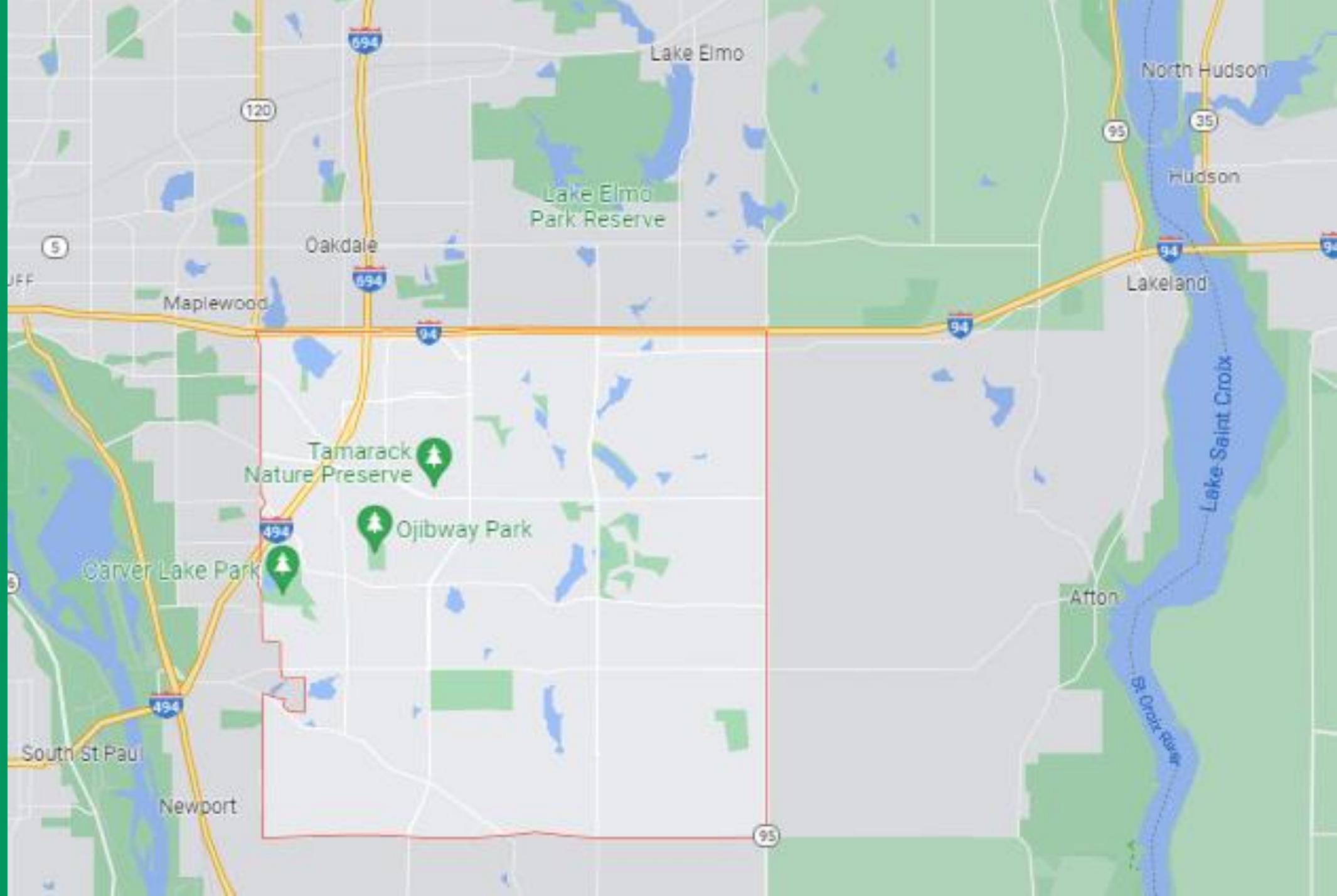


Best Practices for Pond Maintenance and Dredging

Kristin Seaman, Environmental Specialist

Evan Sieben, Streets Lead Worker



Lake Elmo

North Hudson

120

95

35

Lake Elmo
Park Reserve

Hudson

5

Oakdale

694

94

94

JFF

Maplewood

Lakeland

Tamarack
Nature Preserve

Ojibway Park

Carver Lake Park

494

94

Lake Saint Croix

Atton

6

South St Paul

494

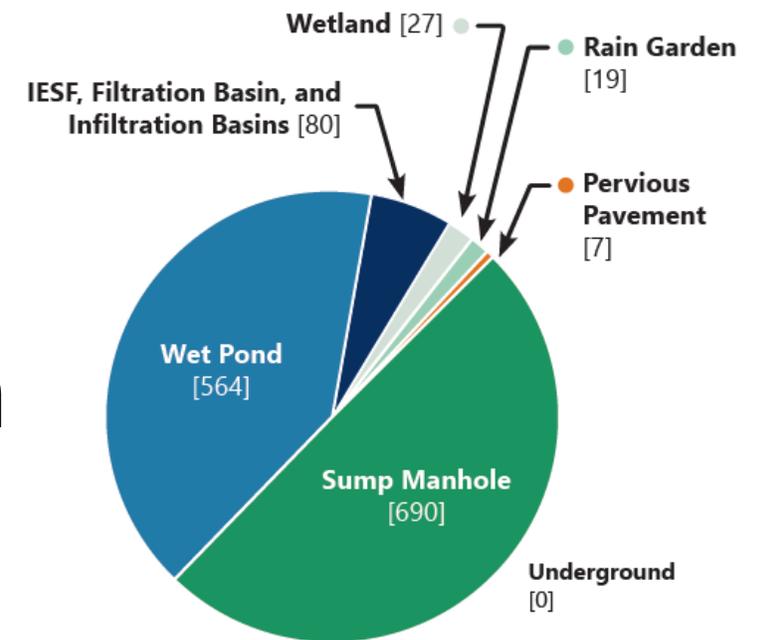
Newport

95

St. Croix River

City of Woodbury, MS4 community

- **Almost 1,700 structural stormwater best management practices**
- **Infrastructure >30 years old,**
- **New infrastructure each year**
- **Annually inspect ¼ of system**
- **2021 BMP Maintenance Plan**
 - **Holistic approach**



BMP's Included



Alum Treatment Facility

A facility that adds aluminum sulfate (alum) to stormwater. Alum binds to phosphorus and settles out of the water column.



Pervious Pavement

Pavement designed with porosity to allow infiltration through the pavement section and into the underlying permeable soil.



Infiltration Basin

A basin that captures, temporarily stores, and infiltrates water. Infiltration occurs due to the naturally permeable soil below and surrounding the basin.



Iron Enhanced Sand Filter

A basin that has an engineered iron and sand media bottom. Water filters through the iron and sand media to an underdrain and then is discharged downstream.



Sump Manhole

A manhole with the bottom of the structure depressed below the lowest invert allowing sediment to be captured, typically >2 feet deep.



Rain Garden

A garden of native shrubs, grasses, and forbes planted in a small depression.



Reuse System

An irrigation system that draws water from wet ponds and applies it over a pervious area like an athletic field or park.



Filtration Basin

A basin that has a sand media bottom. Water filters through the sand media to an underdrain and then is discharged downstream.



Water Quality Filters and Hydrodynamic Devices

Structures typically placed in manholes that separate or filter pollutants from stormwater.



Spent Lime Filter

A basin that contains a spent lime mixture. Can be an underground vault or an aboveground basin.



Tree Trench

A small tree planter that contains a filtration media.



Underground System

A system of underground vaults or chambers that collects and detains, filters or infiltrates stormwater.



Green Roof

A vegetated roof allowing plant uptake.



Wet Pond

A basin that collects and retains stormwater



Wetland

A natural basin that is utilized as a wet pond.

 City-Owned

 Not Owned By City



PREVENTATIVE MAINTENANCE

- Visual Inspection
- Litter & Debris Removal
- Mowing and Weeding



CONDITION-BASED MAINTENANCE

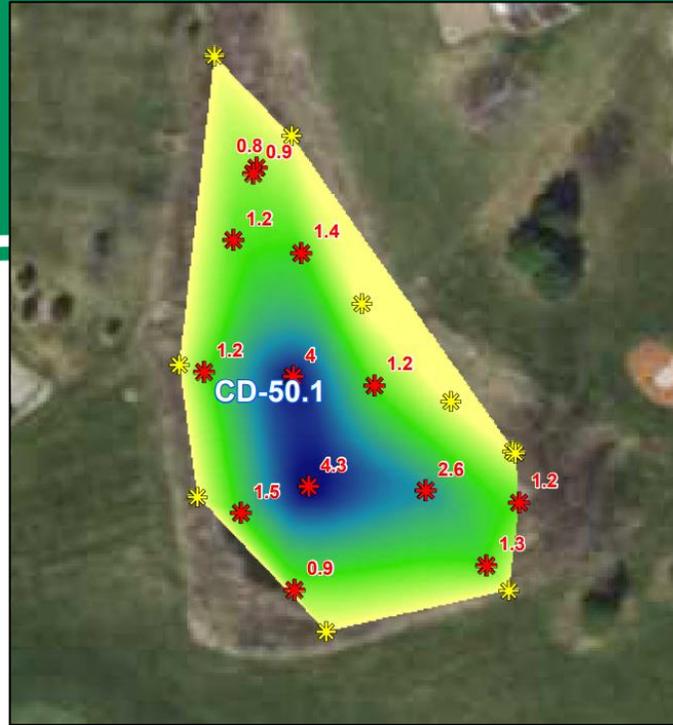
- Clean Drain Tile
- Dredge Ponds
- Add Filter Material
- Minor Construction Activity to Restore BMP Functionality



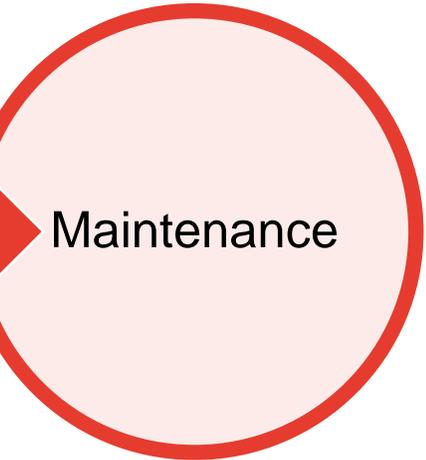
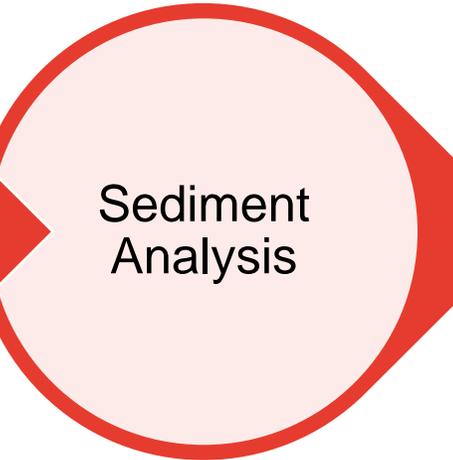
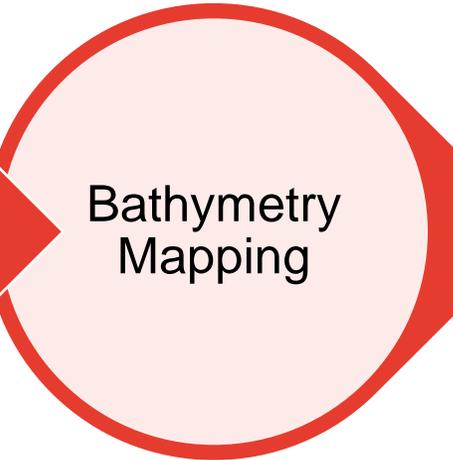
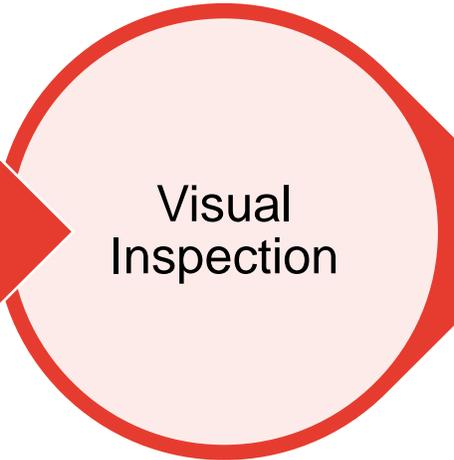
REHABILITATION

- Complete Reconstruction of BMP

- **Cost low to high**
- **Focus on preventative and condition-based maintenance to avoid/delay rehabilitation**



- 1. Inlet
- 2. Outlet
- 3. Evidence of issues



SC 327

- Resident complaint
- SWAMP score 0.00
- Bathymetry map, couldn't get the boat into the water



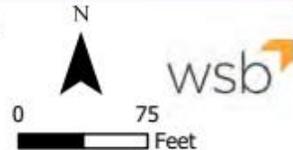
 **Pond Depth Map: SC-327**
City of Woodbury

Pond Surface Area
2.1 ac.

Watershed District ID
CL-9.1

- | Symbol | |
|---------------------------------------------------------------------------------------|-----------------|
|  | Edge Point |
|  | Depth Point |
|  | Storm Sewer |
|  | Surveyed Inlet |
|  | Surveyed Outlet |
|  | Surveyed OCS |

Estimated Depths
Max: 0.6 ft.
Avg: 0 ft.
Min: 0 ft.



- Natural wetland
- Association owned property
- Private Road
- No pre-treatment upstream
- Level 3 sediment
- Partnered with watershed district coordinated capital improvement project



SURVEY LEGEND

- ▲ GPS CONTROL POINT
- VERTICAL BENCH MARK
- CONTROL HUB / LATH
- ⊕ POWER POLE
- ⊙ GUY WIRE
- ⊙ LIGHT POLE
- ⊙ HYDRANT
- ⊙ GATE VALVE
- ⊙ SIGN POST
- DECIDUOUS TREE
- CONIFEROUS TREE
- SANITARY MANHOLE
- ⊗ CATCH BASIN
- ⊗ STORM SEWER MANHOLE
- ⊗ ELECTRICAL MANHOLE
- ⊗ WATER MANHOLE
- ⊗ COMMUNICATIONS BOX
- PROPERTY LINE
- FENCE LINE
- BACK OF CURB LINE
- FLOW LINE
- CENTER LINE
- GAS
- UE
- PD
- SAN
- SS
- GAS LINE
- UNDERGROUND ELECTRIC
- FIBER OPTIC LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- MAJOR CONTOUR
- MINOR CONTOUR
- WATER'S EDGE
- SWALES
- CATTAIL EDGE

BASIS OF DRAWING FILE:

DATE OF SURVEY: 09-23-2020

ORIGIN DATE OF BASE: WASHINGTON2020

COORDINATE SYSTEM: WASHINGTON COUNTY

HORIZONTAL DATUM: NAD83(2011) REF: VRS SYSTEM

VERTICAL DATUM: NAVD83 MSL REF: VRS SYSTEM

ADDITIONAL FILE INFORMATION:

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Minnesota.

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

PROJECT NAME:	
SHEET NO.:	
DATE:	
RELEASED TO FOR:	
DATE RELEASED:	

BARR Engineering Co.
 4300 MARKPOINTS DRIVE
 Suite 200
 MINNEAPOLIS, MN 55425
 Ph: 1-800-832-2277
 Fax: (612) 832-2277
 www.barr.com

Date:	AS SHOWN
Drawn:	
Checked:	JHS
Designed:	
Approved:	

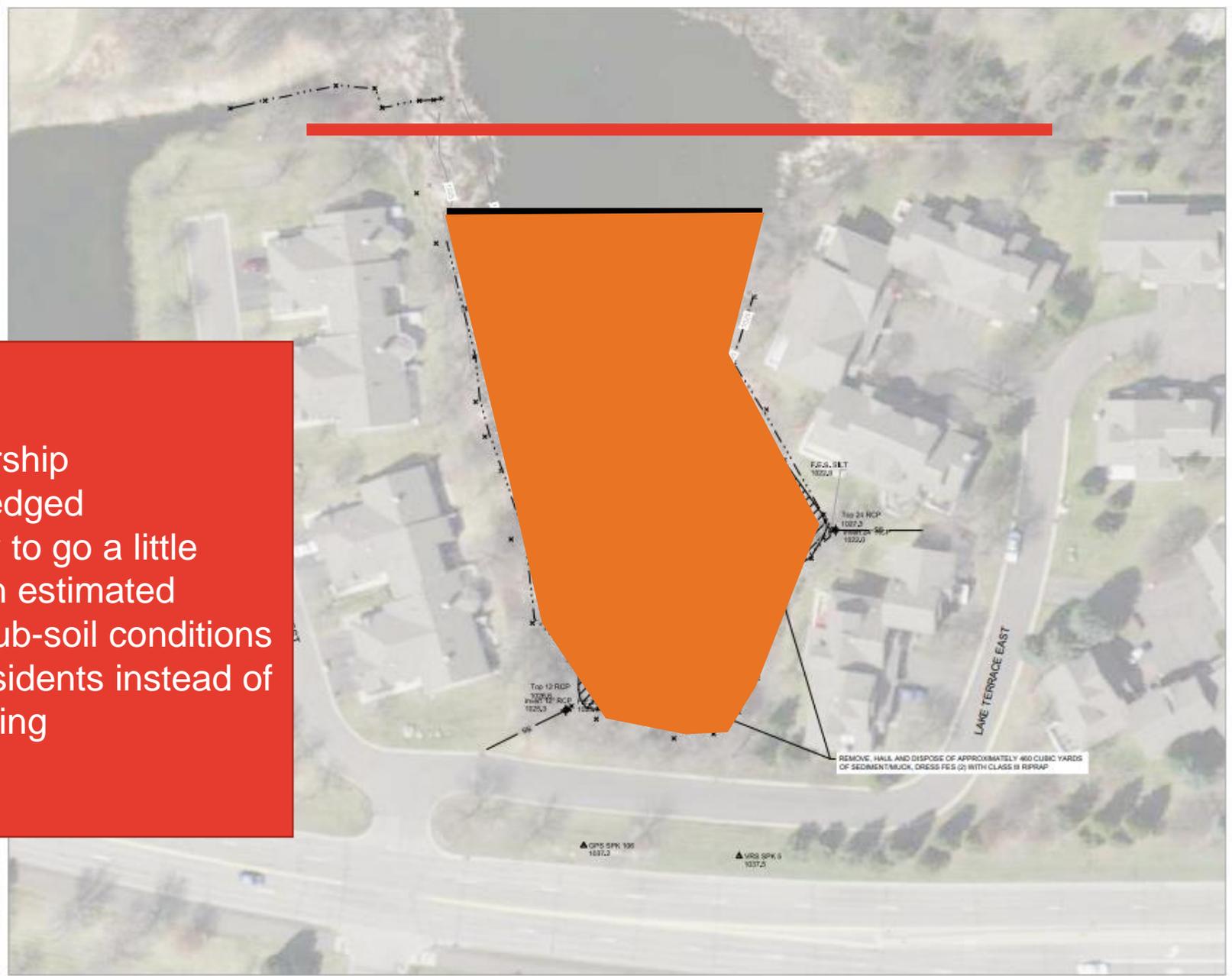
R.W.M.W.D.
 LITTLE CANADA, MINNESOTA

WOODBURY STORM POND
 WOODBURY, MINNESOTA

POND SC 327 / LAKE TERRACE EAST
 2020 POND SURVEY

BARR PROJECT No:	23162-0282 26
CLIENT PROJECT No:	
DRWG. No.:	
REV. No.:	

- Land ownership
- Actually dredged
- Opportunity to go a little deeper than estimated based on sub-soil conditions
- Letter to residents instead of public meeting



SURVEY LEGEND

- ▲ GPS CONTROL POINT
- VERTICAL BENCH MARK
- CONTROL HUB / LATH
- POWER POLE
- GUY WIRE
- LIGHT POLE
- HYDRANT
- GATE VALVE
- SIGN POST
- DECIDUOUS TREE
- CONIFEROUS TREE
- SANITARY MANHOLE
- CATCH BASIN
- STORM SEWER MANHOLE
- ELECTRICAL MANHOLE
- WATER MANHOLE
- COMMUNICATIONS BOX
- PROPERTY LINE
- FENCE LINE
- BACK OF CURB LINE
- FLOW LINE
- CENTER LINE
- GAS
- UE
- PE
- SAN
- SS
- GAS LINE
- UNDERGROUND ELECTRIC
- FIBER OPTIC LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- MAJOR CONTOUR
- MINOR CONTOUR
- WATER'S EDGE
- SWALES
- CATTAIL EDGE

BASIS OF DRAWING FILE:

DATE OF SURVEY: 09-22-2020

ORIGIN DATE OF BASE: WASHINGTON2020

COORDINATE SYSTEM: WASHINGTON COUNTY

HORIZONTAL DATUM: NAD83(2011) REF: VRS SYSTEM

VERTICAL DATUM: NAVD83 MSL REF: VRS SYSTEM

ADDITIONAL FILE INFORMATION:

I, the undersigned, certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Minnesota.

NO.	BY	CHK	APP	DATE	REVISION DESCRIPTION

PRINTED NAME: _____ SIGNATURE: _____ DATE: _____	I HEREBY CERTIFY THAT THE PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	RELEASED TO: FOR _____ DATE RELEASED: _____
--------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------

BARR Consulting Engineers
 Minneapolis, Minnesota
 Ph: 1-800-432-3277
 Fax: (952) 832-3287
 www.barr.com

Project Office:
 BARR ENGINEERING CO.
 4300 MARKETPOINTS DRIVE
 Suite 200
 MINNEAPOLIS, MN 55425
 Ph: 1-800-432-3277
 Fax: (952) 832-3287
 www.barr.com

Date	AS SHOWN
Drawn	JHS
Checked	
Designed	
Approved	

R.W.M.W.D.
 LITTLE CANADA, MINNESOTA

WOODBURY STORM POND
 WOODBURY, MINNESOTA

POND SC 327 / LAKE TERRACE EAST
 2020 POND SURVEY

BARR PROJECT No:	23162-0282 26
CLIENT PROJECT No:	
URNG No:	
REV No:	





Nothing
ever
goes
wrong
right?

