

2014 Draft Massachusetts MS4 Permit

Newton Tedder
EPA New England

Presentation Overview

NPDES and Stormwater Regulation

MS4 Permit Requirements

MEP Requirements

Water Quality Based

Impaired Waters Requirements

TMDLs

Questions

This presentation is for informational purposes only. Any comments made by the presenter or attendees is not part of the administrative record for this draft permit. Any comments participants wish to be part of the administrative record must submit them in writing to EPA during the public comment period or orally during the public hearing.

**Public Comment Period: September 30, 2014 –
December 29, 2014**

Public Hearing:

Date: November 19, 2014

Time: 1:00pm

Location: Leominster Public Library
(Community Room), 30 West Street,
Leominster, Massachusetts 01453.

Clean Water Act - 1972

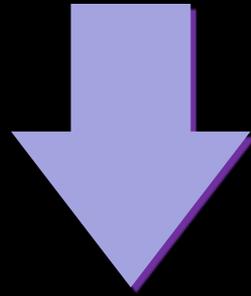


Goal



CWA Section 4

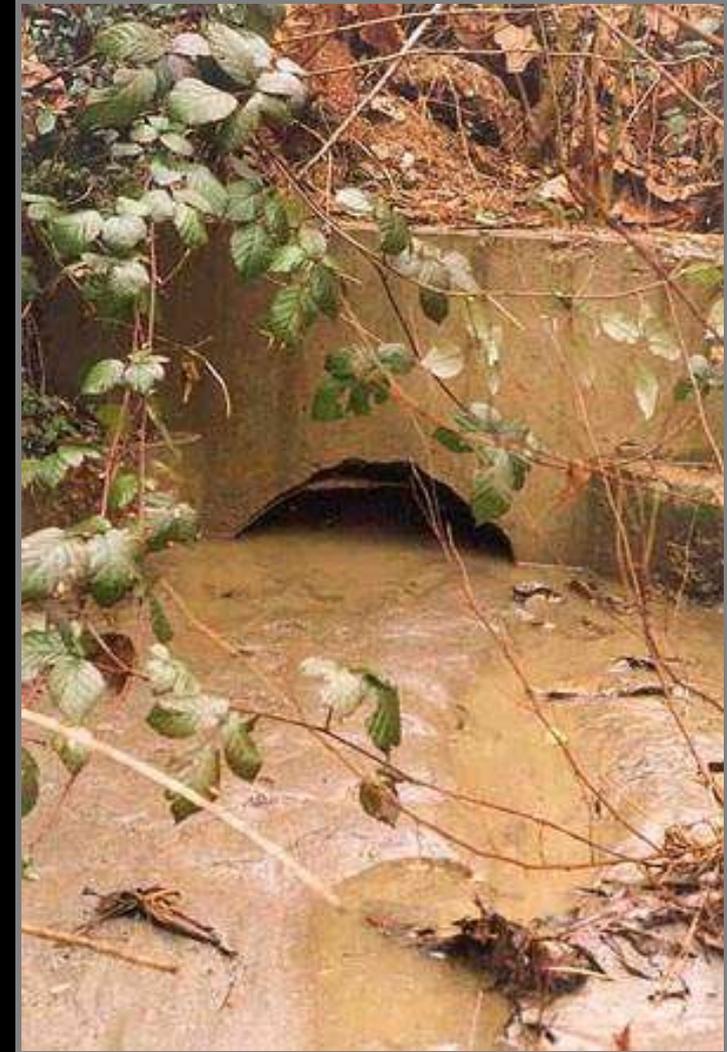
All “point” sources
“discharging pollutants”
into “waters of the U.S.”



Must obtain an NPDES permit from
an authorized state or EPA

Nationwide Urban Runoff Program (NURP)

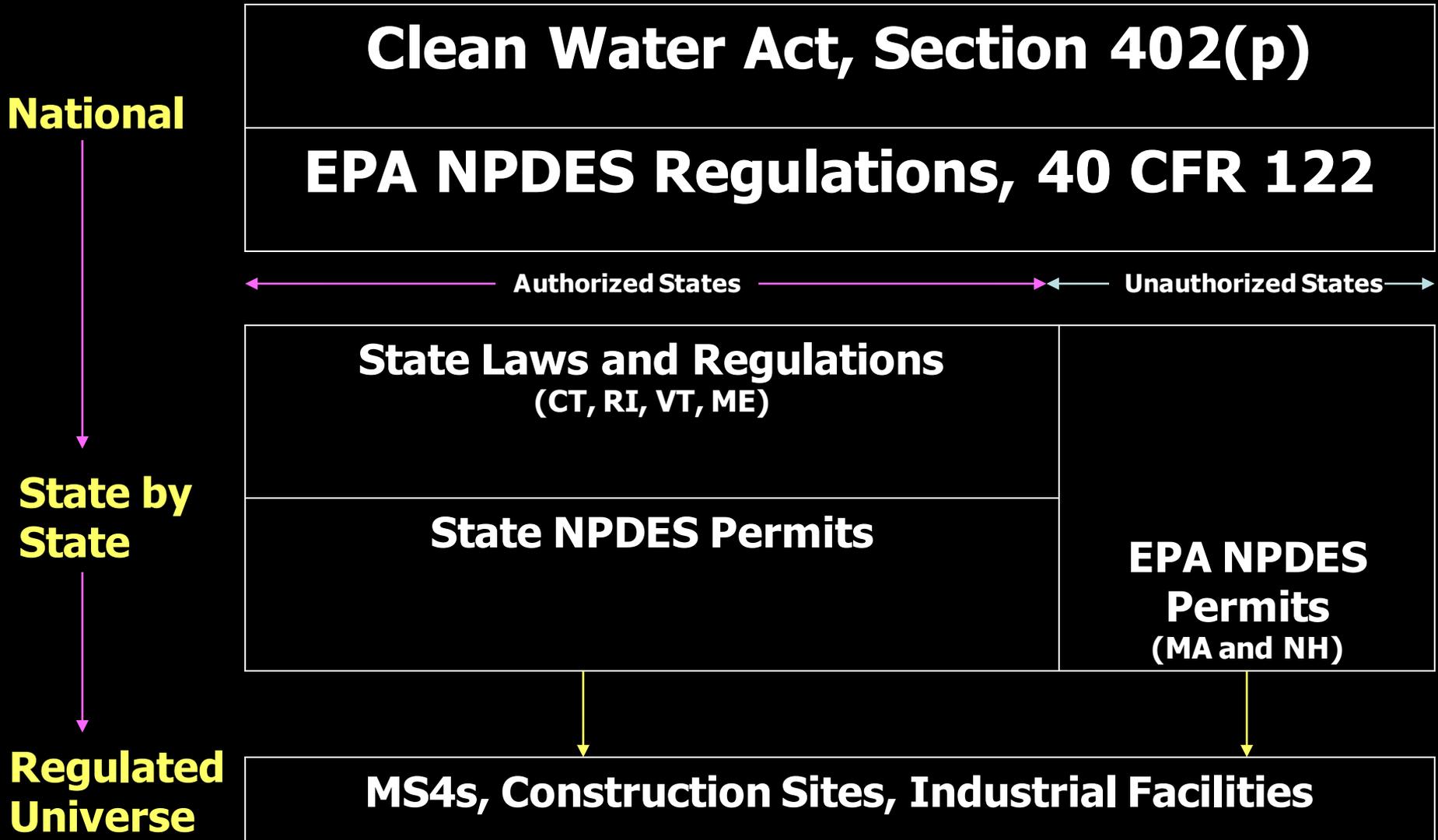
- ▶ Conducted by EPA between 1979 and 1983
- ▶ First comprehensive study of urban runoff pollution across U.S.
- ▶ Found high levels of heavy metals, fecal coliform, TSS, nutrients and hydrocarbons in urban runoff



Regulatory History

- ▶ Before 1987 stormwater considered a non-point source and not regulated
- ▶ Water Quality Act of 1987 required NPDES permitting of certain stormwater discharges
 - Medium and large municipalities (serving over 100,000 persons)
 - Industrial activities
 - Others, as determined by EPA, “to protect water quality”

Stormwater Regulatory Framework



Phase I Program

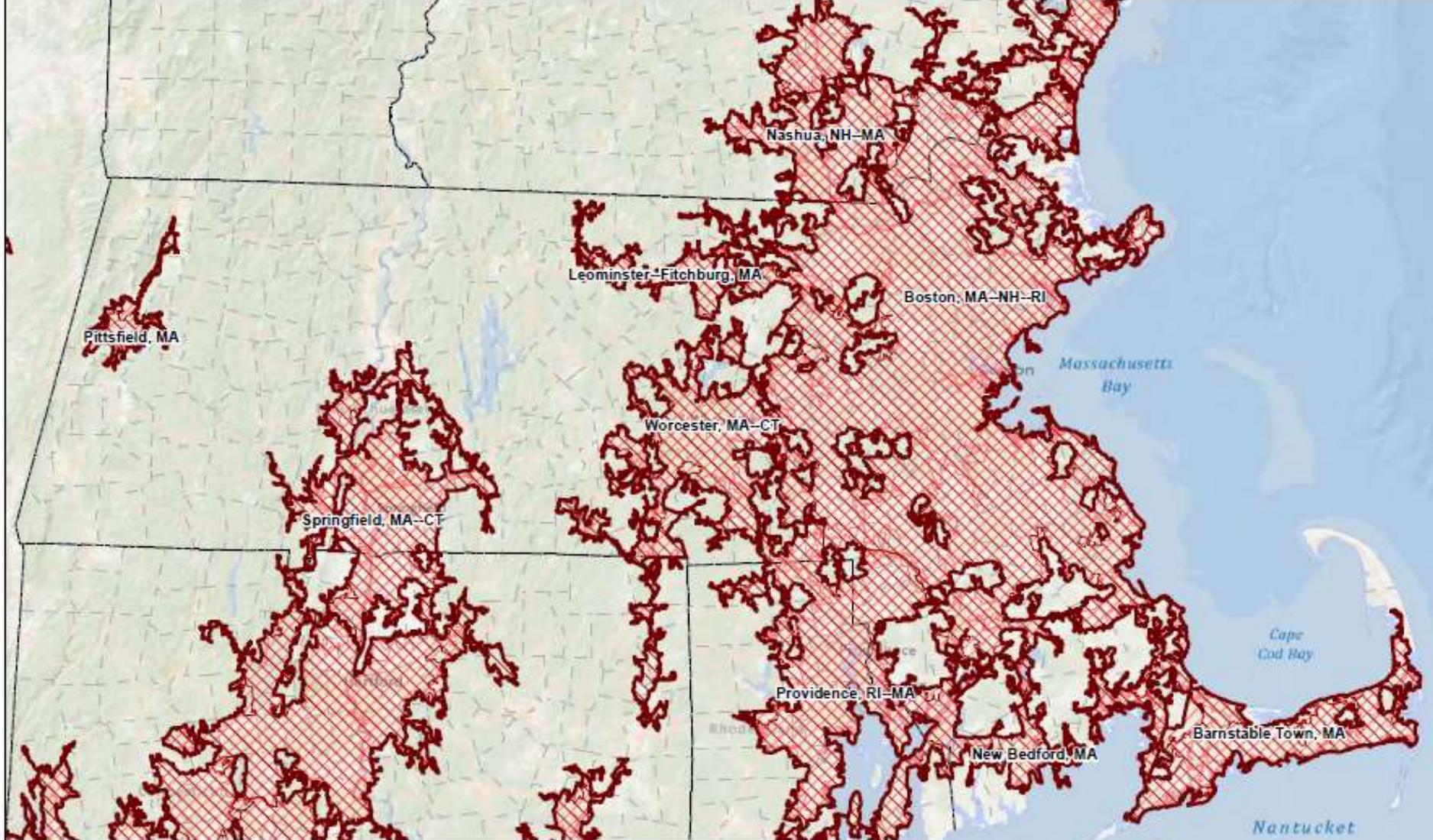
- ▶ Stormwater management program must reduce the discharge of pollutants to the maximum extent practicable (MEP) and protect water quality
- ▶ Medium and large municipalities (over 100,000)
- ▶ Industrial activity
(11 categories)
- ▶ Construction over
5 acres



Phase II Coverage

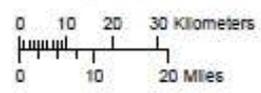
- ▶ 1995 Report to Congress, EPA determined that small municipalities also needed regulation – Regulations passed in 1999
- ▶ Permitting authorities can also designate additional small MS4s that are outside of urbanized areas
- ▶ Includes non-traditional MS4s within urbanized areas, such as:
 - Military bases
 - Public universities
 - Prisons, etc.
- ▶ First Massachusetts Phase II Permit: 2003





Massachusetts

NPDES Phase II
Stormwater Program
Automatically Designated
MS4 Areas

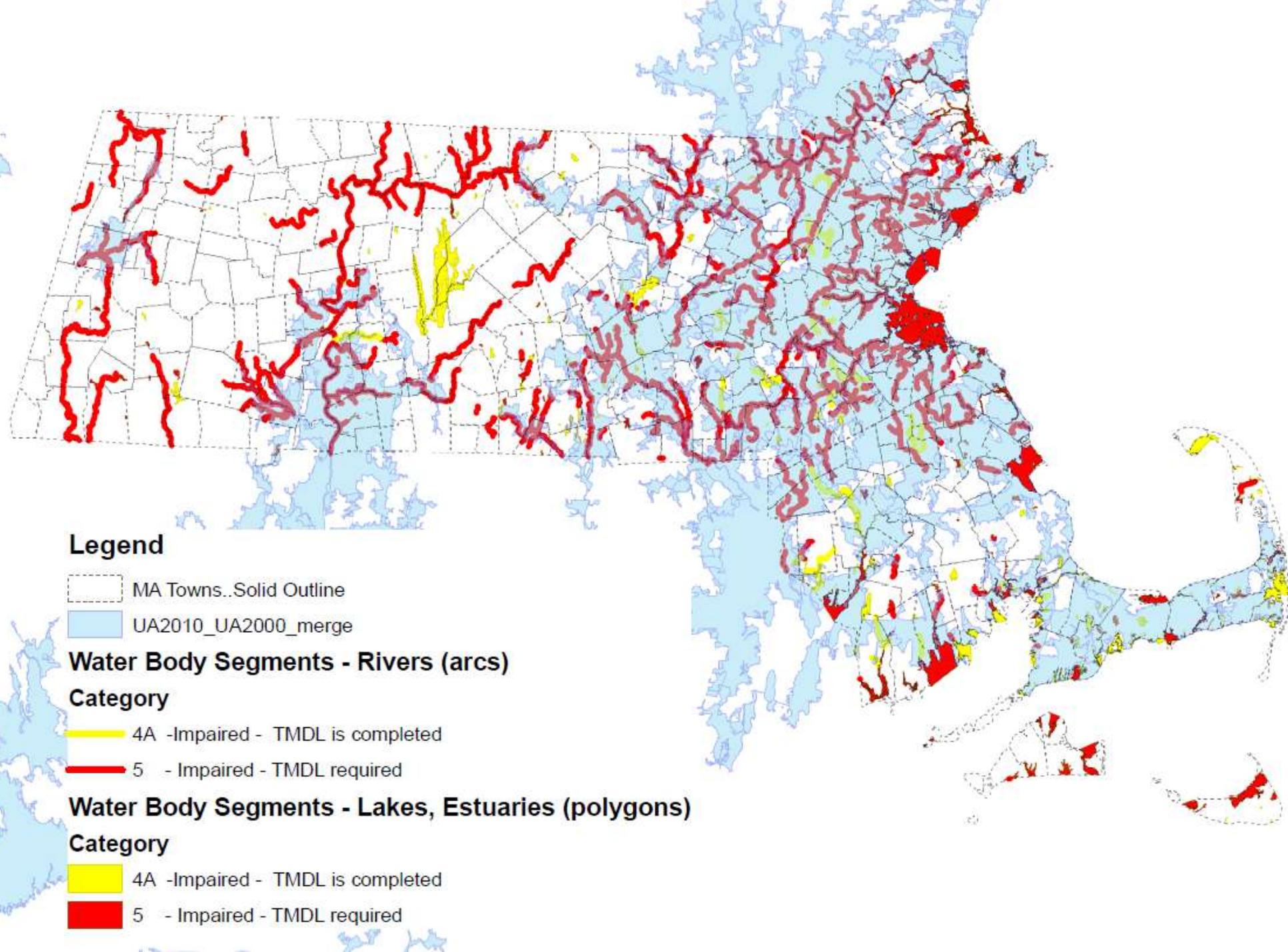


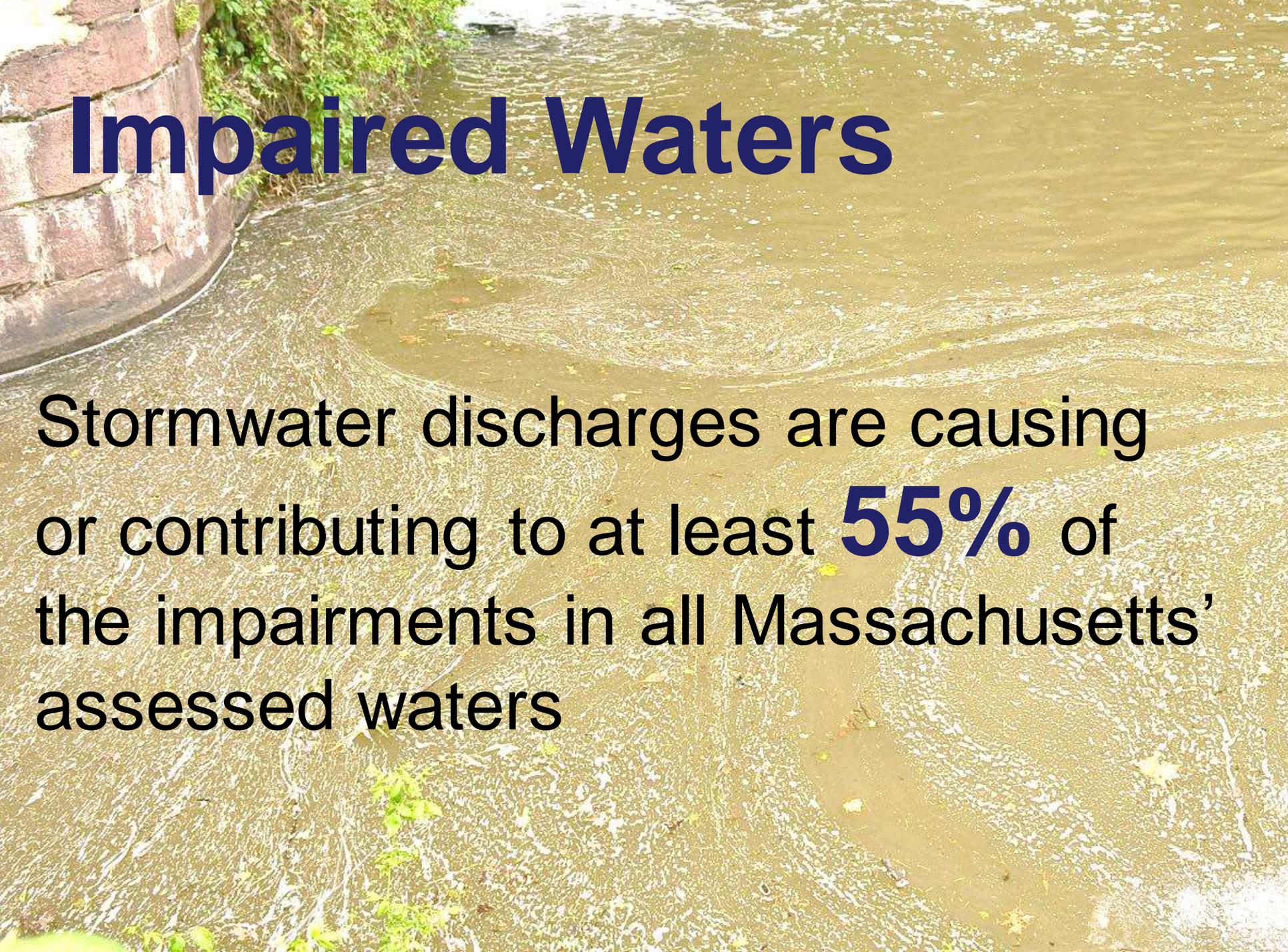
Regulated Area:



Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map: US National Park Service

US EPA Region 1 GIS Center Map #8824, 11/19/2012





Impaired Waters

Stormwater discharges are causing or contributing to at least **55%** of the impairments in all Massachusetts' assessed waters



Draft Massachusetts MS4 Permit Requirements

NOI and SWMP

Required NOI Info

Basic Info

2003 permit items

Endangered Species

Historic Properties

BMPs

Cert & signature



Notice of Intent - NOI

Notice of Intent (NOI) for coverage under Small MS4 General Permit Page 1 of 14

Part I: General Conditions

General Information

Name of Municipality or Organization: State

EPA NPDES Permit Number:

Primary MS4 Program Manager Contact Information

Name: Title:

Street Address Line 1

City State Zip Code

Fax Number:

Check the box if your municipality or organization was covered under the 2003 MS4 General Permit

Stormwater Management Program (SWMP) Location

Eligibility Determination

Endangered Species Act (ESA) Determination Complete? Eligibility Criteria (check all that apply): A B C D E F

National Historic Preservation Act (NHPA) Determination Complete? Eligibility Criteria (check all that apply): A B C D

MS4 Infrastructure (if covered under the 2003 permit)

Due 90 days from effective date of permit
Information required on NOI
Public notice of the NOI
Authorization to discharge

Elements of SWMP

Description & details

Map

Annual evaluation





MEP Requirements

Six Minimum Measures

1. Public education
2. Public involvement
3. Illicit discharge detection & elimination
4. Construction runoff
5. Post-construction stormwater management
6. Pollution Prevention

Shared Responsibility

The regulations, 40 CFR 122.35, allow for MS4s to share responsibility for the implementation of the six minimum measures



Public Education and Outreach

▶ Four Audiences

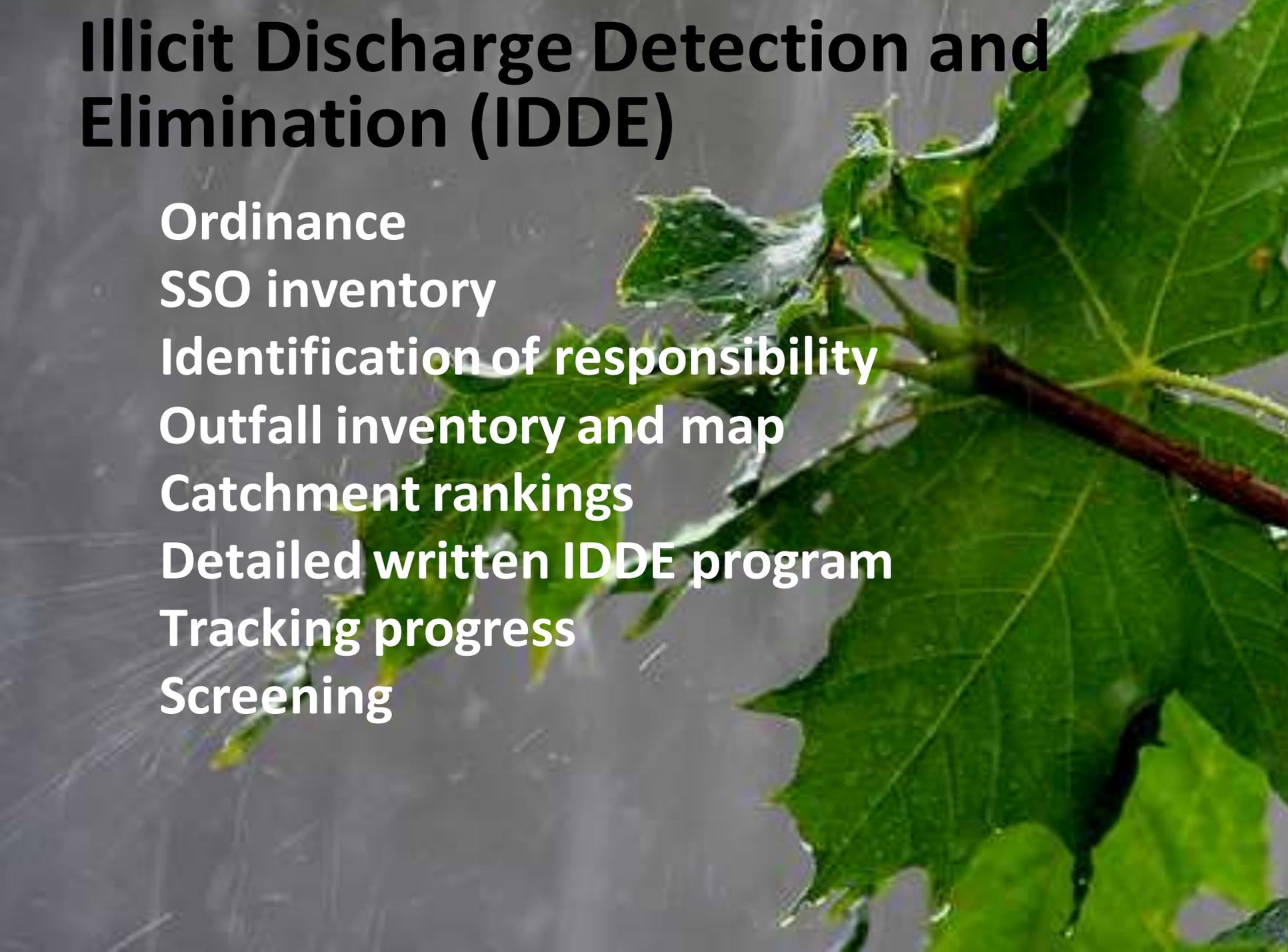
- Residents
- Businesses and commercial facilities
- Developers
- Industrial Facilities

▶ Two messages to each audience over the permit term

Public Involvement and Participation

- ▶ Public review of SWMP
- ▶ Make all reports available to the public

Illicit Discharge Detection and Elimination (IDDE)



Ordinance

SSO inventory

Identification of responsibility

Outfall inventory and map

Catchment rankings

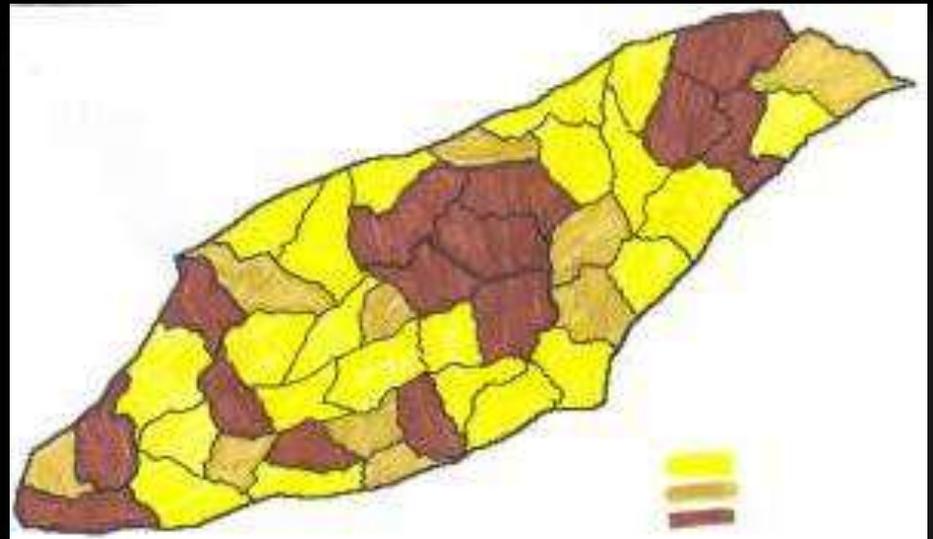
Detailed written IDDE program

Tracking progress

Screening

IDDE - Catchment Ranking

- Excluded Catchments
- Problem Catchments
- High Priority Catchments
- Low Priority Catchments



Construction Site Runoff Control

Ordinance

Site Inspection procedures

Sediment control requirements

Requirements to control waste

Site Plan Review



Post-Construction Stormwater Management



Updated Ordinance

Retain and or treat the first 1" of runoff from IA on site from new and re-development disturbing ≥ 1 acre



Street design &
Parking assessment

Green infrastructure

Tracking impervious area

Good Housekeeping

O&M procedures

Catch basin cleaning

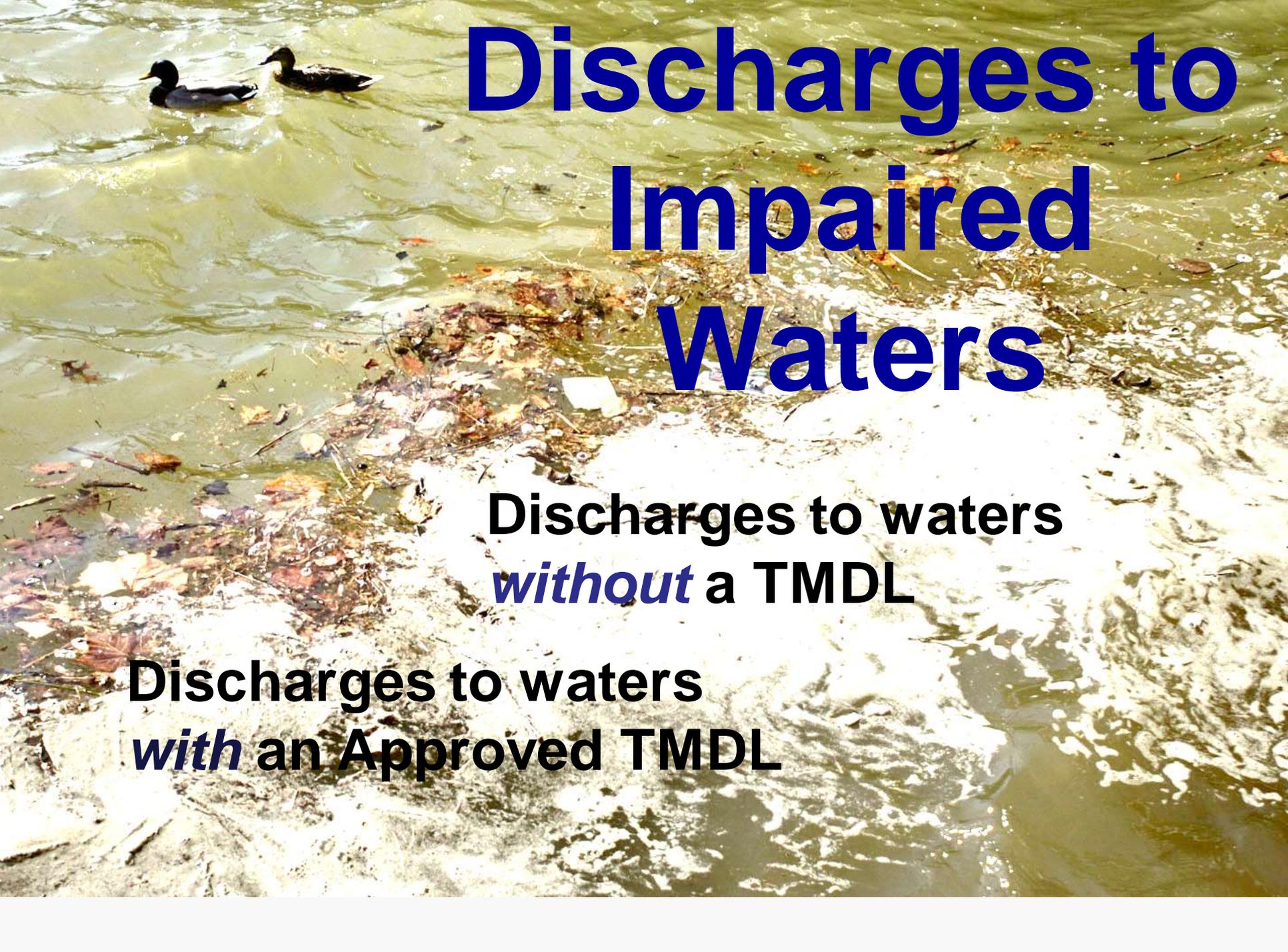
Street sweeping

SWPPP





Water Quality Requirements

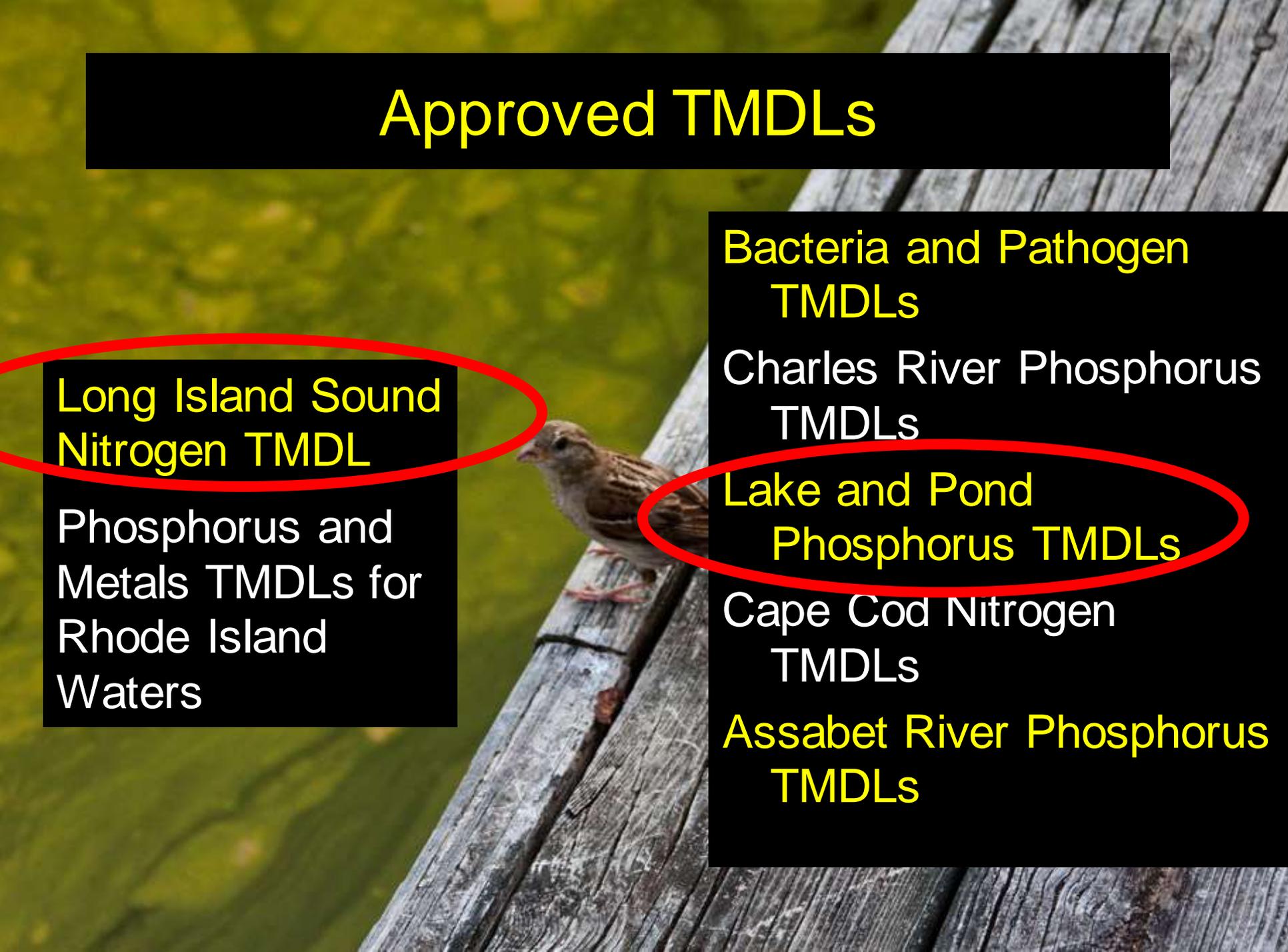


Discharges to Impaired Waters

Discharges to waters
without a TMDL

Discharges to waters
with an Approved TMDL

Approved TMDLs



Long Island Sound
Nitrogen TMDL

Phosphorus and
Metals TMDLs for
Rhode Island
Waters

Bacteria and Pathogen
TMDLs

Charles River Phosphorus
TMDLs

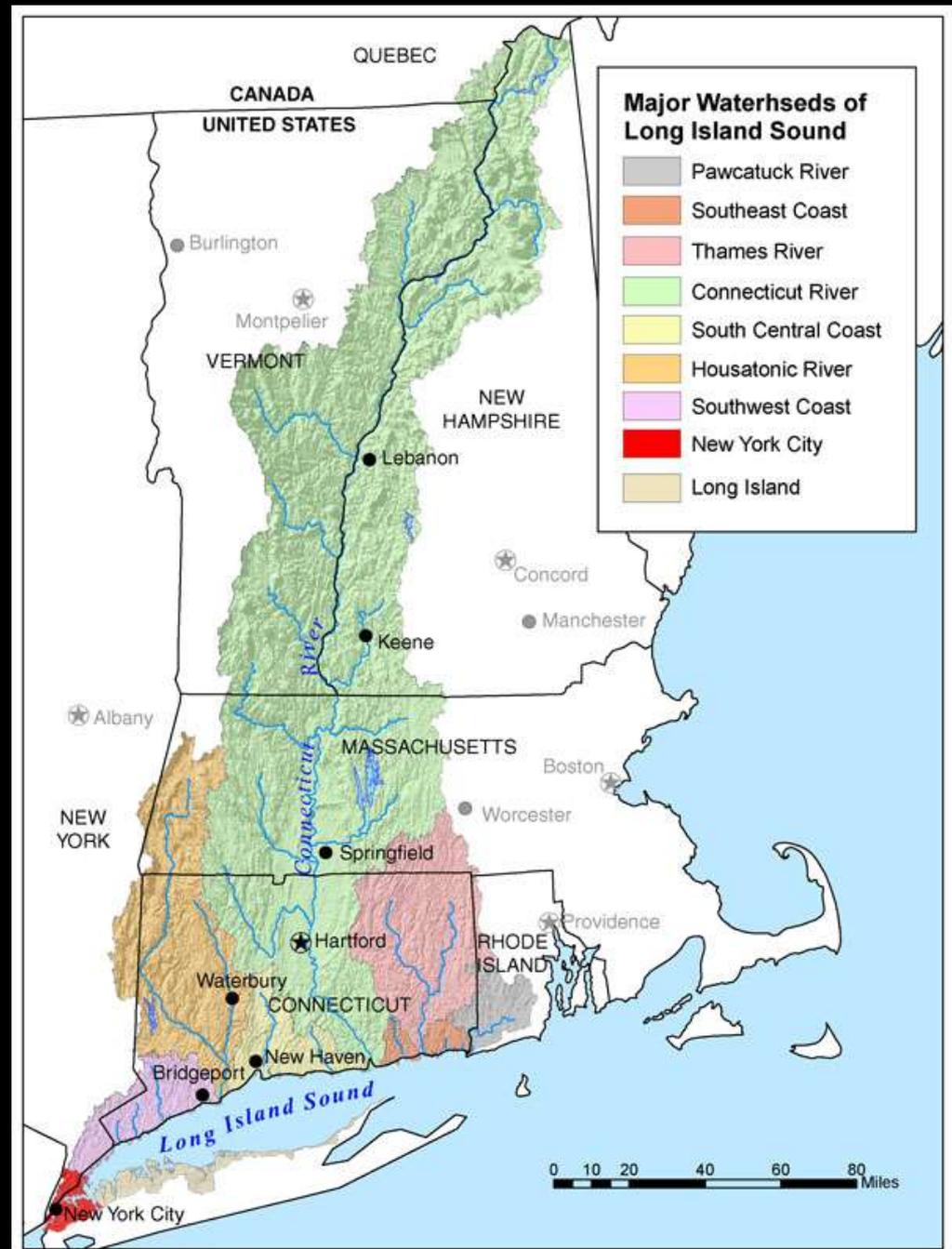
Lake and Pond
Phosphorus TMDLs

Cape Cod Nitrogen
TMDLs

Assabet River Phosphorus
TMDLs

Long Island Sound TMDL

- Connecticut River Watershed
- Housatonic River Watershed
- Thames River Watershed



N Reduction Through Enhanced BMPs

- 
- **Public Education**
 - **New Development/
Redevelopment**
 - **Good Housekeeping**

Nitrogen Source Identification Report

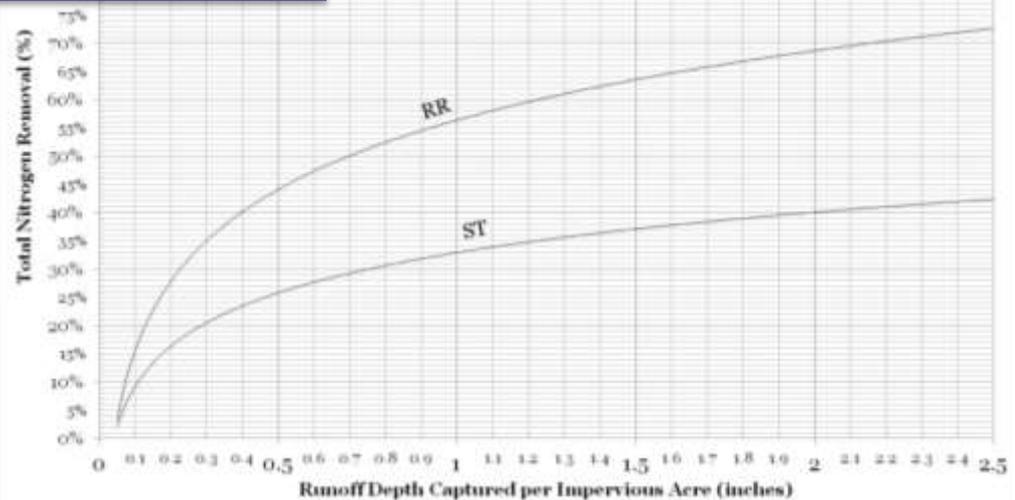


- Due Year 4
- Delineate potential N sources
- ID potential retrofits
- 1 demonstration project by year 6

Tracking – Structural BMPs

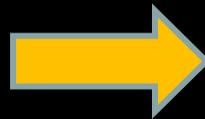
| Structural BMP | Classification |
|---|---------------------------|
| Infiltration Trench | Runoff Reduction (RR) |
| Infiltration Basin or other surface infiltration practice | Runoff Reduction (RR) |
| Bioretention Practice | Runoff Reduction (RR) |
| Gravel Wetland System | Stormwater Treatment (ST) |
| Porous Pavement | Runoff Reduction (RR) |
| Wet Pond or wet detention basin | Stormwater Treatment (ST) |
| Dry Pond or detention basin | Runoff Reduction (RR) |
| Water Quality Swale | Runoff Reduction (RR) |

Total Nitrogen Removal and ST New Development Practices



Lake and Pond Phosphorus TMDLs

***EXCESSIVE
PHOSPHORUS***



- ▶ Reduced clarity
- ▶ Noxious scums
- ▶ Toxic blooms
- ▶ Surface waters choked with plant matter
- ▶ Low dissolved oxygen for aquatic life (e.g., fish)

Urban Stormwater Phosphorus



Tends to be associated with very fine particles ~ 40 microns

Much is washed from impervious surfaces with small amounts of rainfall (e.g., 0.3 inches)

Stormwater controls must have filtration component to be effective

Enhanced Non-Structural Best Management Practices Eligible for Phosphorus Reduction Credits (BMPs)

► Enhanced non-structural Best Management Practices

- Enhanced sweeping program (1-15% credit)
- Semi-annual catch basin cleaning (2% credit for P)
- No application of fertilizers containing phosphorus (50% credit for lawns)
- Weekly leaf litter and organic debris collection program (5% credit for P)



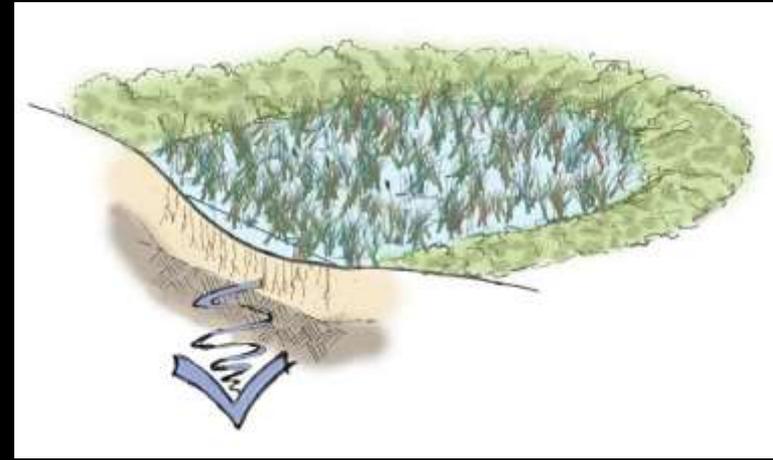
Attachment 2 to App. F to Permit provides methodology for calculating default phosphorus reduction credits for enhanced non-structural Best Management Practices



Structural Best Management Practices for Phosphorus Reduction Credit

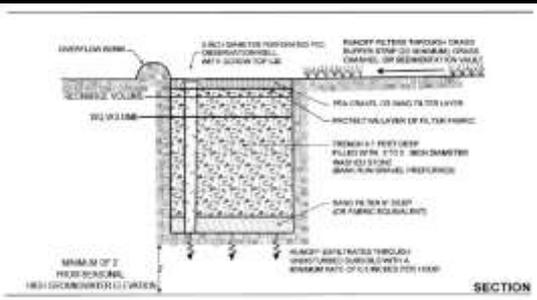
- ▶ Infiltration practices are highly effective at managing stormwater runoff
 - Surface infiltration (e.g., basins, swales, rain gardens)
 - Subsurface infiltration (e.g., trench and chambers)

Excellent for phosphorus and bacteria removal and replenishing ground water aquifers

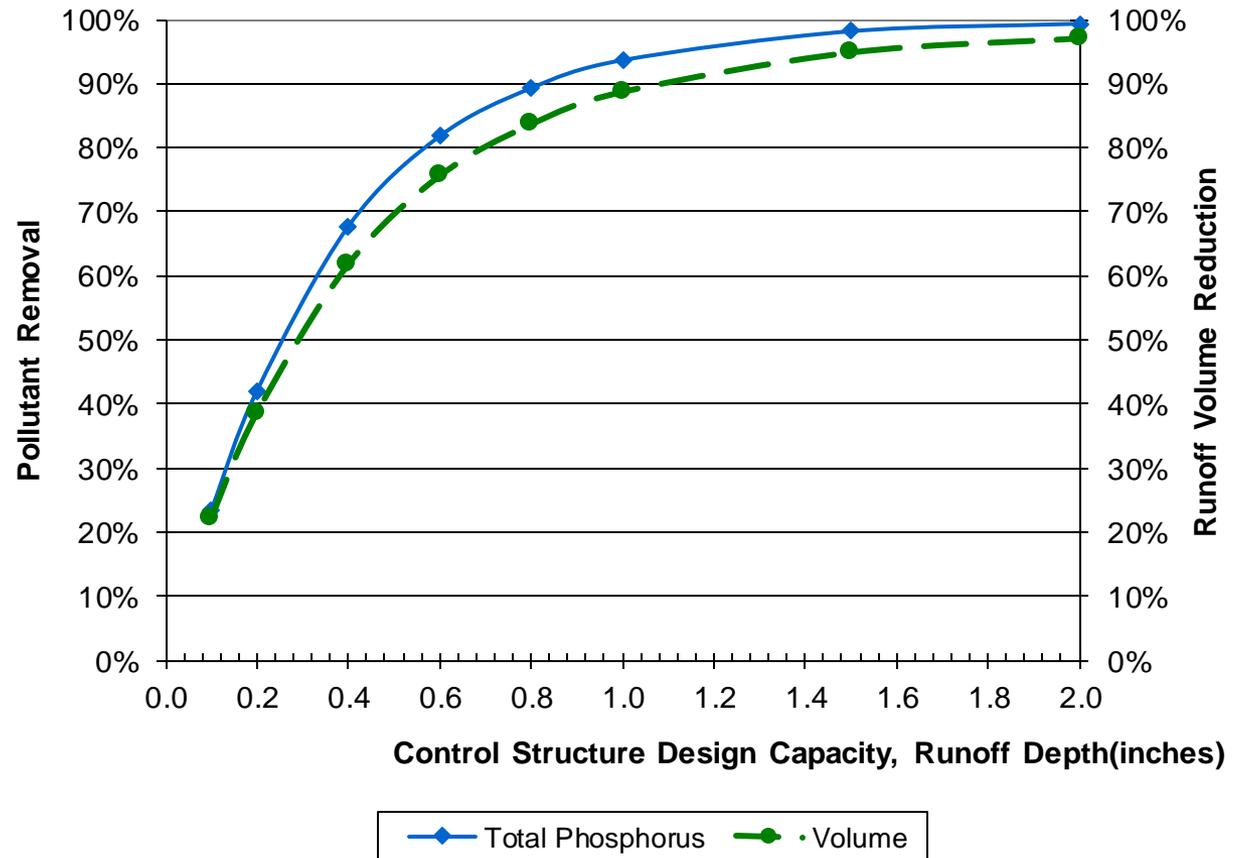


Long-Term Cumulative Performance Curve for Infiltration Trench

Attachment 3 to Appendix F of draft MA MS4 Permit



BMP Performance Curve: Infiltration Trench
(Soil infiltration rate 0.52 in/hr)



Other Structural BMPs for Phosphorus Reduction Credit (continued)

- Bio-filtration systems
- Filter systems
- Gravel wetlands
- Commercial or proprietary treatment systems
- Permeable pavements
- Etc.

Attachment 3 to App. F to the Permit provides a methodology to calculate phosphorus removal credits for several structural BMPs based on physical storage capacity



Discharges to Waterbodies *Without* an Approved TMDL

Additional requirements for
Bacteria, Nutrients, Solids,
Chloride, Metals and Oil and
Grease

NSQD urban stormwater

| Parameter | Count | Median | Geometric Mean | Minimum | Maximum | 25% | 75% |
|----------------------------------|-------|--------|----------------|---------|---------|------|-------|
| Phosphorus Total (mg/l) | 1967 | 0.25 | 0.26 | 0.02 | 10 | 0.15 | 0.42 |
| Total Nitrogen (mg/L) | 1763 | 2.0 | 2.0 | 1.0 | 7.0 | 1.0 | 3.0 |
| Fecal Coliform (colonies/100 ml) | 524 | 4500 | 3578 | 2.0 | 5230000 | 800 | 26000 |
| Total E Coli (colonies/100 ml) | 25 | 1100 | 1366 | 10 | 35000 | 460 | 8500 |
| Chloride (mg/l) | 57 | 6.0 | 7.0 | 1.0 | 350 | 4.0 | 10 |
| Turbidity (NTU) | 12 | 106 | 98 | 16 | 630 | 43 | 176 |
| Total Suspended Solids (mg/l) | 2046 | 45 | 46 | 1.0 | 2405 | 22 | 95 |
| Oil and Grease Total (mg/l) | 390 | 5.0 | 4.8 | 0.2 | 570 | 2.5 | 8.5 |
| Zinc Total (ug/l) | 1592 | 105 | 89 | 1.4 | 3050 | 50 | 190 |

Discharges To Bacteria Impaired Waters

- If discharge contains illicits remove in 60 days
- Additional BMPs
 - Public Education
 - IDDE

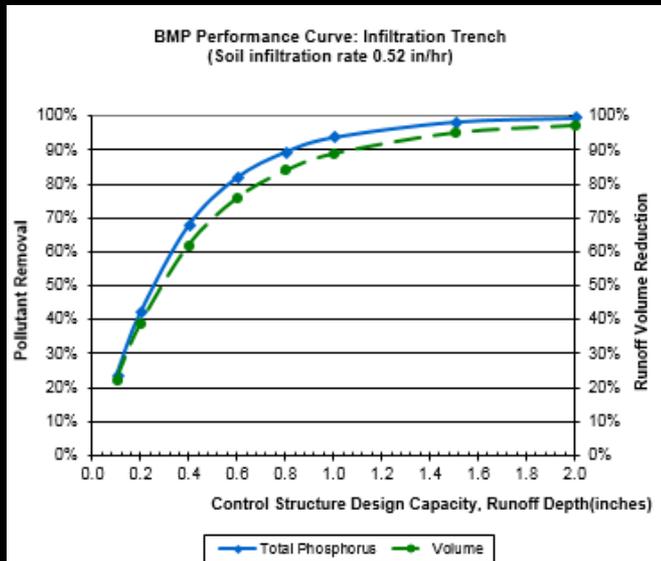


Discharges To Nutrient Impaired Waters or their Tributaries

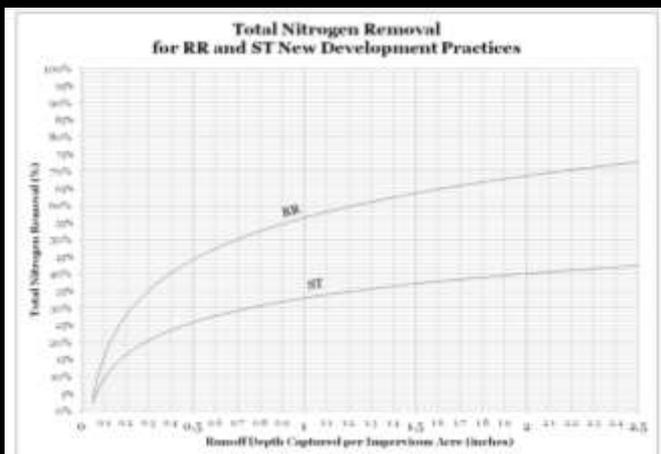
Enhanced BMPs

- Public Education
- New Development/
Redevelopment
- Good Housekeeping

Nutrient Source Identification Report



- Due Year 4
- Delineate potential N or P sources
- ID potential retrofits
- 1 demonstration project by year 6
- Tracking of N or P reductions through implementation of structural BMPs



Discharges To Chloride Impaired Waters

Salt Reduction Plan

- Track the amount of salt applied
- New or modified equipment
- Adopt application rate guidelines
- Training for applicators
- Equipment Calibration
- No Salt Zones



Discharges To Chloride Impaired Waters (cont)

Additional BMPs

- Mechanism to ensure private industry and commercial sites cover salt piles
- Public Education
- New Development and Redevelopment

Discharges To Sediment, Metals or Oil and Grease Impaired Waters

- If discharge contains
illicits remove in 60 days

- Additional BMPs

- New Development/
Redevelopment

- Good Housekeeping



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Sidewalk Tree – Credit: <http://www.flickr.com/photos/madmardign777/79436383/>

Letters – Credit: <http://www.flickr.com/photos/calliope/234447967/>

Ruler – Credit: <http://www.flickr.com/photos/vrillusions/5197046091/>

Impaired waters, Algae, Bacteria, Sediment/trash, Salt, LID Street images, BMP near reservoir, Catch Basin - Credit: EPA

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Long Island Plume - <http://www.wnpr.org>

Long Island Sound Watershed - USGS

Great Bay - <http://www.flickr.com/photos/usfwsnortheast/5198415699/>

All pictograms sourced from EPA HQ

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Thank you

Questions ?

**Newton Tedder
US EPA – (OEP06-4)
5 Post Office Square – Suite 100
Boston, MA 02109-3912
617.918.1038
tedder.newton@epa.gov**

Draft Permit Documents: http://www.epa.gov/region1/npdes/stormwater/MS4_MA.html