



# Inflow & Infiltration – I&I

---



Eric Hoversten – City Manager/Public Works Director  
Brian Simmons - Assistant City Engineer

# February 23, 2016

---

- Rates – How we're billed by the Metropolitan Council
- Risk and sensitivity
- Annualized Cost of I/I
- Sewershed Risk Analysis
- I&I Analysis Update
- Applying Rehab Prioritization

# MCES Sewer Rates

---

- MCES Assigns service fee based on total METRO WIDE cost
- METRO WIDE is proportioned to contributors based on % of total flow
- 2016 rates based on:
  - 2015 Flows
  - 2016 Projected Total Operating Budget of \$201mil (O&M, Capitol Improvements, Repairs, Staff, Debt Service)

# MCES Sewer Rates

---

- Mound 2015 Flow: 284.5 million gallons
- Total Metro Area Flow: 85,600 million gallons
- Mound = 0.33% of the Total Metro Area Flow
  - Based on this % Mound's 2016 bill is ~\$670,000
- Checks and Balances >
  - Mound's ~10k is about 0.3% of total area population
  - This passes the smell test

# 2015 Rates in Contrast

---

- 2015 MCES Total Operating Cost: \$190mil (O&M, Capitol Improvements, Repairs, Staff, Debt Service)
- Mound's 2014 Flow: 370 million gallons
- Total Metro Area Flow: 91,500 million gallons
- Mound = 0.40% of the Total Metro Area Flow
  - Based on this % Mound's 2015 bill is/was \$770,000
- Checks and Balances
  - Mound is (still) 0.3% of total area population
  - Something is different between 2015 and 2016
  - \$100,000 Difference

# Sensitivity Analysis

- Total Flows: Mound experienced a 40% increase over normalized annual flows
- The Metro Area experienced a 7% increase over normalized annual flows
- Local Comparators:

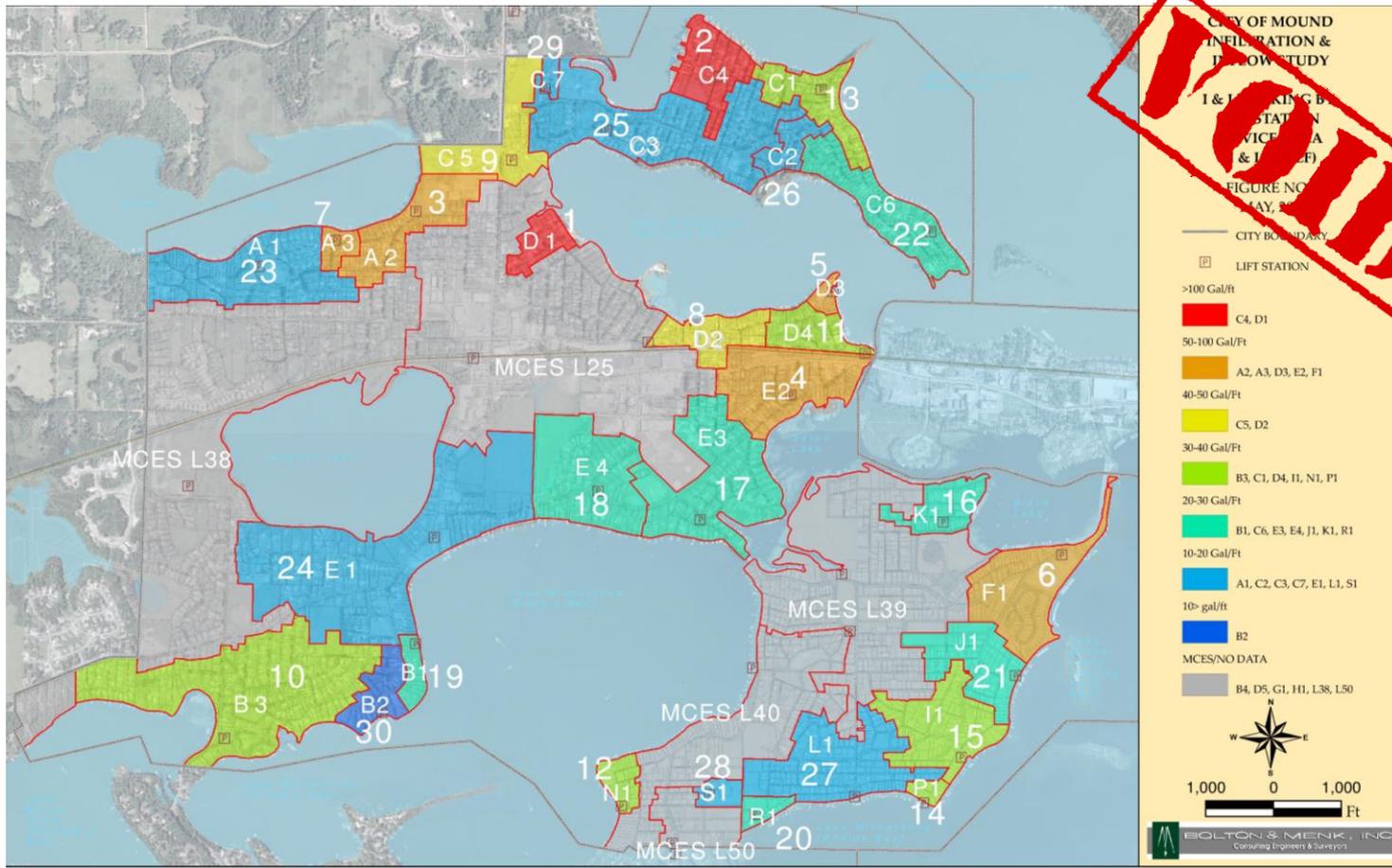
	2014 Flow (milgal)	% Total Metro Area	2015 Flow (mil gal)	% Total Metro Area	% Change	Tariff Change
Mound	370	0.40%	285	0.33%	30%	+0.07%
Deephaven	157	0.17%	171	0.20%	-8%	-0.03%
Excelsior	76.6	0.08%	68.8	0.08%	11%	0.00%
Greenwood	11	0.01%	16.4	0.02%	-32%	-0.01%
Long Lake	97.77	0.10%	87	0.10%	11%	0.00%
Mtka Beach	22.2	0.02%	19	0.02%	16%	0.00%
Minnetrista	137.4	0.15%	107	0.12%	28%	+0.03%
Shorewood	292.3	0.31%	250	0.29%	17%	+0.02%
Spring Park	91.6	0.10%	84.8	0.10%	8%	0.00%
Tonka Bay	88.8	0.10%	80.4	0.09%	10%	+0.01%
Wayzata	212.3	0.23%	192	0.22%	10%	+0.01%

# Total Annualized Cost of I&I

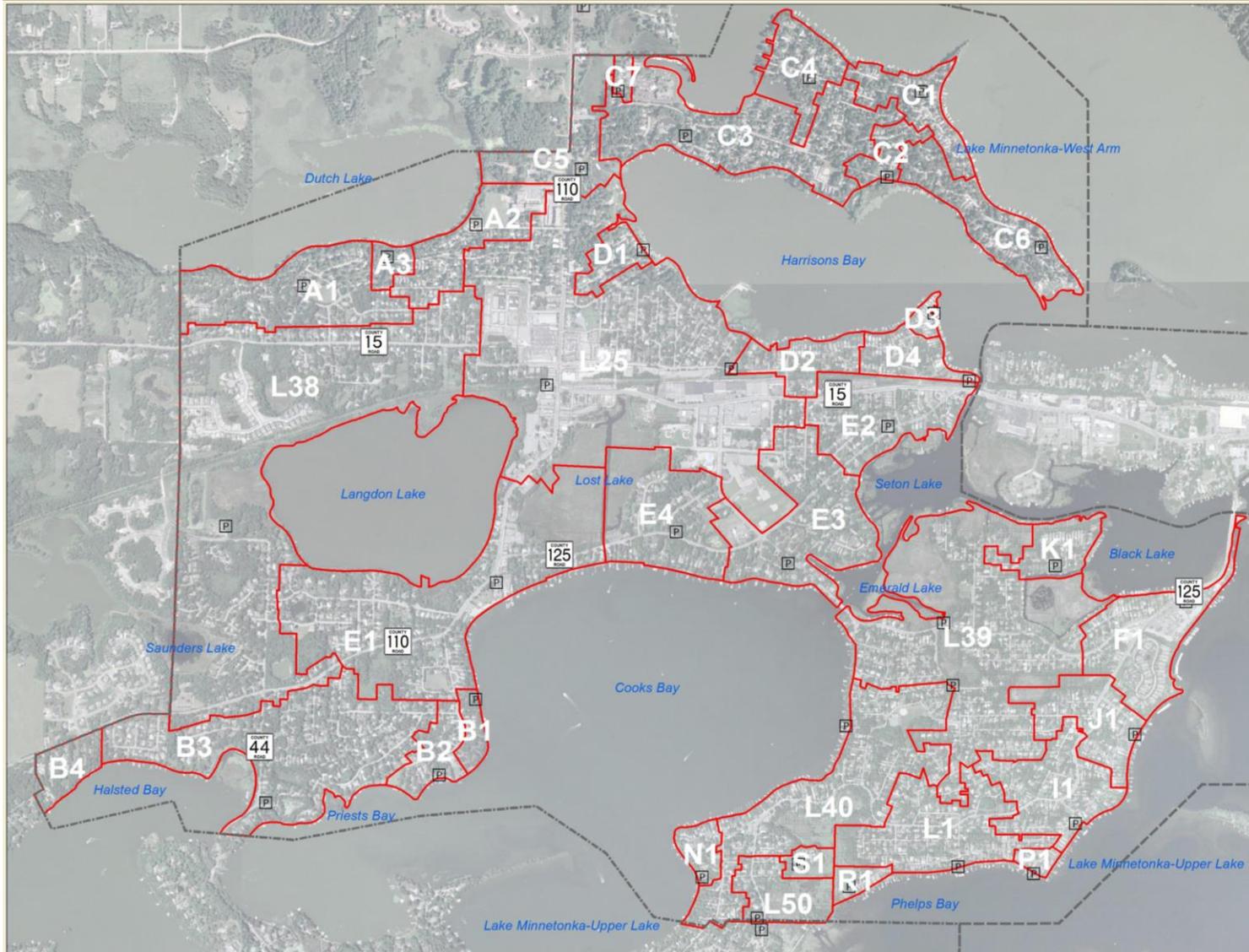
- Absolute Fixed Cost – Real Dollars
  - Fiscal Years 2015-2018: I&I Surcharge = \$250,000
  - 2015 hit compared to 285 mil gal normal flow = \$175k
  - 2015 hit compared to 0.33% total flow = \$150k
  - 2015 actual rate hit = \$100k
- Softer Dollars – what if we completely eliminate I&I?
  - Sewer flow = potable water sold = 200 million gallons
  - 200 mil gal = 0.23% of Total Metro Area Flows
  - 0.23% = \$469,000 sewer rate for 2015
- The Cost of I&I is ~\$200,000 per year
- Over the period of 2015-2018 I&I cost = \$2,000,000

# Inflow and Infiltration Analysis Update

- Major need is to “fill in the gaps” and eliminate the “white space” from the 2007 study



# Inflow and Infiltration Analysis Update



INFILTRATION & INFLOW  
2016 UPDATE

## Legend

- Lift Stations
- City Boundary
- Parcel Boundaries



0 1,000  
Feet

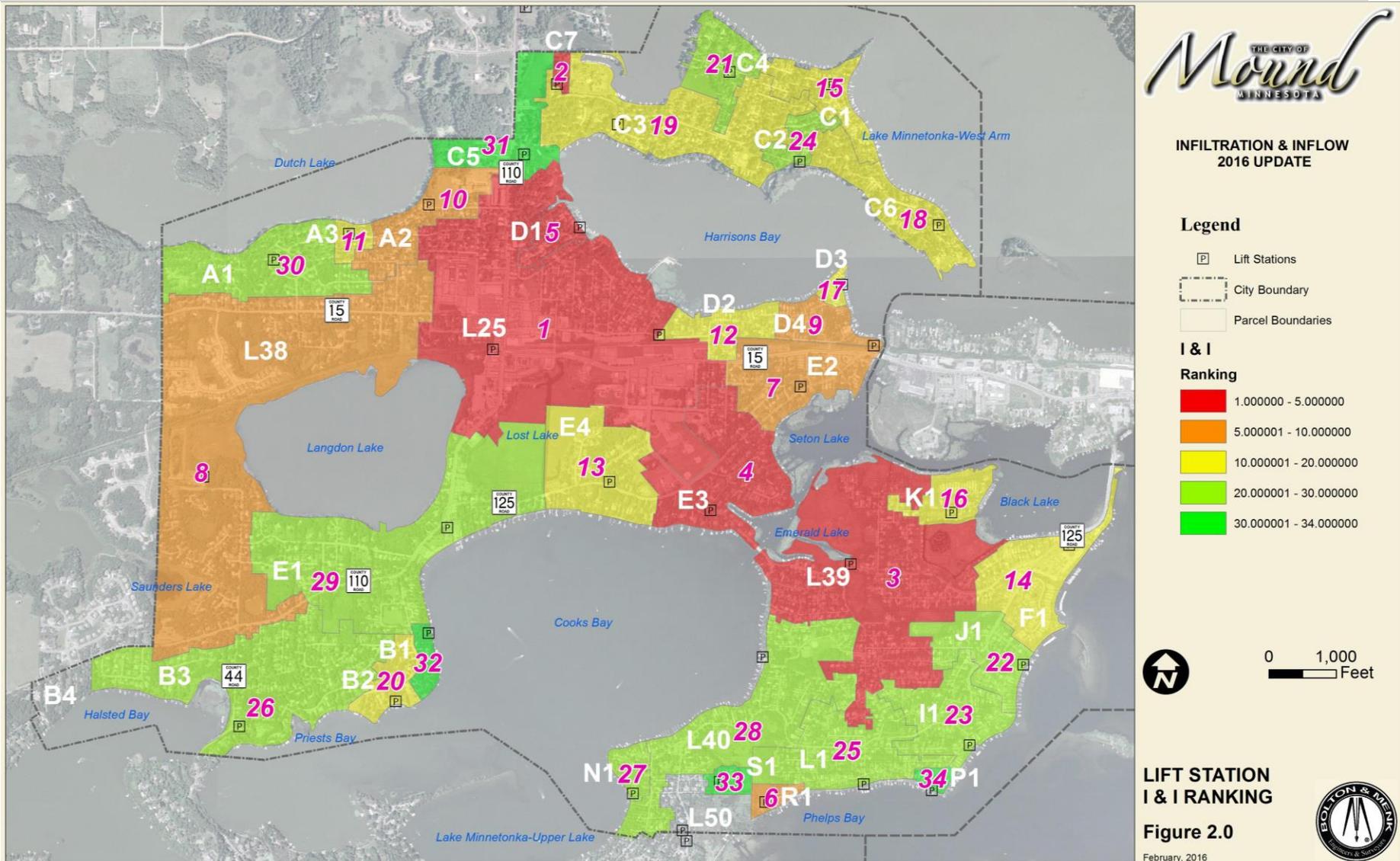
LIFT STATION  
SEWERSHEDS

Figure 1.0

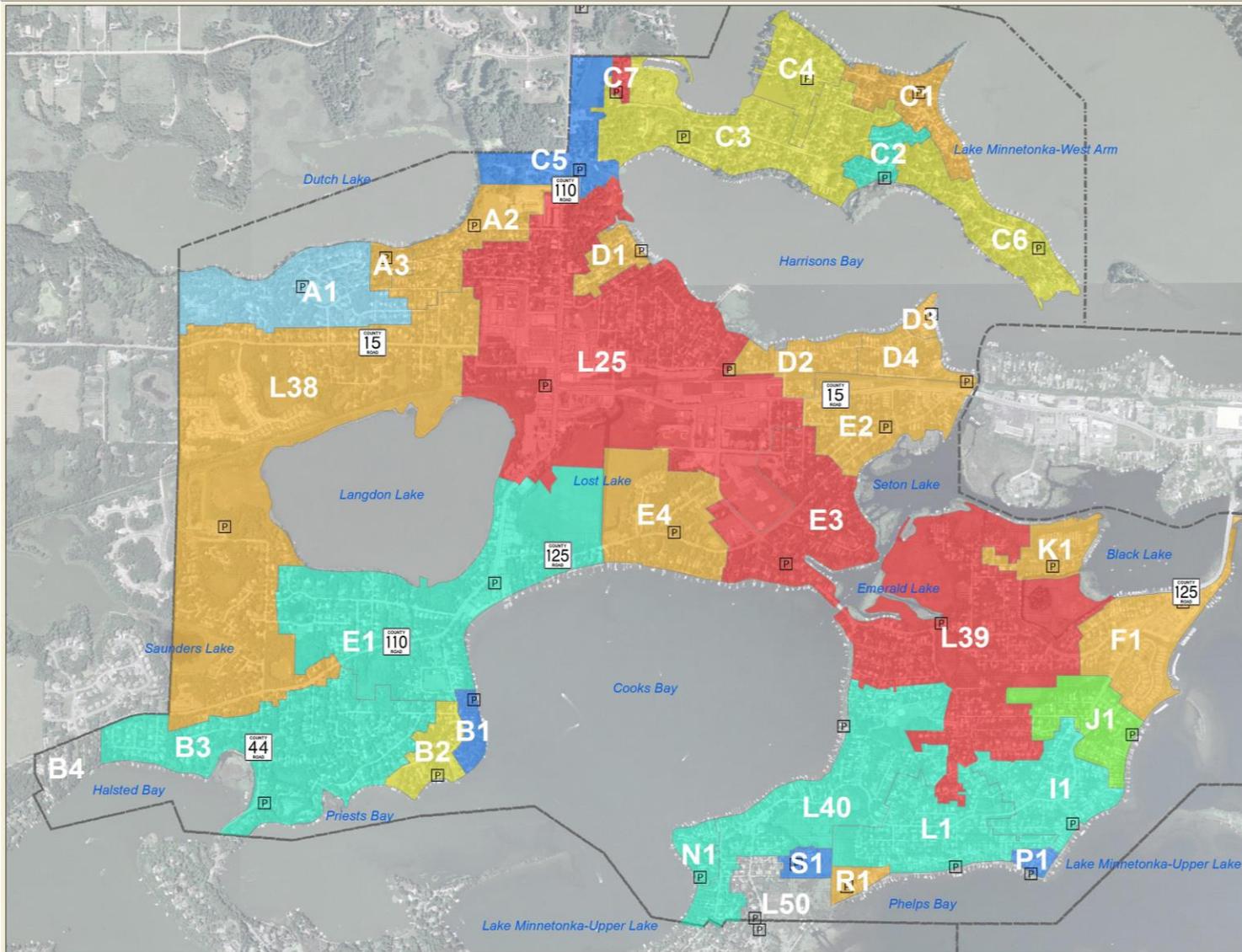
February, 2016



# Inflow and Infiltration Analysis Update – I & I Rankings by Sewershed



# Inflow and Infiltration Analysis Update – I & I in gallons per foot of pipe by Sewershed



## INFILTRATION & INFLOW 2016 UPDATE

### Legend

- Lift Stations
- City Boundary
- Parcel Boundaries

### I & I

#### Gallons per ft of pipe

- 1.033210 - 10.000000
- 10.000001 - 20.000000
- 20.000001 - 30.000000
- 30.000001 - 40.000000
- 40.000001 - 50.000000
- 50.000001 - 100.000000
- 100.000001 - 507.996812



0 1,000  
Feet

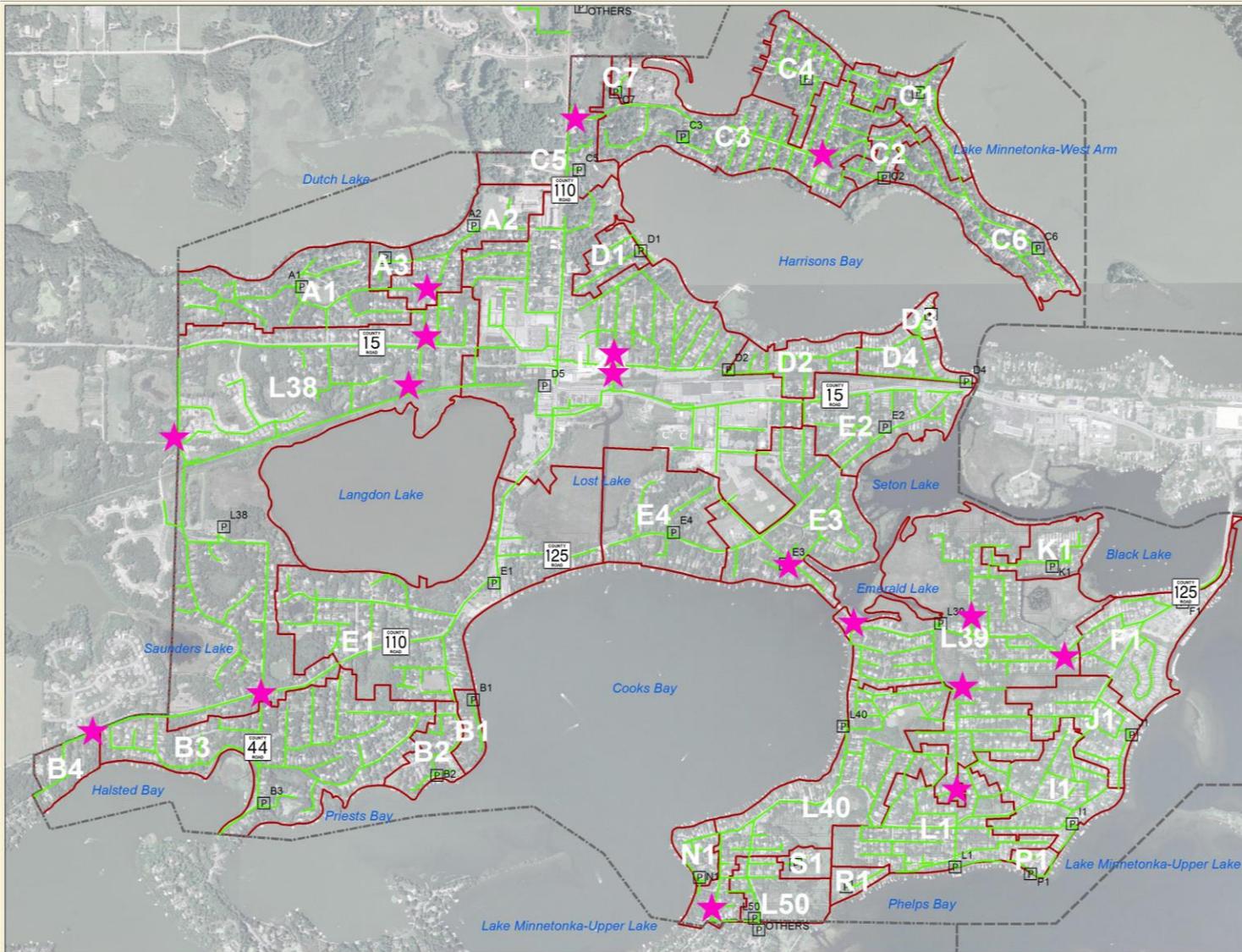
### LIFT STATION I & I / FT of PIPE

Figure 3.0

February, 2016



# Inflow and Infiltration Analysis Update – Critical Flow and Meter Points



**INFILTRATION & INFLOW  
2016 UPDATE**

**Legend**

-  Lift Stations
-  Sanitary Sewer
-  City Boundary
-  Parcel Boundaries



0 1,000  
Feet

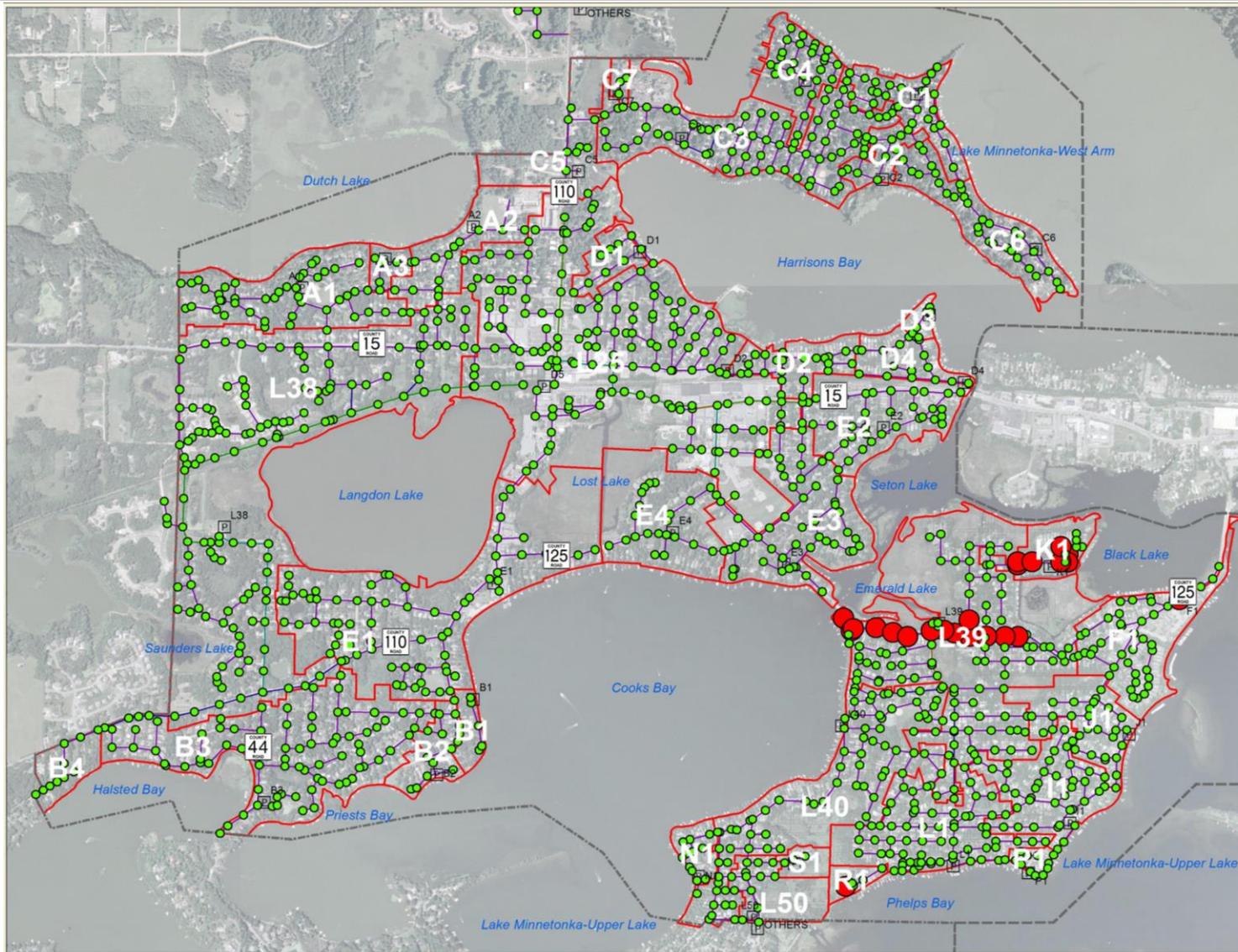
**CRITICAL FLOW &  
METER POINTS**

**Figure 4.0**

February, 2016



# Inflow and Infiltration Analysis Update – Sewer at/below lake/groundwater level



INFILTRATION & INFLOW  
2016 UPDATE

### Legend

-  Lift Stations
-  City Boundary
-  Parcel Boundaries

### Manholes Below Lake Level

-  NO
-  YES



0 1,000  
Feet

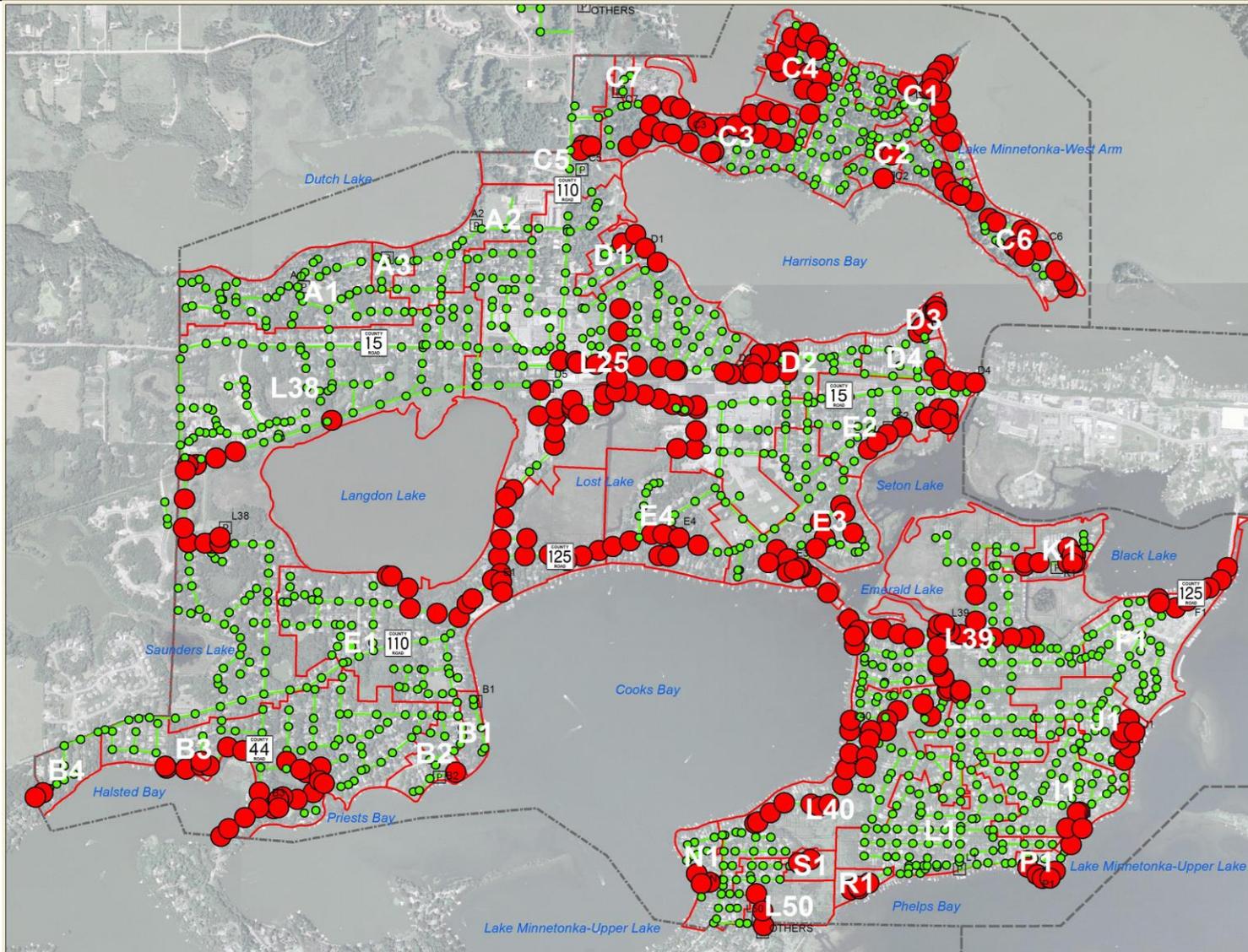
SEWER INFRASTRUCTURE  
BELOW LAKE AND  
GROUNDWATER  
LEVEL - 929.30

Figure 5.0

February, 2016



# Inflow and Infiltration Analysis Update – Sewer at/below RECORD lake/groundwater level



INFILTRATION & INFLOW  
2016 UPDATE

### Legend

- P Lift Stations
- City Boundary
- Parcel Boundaries
- Manholes Below Record Level**
- NO
- YES



0 1,000  
Feet

SEWER INFRASTRUCTURE  
BELOW RECORD  
LEVEL - 931.05

Figure 6.0

February, 2016



# Sensitivity - Again

## CITY OF MOUND INFILTRATION & INFLOW STUDY

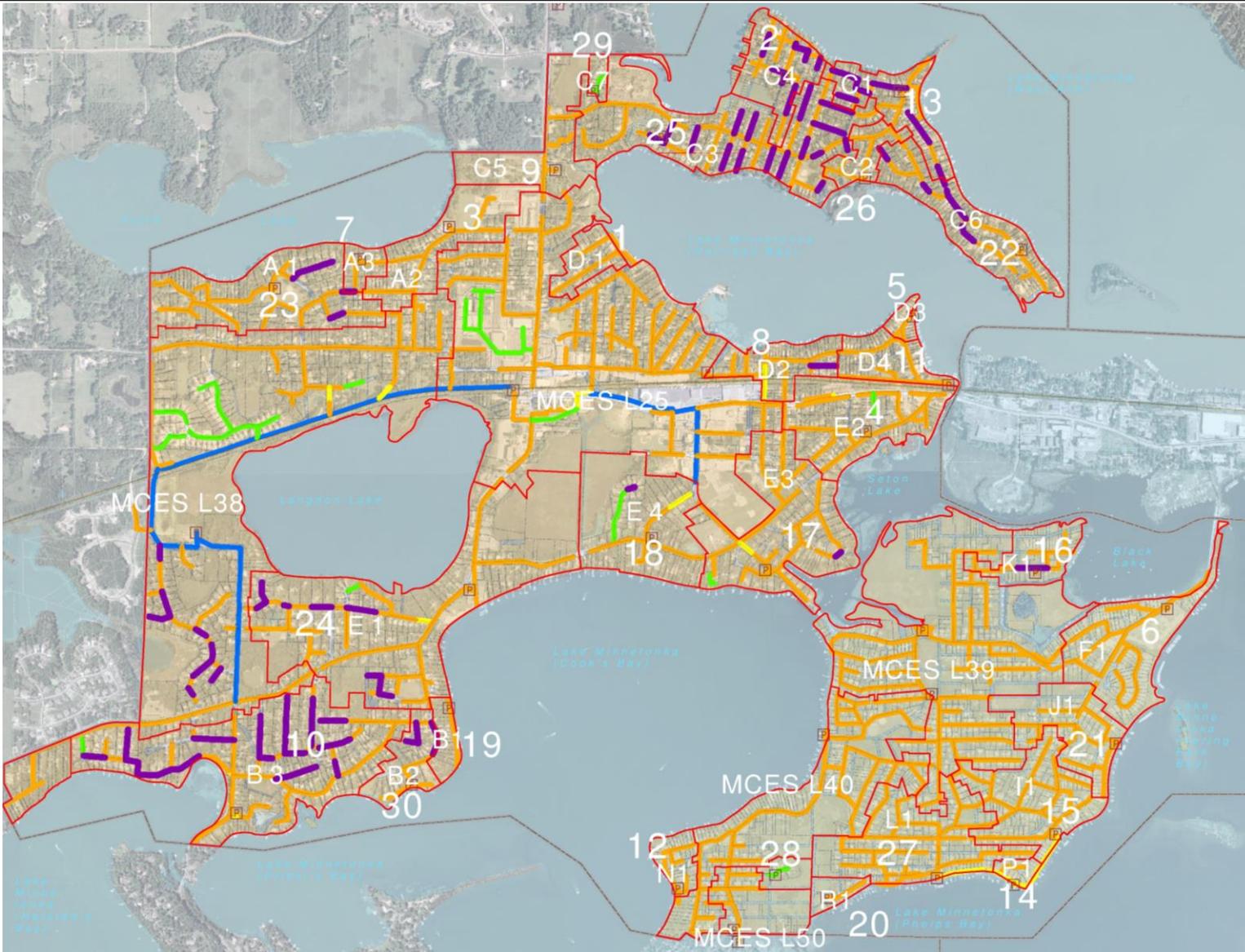
### PIPE MATERIALS

FIGURE NO. 4  
MAY, 2007

- CITY BOUNDARY
- LIFT STATION
- CLAY (VCP)
- METAL (DIP/CIP)
- PLASTICS (PVC)
- CONCRETE (RCP)
- PREVIOUSLY LINED



1,000 0 1,000  
Ft



## Updates Analysis Indicates:

---

- We DO have an I & I problem in areas that gravity flow directly to MCES Lift Stations (white areas)
- We need to continue efforts to identify lake level/groundwater conflicts
- Meters installed at lift stations are providing much needed information and flow data
- Additional flow metering is needed to pinpoint efforts for rehabilitation
- Progress is evident, CIPP dollars are well spent
- We still have a long ways to go to solve our problem

# Next Steps

---

- Use revised I & I analysis to drive additional study and flow metering – address the problems in the previous gaps in data
- Evaluate Success of municipal work
- Expand Public Outreach and Awareness – We share the problem and all residents pay for it
- Continue discussing I & I and what the solution looks like for Mound
- Continue private sewer lateral ordinance work  
Return to Council with DRAFT proposed private sewer lateral ordinance – April/May