

SSES Implementation and SSES Pilot Study Program

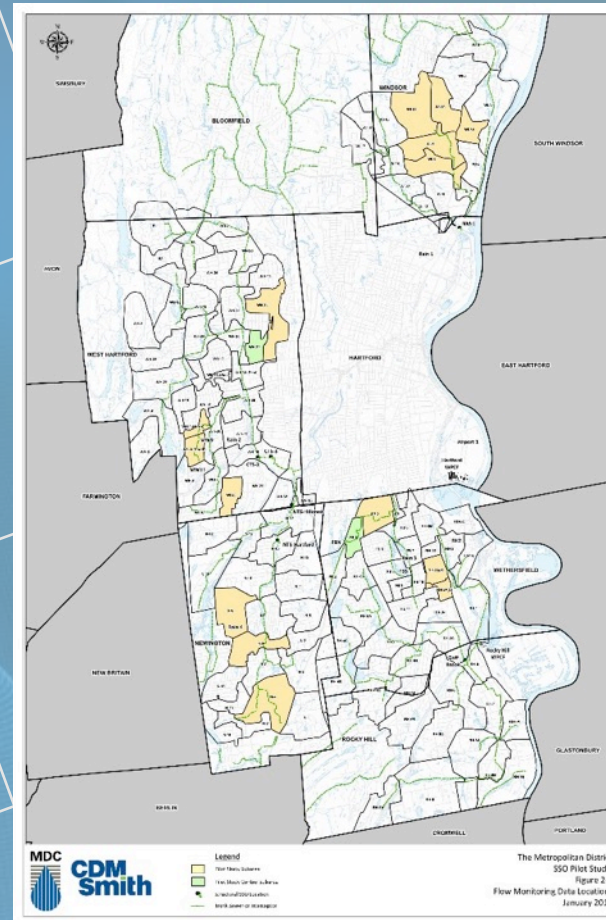
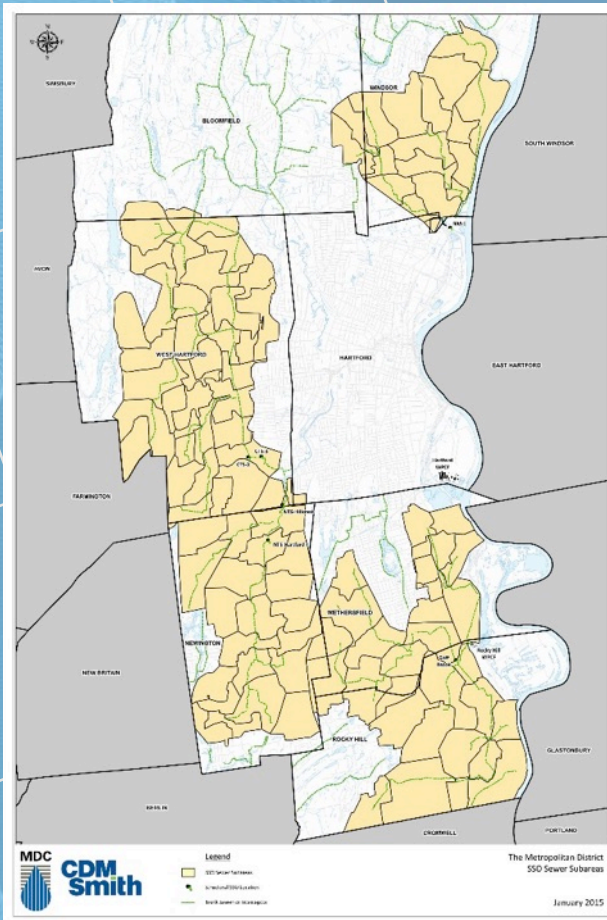
Large-Scale Rehabilitation in Multiple Towns



Jason F. Waterbury, P.E.
The Metropolitan District
555 Main Street
Hartford, CT 06142

Katelyn M. Biedron, P.E.
John A. Harper, Jr., P.E.
Joseph L. Laliberte, P.E.
CDM Smith
670 N. Commercial Street
Manchester, NH 03101

NEWEA Annual Conference 2015
January 27, 2015



Presentation Overview

Introduction

MDC Clean Water Project

SSO Program

SSES Implementation

SSES Pilot Study

Lessons Learned

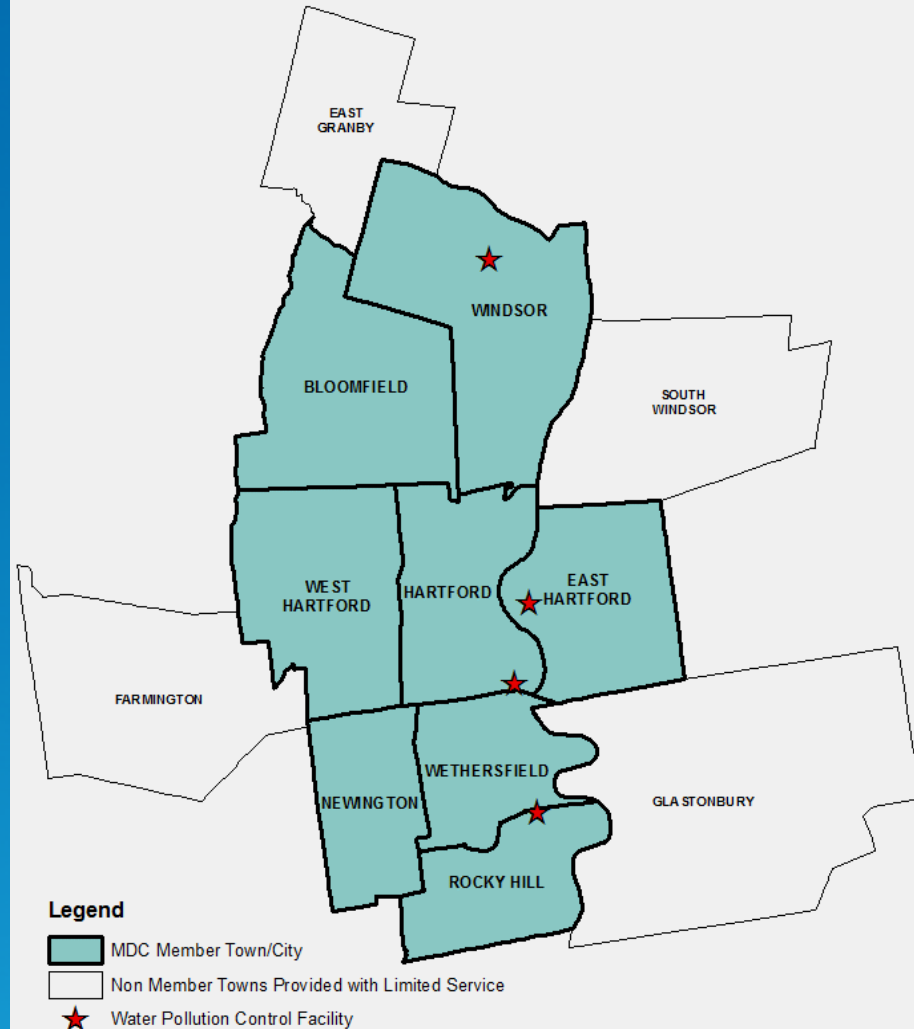


Introduction

The MDC is a nonprofit municipal corporation chartered by the Connecticut General Assembly in 1929

Our mission is to provide our customers with safe, pure drinking water, environmentally protective wastewater collection and treatment and other services that benefit the member towns

We provide water, sewer and household hazardous waste collection to its member towns and treated water to portions of non-member towns



Clean Water Project

2006 Consent Decree/2007 Consent Order by USEPA and CTDEEP

Main Goals

- Eliminate Sanitary Sewer Overflows (SSO)
- Reduce the amount of combined sewage that enters the CT River
- Reduce the amount of Nitrogen released into the CT River

Clean Water Project Components

- WPCF Improvements
- Sewer Separation
- Storage and Conveyance Tunnels
- Relief and Consolidation Pipe
- Inflow and Infiltration (I/I) Reduction

SSO Program Overview

Sewer System Evaluation Studies (SSES)

Initial SSES Implementation Projects

- Contracts 2005-84, 2005-85, 2005-86 and 2005-89
- Contract 2006-01, 2006-35 and 2007-104
- Contracts 2008-44, 2008-63, 2008-70 and 2008-71

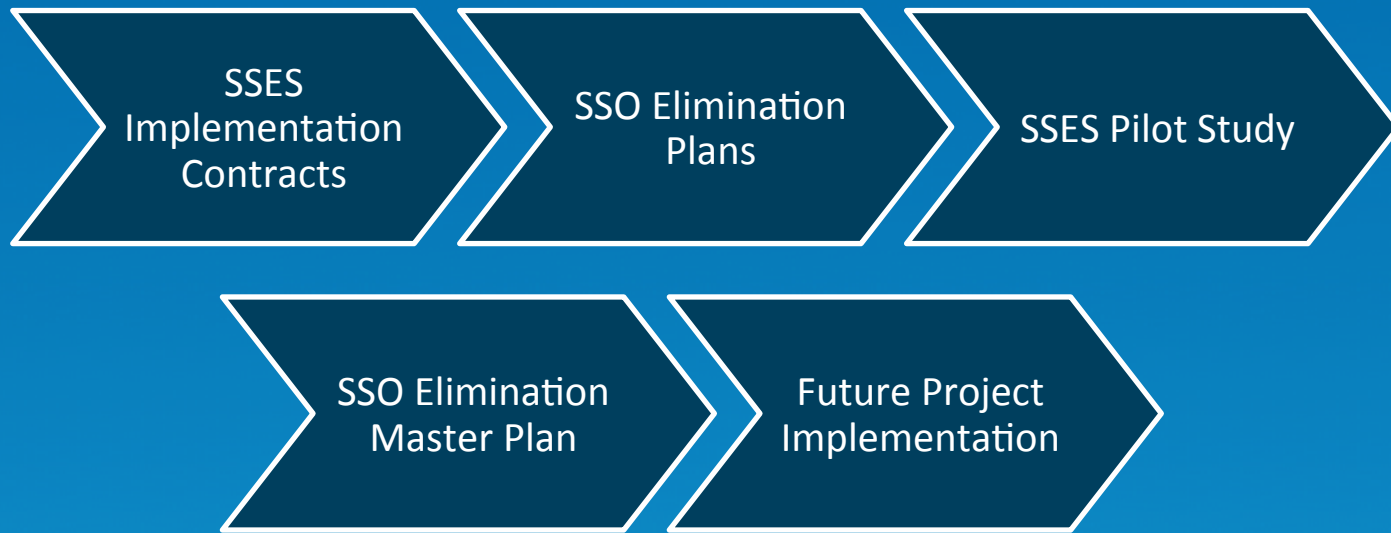
Modeling and Capacity Assessments

Additional SSES Implementation Projects

SSO Elimination Plans (2010) Approved by EPA January 4, 2013

- Eliminate Structural SSOs: 25-year Level of Service
- Eliminate Manhole Flooding: 10-year Level of Service
- Eliminate Sewer Backups: 5-year Level of Service
- **Assumed 10% I/I Reduction**

SSO Program Evolution





Toilet Back Up



Manhole Surcharge



Sewer Main Defect



Sanitary Sewer Overflow

SSES Implementation Scope of Work

Sewer Mains and Laterals

- Segment Replacement
- Point Repairs
- Cured-in-Place Pipe (CIPP) Lining
- CIPP Short Liners
- Lateral Repairs and CIPP Lining

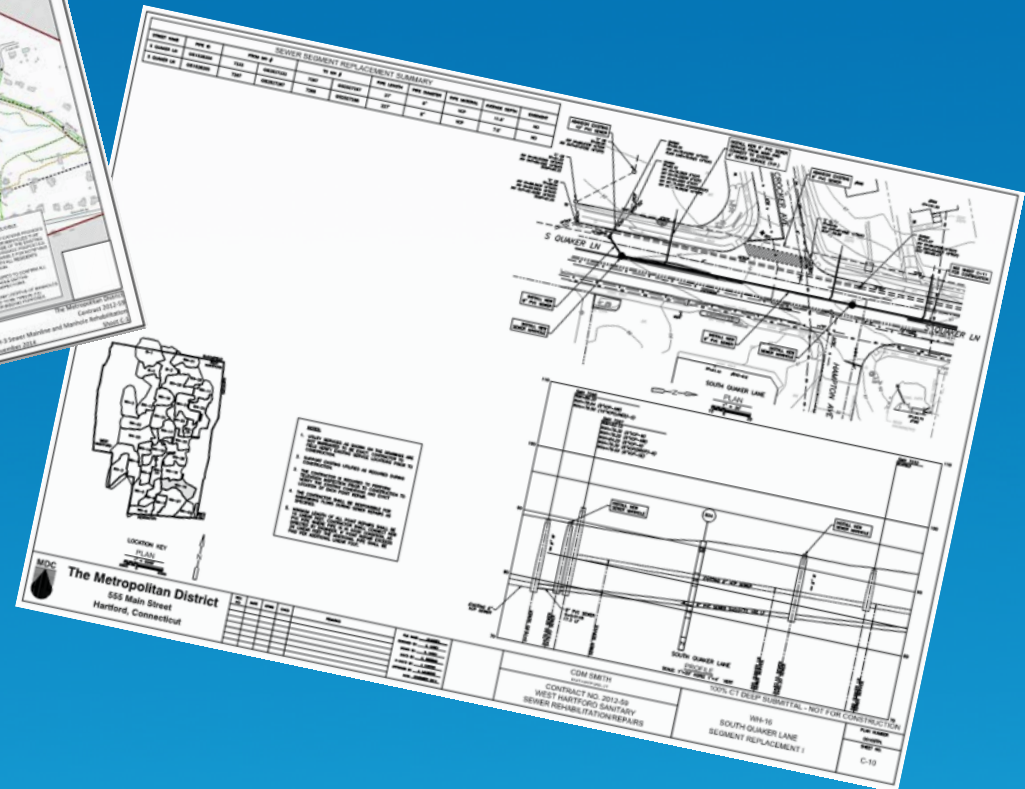
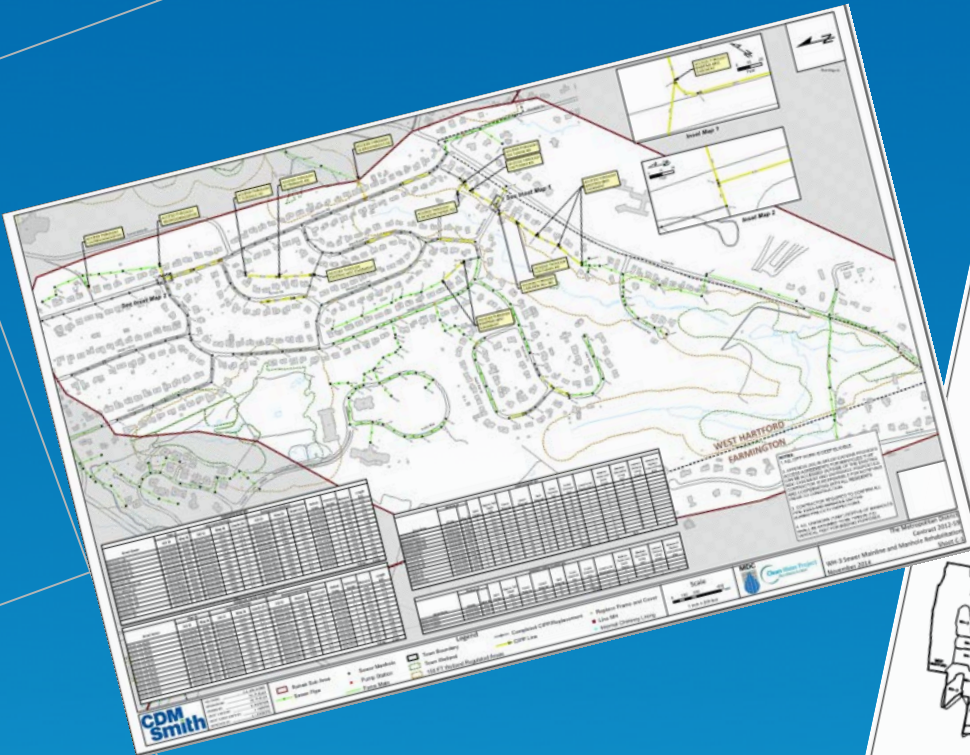


Manholes

- Frame and Cover Replacement
- Cementitious Lining
- Internal Chimney Lining
- Dead End Manholes



Design Drawings



Additional SSES Implementation Contracts

Contract	Town	Construction Cost	Point Repairs (Ea)	Segment Replacement (LF)	CIPP Lining (LF)	F&C Replacement (Ea)	Lined Manholes (ea)
2009-47A	West Hartford	\$ 2.7 M	40	1,413	-	-	-
2009-61	Newington	\$ 5.0 M	1	-	66,398	87	97
2009-96A	Rocky Hill & Wethersfield	\$ 7.9 M	1	-	58,000	250	100
2014B-22	Rocky Hill & Wethersfield	\$ 8.0 M	2	1,850	29,650	165	115
2012-58	Windsor	\$ 8.4 M	7	1,434	14,540	210	109
2012-59	West Hartford	\$ 15.0 M	12	1,860	108,300	206	75
2015-XX	West Hartford	\$ 7.0 M	12	2,500	70,000	60	30
Totals		\$ 54.0 M	81	9,057	346,888	978	526

SSES Implementation Lessons Learned

Field Investigations

- Survey and Borings

Closed-Circuit Television Inspection (CCTV)

- All Dig Locations
- Verify Any Completed/Existing Repairs

Manhole Inspections

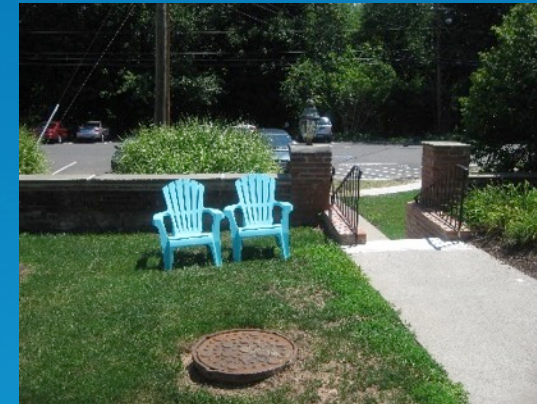
- Verify Depth of Manhole
- Corbel Dimensions for Frame and Cover Sizing

Access Agreements

- Resident Coordination

Permitting

- Use Maintenance Approach



SSES Implementation Totals

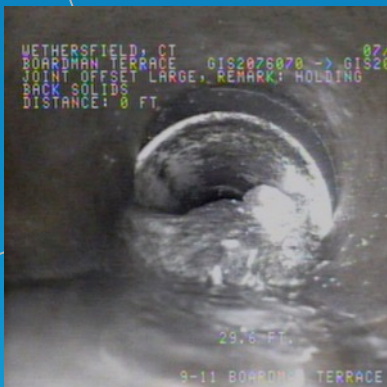
Town	Sewer Main Lining (LF)	% Total Pipe Lined	% Total Non-Plastic Pipe Lined	Pipe Replaced (LF)	Point Repairs (Ea)	Manhole Lining (Ea)	Manhole Sealing (Ea)	F&C Replaced (Ea)
Newington	161,419	29%	39%	1,396	1	142	39	763
West Hartford	503,112	50%	65%	16,469	169	403	21	1,617
Windsor	117,999	31%	47%	1,616	10	369	50	389
Wethersfield	169,122	35%	71%	2,522	15	361	43	453
Rocky Hill	22,031	8%	10%	0	2	90	0	142
Totals	973,683	31%	52%	22,003	197	1,365	153	3,364

SSES Pilot Study

Validate 10% I/I Reduction
Develop 'Toolbox' of Rehabilitation Techniques
Cost Effective Capacity Solutions

Key Aspects

Field Investigations
Flow Monitoring
Design and Construction
Data, Reduction and Cost Analyses
Summary Report



SSES Pilot Study Areas

Project Areas

Newington N6

West Hartford WH8, WH9N-S, WH29, WH34

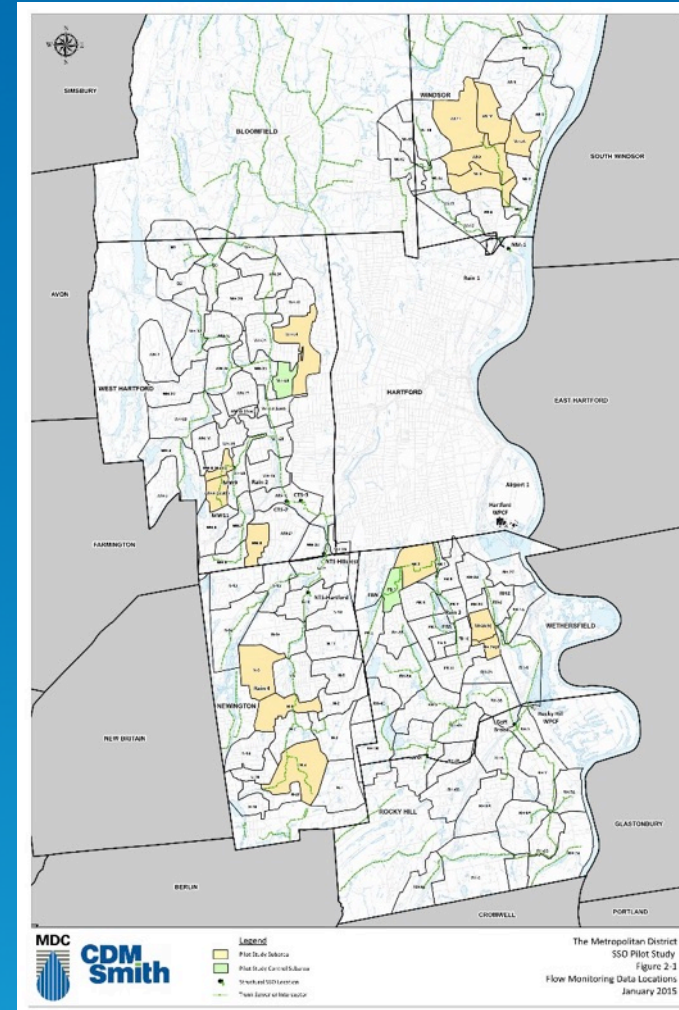
Wethersfield FB2, FB3, RH2AN-S

Windsor WI3A, WI8-9-10-11

6 SSES Implementation Areas

7 Pilot Study Areas

2 Control Areas



SSES Pilot Study Implementation and Results

Windsor WI3A
\$2.14M
Private I/I Removal
55 Sump Pumps/Pits
1,700 LF of Storm Drain
2,100 LF of Collector Drain
1,800 LF of Drain Service
4,174 LF CIPP (26%)
20 Lined Manholes (25%)
29 F&C (36%)

West Hartford WH8
\$1.11M
Comprehensive Manhole Lining
110 Lined Manholes (96%)
14,417 LF CIPP (59%)
63 F&C (55%)

West Hartford WH34
\$2.51M
Comprehensive Mainline Rehabilitation
27,647 LF CIPP (89%)
130 Lined Manholes (98%)
500 Top Hats (96%)
68 F&C (51%)



53% Reduction

No Reduction

30% Reduction



1% Reduction

62% Reduction

No Reduction



SSES Pilot Study Implementation and Results

Wethersfield FB2
\$2.91M
Private I/I Removal
40 Sump Pumps/Pits
1,620 LF of Storm Drain
1,200 LF of Collector Drain
1,600 LF of Drain Service

6,820 LF CIPP (33%)
15 Manholes Lined (17%)
30 F&C (34%)

Wethersfield RH2A South
\$3.07M
Full Lateral Rehabilitation
w/ Cleanout

202 Laterals
11,130 LF Lateral CIPP

6,957 LF CIPP (73%)
3 Manholes Lined (7%)
21 F&C (47%)

Wethersfield RH2A North
\$6.79M
Lateral Replacement to
Property Line

240 Laterals
6,500 LF Replacement
3,600 LF Lateral CIPP

17,188 LF CIPP (96%)
10 Manholes Lined (13%)
36 F&C (46%)



3% Reduction

40% Reduction

51% Reduction



20% Reduction

No Reduction

55% Reduction



SSES Pilot Study Implementation and Results

West Hartford WH9
South
\$1.65M
Lateral Rehabilitation to Property Line

191 Laterals
7,000 LF Lateral CIPP

10,156 LF CIPP (76%)
1 Manhole Lined (2%)
25 F&C (37%)

SSES Implementation Only
0-40% RDII Reduction
(WH9N, N6, WI8-9-10-11)

FB3 Control

No RDII Reduction
100% GWI Increase

WH29 Control

8% RDII Reduction
68% GWI Increase

Four Mile Road Project
\$6.00M
Comprehensive Relief (Non-Pilot)

4,000 LF Sewer Replacement
1,000 LF Lateral Replacement
1,200 LF Lateral CIPP

50 Sump Pumps/Pits
2,500 LF of Collector Drain
2,600 LF of Drain Service

 RDII
No Reduction

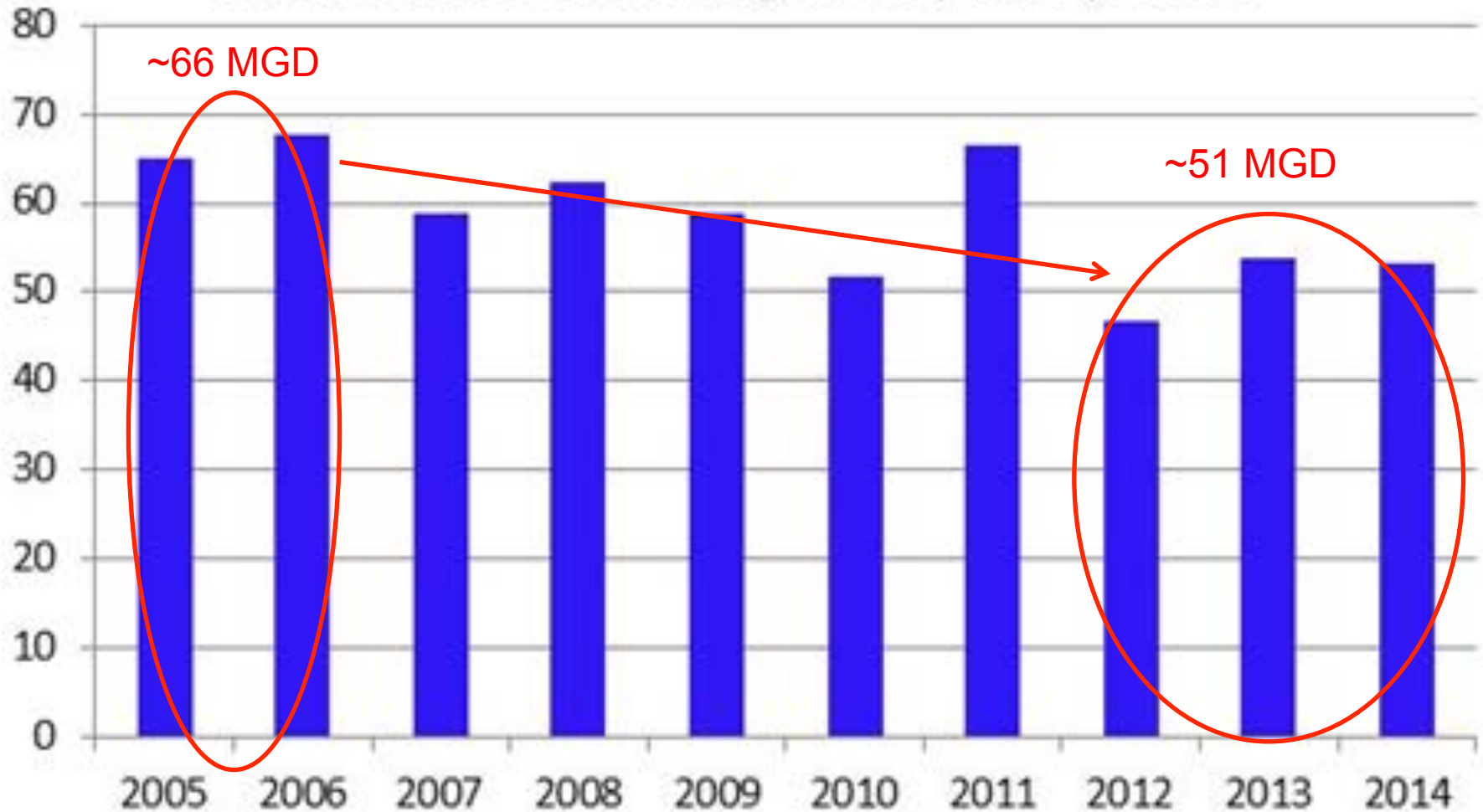
 GWI
30% Reduction

25% Reduction  RDII

23% Reduction  GWI



Hartford WPCF Average Daily Flow, MGD



SSES Pilot Study Lessons Learned

Comprehensive vs. Focused Approach

- Public and Private

Piecemeal Approach = Inconclusive Results

- Water Migrates!

System Wide Standards are Challenging

- Each Town/Area/Street/House is variable
- Antecedent Moisture Conditions

Pre-Investigation Assumptions

Accurate and Applicable Data Analysis

Complete Cost Effective Analysis and Pilot Study Report

Complete SSO Elimination Plan Updates

Thank You!!



Questions?