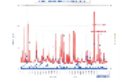


# City of Appleton I/I Overall Sewer Basin Ratings 2012 - 2016

**City of Appleton Stormwater Program**  
 10000 Appleton Ave  
 Appleton, WI 54912  
 920.833.2200  
[www.cityofappleton.com](http://www.cityofappleton.com)

**Program Focus Areas**  
 • Stormwater Management  
 • Sewer System Maintenance  
 • Public Works



**Storm Water Sampling and Testing**  
 • Regular sampling of stormwater for pollutants  
 • Testing for nutrients, metals, and other contaminants  
 • Results used to inform stormwater management practices



**Program Benefits and Goals**  
 • Reduce stormwater runoff  
 • Improve water quality  
 • Protect public health and the environment

**Private Lateral Policy Options**  
 • Property owners responsible for maintaining their own sewer laterals  
 • City provides technical assistance and enforcement

**Private Lateral Policy Challenges**  
 • Limited resources  
 • Lack of public awareness  
 • Enforcement difficulties

**Private Lateral Policy Options**  
 • Property owners responsible for maintaining their own sewer laterals  
 • City provides technical assistance and enforcement

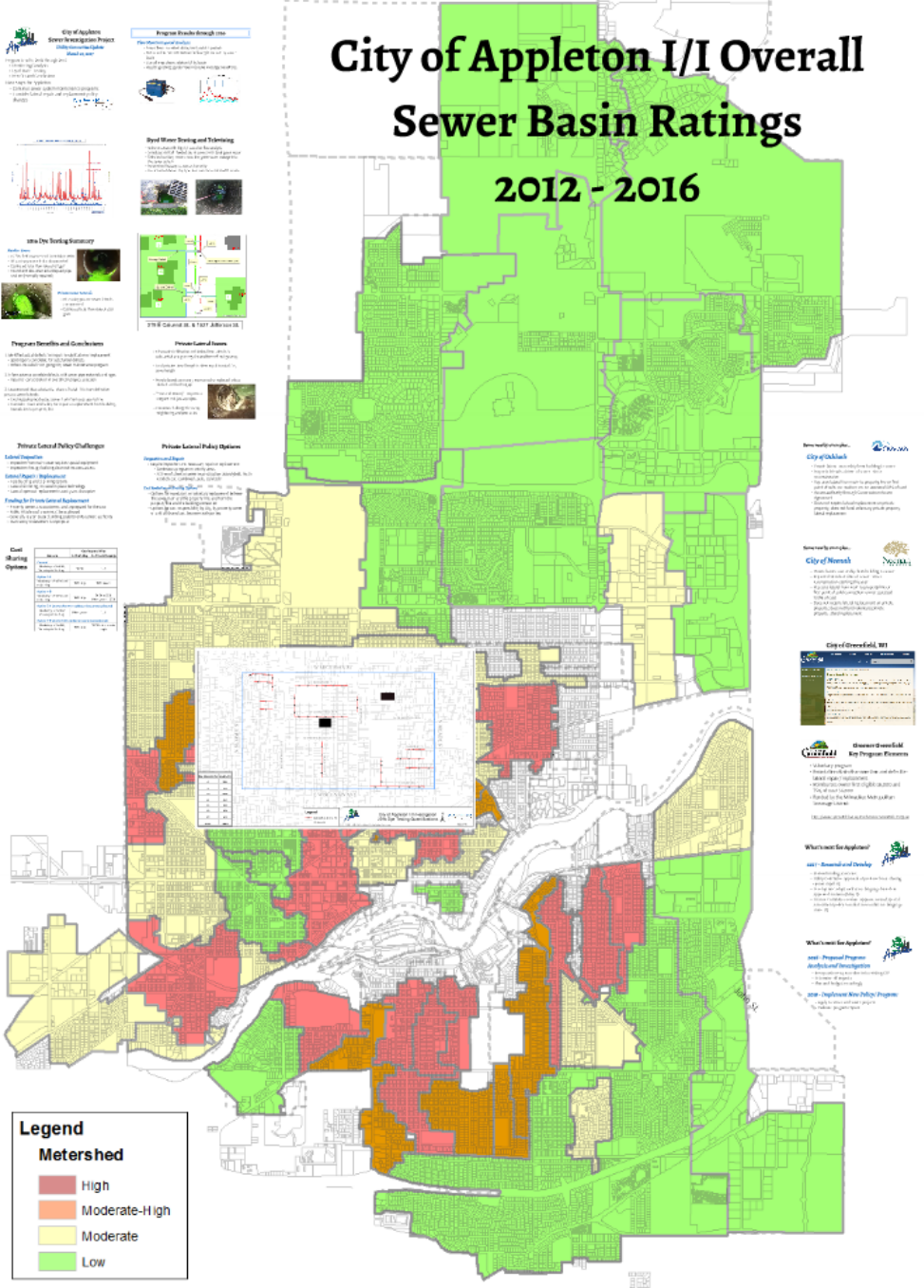
**Cost Sharing Options**

Option	Description
1	Property owner pays 100% of the cost of the lateral
2	Property owner pays 50% of the cost of the lateral
3	Property owner pays 25% of the cost of the lateral
4	City pays 100% of the cost of the lateral

**Legend**

**Metershed**

- High
- Moderate-High
- Moderate
- Low



**City of Oakleaf**  
 • Stormwater Management  
 • Sewer System Maintenance  
 • Public Works

**City of Nesh**  
 • Stormwater Management  
 • Sewer System Maintenance  
 • Public Works

**City of Overfield, WI**  
 • Stormwater Management  
 • Sewer System Maintenance  
 • Public Works

**Overfield Rip Program**  
 • Riparian Zone Management  
 • Stream Bank Stabilization  
 • Wetland Restoration

**What's Next for Appleton?**  
 • Continued investment in stormwater infrastructure  
 • Public awareness campaigns  
 • Enforcement of stormwater regulations

**What's Next for Appleton?**  
 • Continued investment in stormwater infrastructure  
 • Public awareness campaigns  
 • Enforcement of stormwater regulations



2012-2016 Flow Monitoring I/I Quantification Overall Priority Ratings





# City of Appleton

## Sewer Investigation Project

*Utility Committee Update*

*March 21, 2017*

Program Results: 2012 through 2016

- Monitoring/ Analysis
- Dyed Water Testing
- Benefits and Conclusions

Next Steps for Appleton

- Continue sewer system maintenance programs
- Consider lateral repair and replacement policy changes

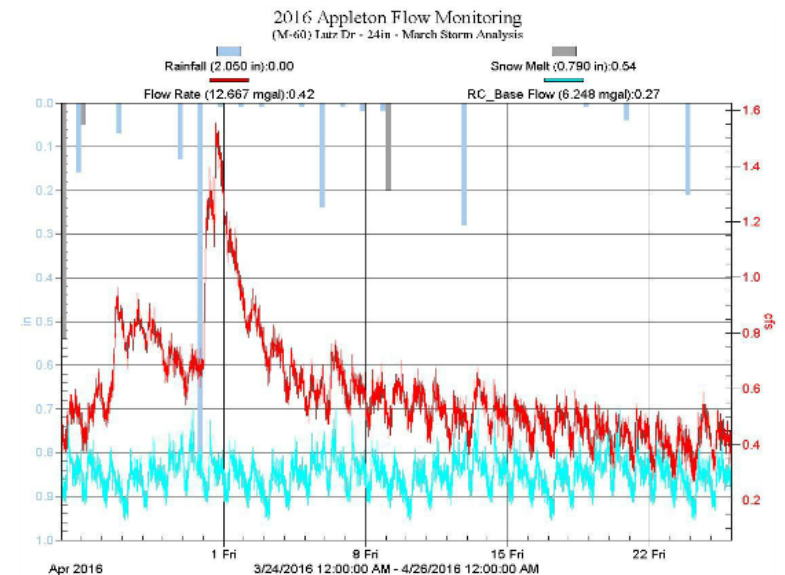
**R.A. Smith National**

*Beyond Surveying  
and Engineering*

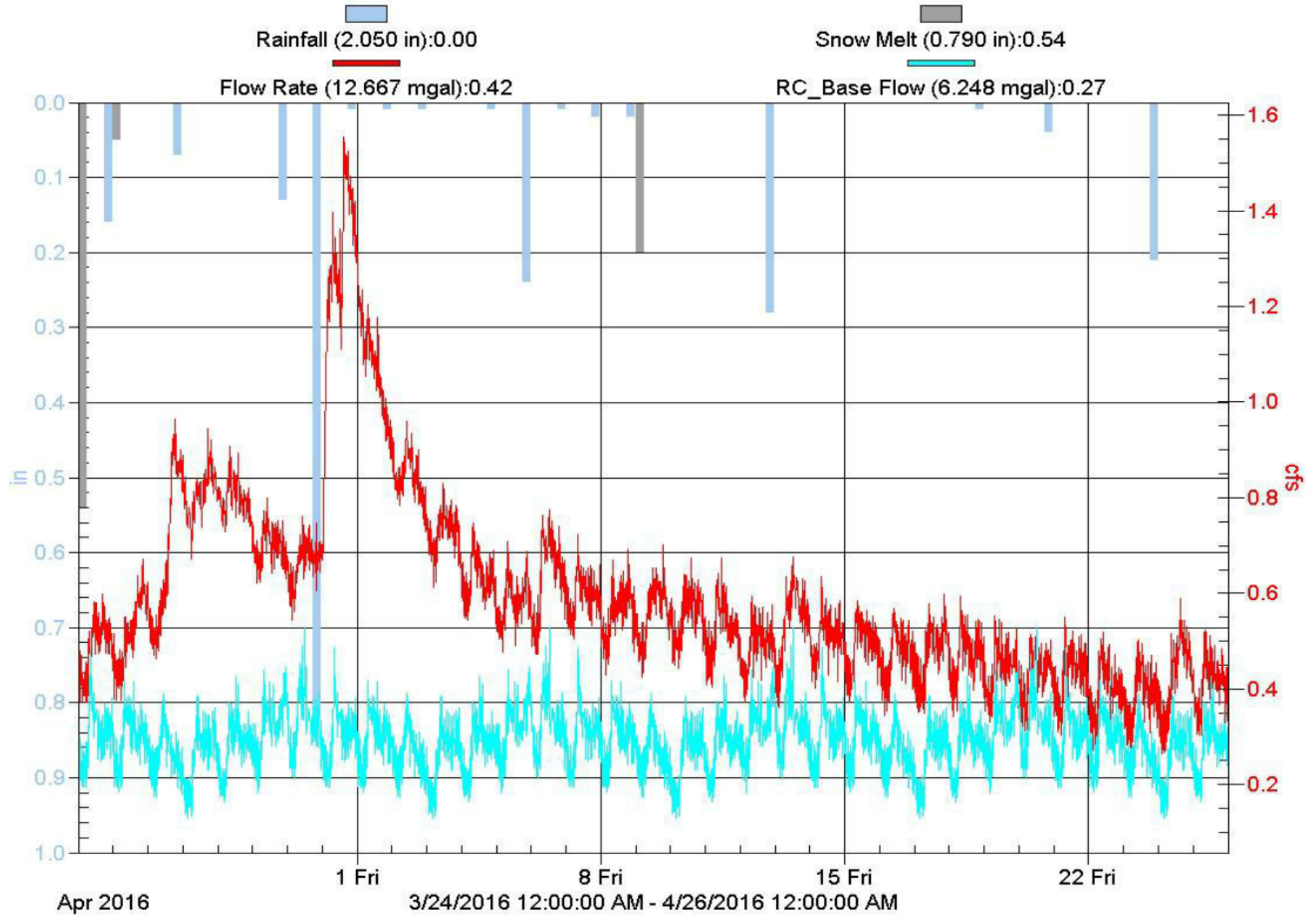
# Program Results through 2016

## *Flow Monitoring and Analysis*

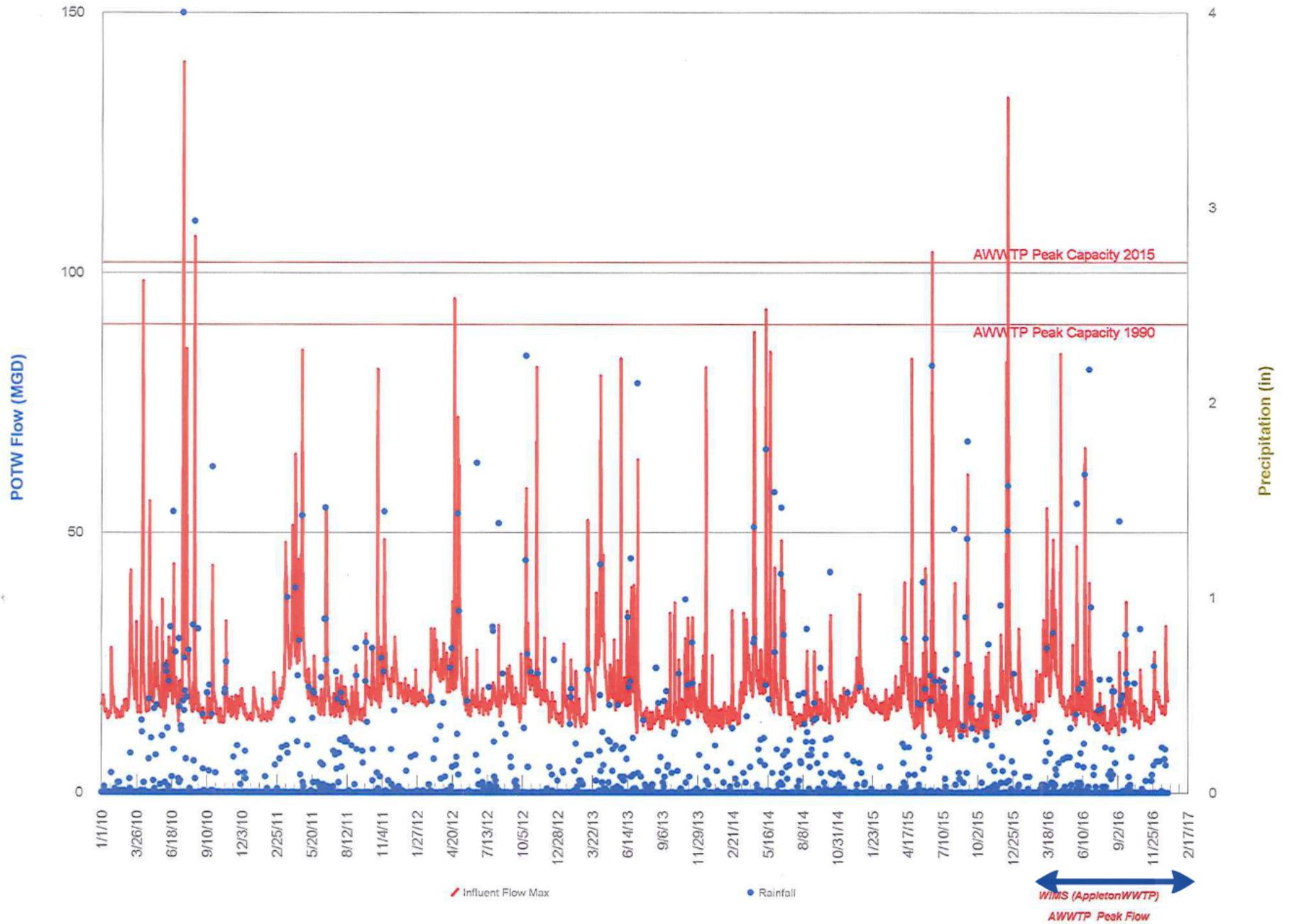
- Sewer flows recorded during wet and dry periods
- Data used to rate infiltration/ inflow (I/I) impact by sewer basin
- Overall map shows relative I/I by basin
- Resulting ratings guide more intensive investigative efforts



# 2016 Appleton Flow Monitoring (M-60) Lutz Dr - 24in - March Storm Analysis



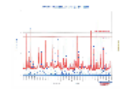
# AWWTP Influent Maximum Flow 2010-2016



# City of Appleton I/I Overall Sewer Basin Ratings

## 2012 - 2016

**City of Appleton**  
**Water Conservation Program**  
**Water Conservation System**  
**March 2017**



**Program Goals and Objectives**  
 The City of Appleton's Water Conservation Program is designed to reduce water consumption and improve water efficiency throughout the community. The program focuses on residential, commercial, and industrial sectors, with the goal of reducing water usage by 10% over the next five years.

**Private Sewer Policy Challenges**  
 The City of Appleton faces several challenges in implementing a private sewer policy, including the need for increased funding, the complexity of rate structures, and the need for public education and outreach.

**GIS Sharing System**

System	URL
City of Appleton GIS	http://gis.cityofappleton.com
City of Appleton Water	http://water.cityofappleton.com

**Program Results Through 2016**  
 The City of Appleton's Water Conservation Program has achieved significant results through 2016, including a 10% reduction in water consumption and the installation of over 10,000 water-saving devices.

**Special Water Saving and Fixing**  
 The City of Appleton offers a special water saving and fixing program for residents who are unable to afford the cost of water-saving devices. The program provides free or low-cost water-saving devices to eligible residents.



**Private Sewer Policy**  
 The City of Appleton is currently reviewing a private sewer policy to address the challenges of providing sewer service to private property owners. The policy is expected to be implemented in the next few years.

**Private Sewer Policy System**  
 The City of Appleton is currently reviewing a private sewer policy to address the challenges of providing sewer service to private property owners. The policy is expected to be implemented in the next few years.

**Legend**

**Metershed**

- High
- Moderate-High
- Moderate
- Low



2012-2016 Flow Monitoring I/I Quantification Overall Priority Ratings



- Service Examples:**
  - City of Duluth
  - City of Menasha
  - City of Greenfield, WI
  - Greenfield, WI Key Program Elements
- What's new for Appleton?**
  - 2017 - Sewer and Drainage
  - 2018 - Proposed Program
  - 2019 - Proposed Program
  - 2020 - Proposed Program

# Dyed Water Testing and Televising

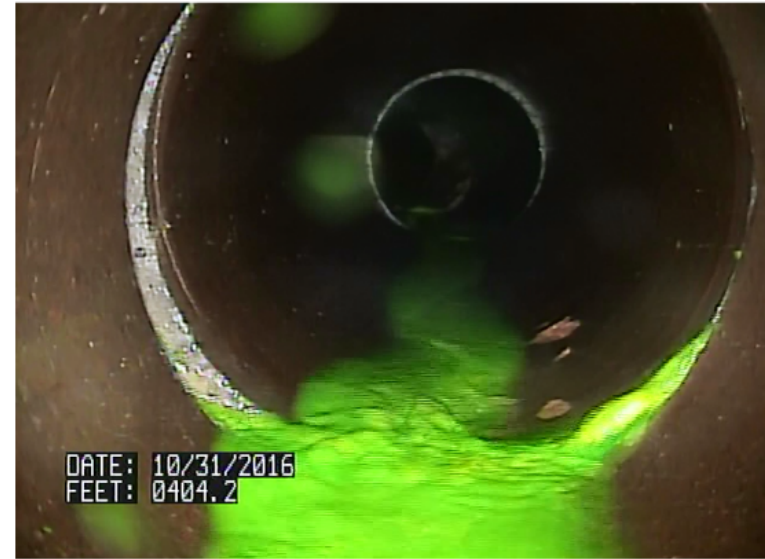
- Selected areas with high I/I based on flow analysis
- Simulated rainfall; flooded storm sewers with dyed green water
- Televised sanitary sewers; recorded green water leakage into the sewer system
- Determined leakage source and severity
- Documented defects by type, location and estimated flow rate



# 2016 Dye Testing Summary

## *Mainline Sewers*

- 14,316 lf of sewer tested in October 2016
- 56 sanitary sewer leaks documented
- Estimated total flow rate of 67 gpm
- Found and documented collapsed pipe section (Promptly repaired)

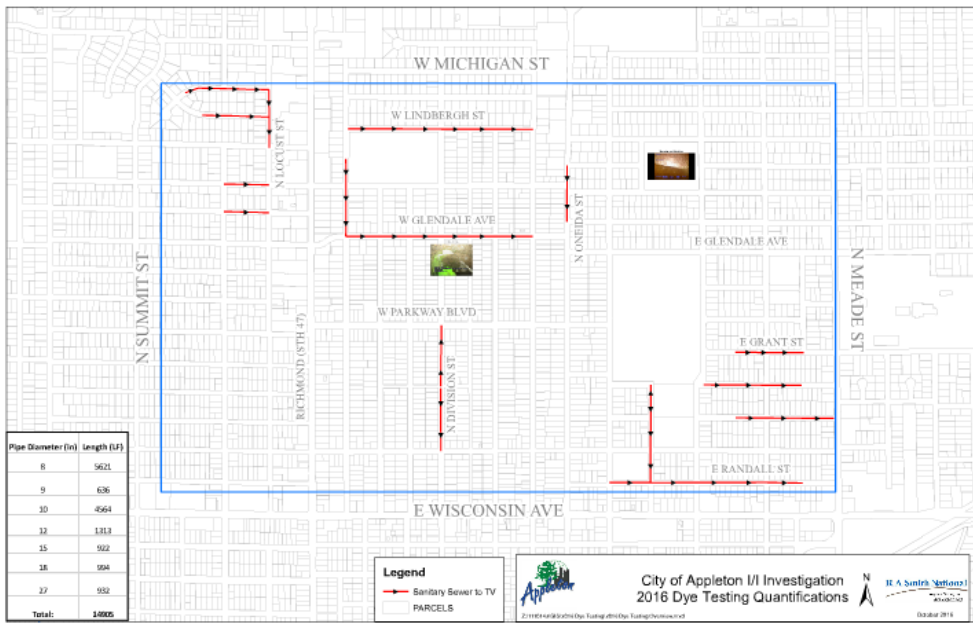


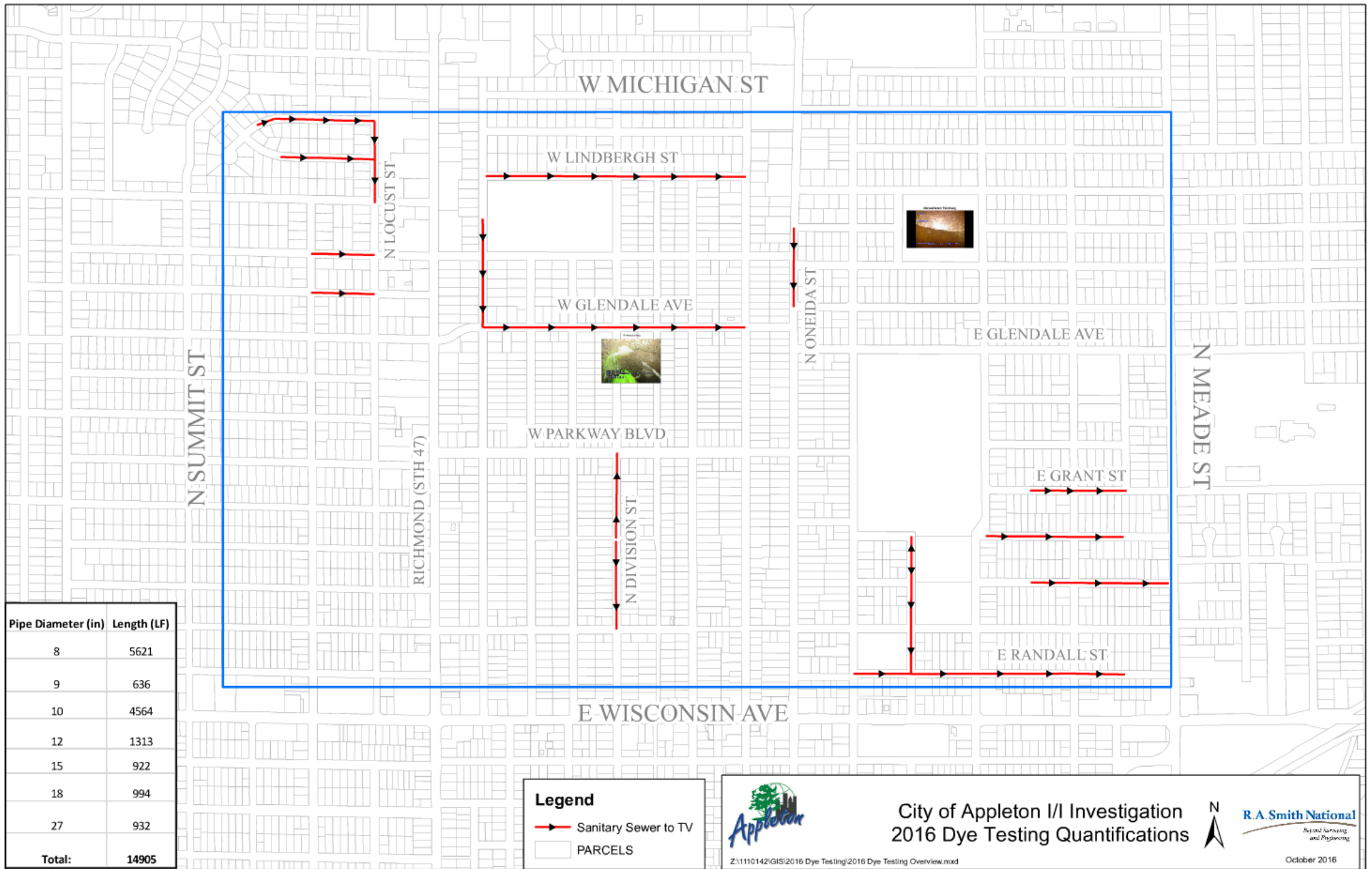
## *Private Sewer Laterals*

- 61 leaking private sewer laterals documented
- Estimated total flow rate of 220 gpm



Ability	Private Property
N/A	
37% Owner	
1/50 to 25 ft	Owner > 25 ft
erty (lateral)	
N/A	
erty (lateral)	
0 entire private	length





Pipe Diameter (in)	Length (LF)
8	5621
9	636
10	4564
12	1313
15	922
18	994
27	932
<b>Total:</b>	<b>14905</b>

**Legend**

- Sanitary Sewer to TV
- PARCELS



City of Appleton I/I Investigation  
2016 Dye Testing Quantifications



**R.A. Smith National**  
Surveying  
and Engineering

October 2016

Z:\1110142\GIS\2016 Dye Testing\2016 Dye Testing Overview.mxd

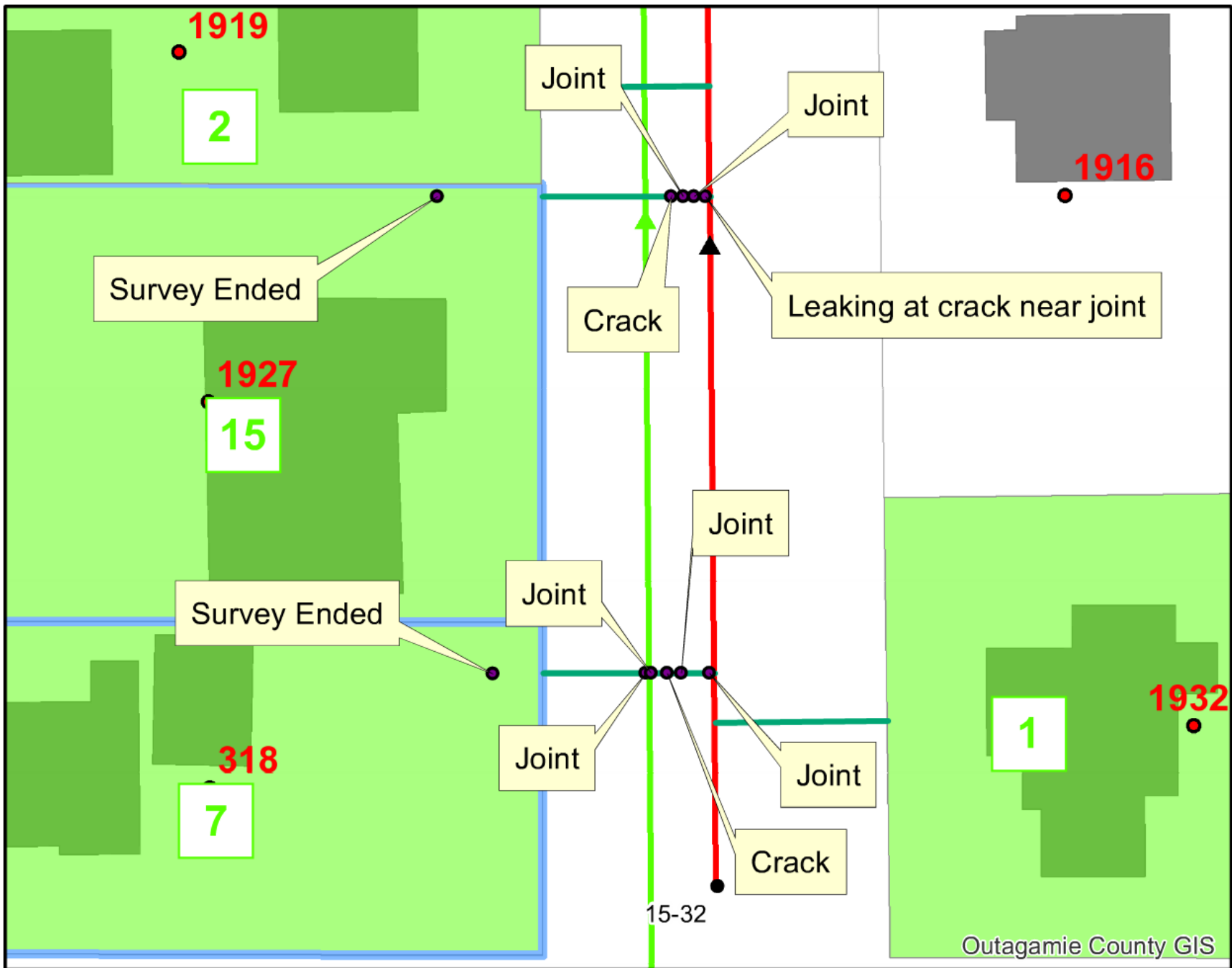
# Normal Sewer Televising



# W. Glendale Avenue



INCIDENT CODE: IG  
INCIDENT DESCRIPTION: INFILTRATION - GUSHER  
FEET: 0127.0  
POSITION: 9 TO 3



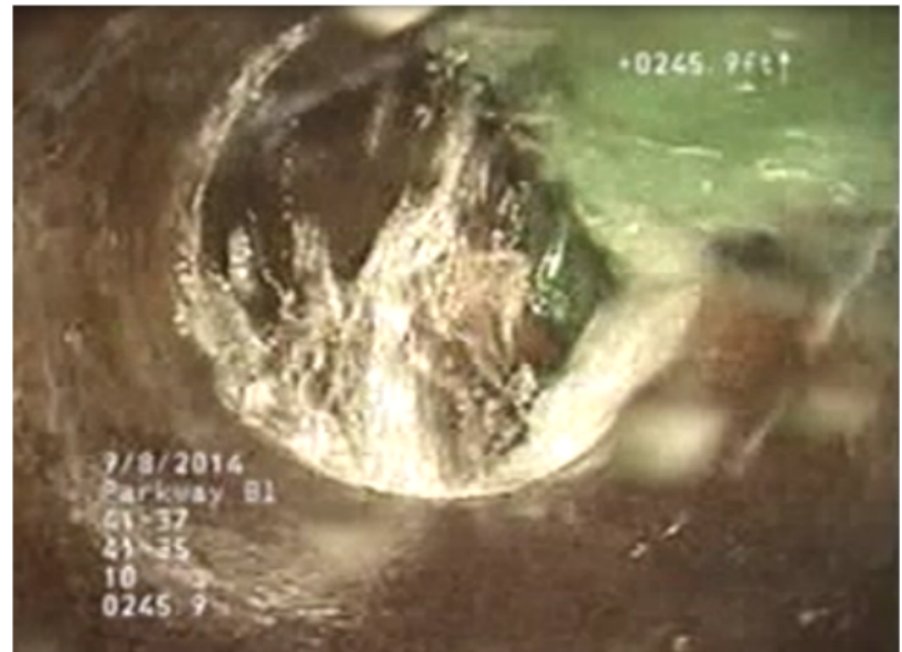
318 E Calumet St. & 1927 Jefferson St.

# Program Benefits and Conclusions

1. Identified actual defects for repair, rehabilitation or replacement
  - Spot repairs completed for substantial defects
  - Others included in on-going City sewer maintenance program
2. Information to correlate defects with sewer pipe materials and ages
  - Input for consideration in overall CIP project selection
3. Documented that substantial share of total I/I is from defective private sewer laterals
  - Existing policy addresses sewer from main to property line
  - Consider issues and policy for repair or replacement from building foundation to property line

# Private Lateral Issues

- Clearwater infiltration and inflow from laterals is substantial and growing; the problem will not go away
- Total private lateral length is often equal to total City sewer length
- Private laterals are rarely maintained or replaced unless blocked and backing up
- "Time and Money" - requires a program, not just a project
- Common challenge for many neighboring and peer cities



# Private Lateral Policy Challenges

## *Lateral Inspection*

- Inspection from main sewer requires special equipment
- Inspection through building clean-out requires access

## *Lateral Repair / Replacement*

- Pipe bursting and slip lining options
- Lateral slip lining, or cured-in-place technology
- Lateral open-cut replacement is costly and disruptive

## *Funding for Private Lateral Replacement*

- Property owners unaccustomed and unprepared for the cost
- Public-Private cost share must be addressed
- Generally rely on State plumbing code for enforcement authority
- Mandatory replacement is unpopular



# Private Lateral Policy Options

## *Inspection and Repair*

- Require inspection and necessary repair or replacement:
  - Continuous program in priority areas
  - At time of street or sewer reconstruction (*Marshfield, North Fond du Lac, Combined Locks, Oshkosh*)

## *Cost Reduction or Sharing Options*

- Options for mandatory or voluntary replacement between the sewer main and the property line, and from the property line and the building connection
- Options for cost responsibility by City, by property owner or split as shared cost between both parties



# Cost Sharing Options

Scenario	Cost Responsibility	
	In Rt-of-Way	On Private Property
<b><i>Current</i></b>		
Mandatory in R-of-W; Voluntary to Building	50/50	N/A
<b><i>Option 1-A</i></b>		
Mandatory in R-of-W and to Building	100% City	100% Owner
<b><i>Option 1-B</i></b>		
Mandatory in R-of-W and to Building	100% City	50/50 to 25 ft 100% Owner > 25 ft
<b><i>Option 2-A (Owner does NOT replace private property lateral)</i></b>		
Mandatory in R-of-W; Voluntary to Building	100% Owner	N/A
<b><i>Option 2-B (Owner DOES replace private property lateral)</i></b>		
Mandatory in R-of-W; Voluntary to Building	100% City	50/50 entire private length

# What's next for Appleton?



## *2017 - Research and Develop*

- Review funding scenarios
- Utility Committee approval of preferred cost sharing option (April 11)
- Develop and adopt ordinance language based on approved scenario (May 9)
- Finance Committee review/ approve revised special assessment policy to reflect new ordinance language (June 13)

# What's next for Appleton?



## *2018 - Proposed Program*

### *Analysis and Investigation*

- Incorporate new procedure into existing CIP
- Determine all impacts
- Plan and budget accordingly

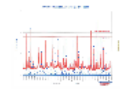
## *2019 - Implement New Policy/ Program*

- Apply to street and sewer projects
- Evaluate program impact

# City of Appleton I/I Overall Sewer Basin Ratings

## 2012 - 2016

**City of Appleton**  
**Water Conservation Program**  
**Water Conservation System**  
**March 2017**



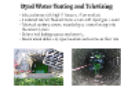
**Program Goals and Objectives**  
 The City of Appleton's Water Conservation Program is designed to reduce water consumption and improve water efficiency throughout the community. The program focuses on residential, commercial, and industrial sectors, with the goal of reducing water usage by 10% over the next five years.

**Private Sewer Policy Challenges**  
 The City of Appleton faces several challenges in implementing a private sewer policy, including the need for increased funding, the complexity of rate structures, and the need for improved infrastructure. The city is currently exploring various options to address these challenges and ensure the long-term sustainability of the sewer system.

**GIS Sharing System**

System Name	URL
City of Appleton GIS	http://gis.cityofappleton.com
City of Appleton Water	http://water.cityofappleton.com

**Program Goals and Objectives**  
 The City of Appleton's Water Conservation Program is designed to reduce water consumption and improve water efficiency throughout the community. The program focuses on residential, commercial, and industrial sectors, with the goal of reducing water usage by 10% over the next five years.



**Private Sewer Policy Challenges**  
 The City of Appleton faces several challenges in implementing a private sewer policy, including the need for increased funding, the complexity of rate structures, and the need for improved infrastructure. The city is currently exploring various options to address these challenges and ensure the long-term sustainability of the sewer system.

**Private Sewer Policy Challenges**  
 The City of Appleton faces several challenges in implementing a private sewer policy, including the need for increased funding, the complexity of rate structures, and the need for improved infrastructure. The city is currently exploring various options to address these challenges and ensure the long-term sustainability of the sewer system.

**Legend**

**Metershed**

- High
- Moderate-High
- Moderate
- Low



2012-2016 Flow Monitoring I/I Quantification Overall Priority Ratings



**Service Examples**  
**City of Duluth**  
 The City of Duluth has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.

**Service Examples**  
**City of Newark**  
 The City of Newark has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.

**Service Examples**  
**City of Greenfield, NH**  
 The City of Greenfield, NH has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.

**Service Examples**  
**Greenfield, NH**  
 The City of Greenfield, NH has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.

**What's new for Appleton?**  
**Water Conservation Program**  
 The City of Appleton has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.

**What's new for Appleton?**  
**Water Conservation Program**  
 The City of Appleton has implemented a comprehensive water conservation program that includes public education campaigns, water audits for businesses, and the installation of water-saving devices in public buildings.



# City of Appleton

## Sewer Investigation Project

*Utility Committee Update*

*March 21, 2017*

Program Results: 2012 through 2016

- Monitoring/ Analysis
- Dyed Water Testing
- Benefits and Conclusions

Next Steps for Appleton

- Continue sewer system maintenance programs
- Consider lateral repair and replacement policy changes

**R.A. Smith National**

*Beyond Surveying  
and Engineering*