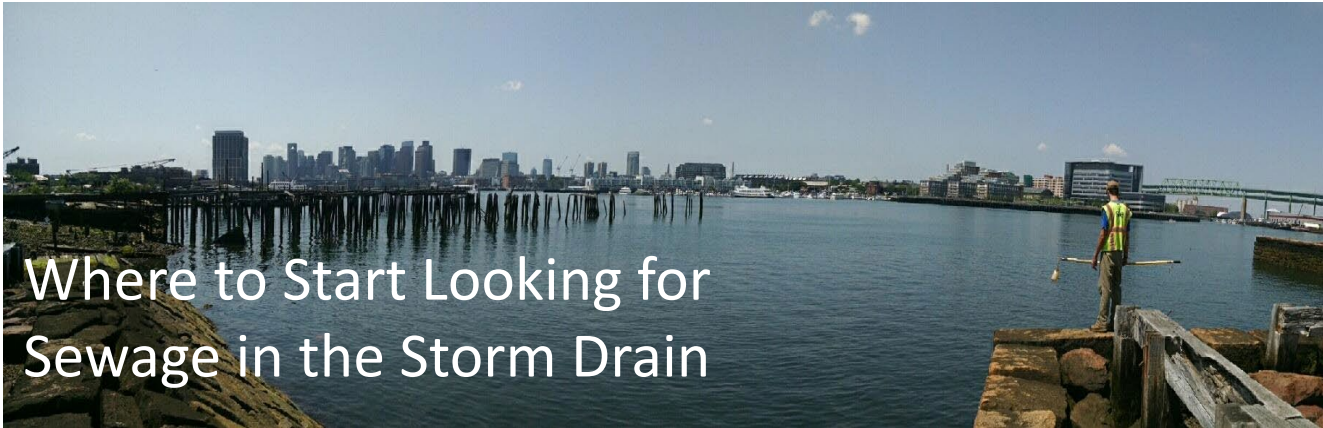


Heads or Tails?



Where to Start Looking for
Sewage in the Storm Drain

NEWEA 2019 Annual Conference

Session 32

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sde

Session Agenda

- Background on SDE
- MA Small Municipal Separate Storm Sewer System (MS4) Permit Requirements
- Investigation Procedures
- Explanation of Bottom-Up Method
- Explanation of Top-Down Method
- Pros and Cons for Each Method

SDE's Background

- Conducting Illicit Discharge Detection and Elimination (IDDE) projects since 2001
- Completed 20+ projects in dozens of communities across Massachusetts
- Located over 935 direct and indirect illicit connections
 - Over 1,000,000 gallons of sewage per day removed
- Responsible for most investigative field work with Boston Water and Sewer Commission's (BWSC) IDDE program
 - Project Engineer for BWSC Citywide Illegals 4
- Experienced in top-down, bottom-up and hybrid approaches

IDDE Program Requirements

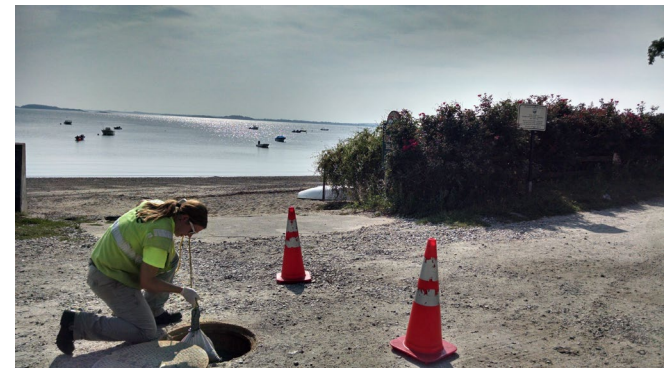
Objective: The permittee shall implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges.

IDDE Program Requirements (continued)

- Mapping
 - Phase 1 (within 2 years)
 - Phase 2 (within 10 years)
- Written IDDE Program detailing procedures – Due **6/30/2019**
- Outfall/Interconnection Inventory and Initial Rankings
- Dry Weather Outfall Screening
 - If you have system vulnerability factors then conduct Wet Weather Outfall Screening
- Conduct Catchment Investigations
 - Inspect **ALL** Key Junction Manholes (except excluded catchments)
 - Investigation in Problem Catchments (begin within 2 years complete within 7 years)
 - Investigation of catchment where outfall screening shows any info indicative of sewer input must be completed within 7 years
 - Investigation of High and Low Priority Catchments must be completed within 10 years

Key Junction Manhole Inspections

- Goal is to clear lines and to isolate any contamination
- Manhole Inspections – Inlet by Inlet during dry weather
 - Flowing – perform test kits and field testing
 - Visual and Olfactory observations
 - Test Kits
 - Ammonia – Most reliable indicator
 - Surfactants
 - Chlorine
 - Observed Dry
 - Place sandbag for minimum of 48 hours
 - If flow captured by sandbag conduct same suite of test kits used on flowing lines
 - Clean test kit or dry sandbag can clear 800 to 1,000 linear feet of pipe
 - Standing Water
 - Unable to conduct inspection
 - Proceed upstream and downstream to bracket standing water
- Monitoring for Dry Weather Conditions



Building Inspections

Once contamination has been isolated, conduct building inspections to locate source

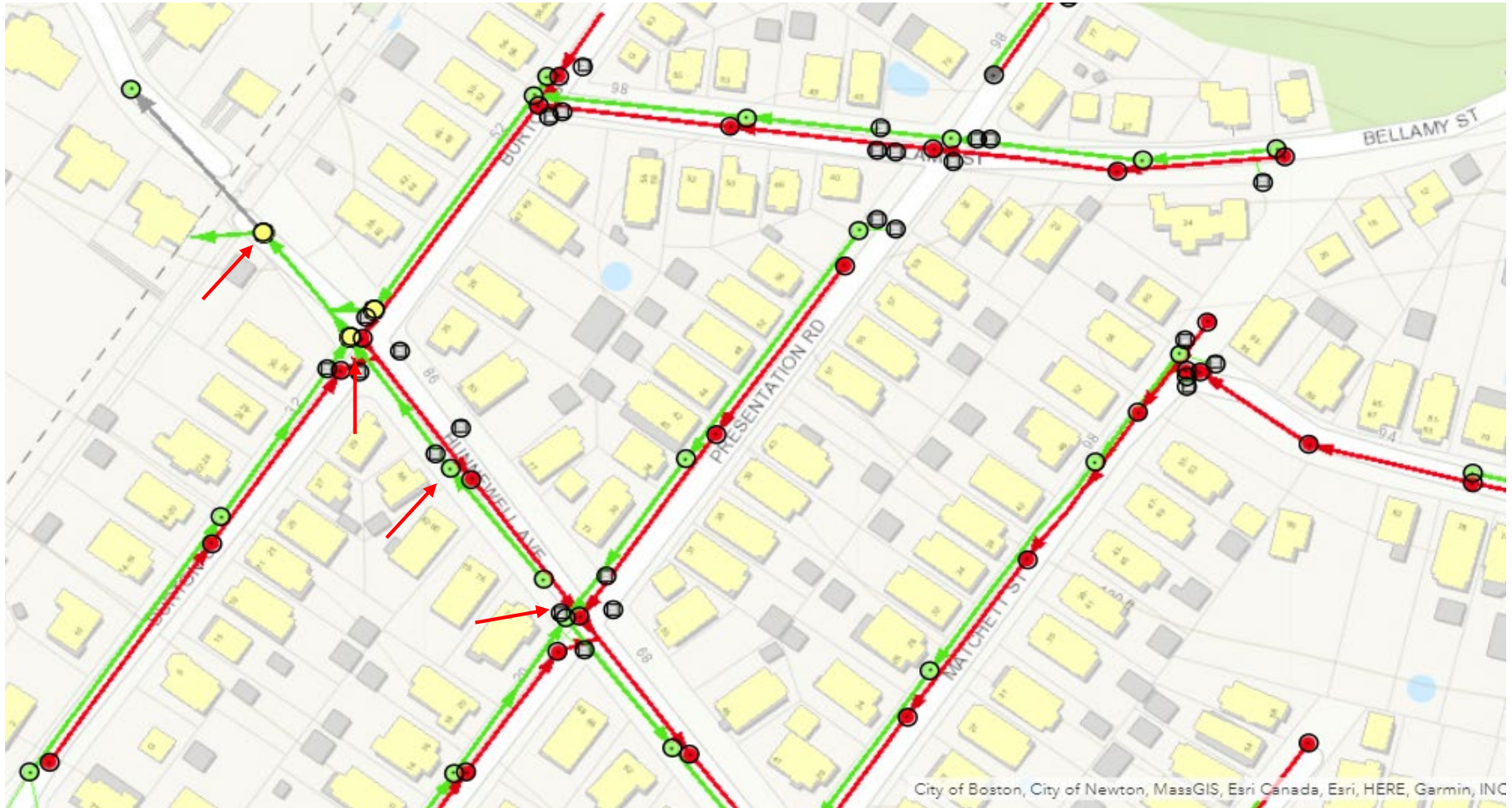
- Test multiple fixtures
- Allow enough time to find leaks
- Induce flow in pipes observed with standing water



Bottom-Up Method

- Begin manhole inspections at the outfall or interconnection
- Work systematically upstream until you reach the top of the catchment
- If contamination is found:
 - Continue inspecting upstream until the origin of the contamination is located
 - Continue inspecting side lines as you go
 - Once the origin has been located, then conduct additional investigations
- Note: All key junction manholes need to be inspected even if pipes are dry

Bottom-Up Method (Continued)



Map Images are courtesy of Boston Water and Sewer Commission

Top-Down Method

- Begin manhole inspections at the upper reaches of a catchment
- Work systematically downstream
- Inspect side lines as you go
- If contamination is found:
 - Work back upstream to isolate contamination to shortest stretch possible
 - Single run of pipe between manholes is ideal
 - Additional investigations along that contaminated segment to determine source
- Traditional approach
 - Stop working downstream once contamination is found
 - Wait for issues to be abated before proceeding
 - This can take time especially when homeowners are making repairs

Top-Down Method (continued)



Map Images are courtesy of Boston Water and Sewer Commission

Top-Down Method (Continued)

- Modified Approach
 - Start process the same as the traditional approach
 - Once contamination is found in a line
 - Continue conducting inspections downstream
 - Pipes with contamination are flagged indicating upstream contamination
 - This allows investigation to proceed without waiting for abatement
 - Can find additional issues if spikes in contamination levels are found

Top-Down vs. Bottom-Up

The biggest factor for determining which method will locate illicit more quickly is where are those illicit located within the catchment.

	Bottom-Up	Top-Down
Pros	<ol style="list-style-type: none">1. Does not require as detailed or accurate mapping2. Quicker if illicit are located near outfall	<ol style="list-style-type: none">1. Traditional approach is most efficient2. Quicker if illicit are located in upper portion of catchment
Cons	<ol style="list-style-type: none">1. Unable to determine if there is one issue or many2. Not as efficient3. Potentially lots of dilution at starting point	<ol style="list-style-type: none">1. Requires good mapping2. Takes more time

Questions?

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