

# THOMPSON LAKE RESTORATION

## 2019 Water Summit Bridging Science and Society

**Cathy Udem**  
Dakota County  
Water Resources Specialist

**Joe Barten**  
Dakota County SWCD &  
LMRWMO Administrator



# THOMPSON LAKE RESTORATION

## Outline

Project Definition and Background

Project History

- PAH Contamination

- Stormwater Issues

Project Implementation

Project Benefits

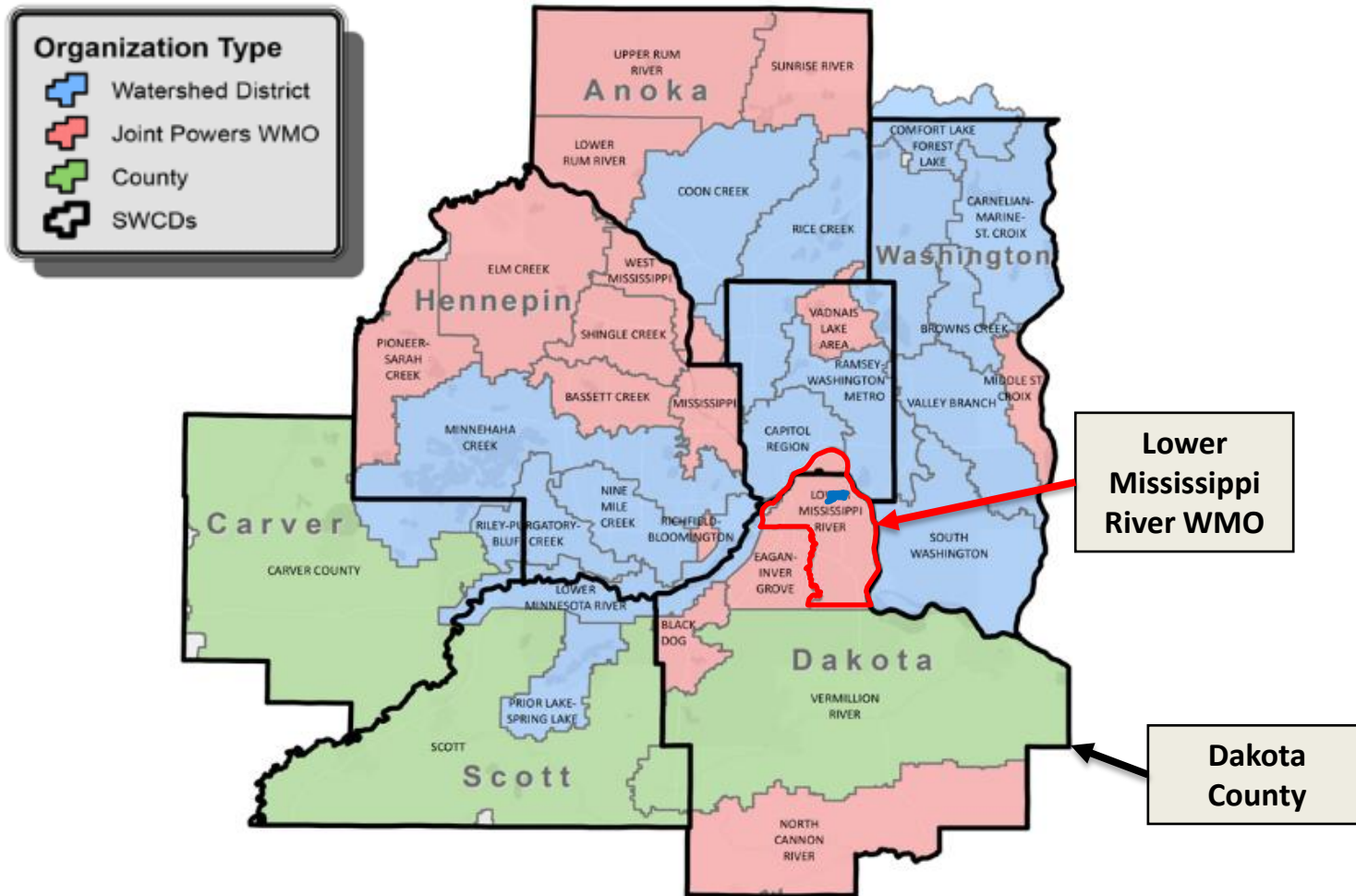
Outreach Strategy

Lessons Learned



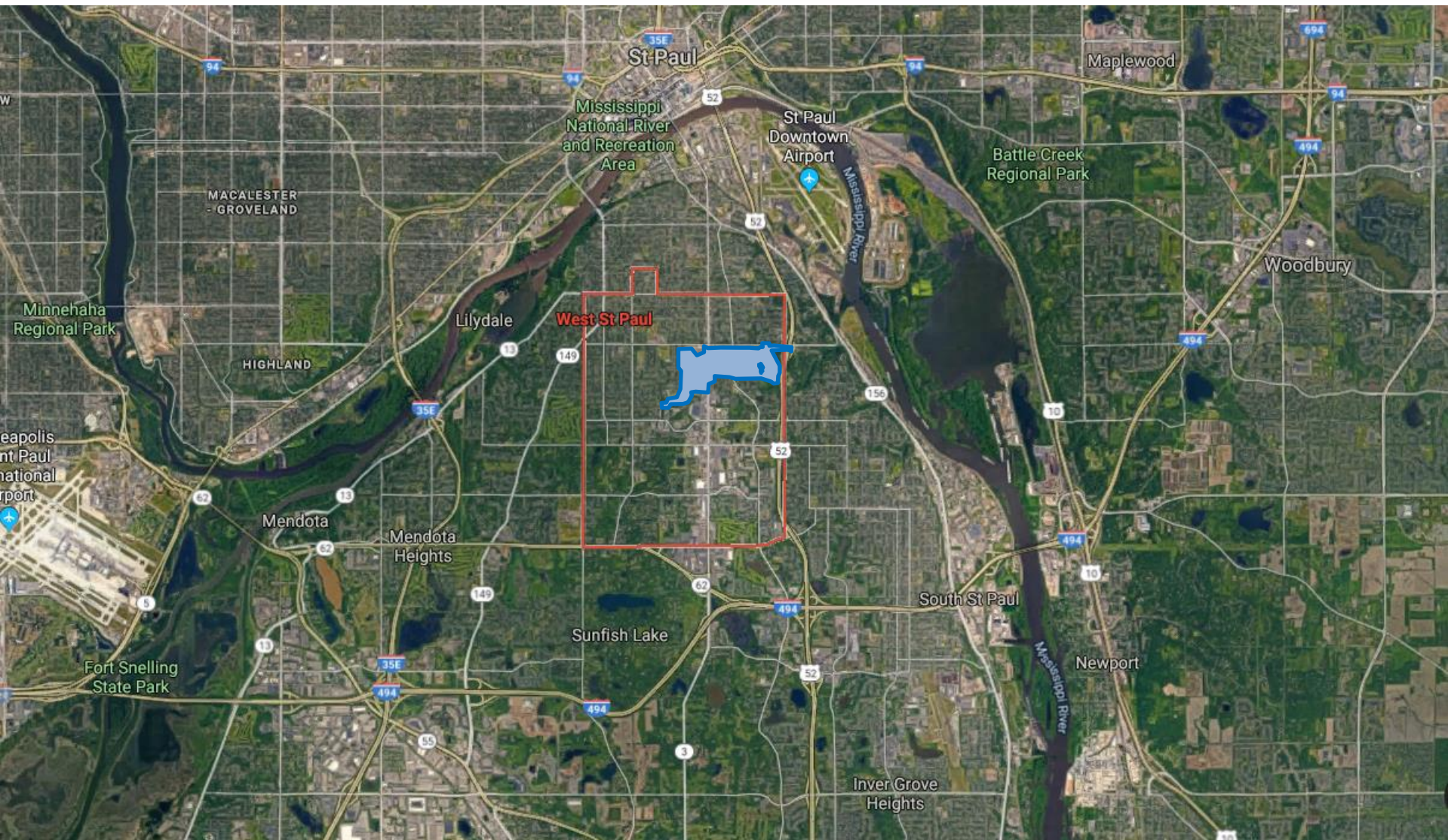


# ORIENTATION – 7 COUNTY METRO



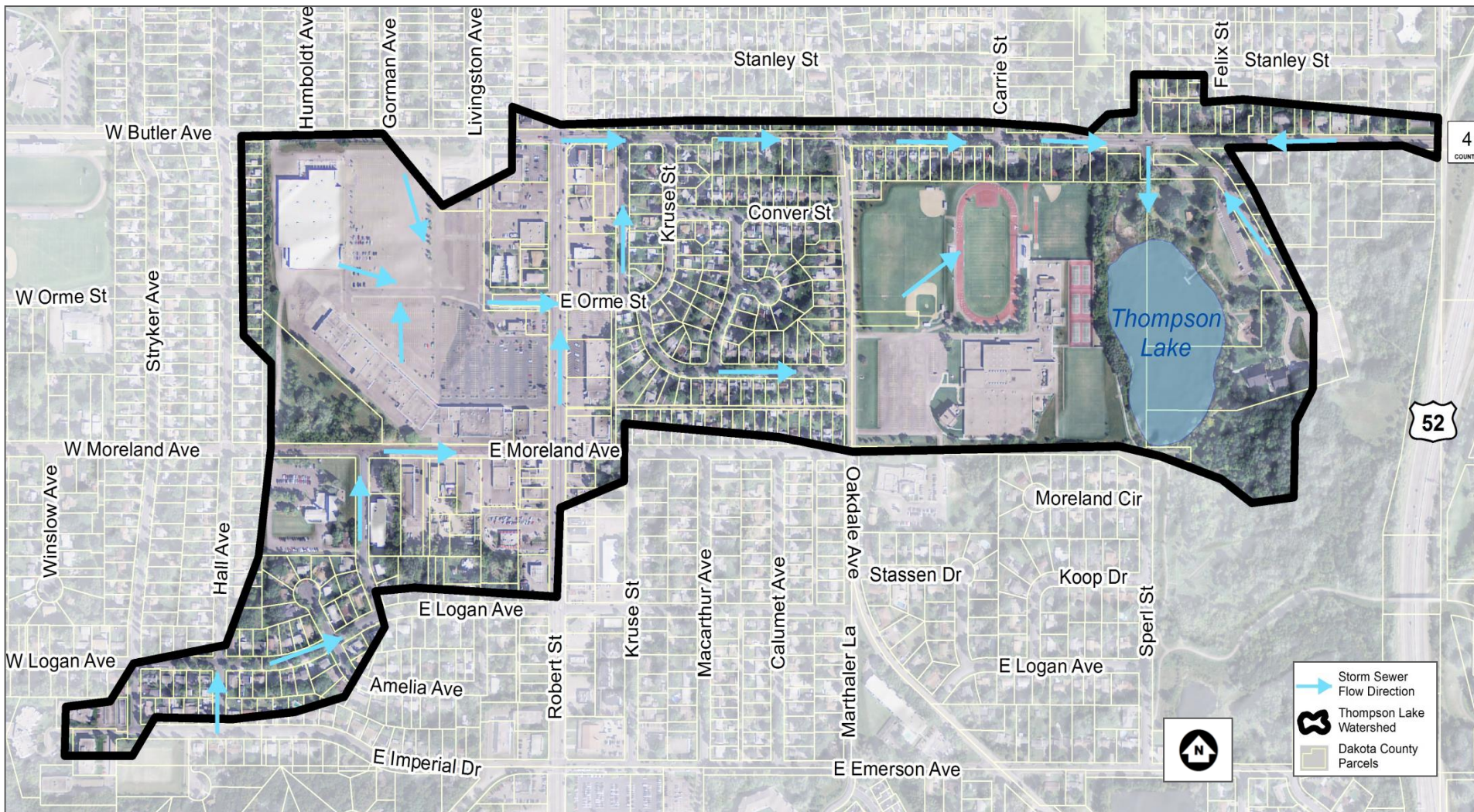


# ORIENTATION – WEST ST. PAUL





# ORIENTATION – THOMPSON LAKE WATERSHED





# VITAL STATISTICS

- **Thompson Lake – DNR Waterbody**
  - Designated for fishing and recreation
  - 8 Acres, 8 feet deep
  - Fish stocked – Black bullhead, black crappies, bluegill, channel catfish, green sunfish, large mouth bass, pumpkin seed, golden shiner
- **Dakota County**
  - Major feature of 57 acre Thompson County Park
  - Owns 2/3 of lake property
- **Lower Mississippi River Watershed Management Organization**
  - Responsible for monitoring and management
  - WRAPS Study focus on Thompson Lake
- **City of West St Paul**
  - Owns inlet and outlet
  - Uses for stormwater management
- **St Croix Lutheran High School**
  - Owns 1/3 of lake property
  - Lake is used for outside laboratory





# A REGIONAL RESOURCE



Photo: Dan Nowicki



Present Day

[No Title]





Pre 1800-1896



Ce-Tan We-Ku-We Ma-Ni

1937

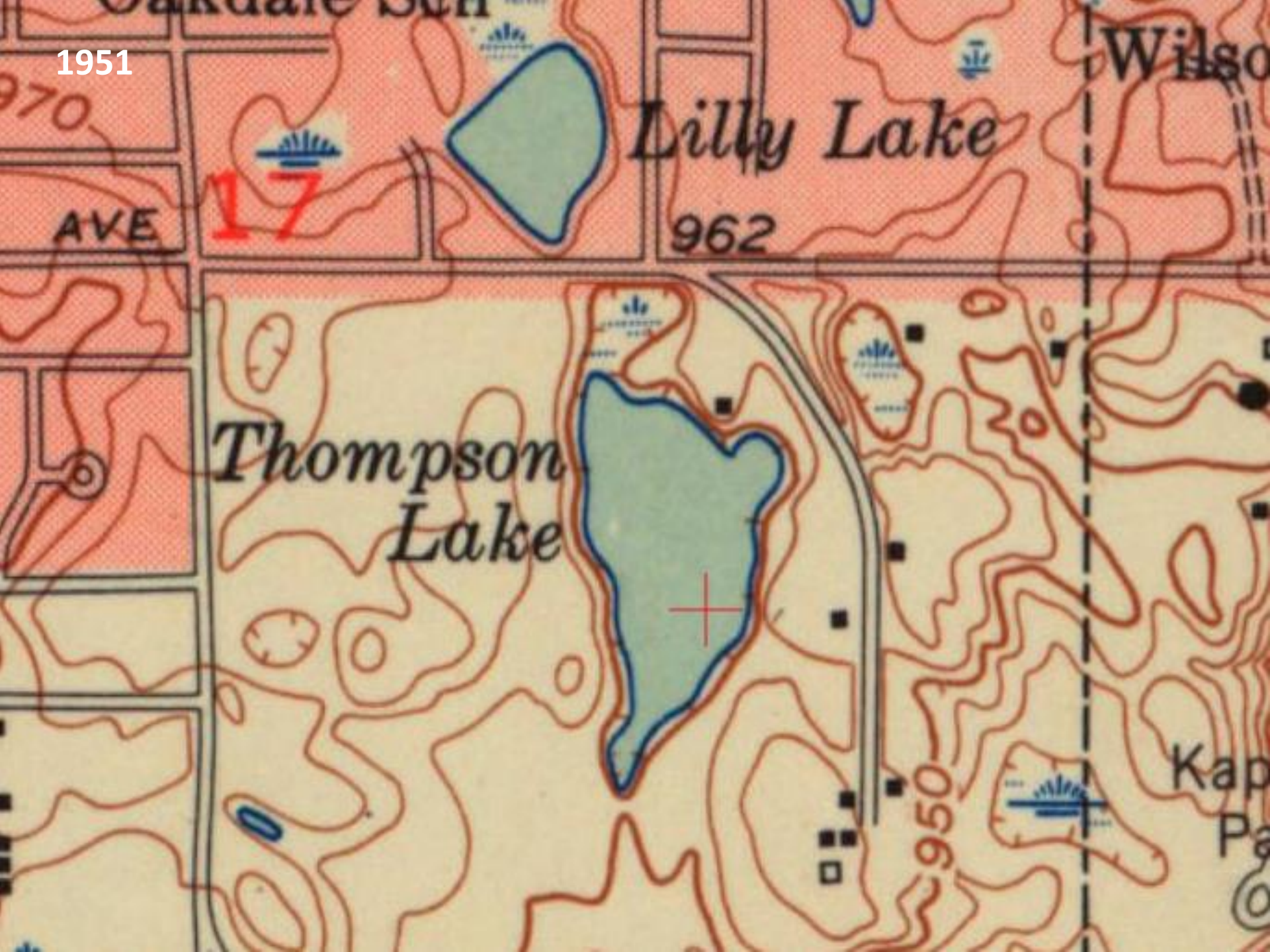


School Outline





1951



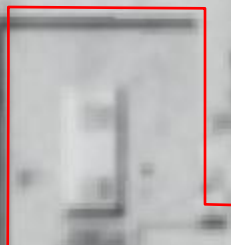
1951





1964

Swimming Beach  
Area Filled



1997





2000



2005

# Thompson County Park Master Plan



Prepared by:  
 Hoisington Koezler Group, Inc.  
with Ingraham & Associates, Barr Engineering, The 106 Group

Prepared for:  
Dakota County Parks



2006



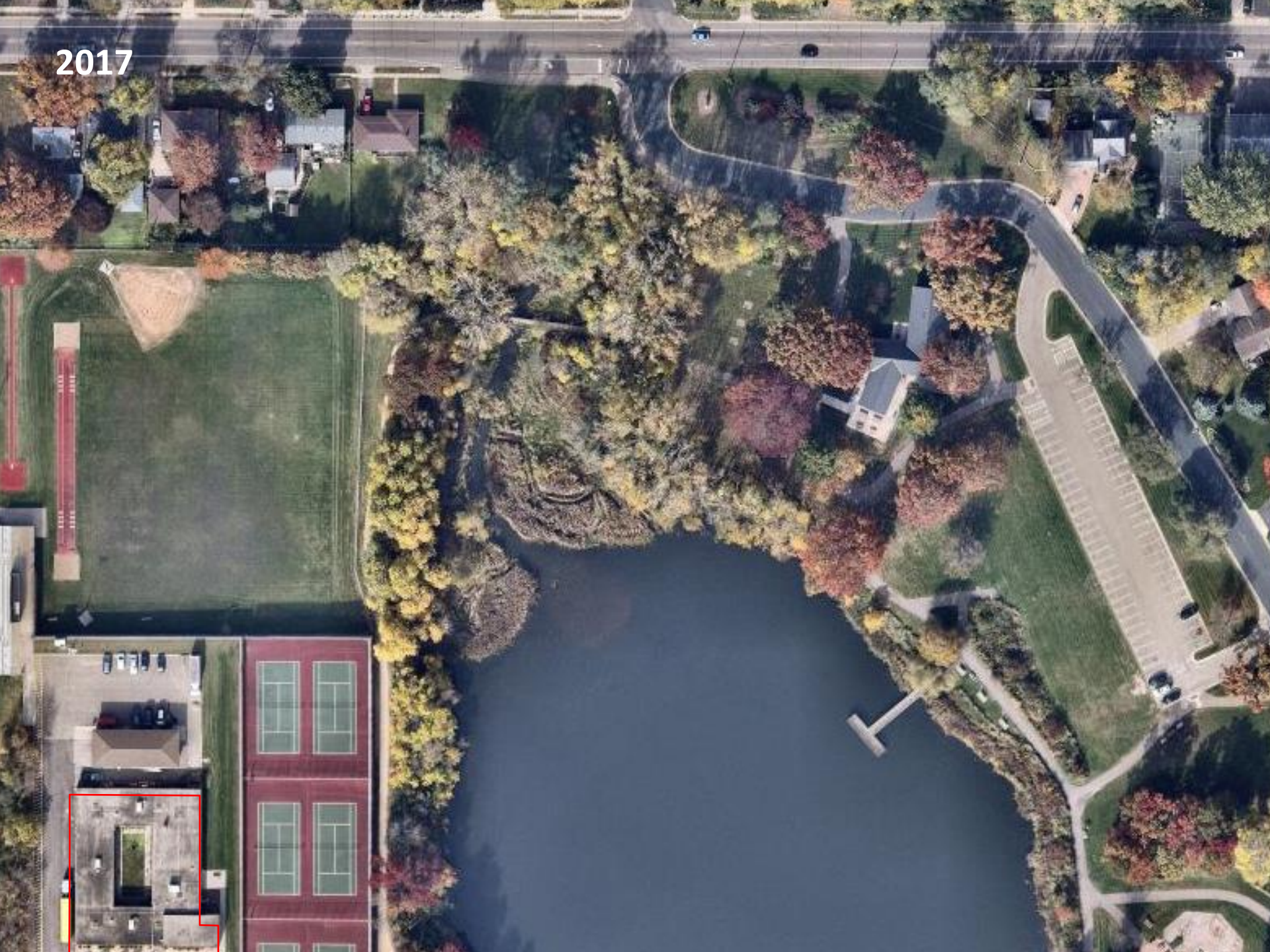
2014

[No Title]





2017





# Sediment Deposition from 1980's - 2017

Approximate 1951  
Lake Boundary &  
Wetland Boundary

Sediment now  
below vegetation  
and in **underwater  
sediment delta**





# THE PROBLEM



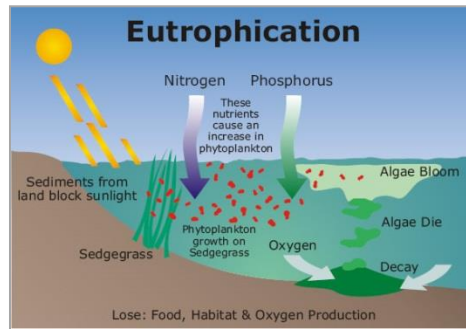


# POLLUTANTS OF CONCERN

## Excess Nutrients (Phosphorus)

In 2014, water monitoring showed Thompson Lake to have average of 78 mg/L of Phosphorus present in Lake (110 mg/L at highest) with a Regulatory Limit of 60 mg/L.

This excess phosphorus is causing **eutrophication**, excess algae growth in the lake, reducing water clarity for recreation and aquatic habitat value.



## Polycyclic Aromatic Hydrocarbons (PAHs)

These potential carcinogens come from coal-tar based sealants for driveways, streets, paths, etc. and are found in the sediment in Thompson Lake.

These Coal-tar based sealants were banned in Minnesota in 2014, but they are already accumulated in Thompson Lake from decades of stormwater runoff and still remain in many existing trails, roads, and driveways.

## Chloride (Deicer Salt)



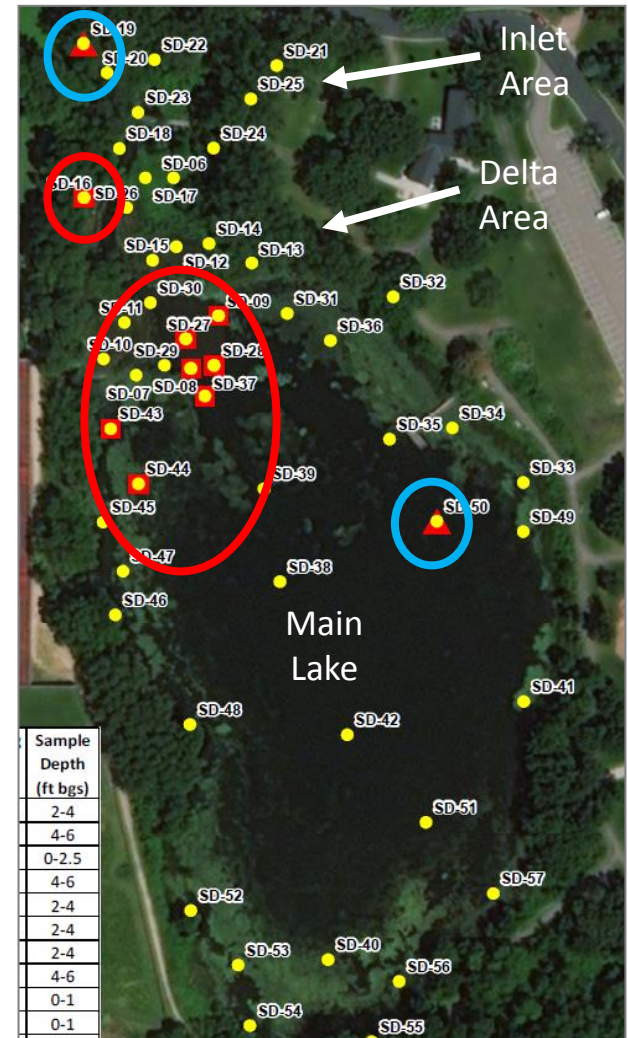
Thompson Lake has elevated levels of chloride due to winter maintenance and deicing activity on roads, parking lots, driveways, and sidewalks.





# PAH LAKE INVESTIGATION

- Completed Lake Bathymetry
- Sediment had oily sheen and strong petroleum odor
- Additional sampling in 2017 added to 2009
- 65 sediment samples collected in 22 locations
  - Inlet/Channel ~ 1' to 3' of sediment
  - Delta ~ 8' to 13' of sediment
  - Main Lake Area ~ 1' to 2' of sediment
- Eight locations exceeded PAH limits for human health exposure (MDH)
- Two locations exceeded limits for arsenic



# ANALYSIS, STUDY, REPORT, MEET, REPEAT

2007

- Stassen Lane Reconstruction – WSB
- Thompson Lake Permanent Stormwater Improvement and Habitat Restoration Project – WSB
- Environmental Impact Worksheet – WSB
- Thompson Park Site Contamination Assessment and Water Quality Monitoring Plan – EOR
- Thompson Lake Fact Sheet – LMRWMO
- LMRWMO WRAPS and TMDL Report – MPCA
- Feasibility Study to Address PAH Contamination in Thompson Lake – Hydromethods
- Field Investigation Report Part 1 – TetraTech
- Lake Bottom Assessment SAP – TetraTech
- Thompson Lake Human Health and Ecological Risk Assessment – TetraTech
- Engineering Design & Specs – TetraTech



2019





# THE SOLUTION - FUNDING & PARTNERS



## **2008 Clean Water, Land and Legacy Amendment \$576,000**

To preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater

3/8ths of 1% of MN sales tax goes into fund



## **Environmental Legacy Fund (ELF)**

## **Dakota County Environmental Legacy Fund (ELF) \$1,300,000**

Host fees from Dakota County landfills allocated for environmental cleanup



## **City of West St. Paul CIP \$144,000**

City capital improvement budget to meet waste load allocations from WRAPS study/Total Maximum Daily Load (MDL)

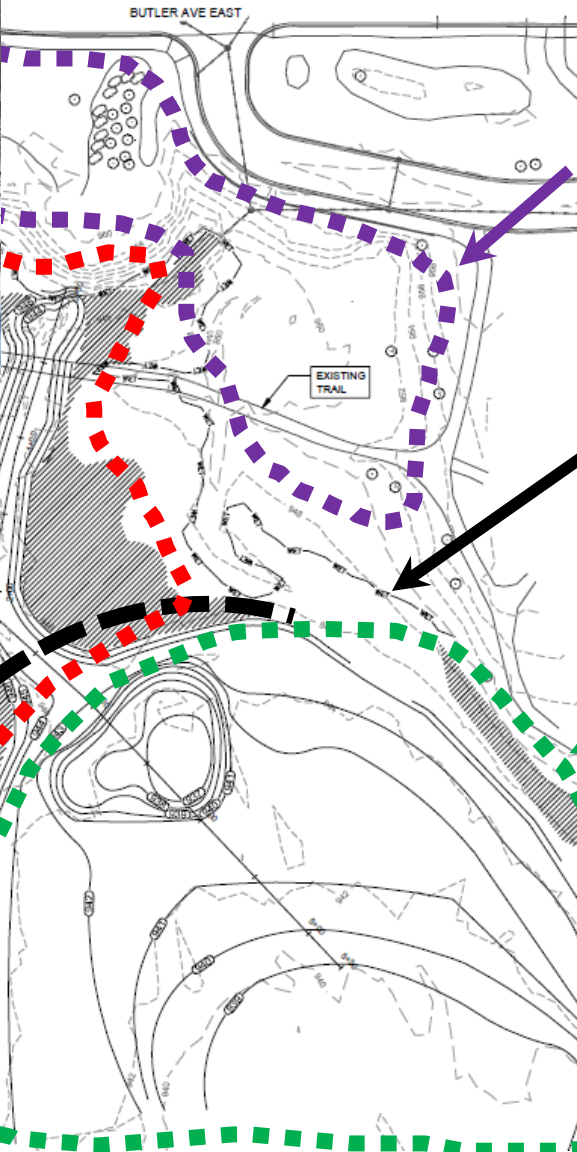


## **Total Budget - \$2,020,000**





# PHASE 1 – SEDIMENT REMOVAL



Stockpiling area for dewatering before hauling contaminated material to landfill  
Total Removals – 6,000 CY

Cofferdam

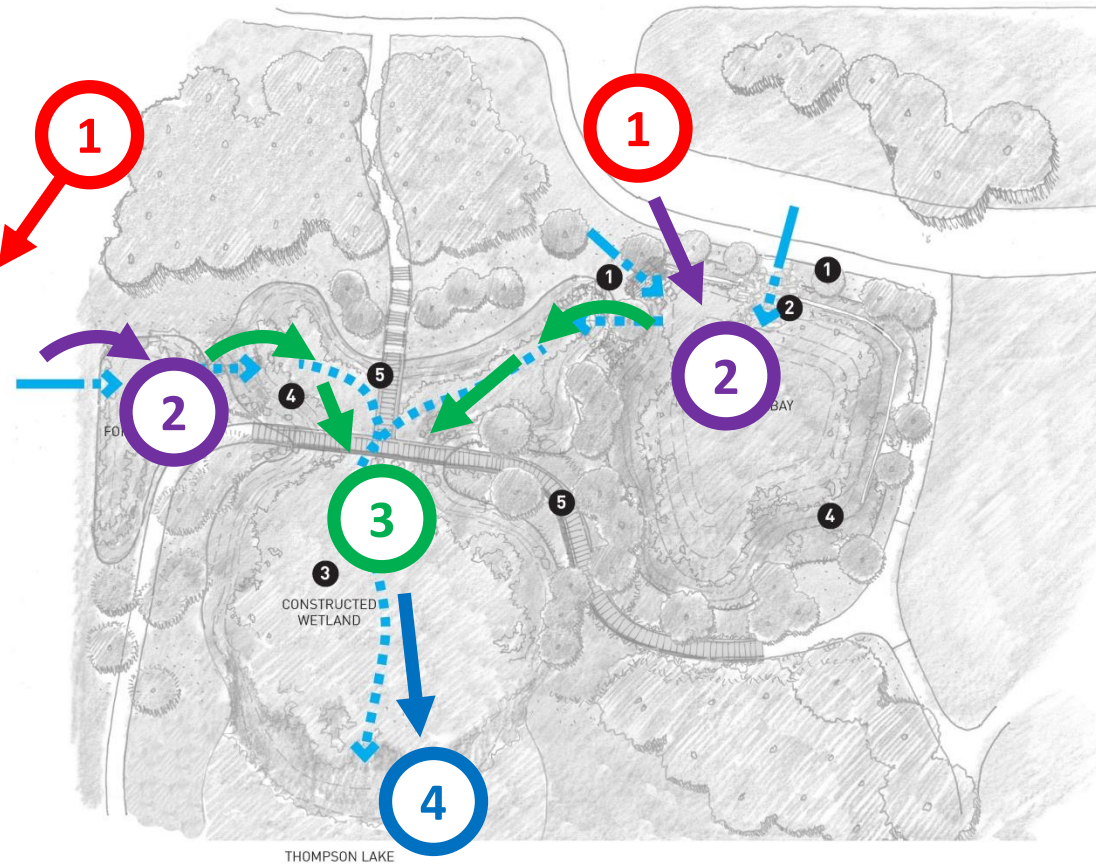
Excavation of material in dry condition

Dredging of material in wet condition

Lake level will be drawn down approximately 2.5 feet

# PHASE 2 – STORMWATER BMPS

## Treatment Train Approach to Stormwater Management



1 OUTFALL STRUCTURE



4 WETLAND PLANTINGS



2 OUTCROPPING STONE RETAINING WALL



5 BOARDWALK



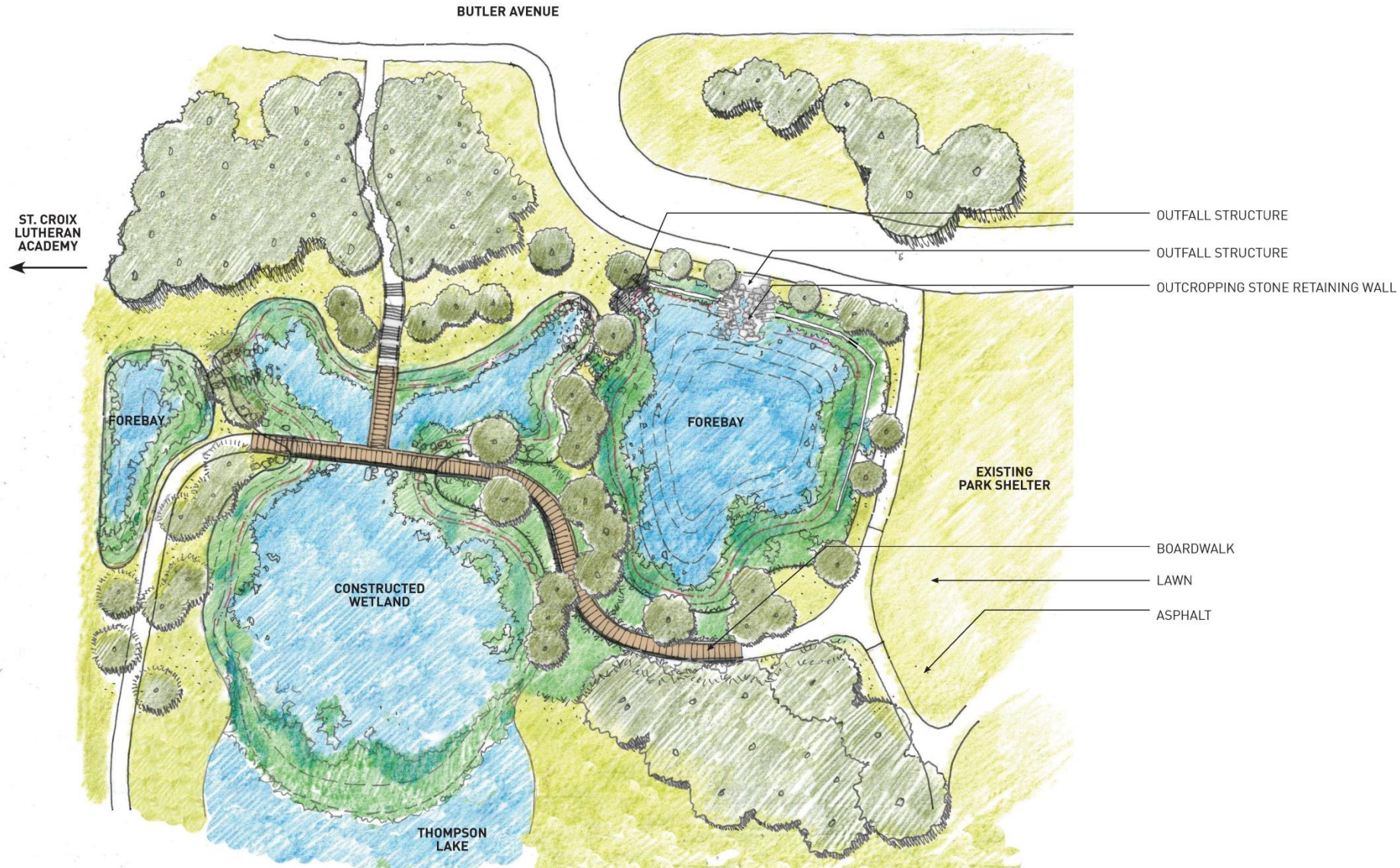
3 CONSTRUCTED WETLAND



1. Hydrodynamic Separator Structures
2. Stormwater Forebay
3. Constructed Wetland
4. Outlet to Main Lake



# PHASE 2 – STORMWATER BMPS





# CONSTRUCTION





# CONSTRUCTION





# CONSTRUCTION





# CONSTRUCTION





# CONSTRUCTION









# PROJECT BENEFITS

- Project Goals
  - Remove all contaminated sediment from lake inlet area
  - Achieve a 30% reduction in total phosphorus (TP) loading (WRAPS)
  - Achieve a 50% reduction in total suspended solids (TSS) loading
  - Utilize multiple BMPs to accomplish removal goals
- Outcomes
  - 600 dump trucks (6,000 cubic yards of PAH contaminated sediment removed from lake/inlet
  - Incorporation of two underground hydrodynamic separators, irrigation reuse system, stormwater forebay, stormwater treatment wetland
  - **41% decrease in TP (48.4 lbs annually)** P-8, MIDS
  - **70% decrease in TSS (12.9 tons annually)** P-8, MIDS
  - Invasive species removal
  - Improved water quality for Thompson Lake



## OUTREACH & ENGAGEMENT – PRE PROJECT



- Community meetings
- Park master plan meetings
- Stakeholder meetings
- Agency/Regulatory meetings



# PROJECT WEBSITE STORY MAP

Usage details for the period:

April 7, 2019 - May 7, 2019

Past 30 Days

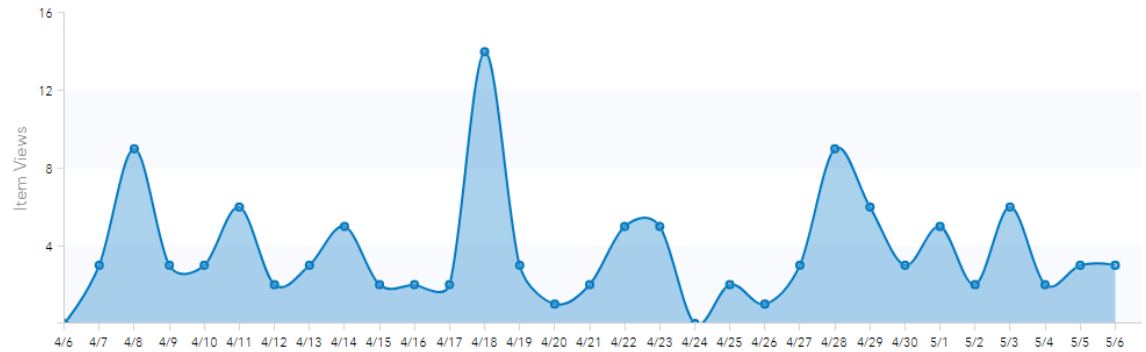
Item Views this Period

115

Avg Item Views Per Day

3.83

Usage Time Series



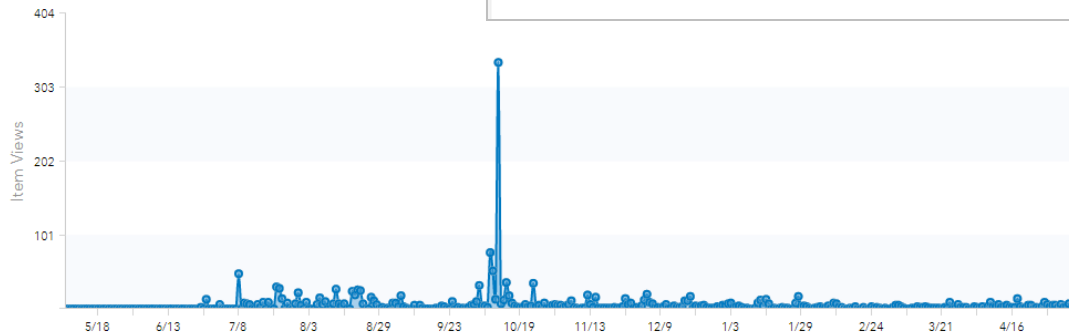
Usage details for the period:

May 7, 2018 - May 7, 2019

Item Views this Period

1,884

Usage Time Series





# OUTREACH & ENGAGEMENT – DURING PROJECT





**LMRWMO**  
LOWER MISSISSIPPI RIVER  
WATERSHED MANAGEMENT ORGANIZATION






Dear Thompson Lake Watershed Neighbors,

Your property has been identified by the Lower Mississippi River Watershed Management Organization (LMRWMO) as being within the direct drainage watershed of the wonderful amenity that is Thompson Lake, in Dakota County's Thompson County Park.

As part of efforts to reduce the amount of stormwater runoff reaching the lake, the LMRWMO has partnered with the Friends of the Mississippi River to offer rain barrels to you, a watershed resident, at a cost of just \$30, a savings of \$50! Rain barrels catch stormwater from your roof via the downspout. Installing a rain barrel on your property is an easy way to decrease runoff while creating a source of reusable water for your property.

This rain barrel program is part of a larger Thompson Lake Restoration Project undertaken by the LMRWMO, Dakota County, and West. St. Paul using a State Clean Water Fund grant, County Environmental Funds, and City funding. The restoration will remove contaminated sediment from the lake area and install stormwater treatment chambers, ponds, and wetlands to stop pollutants and nutrients from entering Thompson Lake.



*The 72 inch storm sewer pipe brings stormwater to the lake (left). The Thompson Lake watershed, the less we*



175 acres.

**Do your part to reduce the flow of stormwater**

Enter code: 'watershed' to access the Eventbrite page to purchase your rain barrel today

Please indicate your pickup preference during checkout via

**Saturday, June 8th from 10 a.m. - noon** at the N located on St. Paul's West  
-or-  
**Sunday, June 9th from 10 a.m. - noon** at Thompson

(If these times don't work for you, special arrangements may be made)



irrel  
nes are:  
ance

# TIMELAPSE VIDEO



autotimelapse (1).mp4



# OUTREACH & ENGAGEMENT – POST PROJECT

## Take A Kid Fishing: Event Map

You're at: 360 Butler Avenue East, West St. Paul, MN

THOMPSON LAKE RESTORATION PROJECT

## SEED BOMBS



## HERE



The Thompson Lake Restoration Project was funded in part by a grant from the Lower Mississippi River Watershed Management Organization via the State Board of Water and Soil Resources Clean Water Fund, Dakota County, and the City of West St. Paul.

## PRAIRIE & WETLAND RESTORATION IN PROGRESS

PLEASE DO NOT DISTURB!



The Thompson Lake Restoration Project was funded in part by a grant from the Lower Mississippi River Watershed Management Organization via the State Board of Water and Soil Resources Clean Water Fund, Dakota County, and the City of West St. Paul.

## THANK YOU

## to our event partners!



# OUTREACH & ENGAGEMENT – LONG TERM



## Master Water Stewards

*Community Leadership for Clean Water*



**DAKOTA COUNTY**

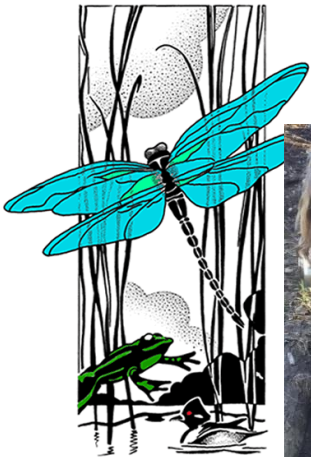


— SOIL & WATER —  
CONSERVATION DISTRICT

## LANDSCAPING FOR CLEAN WATER

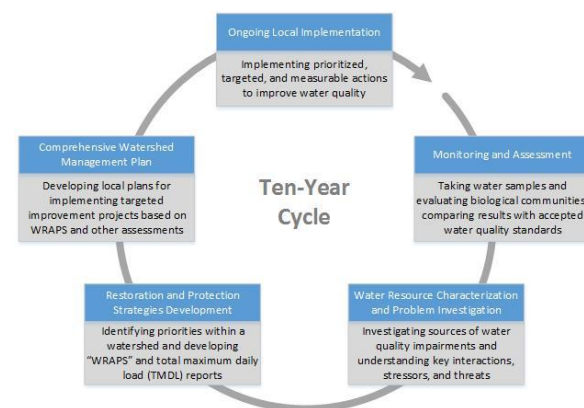
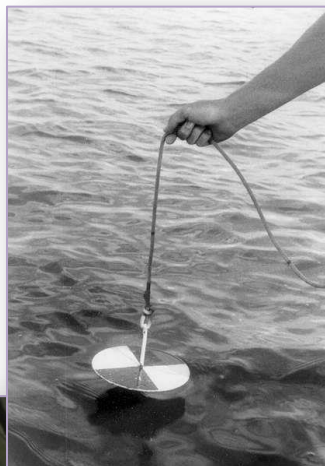


Dakota County Soil and  
Water Conservation District





# NEXT STEPS – MONITORING & MAINTENANCE



# LESSONS LEARNED

- These things take time, projects do not follow a linear path
- Impact of outside forces , economy, PAH awareness, politics, funding
- Having an impairment helps with funding
- Sometimes a catalyst is needed to bring out motivation and additional funding
- Planning is good, follow-up is better, being on-site is best
- Information to public early and often reduces likelihood of issues





# THOMPSON LAKE RESTORATION

Questions, Comments, Ideas?

**Cathy Udem**

Dakota County  
Water Resources Specialist

**Joe Barten**

Dakota County SWCD  
LMRWMO Administrator





**LANDSCAPE OPEN NOW**

**SPRING IS HERE  
IM SO EXCITED  
I WET MY PLANTS**

TOADSIDE

SALES & SERVICE  
1400 453 678