater Program

Program Status: State-wide stormwater regulation separate from NPDES. Administered by the State (10 V.S.A. 1264 Chapter 47: Water Pollution Control).

Regulatory Authority: Vermont Stormwater Management Rule and Manual

Standard source: 10 V.S.A. 1264 Chapter 47: Water Pollution Control

Website references:
Vermont Stormwater Program
http://www.vtwaterquality.org/stormwater.htm

Vermont Stormwater Management Manual (2002):
www.anr.state.vt.us/dec//waterq/stormwater/docs/sw_manual-vol1.pdf

Vermont Stormwater Management Manual Revision
http://www.vtwaterquality.org/stormwater/htm/sw_manualrevision.htm

Permit:
http://www.anr.state.vt.us/dec//waterq/stormwater/htm/sw_3-9015.htm

General Permit 3-9010 to implement non-impaired rule and renewing existing permits
http://www.anr.state.vt.us/dec//waterq/stormwater/htm/sw_3-9010.htm

Regulations:
10 V.S.A. 1264 Chapter 47; Vermont Stormwater Management Rule
http://legislature.vermont.gov/statutes/section/10/047/01264

Chapter 18, Environmental Management Rule for Non-impaired Waters
http://www.anr.state.vt.us/dec/rulessum.htm
www.anr.state.vt.us/dec//waterq/stormwater/docs/sw_rule-unimpaired.pdf

Chapter 22, Environmental Management Rule for Impaired Water
http://www.anr.state.vt.us/dec/rulessum.htm

Size Threshold: New development, expansion of existing impervious surface and redevelopment equal to or greater than one acre. State may regulate discharges from any size impervious surface as deemed to reduce adverse impacts. Exceptions apply as §18-304(a)(4) of the Rule (§18-302)

10 V.S.A. § 1264 (d)(1)(D) states "requirements concerning a permit for discharges of regulated stormwater runoff from the development, redevelopment, or expansion of impervious surfaces equal to or greater than one acre or any combination of development, redevelopment, and expansion of impervious surfaces equal to or greater than one acre"

Limited geographic area where standards apply: none – applies statewide

Significant exemptions: Does not apply to stormwater discharges to impaired waters (303(d) listed) (separate permit), or MS4 municipalities who administer their own post-construction program and projects.

The expansion of an existing impervious surface, such that the total resulting impervious surface is equal to or greater than one (1) acre, if:

(A) the increase or addition of impervious surface is less than 5,000 square feet; and
(B) the expansion is made to existing impervious surfaces created prior to June 1, 2002; and
(C) This exemption may be used for consecutive expansions of an existing impervious surface up to a cumulative total of 5,000 square feet. When the cumulative total expansion exceeds 5,000 square feet, the expanded impervious surface in excess of 5,000 square feet must comply with the treatment standard in subsection 18-306(a)(1) of this Rule. (§18-304(a)(4), p10-11)

Post-Construction Standards for New Development:

On-Site Retention/Volume Control
Capture 90 percent of the annual storm events (Manual, p. 1-3)

Treatment requirement:
Remove 80 percent of the average annual post development total suspended solids load (TSS), and 40 percent of the total phosphorus (TP) load.

Infiltration Standard:
The average annual recharge rate for the prevailing hydrologic soil group(s) (HSG) shall be maintained in order to preserve existing water table elevations. Recharge volume (Rev) is determined as a function of annual predevelopment recharge for a given soil group, average annual rainfall volume, and amount of impervious cover at a site.

The groundwater recharge treatment standard shall be satisfied by one of two methods or a combination of both. The first is designated as the "Percent Volume Method," and is based on infiltrating the recharge volume using one or more approved structural STPs (see Manual, Tables 2.1 and 2.2). The second method is designated as the "Percent Area Method," and is based on draining runoff from some or all of the site impervious area through one or more approved nonstructural STPs (See Manual Table 2.2).

Channel protection requirement:
The channel protection volume (CPv) shall be provided by means of 12 to 24 hours of extended detention storage (ED) for the one-year, 24-hour rainfall event. If a stormwater discharge is to a coldwater fish habitat, 12 hours of extended detention is required and if a stormwater discharge is to a warmwater fish habitat, 24 hours of extended detention is required.

Where extended detention is being used as a water quality treatment component, routing through the treatment practice can use a composite stage-discharge relationship. In addition, where an offline treatment practice is used to treat only the water quality volume, an additional facility is necessary to manage the full channel protection volume (that is, CP_v and WQ_v shall be provided separately).

Alternative design standards may be used where majority of impervious surfaces are disconnected on the site and the post-developed peak discharge from the disconnected portion of the site for the one-

year storm is no greater than the peak discharge from the same portion of the site as modeled as if 12-hour detention were provided (Amendments to Manual Section 1.1.2, in §18 Stormwater Rule, p 29).

The treatment standard for channel protection shall be waived for:

1. Expansions involving less than or equal to one (1) acre of impervious cover;

2. A site where the pre-routed post-development discharge is less than 2 cubic feet per second; or

3. A site that directly discharges to a waterbody with a drainage area equal to or greater than 10 square miles, and that is less than 5% of the watershed area at the site's upstream boundary; (Manual, p. 1-4).

Flood control requirement:
Overbank protection (Q_{p10}) for the post-development peak discharge rate shall not exceed the pre-development peak discharge rate for the 10-year, 24-hour storm event.

The Agency will waive the 10-year control requirement on a case-by-case basis where the developer demonstrates that there will be no increase in flood threat downstream to the point of the "so-called" 10% rule following downstream hydrologic/hydraulic analyses.

The treatment standard for overbank flood protection shall be waived if:

- A site discharges directly to a large reservoir, lake, or stream with a drainage area greater than or equal to 10 square miles; or
- The site is smaller than five (5) acres and the channel has adequate capacity to convey the post-development 10-year discharge downstream to the point of the so-called 10% rule; and downstream conveyance systems have adequate capacity to convey the 10-year storm.

Extreme Storm: (Qp100) Control the peak discharge from the 100-year storm to 100-year predevelopment rates.

Redevelopment standard: Discharges of regulated stormwater runoff from redeveloped impervious surfaces obtain an individual permit or coverage under a general permit consistent with the following:

- The existing impervious surface shall be reduced by a minimum of 20%; or
- a stormwater treatment practice shall be designed to capture and treat 20% of the water quality from the existing impervious surface; or
- a combination of (A) and (B) that when combined equal a minimum 20% reduction/treatment. (§18-306)

Special criteria:
Stormwater Credits Six specific non-structural practices are set forth, which, if used properly, can result in the granting of a stormwater credit to a site designer. A stormwater credit can reduce the required water quality and recharge storage volumes, thereby reducing the size and cost of structural STPs. (Manual, 3-1).

Cold Climate Considerations: Mandatory guidance is given to modify BMP designs (Amendments to Manual Section 2.7.2.G, in §18 Stormwater Rule, p. 30).

Groundwater recharge: The average annual recharge rate for the prevailing hydrologic soil group(s) (HSG) shall be maintained in order to preserve existing water table elevations (Manual, p. 1-6).

The groundwater recharge treatment standard shall be waived for:
1. Stormwater runoff from hotspot land uses (as described in section 2.6).
2. Stormwater recharge may be prohibited or otherwise restricted within groundwater recharge areas, wellhead protection areas, or where certain unusual geological features may exist such as karst topographic areas; areas of documented slope failure, or redevelopment projects.
3. No subsurface infiltration of stormwater will be allowed within 500' of a public community water supply or non-transient non-community water supply. (Manual, p. 1-8)

Offset /mitigation: Offsets are defined as "a state-permitted action or project within a stormwater-impaired water that a discharger or a third person may complete to mitigate the impacts that an existing or proposed discharge or discharges of regulated stormwater runoff has or is expected to have on the stormwater-impaired water (§18, Glossary). It is not discussed further in the manual.

Compliance: Permit compliance shall be judged on the basis of performance with the terms and conditions of the discharge permit, including construction and maintenance in accordance with

BMP specifications (§18-307).

Inspection & Maintenance/O&M: A general permit shall require that the permittee properly operate and maintain all stormwater collection, treatment and control systems and that the permittee shall submit an annual inspection report on the operation, maintenance and condition of the stormwater collection, treatment and control systems. Inspections shall be conducted between the conclusion of spring snow melt and June 15th of each year and the inspection report shall be submitted to the Secretary by July 15th of each year, or by July 30th of each year if performed by a utility or municipality pursuant to a duly adopted stormwater management ordinance. The first annual inspection report for a new development, redevelopment or expansion shall include a written certification by a designer, other than the landowner, stating that the stormwater system was installed in accordance with the conditions of the general permit and is functioning properly (§18-307 (c)(2)). Maintenance requirements are specified for individual treatment practices in the Manual and agreements are a condition of approval (Manual, various pages in section 2.7).

Does development on agricultural land qualify as redevelopment? Not addressed.

Definition of impervious surface: those man-made surfaces, including, but not limited to, paved and unpaved roads, parking areas, roofs, driveways and walkways, from which precipitation runs off rather than infiltrates. (§ 18-201)

Definition of new development: means the construction of new impervious surface on a tract or tracts of land where no impervious surface previously existed. (§ 18-201)

Definition of predevelopment: land use for on-site areas shall be woods, meadow, or pasture in good condition. For agricultural land, assume pasture in good condition. (Manual, p. 1-2)

Definition of redevelopment: means the construction or reconstruction of an impervious surface where an impervious surface already exists when such new construction involves substantial site grading, substantial subsurface excavation, or substantial modification of existing stormwater conveyance, such

that the total of impervious surface to be constructed or reconstructed is greater than the minimum regulatory threshold. Redevelopment does not mean the construction or reconstruction of impervious surface where impervious surface already exists when the construction or reconstruction involves less than 5,000 square feet. Redevelopment does not mean public road management activities, including any crack sealing, patching, coldplaning, resurfacing, reclaiming, or grading treatments used to maintain pavement, bridges, and unpaved roads. (10 V.S.A. § 1264 (10)).

Stormwater Program Summary – New Jersey

Program Name: New Jersey State Stormwater Management Program

Program Status:

- State-wide stormwater management rules, New Jersey Administrative Code (NJAC) 7:8;
- The Department issued final stormwater rules on February 2, 2004 and four (4) NJPDES general permits authorizing stormwater discharges from (MS4s). NJPDES Permits (No.NJ0141852, NJ0141861, NJ0141887, and NJ0141879); March 1, 2009.

Regulatory Authority:
NJ Stormwater Management rules are separate from the NJPDES program, but are considered to be an equivalent state program, and are implemented by:

- Local authorities through the Municipal Land Use Law (MLUL) and the Residential Site Improvement Standards (RSIS);Local authorities through NJPDES MS4 Permits - NJPDES Municipal Stormwater Regulation Program has assigned New Jersey municipalities into Tier A or Tier B. Tier A Municipalities are generally located within the more densely populated regions of the state or along or near the coast. Tier B municipalities are generally located in more rural areas and in non-coastal regions.
- The New Jersey Department of Environmental Protection through the review of permits issued by the Division of Land Use Regulation (DLUR) (Flood Hazard, Freshwater Wetlands, Coastal Area Facility Review Act (CAFRA), Waterfront Development, Coastal Wetlands, and Highlands Water Protection and Planning Rule). The regulations implemented by DLUR include a ¼ acre of new impervious coverage as a size threshold. Local level approvals do not include this size threshold.

Standard source: Technical criteria outlined in:

- Stormwater management rules, NJAC 7:8;
- New Jersey Stormwater Best Management Practices Manual (Technical Guidance Document).

Website references:
New Jersey Stormwater Program
http://www.nj.gov/dep/stormwater/

Stormwater Design Manual: New Jersey Department of Environmental Protection; njstormwater.org
http://www.njstormwater.org/bmp_manual2.htm

Regulations:
New Jersey Department of Environmental Protection; njstormwater.org; last amended April 19, 2010.
http://www.nj.gov/dep/rules/rules/njac7_8.pdf

Size Threshold: Land development projects that disturb greater than 1 acre, including projects less than one acre that are part of a larger common plan of development or sale (MS4 Permits: NJ0141852 and NJ0141861); or increase impervious cover by ¼ acre or more. (Regulations; 7:8-1.2 Definitions: Major Development, p. 6; 7:8-1.6 Applicability to major development, p. 9). The ¼ acre increase in impervious cover applies only to projects receiving permits from the DLUR as noted above.

Limited geographic area where standards apply: Applies statewide

Significant exemptions:

- Underground utility lines if revegetated
- Aboveground utility lines if existing conditions are maintained to max. extent practicable
- Public pedestrian access if pervious and no greater than 14' wide
- Enlargement of public roadways, railroads, or pedestrian access provided there is a public need and they meet the standards to the max. extent practicable
- Previously developed sites within the "urban redevelopment area" are exempt from the recharge standard
- Sites with separate NJPDES permits with numeric TSS effluent limitations are exempt from the treatment requirement

Post-Construction Standards for New Development:

On-Site Retention/Volume Control (Regulation 7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards; p.28):

- Maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or
- Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.

Treatment requirement (*Regulation* 7:8-5.5 Stormwater runoff quality standards):

- Reduce the post-construction annual average load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80 percent of the anticipated load from the developed site.
- 95% TSS removal is required along Category 1 watercourses.
- The water quality design storm is 1.25 inches of rainfall in two hours (a rainfall distribution for the 1.25 inch-2 hour storm is provided.
- List of BMPs and TSS removal credits is provided;
- Provision for BMPs in series is provided.

Channel protection AND flood control requirement (7:8-5.4 Erosion control, groundwater recharge and runoff quantity standards):

Using hydrologic and hydraulic design calculations as defined in N.J.A.C. 7:8-5.6 demonstrate one of the following:

- post-construction runoff hydrographs for the 2, 10 and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events; or
- no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 10 and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site.
- Design stormwater management measures so that the post-construction peak runoff rates for the two, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction

stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed

Flood control requirement:
See Channel Protection Requirement above

Redevelopment standard:
Redevelopment is defined as new impervious surface replacing an equal area of existing impervious surface on a project site, and requires:

- 50% TSS reduction or equivalent reduction to an existing BMP (if present);
- 80% TSS removal rate applies to the new impervious surfaces on the site.
- Groundwater recharge is waived for previously developed sites within the "urban redevelopment area".
- However, the water quality provisions of the Stormwater Management rules only apply if the impervious surface onsite increases by at least 0.25 of an acre.

Special criteria:

Pinelands Area

Pinelands Area Municipalities have a model ordinance that includes language for alternative calculation methods to the NRCS methodology that may be utilized to calculate runoff rates and volumes. This language is consistent with the Pinelands Comprehensive Management Plan at N.J.A.C. 7:50-6.84(a)6.i(1).

Regional Stormwater Management Planning

Regional stormwater management planning addresses stormwater-related water quality, groundwater recharge and/or water quantity impacts of new and existing land uses in a regional stormwater management planning area. (Regulation 7:8-3; p. 13)

Non-structural Stormwater Management Strategies:

Nonstructural stormwater management strategies must be utilized to the maximum extent practicable to meet the erosion control, groundwater recharge, runoff quantity, and runoff quality standards. (7:8-5.3 Nonstructural stormwater management strategies; p. 27).

Performance verification of manufactured BMPs:

Verification of manufactured BMPs in meeting the water quality TSS performance goals is provided through the New Jersey Corporation for Advanced Technology (NJCAT). http://www.njcat.org/verification-process.html

Offset /mitigation: Municipalities can grant waivers to standards if the developer implements a mitigation project from the municipality's mitigation plan. The mitigation must offset the waiver and must be located in the same watershed.

Compliance: Compliance achieved through County and Municipal local program plan review, approval and inspections

Inspection & Maintenance/O&M: (7:8-5.8 Maintenance requirements)
Stormwater plan shall include a maintenance plan for the stormwater management measures, including preventative and corrective maintenance to be performed to maintain the function of the stormwater

management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash.

Municipalities may require the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: "Impervious surface" means a surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

Definition of predevelopment: N/A

Definition of new development: "Development" means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure, any mining excavation or landfill, and any use or change in the use of any building or other structure, or land or extension of use of land, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.

Definition of redevelopment: "Redevelopment" is defined as new impervious surface replacing an equal area of existing impervious surface on a project site: 50% TSS reduction or equivalent reduction to an existing BMP (if present);

"Urban Redevelopment Area" is defined as previously developed portions of areas:

- Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
- Designated as CAFRA Centers, Cores or Nodes;
- Designated as Urban Enterprise Zones; and
- Designated as Urban Coordinating Council Empowerment Neighborhoods.

Stormwater Program Summary – New York

Program Name: New York State Stormwater program

Program Status: Phase II Permit (New York SPDES Permit (Permit No: GP-0-15-003)) was issued in April 2015, and became effective on May 1, 2015. GP-0-15-003 is a two year interim permit.

Regulatory Authority: Codes, Rules And Regulations Of The State Of New York, Title 6. Department of Environmental Conservation, Chapter X. Division of Water Resources, Subchapter A. General Article 3. State Pollutant Discharge Elimination System, Part 750. State Pollutant Discharge Elimination System (SPDES) Permits. New York Environmental Conservation Law, Article 17, Titles 7, 8 and Article 70.

Standard source: New York State Stormwater Manual; SPDES Permits for construction and MS4

Website reference:
New York State Stormwater Program
http://www.dec.ny.gov/chemical/8468.html

2015 General Permit for Storm Water Discharge Associated with Municipal Separate Storm Sewer System
http://www.dec.ny.gov/chemical/43150.html

2015 General Permit for Storm Water Discharges from Construction Activity
http://www.dec.ny.gov/chemical/43133.html

Codes, Rules And Regulations Of The State Of New York, Title 6. Department of Environmental Conservation, Chapter X. Division of Water Resources, Subchapter A. General Article 3. State Pollutant Discharge Elimination System, Part 750. State Pollutant Discharge Elimination System (SPDES) Permits
http://government.westlaw.com/linkedslice/default.asp?SP=nycrr-1000

New York Environmental Conservation Law, Article 17, Titles 7, 8 and Article 70
http://codes.lp.findlaw.com/nycode/ENV

New York State Stormwater Manual (2015)
http://www.dec.ny.gov/chemical/29072.html

Size Threshold: New development and redevelopment projects that result in a land disturbance of one acre or greater, including projects less than one acre if they are part of a larger common plan of development or sale or if controlling such activities in a particular watershed is required by the Department (New York SPDES Permit No: GP-0-15-003, Part VII.A.5.a.ii.)

Limited geographic area where standards apply: Standards are applied statewide. The CGP Part III.B.2 require post-construction controls that meet applicable sizing and performance criteria in the State Stormwater Management Design Manual for most projects greater than 1 acre (see Appendix B, Table 2 for list of projects that require post-construction standards)

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control
Runoff reduction shall be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100 percent of the post-development water quality volumes (90 percentile storm = 0.8" – 1.2") to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow by using runoff control techniques to provide treatment in a distributed manner before runoff reaches the collection system. This requirement can be accomplished by application of on-site green infrastructure techniques, standard stormwater management practices with runoff reduction capacity, and good operation and maintenance. (New York State Stormwater Manual, Chapter 4, Section 4-3)

Treatment requirement
All design and plan review professionals must adhere to the design parameters that constitute the removal efficiency equivalent to the Department's performance criteria (80% TSS removal and 40% phosphorus removal). (New York State Stormwater Manual, Chapter 3, Section 3-3)

Channel protection requirement
Stream Channel Protection Volume Requirements (Cpv) are designed to protect stream channels from erosion. In New York State this goal is accomplished by providing 24-hour extended detention of the one-year, 24-hour storm event, remained from runoff reduction. Reduction of runoff for meeting stream channel protection objectives, where site conditions allow, is encouraged and the volume reduction achieved through green infrastructure can be deducted from CPv. Trout waters may be exempted from the 24-hour ED requirement, with only 12 hours of extended detention required to meet this criterion. (New York State Stormwater Manual, Chapter 4, Section 4-4)

Flood control requirement
Overbank control requires storage to attenuate the post development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. (New York State Stormwater Manual, Chapter 4, Section 4-5)

100 Year Control requires storage to attenuate the post development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. (New York State Stormwater Manual, Chapter 4, Section 4-6)

Redevelopment standard
Redevelopment sites must first attempt to comply with all the post-construction management requirements outlined in the Manual. When physical constraints in a redevelopment situation are present, alternative stormwater management practices and sizing criteria may be used:

- Channel protection requirements are waived if impervious cover will not increase
- For water quality volume control, existing impervious cover should be reduced by 25%, 25% of the WQv should be treated or reduced, 75% of WQv should be treated by an alternative practice (acceptable technologies listed on the Department's website) or a combination of the above. (New York State Stormwater Manual, Chapter 9, Section 9.2)

Special criteria:
Lake George Stormwater Management
The Lake George Park Commission oversees and manages the unique resources of the "Lake George Park" by special authority and responsibility of New York State. The Lake George Park Commission has the authority to develop regulations to guide preparation of local stormwater management plans and

regulatory programs. (Codes, Rules and Regulations of the State Of New York, Title 6. Department of Environmental Conservation, Chapter IX). Independent Agencies within the Department, Subchapter A. Lake George Park Commission, Part 646. Substantive Regulations, Subpart 646-4. Stormwater Management)

Watershed Improvement Strategy Requirements
The state has developed criteria and design standards for specific watersheds with regards to phosphorus, pathogens, and nitrogen. The watershed areas are identified in the permit, and specific requirements for the post-construction stormwater management measures are detailed. In addition, the Watershed Improvement Strategy Requirements specifically call for the implementation of a retrofit program to address runoff from sites with regards to phosphorus, pathogens, and nitrogen. The Stormwater Management Manual has a chapter devoted to design standards for "enhanced phosphorus removal" for projects in phosphorus-limited watersheds. (New York SPDES Permit No: GP-0-15-003, Part IX; New York State Stormwater Manual, Chapter 10)

Green Infrastructure
The SPDES permit includes a requirement for SWMP's to utilize a combination of structural and non-structural management (according to standards defined in the most current version of the NYS Stormwater Management Design Manual) that will reduce the discharge of pollutants to the maximum extent practicable. In the development of the watershed plans, municipal comprehensive plans, open space preservation programs, local law, ordinances and land use regulation, covered entities must consider principles of Low Impact Development (LID), Better Site Design (BSD) and other Green Infrastructure practices to the MEP. (New York SPDES Permit: GP-0-15-003, Part VII.A.5.a.iv)

Offset /mitigation: For redevelopment projects, under conditions where onsite treatment is not practicable, an appropriate off-site watershed improvement to offset the required level of control may be applied, in the presence of a regulated/permitted municipal stormwater management program. The off-site stormwater management approach is subject to applicable local agency approval for banking and trading of credits. (New York State Stormwater Manual, Chapter 9, 9-2)

Covered entities may include in the SWMP Plan provisions for development of a banking and credit system. Ms4s must have an existing watershed plan based on which offsite alternative stormwater management in lieu of or in addition to on-site stormwater management practices are evaluated. Redevelopment projects must be evaluated for pollutant reduction greater than required treatment by the state standards. The individual project must be reviewed and approved by the Department.
Use of a banking and credit system for new development is only acceptable in the impaired watersheds to achieve the no net increase requirement and watershed improvement strategy areas to achieve pollutant reductions in accordance with watershed plan load reduction goals. (New York SPDES Permit No: GP-0-15-003, Part VII.A.5.a.viii.)

Compliance: Compliance is achieved through submission of annual reports by the MS4 to the state.

Inspection & Maintenance/O&M: The responsibility for implementation of long term operation and maintenance of a post-construction stormwater management practice shall be vested with a responsible party by means of a legally binding and enforceable mechanism such as a maintenance agreement, deed covenant or other legal measure. This mechanism shall protect the practice from neglect, adverse alteration and/or unauthorized removal. The mechanism and Operation and Maintenance (O&M) plan must be included in the SWPPP. (New York State Stormwater Manual, Chapter 3, 3-5)

All covered entities must develop a post-construction stormwater program that ensures adequate long-term operation and maintenance of management practices identified in Part VII.5.a.vi by trained staff, including inspection to ensure that practices are performing properly. The inspection shall include inspection items identified in the maintenance requirements (NYS Stormwater Management Design Manual, SWPPP, or other maintenance information) for the practice. (New York SPDES Permit No: GP-0-15-003, Part VII.A.5.a.vii)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious cover: Those surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds. (New York State Stormwater Manual, glossary)

Definition of predevelopment: N/A

Definition of new development: Any land disturbance that does meet the definition of Redevelopment Activity included in this glossary. (New York State Stormwater Manual, glossary)

Definition of redevelopment: The disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.). (New York State Stormwater Manual, glossary)

Stormwater Program Summary – Puerto Rico

Program Name: Puerto Rico Small MS4 Stormwater program

Program Status: EPA Region II small MS4 general permit for the Commonwealth of Puerto Rico (Permit number PRR040000 and PRR04000F) was issued in May 2016, and became effective on July 1, 2016.

Regulatory Authority: Clean Water Act Section 402(p)

Standard source: NPDES MS4 permit

Website reference:
2016 Puerto Rico small MS4 general permit -
https://www3.epa.gov/region02/water/water_permits/Final_2016_NPDES_Small_MS4_General_Permit_Signed.pdf

Size Threshold: New development and redevelopment projects that result in a land disturbance of one acre or greater, including projects less than one acre if they are part of a larger common plan of development or sale.

Limited geographic area where standards apply: Urbanized areas.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control

If practicable, for new development or redevelopment projects greater than one acre, the program shall include a process to require the implementation of low impact development practices that infiltrate, evapotranspire, or capture for reuse the first 1 inch of rainfall from a 24 hour storm preceded by 48 hours of no measurable precipitation. (MS4 permit part 2.4.6.3)

Treatment requirement

No separate standard – see on-site retention standard.

Channel protection requirement

No separate standard – see on-site retention standard.

Flood control requirement

N/A

Redevelopment standard

Same as new development.

Special criteria: N/A

Offset /mitigation: N/A

Compliance: Compliance is achieved through submission of annual reports by the MS4 to the state.

Inspection & Maintenance/O&M: MS4 permit requires filing of a maintenance plan with the real property records if maintenance is performed by the property owner (Part 2.4.6.4.c.ii).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious cover: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Program Name: Delaware Sediment and Stormwater Program

Program Status: Revised final regulations were issued July 18, 2013 and became effective January 1, 2014. Due to a lawsuit the Delaware Superior Court on October 7, 2015 ruled the regulations invalid based on procedural grounds. Delaware's Department of Natural Resources and Environmental Control is appealing the decision and was granted its request that the Superior Court's decision be delayed until the Delaware Supreme Court rules on the matter. As a result, the 2014 regulations remain in effect.

Regulatory Authority: State-wide stormwater regulation authorized by 7 Del. C. Ch. 40 and 7 Del. C. Ch. 60. 7 Del. C. Ch. 40 establishes Delaware's sediment and stormwater program.

Standard source: 7 Del. C. Ch. 40 establishes Delaware's sediment and stormwater program; Delaware Sediment and Stormwater Regulations

Website reference:
Delaware Sediment and Stormwater Program
http://www.swc.dnrec.delaware.gov/Pages/SedimentStormwater.aspx

Stormwater Regulations: 7 DE Admin. Code 5101
http://regulations.delaware.gov/AdminCode/title7/5000/5101.shtml

Size Threshold: Land development projects that disturb greater than 5,000 square feet. (Final Regulations, sec. 1.4)

Limited geographic area where standards apply: Applies statewide

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
Final Regulations (sec. 5.2): For the Resource Protection Event (the 1-year, 24-hour rainfall event – 2.7 inches), runoff volume (RPv) 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. All remaining disturbed areas shall employ runoff reduction practices to achieve an equivalent 0% effective imperviousness.

Treatment requirement:
Final Regulations (sec. 5.2): Additional water quality treatment BMPs shall be provided if the runoff reduction requirements above are not sufficient to meet Total Maximum Daily Load (TMDL) requirements for the receiving water.

Channel protection requirement:
Final Regulations (sec. 5.3) Conveyance Event Criteria: The Conveyance Event Volume (Cv) defined as runoff from the post-development storm having a ten percent (10%) annual probability of occurrence, or the 10-year, 24-hour rainfall event, less any volume reduction achieved for the RPv, shall be reduced to the maximum extent practicable using runoff reduction practices. For any portion of the Cv that is not reduced, quantity management shall be provided using either a standards-based or performance-based approach such that there is no adverse impact.

Flood control requirement:
Final Regulations (sec. 5.4) Flooding Event Criteria: The Flooding Event Volume (Fv), volume of runoff produced by the post-development storm having a one percent (1%) probability of occurrence, or the 100-year, 24-hour rainfall event less any volume reduction achieved for the RPv and Cv, shall first be reduced by runoff reduction practices. Quantity management shall be provided for any runoff that is not reduced such that there is no adverse impact to downstream properties, channels, and structures.

Redevelopment standard:
Final Regulations (sec. 2.0): Projects are exempt from the above regulations if they are limited to reconstruction of existing paved areas, re-grading and replacement of existing pervious areas, or rebuilding or repairing of structures damaged by fire, flood, wind, or other natural disaster and where the disturbed area will return to the original hydrologic condition and land cover at the conclusion of the project.

Final Regulations (sec. 5.6): Runoff from redeveloped areas that were wooded or meadow in the pre-developed condition shall be reduced using runoff reduction practices to an equivalent wooded condition. All remaining redeveloped areas shall employ runoff reduction practices to achieve a 30% reduction in the effective imperviousness based on the existing condition.

Special criteria:
Stormwater Management Plan Design: The developer must certify that all personnel responsible for daily oversight of the construction site and guidance of construction personnel have attended a state-sponsored Contractor Training Program. (Final Regulations, sec. 3.8)

Offset /mitigation: An offset shall be provided for any portion of the RPv that does not meet the minimum reduction requirements or that is not sufficient to meet TMDL requirements. An offset may include trading, banking, fee-in-lieu, or other similar program that serves as compensation when the requirements cannot be reasonably met on an individual project basis

Compliance: Compliance is achieved through review of site plans by the State or by the delegated agencies with a 3-step process. Step 1 of the plan approval process is scheduling and conducting the project application meeting. Step 2 of the plan approval process is submission of the preliminary Sediment and Stormwater Management Plan. Step 3 of the plan approval process is submission of the Sediment and Stormwater Management Plan (Final Regulations, sec. 3.0)

Inspection & Maintenance/O&M: The site owner is responsible for all maintenance of permanent stormwater management systems. The state or delegated agency may conduct maintenance reviews to verify the condition of the systems. (Final Regulations, sec. 3.10)

Does development on agricultural land qualify as redevelopment? No. (Final Regulations, sec. 2.0)

Definition of impervious surface: "Impervious surface" means a surface which either prevents or retards the entry of water into the soil. (Final Regulations, sec. 2.0)

Definition of new development: N/A

Definition of predevelopment: N/A

Definition of redevelopment: "Redevelopment", including brownfield development, means a construction, alteration or improvement, including but not limited to the demolition or building of structures, filling, grading, paving, or excavating, where existing land use is residential, commercial, industrial, or institutional. Ordinary maintenance activities, remodeling of existing buildings, resurfacing of paved areas, and exterior changes or improvements are typically not considered redevelopment activities. (Final Regulations, sec. 2.0)

Program Name: Maryland State Stormwater Management Program

Program Status: Existing Regulations, Stormwater Manual revised in May 2009 (originally issued October 2000)

Regulatory Authority: State-wide stormwater regulation; State-wide stormwater manual (regulatory)

Standard Source: Code of Maryland Regulations (COMAR) 26.17.02; Maryland Stormwater Design Manual

Website references:
Maryland Stormwater Program
http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/SedimentandStormwaterHome/Pages/Programs/WaterPrograms/SedimentandStormwater/home/index.aspx

Stormwater Design Manual:
http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/MarylandStormwaterDesignManual/Pages/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.aspx

Stormwater Management Guidelines for State and Federal Projects (April 2010)
http://www.mde.maryland.gov/programs/Water/StormwaterManagementProgram/Documents/www.mde.state.md.us/assets/document/State%20and%20Federal%20SWM%20Guidelines%20final.pdf

Regulations:
http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Documents/www.mde.state.md.us/assets/document/26.17.02.%202009.pdf

Size Threshold: Land development projects that disturb greater than 5,000 square feet. (Regulations, 26.17.02.05B(2), p. 12)

Limited geographic area where standards apply: Applies statewide

Significant exemptions: Agricultural land management practices and any project that does not disturb over 5,000 square feet of land.

Post-Construction Standards for New Development:

On-Site Retention/Volume Control (enacted 2000, significant revisions in 2009):

Accepted Environmental Site Design (ESD) practices as defined in the Stormwater Design Manual must be implemented to manage the stormwater quality volume, defined as the runoff volume from the 1-inch rain event in the MD Eastern Rainfall Zone and 0.9" in the MD Western Rainfall Zone. (See channel protection requirements as well). (Manual, p. 5.18)

Treatment requirement (enacted 2000):
40% phosphorous and 80% TSS reduction required. Assumed to be met if On-Site Retention/Volume Control requirements are met. (Manual, p. 1.13)

Channel protection requirement (enacted 2000, significant revisions in 2009):
Environmental Site Design (ESD) must be implemented to the Maximum Extent Practicable (MEP) to mimic predevelopment hydrologic conditions, defined as woods in good condition, when subjected to a 1-year 24-hour design rain event. This means that ESD practices must provide retention storage sufficient to reduce the runoff depth of the proposed development to that of woods in good condition. Any channel protection volume remaining after the implementation of ESD to the MEP can be managed utilizing the traditional strategies and practices designed in accordance with the State Manual (such as detention ponds, filtration or other treatment structures). (Manual, p. 5.18)

Flood control requirement (enacted 2000):
Optional criteria applied at the discretion of the appropriate plan review/approval authority to control the developed condition peak rate of discharge from the 10-year 24-hour design storm event to the pre-development rate. (Manual, p. 2.1)

Redevelopment standard:
Any land development project disturbing 5,000 square feet or more where existing land use is commercial, industrial, institutional, or multifamily residential and existing site impervious area exceeds 40 percent must achieve one of the following:

a) Reduce existing impervious area within the limit of disturbance by at least 50 percent according to the Design Manual;
b) Implement ESD to the MEP to provide water quality treatment (1" or 0.9") for at least 50 percent of the existing impervious area within the limit of disturbance; or
c) Use a combination of both a) and b) for at least 50 percent of the existing site impervious area.

Alternative measures may be allowed if the applicant successfully demonstrates implementation of the above to the MEP. (Regulations, 26.17.02.02B(29), p. 6; 26.17.02.05D, p. 13)

Additionally, Maryland provides specific guidelines for state and federal projects for redevelopment (see Stormwater Management Guidelines for State and Federal Projects, April 2010)

Special criteria:
Stormwater Management Plan Design: MD Stormwater Act of 2007 requires a comprehensive process at the county and municipal level for approving grading and sediment control plans and stormwater management plans. This is to include a Concept Design and Review Phase, a Site Development and Review Phase, and a Final Plan Design and Review Phase. (Regulations, 26.17.02.04, p. 11)

Groundwater Recharge: The groundwater recharge volume is a fraction of the water quality volume based on the pre-developed hydrologic soil group. Therefore, ESD must be implemented to manage both groundwater recharge and water quality volumes. (Manual, p. 2.1)

Offset /mitigation: MDE has developed a *Phase I Point Source Nutrient Trading Policy* for point source discharges. Draft *Phase II A* and *Phase II B Guidelines* that govern the generation and purchase of Agricultural Nonpoint Nutrient Credits have been developed. No program exists for urban nonpoint nutrient trading or offset and/or in-lieu fee program. (Maryland Nutrient Trading webpage)

Compliance: Compliance is achieved through review of site plans by each localities stormwater management program. (Regulations, 26.17.02.04, p. 11)

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by state regulation to be incorporated into local stormwater programs and ordinances. Property owners are responsible for maintenance of all stormwater practices, and the municipality is responsible for ensuring compliance through periodic inspections (once during the initial year of operation and at least once every three years thereafter with corresponding documentation). (Regulations, 26.17.02.11A, p. 29)

Does development on agricultural land qualify as redevelopment? No. (Regulations, 26.17.02.02B(29), p. 6)

Definition of impervious surface: "Impervious area" means any surface that does not allow stormwater to infiltrate into the ground. (Regulations, 26.17.02.02B(20), p. 5) A more detailed definition is provided in the Stormwater Design Manual: Those surfaces in the landscape that cannot infiltrate rainfall consisting of building rooftops, pavement, sidewalks, driveways, etc. (Manual, p. G.6)

Definition of new development: N/A

Definition of predevelopment: N/A

Definition of redevelopment: "Redevelopment" means any construction, alteration, or improvement exceeding five thousand square feet of land disturbance performed on sites where existing land use is commercial, industrial, institutional, or multifamily residential.

Stormwater Program Summary – Pennsylvania

Program Name: Pennsylvania Stormwater Management Program

Program Status: Existing regulations and MS4 NPDES permit. The state's current NPDES Phase II MS4 general permit (PAG-13) has been extended.

Regulatory Authority: Stormwater Management Act of 1978 (Act 167) is original authority for statewide stormwater management. The Comprehensive Stormwater Management Policy (established 2002) is a statement to integrate the state's various stormwater management programs.

- Stormwater Management Act of 1978 (Act 167) requires all counties to develop watershed-based stormwater management plans (as funding becomes available) and requires municipalities to adopt and implement ordinances to regulate development consistent with these plans. These municipal level stormwater ordinances, when developed, are intended to provide the mechanism for meeting the Commonwealth's regulatory requirements. A model ordinance was developed by DEP for use by municipalities across the state.
- Pennsylvania's General NPDES Permit for Stormwater Discharges Associated with Construction Activities (PAG-02) requires all sites disturbing at least one acre to implement BMPs to meet standards and specifications identified in the Stormwater Best Management Practices Manual (part 3.a(4) of PAG-02).

Standard source: Act 167 and Pennsylvania Stormwater Best Management Practices manual (non-regulatory), developed in 2006.

Website references:
Pennsylvania Stormwater Program
http://www.dep.pa.gov/Business/Water/PointNonPointMgmt/StormwaterMgmt/Pages/default.aspx#.VmhesaUo5jo

1978 Stormwater Management Act (Act 167):
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-87074/3930-BK-DEP0121.pdf

MS4 Permit: http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9457

Comprehensive Stormwater Management Policy, DEP Policy No. 392-0300-002:
http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-48415/392-0300-002.pdf

Pennsylvania Stormwater Best Management Practices Manual (2006):
http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8305

Size Threshold: Applies to land development disturbances of one acre or more, including projects less than one acre that are part of a larger common plan of development or sale.

Limited geographic area where standards apply: The NPDES Permit for construction activities applies statewide.

Significant exemptions: N/A

Post-Construction Standards for New Development:
The following post-construction design standards are contained in the state's BMP manual which is implemented through the state's construction general permit.

On-Site Retention/Volume Control:
Volume Control Guideline 1 (Sec. 3.3.3) – Applicable to any size of land disturbance.

- Do not increase post-development runoff volume for all storms equal to or less than the 2-year/24-hour stormwater event;
- Pre-development non-forested pervious areas must be considered meadow in good condition

Volume Control Guideline 2 (Sec. 3.3.4) – Not applicable to land disturbances of greater than 1 acre or for development projects that require design of stormwater storage facilities.

- Capture at least the first 2" of runoff from all contributing impervious surfaces.
- At least the first 1" of runoff from new impervious surfaces shall be permanently removed from the runoff flow.
- In all cases, the first 0.5" of the permanently removed runoff should be infiltrated.

Treatment requirement: Achieve an 85% reduction in Total Suspended Solids (TSS), an 85% reduction in phosphorus loads, and a 50% reduction in NO3-N loads (Sec. 3.5).

Channel protection requirement: See Volume Control Guideline 1 above.

Flood control requirement: Do not increase the peak rate of discharge for the 1-year through 100-year event; as necessary, provide additional peak rate control as required by applicable Act 167 plans (Sec. 3.4).

Redevelopment standard:
Using Volume Control Guideline 1 to control runoff, 20% of pre-development impervious area shall be considered meadow in good condition in the model for existing conditions (BMP Manual, Sec. 3.3.3).

Special criteria: According to StormwaterPA.org, Pennsylvania's regulatory standards for post construction stormwater discharges are designed to meet the anti-degradation requirements of Chapter 93 Water Quality Standards:

- *In Areas Tributary to High Quality and Exceptional Value (Special Protection) Waters*—there shall be no degradation of existing or designated stream quality through a change in post construction stormwater runoff volume, rate and quality.

Offset/mitigation: N/A

Compliance: Many Act 167 stormwater programs are administered by conservation districts. MS4 jurisdictions review site plans for compliance with NPDES and local ordinance stormwater rules.

Inspection & Maintenance/O&M: MS4s must ensure long-term operation and maintenance of required stormwater management BMPs.

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: A surface that prevents the infiltration of water into the ground. Impervious surfaces (or covers) shall include, but not be limited to, roofs, additional indoor living spaces, patios, garages, storage sheds and similar structures, and any new streets or sidewalks. Decks, parking

areas, and driveway areas are not counted as impervious areas if they do not prevent infiltration (Model Ordinance, pg. 12).

Definition of Predevelopment: Not officially defined.

Definition of New Development: Not officially defined.

Definition of Redevelopment: Not officially defined.

Additional references:
Pennsylvania Model Stormwater Ordinance:
http://www.stormwaterpa.org/assets/media/regulatory/363-0300-003.pdf

Stormwater Program Summary – Virginia

Program Name: Virginia Stormwater Management Program (VSMP/NPDES)

Program Status: New stormwater management regulations became effective July 1, 2013.

Regulatory Authority:

- Virginia stormwater law and regulations were amended in 2005 to combine the existing State stormwater program and the State NPDES permit program into one program: the Virginia Stormwater Management Program (VSMP/NPDES) Permit Regulations: Virginia Administrative Code (VAC) 4VAC50-60;
- The technical criteria is also required for certain localities (tidal Virginia) by the Chesapeake Bay Preservation Area Designation and Management Regulations, 9VAC10-20

Standards source: Technical criteria outlined in:

- VSMP Regulations Part II (4VAC50-60-40)
- Virginia Stormwater Management Handbook (published in 1999); Draft Handbook was published in 2013; Handbook is guidance, intended to be referenced as regulation.

Website references:
Virginia Stormwater Program
http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx

Stormwater Management Handbook:
Volume 1 - http://www.deq.virginia.gov/Portals/0/DEQ/Water/Publications/HndbkVolumeI.pdf
Volume 2-
http://www.deq.virginia.gov/Portals/0/DEQ/Water/StormwaterManagement/SWMHandbookVolume%20II.pdf

Regulations:
http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/LocalVSMPProgramDevelopment.aspx

Size Threshold: Land development projects that are regulated by §10.1-603.8 (Construction General Permit) of the Code of Virginia (Regulations 4VAC50-60-30):

- Statewide: land development projects that disturb greater than 1 acre or 2,500 square feet within the Chesapeake Preservation Area

Limited geographic area where standards apply:

- Regulated MS4 area (either under the operational control of the local government MS4 or VDOT MS4).
- Construction General Permit statewide.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Note: No current requirement, however regulations require compliance with a site-based Total Phosphorus (TP) load limit through the use of volume reduction and/or pollutant removal BMPs. Otherwise, there is no prescriptive volume reduction or retention standard.

Treatment requirement:
Requires runoff volume reduction to the extent needed to meet a site based TP load limit of 0.41 lb/ac/yr using simple method. Compliance is possible using a traditional pond/wetland design that achieves little to no runoff volume reduction (or retention). TP is surrogate parameter for compliance; reductions in TN and TSS are also reported but not part of the compliance formula.

Channel protection requirement:
Requires control of the 1-yr storm as a function of the condition of the downstream channel (4VAC50-60-66(B)):

1. Manmade: Peak rate from the two-year, 24-hour storm event within the capacity of the system;
2. Restored: Peak rate reduced to the non-erosive capacity or as required for natural system; or
3. Natural System: post-developed maximum allowed peak flow rate from the one-year, 24-hour storm event must be less than the pre-developed rate reduced by an Improvement Factor (IF) and the ratio of pre- and post-developed runoff volumes.

Flood control requirement:
Reduction of the post-developed peak discharge from the 10-year 24-hour design storm to pre-developed rate or to that which will not result in flooding. (Regulation 4VAC50-60-66(C))

***Redevelopment standard*:**
Sites ≥ 1 ac must reduce existing condition TP load by 20%. Less than 1 ac (regulated by state law independent of permit) required to reduce TP load by 10%.

Special criteria: N/A

Offset/Mitigation: Offset fees and nutrient trading are not part of the existing program. However, the regulation update will include provisions for offset fees, offsite compensatory treatment, nutrient trading, or other form of offsite mitigation.

Compliance:

- Compliance achieved through plan review, approval and inspections where local program is required: tidal Virginia; MS4 communities (or adopted at local option);
- Non-tidal portion of VA, and non-MS4 localities are managed through state implementation of Construction General Permit: no plan review, only random audit inspections of SW construction, and no mechanism to enforce long term BMP maintenance after NOT).

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by state regulation to be incorporated into local stormwater programs and ordinances. Property owners are responsible for maintenance of all stormwater practices, and the municipality is responsible for ensuring compliance through periodic inspections (once during the initial year of operation and at least once every three years thereafter with corresponding documentation). (Regulations, 4VAC50-60-150. Administrative procedures: maintenance and inspections.)

Does development on agricultural land qualify as redevelopment? No. (Regulations, 4VAC50-60-60. Water quality, p. 18)

Definition of impervious surface: "Impervious cover" means a surface composed of material that significantly impedes or prevents natural infiltration of water into soil. (Regulations 4VAC50-60-10. Definitions).

Definition of predevelopment: "Pre-development" refers to the conditions that exist at the time that plans for the land development of a tract of land are approved by the plan approval authority. Where phased development or plan approval occurs (preliminary grading, demolition of existing structures, roads and utilities, etc.), the existing conditions at the time prior to the first item being approved or permitted shall establish pre-development conditions. (Regulations 4VAC50-60-10. Definitions).

Definition of new development: "Land disturbance" or "land-disturbing activity" means a manmade change to the land surface that potentially changes its runoff characteristics including any clearing, grading, or excavation associated with a construction activity regulated pursuant to the federal Clean Water Act, the Act, and this chapter. (Regulations 4VAC50-60-10. Definitions).

Definition of redevelopment: Any construction, alteration, or improvement on existing development (Handbook, Volume 2 Glossary).

Additional references:
VA Stormwater BMP Clearinghouse:
http://www.vwrrc.vt.edu/swc

Final MS4 General Permit:
http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/MS4Permits.aspx

Final Construction General Permit:
http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx

Chesapeake Bay Watershed Nutrient Credit Exchange
http://www.deq.virginia.gov/Programs/Water/PermittingCompliance/PollutionDischargeElimination/NutrientTrading.aspx

Program Name: District of Columbia Stormwater Program

Program Status: In 2013, the District of Columbia Department of the Environment (DDOE) published amendments to the District's regulations governing soil erosion, sediment control, and stormwater management (District of Columbia Municipal Regulations Title 21, Chapter 5). In addition to establishing a new set of District-wide stormwater management requirements, the amendments enhance stormwater management standards for private projects within the Anacostia Waterfront Corporation Development Zone. Specifically, these amendments promote the use of low impact development practices such as rain gardens, cisterns, green roofs, and other green technology best management practices to control and treat stormwater. In the Anacostia Waterfront Corporation Development Zone, surface water runoff volume must be reduced by one (1) inch, and an additional two (2) inches treated; in the rest of the District, three quarters of the total volume of surface water runoff must be reduced, and the remaining one quarter treated.

A new MS4 permit was issued by EPA Region III in September 2011 (modified November 2012) (http://www.epa.gov/reg3wapd/npdes/dcpermits.htm). This program summary includes pertinent information regarding existing District stormwater standards and the standards in the MS4 permit. The existing District stormwater standards will need to be updated to reflect the standard in the MS4 permit.

Authority: The regulations governing stormwater management, erosion and sediment control, and floodplain management are outlined in District of Columbia Municipal Regulations Title 21, Chapter 5

Standard source: Chapter 5 of Title 21, and Chapter 31 of Title 20, District of Columbia Municipal Regulations (DCMR), DC Stormwater Management Guidebook (2013), and MS4 permit.

Website references:
DC Stormwater Program
http://doee.dc.gov/service/stormwater-management

Chapter 5 of Title 21, and Chapter 31 of Title 20, District of Columbia Municipal Regulations (DCMR)
http://www.dcregs.dc.gov/Gateway/ChapterHome.aspx?ChapterNumber=21-5
http://www.dcregs.dc.gov/Gateway/ChapterHome.aspx?ChapterNumber=20-31

Stormwater Management Guidebook
http://ddoe.dc.gov/page/2013-stormwater-management-guidebook

Size threshold: A stormwater management plan is required for 5,000 square feet of land disturbance. For any proposed construction or development located entirely or partially within any identified Special Flood Hazard Area (SFHA), a floodplain development plan and study are required.

Limited geographic area where standards apply: District-wide

Significant exemptions: N/A

Post-Construction Standards:

On-Site Retention/Volume Control:
The MS4 permit requires all projects disturbing greater than 5,000 square feet to achieve on-site retention of 1.2 inches of stormwater from a 24-hour storm.

Treatment requirement:
Though not in the regulations, the DDOE Stormwater Guidebook uses the following formula for determining the volume of water to be treated.

$V_w = R \times I_a / 12$
V_w = water quality volume to be treated, in $feet^3$
R = runoff depth, in inches, as follows:
- R= 0.5 in for parking lots, city streets, and high speed roads
- R = 0.3 for rooftops, sidewalks, and pedestrian plaza areas

I_a = impervious area, in $feet^2$

Channel protection requirement:
The existing regulations require that a developer must maintain the post-development peak discharges for a twenty-four hour, two- and fifteen-year frequency storm event at a level that is equal to or less than the respective, twenty-four hour, two- and fifteen-year pre-development peak discharge rate through storm water management practices that control the volume, timing and rate of flows.

Flood control requirement:
Where any development is planned in which the stormwater runoff will increase the downstream discharge into an area designated as a flood hazard watershed, as delineated on the National Flood insurance Flood Hazard Boundary Maps (FHBM), the developer shall complete an analysis of the downstream peak discharge for a one-hundred year frequency storm event, and shall install the appropriate controls to avoid exceeding this peak discharge.

Redevelopment standard: Same as for new development.

Special criteria: The MS4 permit requires the District to retrofit existing impervious surface. The DC Retrofit Program must manage runoff from 18,000,000 square feet of impervious surfaces over the Permit term. A minimum of 1,500,000 square feet of this objective must be in transportation rights-of-way.

Offset/mitigation: A stormwater retention credit trading program (SRC) has been developed for voluntary green infrastructure that allows owners to trade their SRCs in an open market to others who use them to meet regulatory requirements for retaining stormwater (http://doee.dc.gov/src).

Compliance: The District Department of Environmental Services reviews sites plans to ensure standards are included.

Inspection & Maintenance/O&M: The District inspects SWM facilities for maintenance. A Declaration of Covenant for SWM is required for residential and business property owners. The covenant states that the owner must provide a schedule for maintenance, inspect the device periodically, and be responsible for any maintenance.

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surfaces: "Impervious cover" - A surface area which has been compacted or covered with a layer of material that impedes or prevents the infiltration of water into the ground, examples include conventional streets, parking lots, rooftops, sidewalks, pathways with compacted sub-base, and any concrete, asphalt, or compacted gravel surface and other similar surfaces (Guidebook, Appendix U).

Definition of New Development: N/A

Definition of Predevelopment: MS4 permit defines predevelopment as "the combination of runoff, infiltration and evapotranspiration rates, volumes, durations and temperatures that typically existed on the site with natural soils and vegetation before human-induced land disturbance occurred. In the context of requirements in this permit the environmental objective is a stable, natural hydrologic site condition that protects or restores to the degree relevant for that site, stable hydrology in the receiving water, which will not necessarily be the hydrologic regime of that receiving water prior to any human disturbance in the watershed."

Definition of Redevelopment: N/A

Program Name: West Virginia Stormwater Program

Program Status: Existing MS4 Stormwater Permit (Permit No. WV0116025). Issued on June 11, 2014, effective date August 11, 2014, expiration date August 11, 2019.

Regulatory Authority: MS4 permit

Standard source: MS4 Permit

Website references:
West Virginia Stormwater Program
http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx

Stormwater Management and Design Guidance Manual:
http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/Pages/StormwaterManagementDesignandGuidanceManual.aspx

MS4 Permit:
http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Documents/MS4%20GP%202014.pdf

Size Threshold: Projects that disturb a land area one acre or greater, including projects less than one acre that are part of a larger common plan of development or sale.

Limited geographic area where standards apply: Only in the regulated MS4 areas (urbanized areas)

Significant exemptions: N/A

Post-Construction Standards:

On-Site Retention/Volume Control:
Keep and manage onsite the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation.

Runoff volume reduction can be achieved by canopy interception, soil amendments, evaporation, evapotranspiration, rainfall harvesting, grass channels and swales, reforestation, green roofs, rooftop disconnections, permeable pavers/pavement, porous concrete, engineered infiltration, and/or extended filtration and any combination of the aforementioned practices. This first one inch of rainfall must be 100% managed with no discharge to surface waters, except when the stormwater is treated prior to discharge to surface waters, e.g. with engineered infiltration, payment in-lieu or off-site mitigation is used, or an alternative method is approved. (Permit Part II.C.7.e.11)

Treatment requirement: No separate standard – see on-site retention standard.

Channel protection requirement: No separate standard – see on-site retention standard.

Flood control requirement: N/A

Redevelopment standard:

A reduction of 0.2 inches from the one inch on-site retention standard may be applied for redevelopment projects. Additional 0.2 inch reductions (up to a maximum reduction of 0.75 inches) may be applied for (Permit Part II.C.7.e.13):

- Brownfield redevelopment
- High density (>7 units per acre)
- Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre)
- Mixed use and Transit Oriented Development (within ½ mile of transit)

Special criteria: N/A

Offset/mitigation: For projects that cannot meet 100% of the runoff reduction requirement on site, the permittee may allow an alternative approach for off-site mitigation, payment in lieu, or for another approved method of capturing or treating the subject first 1 inch stormwater. (Permit Part II.C.7.e.16)

Alternatives are managed by the MS4, which must first develop a program and criteria before the alternative can be used. A determination to allow an alternative to on-site stormwater retention and treatment may be based on the difficulty or cost of implementing measures.

If, as demonstrated to the permittee, it is technically infeasible to manage on site a portion or all of the subject l" of rainfall, off site mitigation, payment in lieu, or another approved alternative approach will be applied at a 1: 1 ratio for that portion.

- *Off-site mitigation*. Runoff reduction practices may be implemented at another location in the same sewershed/watershed as the original project, approved by the permittee. Mitigation must be for retrofit or redevelopment projects, and cannot be applied to new development.
- *Payment in lieu*. Payment in lieu may be made to the permittee, who will apply the funds to a public stormwater project.

Compliance: Standards are reviewed by the MS4 during site plan review at the local level.

Inspection & Maintenance/O&M:

- Maintenance agreement and maintenance plan required for all approved stormwater management practices. Verification of maintenance must be provided by property owners. (Permit Part II.C.7.e.16.n)
- MS4 required to inspect stormwater BMPs at least once every five years (Permit Part II.C.7.e.16.s)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surfaces: Permit defined “accessory impervious surfaces” as “those additional impervious surfaces that are created to service new development; including roads, shopping centers, office parks and parking lots. (Permit, Appendix B)

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: New construction requiring land disturbance that alters the footprint of an existing developed site. (Permit, Appendix B)

Stormwater Program Summary – Alabama

Program Name: Alabama Stormwater Program

Program Status: MS4 permit issued January 2011 (modified February, 2012); Existing Regulations (modified March, 2013)

Regulatory Authority: NPDES Phase II MS4 Permit and state regulation: Code of Alabama 1975, §§ 22-22-1 to 22-22-14 and §§ 22-22A-1 to 22-22A-16 et seq., as amended.

Standard source: Phase II MS4 Permit

Website references:
Alabama Stormwater Program
http://www.adem.state.al.us/programs/water/municipal.cnt

Regulations:
http://www.adem.state.al.us/alEnviroRegLaws/files/Division6Vol1.pdf

Phase II MS4 Permit:
http://www.adem.state.al.us/programs/water/permits/ALR040000StormwaterDischarges.pdf

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the Permittee's regulated MS4. (Permit, p. 29)

Limited geographic area where standards apply: Only in the regulated MS4 areas (urbanized areas).

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: Permit (p.15) requires MS4 to ensure "the volume and velocity of pre-construction stormwater runoff is not significantly exceeded. A design rainfall event with an intensity of up to that of a 2-yr, 24-hr storm event shall be the basis for the design and implementation of post-construction BMPs."

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: There is no program for mitigation.

Compliance: MS4s must establish and use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State law. (Permit, p. 15)

Inspection & Maintenance/O&M: MS4s must include how they will ensure the long-term operation and maintenance (O&M) of the selected BMPs in the SWMP. (Permit, p. 16)

Does development on agricultural land qualify as redevelopment? Not addressed.

Definition of impervious surface: Impervious means not allowing infiltration. (Manual, p. A.56)

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: N/A

Additional references:
Handbook for ESC:
http://swcc.alabama.gov/pages/erosion_handbook.aspx

Stormwater Program Summary – Florida

Program Name: Florida State Stormwater Program

Program Status: Existing Programs:

- First state rules implemented in February 1982. Changes to BMP design criteria done regularly through 1994 when Environmental Resource Permitting program implemented which integrates stormwater quantity, stormwater quality, and wetlands protection within one permit. Currently have five sets of rules implemented cooperatively by Florida Department of Environmental Protection and five regional water management districts.
- NPDES Phase I and Phase II MS4 permits reference the state stormwater rules as an equivalent state program for stormwater discharges from new development and redevelopment.
- Florida DEP implements the FL NPDES stormwater program. The NPDES stormwater permitting program is separate from the State's stormwater/environmental resource permitting (ERP) programs. The ERP program is implemented by the FL Department of Environmental Protection (DEP) and Water Management Districts (WMD), and local programs. The ERP Stormwater Program is considered an equivalent state program for the NPDES MCM 5.

Regulatory Authority:

- State Stormwater: Chapter 373, Part IV and Chapter 403, Florida Statute (F.S.) combine wetland resource permitting and stormwater management permitting into an "Environmental Resource Permit" regulation. This is a technology-based rule which relies upon specific BMP design criteria that are presumed to achieve the minimum stormwater treatment standards specified in Ch. 62-40.432 F.A.C (Water Resource Implementation Rule).
- NPDES Stormwater: Section 403.0885, F.S. and implementing regulations such as Chapter 62-624, F.A.C. for MS4 permits

Standard source:

Florida Stormwater Erosion and Sedimentation Control Inspectors Manual, July 2008
http://www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf

Post-Construction Stormwater Management in New Development and Redevelopment
http://www.dep.state.fl.us/water/wetlands/erp/index.htm

Florida Development Manual: A Guide to Sound Land and Water Management
http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/Stormwater_Guide.pdf

State of Florida Erosion & Sediment Control Designer & Reviewer Manual
http://www.dot.state.fl.us/construction/Engineers/Environment/PagesErosionSedimentManual_0309.pdf

Website references:

DEP MS4 Permit Program:
http://www.dep.state.fl.us/water/stormwater/npdes/MS4_1.htm

Urban Stormwater Program Overview:
http://www.dep.state.fl.us/water/nonpoint/urban1.htm

DEP/WMD Environmental Resource Permit Program:
http://www.dep.state.fl.us/water/wetlands/erp/index.htm

Regulations:
State ERP regulations:
http://www.dep.state.fl.us/water/wetlands/erp/index.htm

NPDES MS4 Phase I (Chapter 62-624, F.A.C)
http://www.dep.state.fl.us/legal/rules/shared/62-624.pdf

NPDES MS4 Phase II
http://www.dep.state.fl.us/water/stormwater/npdes/docs/Phase_II_MS4_GP.pdf

Size Threshold: State environmental resource permits and corresponding stormwater treatment are needed for all new or modified stormwater discharges and for all projects disturbing 4,000 square feet or more of impervious surface. The NPDES stormwater generic permit is required for all sites that disturb one or more acres of land.

Limited geographic area where standards apply: Statewide

Significant exemptions: N/A

Post-Construction Standards for New Development:
All new development and redevelopment projects must implement site appropriate BMPs that meet the required level of stormwater treatment set forth in the program's stormwater treatment performance standards which are found in Chapter 62-40.432, F.A.C. Local governments may adopt alternative or more stringent local requirements than the State standards.

On-Site Retention/Volume Control:
Volume control requirements are specific to each of the WMDs as set forth in their rules and Applicant's Handbook. Volume control (post=pre) is required in closed drainage basins to prevent flooding.

Treatment requirement:
Specific design criteria are provided for numerous BMPs including retention and detention systems that will provide the level of treatment required by the applicable performance standard.

The treatment volume for retention systems vary by WMD. The smallest retention volume is the first one half inch of runoff but it can be as much as 1.25 times the percent imperviousness plus an additional one half inch of runoff for online retention systems within the SJRWMD.

To minimize mosquito production and provide storage for the next storm, the specified treatment volume for a retention system must be recovered within 72 hours following a storm event.

Section 62-40.432, F.A.C., titled "Surface Water Management Regulation" establishes the minimum stormwater treatment performance standards:

- Stormwater discharges from construction sites shall not cause or contribute to violations of water quality standards which is 29 NTU above background
- New stormwater discharges must achieve at least 80% reduction of the average annual load of pollutants that would cause or contribute to violations of State water quality standards. However, current rules are based on TSS load reduction. New rule under development is based on TN and TP reduction;

- New stormwater discharges to Outstanding Florida Waters must achieve at least 95% reduction of the average annual load of pollutants that would cause or contribute to violations of State water quality standards (based on TSS at present).
- New stormwater discharges to impaired waters must achieve "net environmental improvement" which means that the loading from the site for the pollutant of concern must not increase above current levels.

Channel protection requirement:
Varies by WMD. Within the SJRWMD and NWFWMD, stormwater systems serving new construction that is greater than 50 percent impervious of the project area, the post-development peak discharge rate must not exceed the predevelopment peak discharge rate for the 2-year, 24-hour design storm event).

Flood control requirement:
Flood control requirements are established in the rules and Applicant's Handbook of the five regional WMDs. In general, the post-development peak discharge rate will not exceed the pre-development peak discharge rate for a specific design storm. The design storm varies by WMD from a 25 year, 24 hour design storm event to a three day 25-year design storm.

Redevelopment standard:
Urban redevelopment projects which result in an increase in stormwater loading are subject to the stormwater treatment requirements within the existing stormwater rules of the WMDs

Special criteria:
Stormwater discharges to sensitive waterways such as Outstanding Florida Waters (OFWs) and impaired waters must provide a higher level of treatment. The performance standard for OFWs is 95% annual average TSS loading. The performance standard for discharges to an impaired water is "net environmental improvement" which means that the stormwater discharged from the site after development must have lower loading for the pollutant causing or contributing to violations of water quality standards. Several of the WMDs have adopted "basin specific rules" that require a higher level of treatment within specific watersheds.

Offset /mitigation: Off-site compensating treatment within the same watershed may be used if it is not possible to meet the stormwater treatment requirements on the project site

Compliance:
Penalties for violating permit requirements are set forth in Sections 403.121 and 403.161. F.S.

Inspection & Maintenance/O&M: Inspections during construction are conducted by WMD, DEP, or local stormwater staff. In addition, projects with a NPDES stormwater permit must have inspections done by qualified inspectors (i.e., completed the DEP's Stormwater, Erosion, and Sedimentation Control Inspector Training Program) on a weekly basis or after any storm of 0.5" of rainfall or more. Regular inspections of post-development stormwater systems are required by three of the WMDs with recertification that the system is operating as permitted. All permits must identify the legal Operation and Maintenance entity, consistent with DEP and WMD regulations, which will be responsible for long term OM.

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: "Impervious" means land surfaces that do not allow, or minimally allow, the penetration of water; such as building roofs, non-porous concrete and asphalt pavements, and some fine grained or compacted soils

Definition of new development: N/A

Definition of predevelopment: Used for discharges to impaired waters when the "net environmental improvement" performance standard must be met and is defined as the existing land use condition.

Definition of redevelopment: "Redevelopment" means the construction of a stormwater treatment system on sites having existing commercial, industrial, institutional, or multi-family land uses where the existing impervious surface will be removed as part of the proposed activity.

Additional references:

- Evaluation of Current Stormwater Design Criteria within the State of Florida. (2007). Harvey H. Harper, PhD, PE and David M Baker, PE. http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/SW_TreatmentReportFinal_71907.pdf
- Florida's Water Management Districts Permitting Portal http://flwaterpermits.com
- University of Central Florida Stormwater Management Academy http://stormwater.ucf.edu/

Stormwater Program Summary – Georgia

Program Name: Georgia Department of Natural Resources Environmental Protection Division

Program Status: NPDES Phase II Permit (No. GAG610000) (effective December 6, 2012) Existing Regulations, Georgia's Stormwater Management Manual Volume 2: Technical Handbook (2001)

Regulatory Authority: State-wide stormwater guidance; State-wide stormwater manuals

Standard source: NPDES Phase II permit and Georgia's Volume 2: Technical Handbook (2001) MS4 Permit requires adoption of the State Stormwater Manual.

Website references:

GA NPDES Phase II Permit
https://epd.georgia.gov/sites/epd.georgia.gov/files/related_files/site_page/FINAL_GAEPD_NPDES_MS4_PhaseIISmall_GAG610000_Y2012Dec6.pdf

GA Erosion and Sediment Control Act of 1975 (amended 2010)
https://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/OCGA_12-7-1_2011.pdf

GA's Stormwater Management Manual, Volume 2: Technical Handbook (2001)
http://www.atlantaregional.com/environment/georgia-stormwater-manual

Coastal Stormwater Supplement (GA CSS) (2009)
http://epd.georgia.gov/georgia-epd-coastal-stormwater-supplement-stormwater-management-manual

Size Threshold: At a minimum, the permittee shall apply the standards for new development and redevelopment to any site that meets one or more of the following criteria:

For those permittees located outside of the 11-county coastal management program service area and subject to the GSMM:

- New development that creates or adds 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 5,000 square feet or greater.
- Redevelopment that creates or adds 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 1 acre or more, including projects less than 1 acre if they are part of a larger common plan of development or sale.

For those permittees located outside of the 11-county coastal management program service area, subject to the GSMM and the Metropolitan North Georgia Water Planning District:

- New development that creates or adds 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 1 acre or greater.
- Redevelopment that creates or adds or replaces 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 1 acre or more.

For those permittees located within the 11-county coastal management program service area and also subject to the CSS:

- New development that creates or adds 5,000 square feet or greater of impervious surface area, or that involves land disturbing activity of 1 acre or greater.

- Redevelopment that creates or adds or replaces 5,000 square feet or greater of new impervious surface area, or that involves land disturbing activity of 1 acre or more, including projects less than 1 acre if they are part of a larger common plan of development or sale.

Limited geographic area where standards apply: Applies to designated MS4's statewide and Coastal Zone.

Significant exemptions: N/A

Post-Construction Standards for New Development: Develop, implement and enforce a program to address storm water runoff into the MS4 from new development and redevelopment projects that disturb greater than or equal to one acre of land, including projects less than one acre if they are part of a larger common plan of development of sale. (NPDES Phase II permit, p. 17).

On-Site Retention/Volume Control: N/A

Treatment requirement (enacted 2001): All stormwater runoff shall be adequately treated prior to discharge. The stormwater management system shall be designed to remove 80% of the average annual post-development total suspended solids (TSS) load as defined in the GSMM or in the equivalent manual. Compliance with this performance standard is presumed to be met if the stormwater management system is sized to capture and treat the water quality treatment volume, which is defined as the runoff volume resulting from the first 1.2 inches of rainfall from a site (NPDES Phase II Permit, p. 19). (Volume 2, p. 1.3-1).

Channel protection requirement (enacted 2001): Provide extended detention for the 1-year storm event released over a 24 hour period (Volume 2, p. 1.3-1).

Stream channel and/or aquatic resource protection shall be provided by using the following approaches: 1) 24-hour extended detention storage of the 1-year, 24-hour return frequency storm event; 2) erosion prevention measures such as energy dissipation and velocity control; and 3) preservation of the applicable stream buffer (NPDES Phase II Permit, p. 20).

Flood control requirement (enacted 2001): Post-development peak discharge control does not exceed predevelopment peak discharge rate for the 25-year, 24-hour storm event (Volume 2, p. 1.2-3).

Overbank Flood Protection: Downstream overbank flood protection shall be provided by controlling the post-development peak discharge rate to the predevelopment rate for the 25-year, 24-hour storm event (NPDES Phase II Permit, p. 20).

Extreme Flood Protection: Extreme flood protection shall be provided by controlling the 100-year, 24-hour storm event such that flooding is not exacerbated (NPDES Phase II Permit, p. 20).

Redevelopment standard: Redevelopment is defined and covered under the same guidelines as new development (Volume 2, p. 1.2-1 and NPDES Phase II Permit).

Special criteria:
Stormwater requirements comparable to the NPDES MS4 post construction rules are required in GA's 24 coastal counties the GA Coastal Stormwater Supplement (2009) provides stormwater management guidance to reduce TSS by 80% in post construction runoff, maintain pre-development hydrology,

reduce erosion and sediment loss, preserve lands, protect waterways, and limit land disturbing areas whenever possible (GA CSS, p. 1-2). This is administered by GA's Coastal Resources Division.

Offset /mitigation: N/A

Compliance: Stormwater management compliance is through the local ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State and local law;

Inspection & Maintenance/O&M: Local programs must ensure adequate long-term operation and maintenance of the BMPs through ordinance provisions.

Does development on agricultural land qualify as redevelopment? Unknown.

Definition of impervious surface: "Impervious Cover" means a surface composed of any material that greatly impedes or prevents the natural infiltration of water into the underlying native soils. Impervious surfaces include, but are not limited to, rooftops, buildings, sidewalks, driveways, streets and roads (GA CSS, p. 10-3).

Definition of new development: New development is defined as land disturbing activities, structural development (construction, installation or expansion of a building or other structure), and/or creation of impervious surfaces on a previously undeveloped site. (GA Manual Volume 1, page 57).

Definition of predevelopment: N/A

Definition of redevelopment: Redevelopment is defined as structural development (construction, installation or expansion of a building or other structure), creation or addition of impervious surfaces, replacement of impervious surface not part of routine maintenance, and land disturbing activities associated with structural or impervious development. Redevelopment does not include such activities as exterior remodeling. (GA Stormwater Management Manual Volume 1, page 57; Volume 2, page 1.2-2).

Additional references:
Manual for Erosion and Sediment Control in Georgia (2014)
https://gaswcc.georgia.gov/technical-guidance-0

Volume 1: Stormwater Policy Guidebook (2001)
http://www.atlantaregional.com/environment/georgia-stormwater-manual

GA Erosion and Sediment Control Act of 1975 (amended 2010)
http://epd.georgia.gov/erosion-and-sedimentation

GA DEP Watershed Protection Branch Technical Guidance
http://epd.georgia.gov/watershed-protection-branch-technical-guidance

Stormwater Program Summary – Kentucky

Program Name: Kentucky NPDES Stormwater Program

Program Status: NPDES MS4 Phase I and Phase II (KPDES No**.:** KYG200000; 3/1/10) permits.

Regulatory Authority: MS4 permits

Standard source: Phase II MS4 permit

Website references:
Phase II MS4 General Permit (KPDES No**.:** KYG200000; 3/1/10)
http://water.ky.gov/wet_weather/Documents/Phase%20II%20General%20Permit%20Issued.pdf

NPDES MS4 Phase II KY Transportation Cabinet
http://transportation.ky.gov/stormwater/Pages/default.aspx

Regulations:
Kentucky DOW Regulations
http://lrc.ky.gov/kar/TITLE401.HTM

Size Threshold: Construction activity that disturbs one acre or more (Phase II permit, Page II-7).

Limited geographic area where standards apply: MS4 areas

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement

- Permit recommends the use of non-structural practices.
- For structural practices: MS4s required to develop a locally derived water quality treatment standard that requires new development projects to implement controls to manage runoff through water-quality control structures. The standard shall be based on an analysis of precipitation records to determine the equivalent surface depth of runoff (e.g. 0.75 inches) produced from an 80th percentile precipitation event (Phase II Permit, Page II-7)

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: For projects that cannot meet the water-quality treatment standard, the local program may include an off-site mitigation and/or payment-in-lieu program based on conditions set out in the MS4 permit (PART II, Page II-7-8)

Compliance: Compliance through local ordinance for plan review, inspection, and enforcement authority per MS4 permits: Develop procedures for a post-construction process to demonstrate and document that post-construction stormwater measures have been installed per design specifications, which includes enforceable procedures for bringing noncompliant projects into compliance.

(MS4 Permit PART II, Page II-8)

Inspection & Maintenance/O&M: Implemented through local ordinance permittee shall establish and implement procedures for inspection of a representative number of installed Best Management Practices (BMPs) (MS4 Permit Part II Page II-9)

Does development on agricultural land qualify as redevelopment? Unknown.

Definition of impervious surface: N/A

Definition of new development: N/A

Definition of predevelopment: N/A

Definition of redevelopment: N/A

Additional references:
Stormwater Management Handbook Implementing Green Infrastructure in Northern Kentucky Communities (2009)
http://www2.epa.gov/smart-growth/stormwater-management-handbook

Stormwater Program Summary – Mississippi

Program Name: Mississippi Stormwater Program

Program Status: Existing Small MS4 General NPDES Permit, Effective March 18, 2016

Regulatory Authority: Small MS4 NPDES Permit; State-wide Stormwater Guidance Manual (voluntary).

Standard source: Permit No. MSRMS4 (March 18, 2016); Mississippi's Phase II Small Municipal Separate Storm Sewer System (MS4) Guidance Manual (2002)

Website references:
General Permit
http://www.deq.state.ms.us/mdeq.nsf/pdf/epd_MS4PhaseIIStormWaterGeneralPermit/$File/22General.pdf?OpenElement

Size Threshold: New development and redevelopment projects that disturb greater than or equal to one (1) acre, including projects less than one (1) acre that are part of a larger common plan of development or sale, that discharge into the regulated entity's small MS4 (General Permit, Act 5(5)(A), p. 18).

Limited geographic area where standards apply: Applies only to MS4s.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: MS4s required to develop site design standards for all new development and redevelopment projects and require measures that are designed, built and maintained to infiltrate, evapotranspire, harvest and/or use, at a minimum the first inch of every rainfall event preceded by 72 hours of no measurable precipitation (General Permit, Act 5(5)(E), page 19).

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: Same as new development standard.

Special criteria: N/A

Offset /mitigation: N/A

Compliance: Through MS4 permit review and compliance.

Inspection & Maintenance/O&M: Mississippi Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas. The MS4 shall require a maintenance agreement and provide verification of maintenance provisions for post-construction management practices. These agreements shall allow the MS4, or its designee, to conduct inspections of the management practices and also account for transfer of responsibility in leases and/or deed transfers. Maintenance must follow the standards in the *Mississippi Handbook for Erosion Control, Sediment*

Control and Stormwater Management on Construction Sites and Urban Areas (attached as Appendix to Permit) (General Permit, Act 5(5)(F), p. 19).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Program Name: North Carolina Stormwater Program

Program Status: Existing Regulations, NPDES MS4 Phase I and II, State SW (ORW, HQW, & Coastal rules), Nutrient Sensitive Waters (NSW) rules, Water Supply Watershed rules, Site Specific Water Quality Management Plans, Jordan Lake & Falls Lake NSW rules, Universal Stormwater Management

The State is drafting new stormwater rules that reflect new "minimum design criteria." (http://portal.ncdenr.org/web/lr/rule-readoption)

Regulatory Authority: State-wide stormwater regulation; Phase II Post-Construction (Session Law 2006-246), Blue Book (15A NCAC 02H.0126, amended September 1, 2006), and Red Book (15A NCAC 02B.0100, .0200, .0300), State SW rules (15A NCAC 02H .1000) (Session Law 2008-211), WQ Management Plans (15A NCAC 02B .0600), General Statutes – 143-214.7, 143-215.1

Standard source: State-wide stormwater manual; Session Law 2006-246; Session Law 2008-211); 15A NCAC 02H .1000; 15A NCAC 2B .100 and .200

Website references:
State Stormwater Permitting Program website
http://portal.ncdenr.org/web/lr/stormwater

State Stormwater Rules and Laws
http://portal.ncdenr.org/web/lr/rules-and-regulations

NCDENR Stormwater BMP Manual
http://portal.ncdenr.org/web/lr/bmp-manual

"Redbook"

- 15A NCAC 02B .0100 (Assignment of Water Quality Standards)
- 15A NCAC 02B .0200 (Standards for Surface Waters & Wetlands (NSW, Buffers, Water Supply))
- 15A NCAC 02B.0225 (Updated ORW Rule)
- 15A NCAC 02B .0262-.0273 (Jordan Lake Rules (also see JordanLake.org))
- 15A NCAC 02B .0600 (Goose Creek Rules)
- 15A NCAC 02B .0300 (Assignment of Stream Classifications)

Regulations:
http://portal.ncdenr.org/web/stormwater/state-stormwater

Size Threshold: Permittees, delegated programs, and regulated entities must require stormwater controls for a project that:

- Statewide: disturbs one acre or more of land, including a project that disturbs less than one acre of land that is part of a larger common plan of development or sale. (Session Law 2006-246, p. 11 and BMP Manual, p. 2-1).
- Jordan Lake Rules: require stormwater permit for new development for

  - Single family and duplex residential property and recreational facilities that disturb one acre or more
  - Commercial, industrial, institutional, multifamily residential, or local government property that disturb ½ acre or more
- Falls Lake Rules: require stormwater permit for new development for
  - Single family and duplex residential property and recreational facilities that disturb ½ acre or more
  - Commercial, industrial, institutional, multifamily residential, or local government property that disturb 12,000 sf or more
- Coastal Counties: require stormwater permit for
  - Nonresidential development that disturb less than one acre but add more than 10,000 square feet of built upon area; and
  - Residential development that disturb one acre or more; and
  - Residential development activities within ½ mile of and draining to shellfishing waters (SA) that disturb less than one care but add more than 10,000 square feet built upon area resulting in at least 12% total built upon area, also require a permit
    (Session Law 2008-211)

Limited geographic area where standards apply: Applies in areas subject to the following programs: Phase I & II MS4 entities, Municipal spheres of influence (MSIs) around some phase I & II entities, Counties "tipped-in" to phase II, 20 coastal counties, ORW & HQW watersheds, water supply watersheds, Neuse & Tar-Pamlico NSW Basins, Jordan Lake & Falls Lake watersheds, Randaleman Lake watershed, Goose Creek, Six Mile Creek, and Waxhaw Creek watersheds. Programs cover around 65% of the state. See interactive online map (available at http://portal.ncdenr.org/web/lr/stormwater)

Areas that are not included in these programs do not have state stormwater requirements. However, they must meet the requirements of the impervious parking legislation. The impervious parking legislation is not a state stormwater program. It is implemented by local building inspectors.

Significant exemptions: N/A

Post-Construction Standards for New Development:

Specific Standards designated for:

1) Water Supply Watershed I (WS-I) – 15A NCAC 2B.0212.
2) Water Supply Watershed II (WS-II) – 15A NCAC 2B.0214.
3) Water Supply Watershed III (WS-III) – 15A NCAC 2B.0215.
4) Water Supply Watershed IV (WS-IV) – 15A NCAC 2B.0216.
5) Freshwater High Quality Waters (HQW) – 15A NCAC 2H.1006.
6) Freshwater Outstanding Resource Waters (ORW) – 15A NCAC 2H.1007.
7) The Neuse River Basin Nutrient Sensitive Waters (NSW) Management Strategy – 15A NCAC 2B.0235. 8) The Tar-Pamlico River Basin Nutrient Sensitive (NSW) Management Strategy – 15A NCAC 2B.0258.
8) The Tar-Pamlico River Basin Nutrient Sensitive (NSW) Management Strategy – 15A NCAC 2B.0258.
9) The Randleman Lake Water Supply Watershed Nutrient Management Strategy – 15A NCAC 2B.0251.
10) Coastal Counties – Session Law 2008-211 (formerly 15A NCAC 02H .1005)
11) Goose Creek (includes Six Mile & Waxhaw Creeks) – 15A NCAC 02B .0600

12) Jordan Water Supply Nutrient Strategy – 15A NCAC 02B .0262
13) Falls Water Supply Nutrient Strategy – 15A NCAC 02B .0275
14) Phase I & II entities (includes MSIs & "tipped" counties) – Session Law 2006-246
15) Lockwoods Folly River Area WQ Management Plan – 15A NCAC 02B .0227

Additional standards (such as buffers and setbacks, approval authority, drainage specifications, etc.) for projects designated as:

- Density:
    - High
    - Low
    - Location: All post-construction programs except Goose Creek
- Buffers and/or setbacks:
    - 30'-50' (100'-200' in Goose Creek);
    - Location: All programs

On-Site Retention/Volume Control: N/A

Treatment requirement:
Statewide: Runoff from 1" rain; Coastal Counties: Runoff from 1.5-inch rain or the difference in the runoff volume from the predevelopment and post-development conditions for the 1-year, 24- hour storm;

- Draw down the treatment volume no faster than 48 hours, but no slower than 120 hours.
    - Discharge the storage volume at a rate equal to or less than the predevelopment discharge rate for the one-year, 24-hour storm.
    - Remove 85% average annual TSS.
    - Meet the General Engineering Design Criteria set out in 15A NCAC 02H .1008(c).

    (Session Law 2006-246, p. 11; Session Law 2008-211).
- TN target in Neuse Basin; TN & TP targets in Tar-Pamlico, Jordan, & Falls

Channel protection requirement: (Not designated as channel protection in regulations).

- Control and treat the difference in the runoff from the predevelopment and post-development conditions for the 1-year, 24- hour storm (only in SA waters and Goose Creek).
- Discharge the storage volume at a rate equal to or less than the predevelopment discharge rate for the one-year, 24-hour storm (Session Law 2006-246, p. 11; Session Law 2008-211).

Flood control requirement: See Channel Protection (Session Law 2006-246, p. 11). Flood control authority is granted to local governments rather than the state.

Redevelopment standard: Post construction practices do not apply to redevelopment (Session Law 2006-246, p. 11; Session Law 2008-211) unless built-upon area is increasing.

Special criteria:

- Permittees, delegated programs, and regulated entities must require built-upon areas to be located at least 30 feet landward of all perennial and intermittent surface waters, have a fecal coliform reduction program, and have deed restrictions (Session Law 2006-246, p. 12).
- 30'-50' buffers in non-phase II programs (100'-200' buffers in Goose Creek).

- Additional requirements exist for areas draining to Class SA waters, Trout Waters, and Nutrient Sensitive Waters (Session Law 2006-246, p. 14).
- Goose Creek rules require infiltration of runoff to protect a federal endangered species.
- Impervious parking legislation mandates limits on percent impervious areas for vehicular parking lots (Session Law 2008-198, effective April 1, 2009) and for parking lots greater than 1 acre must have 20% impervious surface or 20% of a 2 inch rain event must flow to a bioretention area (Session Law 2008-246, p. 6). (This is implemented by local building inspectors; and is not really part of the state stormwater programs)

Offset /mitigation: Water quality protection program offset can be granted by the Commission upon review that existing water quality protection programs can offset NPDES Phase II permit (Session Law 2006-246, p. 8 – this allowance is specifically aimed at allowing an area to avoid petitioning for NPDES coverage). Offset options are available for portions of nutrient reduction requirements under NSW programs.

Compliance:

- Compliance is achieved through review of site plans by each locality's stormwater management program; and by DWQ staff in areas outside of locally delegated phase I & II programs.
- NCDENR has a compliance section. NC Division of Water Quality dispenses civil penalties under the NC General Statue 143-214.5(c). The enforcement procedures are clearly explained here: http://portal.ncdenr.org/web/wq/swp/ws/cu/enforcement

Inspection & Maintenance/O&M: Long term operation and maintenance for structural BMPs is required. An O&M Agreement must be signed by the owner and submitted with all applications. Annual maintenance inspection reports are required per structural BMP (Session Law 2006-246, p. 13; Session Law 2008-211, 02H .1000, & all of the other sw rules).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: "Impervious surface" means any material that prevents the natural infiltration of water into the soil (Session Law 2008-246, p. 5).

Definition of new development: See various rule definitions and descriptions.

Definition of predevelopment: N/A

Definition of redevelopment: "Redevelopment" means any land-disturbing activity that does not result in a net increase in built-upon area and that provides greater or equal stormwater control than the previous development (Session Law 2006-246, p. 2; Session Law 2008-211).

Additional references:
15A NCAC 02H .1000 (General State SW Requirements, ORW & HQW Rules)
http://portal.ncdenr.org/c/document_library/get_file?uuid=ea31b446-44ef-4f78-9257-08865ab299df&groupId=38364

15A NCAC 02H .1020 (Universal Stormwater Management Program (USMP)
http://portal.ncdenr.org/c/document_library/get_file?uuid=4ff04b0a-f07e-48a0-8ea1-dbedb4922ee9&groupId=38364

NPDES Phase I/II MS4 Resources and Guidance
http://portal.ncdenr.org/web/lr/ms4-resources

LID Guidebook
http://www.bae.ncsu.edu/topic/lid/resources.html

Program Name: South Carolina Stormwater Management Program administered by the South Carolina Department of Health and Environmental Control (SCDHEC)

Program Status: MS4 permit issued November 1, 2013.

Regulatory Authority: Regulated as MS4 designations by SCDHEC and in the Coastal Zone by SCDHEC-Office of Coastal Resource Management (OCRM); NPDES General Permit Phase II (issued 11/1/13)

Standard source: SC BMP Guidebook; Revised in 2005

Website references:
NPDES General Permit Phase II
http://www.scdhec.gov/Environment/docs/Final_SMS4_Permit.pdf

SCDHEC-MS4 program
http://www.scdhec.gov/Environment/WaterQuality/Stormwater/RegulatedMS4s/MS4Overview/

SCDHEC Stormwater Management BMP Field Manual (2005)
http://www.scdhec.gov/Environment/docs/OCRM_DHEC_FIELD_MANUAL.pdf

Stormwater Management BMP Handbook (2005)
https://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook/

Stormwater Management and Sediment and Erosion Control Plan Review Checklist For Design Professionals (2006)
http://www.scdhec.gov/Environment/docs/erfchecklist.pdf

Regulations:
SC Water Pollution Control Permits Regulation 61-9 122.26 (2011)
http://www.scdhec.gov/environment/water/regs/r61-9.pdf

Standards for Stormwater Management and Sediment Reduction Regulation
http://www.scdhec.gov/Agency/docs/water-regs/r72-300.pdf

Size Threshold: One acre (NPDES Phase II Permit, Part 4.2.4).

Limited geographic area where standards apply: MS4 designated municipalities statewide and in Coastal Zone

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-site Retention/Volume Control: Projects located within ½ mile of a coastal receiving water must retain the first ½ inch of runoff from the site's disturbed area, or the first 1 inch of runoff from the site's built-upon portion, whichever is greater. For projects located within 1,000 feet of shellfish beds, the first 1 ½ inches of runoff from the built-upon portion of the property must be retained on-site.

Treatment requirement:

- Wet Ponds: 24-hour release of ½-runoff from the site;
- Dry Ponds: 24-hour release of 1-inch runoff from the site;
- Wet and Dry Ponds within 1/2–mile of receiving water body in Coastal Zone:
  - 24-hour release of ½-runoff from the site; or
  - 24-hour release of 1-inch from the built-upon area, whichever is greater;
- Projects within 1,000 feet of shellfish beds retain 1.5-inches from the built upon area;
- Infiltration practices sized to infiltrate 1-inch of runoff from the impervious area of the site; (Standards for Stormwater Management and Sediment Reduction Regulation June 28, 2002; Section 72-307: Specific Design Criteria, Minimum Standards and Specifications)

Channel Protection & Flood Control Requirements:

- Post-development peak discharge rates shall not exceed pre-development discharge rates for the 2-and 10-year frequency 24-hour duration storm event.
- (b) Discharge velocities shall be reduced to provide a nonerosive velocity or the pre-developed velocity of the 10-year, 24-hour storm, whichever is greater.
- (c) Local governments may designate more stringent criteria in watersheds where documented water quantity problems exist.
  (Standards for Stormwater Management and Sediment Reduction Regulation June 28, 2002; Section 72-307: Specific Design Criteria, Minimum Standards and Specifications)

Flood control requirement: See Channel Protection.

Redevelopment standard: N/A

Special criteria:
Coastal Stormwater Management applies in the eight coastal counties (Beufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, and Horry), and administered by the SCDHEC-Office of Ocean and Coastal Resource Management

Offset /mitigation: None.

Compliance: Compliance is achieved through review of site plans by each MS4 jurisdiction. As-Builts are required (SC Water Pollution Control Permits Regulation 61-9, p. 103).

Inspection & Maintenance/O&M: Requires land owners to adequately maintain the stormwater management/Best Management Practices (BMP) facilities to ensure adequate long-term operation. Signed agreements between the responsible party accepting ownership is responsible for maintenance and a maintenance plan must be in place and used. Maintenance procedures should be scheduled

(Standards for Stormwater Management and Sediment Reduction Regulation June 28, 2002; Section 72-308. Maintenance Requirements and Off-Site Damage Correction and SC Water Pollution Control Permits Regulation 61-9, p. 101).

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: N/A

Definition of new development: "Develop Land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.

Definition of predevelopment: "Pre-Development" means the conditions which existed prior to the initiation of the land disturbing activity in terms of topography, vegetation, land use and rate, volume or direction of stormwater runoff.

Definition of redevelopment: "Redevelopment" means a land disturbance activity that alters the current use of the land but does not necessarily alter the pre-development runoff characteristics.

Additional references:

NPDES Construction General Permit (SCR100000)
http://www.scdhec.gov/Environment/docs/CGP-permit.pdf

SC Standards for Stormwater Management and Sediment Reduction (2002)
http://www.scdhec.gov/environment/water/regs/r72-300.pdf

Small Project Requirements in Non-Coastal Counties
http://www.scdhec.gov/Environment/docs/nonCoastal1-2Acre-req.pdf

Permanent Stormwater System Maintenance and Responsibility Agreement
http://www.scdhec.gov/Environment/docs/pond_maint.pdf

Stormwater Program Summary – Tennessee

Program Name: Tennessee NPDES Stormwater Program

Program Status: Existing Regulations, NPDES MS4 Phase I Permit (4 jurisdictions and TDOT) and Phase II (Effective October 1, 2010)

Regulatory Authority: TN Water Quality Control Act of 1977 (T.C.A. 69-3-101), required in MS4 areas and suggested for other areas (NPDES GCP, p. 21).

Standard source: Phase II MS4 permit

Website reference:
NPDES Phase I (four jurisdictions)
https://tn.gov/environment/article/permit-water-stormwater-discharges-permitting

NPDES Phase II (effective October 1, 2010)
https://tn.gov/assets/entities/environment/attachments/permit_water_tns000000_ms4_phase_ii_2010.pdf

Size Threshold: Stormwater runoff from construction activities or part of a larger common development that results in a land disturbance of equal to or greater than one acre (NPDES Phase II, p. 14)

Limited geographic area where standards apply: Applies to designated MS4's statewide (NPDES Phase II, p. 1).

Significant exemptions: N/A

Post-Construction Standards for New Development:
N/A

On-Site Retention/Volume Control:
Site design standards for all new and redevelopment require, in combination or alone, management measures that are designed, built and maintained to infiltrate, evapotranspire, harvest and/or use, at a minimum, the first inch of every rainfall event preceded by 72 hours of no measurable precipitation. This first inch of rainfall must be 100% managed with no storm water runoff being discharged to surface waters.

Treatment requirement:
For projects that cannot meet 100% of the runoff reduction requirement unless subject to the incentive standards, the remainder of the stipulated amount of rainfall must be treated prior to discharge with a technology reasonably expected to remove 80% total suspended solids (TSS). The treatment technology must be designed, installed and maintained to continue to meet this performance standard. (NPDES Phase II, p. 14).

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard:
The MS4 may develop a program to allow for incentive standards for redeveloped sites. The MS4 may provide a 10% reduction in the volume of rainfall to be managed for any of the Small MS4 General NPDES Permit following types of development. Such credits are additive such that a maximum reduction of 50% of the standard in the paragraph above is possible for a project that meets all 5 criteria:

- Redevelopment;
- Brownfield redevelopment;
- High density (>7 units per acre);
- Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre); and
- Mixed use and Transit Oriented Development (within ½ mile of transit) (NPDES Phase II, p. 16).

Special criteria: N/A

Offset /mitigation: If runoff reduction and/or pollutant removal cannot be fully accomplished on-site per the MS4 Permit program then the MS4 may propose off-site mitigation and/or payment into a fund for public stormwater projects. The MS4 must develop and apply criteria for determining the circumstances under which these alternatives will be available. (NPDES Phase II, p. 16).

Compliance: Compliance through local implementation of ordinance or other regulatory mechanism to address project review, approval and enforcement procedures to ensure that permanent stormwater BMPs have been installed per design specifications, that includes enforceable procedures for bringing noncompliant projects into compliance. (NPDES Phase II, p. 18).

Inspection & Maintenance/O&M: Local MS4 program shall ensure the long-term maintenance of stormwater BMPs by requiring the owner or operator to develop and implement a maintenance agreement (or an equivalent document ensuring compliance with this sub-section) addressing maintenance requirements for any BMPs, including off-site mitigation. The agreement must allow the MS4, or its designee, to conduct inspections of the stormwater BMPs and also account for transfer of responsibility in leases and/or deeds. (NPDES Phase II, p. 18).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of new development: N/A

Definition of predevelopment: N/A

Definition of redevelopment: *Redevelopment* means the alteration of developed land that disturbs one acre or more, or less than an acre if part of a larger common plan of development, and increases the site or building impervious footprint, or offers a new opportunity for stormwater controls. The term is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse stormwater quality impacts (NPDES Phase II, p. 35).

Stormwater Program Summary – Illinois

Program Name: Illinois State Stormwater Management Program

Program Status: Existing Regulations (effective February 2009)

Regulatory Authority: State-wide stormwater regulation for small MS4s (Illinois Pollution Control Board Rules and Regulations 35 III. Adm. Code, Subtitle C, Chapter 1)

Standard source: General NPDES Permit No. ILR40 reissued effective March 1, 2016

Website reference:
General Permit (reissued March 1, 2016):
http://www.epa.illinois.gov/Assets/iepa/water-quality/surface-water/storm-water/ms4/general-ms4-permit.pdf

Stormwater program requirements:
http://www.epa.illinois.gov/topics/forms/water-permits/storm-water/index

Size Threshold: New development and redevelopment projects that disturb greater than or equal to one acre, projects less than one acre that are part of a larger common plan of development or sale or that have been designed to protect water quality, that discharge into the permittee's small MS4 within the MS4's jurisdictional control (General Permit, page 9).

Limited geographic area where standards apply: Applies in regulated MS4s

Significant exemptions: Not specified

Post-Construction Standards for New Development: N/A

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: Same as new development. (General Permit, page 9)

Special criteria: N/A

Compliance: Compliance is achieved through the use of an ordinance or other regulatory mechanism by the permittee. (General Permit, p. 10)

Inspection & Maintenance/O&M: The MS4 is required to ensure adequate long-term operation and maintenance of BMPs. (General Permit, page 10)

Does development on agricultural land qualify as redevelopment? Not specified

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Additional references:
Illinois Green Infrastructure Study:
http://www.epa.state.il.us/green-infrastructure/docs/draft-final-report.pdf

Stormwater Program Summary – Indiana

Program Name: Indiana State Stormwater Program

Program Status: Existing Regulations, Phase I enacted October 2004, Phase II General Permit effective August, 2003

Regulatory Authority: Phase I (Indianapolis only) Permit No INS40001; Indiana Stormwater Design and Construction Specifications Manual (regulatory through code of City of Indianapolis Article 1 Section 561-101); Phase II - 327 IAC 15-13, Rule 13

Standard source: Indiana Stormwater Water Quality Manual

Website references:
Indiana Stormwater Water Quality Manual:
http://www.in.gov/idem/stormwater/2363.htm

Indianapolis Stormwater Design and Construction Specifications Manual:
http://www.indy.gov/eGov/City/DPW/Business/Specs/Pages/stormwater.aspx

Indiana MS4 Program and Rule 13:
http://www.in.gov/idem/stormwater/2333.htm

Size Threshold: Projects that disturb one (1) or more acres of land or disturbances of less than one (1) acre of land that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one (1) or more acres of land within the MS4 area. (Regulations, page 86)

Limited geographic area where standards apply: Applies statewide

Significant exemptions: None.

Post-Construction Standards for New Development:
Through the use of an ordinance or other regulatory means, an MS4 operator shall implement planning procedures to promote improved water quality. These planning procedures must include, at a minimum, the post construction requirements of a stormwater pollution prevention plan and, where appropriate, and to the extent of the MS4 operator's authority, the procedures may also include the following:
(1) Buffer strip and riparian zone preservation.
(2) Filter strip creation.
(3) Minimization of land disturbance and surface imperviousness.
(4) Minimization of directly connected impervious areas.
(5) Maximization of open space.
(6) Directing the community's physical growth away from sensitive areas and toward areas that can support it without compromising water quality. (Regulations, p. 86)

On-Site Retention/Volume Control: N/A

Treatment requirement:
Phase 1 – 80% TSS removal. BMPs must be designed to treat the water quality volume or the first flush of runoff (1" of precipitation). (Indianapolis Stormwater Design and Construction Specifications Manual, page 7-2)

Phase II – Specific reduction percentages and timetables must be identified by the MS4. At a minimum, goals must address relevant regulatory mechanism implementation, planning and structural BMP strategies, new impervious surface reduction, and discharge quality improvement. (Regulations, page 87)

Channel protection requirement:
Defined by individual stormwater management programs.

Flood control requirement:
Defined by individual stormwater management programs.

Redevelopment standard:
Phase I – activity that disturbs more than 0.5 acre must meet the new development requirements (Indianapolis Stormwater Design and Construction Specifications Manual , page 7-3) Phase II - Same as new development. (Regulations, page 86)

Special criteria: *TMDL requirement:* If a TMDL is approved for any waterbody into which an MS4 conveyance discharges, the MS4 operator must review and appropriately modify portions of their stormwater water quality management plan if the TMDL includes requirements for control of stormwater discharges under the jurisdiction of the MS4 operator. (Regulations, page 81)

Offset /mitigation: Not specified

Compliance: Compliance is achieved through review of site plans by each MS4's stormwater management program or designated authority. (Regulations, page 85)

Inspection & Maintenance/O&M: An MS4 operator shall develop and implement a written operational and maintenance plan for all storm water structural BMPs. (Regulations, page 86)

Does development on agricultural land qualify as redevelopment? Not specified

Definition of impervious surface: "Impervious Surface" means any surface that prevents stormwater to readily infiltrate into the soils. (Regulations, page 73)

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: "Redevelopment" means alterations of a property that change a site or building in such a way that there is disturbance of one (1) acre or more of land. The term does not include such activities as exterior remodeling. (Regulations, page 75)

Stormwater Program Summary – Michigan

Program Name: Michigan NPDES Wastewater Discharge Individual Permits

Program Status: Michigan DEQ is currently issuing individual permits to all regulated MS4s (both Phase I and Phase II MS4s). DEQ is on a schedule to issue them over a 5 year period. This performance standard summary is based on the permit application completed by MS4s before permit issuance – the specific standard contained in each individual MS4 permit may be different.

Regulatory Authority: Michigan NPDES Permit Program

Standard source: MS4 permit application

Website references:
Michigan Stormwater Program: www.mi.gov/deqstormwater

Low Impact Development Manual for Michigan: http://www.semcog.org/plans-for-the-region/environment/green-infrastructure

Size Threshold: Projects that disturb one (1) or more acres of land or disturbances of less than one (1) acre of land that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one (1) or more acres of land within the MS4 area.

Limited geographic area where standards apply: Regulated MS4s

Significant exemptions: The Great Lakes, connecting channels of the Great Lakes, and a few other waters of the state that discharge directly to the Great Lakes are exempt from the channel protection requirement.

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: (***Channel protection requirement)*** – Post-Construction runoff rate and volume of discharge shall not exceed the pre-development rate and volume for all storms up to the 2-year/24-hour storm at the project site. Predevelopment is defined as the last land use prior to the planned new development or redevelopment.

Treatment requirement:
MDEQ in their permit application offers two options: Treat the first inch of runoff from the entire project site and/or treat the runoff generated from 90 percent of all runoff-producing storms for the project site. Treatment is defined as reducing the post-development TSS loadings by 80% or achieve a discharge concentration of TSS not to exceed 80 mg/l.

Flood control requirement: None

Redevelopment standard: Same as new development.

Special criteria: None.

Offset /mitigation: Allowed if implemented at another location within the same jurisdiction and watershed as the original project site.

Compliance: Post-construction ordinance or other regulatory mechanism required.

Inspection & Maintenance/O&M: Maintenance agreement required between the MS4 permittee and owner/operator responsible for the long-term O&M of BMPs installed/implemented to meet the performance standards. Agreement must allow the MS4 permittee to inspect the BMP.

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of predevelopment: At a minimum, predevelopment is the last land use prior to the planned new development or redevelopment.

Definition of new development: N/A

Definition of redevelopment: N/A

Program Name: Minnesota Pollution Control Agency Stormwater Regulatory Program

Program Status: Minnesota post-construction stormwater standards are found in the NPDES/SDS Construction Stormwater General Permit No. MNR100001 (August 2013); the NPDES/SDS MS4 General Permit No. MNR040000 (August 2013); and the State-wide Minnesota Stormwater Manual is voluntary and intended as a guidance document. The Manual is not intended to establish new regulatory requirements and does not supersede existing local, state or federal requirements.

Regulatory Authority: Construction General Permit; MS4 General Permit; Minnesota Stormwater Manual (voluntary)

Standard Source: Minnesota post-construction stormwater standards are found in the Construction Stormwater General Permit No. MNR100001 (August 2013); MS4 General Permit No. MNR040000; and the Minnesota Stormwater Manual

Website References:
Regulations
https://www.revisor.mn.gov/rules/?id=7090

Phase II MS4 General Permit
http://stormwater.pca.state.mn.us/index.php/MS4_General_Permit

Construction General Permit
http://stormwater.pca.state.mn.us/index.php/Construction_stormwater_permit

Minnesota Stormwater Manual (web-based)
http://stormwater.pca.state.mn.us/index.php/Main_Page

Technical Support Document for the Post-Construction Stormwater Management Conditions in the General Stormwater Permit (MNR040000) for Small Municipal Separate Storm Sewer Systems
https://www.pca.state.mn.us/sites/default/files/wq-strm4-59e.pdf

Minimal Impact Design Standards
http://stormwater.pca.state.mn.us/index.php/Minimal_Impact_Design_Standards

Size Threshold:
Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger Common Plan of Development or Sale.

Significant exemptions: N/A

Post-Construction Standards for New Development:
The following post-construction requirements are found in the Construction Stormwater General Permit, Part III.D

- on-site retention of 1 inch of stormwater runoff from new impervious surfaces

The following post-construction requirements are found in the MS4 General Permit, Part III.D

- For new development projects: no net increase from pre-project conditions in stormwater discharge volume, TSS and TP
- For redevelopment projects: a net reduction from pre-project conditions in stormwater discharge volume, TSS and TP

The following post-construction standards for new development are taken from the Minnesota Stormwater Manual which is voluntary.

On-Site Retention/Volume Control:
Both the Construction General Permit and MS4 General Permit require on-site retention/volume control.

Where a project's ultimate development replaces vegetation and/or other pervious surfaces with one (1) or more acres of cumulative impervious surface, the Permittee(s) must design the project so that the water quality volume of one (1) inch of runoff from the new impervious surfaces created by the project is retained on site (i.e. infiltration or other volume reduction practices) and not discharged to a surface water. For purposes of this part, surface waters does not include man-made drainage systems that convey stormwater to a compliant permanent stormwater management system. (Construction General Permit, Part III.D)

MS4 permittees must develop a program that meets the following requirements.
For new development projects - no net increase from pre-project conditions (on an annual average basis) of:

- Stormwater discharge Volume, unless precluded by the stormwater management limitations in Part 111.D.5.a(3)(a)
- Stormwater discharges of Total Suspended Sediment (TSS)
- Stormwater discharges of Total Phosphorus (Phase II MS4 Permit, p. 15).

MPCA has developed guidance to help MS4s implement the post-construction requirements (Technical Support Document for Post-Construction Stormwater Management Conditions). The guidance presents five different options for meeting the MS4 permit requirements, including adopting the Minimal Impact Design Standards (MIDS) developed by MPCA. The MIDS performance goal for new development is to capture and retain on-site 1.1 inches of runoff from the impervious surfaces in post-construction conditions.

Treatment requirement:
For new development projects - no net increase from pre-project conditions (on an annual average basis) of:

- Stormwater discharges of Total Suspended Solids (TSS)
- Stormwater discharges of Total Phosphorus (TP)

Channel protection requirement:
Regular Waters
No current state requirement. It is recommended that communities adopt a criterion for either 24-hour extended detention of the 1-year, 24-hour design storm or one-half of the 2-yr, 24-hr pre-development peak flow when revising or adopting local stormwater ordinances for peak flow control (and eliminate two-year peak discharge requirements) (Manual).

Special Waters
One- and two-year design storm peak discharge and volume control required in four special water categories (wilderness, trout lakes, lake trout lakes, and scientific and natural areas) (Manual). This is a requirement in the Construction Stormwater General Permit for these types of waters.

Flood control requirement:
Regular Waters

- No State requirement but falls under local requirements and typically involves either 10-year design storm peak discharge control, or a combination of 10- and 25-year design storm peak discharge control.
- For extreme storms frequently involves 100-year design storm peak discharge control (Manual).

Redevelopment Standard:
A net reduction from pre-project conditions (on an annual average basis) of stormwater discharge volume and stormwater discharges of TSS and TP. (Phase II MS4 permit, page 15)

Special Criteria: N/A

Offset/mitigation:
Mitigation allowed in some cases as described in Phase II MS4 Permit, p. 17.

Compliance: (NPDES/SDS MS4 General Permit No. MNR040000, Part III(D)(5)(b), p. 13). Requirements for permanent treatment are also found in the Construction Stormwater General Permit.

Inspection & Maintenance/O&M: The permittee shall at all times properly operate and maintain the facilities and systems of treatment and control and the appurtenances related to them which are installed or used by the permittee to achieve compliance with the conditions of the permit (NPDES/SDS MS4 General Permit No. MNR040000, Part V(F), p. 27). Requirements for inspection and maintenance are also found in the Construction Stormwater General Permit.

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: "Impervious Surface" means a constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads (CGP, Appendix B, p. 32).

Definition of predevelopment: N/A

Definition of new development: All construction activity that is not defined as redevelopment (Phase II MS4 Permit, p. 35).

Definition of redevelopment: Any construction activity where, prior to the start of construction, the areas to be disturbed have 15 percent or more of impervious surface(s) (Phase II MS4 Permit, p. 36).

Stormwater Program Summary – Ohio

Program Name: Ohio Storm Water Program

Program Status: Existing Regulations, Rainwater and Land Development Manual

Updated in November 2014 (non-regulatory)

Regulatory Authority: NPDES Permit numbers OHC000004 (Statewide Construction General Permit) and OHQ000002 (Small MS4 Permit) and state regulation: Ohio Administrative Code Chapter 3745-39.

Watershed specific construction general permits in the Olentangy River Watershed (OHCO00002) and the Big Darby Creek Watershed (OHCD00002)

Standard source: Statewide Construction general permit, Watershed Construction General Permits and Phase II MS4 General Permit.

Website references:
Rainwater and Land Development Manual:
http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/stormwater/RLD_11-6-14All.pdf

Regulations:
http://www.epa.state.oh.us/portals/35/rules/39_all.pdf

MS4 General Permit:
http://www.epa.state.oh.us/dsw/permits/GP_MS4StormWater.aspx

Construction General Permits:
http://www.epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater.aspx
http://www.epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater_Olentangy.aspx
http://www.epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater_Darby.aspx

FAQ:
http://www.epa.state.oh.us/dsw/storm/CGPPCQA.aspx
(Note: MS4 requirements to be equivalent to requirements in CGP.)

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. (OAC# 3745-39-03, p.8)

Limited geographic area where standards apply: Statewide through construction storm water general permit. In regulated MS4 areas through the MS4 general permit. Watershed-specific Construction General Permits for the Olentangy River and Big Darby Creek watersheds contain higher standards for riparian setbacks (both watersheds) and groundwater recharge requirement for the Bid Darby Creek Watershed.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-site Retention/Volume Control: Currently required only in the Big Darby Creek Watershed (OHCD00002, p.14): The Stormwater Pollution Prevention Plan shall ensure that the overall site post-development groundwater recharge equals the pre-development groundwater recharge. Determined based on pre- and post-development land use and soil group using the required formula.

Treatment Requirement:
Structural (designed) post-construction storm water treatment practices must be sized to treat the water quality volume (WQv) equivalent to the volume of runoff from a 0.75-inch rainfall and shall be determined according to the following equation: WQv = C * P * A / 12 (Ohio Construction General Permit, p.19).

Note: Small MS4's construction and post-construction requirements are equivalent with the technical requirements set forth in the Ohio EPA NPDES Construction General Permit(s) applicable for the MS4's permit area. (Ohio MS4 General Permit, p.12)

Reduce at least 80% of the average annual total suspended solids (TSS) load and floatable debris, including oil and petroleum products (Assumed to be achieved by water quality volume control standards alone or in combination with pretreatment). (Stormwater Post-construction FAQ 10)

Channel Protection Requirement:
Extended detention for WQv of 24-48 hours to minimize stream bed erosion from frequent small storms.

Flood Control Requirement: N/A

Redevelopment standard: Post-construction BMPs are required on projects that qualify as redevelopment. Structural BMPs are still required on large construction sites. However, due to the site constraints typically incurred in redevelopment situations, three options for meeting post-construction requirements are provided: treatment must be provided for 20% of the WQv; the impervious area of the proposed redevelopment project will be 20% less than the impervious area on the existing site prior to the construction activity; or a combination of the two. (Storm Water Post-construction FAQ 17)

Special criteria: N/A

Offset /mitigation: Ohio EPA may authorize the offsite mitigation of the post-construction requirements of Part III.G.2.e of this permit on a case by case basis provided the permittee clearly demonstrates the BMPs listed in Table 2 are not feasible and the following criteria is met: (1) a maintenance agreement or policy is established to ensure operations and treatment in perpetuity; (2) the offsite location discharges to the same HUC-14 the point of retrofit, whichever is greater. Requests for offsite mitigation must be received prior to receipt of the NOI applications (Ohio Construction General Permit, p.22).

Compliance: MS4s must use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law. The ordinance or other regulatory mechanism shall, at a minimum, be equivalent with the technical requirements set forth in the Ohio EPA NPDES General Storm Water Permit(s) for Construction Activities applicable for your permit area which have been issued (Ohio MS4 General Permit, p.12)

Inspection & Maintenance/O&M: MS4s post-construction SWMP shall also ensure that long-term operation and maintenance (O&M) plans are developed and agreements in place for all applicable sites (Ohio MS4 General Permit, p.13)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: Ohio EPA interprets redevelopment to mean construction projects on land where impervious surfaces had previously been developed and where the new land use will not increase the runoff coefficient. (Stormwater Post-construction FAQ 15)

Program Name: Wisconsin Stormwater Management Program

Program Status: State regulations, dated September 24, 2010.

Authority: State regulation revisions (Chapters NR 151, 153, and 155 and 216, Wis. Adm. Code); Existing permit: authorizing WPDES Permit No. WI-S050075-1 (Note: Summary below incorporates information from existing permit, and the state regulation revisions, where applicable).

Standard source: Final Rulemaking Order, dated September 24, 2010 (NR 151.12 and NR 151.24)

Website references:
WPDES Permit No. WI-S050075-2:
http://dnr.wi.gov/topic/StormWater/documents/WPDES-WI-S050075-2.pdf

Runoff Management Regulations:
http://docs.legis.wisconsin.gov/code/admin_code/nr/100/151.pdf

Size Threshold: Land development projects that disturb greater than 1 acre. (Regulations, 151.11)

Limited geographic area where standards apply: Applies statewide

Significant exemptions:
Post-construction sites with less than 10 percent connected imperviousness, based on the area of land disturbance, provided the cumulative area of all impervious surfaces is less than one acre.

Agricultural facilities and practices, including impervious area (Regulations, 151.121)

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
BMPs shall be designed, installed and maintained to infiltrate runoff in accordance with the following or to the maximum extent practicable:

- Low imperviousness. For development with less than 40 percent connected imperviousness, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 90 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than one percent of the post-construction site is required as an effective infiltration area.
- Moderate imperviousness. For development with more than 40 percent and up to 80 percent connected imperviousness, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 75 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no more than 2 percent of the post-construction site is required as an effective infiltration area.
- High imperviousness. For development with more than 80 percent connected imperviousness, infiltrate sufficient runoff volume so that the post-development infiltration volume shall be at least 60 percent of the pre-development infiltration volume, based on an average annual rainfall. However, when designing appropriate infiltration systems to meet this requirement, no

more than 2 percent of the post-construction site is required as an effective infiltration area (Regulations, 151.124).

Treatment requirement:
80% TSS reduction required, or maximum extent practicable. (Regulations, 151.122)

Channel protection requirement:
By design, BMPs shall be employed to maintain or reduce the 1-year, 24-hour and the 2-year, 24-hour post-construction peak runoff discharge rates to the 1-year, 24-hour and the 2-year, 24-hour pre-development peak runoff discharge rates respectively, or to the maximum extent practicable. (Regulations, 151.123)

Channel protection requirements are waived if the stormwater runoff discharge is directly into a lake over 5,000 acres or a stream or river segment draining more than 500 square miles, or if the site is an infill site of less than 5 acres (Regulations, 151.123(2)).

Flood control requirement: N/A

Redevelopment standard:
40% TSS reduction required from parking areas and roads, or maximum extent practicable. (Regulations, 151.122)

For sites originally built after 2004, when the stormwater permit was first in effect, redevelopments must meet the 2004 standards or the current redevelopment standard, whichever is more stringent. (Regulations, 151.121(5))

Special criteria: *Runoff from Existing Development:* Municipalities must achieve a 20 percent reduction in total suspended solids, or to the maximum extent practicable, as compared to no controls, for runoff from existing development that enters waters of the state. (Permit 2.7.1)

Within 7 years of receiving permit coverage, municipalities must achieve a 40 percent reduction in total suspended solids. (Regulations, 151.13)

Offset /mitigation: N/A

Compliance: Compliance is achieved through enforcement of a stormwater management ordinance and review of site plans by each locality. (Permit, 2.5.1)

Inspection & Maintenance/O&M: The landowner is required to maintain all post-construction BMPs (Regulations, 151.121(3))

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: "Impervious surface" means an area that releases as runoff all or a large portion of the precipitation that falls on it, except for frozen soil. Rooftops, sidewalks, driveways, gravel or paved parking lots and streets are examples of surfaces that typically are impervious. (Regulations, 151.002(17))

Definition of new development: N/A

Definition of predevelopment: Predevelopment is not specifically defined, but may include grassland, woodland, or cropland. (Regulations, 151.123)

Definition of redevelopment: "Redevelopment" means areas where development is replacing older development. (Permit, 4.20)

Additional references:
Stormwater Post-construction Technical Standards:
http://dnr.wi.gov/topic/stormwater/standards/postconst_standards.html

Stormwater Manual:
http://dnr.wi.gov/topic/stormwater/manual.html

Stormwater Program Summary – Arkansas

Program Name: Arkansas Stormwater Program

Program Status: Existing Regulations

Regulatory Authority: NPDES Permit and state regulation: Arkansas Water and Air Pollution Control Act, as amended (§§ 8-4-101— 8-4-106, 8-4-201 — 8-4-229, 8-4-301 — 8-4-314); Pollution Control and Ecology Commission Regulation 6 (May, 2010)

Standard source: Phase II MS4 general permit

Website references:
Phase II MS4 general NPDES Permit:
http://www2.adeq.state.ar.us/water/branch_permits/general_permits/stormwater/default.htm

Regulations:
http://www.adeq.state.ar.us/water/regulations.htm
http://www.lexisnexis.com/hottopics/arcode/Default.asp

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into a small MS4. (NPDES Permit No. ARR040000, 3.2.5.1, p.8)

Limited geographic area where standards apply: Only in the regulated MS4 areas (urbanized areas).

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement:
A goal of at least 80% removal of total suspended solids from these flows which exceed predevelopment levels should be used in designing and installing stormwater management controls (where practicable). (NPDES Permit No. ARR040000, 3.2.5.3, p. 8).

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: N/A

Compliance: The post-construction SWMP shall include pre-construction site plan review for compliance with local requirements for post-construction management of stormwater (NPDES Permit No. ARR040000, 3.2.5.6, p. 10).

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by NPDES permit to be incorporated into local stormwater programs and ordinances (NPDES Permit No.: ARR040000, p. 9).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: N/A

Additional references:
Fact Sheet:
http://www2.adeq.state.ar.us/water/branch_permits/general_permits/stormwater/default.htm

Stormwater Program Summary – Louisiana

Program Name: Louisiana Pollutant Discharge Elimination System (LPDES) Program

Program Status: Existing LPDES General Permit LAR 040000, Effective March 1, 2013

Regulatory Authority: Louisiana's Water Quality Regulations (LAC 33: Chapter IX) authorizes stormwater discharges in compliance with the NPDES MS4 General Permit

Standard source: Small MS4 general permit

Website references:
Regulations
http://www.deq.louisiana.gov/portal/Portals/0/planning/regs/title33/33v09.pdf

General Permit
http://www.deq.louisiana.gov/portal/Portals/0/permits/lpdes/pdf/LAR04_2012_FINAL.pdf

Size Threshold: New development and redevelopment projects that disturb greater than or equal to 1 acre, including projects less than 1 acre that are part of a larger common plan of development or sale (Title 33, Part IX, Subpart 2, Section 2523, B.5.a).

Limited geographic area where standards apply: MS4s only.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset/mitigation: N/A

Compliance: Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under state, tribal, or local law (Title 33, Part IX, Subpart 2, Section 2523, B.5.b.ii; General Permit, p. 13).

Inspection & Maintenance/O&M: Ensure adequate long-term operation and maintenance of BMPs (Title 33, Part IX, Subpart 2, Section 2523, B.5.b.iii; General Permit, p. 15).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Additional references: N/A

Program Name: USEPA Region 6 Small MS4's National Pollutant Discharge Elimination System (NPDES)

Program Status: Existing MS4 Stormwater Program: Small MS4 General Permit issued July 1, 2007 and draft permit published July 2015. Middle Rio Grande watershed based MS4 Permit (Albuquerque area) effective December 22, 2014.

Regulatory Authority: US EPA NPDES Permit (Permit Nos: NMR040000, NMR04000I)

Standard source: NPDES Phase II MS4 general permit

Website reference:
EPA Region 6 stormwater program:
http://www3.epa.gov/region6/water/npdes/sw/

Small MS4 general permit website - http://www3.epa.gov/region6/water/npdes/sw/sms4/index.htm
Middle Rio Grande Watershed Based MS4 Permit (Effective Dec. 22, 2014):
(http://www.epa.gov/region6/water/npdes/sw/ms4/mrg%20ms4%20permit/mrg_ms4_final_permit_121114.pdf).

Size Threshold: Development projects that disturb a land area of one acre or greater, including projects less than one acre that are part of a larger common plan of development or sale. (Permit Nos: NMR040000, NMR04000I, Part 5.2.5, p. 20)

Limited geographic area where standards apply: Regulated MS4 areas designated as urbanized areas or listed in the permit

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control
Incorporate a stormwater quality design standard that manages on-site the 90th percentile storm event discharge volume associated with new development sites and 80th percentile storm event discharge volume associated with redevelopment sites, through stormwater controls that infiltrate, evapotranspire the discharge volume (Permit NMR04A000, Part I.D.5.b.ii)

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: Any controls utilizing impoundments that are also used for flood control that are located in areas where the New Mexico Office of the State Engineer requirements at NMAC 19.26.2.15 (see also Section 72-5-32 NMSA) apply must drain within 96 hours unless the state engineer has issued a waiver to the owner of the impoundment. (Permit NMR04A000, Part I.D.5.b.ii)

Redevelopment standard: The permittee must coordinate with all departments and boards with jurisdiction over the planning, review, permitting, or approval of public and private new development and redevelopment projects/activities within the permit area to ensure the hydrology associated with new development and redevelopment sites mimic to the extent practicable the pre-development

hydrology of the previously undeveloped site, except in instances where the pre-development hydrology requirement conflicts with applicable water rights appropriation requirements. (Permit NMR04A000, Part I.D.5.b.iii)

Special criteria: N/A

Offset /mitigation: When a Permittee determines a project applicant has demonstrated infeasibility due to site constraints to manage the design standard volume or a portion of the design standard volume on-site, the Permittee shall require one of the following mitigation options (Permit NMR04A000, Part I.D.5.b.v):

- *Off-site mitigation*: The off-site mitigation option only applies to redevelopment sites and cannot be applied to new development. Management of the standard volume, or a portion of the volume, may be implemented at another location within the MS4 area, approved by the permittee.
- *Ground Water Replenishment Project*: Implementation of a project that has been determined to provide an opportunity to replenish regional ground water supplies at an offsite location.
- *Payment in lieu:* Payment in lieu may be made to the permittee, who will apply the funds to a public stormwater project. MS4s shall maintain a publicly accessible database of approved projects for which these payments may be used.
- *Other*: In a situation where the alternative options above are not feasible and the permittee wants to establish another alternative option for projects, the permittee may submit to the EPA for approval, the alternative option that meets the standard.

Compliance: An ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law. (Permit NMR04A000, Part I.D.5.b.ii)

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are established by the permitted MS4. The NPDES General Permit requires a permittee to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. (Permit Nos: NMR040000, NMR04000I, Part 6.10, page 32)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: Conventional pavements, sidewalks, driveways, roadways, parking lots, and rooftops. (Permit NMR04A000, Part VII)

Definition of predevelopment [hydrology]: Predevelopment hydrology is generally the rain volume at which runoff would be produced when a site or an area is in its natural condition, prior to development disturbances. For the Middle Rio Grande area, EPA considers predevelopment conditions to be a mix of woods and desert shrub. (Permit NMR04A000, Part VII)

Definition of new development: N/A

Definition of redevelopment: N/A

Stormwater Program Summary – Oklahoma

Program Name: Oklahoma Storm Water Program

Program Status: Existing Regulations

Regulatory Authority: NPDES Permit (OKR04) and state regulation: Oklahoma Administrative Code 252:606-1-3(b)(3)

Standard source: Phase II MS4 general permit (effective Nov. 1, 2015)

Website references:
Regulations:
http://www.oar.state.ok.us/oar/codedoc02.nsf/frmMain?OpenFrameSet&Frame=Main&Src=_75tnm2shfcdnm8pb4dthj0chedppmcbq8dtmmak31ctijujrgcln50ob7ckj42tbkdt374obdcli00_

MS4 General Permit:
http://www.deq.state.ok.us/WQDnew/stormwater/ms4/DEQSmallMS4permit_OCT_2015.pdf

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. (Oklahoma MS4 General Permit, Part IV.C.5.a).

Limited geographic area where standards apply: Only in the regulated MS4 areas (urbanized areas).

Significant exemptions: Does not apply to discharges originating on Indian lands (Oklahoma MS4 General Permit, Part I.C.7).

Post-Construction Standards for New Development:
The State program does not provide numerical standards. The MS4s must address stormwater runoff from new development and redevelopment projects and develop programs that will minimize water quality impacts, and attempt to maintain pre-development runoff conditions (Oklahoma MS4 General Permit, Part IV.C.5.a).

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: N/A

Compliance: MS4s must use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law (Oklahoma MS4 General Permit, Part IV.C.5.a).

Inspection & Maintenance/O&M: Develop (if necessary), implement and enforce procedures to ensure adequate long-term operation and maintenance of BMPs that are put in place after the completion of a construction project, including inspections of each BMP (Oklahoma MS4 General Permit, Part IV.C.5.a).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: N/A

Stormwater Program Summary – Texas

Program Name: Texas Pollutant Discharge Elimination System

Program Status: Existing Texas Pollutant Discharge Elimination System (TPDES); General permit effective December 13, 2013 (http://www.tceq.texas.gov/permitting/stormwater/WQ_ms4_small_TXRO4.html)

Regulatory Authority: The Texas Commission on Environmental Quality (TXCEQ) administers the TPDES Permit: General Permit No. TXR040000 (Small MS4s), and Large and Medium MS4s (Title 30 TAC Chapter 213)

Standard source: Phase II MS4 general permit.

Website reference:
Regulations:
http://www.tceq.state.tx.us/permitting/water_quality/stormwater/WQ_ms4_AIR.html#phase2

Small MS4 Permit:
http://www.tceq.texas.gov/assets/public/permitting/stormwater/txr040000_issued_permit.pdf

Size Threshold: New development and redeveloped sites that discharge into the small MS4 that disturb one acre or more, including projects that disturb less than one acre that are part of a larger common plan of development or sale. (MS4 Permit, p. 38-39)

Limited geographic area where standards apply: MS4s

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: N/A

Compliance: All permittees shall use, to the extent allowable under state, federal, and local law and local development standards, an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. (MS4 Permit, p. 39).

Inspection & Maintenance/O&M: Standard permit language requiring provisions for adequate long-term operation and maintenance of BMPs (MS4 Permit, p. 39).

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: N/A

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: Alterations of a property that changed the "footprint" of a site or building in such a way that there is a disturbance of equal to or greater than one (1) acre of land. This term does not include such activities as exterior remodeling, routine maintenance activities, and linear utility installation. (MS4 Permit, p. 9).

Additional references:
Edwards Aquifer:
http://www.tceq.state.tx.us/publications/rg/rg-348

Stormwater Program Summary – Iowa

Program Name: Iowa State Stormwater Management Program

Program Status: Existing regulations and MS4 permit

Regulatory Authority: Iowa Administrative Code 567—64.13(2). This rule is intended to implement Iowa Code chapter 455B, division III, part 1 (455B.171 to 455B.187)

Standard source: Iowa stormwater management manual (non-regulatory)

Website references:
Stormwater Management Manual (non-regulatory):
http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Watershed-Improvement/Stormwater#Manual

Regulations:
https://www.legis.iowa.gov/DOCS/ACO/GNAC/iacpdf(9-4-02)/iac/567iac/56764/56764.pdf

Size Threshold: New development or redevelopment that disturbs 1 acre or more. (Iowa Stormwater Management Manual, 2A-4, p. 1)

Limited geographic area where standards apply: Applies to regulated MS4 jurisdictions.

Significant exemptions: N/A

Post-Construction Standards for New Development:
The standards below are taken from the Stormwater Management Manual, which is non-regulatory, but may be adopted by the MS4s.

On-Site Retention/Volume Control: N/A

Voluntary Treatment Standard:
A statewide WQv of 1.25 inches is recommended or jurisdictions can use a similar value derived from an analysis of local historical rainfall data, i.e., adjusted based on location factors in Iowa (climate districts 1-9) (Manual, 2A-4, p.3).

Provide for treatment of the WQv for all developments where stormwater management is required. A minimum WQv of 0.2 inches per acre should be met at sites or in drainage areas that have less than 15% impervious cover (Manual, 2A-4, p.3).

Drainage areas having no impervious cover and no proposed disturbance during development may be excluded from the WQv calculations. Designers are encouraged to use these areas as non-structural practices for WQv treatment (Manual, 2A-4, p.3).

WQv from a site to reduce post-development TSS loadings by 80%. Jurisdictions may use other parameters based on local conditions (Manual, 2A-4, p. 2).

Channel protection requirement
Protection of stream channels is accomplished through three complementary criteria:

1. Extended detention of the 1-year, 24-hour storm for a period of 24 hours using structural stormwater controls. This requirement may be waived by a local jurisdiction for sites that discharge directly into piped stormwater drainage systems, larger streams, rivers, wetlands, lakes, or other situations where the reduction in the smaller flows will not have an impact on streambank or channel integrity.
2. Implement velocity control, energy dissipation, streambank stabilization, and erosion prevention practices and structures as necessary in the stormwater management system to prevent downstream erosion and streambank damage.
3. Establishment of riparian stream buffers on the development site with 100-ft buffers recommended where feasible. (Manual, 2A-4, p.4).

Flood control requirement:
Post-development 5-year, 24-hour storm peak discharge rate (denoted Qp5) must be reduced to the predevelopment (or natural conditions) discharge rate using structural stormwater controls (Manual, 2A-4, p 5).

Smaller storm events (e.g., 2-year and 10-year) should be controlled through the combination of the extended detention for the 1-year, 24-hour event (CPv) and the control of the 25-year peak rate for overbank flood protection. These design guidelines are intended to be used together. If the control of the 1-year, 24-hour storm is exempted, then for overbank flood protection, peak flow attenuation of the 2-year (Qp2) through the 50-year (Qp-50) return frequency storm events must be provided. This guideline may be adjusted by a local jurisdiction for areas where all downstream conveyances and receiving waters have the natural capacity to handle the full build-out 50-year storm through a combination of channel capacity and overbank flood storage without causing flood damage (Manual, 2A-4, p 5).

Extreme flood protection:
Extreme flood protection is provided by controlling and/or safely conveying the 100-year, 24-hour storm event (denoted Qf) (Manual, 2A-4, p 5).

Redevelopment standard: Above applies to redevelopment

Special criteria:
Critical or Sensitive areas: Restrictions or additional requirements may be used where new development or redevelopment occurs in critical or sensitive areas, or as identified through a watershed study or plan (Manual, 2A-4, p.2)

Downstream analysis: A downstream hydrologic analysis is performed to determine if there are any additional impacts in terms of peak flow increase or downstream flooding (Manual, 2A-4, p.5).

Groundwater recharge: Recharge to groundwater is implemented to the extent practicable through the use of nonstructural better site design techniques that allow for recharge of stormwater runoff into the soil. The annual recharge from the post-development site should approximate the annual recharge from the pre-development or existing site conditions, based on soil types. Stormwater runoff from a hotspot should not be infiltrated without effective pretreatment (Manual, 2A-4, p5).

Annual groundwater recharge rates should be maintained to the extent practicable through the use of nonstructural methods.

Infiltration: Use of site design practices that promote infiltration (LID/ Better Site Design) mentioned throughout Section 2A-4 of the stormwater manual.

Offset /mitigation: N/A

Compliance: Compliance is achieved through site plan review by localities.

Inspection & Maintenance/O&M:
Operation and maintenance plan provides:

- A clear assignment of stormwater inspection and maintenance responsibilities
- The routine and non-routine maintenance tasks to be undertaken
- A schedule for inspection and maintenance
- Any necessary legally binding maintenance agreements (Manual, 2A-4, p.6)

Localities may also require evidence that project proponents have executed an approved method of BMP maintenance, repair, and replacement before construction approvals are issued. May require Operation and Maintenance agreement, Maintenance Plan and locality may conduct annual inspections (Manual, 2A-2, p.5).

Does development on agricultural land qualify as redevelopment? No.

Definition of Predevelopment: not given although "natural conditions" is given in parentheses in the Manual text when predevelopment mentioned (Manual, A2-4, p4).

Definition of New development: land disturbing activities, structural development (construction, installation, or expansion of a building or other structure), and/or creation of impervious surfaces on a previously undeveloped site (Manual, A2-4, p2).

Definition of Redevelopment: structural development (construction, installation, or expansion of a building or other structure), creation or addition of impervious surfaces, replacement of impervious surface not part of routine maintenance, and land disturbing activities associated with structural or impervious development. Redevelopment does not include such activities as exterior remodeling (Manual, A2-4, p2).

Definition of impervious surface: N/A

Stormwater Program Summary – Kansas

Program Name: Kansas Municipal Stormwater Program

Program Status: Existing Kansas National Pollutant Discharge Elimination System MS4 Permit

Regulatory Authority: Kansas Water Quality Regulations; NPDES program, or both, with code reference

Standard source: Guidance Manuals have been developed individually by the Phase I municipalities, and a consortium of 19 Phase II municipalities. There is no State level guidance manual.

Website reference:
Regulations:
http://www.kdheks.gov/muni/ms4.htm

Size Threshold: Projects that will result in a land disturbance area of greater than or equal to one (1) acre, including new developments and redevelopments that will result in a land disturbance area less than one (1) acre that are part of a larger common plan of development or sale that would disturb one (1) acre or more.

Limited geographic area where standards apply: Applies to designated MS4s statewide.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Compliance: Standard NPDES Permit language that requires a local ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment projects to the extent allowable under State. Compliance is achieved through review of site plans by each locality's stormwater management program.

Inspection & Maintenance/O&M: Standard NPDES Permit language that requires a local ordinance to ensure adequate long term operation and maintenance of BMPs. Requires the MS4 to develop a maintenance agreement and provide verification of maintenance provisions for post-construction management practices through inspections.

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Stormwater Program Summary – Missouri

Program Name: Missouri Storm Water Regulations

Program Status: Existing MS4 Stormwater Program

Regulatory Authority: NPDES Permit No. Mo-R04000 (June 13, 2008); State-wide Stormwater Regulations authorized by 10 CSR 20-6.200 (April 2014).

Standard source: Phase II MS4 general permit

Website reference:
Regulations
http://s1.sos.mo.gov/cmsimages/adrules/csr/current/10csr/10c20-6.pdf

General Permit
http://dnr.mo.gov/env/wpp/permits/issued/docs/R040000.pdf

Guidance Manual
http://www.dnr.mo.gov/env/wpp/stormwater/sw-guide-phaseii.htm

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge in to the permittee's regulated small MS4 (General Permit, 4.2.5.1, p. 11).

Limited geographic area where standards apply: Applies to regulated MS4s.

Significant exemptions: N/A

Post-Construction Standards for New Development: The Phase II Small MS4 general permit (general permit) requires the permittee to develop and implement strategies to minimize water quality impacts, by reasonably mimicking pre-construction runoff conditions in affected new developments to the MEP

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: N/A

Compliance: Include an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, or local law.

Inspection & Maintenance/O&M: A plan to ensure adequate long-term operation and maintenance of selected BMPs, including types of agreements between the permittee and other parties such as the post-development landowners or regional authorities (General Permit, 4.2.5.1.3, p. 12).

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Additional references: N/A

Stormwater Program Summary – Nebraska

Program Name: Nebraska Department of Environmental Quality NPDES Permits and Compliance Unit

Program Status: Existing MS4 Stormwater Program: Statewide NPDES Phase II Permits originally issued July 2005, and currently on administrative extension. For three specific counties, permits were issued in October 2009, and expire in 2014.

Regulatory Authority: NPDES Permits; Nebraska Administrative Code

Standard source: NPDES Permit Number: NER210000, NER300000; Nebraska Administrative Code, Title 119 - Nebraska Department Of Environmental Quality, Chapter 10 - NPDES Regulations Applicable To Storm Water Discharges

Website references:
General Permit for Storm Water Discharge Associated with Small Municipal Separate Storm Sewer System - Not online; Available by calling Nebraska Department of Environmental Quality

Title 119 Rules and Regulations Pertaining To the Issuance Of Permits Under The National Pollutant Discharge Elimination System http://deq.ne.gov/RuleAndR.nsf/Title_119.xsp.

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the Small Municipal Separate Storm Sewer System (sMS4). (NPDES Permit Number NER210000 - Phase II MS4s in Douglas, Sarpy, and Washington Counties of Nebraska, Part IV, Section B, Number 5, Page 10.)

Limited geographic area where standards apply:
NPDES Permit Number NER300000 – statewide to any Phase II MS4s except those covered under NER21000.

NPDES Permit Number NER210000 - Phase II MS4s in Douglas, Sarpy, and Washington Counties of Nebraska

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria:
Part VIII. Wet Weather Monitoring Requirements
The permittee shall conduct baseline wet weather monitoring during the second year and fourth year after the issuance of authorization. (NPDES Permit Number NER300000, Part VIII, Page 14.)

Offset /mitigation: There is no language regarding mitigation or offset for stormwater management requirements in the permit or Administrative Code.

Compliance: Compliance is achieved through submission of annual reports by the MS4. MS4s must develop an ordinance to address post-construction stormwater runoff.

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are established by the permitted MS4. The permit only requires that the MS4s ensure adequate long-term operation and maintenance of BMPs. (NPDES Permit Number NER210000 - Phase II MS4s in Douglas, Sarpy, and Washington Counties of Nebraska, Part IV, Section B, Number 5, Page 10.)

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface*:* N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Stormwater Program Summary – Colorado

Program Name: Colorado Storm Water Program

Program Status: Existing Regulations

Regulatory Authority: NPDES Permit COR-070000, COR-090000 & COR-080000; Phase I individual MS4 permits; Code of Colorado Regulations (CCR 61.8(11)(a)(ii)(E))

Standard source: None. Treatment standards are determined by individual communities.

Website references:
Regulations:
https://www.colorado.gov/pacific/sites/default/files/Regulation-Num-61-Colorado-Discharge-Permit-Sys-Regs.pdf

Colorado's Stormwater Program Permits and Fact Sheets (Small MS4 permit issued April 2016):
https://www.colorado.gov/pacific/cdphe/wq-municipal-ms4-general-permits

Size Threshold: Projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. (Required by all MS4 permits and in CCR 6; Guidance, p.35)

Limited geographic area where standards apply: Only in the regulated MS4 areas.

Significant exemptions: MS4 permit part I.E.4.a.i includes a list of sites that are excluded from the post-construction requirements, including certain roadway projects, large lot single family sites, oil and gas exploration, and other types of sites.

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: Control measures required by MS4s must meet one of seven different base design standards (see MS4 permit Part I.E.4.a.iv for details on all base design standards). The "Water Quality Capture Volume (WQCV)" standard requires treatment and/or infiltration of the WQCV (the volume equivalent to the runoff from an 80th percentile storm (MS4 permit Part I.J.50)). The "Runoff Reduction Standard" requires the BMP to be designed to infiltrate into the ground where site geology permits, evaporate, or evapotranspire a quantity of water equal to 60% of what the calculated WQCV would be if all impervious area for the applicable development site discharged without infiltration.

Treatment requirement: The "Pollutant Removal Standard" requires the BMP to be designed to treat at a minimum the 80th percentile storm event. The control measure(s) shall be designed to treat stormwater runoff in a manner expected to reduce the event mean concentration of total suspended solids (TSS) to a median value of 30 mg/L or less.

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: The "Constrained Redevelopment Sites Standard" applies when the site has greater than 75% impervious area and the MS4 has determined that it is not practical to meet one of the

other design standards. The control measure must be designed to provide treatment of the WQCV for at least 50% of the impervious area or designed to provide treatment of the 80th percentile storm event.

Special criteria: N/A

Offset /mitigation: N/A

Compliance: The permit requires that the MS4 operator implement appropriate written enforcement procedures and actions. (MS4 permit Part I.E.4.a.viii)

Inspection & Maintenance/O&M: MS4 operator must implement written procedures to ensure adequate O&M of control measures. Inspection frequency is determined by the MS4, but must be at least once during the permit term except for measures on individual residential lots. (MS4 permit Part I.E.4.a.vii)

Does development on agricultural land qualify as redevelopment? Not exempted.

Definition of impervious surface: "Impervious Area" means developed areas with covering or pavement that prevents the land's natural ability to absorb and infiltrate typical precipitation and irrigation events. Impervious areas include, but are not limited to; roof tops, walkways, patios, driveways, parking lots, impervious storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering. (MS4 permit part I.J.22)

Definition of new development: "New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision for a site that does not meet the definition of redevelopment. (MS4 permit part I.J.31).

Definition of redevelopment: "Redevelopment" includes a site that is already substantially developed with 35% or more of existing imperviousness; with the creation or addition of impervious area (including removal and/or replacement), to include the expansion of a building footprint or addition or replacement of a structure; structural development including construction, replacement of impervious area that is not part of a routine maintenance activity; and land disturbing activities. (MS4 permit part I.J.40).

Definition of predevelopment: N/A

Additional references:
Denver Urban Drainage and Flood Control Manual (often used reference):
http://udfcd.org/criteria-manual

Stormwater Program Summary – Montana

Program Name: Montana Pollutant Discharge Elimination system (MPDES) program

Program Status: Existing MS4 Stormwater Program: Permits originally issued January 2005, and reissued in December 2014.

Regulatory Authority: NPDES Permit (MTRO40000); State-wide Administrative Rules of Montana (ARM), Title 17, Chapter 30, Subchapters 11 and 13

Standard source: NPDES Phase II MS4 general Permit

Website references:
2015 General Permit for Storm Water Discharge Associated with Small Municipal Separate Storm Sewer System
http://deq.mt.gov/wqinfo/MPDES/StormWater/ms4.mcpx

Regulations:
http://deq.mt.gov/DEQAdmin/dir/legal/Chapters/ch30-toc

Size Threshold: Development projects that disturb a land area of one acre or greater, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the permitted small MS4 (MPDES Permit MTR040000, p. 14)

Limited geographic area where standards apply: Regulated MS4s

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
For new development or redevelopment projects greater than or equal to one acre, a program shall include a process to require the implementation of low impact development practices that infiltrate, evapotranspire, or capture for reuse the runoff generated from the first 0.5 inches of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation. (MPDES Permit MTR040000, p. 15)

Treatment requirement:
None

Channel protection requirement:
Detention/retention ponds shall be sized for a 2-year event, but must also be analyzed for a 100-year event, to ensure that no home sites or drainfields are inundated during this event. (DEQ Circular 8, page 8).

Flood control requirement:
See channel protection requirement.

Redevelopment standard: N/A

Special criteria: N/A

Offset /mitigation: There is no language regarding mitigation or offset for stormwater management requirements in the permit or Administrative rules.

Compliance: Compliance is achieved through submission of annual reports by the MS4. (Administrative Rules of Montana, Title 17, Chapter 30, Subchapter 11, Section 1111 (14)).

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are established by the permitted MS4. The MPDES General Permit and the Administrative Rules require a permittee to properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. (Administrative Rules of Montana, Title 17, Chapter 30, Subchapter 13, Section 1342 (5))

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Additional references:
Montana DEQ Circular Number 8: Montana Standards for Subdivision Storm Drainage:
https://deq.mt.gov/Portals/112/Water/wqinfo/documents/Circulars/Circulars/CIRCULAR8.pdf

Stormwater Program Summary – North Dakota

Program Name: North Dakota General Permit for Storm Water Discharges from Small MS4s

Program Status: Existing state-wide MS4 stormwater program, through NPDES Permit *NDR04-0000* (effective April 1, 2016).

Regulatory Authority: NPDES general permit with North Dakota Department of Health as the delegated permitting authority (Chapter 33-16-01 of North Dakota Department of Health rules promulgated under Chapter 61-28 of the North Dakota Century Code).

Standard source: Phase II MS4 general permit (effective April 1, 2016)

Website reference:
Small MS4 Permit: http://www.ndhealth.gov/wq/storm/ms4/ms4permit.htm

Size Threshold: Projects that disturb a land area one acre or greater, including projects less than one acre that are part of a larger common plan of development or sale (MS4 Permit part IV.F.5).

Limited geographic area where standards apply: Only in the regulated MS4 areas (urbanized areas)

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: MS4 permit says "post-construction controls should include a water quality component as outlined in Appendix 1." Guidelines in Appendix 1 essentially call for treatment of 0.5 inch of runoff from impervious area.

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Size Threshold: N/A

Special criteria: N/A

Offset /mitigation: N/A

Compliance: MS4 must verify that BMPs are installed according to specifications (MS4 Permit part IV.F.5.c.1).

Inspection & Maintenance/O&M: The MS4s must develop, implement, and document procedures to ensure adequate long-term operation and maintenance of public and private post-construction controls, including procedures to enforce the requirements for other parties, both public and private, to maintain post-construction controls (MS4 Permit part IV.F.5.c).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A.

Definition of Predevelopment: N/A

Definition of New Development: "New development" means construction activities that create new impervious surface (MS4 Permit, pg. 7).

Definition of Redevelopment: **"**Redevelopment" refers to alterations of a property that change the "footprint" of a site or building in such a way that results in the disturbance of equal to or greater than one acre of land. The term is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse stormwater quality impacts and offer no new opportunity for stormwater controls (MS4 Permit, pg. 7).

Additional references:
MS4 Designation Criteria:
http://www.ndhealth.gov/WQ/Storm/MS4/NDR04-MS4_Designation_Criteria.pdf

DOH MS4 Permit Program website:
http://www.ndhealth.gov/wq/Storm/MS4/MS4Permit.htm

Program Name: South Dakota General Permit for Storm Water Discharges from Small MS4s

Program Status: Existing MS4 Stormwater Program: State-wide general permit and guidance manual issued December 2002.

Regulatory Authority: MS4 General Permit administered by South Dakota Department of Environment and Natural Resources, Surface Water Quality Program as mandated in the Administrative Rules of South Dakota (Chapters 74:52:01 through 74:52:11).

Standard source: Phase II MS4 general permit

Website reference:
Surface Water Discharge Permit Regulations:
http://legis.sd.gov/rules/DisplayRule.aspx?Rule=74%3A52

Permit for Small Municipal Separate Storm Sewer Systems in South Dakota:
http://denr.sd.gov/des/sw/IPermits/D1746V1-MS4.pdf

Phase II Municipal Guidance Manual:
http://denr.sd.gov/des/sw/eforms/MunicipalGuide.pdf

Size Threshold: Projects that disturb a land area one acre or greater, including projects less than one acre that are part of a larger common plan of development or sale (Permit, Section 4.5, pg. 13).

Limited geographic area where standards apply: Regulated MS4 areas (urbanized areas)

Significant exemptions:
Development/redevelopment sites zoned single or double family residential disturbing between 1 and 2 acres, or with only 2 residential lots if they are determined to pose a low risk of impact (Manual, pg. 6-2).

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Size Threshold*:* N/A

Special criteria:
If a Total Maximum Daily Load (TMDL) is developed and implemented for any waterbody into which the MS4 discharges, the stormwater management plan must be reviewed to determine whether the program meets the requirements of the TMDL implementation plan. If not, the plan must be modified,

as appropriate, to meet the applicable requirements and schedules of the TMDL allocation(s) (Permit, Section 3.8.3, pg. 9).

Offset /mitigation: N/A

Compliance: Standards are reviewed by the MS4 during site plan review at the local level (Manual, pg. 6-2).

Inspection & Maintenance/O&M: The MS4 operator must ensure adequate long-term operation and maintenance of BMPs. MS4s should require that, as part of the plat, it be noted that the legal title holder to the property is responsible for maintaining the BMPs, and that the municipality has the legal right to enforce that obligation, either by legal action to obtain compliance, or by performing the maintenance itself and then collecting those expenses by recording a lien on the property. Post-construction inspection and enforcement programs are required (Manual, pg. 6-4).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of Predevelopment: N/A

Definition of New Development: N/A

Definition of Redevelopment: Alterations of a property that change the "footprint" of a site or building in such a way that there is a disturbance of land equal to or greater than one acre. The term is not intended to include such activities as exterior remodeling water controls (Permit, Section 7.0, pg. 20).

Additional references:
DENR Storm Water Permitting website:
http://denr.sd.gov/des/sw/stormwater.aspx

Program Name: Utah Small MS4 General UPDES Permit

Program Status: Existing Program

Regulatory Authority: Utah Permit No. UTR090000, March 1, 2016; Utah Code – Title 19 – Chapter 05 – Water Quality Act

Standard source: Phase II MS4 general permit

Website reference:
Utah DEQ and Permit:
http://www.deq.utah.gov/Permits/water/updes/stormwatermun.htm

Size Threshold: Projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. (UPDES Permit 4.2.5.1.)

Limited geographic area where standards apply: Applies within MS4s

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
Projects greater than one acre must manage rainfall on-site and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 90th percentile rainfall event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, evapotranspire and/or harvest and reuse rainwater. As of May 11, 2010, rainwater harvesting is legal in the state of Utah. (UPDES Permit 4.2.5.3.4)

Treatment requirement:
No specific criteria are established; however the permit requires:

- Permittees shall provide developers and contractors with preferred design specifications to more effectively treat stormwater for different development types such as industrial parks, commercial strip malls, retail gasoline outlets, restaurants, parking lots, automotive service facilities, street and road construction, and projects located in, adjacent to, or discharging to environmentally sensitive areas. (UPDES Permit 4.2.5.4.2)
- Documentation on how the requirements of the ordinance or other regulatory mechanism will protect water quality and reduce the discharge of pollutants to the MS4. Documentation shall include:
    - How long-term stormwater BMPs were selected;
    - The pollutant removal expected from the selected BMPs; and
    - The technical basis which supports the performance claims for the selected BMPs. (UPDES Permit 4.2.5.2.2)

Channel protection requirement: N/A

Flood control requirement: N/A

***Redevelopment standard*:** N/A

Special criteria: Retrofit plan must be developed for existing developed sites that are adversely impacting water quality (UPDES Permit 4.2.5.3.3)

Offset /mitigation: N/A

Compliance:
Compliance achieved through local MS4 program plan review, approval and inspections. Ordinances must develop an enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism. Procedures for enforcement of BMPs include: Procedures that include specific processes and sanctions to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators which shall include appropriate, escalating enforcement procedures and actions. (UPDES Permit 4.2.5.2)

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by state permit:

- The ordinance or other regulatory mechanism must include a provision for both construction-phase inspection and post-construction access for Permittees to inspect storm water BMPs on private properties that discharge to the MS4 as described in Part 4.2.5.5.1.
- Structural BMPs shall be inspected at least once during installation (Part 4.2.5.5.2), inspected annually by the Permittee and maintained as necessary (Part 4.2.5.5.3).
- The property owner/operator or third party may conduct an inspection in lieu of the Permittee through a maintenance agreement and with annual certification provided by the owner/operator or third party (Part 4.2.5.5.1).
- The Permittee is required to verify and ensure proper maintenance of those structures at least once during the 5-year Permit term (Part 4.2.5.5.3).

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: "Redevelopment" is the replacement or improvement of impervious surfaces on a developed site.

Stormwater Program Summary – Wyoming

Program Name: Wyoming State Stormwater Management Program

Program Status: Existing

Regulatory Authority: NPDES, WYDES permit, WYR04-0000 issued under provisions of WY Water Quality Rules and Regulations (WYRR), Chapter 2 Section 6(j)(i)(C)

Standard source: Phase II MS4 general permit

Website references:
WYPDES Stormwater Program
http://deq.wyoming.gov/wqd/storm-water-permitting/resources/ms4s/

State of Wyoming Phase 2 Municipal Guidance
http://sgirt.webfactional.com/filesearch/content/Water%20Quality%20Division/Programs/WYPDES/sub/Discharge%20Permitting/Storm%20Water%20Permitting-Municipal%20Separate%20Storm%20Sewer/01_WQD-WYPDES-Municipal-Separate-Storm-Water-Sewer-Systems_State-of-Wyoming-Phase-2-Municipal-Guidance_2010-05.pdf

Permit
http://deq.wyoming.gov/media/attachments/Water%20Quality/Storm%20Water%20Permitting%20/Municipal%20Separate%20Storm%20Sewer/04_WQD-WYPDES-Municipal-Separate-Storm-Water-Sewer-Systems_MS4-Permit.pdf

Regulations
http://soswy.state.wy.us/Rules/RULES/9763.pdf

Size Threshold: Significant development or new development defined by projects that disturb one acre or more; site that discharges to sensitive waters such as on 303d list, less than one acre applies (Permit, p. 16)

Limited geographic area where standards apply: Applies statewide to regulated MS4s with exception of Wind River Indian Reservation (Permit, p. 1)

Significant exemptions: The permit covers all areas within the State of Wyoming except areas within the Wind River Indian Reservation where the State does not have jurisdiction. Permit applies to MS4 Phase II communities. (Permit, p. 1)

Post-Construction Standards for New Development: N/A

On-Site Retention/Volume Control): N/A

***Treatment requirement*:** N/A

***Channel protection requirement*:** N/A

Flood control requirement: N/A

Redevelopment standard: Redevelopment standard same as new development

Special criteria: N/A

Offset /mitigation: N/A

Compliance:
The MS4 operator should review their existing "review and approval" procedures to determine if the current program includes elements required in the regulation, or if additional improvements are warranted. If a review and approval procedure does not exist, a program should be developed.

Monitoring:
This may be a part of Section 6.3.6 of WYRR04-0000 that requires the MS4 operator to ensure adequate long-term operation and maintenance of BMPs to ensure long-term compliance. An inspection and enforcement program is required. Elements of the programs to include are provided.

Inspection & Maintenance/O&M: The MS4 operator is expected to develop procedures, ordinances or other regulatory mechanisms that will require, to the extent allowed by state or local law, that BMPs be appropriately designed and planned, and provide for enforceable operation and maintenance by the owner/operator. (Municipal Guidance, p. 46)

Does development on agricultural land qualify as redevelopment? There is no reference to agricultural land redevelopment

Definition of redevelopment: means alterations of a property that change the "footprint" of a site or building in such a way that results in a land surface disturbance of one or more acres. The term does not include such activities as exterior remodeling. (Permit, p. 4)

Definition of predevelopment: N/A

Definition of New development: N/A

Definition of impervious surface: N/A

Additional references:
http://deq.wyoming.gov/wqd/non-point-source/

Program Name: Arizona Pollutant Discharge Elimination System

Program Status: Existing Regulations

Regulatory Authority: NPDES Permit (AZG2002-002) and state regulation: Arizona Administrative Code (A.A.C.) R18-9-A905

Standard source: Phase I MS4 permits (Phoenix, Tempe, Mesa and Glendale); Phase II MS4 general permit

Website reference:
Permit:
http://www.azdeq.gov/environ/water/permits/download/ms4small.pdf

Regulations:
http://apps.azsos.gov/public_services/Title_18/18-09.pdf

Fact Sheet:
http://www.azdeq.gov/environ/water/permits/download/ms4fact1.pdf

Pima County Design Standards:
https://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Flood%20Control/Rules%20and%20Procedures/Stormwater%20Detention-Retention/dssdr-final-201406-manual.pdf

Size Threshold: New development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, and discharge into the small MS4. (NPDES permit AZG2002-002, p. 12).

Limited geographic area where standards apply: Only applies in regulated MS4 areas

Significant exemptions: Does not apply to Indian Lands

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
The Phoenix, Tempe, Mesa, and Glendale Phase I MS4 permits requires each city to detain on-site the 100-year, 2 hour storm event (Appendix C of each permit). Pima County Design Standards require first flush retention of 0.5 inch of rainfall from all newly disturbed or impervious areas. The Phase II MS4 general permit includes a narrative post-construction standard.

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Redevelopment standard: The State program does not provide numerical standards. (Regulations A.A.R18-9-A905)

Special criteria: N/A

Offset /mitigation: The State program does not have a stormwater offset program.

Compliance: The MS4 must establish an ordinance or other regulatory mechanism used to address post-construction runoff control and procedures to ensure compliance with local requirements (NPDES Permit No. AZG2002-002 p. 13).

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by state regulation to be incorporated into local stormwater programs and ordinances. (Regulations, A.A.R18-9-A905) (NPDES Permit No. AZG2002-002 p. 13).

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of New Development: N/A

Definition of Pre-development: N/A

Definition of Redevelopment: N/A

Additional references:
MS4 Guidance document:
http://www.azdeq.gov/environ/water/permits/download/ms4guid.pdf

Model SWMP
http://www.azdeq.gov/environ/water/permits/download/ms4model.pdf

Program Name: California NPDES Stormwater Discharge General Permit

Program Status: Existing General NPDES Permits: Phase I, 2013 Phase II

Regulatory Authority:

- Small MS4 Permit, Phase II, Permit No. CAS000004 issued 2003, covers approximately 250 entities in California. Permit renewed February 2013 and made effective July 2013.
- Medium and Large MS4 Permits, Phase I, issued in 1990 through 9 Regional Water Quality Control Boards. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire.

Standard source: Varies; each MS4 or regional co-permittees have adopted reference and technical guidance documents. State construction permit includes post-construction requirement that applies in areas outside of MS4.

MS4 Permit Phase I and Phase II Technical Design resources:
http://www.swrcb.ca.gov/water_issues/programs/stormwater/links.shtml#phase_i

California Stormwater Quality Association:
http://www.cabmphandbooks.com

Website reference:
General Permit
State Water Resources Control Board:
http://www.swrcb.ca.gov/water_issues/programs/stormwater/municipal.shtml

Size Threshold: Jurisdictions have adopted varying thresholds based on land disturbance, development type and density, impervious cover, etc. Phase II MS4 general permit addresses projects that create and/or replace 5,000 square feet or more of impervious surface.

Limited geographic area where standards apply: Statewide.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
Generally, the Phase I permits and Phase II general permit requires the on-site retention of the volume of stormwater produced from a 24-hour 85th percentile storm event. For flow-based BMPs, the requirement is to filter or treat the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each storm event, or the two times the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity.

Treatment requirement:

- If onsite retention LID BMPs are technically infeasible based on the permit authority definitions, approved LID biofiltration BMPs may treat any volume that is not retained onsite by the LID BMPs as follows:
    - The LID biofiltration BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP.

  - Due to the flow through design of biofiltration BMPs, the total volume of the BMP, including pore spaces and prefilter detention volume, must be sized to hold at least 0.75 times the design storm volume that is not retained onsite by LID retention BMPs;
- If it is shown to be technically infeasible to treat the remaining volume up to and including the design capture volume using LID BMPs (retention or biofiltration), the project must implement conventional treatment control BMPs in accordance with the required flow or volume design standard and must also participate in an LID waiver program.

Channel protection requirement:
Channel protection or hydromodification control is referenced in the Small MS4 Permit and has also been adopted by the State Water Control Board for implementation through the Construction General Permit for new development and re-development stormwater performance standards that relate to post-construction runoff and applies to all regulated land disturbing activities statewide:
Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion. Individual jurisdictions are adopting standards applicable to their conditions.

Flood control requirement:
Flood control requirements are referenced as hydromodification and vary by locality.

Redevelopment standard:
Redevelopment standards vary across the Regional Water Board Phase I Permits. The following is representative redevelopment criteria taken from State Water Quality Control Board Region 2:

- Redevelopment is defined as any land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred that creates and/or replaces 10,000 square feet or more of impervious surface (collectively over the entire project site):
  - Where a redevelopment project results in an alteration of **more than 50 percent** of the impervious surface of a previously existing development that was not subject to stormwater quality, the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).
  - Where a redevelopment results in an alteration **of less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3, only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

This requirement is not spelled out in Phase II General Permit, and the definition, as listed below, is from the Phase II General Permit.

Special criteria: N/A

Offset /mitigation: Offset, offsite, and/or mitigation programs are authorized by the Phase I and Phase II permits for when on-site compliance is not feasible.

Compliance: Local ordinance or other regulatory mechanism to address post construction runoff from new development and redevelopment projects to the extent allowable under State or local law.

Inspection & Maintenance/O&M: Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

Does development on agricultural land qualify as redevelopment? Unknown

Definition of impervious surface: A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/storm water. Impervious surfaces include, but are not limited to; roof tops, walkways, patios, driveways, parking lots, storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold the specified volume of rainfall runoff are not impervious surfaces (Phase II General Permit, Attachment I).

Definition of new development: New Development means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision on an area that has not been previously developed. (MS4 Phase II GP Definitions-Attachment I)

Definition of predevelopment: N/A

Definition of redevelopment: Land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred. Redevelopment does not include trenching, excavation and resurfacing associated with LUPs; pavement grinding and resurfacing of existing roadways; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway (Phase II General Permit, Attachment I).

Stormwater Program Summary – Hawaii

Program Name: Hawaii Polluted Runoff Control Program

Program Status: Existing Regulations

Regulatory Authority: NPDES Permit and state regulations: Hawaii Administrative Rules, Chapter 11-55

Standard source: Honolulu Phase I MS4 permit (2015); Phase II MS4 general permit

Website reference:
Handbook:
A Handbook for Stormwater Reclamation and Reuse Best Management Practices in Hawaii (December 2008)
http://files.hawaii.gov/dlnr/cwrm/planning/hsrar_handbook.pdf

Regulations (Hawaii Administrative Rules, Chapter 11-55):
http://health.hawaii.gov/cwb/files/2013/04/Clean_Water_Branch_HAR_11-55_20141115.pdf

Honolulu's stormwater management plan and 2015 MS4 permit
http://www.honolulu.gov/dfmswq/aboutus/875-site-dfm-swq-cat/20922-storm-water-management-plan.html

Size Threshold: Projects that disturb greater than or equal to one acre. In Honolulu's MS4 permit, certain projects between 10,000 sf and 1 acre such as retail gas outlets, automotive repair shops, restaurants, and parking lots are covered by the post-construction requirements.

Limited geographic area where standards apply: Regulated MS4 areas (urbanized areas).

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
Retain on-site by infiltration or evapotranspiration the water quality volume (1 inch rainfall) for projects greater than 5 acres unless determined to be infeasible; use biofilter for any portion not retained on-site. For projects 1-5 acres, either retain on-site or biofilter the water quality volume (1 inch rainfall). (Honolulu Rules Relating to Storm Drainage Standards, 2012).

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Redevelopment standard: Same as new development (for portion of site that was redeveloped).

Special criteria: The permittee shall incorporate the total maximum daily load into the small municipal separate storm sewer system's storm water management plan within sixty days of the date of submittal of the plan and implement necessary steps to meet the plan. (H.A.R Chapter 11-55 Appendix K-5)

Offset /mitigation: The State program does not have a stormwater offset program.

Compliance: Compliance is achieved through review of site plans by each locality's stormwater management program and through the establishment of rules, ordinances, or other regulatory mechanism, including enforcement procedures and actions that address post construction runoff from new development and redevelopment project. (H.A.R Chapter 11-55 Appendix K-10)

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are required by state regulation to be incorporated into local stormwater programs and ordinances. (H.A.R Chapter 11-55 Appendix K-10)

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: N/A

Definition of New Development: N/A

Definition of Predevelopment: N/A

Definition of Redevelopment: N/A

Additional references:

Hawaii Office of Planning, Coastal Zone Management Program, *Low Impact Development, A Practitioner's Guide*, June 2006

City and County of Honolulu, Department of Environmental Services, *Stormwater Management Plan*, March 2007

State of Hawaii, Department of Transportation, Highways Division, *Stormwater Permanent Best Practices Manual*, March 2007 http://stormwaterhawaii.com/pdfs/PermanentManual.pdf

Stormwater Program Summary – Nevada

Program Name: Nevada Division of Environmental Protection (NDEP) Bureau of Water Pollution Control Stormwater Discharge Permit Program

Program Status: Existing MS4 Stormwater Program; Permits originally issued 2002, reissued in July 2010 and expired in July 2015.

Regulatory Authority: NPDES Phase I MS4 Permits (Las Vegas Valley, Nevada DOT, and Truckee Meadows); NPDES Phase II General Permit Number: NVS040000

Standard source: NPDES Permit Number: NVS040000

Website references:
Phase I MS4 permits
http://ndep.nv.gov/bwpc/storm_large.htm

Phase II MS4 permit
http://ndep.nv.gov/bwpc/storm_small03.htm

Statutes & Regulations – Section 445A
http://leg.state.nv.us/law1.cfm

Size Threshold: Projects that disturb areas ≥1 acre, including projects <1 acre that are part of a larger common plan of development or sale. (NPDES Permit Number NVS040000, Section VI.E.3.a.i, Page 16). Note: All of Nevada's MS4 Permits contain similar language concerning post-construction requirements.

Limited geographic area where standards apply: Regulated MS4 areas

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: N/A

Treatment requirement:
Volumetric treatment control BMP design criteria for permittees must meet one of the following conditions:

- Historical rainfall records for the Permittee's locality to determine the maximized capture stormwater volume for the area for the 24- hour event using the formula recommended in Urban Runoff Quality Management, Water Environment Federation Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or
- The volume of annual runoff based on unit basin storage water quality volume, to achieve at least 80% of volume treatment by the method recommended in hydrology manuals, textbooks or similar technical publications. (NPDES Permit Number NVS040000, Section VI.E.4.d.i, Page 18)

Channel protection requirement:
Permittees must develop design standards for peak-urban runoff from NDSR projects that will provide protection against downstream erosion (NPDES Permit Number NVS040000, Section VI.E.4, Page 18)

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria:
Low Impact Development
Permittees must develop low-impact development ("LID") measures that will remain in effect after construction is complete and are effective and appropriate for the Permittee's locality and its environment. The program will outline the selected LID measures found effective and appropriate for the Permittee's locality along with a summary and schedule for implementation in the MS4; (NPDES Permit Number NVS040000, Section VI.E.3.a.ii Page 16)

Carson City UA Discharges to Clear Creek
Permittees within the Carson City UA shall also maintain a separate Clear Creek Master Stormwater Management Program ("CCSWMP"). The CCSWMP must be developed, implemented, and enforced to reduce the discharge of pollutants to the MEP, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. At a minimum, silt fences, vegetative buffer strips, or equivalent sediment controls are required for all down slope boundaries (and for those side slope boundaries deemed appropriate as dictated by individual site conditions) of a construction area, unless a sediment basin providing storage for a calculated volume of runoff from a 2-year, 24-hour storm or 3,600 cubic feet of storage per acre drained, shall be provided. (NPDES Permit Number NVS040000, Section VI.G Page 22)

Offset /mitigation: N/A

Compliance: Compliance with the NPDES permit is achieved through submission of annual reports by the MS4. NDEP also audits the individual MS4 Permittees once every 5 years.

Inspection & Maintenance/O&M: Maintenance and Inspection provisions are established by the permitted MS4.

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: N/A

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Program Name: Alaska Pollutant Discharge Elimination System (APDES); Anchorage Phase I MS4 permit

Program Status: Anchorage Phase I MS4 permit effective Feb. 1, 2010. Existing MS4 Regulations (effective 4/8/2012; stormwater permitting transferred from EPA to state authority in October, 2009). Alaska Stormwater Guide issued December 2011; voluntary.

Regulatory Authority: State stormwater regulation (18 AAC 83 APDES) and NPDES program

Standard source: Anchorage Phase I MS4 permit (Part II.B.2). The two Phase II MS4 permits in Alaska have a narrative post-construction standard.

Website references:
Anchorage Phase I MS4 permit
http://anchoragestormwater.com/Documents/apdes/AKS052558_MOA_MS4_2015_FP.pdf
(effective February 1, 2010)

Regulations:
http://www.dec.state.ak.us/commish/regulations/pdfs/18%20AAC%2072.pdf

Alaska Stormwater Guide:
http://www.dec.state.ak.us/water/wnpspc/stormwater/Guidance.html

Size Threshold: Land development projects that result in a land disturbance of 10,000 sf or more (CGP, which does not include post-construction requirements, applies to one acre or greater disturbance).

Limited geographic area where standards apply: Anchorage Phase I MS4 area.

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control:
In Anchorage, required to keep and manage the runoff generated from the first 0.52 inches of rainfall from a 24 hour event preceded by 48 hours of no measurable precipitation (Part II.B.2.a.i)

Treatment requirement:
In the Alaska Stormwater Guide (voluntary), the goal is to reduce average annual post development TSS loadings by 80% through application of the volume control requirements. (Stormwater Guide, p. 3.10)

Channel protection requirement: N/A

Flood control requirement:
In the Alaska Stormwater Guide, the goals is to provide peak discharge control of the 5-year storm event such that the postdevelopment peak rate does not exceed the downstream conveyance capacity or cause overbank flooding in local urban watersheds. Some jurisdictions may require peak discharge control for the 2-year storm event. Evaluate the effects of the 100-year storm on the storm water management system, adjacent property, and downstream facilities and property. Manage the effects of the extreme storm event through detention controls or floodplain management. (Stormwater Guide, p. 3.10)

Redevelopment standard: Same as new development.

Special criteria: N/A

Offset/Mitigation: In Anchorage, For projects that cannot meet the 100% retention requirement onsite, office mitigation within the same subwatershed may be available subject to restrictions developed by the MS4 (Part II.B.2.a.ii).

Compliance: Implemented through the Anchorage MS4 permit and voluntarily through the Alaska Stormwater Guide.

Inspection & Maintenance/O&M: Operation and Maintenance agreements required under the Anchorage MS4 permit (Part II.B.2.e).

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: A surface in the landscape that impedes the infiltration of rainfall and results in an increased volume of surface runoff (Stormwater Guide, p. 217)

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: Under Anchorage MS4 permit, redevelopment is defined as "the alteration, renewal or restoration of any developed land or property that results in the land disturbance of 10,000 square feet or more, and that has one of the following characteristics: land that currently has an existing structure, such as buildings or houses; or land that is currently covered with an impervious surface, such as a parking lot or roof; or land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering."

Any construction, alteration, or improvement that disturbs greater than or equal to 5,000 square feet of existing impervious cover performed on sites where the existing land use is commercial, industrial, institutional or residential (Stormwater Guide, p. 220).

Stormwater Program Summary – Idaho

Program Name: Idaho National Pollutant Discharge and Elimination System Program

Program Status: Existing Regulations

Regulatory Authority: Required and regulated by EPA Region 10 under Section 402(p) of the Clean Water Act, 33 U.S.C. § 1342(p), and EPA's "Phase II" regulations for MS4 discharges, published in the Federal Register on December 8, 1999, 64 Fed. Reg. 68722. The Department of Environmental Quality (DEQ) is responsible for certifying that EPA permitted facilities meet Idaho water quality standards (http://www.legislature.idaho.gov/idstat/Title67/T67CH58.htm).

Standard source: All MS4 permits in Idaho are individual permits. Boise is most recent (2013) while other permits were issued in 2009 or earlier.

How Applied: State program delegates to localities to administer.

Website reference:
Regulations:
EPA: http://yosemite.epa.gov/R10/WATER.NSF/NPDES+Permits/MS4+requirements+-+Region+10
Idaho: http://www.legislature.idaho.gov/idstat/Title67/T67CH58.htm

Boise Phase I MS4 permit:
http://www3.epa.gov/region10/pdf/permits/npdes/id/ids027561_ms4_fp_2012.pdf

Catalog of Stormwater BMPs for Idaho Cities and Counties
http://www.deq.idaho.gov/media/622263-Stormwater.pdf

Size Threshold: Varies. Boise permit (issued in 2013) has threshold of 5,000 square feet or more, excluding individual one or two family dwelling development ore redevelopment. Older permits have threshold of one acre.

Limited geographic area where standards apply: Applies in regulated MS4s

Significant exemptions: N/A

Post-Construction Standards for New Development:

On-Site Retention/Volume Control: For Boise permit, on-site retention required for first 0.6 inches of rainfall from a 24-hour event preceded by 48 hours of no measurable precipitation.

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Redevelopment standard: N/A

Special criteria:
TMDL Requirements: In a water body where EPA has approved a TMDL, any NPDES permit conditions must be consistent with the assumptions and requirements of available Waste Load Allocations. See 40 C.F.R. §122.44(d)(1)(vii)(B).

Offset/mitigation: In Boise permit, for projects that cannot meet 100% infiltration/evapotranspiration/reuse requirements onsite, the MS4 may allow offsite mitigation within the same subwatershed.

Compliance: Compliance is achieved through development, implementation and enforcement of a Stormwater Management Plan to reduce pollutants to the MEP. (Regulations, 40 CFR §122.34)

Inspection & Maintenance/O&M: N/A

Does development on agricultural land qualify as redevelopment? No.

Definition of impervious surface: Material which resists or blocks the passage of water (Catalog of BMPs).

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: N/A

Stormwater Program Summary – Oregon

Program Name: Oregon Water Quality Permit Program

Program Status: Phase I permits were reissued in March, 2012. Phase II MS4 permits were issued in 2007.

Regulatory Authority: Oregon Administrative Rule 340-045 Regulations pertaining to NPDES and Water Pollution Control Facilities establishes the requirement of an NPDES permit by MS4s for stormwater discharges.

Standard source: Phase I MS4 permits

Website reference:
Water Quality Permit Program:
http://www.deq.state.or.us/wq/stormwater/stormwater.htm

Oregon's Phase II Municipal Stormwater Program:
http://www.deq.state.or.us/wq/stormwater/municipalph2.htm

Regulations:
https://www.oregonlegislature.gov/

Size Threshold: Determined at local level for Phase I permittees, generally 1 acre or larger. Not specified for Phase II programs, but the national regulations are cited, which apply to sites 1 acre and larger.

Limited geographic area where standards apply: Regulated MS4 areas.

Significant exemptions: N/A

Post-Construction Standards for New Development:
Minimum thresholds are established for Phase I permittees regulating 90% of all new or replaced impervious surfaces (DEQ staff, 10/21/2010). In general, DEQ expects that the requirements for post-construction stormwater management will be tailored by individual [co]permittees in order to best accommodate local conditions, watershed priorities and achieve the Maximum Extent Practicable standard. Permittees have the flexibility to determine the practices and measurable goals that are most appropriate for their system. The chosen practices and measurable goals, submitted to DEQ as part of the permit application, become the required stormwater management program. Permittees are also required to assess their progress in achieving their programs' measurable goals. If there is an indication of a need for improved controls, permittees are expected to revise their mix of practices to create a more effective program. (See individual permits, Schedule A)

Phase II permittees – no listed requirements

On-Site Retention/Volume Control:
Capture and treatment of 80% of average annual runoff volume.

Treatment requirement: N/A

Channel protection requirement: N/A

Flood control requirement: N/A

Redevelopment standard: N/A

Special criteria: *Total Maximum Daily Load (TMDL) Requirements:* If a waste load allocation (WLA) has been assigned to urban stormwater due to a TMDL, permittees are required to develop and propose to the Department specific performance measures and pollutant load reduction benchmarks. Performance measures and pollutant load reduction benchmarks are to be developed over the course of the permit cycle and must be submitted to the Department as part of the permit renewal application. (Oregon's Phase II Municipal Stormwater Program, page 2; Permit No 101348, page 33)

Offset /mitigation: See individual permits. Where site-specific conditions make the post-construction requirements infeasible, [co]permittees programs must require an equivalent approach to reduce pollutant loads, such as off-site stormwater quality management. DEQ expects that these alternative options will be granted by [co]permittees on a project-by-project basis. In some cases, water quality benefits may be realized when off-site mitigation projects are implemented in place of on-site practices, depending on a variety of factors, such as the location and nature of the regional projects and the ancillary benefits they offer (habitat, recreation, open space, flood control, etc.). (DEQ staff, 10/21/2010)

Compliance: Compliance conditions not included at this time (Permit no. 101348, page 33)

Inspection & Maintenance/O&M: Phase I permittees, at a minimum, must have a long-term maintenance program with legal authority, the ability to identify and track stormwater management facilities, and include inspection and maintenance requirements, which are reflected in permit conditions. DEQ differentiates the requirements between publicly-owned and operated facilities, and those facilities that are owned or operated by a private entity. DEQ, however, encourages each [co]permittee maintain a general requirement under its legal authority that stormwater treatment facilities be properly operated and maintained. (Permit no. 101348, General Conditions, page 12)

Phase II permittees must ensure that appropriate mechanisms are in place to enforce stormwater programs minimum control measures. (Permit No. 102897 Fact Sheet, p. 6)

Does development on agricultural land qualify as redevelopment? N/A

Definition of impervious surface: Any surface resulting from development activities that prevents the infiltration of water or results in more runoff than in the undeveloped condition. Common impervious surfaces include: building roofs, traditional concrete or asphalt paving on walkways, driveways, parking lots, gravel roads, and packed earthen materials (Permit No. 101348).

Definition of predevelopment: N/A

Definition of new development: N/A

Definition of redevelopment: A project on a previously developed site that results in the addition or replacement of impervious surface (Permit No. 101348).

Additional references:

Department of Environmental Quality memo. Guidelines for Determining the Post-Construction Impervious Area Minimum Threshold for the Municipal Separate Storm Sewer System (MS4) Phase I Permits. June 3, 2009.

NPDES Stormwater Discharge Permits - Phase I Municipalities (MS4):
http://www.deq.state.or.us/wq/stormwater/municipalph1.htm

Permit No. 113604 Fact Sheet:
http://www.deq.state.or.us/wq/pn/permits/ashlandr.pdf

Stormwater Program Summary – Washington

Program Name: Washington State Stormwater Management Program

Program Status: Existing Regulations, Phase I enacted in 1995, reissued in 2012, and made effective in 2013; Phase II permits issued 2007 (reissued in 2012 and made effective in 2013).

Regulatory Authority: State of Washington Water Pollution Control Law Chapter 90.48 Revised Code of Washington Department of Ecology NPDES permit program

Standard source: Stormwater Management Manuals for both Western and Eastern Washington

Website references:
Ecology Stormwater Website
http://www.ecy.wa.gov/programs/wq/stormwater/index.html

Municipal Stormwater Management Design Manuals
http://www.ecy.wa.gov/programs/wq/stormwater/municipal/StrmwtrMan.html

Phase I Municipal Stormwater Permit:
http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/phipermit.html

Size Threshold: Land development projects that disturb greater than 2,000 square feet, or greater, of new, replaced or new plus replaced impervious surface area, or has a land disturbing activity of 7,000 square feet or greater. Additional requirements are required for new development that creates or adds 5,000 square feet, or more of new impervious surface area; converts ¾ acres, or more, of native vegetation to lawn or landscaped areas; or, coverts 2.5 acres, or more, of native vegetation to pasture. (Phase I Municipal Stormwater Permit, Appendix 1, page 11)

Limited geographic area where standards apply: Regulated MS4s

Significant exemptions:
Forest practices regulated under Title 222 WAC, commercial agriculture, oil and gas field activities or operations, pavement maintenance, and underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics have less stringent requirements. (Phase I Municipal Stormwater General Permit, Appendix A, page 1-2)

Post-Construction Standards for New Development:
On-Site Retention/Volume Control:
The Permittee must require On-site Stormwater Management BMPs to infiltrate, disperse, and retain stormwater runoff onsite to the maximum extent feasible without causing flooding or erosion impacts. The discharge of untreated stormwater from pollution-generating hard surfaces to ground water must not be authorized by the Permittee, except for the discharge achieved by infiltration or dispersion of runoff through use of On-site Stormwater Management BMPs in accordance with Chapter 5, Volume V and Chapter 7, Volume V of the *SWMMWW* (2012); or by infiltration through soils meeting the soil suitability criteria in Chapter 3 of Volume III of the *SWMMWW* (2012). (Phase 1 Municipal Stormwater Permit, Appendix 1, pages 20 and 27)

Treatment requirement:
High-use sites that generate high concentrations of oil must achieve Oil Control on the site as defined in the Phase I Municipal Stormwater Permit, Appendix 1, page 24. The requirement to provide phosphorous control is determined by the local government with jurisdiction (e.g., through a lake management plan), or the Department of Ecology (e.g., through a waste load allocation). Enhanced treatment for reduction in dissolved metals is required for the following project sites that discharge to fish-bearing streams, lakes, or to waters or conveyance systems tributary to fish-bearing streams or lakes: Industrial project sites, Commercial project sites, multi-family project sites, and high AADT roads. (Phase I Municipal Stormwater Permit, Appendix 1, pages 24-25)

Channel protection requirement:
Stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The pre-developed condition to be matched shall be a forested land cover unless:

- Reasonable, historic information is available that indicates the site was prairie prior to settlement (modeled as "pasture" in the Western Washington Hydrology Model); or
- The drainage area of the immediate stream and all subsequent downstream basins have had at least 40% total impervious area since 1985. In this case, the pre-developed condition to be matched shall be the existing land cover condition. Where basin-specific studies determine a stream channel to be unstable, even though the above criterion is met, the pre-developed condition assumption shall be the "historic" land cover condition, or a land cover condition commensurate with achieving a target flow regime identified by an approved basin study. This standard requirement is waived for sites that will reliably infiltrate all the runoff from impervious surfaces and converted pervious surfaces. (Phase 1 Municipal Stormwater Permit, Appendix 1, page 29)

Flood control requirement (enacted 2000):
Optional criteria applied at the discretion of the appropriate plan review/approval authority to control the developed condition peak rate of discharge from the 10-year 24-hour design storm event to the pre-development rate. (Manual, p. 2.1)

Redevelopment standard:
All redevelopment shall be required to comply with Minimum Requirement #2 (Construction SWPPP). The following redevelopment shall comply with Minimum Requirements #1 through #5 for the new and replaced hard surfaces and the land disturbed:

- Results in 2,000 square feet, or more, of new plus replaced hard surface area, or
- Has land disturbing activity of 7,000 square feet or greater.

The following redevelopment shall comply with Minimum Requirements #1 through #9 for the new hard surfaces and converted vegetation areas:

- Adds 5,000 square feet or more of new hard surfaces or,
- Converts ¾ acres, or more, of vegetation to lawn or landscaped areas, or
- Converts 2.5 acres, or more, of native vegetation to pasture.

The local government may allow the Minimum Requirements to be met for an equivalent (flow and pollution characteristics) area within the same site. For public road projects, the equivalent area does not have to be within the project limits, but must drain to the same receiving water. If the runoff from the new impervious surfaces and converted pervious surfaces is not separated from runoff from other

surfaces on the project site, the stormwater treatment facilities must be sized for the entire flow that is directed to them.(Phase 1 Municipal Stormwater Permit, Appendix 1, page 11)

Special criteria: *TMDL Requirements*: More specific requirements are applied to those permitted areas draining to TMDL listed waters. (Phase I Municipal Stormwater Permit, Appendix 2, page 1)

Offset/Mitigation: There is no program for stormwater mitigation.

Compliance: Compliance is achieved through implementation of a stormwater management plan by the permittee. (Phase I Municipal Stormwater Permit, page 8)

Inspection & Maintenance/O&M: Permittees must require an operation and maintenance manual that is consistent with the provisions in Volume V of the *Stormwater Management Manual for Western Washington* (2012) for proposed stormwater facilities and BMPs. The party (or parties) responsible for maintenance and operation shall be identified in the operation and maintenance manual. For private facilities approved by the Permittee, a copy of the manual shall be retained onsite or within reasonable access to the site, and shall be transferred with the property to the new owner. For public facilities, a copy of the manual shall be retained in the appropriate department. A log of maintenance activity that indicates what actions were taken shall be kept and be available for inspection by the local government. (Phase I Municipal Stormwater Permit, Appendix 1, page 31)

Does development on agricultural land qualify as redevelopment? No

Definition of impervious surface: A non-vegetated surface area which either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for the purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling. (Stormwater Management Manual for Western Washington, Glossary p. 24 and Phase I Municipal Stormwater Permit, p. 69))

Definition of new development: Land disturbing activities, including Class IV -general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of impervious surfaces; and subdivision, short subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of redevelopment shall not be considered new development. (Stormwater Management Manual for Western Washington, Glossary p. 30; Phase I Municipal Stormwater Permit, p. 71)

Definition of predevelopment: Predeveloped condition means, “The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement.” (Stormwater Management Manual for Western Washington, Glossary p. 34)

Definition of redevelopment: On a site that is already substantially developed (i.e., has 35% or more of existing impervious surface coverage), the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities. (Stormwater Management Manual for Western Washington, Glossary p. 36; Phase I Municipal Stormwater Permit, p.72)