CITY OF CAMBRIDGE STORMWATER MANAGEMENT PROGRAM

EPA Small MS4 General Permit (Phase II NPDES)

Health and Environmental Committee: Public Hearing

September 27, 2018

AGENDA

- MS4 Program Overview
- What Cambridge has been doing
- Permit Requirements
- Changes in the new permit

GLOSSARY OF TERMS AND ABBREVIATIONS (PARTIAL)

BMP: Best Management Practices

CSO: Combined Sewer Overflow

IDDE: Illicit Discharge Detection and Elimination

MCM: Minimum Control Measure

MEP: Maximum Extent Practicable

MS4: Municipal Separate Storm Sewer System

NPDES: National Pollution Discharge Elimination System

PCP: Phosphorous Control Plan

Phase II: City's with populations <100,000 in 1999

Point Source: Any discernible, confined and discrete stormwater conveyance

SSO: Sanitary Sewer Overflow

SWMP: Stormwater Management Plan

TMDL: Total Maximum Daily Load

NPDES PROGRAM OVERVIEW

Clean Water Act

EPA United States Environmental Protection Agency

- The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution.
- Growing public awareness and concern led to sweeping amendments in 1972, the law became commonly known as the Clean Water Act.
  - Established the basic structure for regulating pollutants discharges into the waters of the United States.
  - Made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. Stormwater was not considered a point source discharge.

Cuyahoga River, OH 1969

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NPDES:

National Pollutant Discharge Elimination System

Water Quality Act of 1987 regulated stormwater as a point source discharge

1990: Phase I

- Regulated stormwater discharges from Municipalities (over 100,000 population), industrial operations, construction sites (>5 acres)

1999: Phase II

- Regulates stormwater discharges from small Municipalities (260 municipalities in MA)
- Initial Notice of Intent submitted July 2003
- 2016 Reissued Permit Effective – July 1, 2018 - 2023

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Why is Stormwater a Problem

Source: EPA

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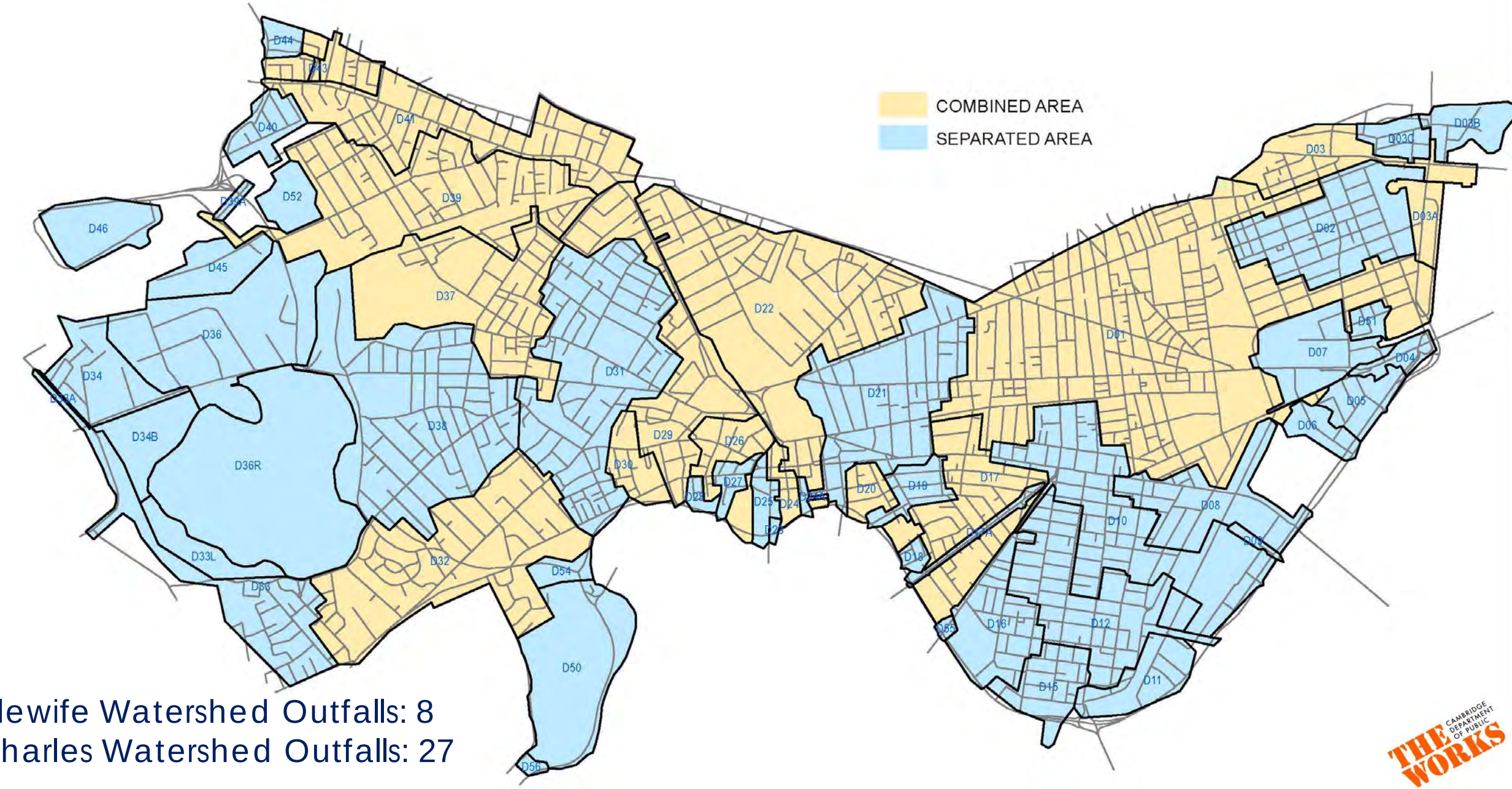
WHAT DOES THIS MEAN FOR CAMBRIDGE?

Regulated Areas



Alewife Watershed Outfalls: 8
Charles Watershed Outfalls: 27

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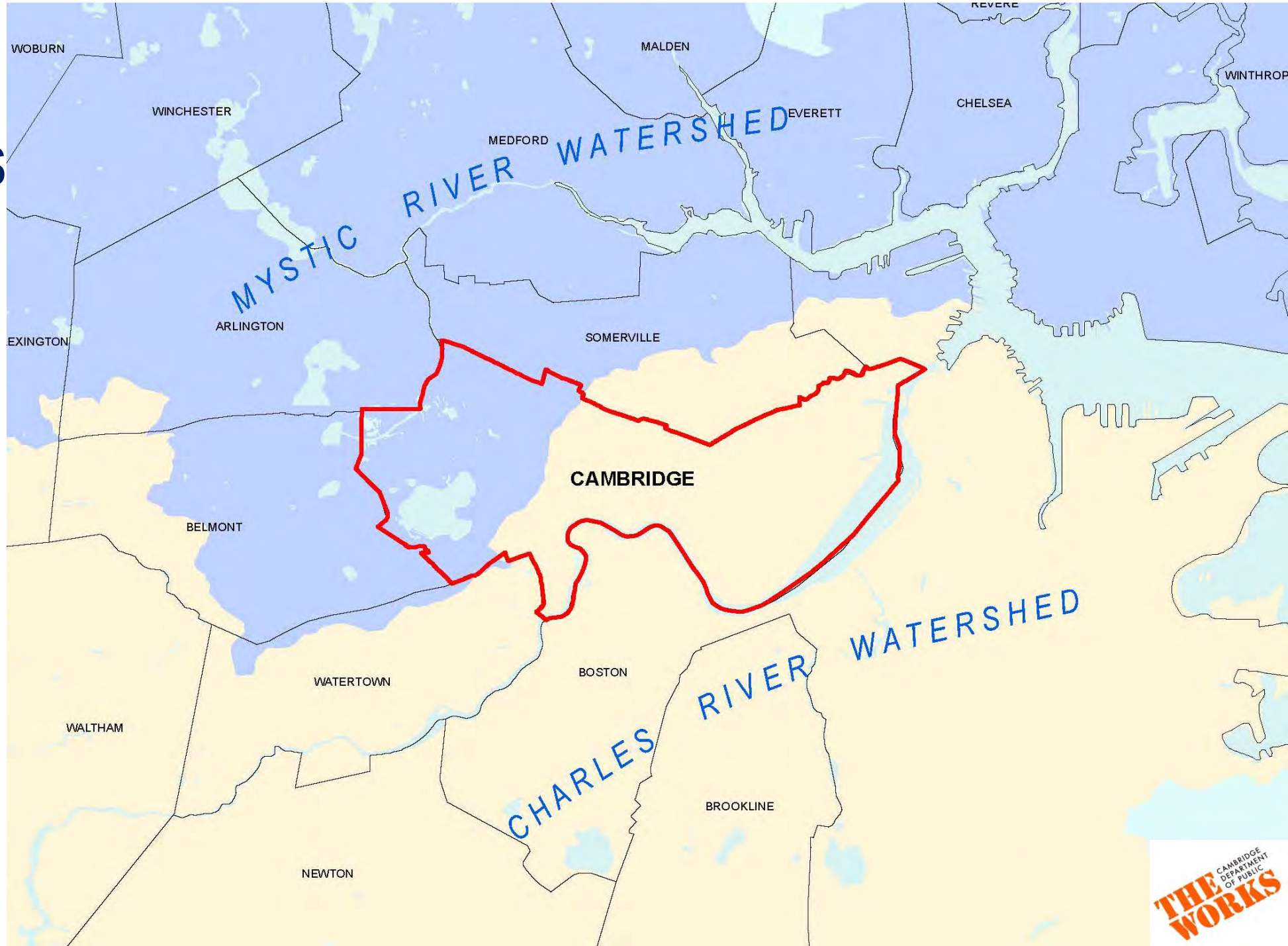
Cambridge Watersheds



Impaired Waters

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

Source: EPA

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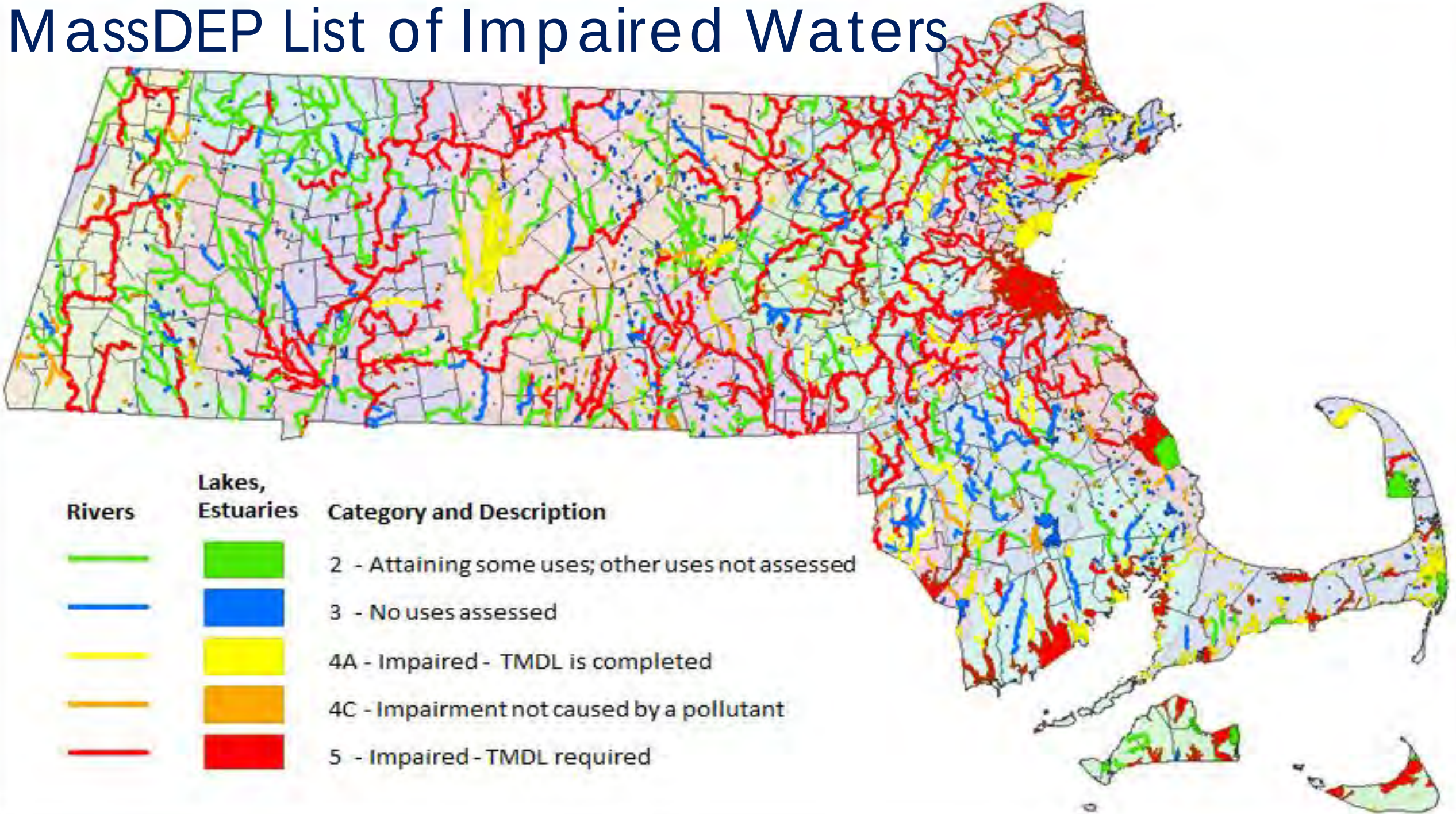
MassDEP List of Impaired Waters



EPA - Charles River Initiative (1995)

Charles River Report Cards Based on State Bacterial Standards							
Year	Overall Grade	% Meets Standards		% Meets Standards in Dry Weather Conditions		% Meets Standards in Wet Weather Conditions	
		Boating	Swimming	Boating	Swimming	Boating	Swimming
2017	A-	95	72	96	89	95	64
2016	B	86	55	98	61	80	53
2015	B+	95	69	98	86	93	60
2014	B+	91	65	100	86	86	53
2013	A-	96	70	97	84	95	63
1998	C+	83	51	98	85	74	31
1997	C	70	34	87	56	61	22
1996	C-	57	21	94	40	45	15
1995	D	39	19				

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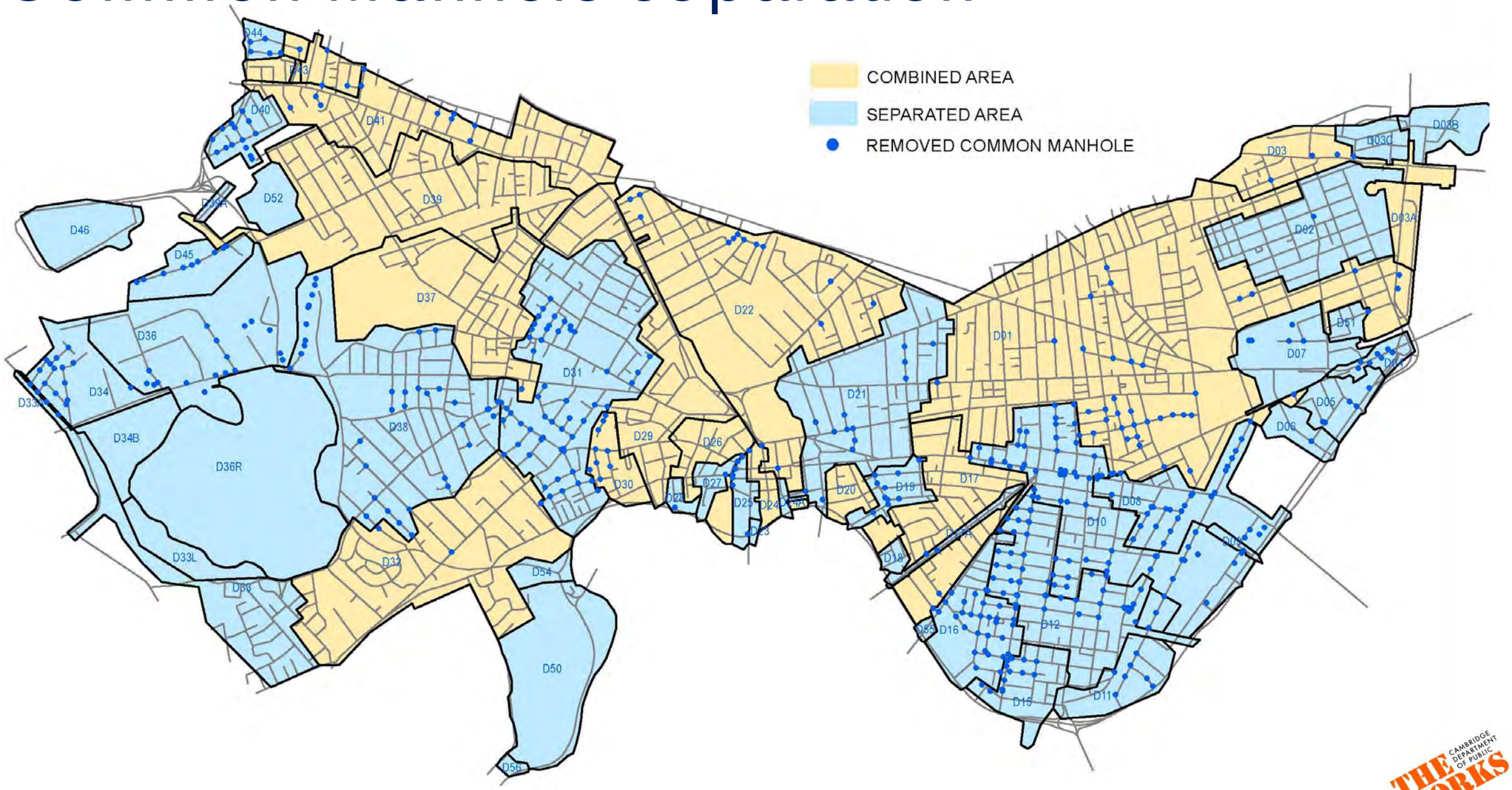
EPA – Mystic River Initiative (2008)

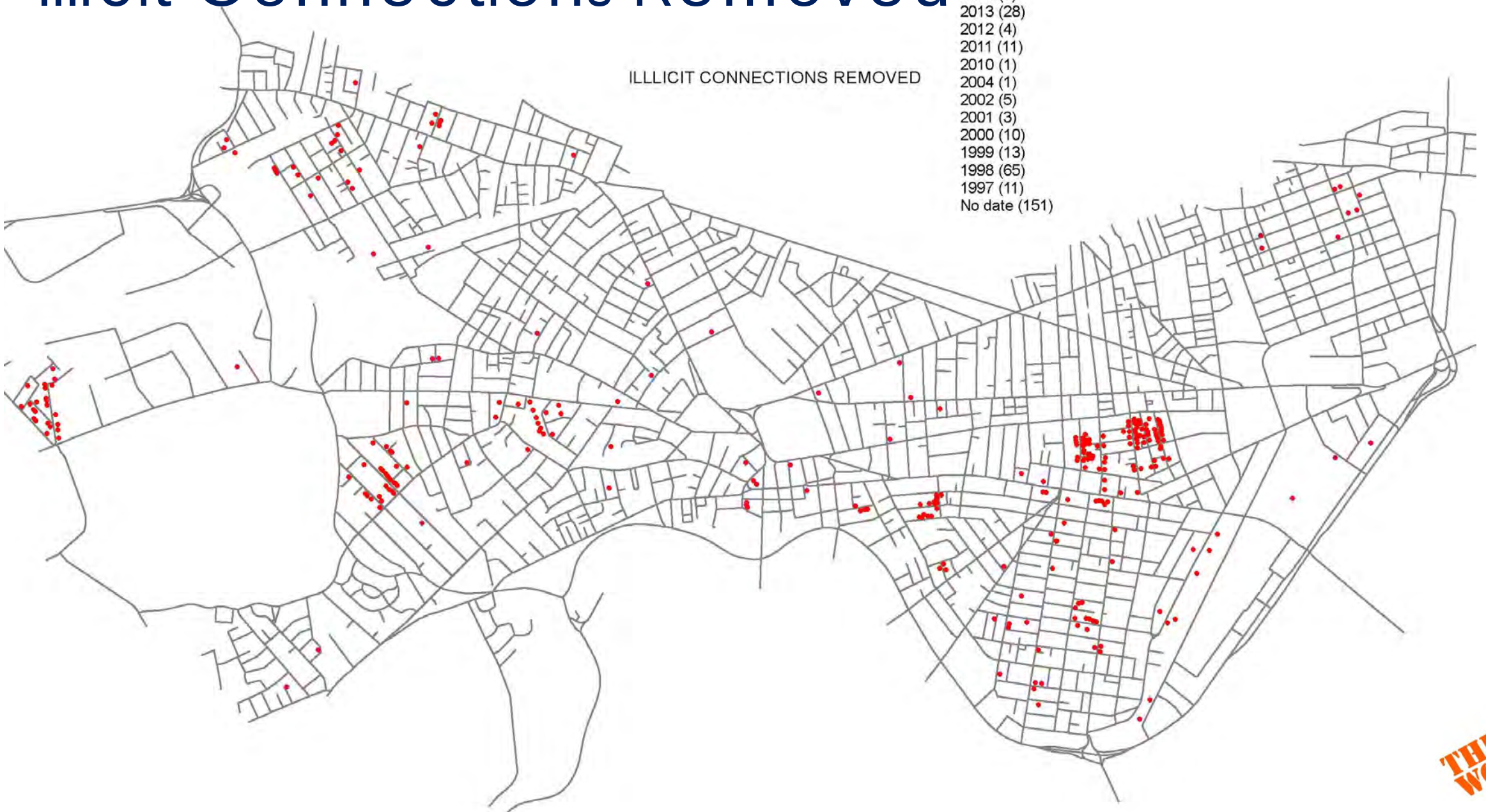
Mystic River Water Quality Grades & Compliance Rates for Freshwater Sites						
	Little River		Alewife Brook		Mystic River (fresh)	
Year	Grade	Total	Grade	Total	Grade	Total
2017	D+	54.20%	D+	53.80%	A-	87.60%
2016	D	49.40%	D+	54.20%	A-	85.80%
2015	D-	44%	D	50%	A-	85%
2014	D-	40%	D	46%	B+	85%

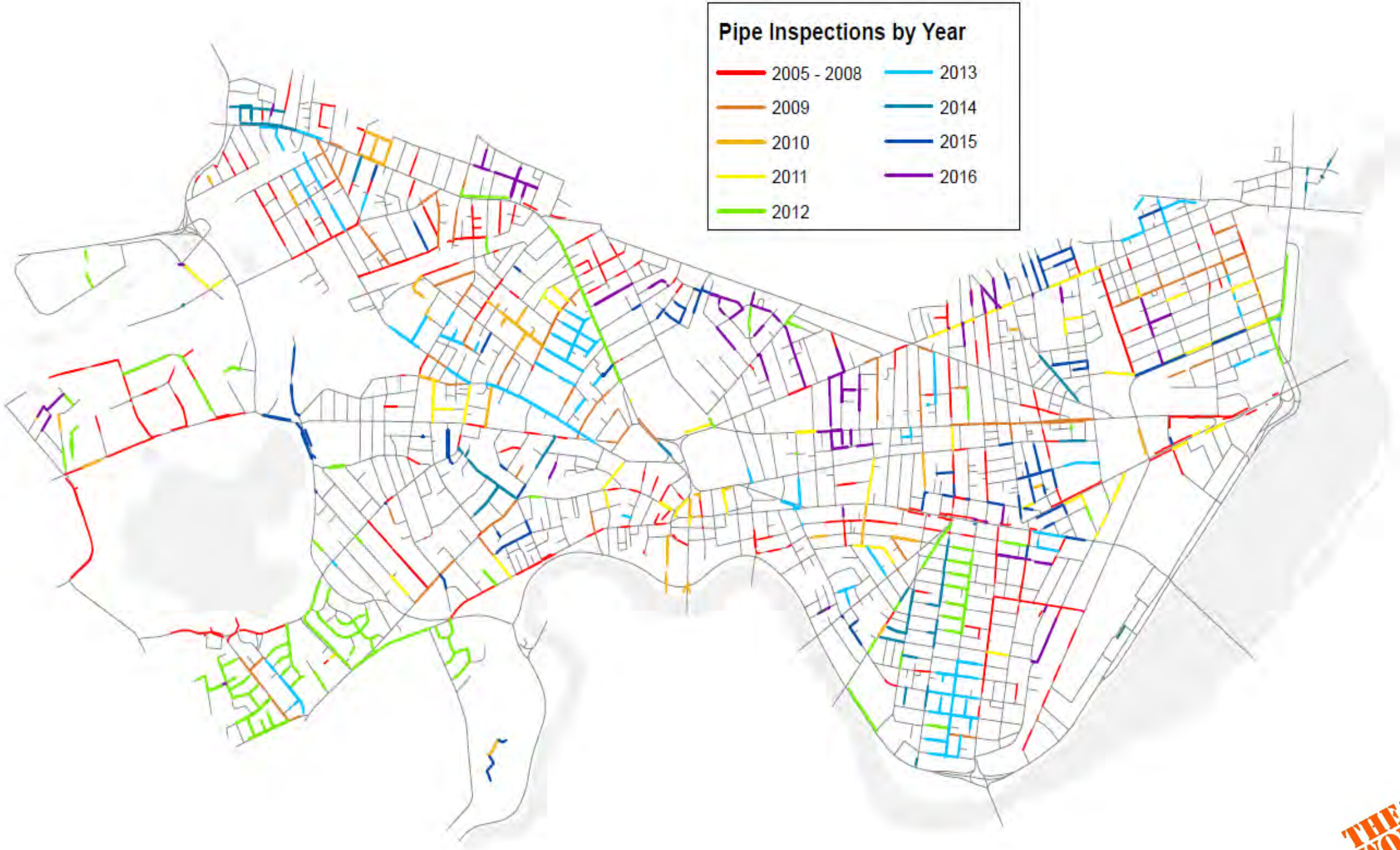
WHAT HAS CAMBRIDGE BEEN DOING

Common Manhole Separation

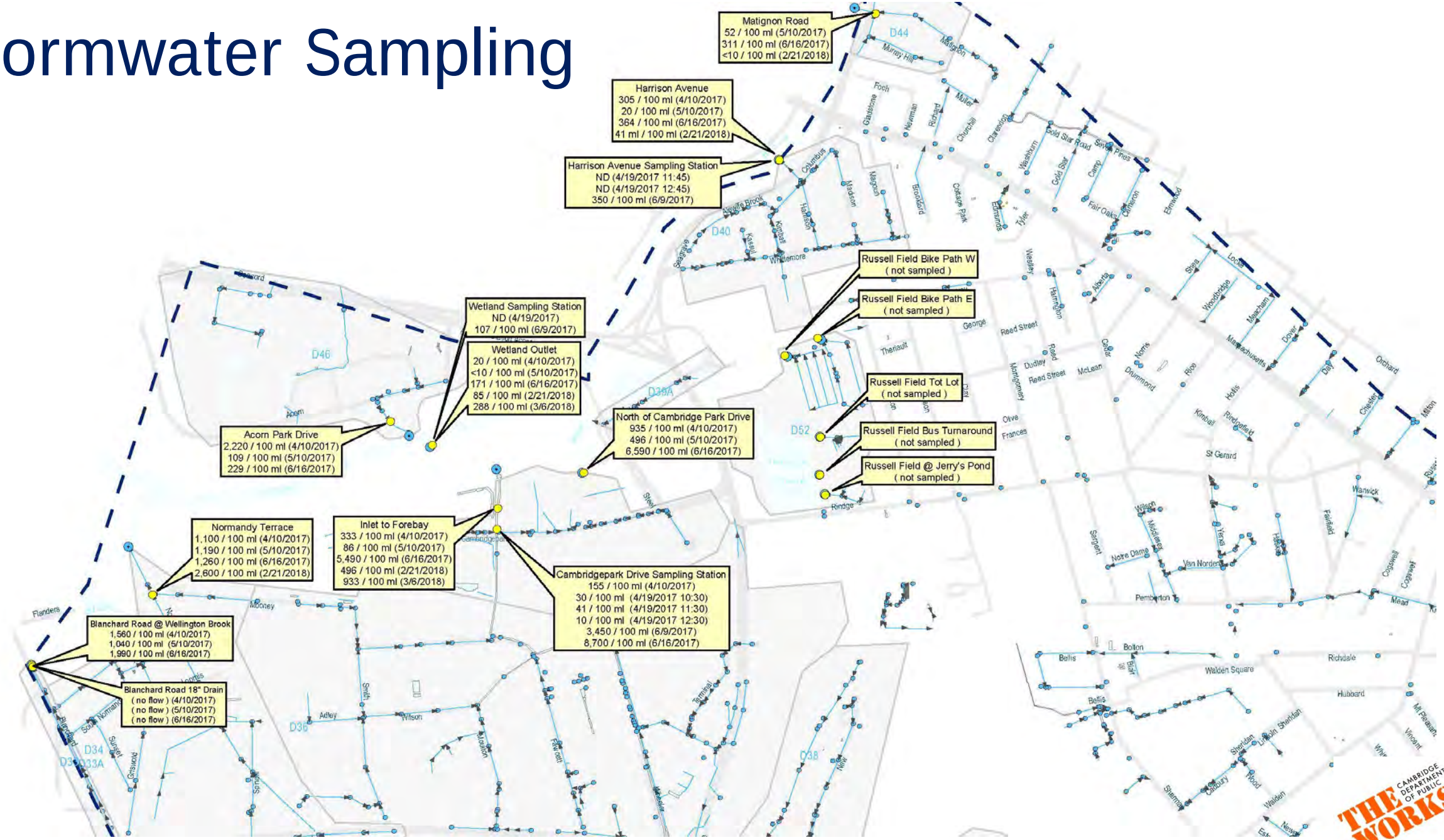


Illicit Connections Removed




Pipe Inspections by Year
2005 - 2008
2009
2010
2011
2012
2013
2014
2015
2016

Stormwater Sampling



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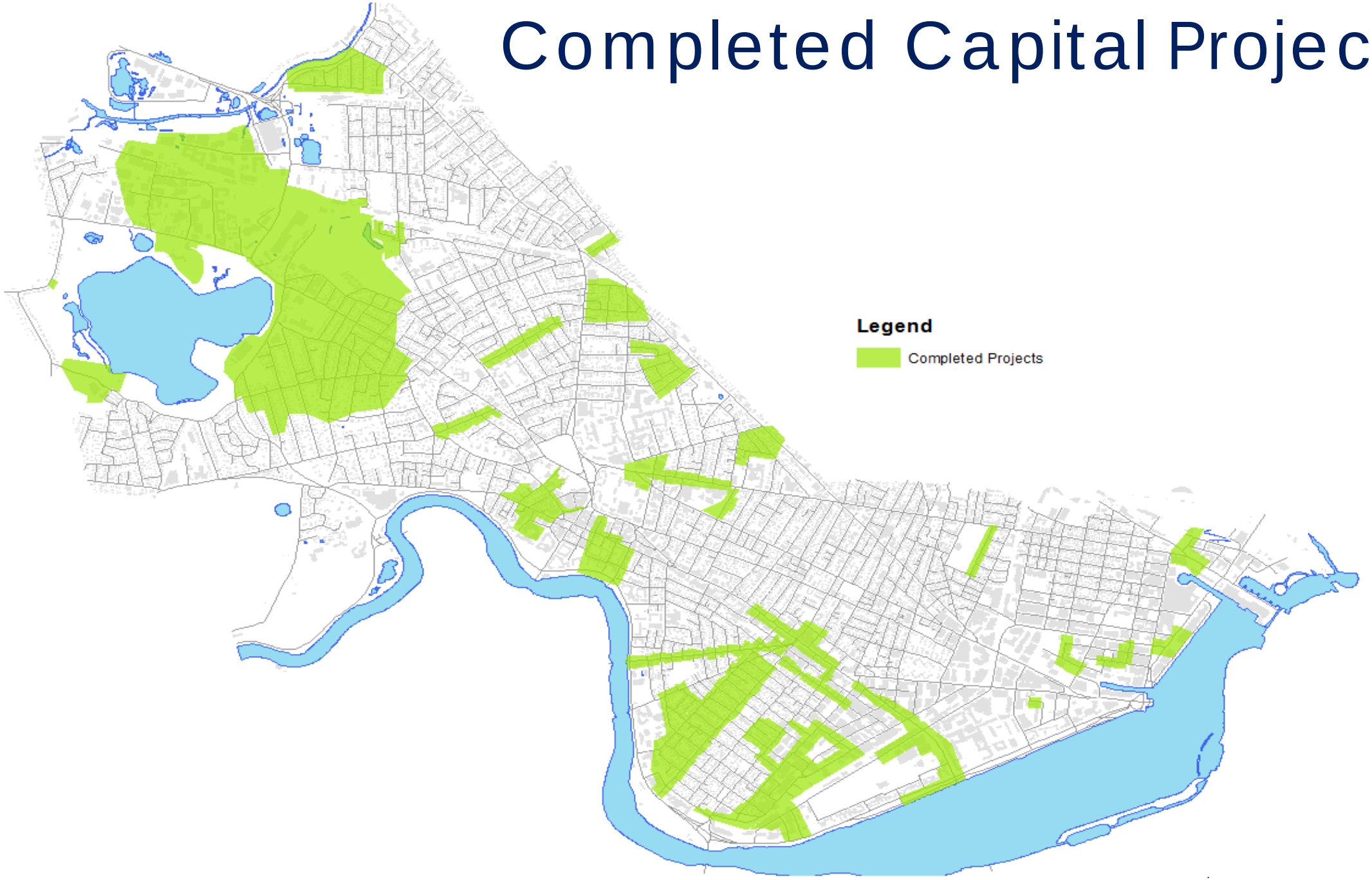
Completed Capital Projects



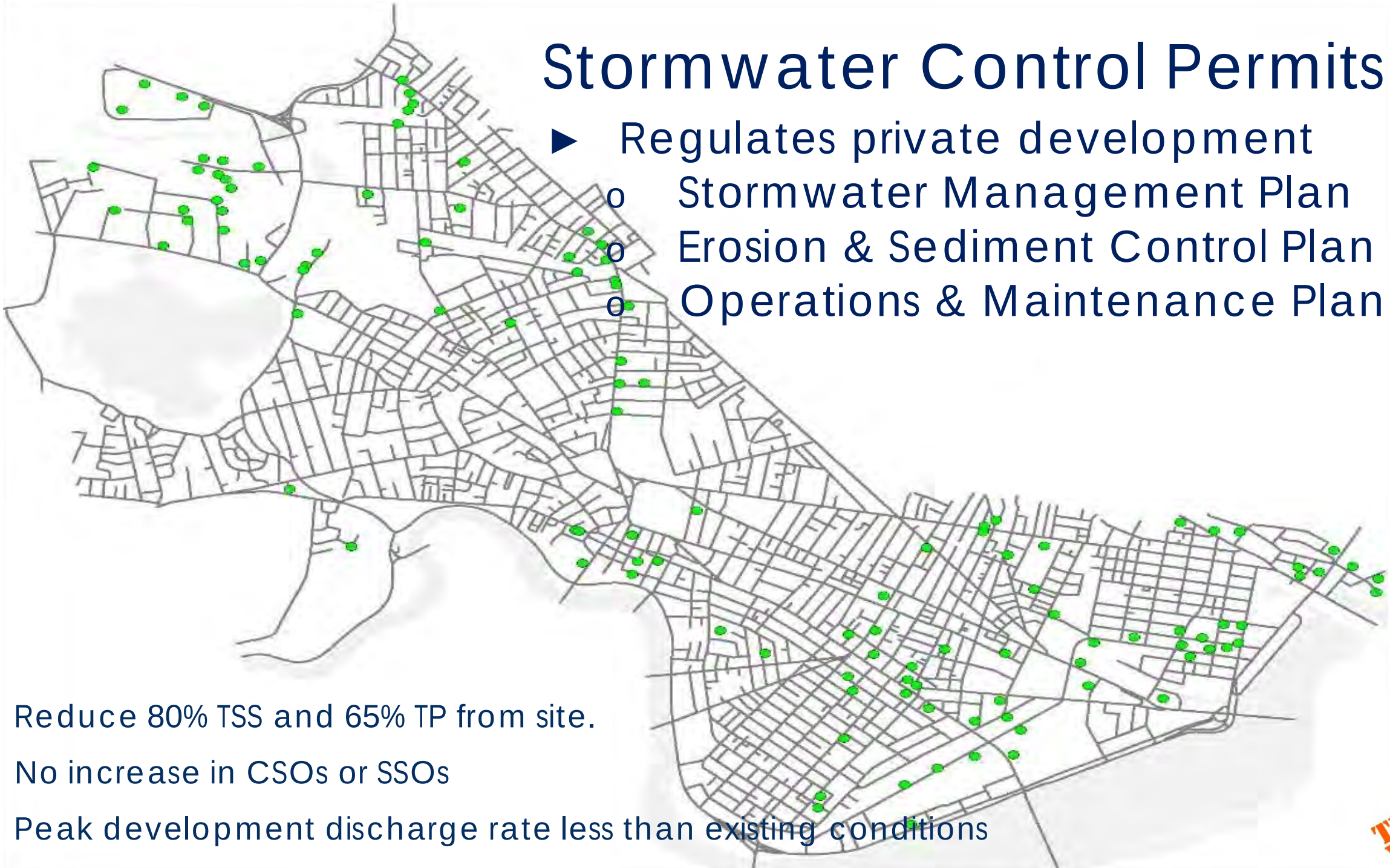
Alewife Reservation Stormwater Wetland

Completed 2013

- 3.4-acre project serving 300+ acres
- The largest engineered wetland in the Eastern United States
- Designed allow sewer separation in West Cambridge, reducing Combined Sewer Overflows (CSOs) to the Little River
- Retains and treats separated stormwater in a constructed wetland before being discharged to the Little River and ultimately Alewife Brook, Mystic River, and Boston Harbor.

Stormwater Control Permits

- Regulates private development
  - Stormwater Management Plan
  - Erosion & Sediment Control Plan
  - Operations & Maintenance Plan



Reduce 80% TSS and 65% TP from site.

No increase in CSOs or SSOs

Peak development discharge rate less than existing conditions

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WHAT ARE THE PERMIT REQUIREMENTS

PERMIT REQUIREMENTS

Address 6 Minimum Control Measures

- Public education/outreach
- Public involvement/participation
- Illicit discharge detection/elimination
- Construction Site stormwater runoff control
- Post-construction stormwater management
- Pollution prevention/good housekeeping for municipal operations

Develop and implement Best Management Practices to address each program area to the *MEP*

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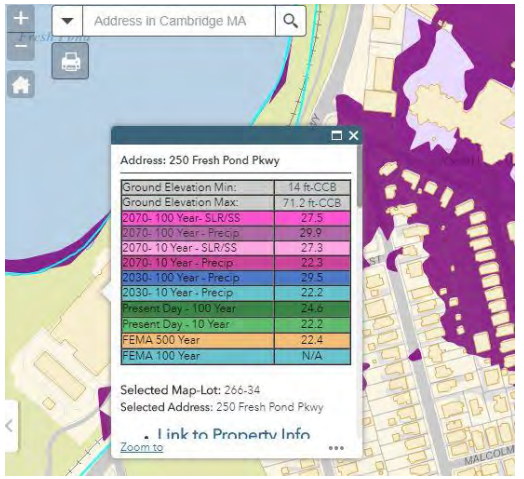
CURRENT ACTIVITIES

#1. PUBLIC EDUCATION & OUTREACH

- Meetings (formal and informal) on infrastructure projects
- Alewife Stormwater Wetland tours
- Provide information at Celebrations/Cookouts
- Maintain a Stormwater webpage, tweets, Facebook www.cambridgema.gov/stormwater
- Develop online tools Flood Viewer www.cambridgema.gov/Services/FloodMap
- Rain Barrel Promotion since 2003



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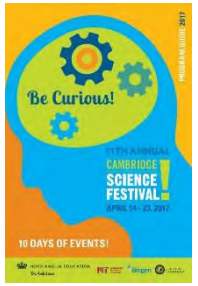
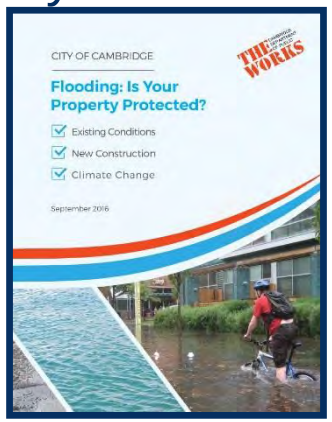
#1. PUBLIC EDUCATION & OUTREACH (CONT.)

- Curb Marker installations
- Youth Outreach
  - Enviroscape demonstration
  - Cambridge Science Festival
  - Arbor Week activities
  - Alewife wetland tours
- Collaborating with other communities
  - MyRWA Stormwater Education Collaborative
  - Charles River Watershed Collaborative
- Provide Information in City Publications:
- Develop Brochures





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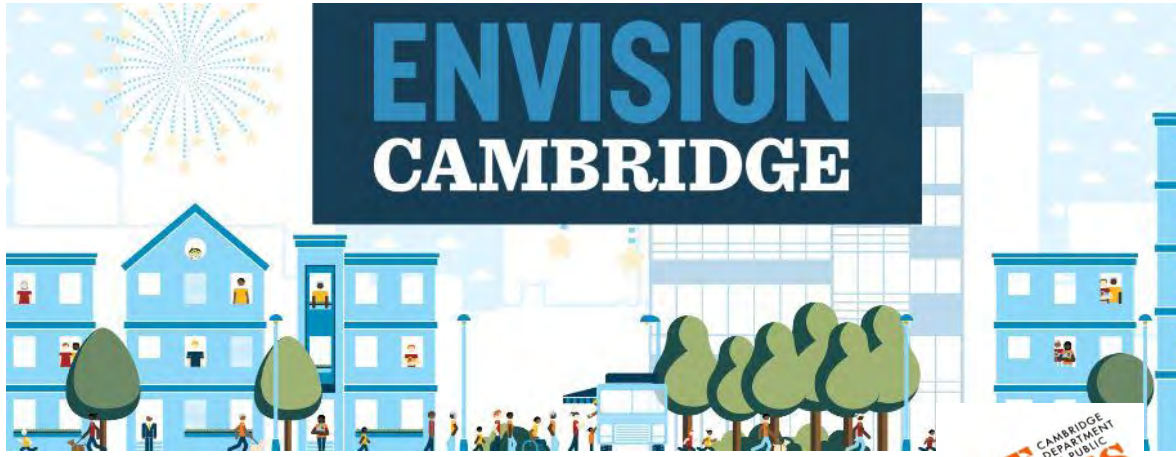
#2. PUBLIC PARTICIPATION & INVOLVEMENT

- Household Hazardous Waste Collections
- Annual Stormwater Meeting
- Envision Cambridge
- Climate Change Preparedness & Resiliency



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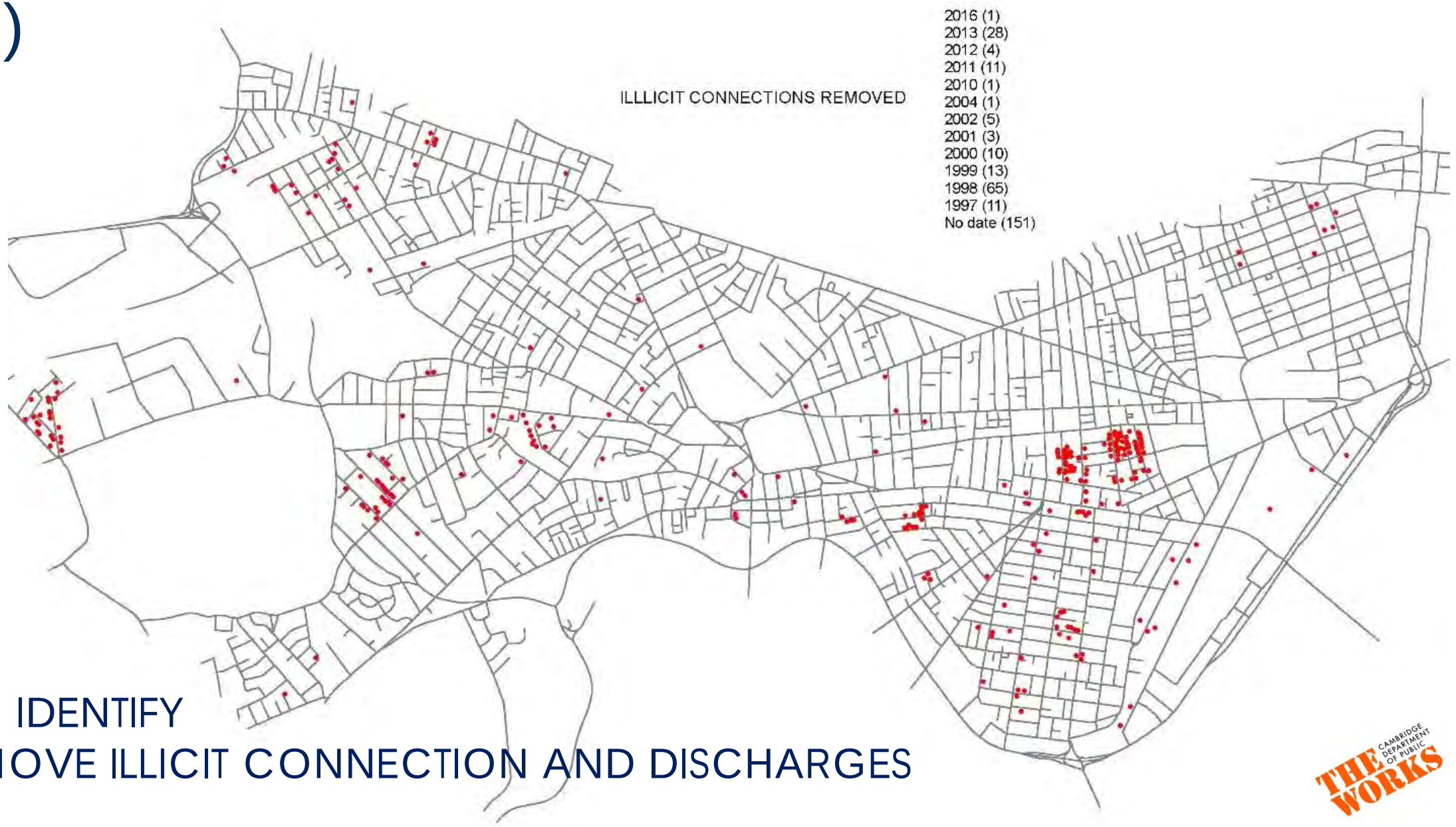
#3. ILLICIT DISCHARGE DETECTION & ELIMINATION (IDDE)



PROHIBIT, IDENTIFY
AND REMOVE ILLICIT CONNECTION AND DISCHARGES

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IDDE PROGRAM

- Investigations
  - Water Quality Sampling (dry, wet, oil/grease)\
  - Inspections prior to construction – TV, die testing
  - Complaints (see,Click,Fix, email, phone calls
- Illicit connection removal through Remedial and sewer separation contracts
- Automatic Sampling Stations (5)

#4. CONSTRUCTION SITE RUNOFF CONTROL

REDUCE POLLUTANTS FROM CONSTRUCTION SITES THAT DISTURB ≥ 1 ACRE AND SIGNIFICANT PROJECTS

- Inspect active construction sites
- Weekly meetings with large contractors during March – Nov
- Issue WARNING tickets for violations

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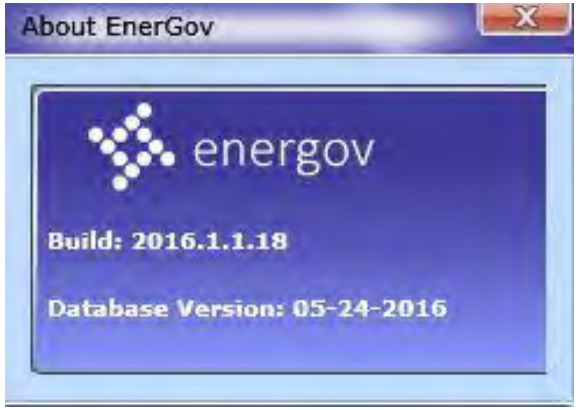
#5. POST CONSTRUCTION STORMWATER MANAGEMENT



- Inspect BMPs Post Construction
- Maintain private BMP Database for private facilities
- Manage permitting, inspections and code enforcement through Energov software

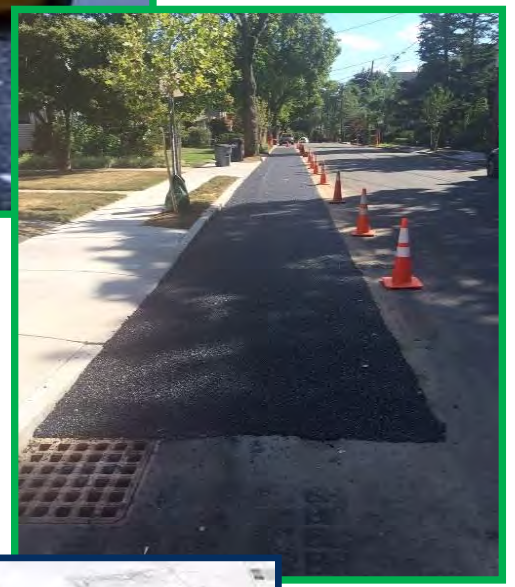
BMP inspection

Filtration system

Infiltration swales

#6. POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

- Street/Infrastructure Maintenance Practices
  - Street sweeping debris (1142 tons)
  - 6,000 catch basins. Annually clean 2,000 (300 tons)
  - TV & Cleaning, Remedial Construction, Pipe Lining
- Construction of Stormwater BMPs in projects
  - Porous Asphalt
  - Rain Gardens/Biobains
  - Infiltrating Catch Basins
  - Grit Chambers



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#6. POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

- Tree Plantings, increase planting areas (Urban Forest Master Plan)
- Inspection of Municipal Facilities
- Employee Training
- Cartegraph for work order management

#6. POLLUTION PREVENTION & GOOD HOUSEKEEPING FOR MUNICIPAL OPERATIONS

UPCOMING CAPITAL IMPROVEMENT HIGHLIGHTS

NEW PERMIT REQUIREMENTS

Status of New NPDES MS4 Permit

- Effective Date: July 1, 2018
- Notice of Intent Due: October 1, 2018
- Stormwater Management Plan Due (SWMP): July 1, 2019
- https://www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit

What's New:
More prescriptive

CHANGES IN THE NEW PERMIT

Highlights

- Develop and implement programs to address TMDLs
  - Charles River: Bacteria/Pathogens
  - Charles River: Phosphorous (P)
    - Develop and implement Phosphorous Control Plan (PCP)

1-5 years after permit effective date	5-10 years after permit effective date	10-15 years after permit effective date	15-20 years after permit effective date
Create Phase 1 Plan	Implement Phase 1 Plan		
	Create Phase 2 Plan	Implement Phase 2 Plan	
		Create Phase 3 Plan	Implement Phase 3 Plan

    - Reduce P load by 51%

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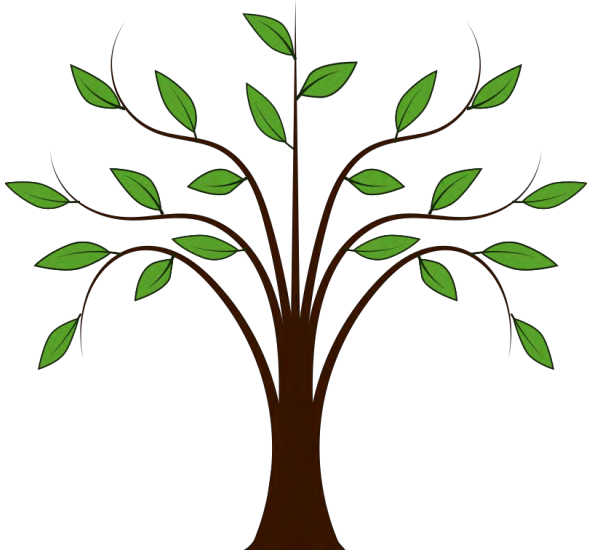
Why is Phosphorous a Problem?

Source of Phosphorous



- plant and leaf litter,
- soil particles,
- pet waste,
- road salt,
- fertilizer, and
- atmospheric deposition of particles.

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CHANGES IN THE NEW PERMIT

Highlights cont.

- Enhanced Program to address Water Quality Limited Waterbodies
  - PHOSPHORUS
  - METALS
  - SOLIDS
  - BACTERIA OR PATHOGENS
  - OIL AND GREASE

WATER-QUALITY BASED REQUIREMENTS FOR IMPAIRED RECEIVING WATERS

- Alewife (Phosphorous, e. Coli)
  - Timed and targeted public outreach materials related to P control, pet waste management
  - P source identification plan (4 yrs)
  - Evaluate muni property for P retrofit opportunities (5 yrs) and install BMP (6 yrs)
  - Manage grass cuttings and leaf litter on Muni property
  - Require new development and redevelopment projects optimize P removal
- Alewife and Charles (oil & grease, solids, metals))
  - Containment of spills on private property
  - Increase street sweeping in high pollutant load areas

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CHANGES IN THE NEW PERMIT CONT.

6 MINIMUM CONTROL MEASURES

1. Public education/outreach
   - Targeted messages
   - Timed messages
2. Public involvement/participation
   - No new changes
3. Illicit discharge detection/elimination (IDDE)
   - Increase dry and wet weather sampling
   - Update system catchment mapping
   - Document IDDE Program
   - Assess, Rank and investigate all Outfalls (7-10 yrs)

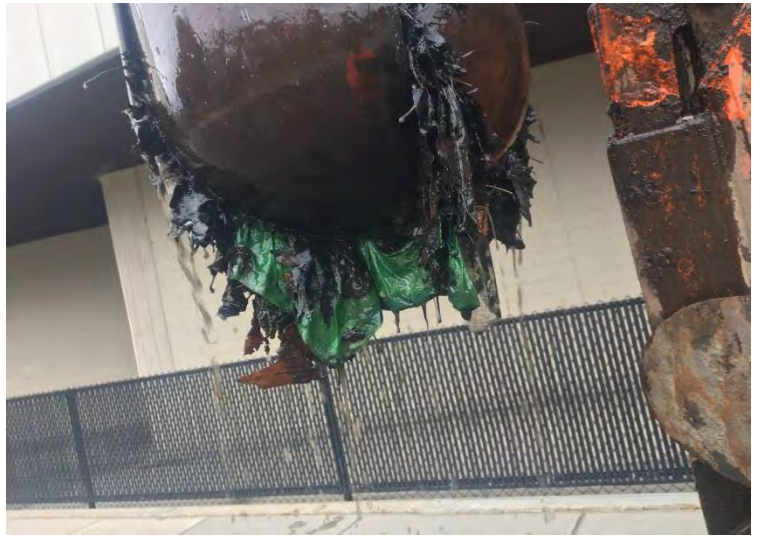
Think Blue Campaign

CHANGES IN THE NEW PERMIT CONT.

4. Construction Site stormwater runoff control
   - No changes
5. Post-construction stormwater management
   - Encourage Low Impact Development strategies – public and private
   - Assess regulations to remove barriers to implementing low impact designs for streets and parking lots.

CHANGES IN THE NEW PERMIT

CONT.



6. Pollution prevention/good housekeeping for municipal operations
   - ► Catch Basin maintenance – 50% sump
   - ► Document road salt use optimization plan
   - ► Document annual inspections of stormwater treatment structures
   - ► Stormwater Pollution Prevention Plans (SWPPP)

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COMMENTS/QUESTIONS

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Cambridge DPW stormwater webpage:
www.cambridgema.gov/stormwater

EPA Massachusetts Small MS4 General Permit:
www.epa.gov/npdes-permits/massachusetts-small-ms4-general-permit