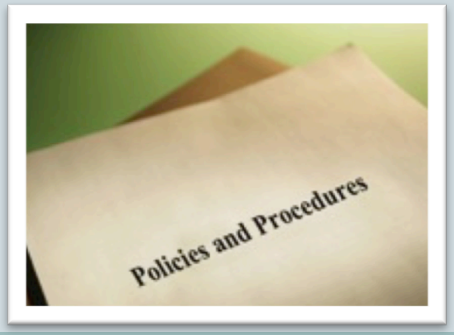
Sanitary Sewer Overflows and Infiltration and Inflow Regulatory Framework

Bureau of Water Resources
Massachusetts Department of Environmental Protection

Summary

- SSO's violate Clean Water Act and State Water Quality Standards
- Many Causes
- Wet weather SSO's widespread issue
- Infiltration/Inflow abatement



SSO's or Not?

- What is an SSO?

Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. The discharge of sewage into a building is not considered an SSO provided that the discharge was not the direct result of problems in the public sewer system.

SSO or Not?

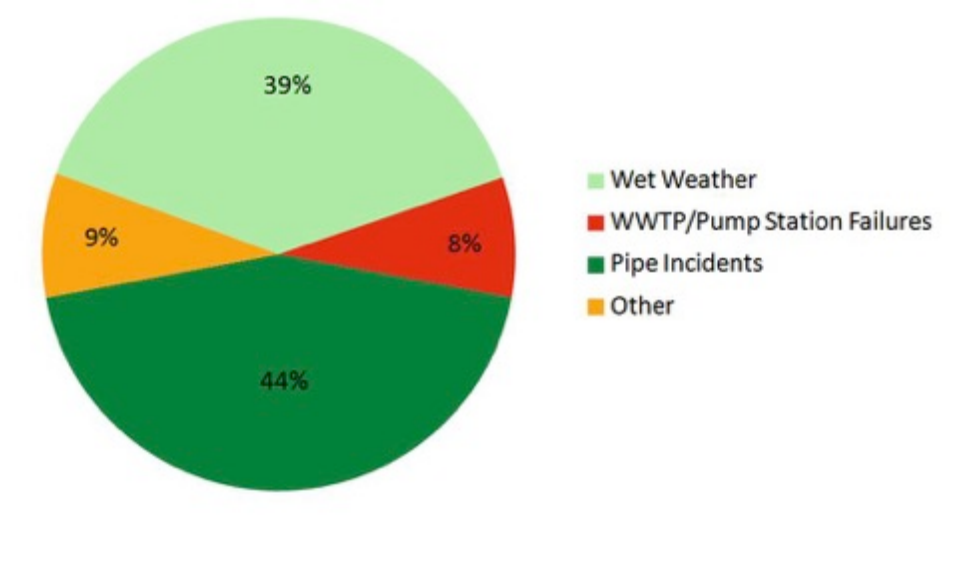
- Not a combined sewer overflow:
  - *System designed to convey wastewater and stormwater*
  - *Included in NPDES permit*
- Private Lateral blockages not reportable SSOs.

SSO's not "Permitted"

- Bypass and Overflow Reporting
  - Use MassDEP form and instructions at http://www.mass.gov/eea/agencies/massdep/service/approvals/sanitary-sewer-overflow-bypass-backup-notification.html
  - Anticipated bypass notify MassDEP 10 days prior
  - Unanticipated bypass notify MassDEP within 24 hrs
  - Within 5 days provide information to MassDEP about activities that led up to the event; steps taken to minimize event; and steps taken to prevent it from occurring again

SSO Problems

- Since 2006 in NERO……
  - > 3,500 events in 70 communities



Wet Weather SSO's

- SSO's widespread in extreme storm events
- SSO's chronic in some systems, mostly due to I/I, but some capacity problems also
- Infiltration/Inflow…..34 – 70 % of ADF!
- Enforcement Actions related to SSO and I/I in about 25% of sewered communities

SSO Enforcement Actions

- Remedies may include:
  - Complete system characterization and investigation.
  - Permanent sewer system metering
  - Development of detailed sewer system models.
  - A “comprehensive” approach to I/I abatement involving complete sewer system/lateral rehabilitation in some or all subareas, along with elimination of all confirmed inflow sources.
  - Restrictions on new or expanded sewer connections to the system, to effectively manage the risk of SSO events.
  - Penalties and fines.

Regulatory Requirements

- **Regulatory Requirements 314 CMR 12.04(2):**

- Develop and implement an ***ongoing*** I/I program:

  - Identify and eliminate "excessive" Inflow/Infiltration sources
  - Focus on inflow sources
  - Phased evaluation of sewer system consistent with MassDEP Guidance
  - I/I mitigation for new connections for some systems

Regulatory Requirements

By December 2017 submit I/I analysis:

- To address excessive I/I based on MassDEP's *Guidelines for Performing I/I Analyses and Sewer Systems Evaluation Survey*
- Assess the risk for sanitary sewer overflows for the 5-year 24 hour storm

Many municipalities well into implementation phase!

Infiltration and Inflow Program

- New Connection Mitigation Programs……

  - Systems with CSOs, tributary to systems with CSOs or with significant SSO risks, provisions for 4 to 1 mitigation for new connections or extensions with design flows in excess of 15,000 gpd.

  - Prohibit connections and extensions that will exceed system capacity causing SSO backups and bypasses

Infiltration and Inflow Program Guidance

Revising 1993 MassDEP I/I Guidance

- NEWEA Collection System Committee/Advisory Group meetings
- Final Draft for public review in upcoming months
- Notice in Environmental Monitor
- 30 day comment period

I/I Abatement Programs

- Guidance establishes four step approach:
  - Infiltration and Inflow Analysis
  - Sewer System Evaluation Survey
  - Sewer System Rehabilitation
  - Post-Construction Monitoring

I/I Guidance Challenges

- No national standards for “excessive” I/I
  - *4,000 gpdim, 120/275 gpcd, > 5% R values*
  - Review of a representative set of I/I reports…….
    - Cost Effective infiltration projects – averaged 12,912 gpdim
    - Still some cost-effective at 1,300 gpdim

Use of 4,000 GPDIM, as tool to prioritize <u>infiltration</u> investigations still appropriate

I/I Guidance Challenges

- No national standard “design storm” for sewers
  - *2 - 25 year storms, 3-4 x ADF*
- MassDEP in past used 1-year, 6-hour storm
- New regulations – system assessment with 5-year, 24-hour storm

I/I Guidance Challenges

- Cornell University - http://precip.eas.cornell.edu/

- 5 Year 24-hour event:
  - 4.11 inches of rain
  - Peak intensity of 1.2 inches/hour

When is I/I Excessive?

- "Excessive" I/I:
  - Contributes/causes SSO's for events up to 5 year storm
  - Infiltration which can be cost-effectively be removed from the sewer system
  - Public and private inflow sources, unless technically infeasible or cost-prohibitive

I/I Guidance Challenges

- CEA hasn't yielded effective I/I removal in some cases
  - *Migration of infiltration*
  - *Limited design life of fixes*
  - *T&T costs presently around $8/GPD*

- *Need to look at*
  - *Design life of fixes*
  - *Removal assumptions (50 % infiltration removal)*
  - *Collecting post-construction data*

Infiltration and Inflow Program Guidance

- Key Concepts for Revisions:
  - More focus on inflow removal
  - Use of both 1 year and 5 year design storms
  - Continued use of cost-effectiveness for infiltration removal
  - Focus on SSO risk mitigation
  - Allow alternative approaches

Questions?