



TODAY'S GOALS

- ✓ Brief stormwater compliance program review
- ✓ Accomplishments to date
- ✓ Clean Charles River Initiative: Phosphorus Control Plan update
- ✓ What's next?

Newton's Municipal Stormwater (MS4) Permit Program Updates

Presentation to Public Facilities Committee



Why Are We Here?

- Municipal Separate Storm Sewer (MS4) General Permit reissued by EPA in 2016 and became effective **July 1, 2018**
- This federal Clean Water Act permit requires multi-faceted municipal implementation – Utilities, Planning, Operations, Engineering, GIS-Information Technology, Communications – **It Takes a Community!**
- **Requirements are very challenging** and we need everyone to understand the implications and needs.

Nationwide Stormwater Permitting Programs

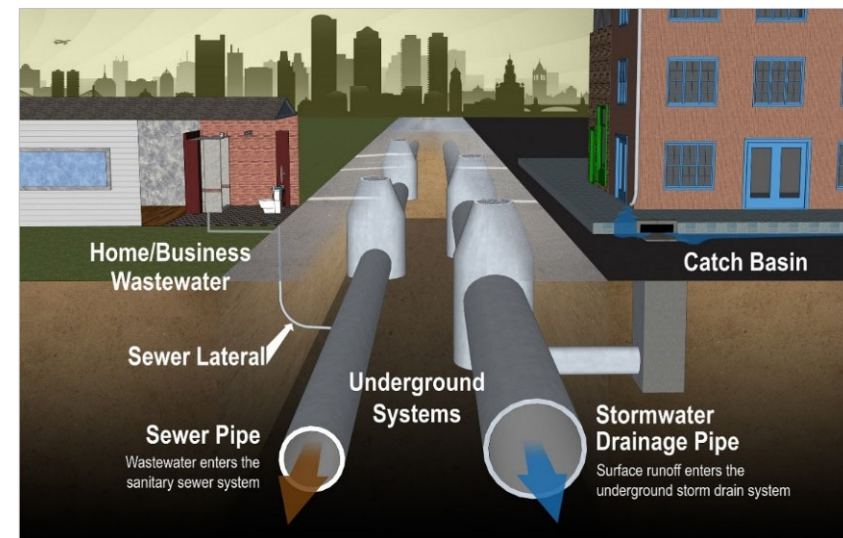
- Construction General Permit (CGP):
Runoff from >1 acre soil disturbance
- Industrial Multi-Sector General Permit (MSGP):
Runoff from Industrial Facility per SIC Code
- **Municipal MS4 General Permit**



What is an MS4?

A **M**unicipal **S**eparate **S**torm **S**ewer **S**ystem is:

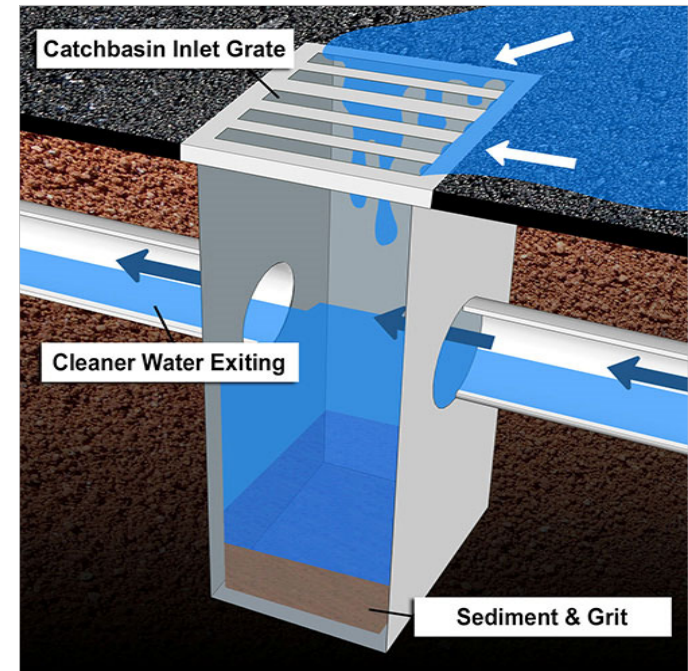
- A conveyance or system of conveyances owned by a state, city, town, or other public entity that discharges to waters of the U.S and is:
 - Designed or used for collecting or conveying stormwater
 - Not a combined sewer
 - Not part of a publicly-owned treatment works



Newton's MS4

Drainage System Facts:

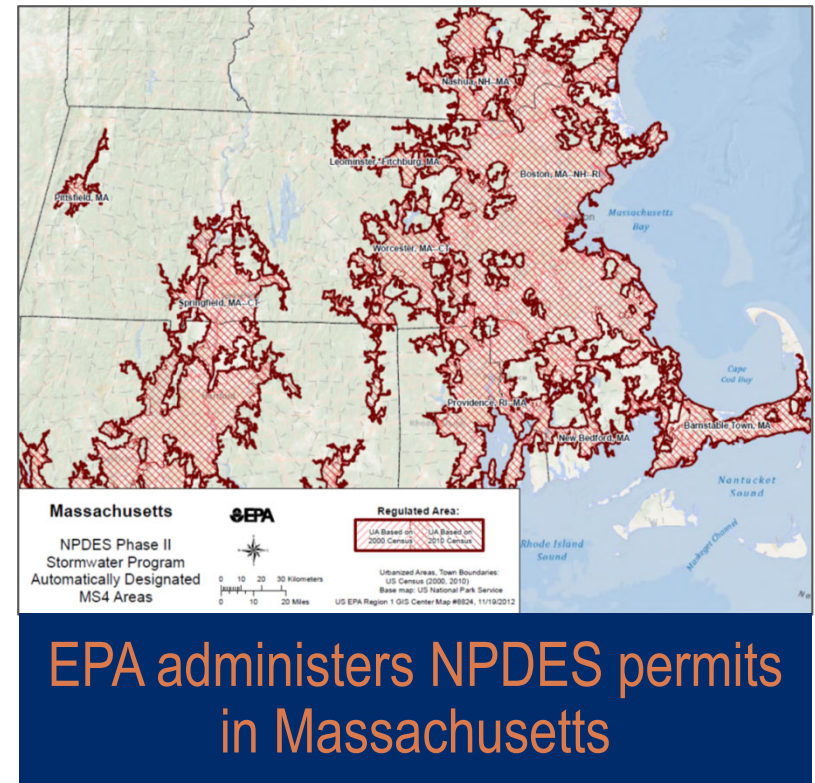
- 320 miles of stormwater drainage pipe
- 12,750 catch basins
- 5,852 of Manholes
- 2 pump stations
- 183 exterior outfalls/interconnections
- 201 Interior outfalls
- 14 miles of streams
- Ditches and Swales as well...



What is the MS4 General Permit?

Clean Water Act requires EPA to regulate any discharges from the MS4 based on 1987 Amendments to the Act

- The MS4 general permit is based on development density and population
- ~260 Municipalities Covered in MA
- In most states, the state administers this permit – MA is EPA regulated
- Every five years a new permit is drafted and issued (in theory)
- Each permittee is required to develop a 5-Year Stormwater Management Plan consistent with the general permit
- Currently in "Permit Year 5"



Municipal Stormwater Compliance

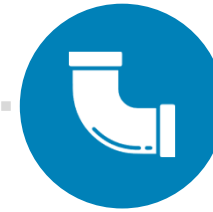
Six Primary Control Measures



1) Public Education



2) Public Involvement



3) Illicit Discharge Detection and Elimination



4) Construction Site Runoff Control



5) Post-Construction Stormwater Management



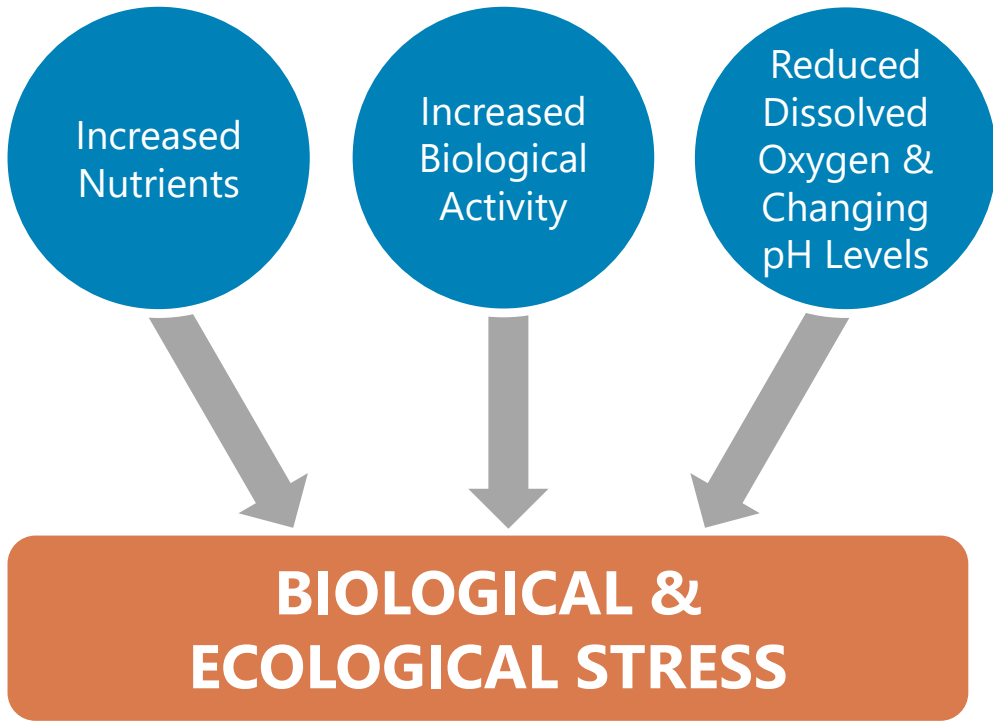
6) Good Housekeeping and Pollution Prevention

Newton's Accomplishments to Date

MS4 Program Highlights

- ✓ On-going social media, Green Cart, stormwater webpage, pet licensing, and paper flier educational materials developed and disseminated.
- ✓ Over 80% of the City's stormwater drainage system investigated for illicit discharges.
- ✓ Hundreds of site plans reviewed annually for compliance with construction erosion control and stormwater control policies.
- ✓ Thousands of construction site inspections annually.
- ✓ Ongoing street sweeping, leaf litter and catchbasin cleaning programs. Over 1500 tons of material swept from streets annually!

Nutrients as a Pollutant



Health Officials Warn Of Blue-Green Algae Bloom in Charles River

August 31, 2016 2:45 PM



Clean Charles River Initiative

- Reduce Phosphorus in discharges through strategic planning and implementation
- 1995: EPA New England launched the Clean Charles initiative.
- The EPA and MassDEP established Total Maximum Daily Load (TMDL) for all discharges
 - 2007, Final TMDL for Nutrients in the Lower Charles River Basin (Lower TMDL)
 - 2011, TMDL for Nutrients in the Upper/Middle Charles River (Upper TMDL)
- TMDL Requirements:
 - Phosphorus WWTF discharge limits for summer/winter at 0.1/0.3 mg/L
 - Stormwater phosphorus reductions are significant!

Medium Density Residential
3,578 kg/yr

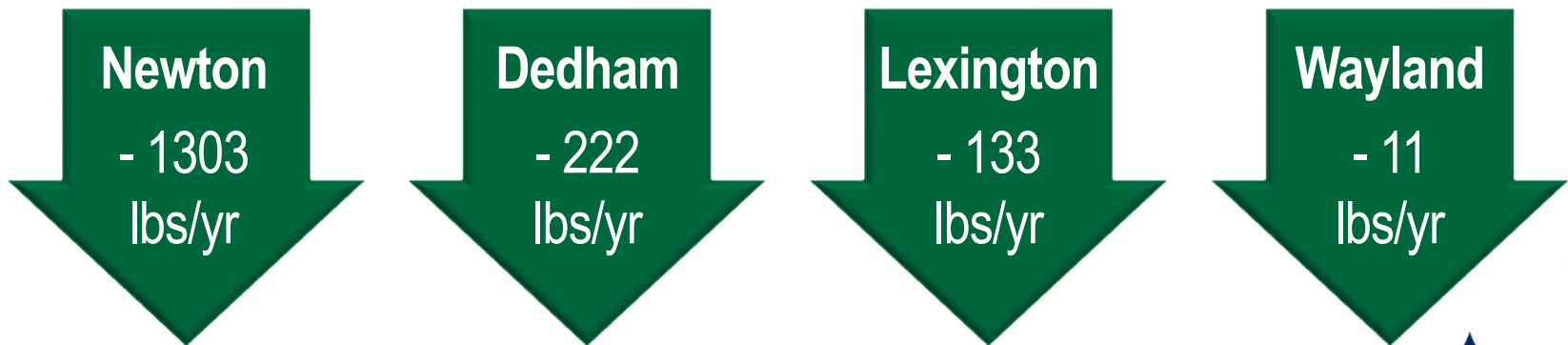
High Density Residential
3,876 kg/yr

Commercial / Industrial
4,091 kg/yr

~12,000 kg/yr reduction
from stormwater
sources

Nutrient Load Reduction Requirements

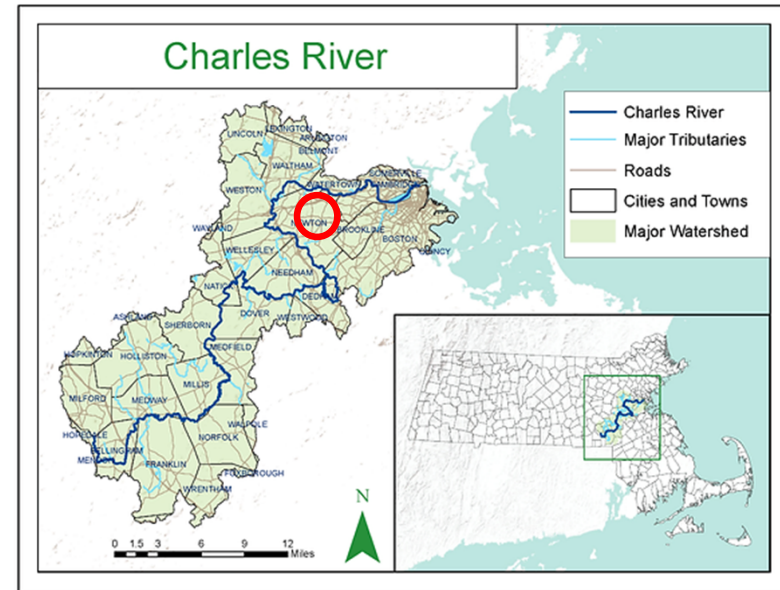
- The MS4 General Permit defines stormwater load reduction targets for individual communities
- 34 regulated communities will be required to meet the Load Reduction Requirement by 20% in the first eight years of the permit term (2026)...**and by 25% in the first ten years (2028)**



Communities Shown Here for Example Only – 30 others included in discharge requirements

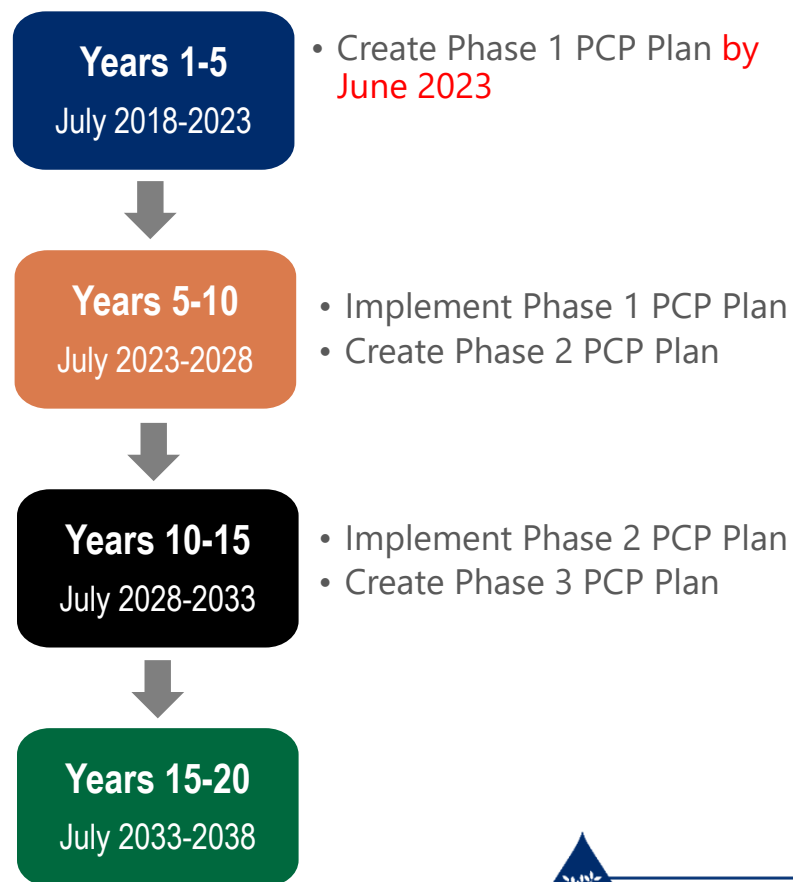
Newton's Phosphorus Control Plan Obligations

- Priority ranking of areas and infrastructure for the implementation of stormwater quality control facilities
- Establish O&M program for those structural controls
- Identify non-structural stormwater controls that will support the reduction of phosphorus loading



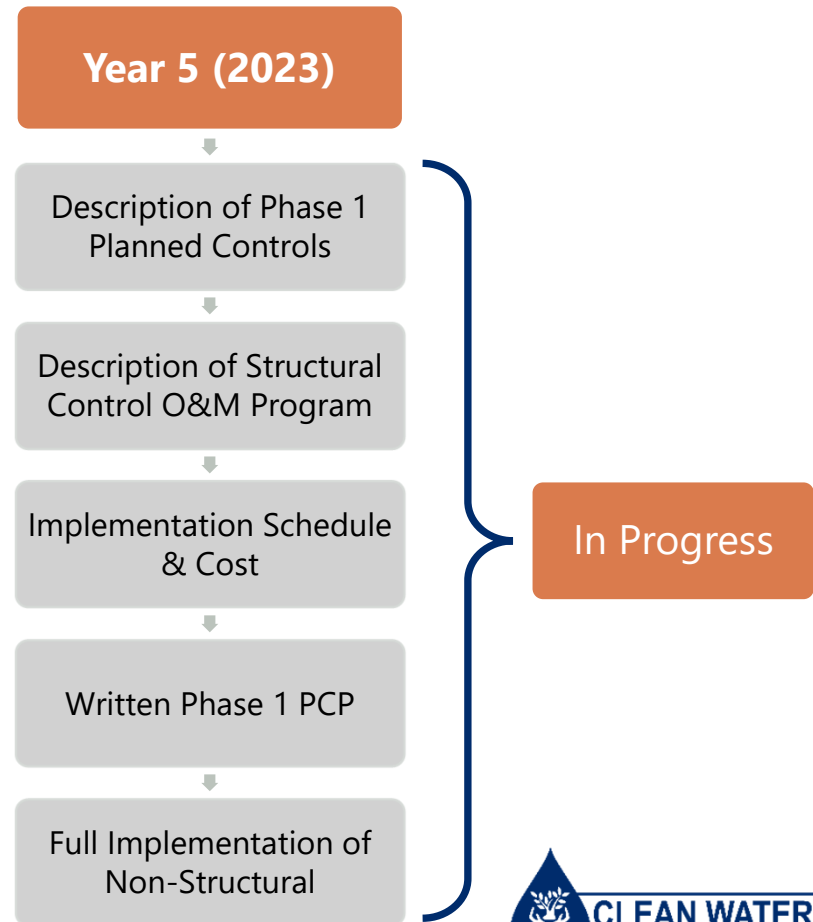
Phosphorus Control Planning Schedule

- Developing a multi-phase plan to achieve TMDL goal.
- Reduce Total Phosphorus from stormwater discharges by 61% or 5,214 lbs by 2038 (Phase 1, 2 and 3 PCP).



Phosphorus Control Plan Status

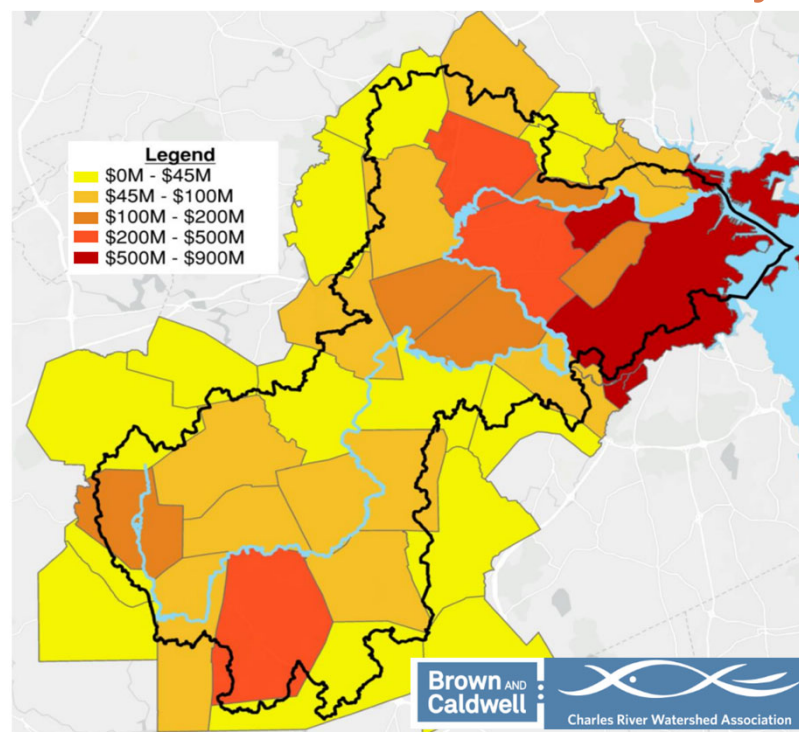
- Currently accounting for anticipated benefits of non-structural controls (street sweeping and leaf litter clean up)
- Identifying potential opportunities to account for existing public and private stormwater controls
- Current projections are that existing “controls” only account for about 1/3 of Permit Year 8 target and 1/4 of Permit Year 10 target



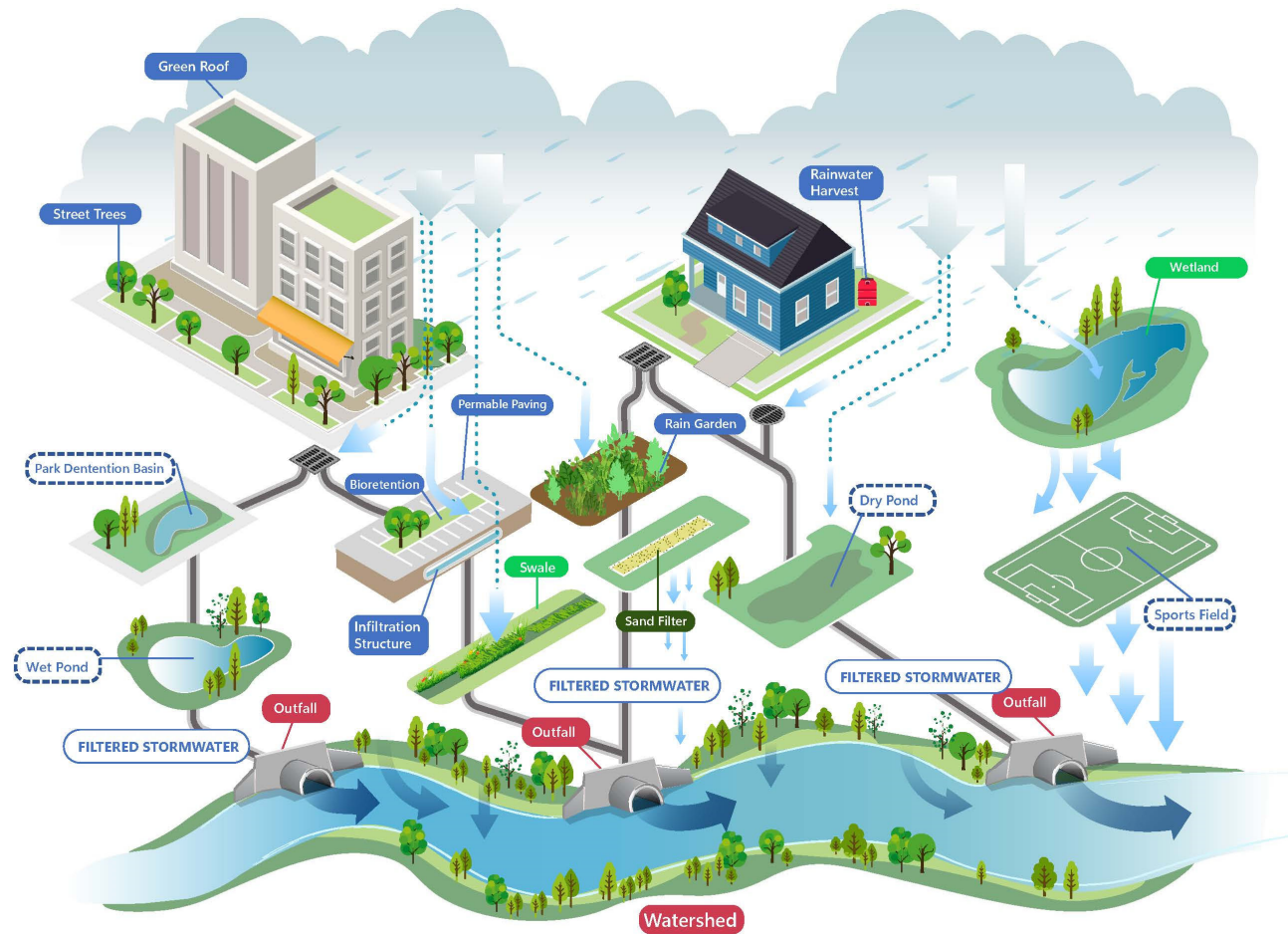
Phosphorus Control Needs?

- About **1,000 lbs of phosphorus** will still need to be targeted for removal through new stormwater control retrofits and non-structural pollution prevention programs on public and private properties to meet Year 10 requirements.
- Close to **4,750 lbs to meet Year 20** requirements.

So...What Does this Mean to the City?



What Does Comprehensive Stormwater Retrofitting Look Like?



What are the Benefits of Comprehensive Stormwater Retrofitting?

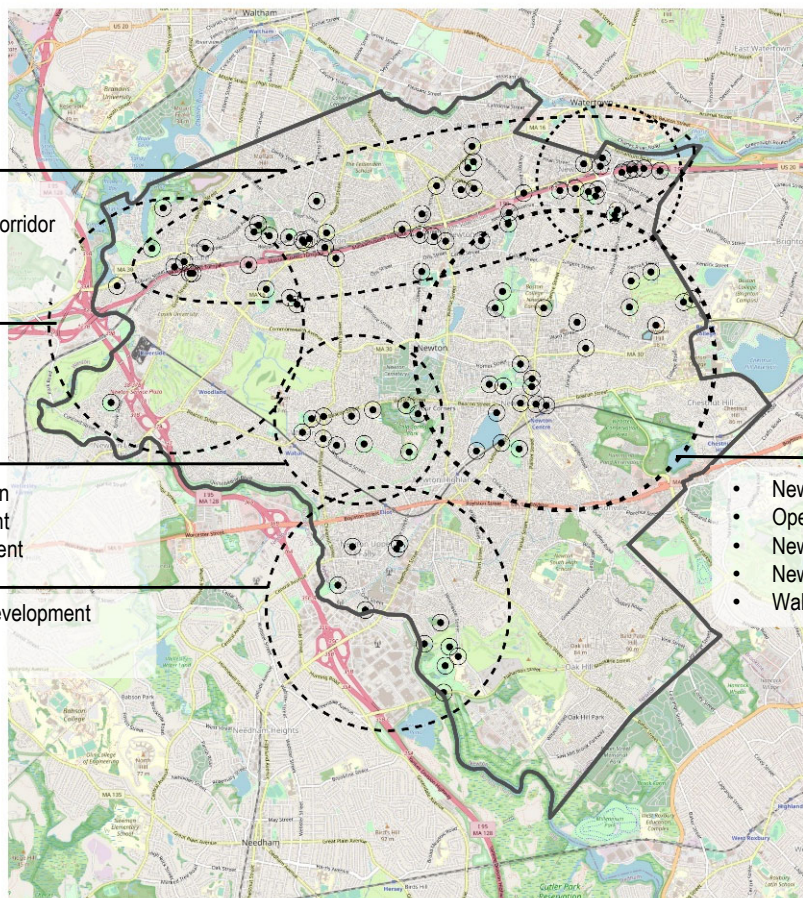
		Runoff Reduction								Peak Flow Reduction		Improved Water Quality				
		Rain Garden	Rainwater Harvesting Residential	Rainwater Harvesting Commercial/Industrial	Green Roof	Permeable Paving	Street Trees	Bioretention Cell	Infiltration Structure	Vegetated Detention Basin	Wet Pond	Biological Treatment		Physical Filtration		
Hydrologic Functions	Stormwater Quantity Functions	Retention	◆	◆	◆	◆	◆	◆	◆	◇	◇	◇	◇	◇	◇	◇
	Infiltration	◆	◇	◇	◇	◆	◇	◆	◆	◇	◇	◇	◇	◇	◇	◇
	Detention	◇			◇		◇	◇	◇	◆	◇	◇	◇	◇	◇	◇
	Evapotranspiration	◇	◇	◇	◆		◆	◆		◇		◆	◆	◇	◇	◇
	Stormwater Quality Functions	Sedimentation	◆	◇	◇		◇	◇		◆	◆	◆	◆	◆	◆	◆
	Filtration	◆	◇	◇	◆	◆	◇	◇		◇		◆	◇	◆	◆	◆
	Removal	◇	◇	◇				◇		◇		◆	◆	◆	◆	◆
	Extended Treatment Chemical	◇			◇					◇	◇	◆	◇	◇	◇	◇
	Extended Treatment Biological	◆			◆		◆	◇		◇	◇	◆	◆	◆	◆	◇
	Community Benefits	Supports Wildlife Habitat	+			+		+	+		+	+	+	+		+
Improves Appearance of Outdoor Spaces	+	+	+	+	+	+	+		+	+	+	+			+	
Mitigates Climate Impacts	+				+	+	+		+	+						
Improves Air Quality	+			+		+	+				+	+			+	
Increases Pervious Surface				+	+	+	+	+	+	+				+		
Creates Runoff Storage for Alternative Uses		+	+					+								
Provides Educational Opportunities	+		+	+	+	+	+	+	+	+	+	+			+	
Extends Open Space				+			+		+	+						
Creates Comfortable Outdoor Areas (Temp. Control)	+			+		+	+		+	+				+		

What are the Benefits of Comprehensive Stormwater Retrofitting?

Function Category	Function	Peak Flow	Improved Water Quality			
			Biological Treatment		Physical Filtration	
			Constructed Wetland	Vegetated Swale	Sand Filter	Filter Strip
Hydrologic Functions	Retards Peak Flow	+				
	Infiltrates	+				
	Detains	+				
	Evapotranspires					
	Sediments					
	Filtrates					
	Removes					
	Extended Treatment					
	Extended Treatment					
	Extended Treatment					
Community Benefits	Supports Wildlife Habitat	+				
	Improves Appearance of Outdoor Spaces	+				
	Mitigates Climate Impacts	+				
	Improves Air Quality	+				
	Increases Pervious Surface					
	Creates Runoff Storage for Alternative Uses					
	Provides Educational Opportunities	+				
Extends Open Space						
Creates Comfortable Outdoor Areas [Temp. Control]	+					
Total		+	+	+	+	+

Where Are We Looking for Retrofit Opportunities?

- Washington Street Vision Plan
 - Newton Business Development Corridor
 - California Street Redevelopment
 - Climate Adaption Improvements
-
- Newton Comprehensive Plan
 - Riverside Vision Plan
 - Needham Street Vision Plan
 - Charles River Mill Development
-
- Four Corners Redevelopment Plan
 - Cochituate Aquaduct Management
 - Upper Falls Greenway Development
-
- Wells Ave. & Business Park Redevelopment



- Newton Comprehensive Plan
- Open Space and Recreation Plan
- Newton Centre Redevelopment
- Newton Square Enhancements
- Walnut Street Enhancements

- Municipal Facilities/Properties
 - School Projects
- High Benefit to Cost
- Anticipated and Upcoming Facility Improvements
- Streetscape Improvements
- Alignment with Community Needs and Vision
 - Village Enhancement Projects

Public/Private Partnerships?



Residential Raingarden
Community Programs

Boston College

University Green
Infrastructure
Collaboration

Mt. Alvernia HS

High School Raingarden
Demonstration and
Educational Programming

Edmand's Park

Newton Day School

Park and Ballfield
Nutrient Best
Management

Urban Pond Restoration
and Park Improvements

Creating a Holistic Urban Clean Water Strategy



In Summary

- Excellent progress on most stormwater permit obligations!
- **PCP Phase 1 Completion June 2023**
- **Continued financial support for operations, program and capital investment**
- **Integration of community economic and community development vision with clean water programs** will reduce costs and accelerate progress on Clean Charles Initiatives



Questions / Discussion
THANK YOU!

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