

# A Proactive Approach to Assessing and Managing Your Wastewater Collection System



**Stamford, CT WPCA**



Presented by:

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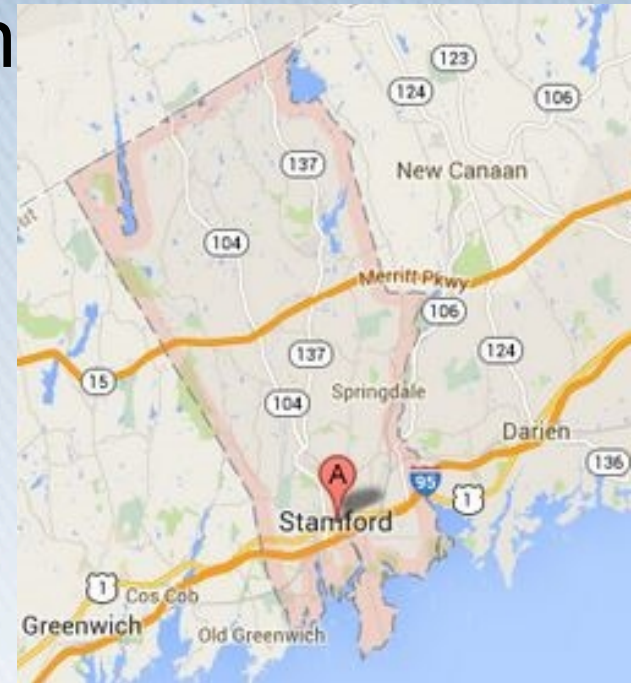
**WRIGHT-PIERCE**   
Engineering a Better Environment

# Introduction

- Overview of the Stamford WPCA's system
- Components of the CMOM plan
- Tools utilized
- Status of CMOM program
- CMOM goals
- Recent results / repairs
- Questions and Answers

# System Overview

- Serves Stamford and Darien
- ~300 miles of sewer
  - Up to 60" diameter
  - ~20 miles of sewer >24"
- 22 Pump Stations
- 24 MGD WWTF





# CMOM Program Components

- CCTV/Laser/Sonar Inspection >24" sewer
  - Phased approach based on criticality
- GIS-based data storage program
- Pump Station & Force Main Evaluations
- Sewer Cleaning & Flow Monitoring
- Develop a Capital Improvement Plan (CIP)



# CMOM Program Components

## Criticality Assessment

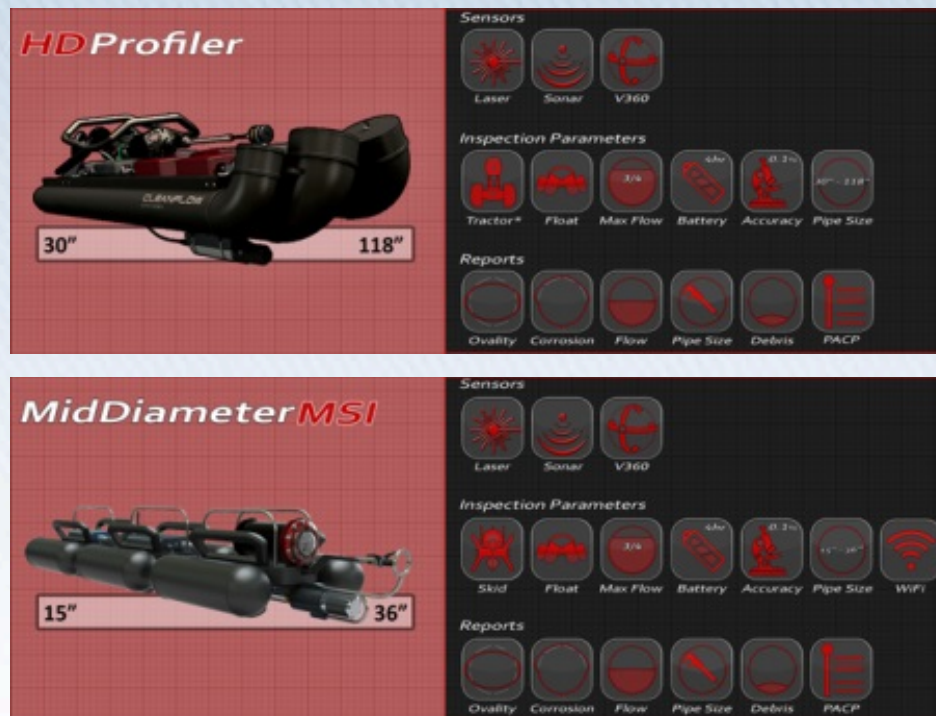
- Focused on large diameter sewers:
  - Lack of WPCA inspection equipment >24"
  - Increased Environmental Risk
  - Increased Cost / Complexity of Repairs
- Prioritized interceptors along waterways
- Concrete and Clay Interceptors



# CMOM Tools

## CCTV/Laser/Sonar Inspection

- RedZone Robotics – Pittsburgh, PA





# CMOM Tools

## RedZone Robotics

GIS Map Asset Dashboard ICOM3 - Multisensor Viewer

Reports GIS Tools R3 Inspection: Downstream 6/6/2013 (Most Recent) Exit Inspection Viewer

7.3 ft

**JHA4**

Payout	Code	Grade	Description
0.0	AMH	0	Manhole
0.0	MWL	0	Water Level
2.0	MGO	0	General Observation
2.0	MGO	0	General Observation
2.0	MGO	0	General Observation
2.0	MGO	0	General Observation
6.5	MGO	0	General Observation
50.0	MGO	0	General Observation
50.0	MGO	0	General Observation
50.0	DAGS	2	Deposits Attached Grease
64.9	MGO	0	General Observation
65.0	IR	4	Infil Runner
67.6	MGO	0	General Observation
89.0	TFA	0	Tap Factory Active
89.4	MGO	0	General Observation
99.9	MGO	0	General Observation
99.9	MGO	0	General Observation
150.0	MGO	0	General Observation
150.0	MGO	0	General Observation
199.9	MGO	0	General Observation
249.9	MGO	0	General Observation
249.9	MGO	0	General Observation
300.0	MGO	0	General Observation
300.0	MGO	0	General Observation
329.1	DAR	2	Deposits Attached Raggin
349.7	MGO	0	General Observation
349.9	MGO	0	General Observation
400.0	MGO	0	General Observation
408.3	AMH	0	Manhole

**JHA3**

**Jefferson** Line No: JHA4-JHA3

**PROFILER**

US MH: JHA4 Downstream DS MH: JHA3

6.6.2013 23:56:89

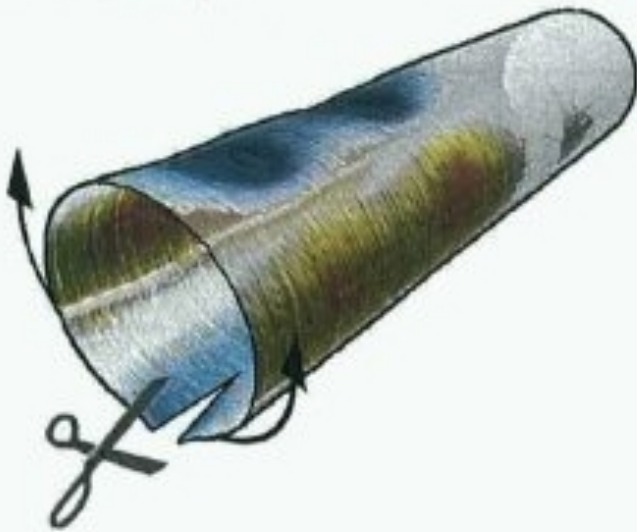
Size: 60in, Clay Tile Distance: 7.20ft

Jump to Distance:  Capture Observation Open Record

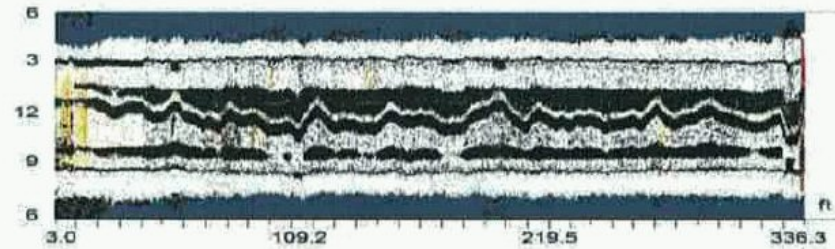
# CMOM Tools

## RedZone Robotics

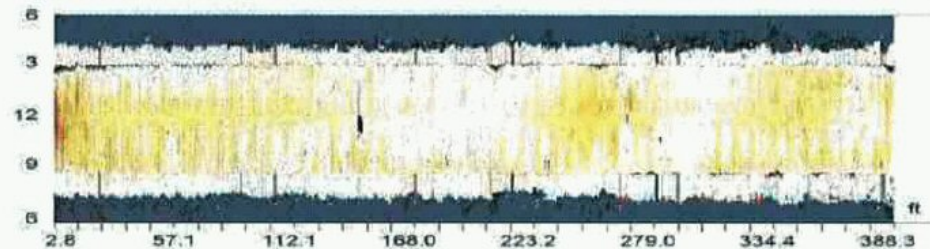
Ovality Example



JC-MH Unknown, 60in Page 54



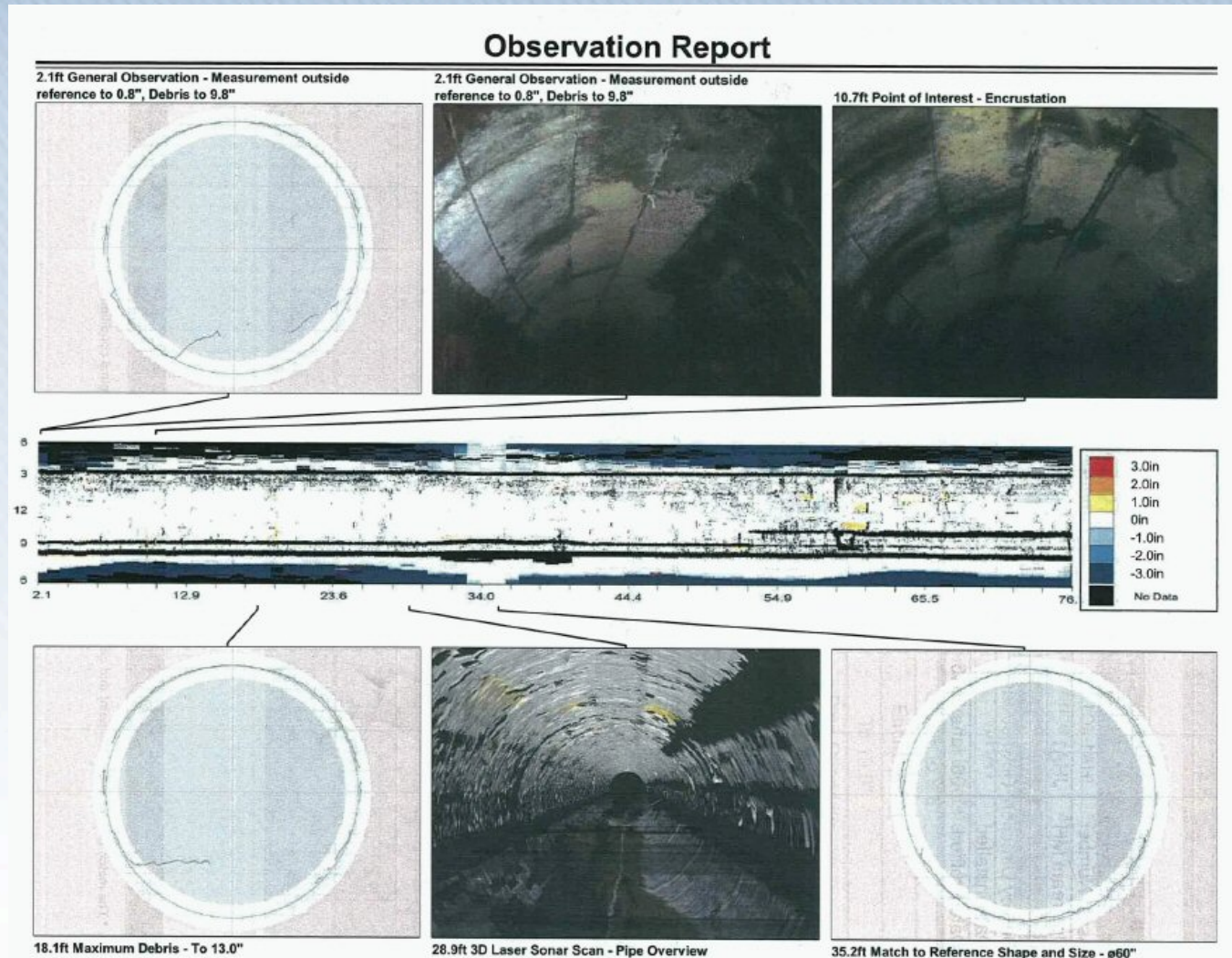
JHA7-JHA6, 60in Page 60





# CMOM Tools

## RedZone Robotics



# CMOM Tools

## RedZone Robotics

ICOM3™ V.2 - Stamford, CT

File Tools Help

Stamford, CT

GIS Map

Asset Dashboard

Legend

Map

- ☒ Collection System
- ☒ Streets
- ☒ Map Pages
- ☒ Parcels

Overlays

- ☐ Max Sediment Depth
- ☐ Max H2S
- ☐ Overall P&CP Score
- ☐ Avg ASTM Qvality
- ☐ Avg Corrosion
- ☒ Last Cleaning
- ☒ Blockage - Deposit
- ☒ I/I Related
- ☒ Inspection Age
- ☒ Inspection Status
- ☒ Map Changes Required
- ☒ O&M Quick
- ☒ Overall Quick
- ☒ R3 Needed
- ☒ R3 Type
- ☒ Blockage - Roots
- ☒ 3 Year Service Call
- ☒ 3 Year SSD
- ☒ Structural Issue
- ☒ Structural Quick

Asset Inventory

Work Management

Plans and Schedules

O&M History

GIS Map

Analysis and Reports

Administration

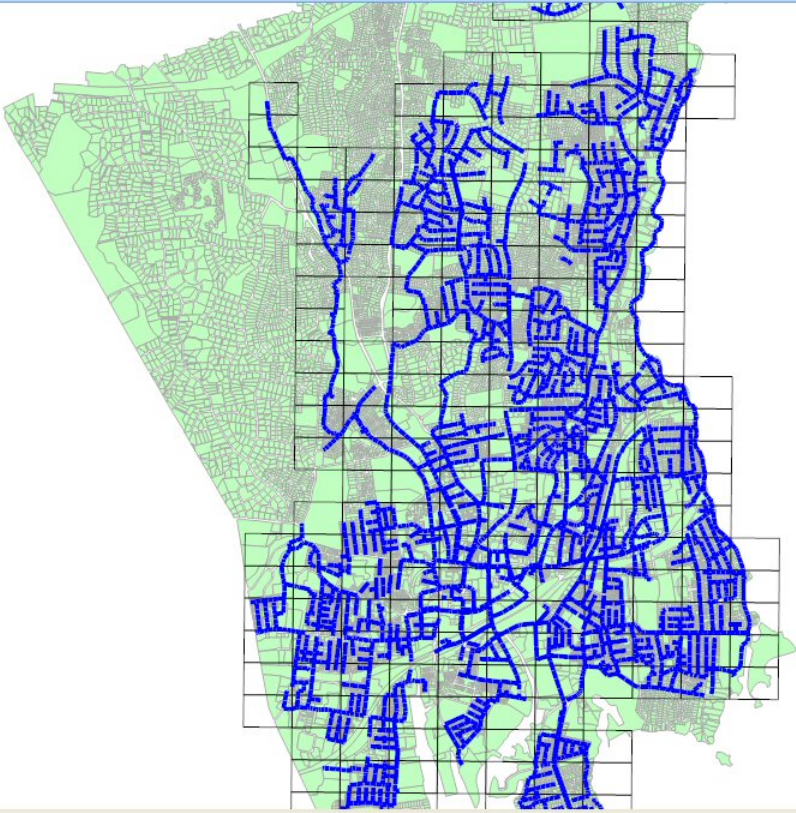
Map Loaded

Overlays

Find Add Overlays Remove Tools Zoom Level: 48376 ft

Last Synchronization at: 4:10 PM

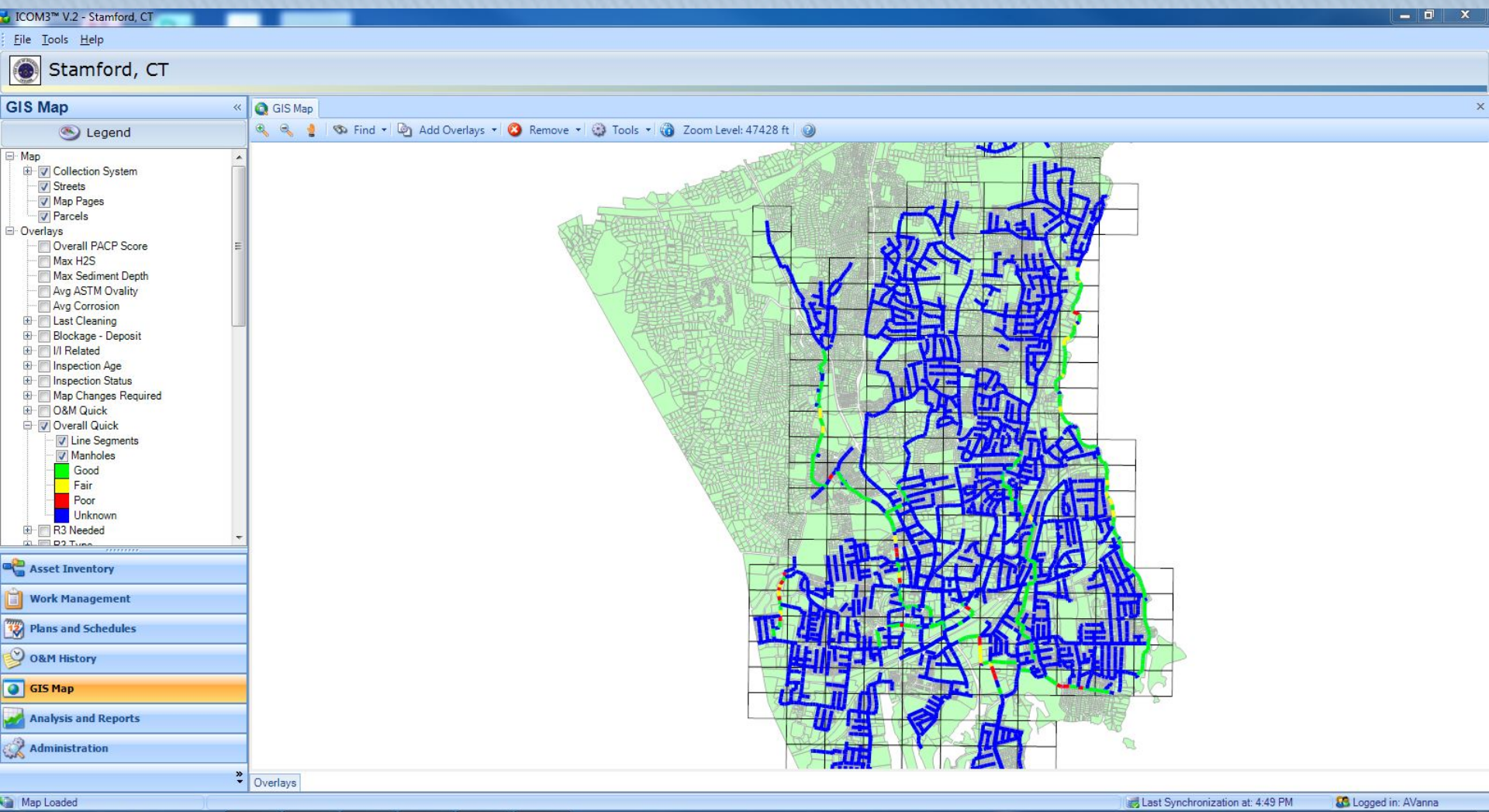
Logged in: AVanna

The screenshot displays the ICOM3 V.2 GIS Map application interface. The main window shows a map of Stamford, CT, with a grid overlay. The map features a network of streets and a collection system. A legend on the left side lists various map layers and overlays, with checkboxes indicating their status. The 'Map' section includes 'Collection System', 'Streets', 'Map Pages', and 'Parcels', all of which are checked. The 'Overlays' section lists numerous data layers, including 'Max Sediment Depth', 'Max H2S', 'Overall P&CP Score', 'Avg ASTM Qvality', 'Avg Corrosion', 'Last Cleaning', 'Blockage - Deposit', 'I/I Related', 'Inspection Age', 'Inspection Status', 'Map Changes Required', 'O&M Quick', 'Overall Quick', 'R3 Needed', 'R3 Type', 'Blockage - Roots', '3 Year Service Call', '3 Year SSD', 'Structural Issue', and 'Structural Quick'. The 'Last Cleaning' overlay is highlighted in blue on the map. The application has a menu bar with 'File', 'Tools', and 'Help'. The status bar at the bottom indicates 'Map Loaded', 'Overlays', 'Last Synchronization at: 4:10 PM', and 'Logged in: AVanna'.



# CMOM Tools

## RedZone Robotics



# CMOM Tools

## RedZone Robotics

ICOM3® V.2 - Stamford, CT

File Tools Help

Stamford, CT

GIS Map

Legend

- ☒ Collection System
- ☒ Streets
- ☒ Map Pages
- ☒ Parcels
- Overlays**
  - ☐ Max Sediment Depth
  - ☐ Max H2S
  - ☐ Overall PACP Score
  - ☐ Avg ASTM Dvality
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  - ☐ R3 Type
  - ☐ Blockage - Roots
  - ☐ 3 Year Service Call
  - ☐ 3 Year SSO
  - ☐ Structural Issue
  - ☐ Structural Quick

Asset Inventory

Work Management

Plans and Schedules

O&M History

GIS Map

Analysis and Reports

Administration

Map Loaded

GIS Map Asset Dashboard

Refresh Asset Type: Line Segments View: Default Manage Views Filter: Assets with Completed Inspections Clear Custom Display as Overlay

Asset	Upstream Manhole	Downstream Manhole	Size	Material	Asset Length	Inspected Length	Last Inspection Date	Inspection Status	Review Status
MH-6 to MH-4	MH-6	MH-4	0"		53.5	52.3	06/06/2013	Complete	Not Submitted
MH-4 to MH-3	MH-4	MH-3	60"	Reinforced Concre	335.2	348.2	06/06/2013	Complete	Not Submitted
NET-14 to MH-746	NET-14	MH-746	60"	Clay Tile	399.9	390.2	06/06/2013	Complete	Not Submitted
MH-746 to MH-747	MH-746	MH-747	60"	Clay Tile	93.5	92.2	06/06/2013	Complete	Not Submitted
MH-747 to MH-748	MH-747	MH-748	60"	Clay Tile	482.4	470.7	06/06/2013	Complete	Not Submitted
MH-748 to MH-751	MH-748	MH-751	60"	Clay Tile	417.7	408.3	06/06/2013	Complete	Not Submitted
MH-751 to MH-752	MH-751	MH-752	60"	Clay Tile	386.2	383.3	06/06/2013	Complete	Not Submitted
MH-752 to MH-753	MH-752	MH-753	60"	Clay Tile	388.4	384.2	06/06/2013	Complete	Not Submitted
MH-275 to MH-6	MH-275	MH-6	48"	Reinforced Concre	362.2	319.4	06/06/2013	Complete	Not Submitted
NET-5 to MH-277	NET-5	MH-277	48"	Reinforced Concre	241.3	242.4	06/06/2013	Complete	Not Submitted
MH-277 to MH-276	MH-277	MH-276	48"	Reinforced Concre	324.7	336.4	06/06/2013	Complete	Not Submitted
MH-276 to MH-275	MH-276	MH-275	48"	Reinforced Concre	322.3	317.2	06/06/2013	Complete	Not Submitted
MH-278 to NET-5	MH-278	NET-5	48"	Reinforced Concre	62.6	256.9	06/06/2013	Complete	Not Submitted
MH-280 to MH-279	MH-280	MH-279	48"	Reinforced Concre	397.2	375.9	06/06/2013	Complete	Not Submitted
MH-279 to NET-6	MH-279	NET-6	48"	Reinforced Concre	114.1	103.4	06/06/2013	Complete	Not Submitted
MH-753 to NET-31	MH-753	NET-31	60"	Reinforced Concre	120.8	82.3	06/06/2013	Complete	Not Submitted

System Overview Asset History Review History Inspections Cleaning Work SSO History Service Calls

Date	Inspection Status	Turnaround Reason	O&M Quick	Structural Quick	Inspection Direction	Inspection Length	Inspection Platform	Comments
6/6/2013 12:00:00 AM	Complete		2200	0000	Downstream	348.2	CLEANFLOW	

Payout	Defect Code	Category	Subcategory	Description	Remarks	Structural Grade	O&M Grade
3.4	MGO	Inspection	General Sewer Cor	General Observation	Corrosion to 1.0"	0	0
4.9	MGO	Inspection	General Sewer Cor	General Observation	Note - Water on lens affects laser	0	0
8.8	MGO	Inspection	General Sewer Cor	General Observation	Maximum Debris - To 16.0"	0	0
16.5	MGO	Inspection	General Sewer Cor	General Observation	Maximum Corrosion - To 2.2"	0	0
50	MGO	Inspection	General Sewer Cor	General Observation	Debris to 10.9"	0	0

Last Synchronization at: 4:10 PM

Logged in: AVanna



# CMOM Tools

## Pump Station and Force Main Evaluations

- Age of Facilities vs. Life Expectancy
- Document known operational issues
- Capacity Evaluation
- Generator Need assessment
- Force main retention times
- Force main velocities

# Current Status

- Phase 2 Complete
  - 14 miles of <24"
  - 6 of 22 Pump Stations & Force Mains
- Phase 3 Starting Soon
  - Remaining <24" sewer
  - Remaining pump Stations





# CMOM Goals

- Database of identified deficiencies
- Capital Improvement Plan
  - Costs and time table for repair needs
- Routine Maintenance Costs
- Knowledgebase
- Expandable with future information

# CMOM Goals

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	APPENDIX C																	
2	INTERCEPTOR SEWER CAPITAL IMPROVEMENTS PLAN																	
3																		
4		Target Replacement/Upgrade Year <sup>2</sup>																
5	Item/Equipment	2014 Cost Estimate	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
6	Inflation factor @ 5% <sup>1</sup>	1	1	1.05	1.1025	1.157625	1.21551	1.276282	1.340096	1.4071	1.47746	1.55133	1.6289	1.7103	1.7959	1.8856	1.9799	2.0789
7																		
8	<b>Sewer System Rehabilitation</b>																	
9	<b>Projects in progress</b>																	
10	Soundview Rehabilitation (S-6412)	\$1,500,000	\$1,500,000															
11	Alvord Lane interceptor rehabilitation (S-6401)	\$100,000	\$100,000															
12																		
13	<b>Phase 2 Area Recommendations</b>																	
14	Repair Elm Street Defect - RCP missing	\$250,000		\$262,500														
15	Investigate 30" DIP corrosion at RR crossing	\$50,000	\$50,000															
16	Repair or rehabilitate RR Crossing pipe (if needed)	\$200,000		\$210,000														
17	Investigate Washington Ave Broken Pipe	\$25,000	\$25,000															
18	Washington Ave Broken Pipe Repair	\$150,000			\$165,375													
19	Investigate Tresser Blvd. Pipe penetration	\$25,000																
20	Repair Tresser Blvd. pipe penetration	\$250,000			\$275,625													
21	Largo Court Repair	\$20,000			\$22,050													
22	Clean Sediment from Phase 1 and 2 areas	\$25,000		\$26,250														
23																		
24	<b>Phase 3 Area Study Efforts</b>																	
25	Phase 3 inspections (24" + interceptors)	\$350,000	\$350,000															
26	Clean Sediment from Phase 3 areas			?????														
27																		
28	<b>Future Annual Line Items</b>																	
29	Annual CCTV (smaller pipe) <sup>4</sup>	\$60,000										\$93,080	\$97,734	\$102,620	\$107,751	\$113,139	\$118,796	\$124,736
30	Annual I/I reduction <sup>5</sup>	\$100,000			\$110,250	\$115,763	\$121,551	\$127,628	\$134,010	\$140,710	\$147,746	\$155,133	\$162,889	\$171,034	\$179,586	\$188,565	\$197,993	\$207,893
31																		
32																		
33																		
34																		
35																		
36																		
37	<b>Total</b>	\$3,105,000	\$2,025,000	\$498,750	\$573,300	\$115,763	\$121,551	\$127,628	\$134,010	\$140,710	\$147,746	\$248,213	\$260,623	\$273,654	\$287,337	\$301,704	\$316,789	\$332,629
38																		



# Recent Results

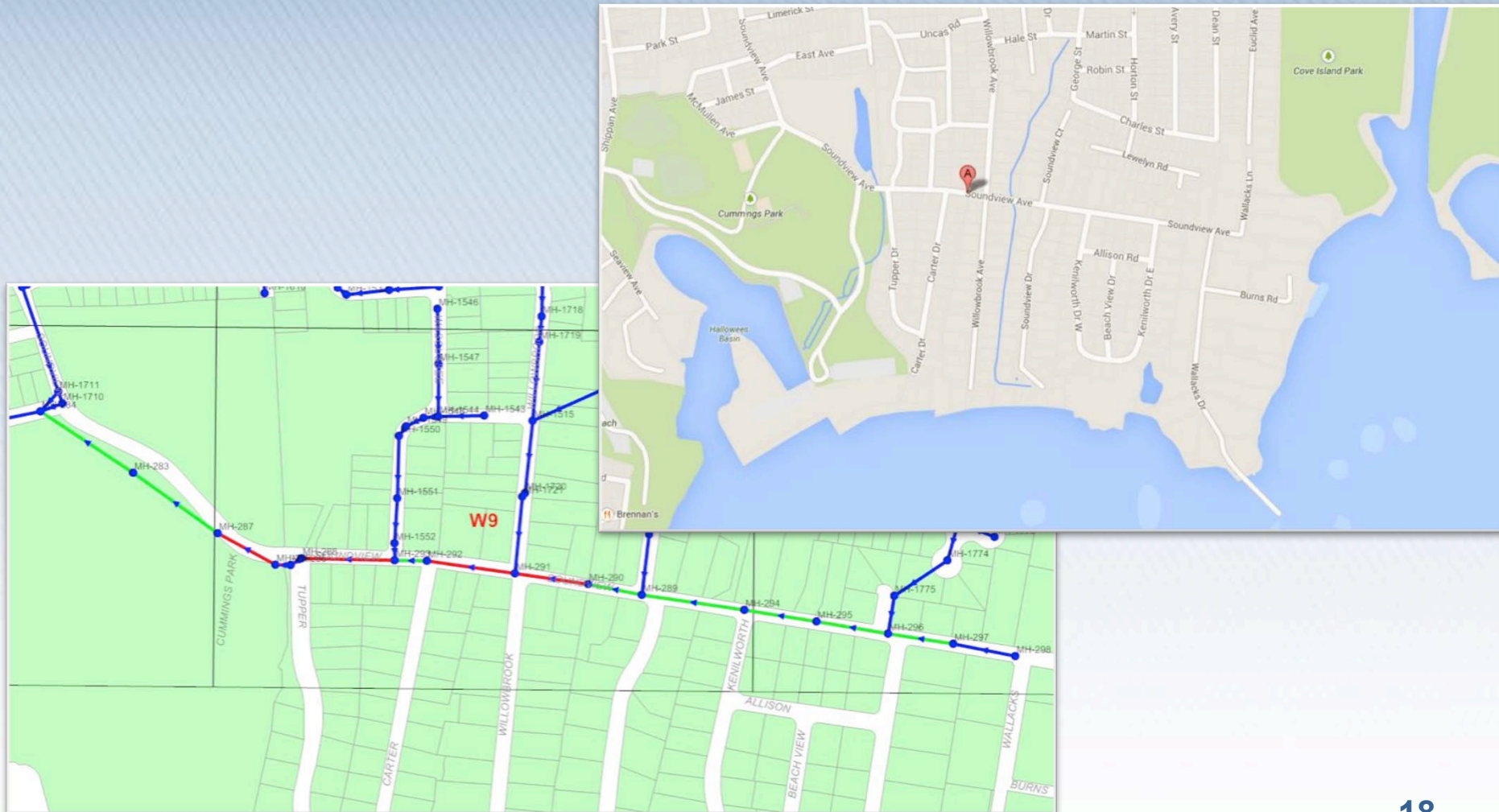
## Soundview Avenue

- 36" and 42" RCP Interceptor
- Rebar visible during inspection
- ~3,000LF of sewer in danger of collapse



# Recent Results

## Soundview Avenue Rehabilitation





# Recent Results

## Soundview Avenue Rehabilitation

- WPCA and W-P initiated design immediately
- Lining was preferred method:
  - Too deep for open cut
  - Too many laterals for sliplining
  - Linestop on upstream forcemains for bypass
- Precision Industrial Maintenance
  - Selected as contractor - very competitive bid
  - UV cured CIPP liner

# Recent Results

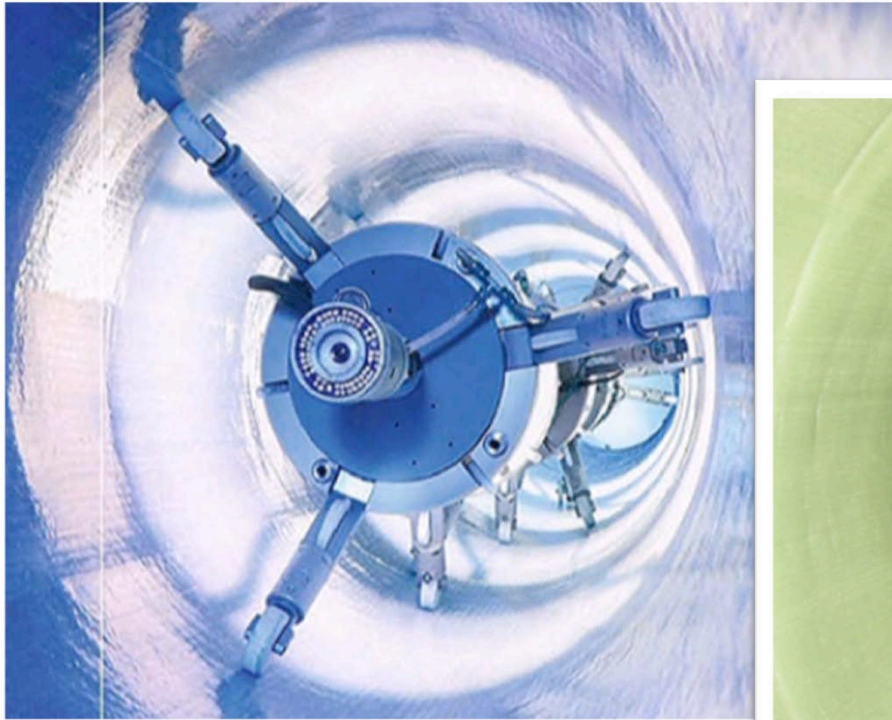
## Soundview Avenue Rehabilitation

- 3,000 LF of 18" HDPE by-pass required
- Differences with UV-cured CIPP
  - UV-Cured using fiberglass vs. “felt sock”
  - Winched into place vs. inverted
  - Quicker cure times are possible
  - Potential for less odor and noise complaints



# Recent Results

## Soundview Avenue Rehabilitation



# Acknowledgements

- Stamford WPCA:
  - Bill Brink, PE – Executive Director
  - Prakash Chakravarti, PE – Supervising Engineer
  - Stephen Pietrzyk - Regulatory Compliance Officer
- Wright-Pierce:
  - Dennis Dievert, Jr. PE – Project Manager
- RedZone Robotics, Inc.
- Precision Industrial Maintenance, Inc.



# Questions / Discussions

