

MS4 Annual Report

Board of Public Works

Phil Gaebler - City of Madison Engineering Department

3/8/2022

Report Overview

- ▶ 4th Year of Online Reporting
 - ▶ Minimal Control Measures
 - ▶ Fiscal Analysis
 - ▶ Progress

Minimal Control Measures – Each Required a Written Program

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Pollutant Control
5. Post-Construction Storm Water Management
6. Pollution Prevention – SWPPPS Required
7. Storm Sewer System Map
8. TMDL Progress and Plan

1. Public Education and Outreach

- ▶ Waterways Newsletter
 - ▶ Stormwater Utility Adjustment Policy
 - ▶ New City Engineer- Jim Wolfe
 - ▶ Watershed Studies
 - ▶ Rain Gardens
- ▶ Ripple-Effects
 - ▶ <https://www.ripple-effects.com/>
 - ▶ Storm Drain Murals - 3 completed
 - ▶ Spring Harbor, Warner Park, Randell Elementary
 - ▶ Plant Dane
 - ▶ Native Plant Workshops
 - ▶ Volunteer Plant Growers-
- ▶ Everyday Engineering Podcast
 - ▶ 10 Episodes in 2022
- ▶ Conference Presentations
- ▶ New Spots



2 presentations at ASCE



Spring Harbor Storm Drain Art



Lake Wingra Gathering Waters Event

Waterways

Top 5 Ways You can Help Water Quality in Our Lakes

The path toward clean lakes is a shared journey where we all have a role to play. If everyone takes small actions at home, we can create a big impact for our lakes, and countless other environmental causes. Here are five great ways to help the lakes:

1. **Plant Native & Diverse Vegetation:** Deep-rooted native plants and trees help absorb water and hold topsoil in place during rain events.
2. **Create a rain garden:** Not only will rain gardens capture stormwater runoff and beautify your property, they also provide biodiversity that helps butterflies and bees survive.
3. **Redirect downspouts:** This simple action allows you to redirect rainwater to your lawn or garden, while also reducing the amount of stormwater that goes to streets and directly into the lakes via storm sewers.
4. **Install a rain barrel:** By capturing rainwater from your roof, rain barrels reduce the amount of stormwater runoff that reaches the lakes.
5. **Rake for leaf-free streets:** Raking leaves from the street edge (three feet from the curb) and onto lawns will help fertilize the grass and reduce cyanobacteria (blue-green algae) blooms in our lakes.



Next Watershed Studies: Near West, Wingra Proper, Door Creek

City Engineering is now working on its next watershed studies on the Near West, Wingra Proper and Door Creek watersheds. The Near West Watershed study is a collaborative partnership between the City and the University of Wisconsin-Madison. The City of Madison Engineering Division launched the Watershed Study Program in January 2019 following the historic floods of 2018.

The City's watershed studies evaluate the existing stormwater system by determining the causes of flooding.

"Is it because the lake is too high and water can't get out? Is it because the pipes are too small and water can't get in? Is it because this area just happens to be low and it is hard for water to get out? That is what the computer models will tell us," Stormwater Engineer Caroline Burger said.



First, consultants use computer models to create maps that display flood risks. The maps will then be available to the public before two public information meetings. The first public information meeting will explain how the City plans to address the flood risks. The second meeting will show residents the results of the mapping.

The results of the studies are used to develop projects that reduce the risk of flooding. Potential projects include installing bigger pipes, pumps and constructing ponds.

"We put together the reports, we work with all of our internal agencies like Parks, Planning and Traffic Engineering to make sure that whatever solutions we develop, they are OK with and will work with their infrastructure programs," Burger said.

Watershed studies generally take 18 to 24 months to complete. The reports are expected to be finalized in late 2023. Check the City's Flooding website, which has project pages for each study. On each project page, there are updates, maps, links to final reports and opportunities for public comment. cityofmadison.com/WatershedStudies

'Set it and Forget it,' Plant Your Rain Garden this Fall

Rain gardens, gardens of native plants built in shallow depressions, are great at combating stormwater runoff by capturing and absorbing water into the ground. Although rain gardens can be planted all year round, planting them in the fall and winter has several benefits.

Planting a rain garden in September and early October requires less work. The sun and heat is not as intense, so plants do not need to be watered as often.

"If you want to set it and forget it, fall is a good time to get plants in the ground," Greenway Vegetation Coordinator Maddie Dumas said.

Although you can't put plants in the ground during the winter, this time of year is perfect for scattering native seed. Winter months help stimulate growth through the freeze thaw cycle.

"Seeds are getting moisture from snow and rain. The rain is pushing the seeds into the soil gently. All those things stimulate the plant so that when sunny conditions come back in the spring, the plant is ready to grow," Dumas said.

Check out City Engineering's rain garden website for native plant suggestions and stay tuned for an upcoming rain garden workshop in the spring for discounts and information on native plants.

Stay connected on cityofmadison.com/RBRainGardenProgram



2. Public Involvement

- ▶ SWU fee Adjustment policy
 - ▶ \$5 for terrace rain garden residents
 - ▶ Increased adjustments for residents with Rain gardens and Commercial properties with non-required stormwater treatment.
- ▶ Public Information meetings
 - ▶ Watershed studies
 - ▶ Implementation
 - ▶ and Reconstruction Projects
- ▶ Illicit Discharge reporting now county wide
- ▶ Friends Groups Grants
 - ▶ Wingra Chloride Monitoring
- ▶ Green Infrastructure Tour
- ▶ Saltwise Fools Flotilla

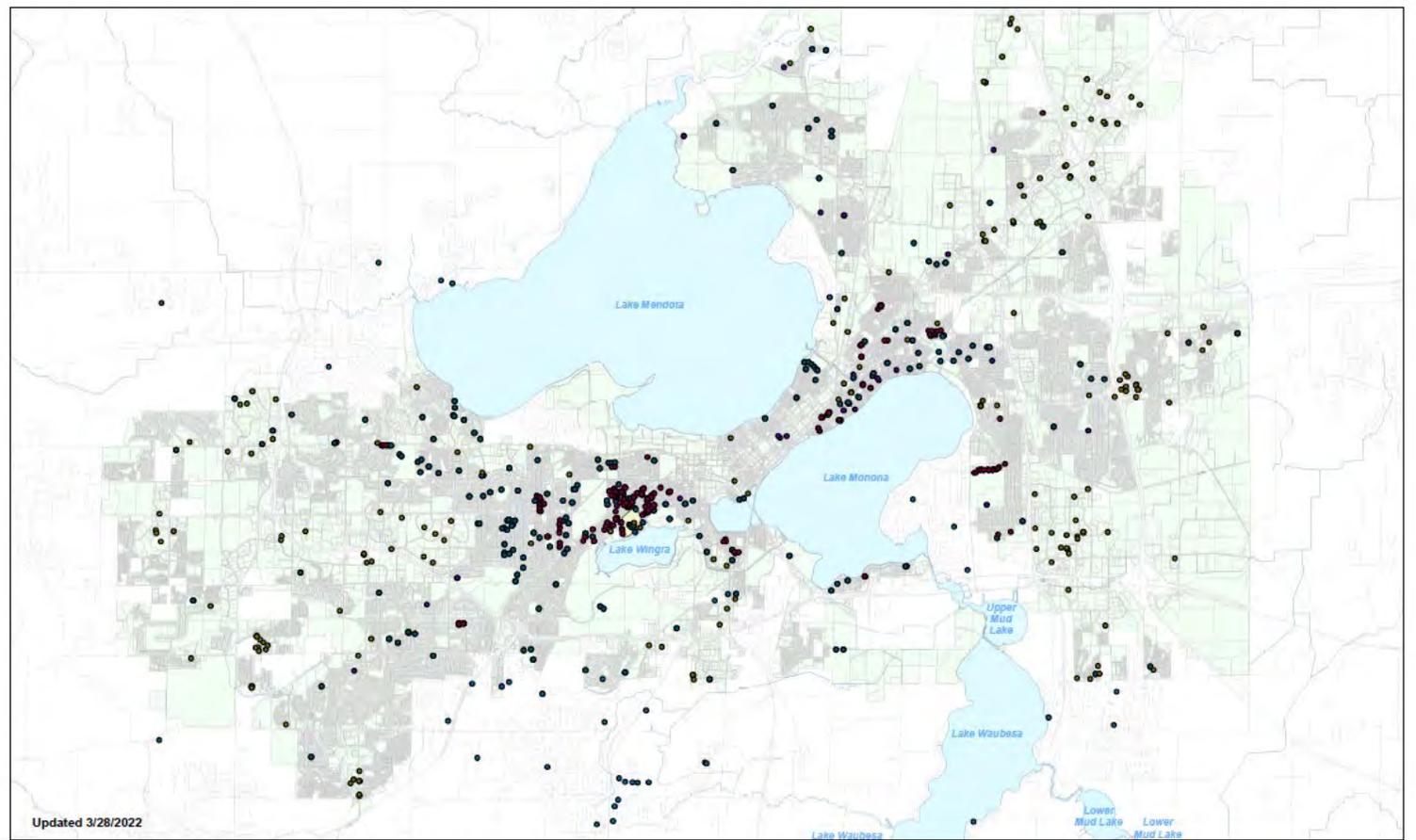


<https://www.cityofmadison.com/flooding/understanding-flooding/watershed-study-flood-risk-map>

2. Public Engagemer Rain Gardens

Continue to promote public and private installation

- Caromar Avenue
- Pilot area
- Lake Mendota Drive

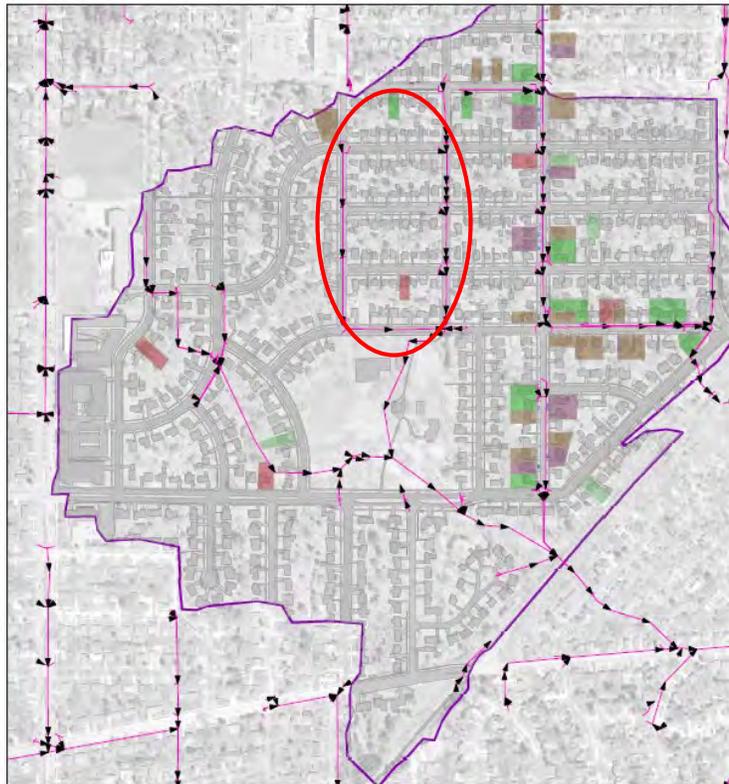


**City of Madison - Rain Gardens
686 Rain Gardens and Counting**

0 1 2 4 Miles



2. Public Engagement GI Pilot Study Installation Map



Green Infrastructure Study Area

Parcels
GI_Options
Private Rain Garden
Rain Barrel
Rain Basin
Rain Garden
Rock Crib

0 250 500 Feet



Public Installation Quantities

- Stormwater Terraces
Rain Gardens :17
Rain Basins: 22
- Permeable Streets
Parking lane of Euclid and St. Clair
6,344 sf + 2000 sf on Caromar
- Rock Cribs : 14
- Sidewalk Drains :129

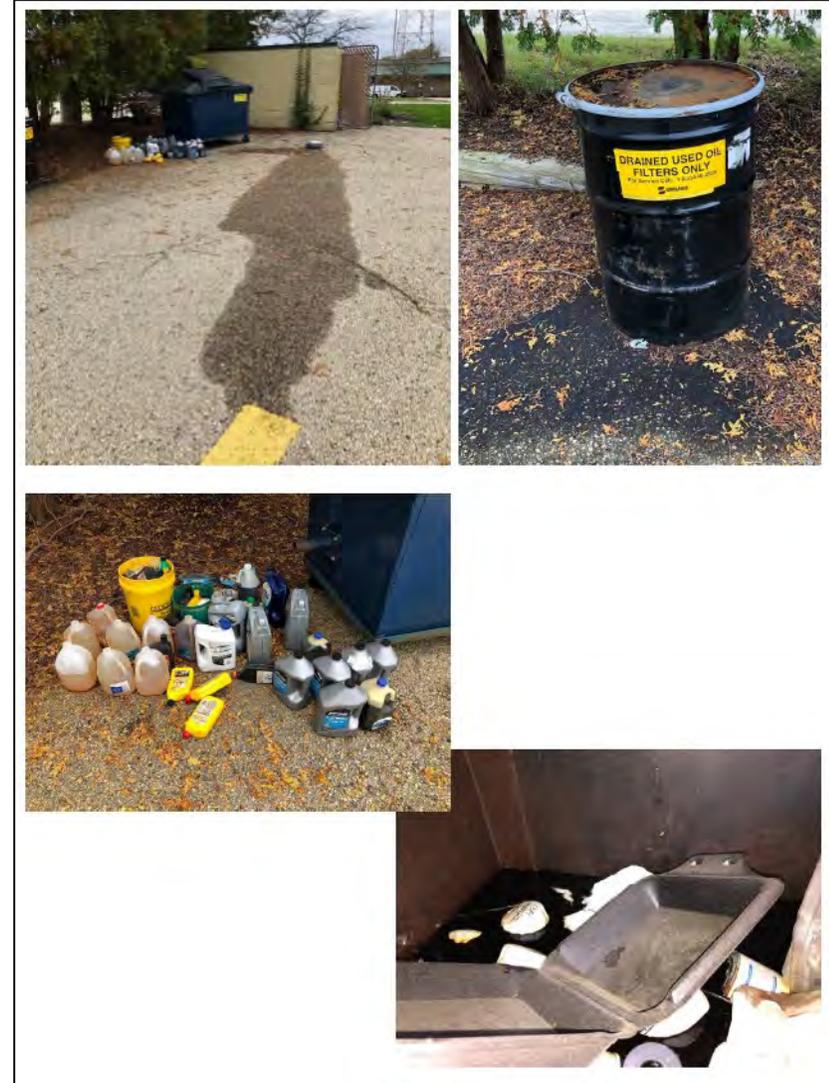
Private Installation Quantities

- 10 Rain Gardens: 2 in the works
- 5 Rain Barrels
- Total Impervious Draining to GI: ~4%
- 100k WDNR Grant for 2023



3. IDDE

- ▶ Illicit Discharge Detection and Elimination
 - ▶ Tests all 590 outfalls on a four year rotation
 - ▶ 106 tested in 2022:
 - ▶ No issues found
 - ▶ Water that should go to Madison Metro Sewerage District that goes to Storm Sewer
 - ▶ Cross Connections
 - ▶ Dumping
 - ▶ Concrete
 - ▶ Carpet Cleaners
 - ▶ Painters
 - ▶ Gave in person training in 2022 to field staff



Waste oil dumps at closed oil change business

4. Construction Site Pollution Control Erosion Control

- ▶ Issued **65** Permits over 1ac for 2022
 - ▶ **250** inspections
 - ▶ 59 Citation
- ▶ Green Tier Erosion Control Tour



Autumn Lake Entrance
Stabilization

5. Post Construction Stormwater Management

Review and maintenance of Private Stormwater Treatment

- ▶ 66 new facilities added
- ▶ 221 inspection reports filed



6. Pollution Prevention Ponds and Greenways

- ▶ 415 Ponds owned and managed by the City
 - ▶ Inspected for sediment depth, bank erosion and clogging
 - ▶ Maintained as needed
 - ▶ 56 Ponds Managed by others in our system
 - ▶ 1550 catchbasins
 - ▶ 601 tons removed
 - ▶ 65 repairs to Ponds
 - ▶ Bank erosion, vegetation
- Surveyed 26 ponds



Wheeler Road Pond

6. Pollution Prevention Winter Maintenance

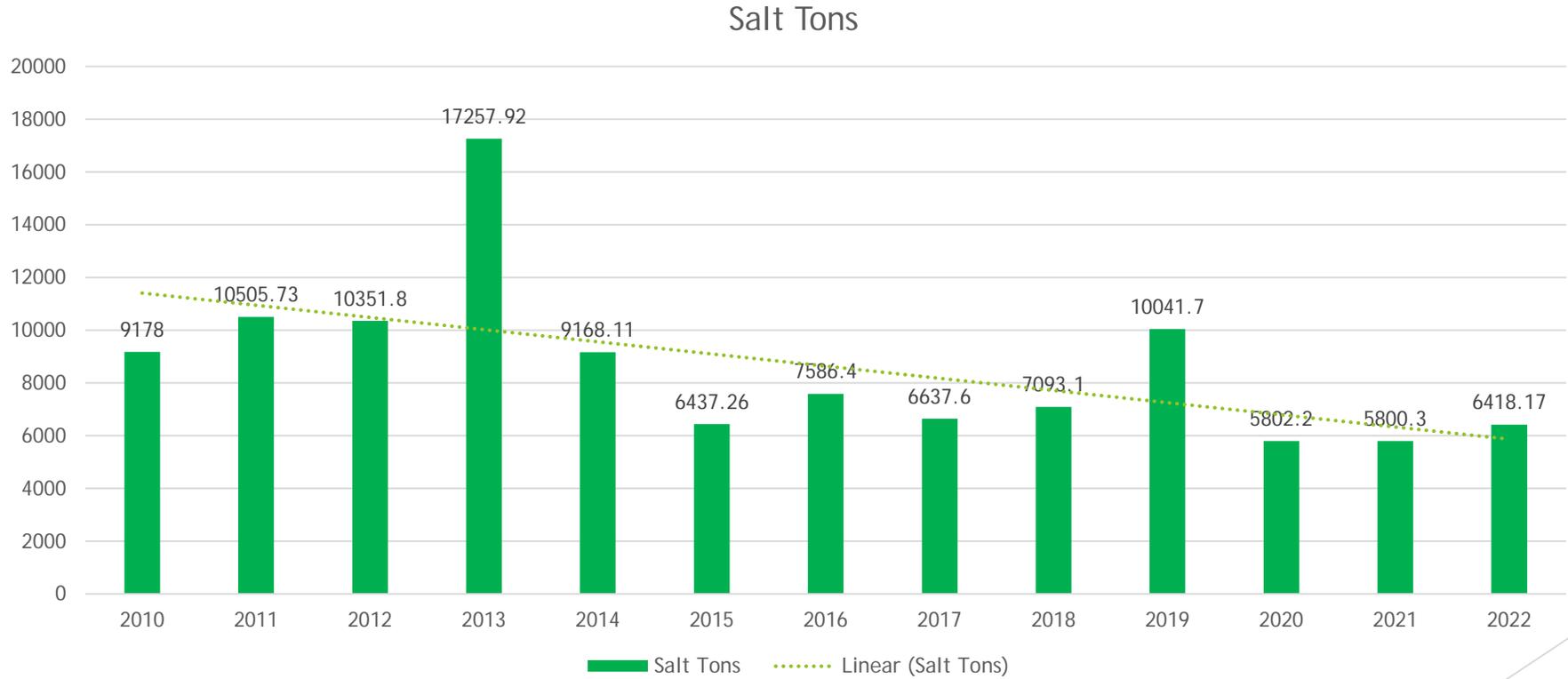
- ▶ Certification program to get public and private applicators educated on ways to effectively reduce de-icing salt.
 - ▶ Co-hosted 2 trainings with Saltwise
- ▶ CARPC led Starkweather Creek Chloride Management Plan
- ▶ Ordinance update to require residual salt be swept up from sidewalks
 - ▶ Only municipality in state to have this ordinance.

MARCH 2021
Starkweather Creek
Chloride Management Plan
2020 - 2024



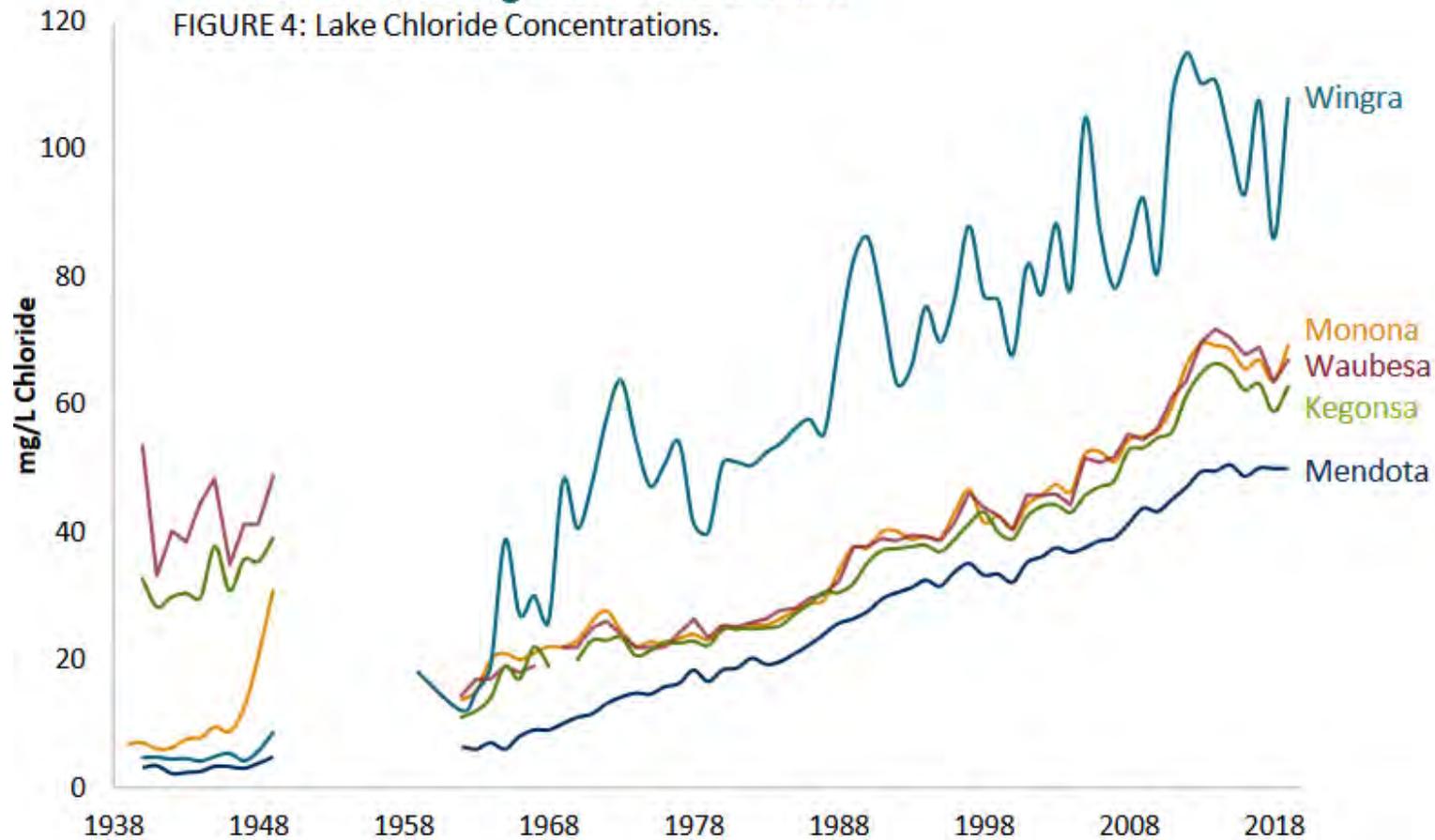
<https://www.capitalarearpc.org/being-salt-wise-for-starkweather-creek/>

6. Pollution Prevention Winter Maintenance City Salt Use 2010-2022



Chloride is increasing in the Yahara Lakes

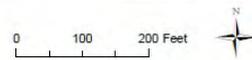
FIGURE 4: Lake Chloride Concentrations.



6. SWPPPS- Stormwater Pollution Prevention Plans

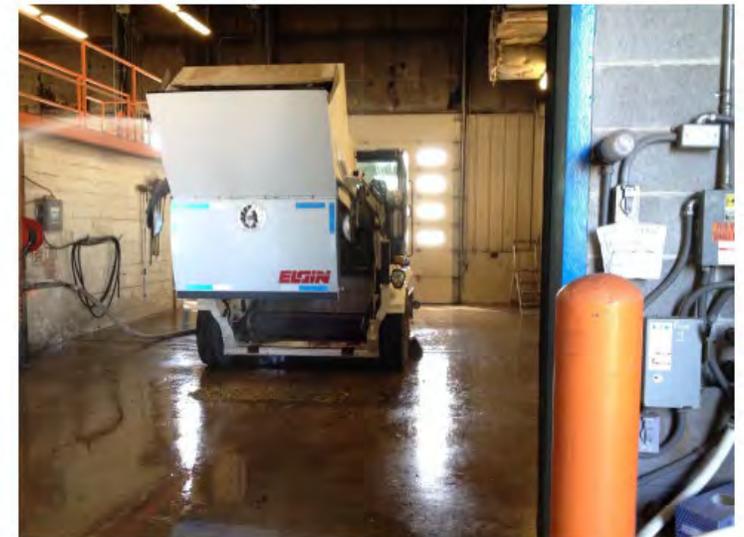


Sycamore Street Facility
Madison, WI



- 8 Sites with SWPPPs
- 2023 moving to Cityworks for Inspections

1	A	B		D	E	F	G	H	I	J		L	
		Indoors	Outdoors							Likelihood of Contact	Risk of release		
2	ACTIVITY/MATERIAL	LOCATION MAP ID		Sediment	Nutrients	Metals	Hydrocarbons	Toxins	other			CURRENT PRACTICE	
3	4	5											
6	Vehicle repair and maintenance	B-2		○	-	●	●	●			○	○	<ul style="list-style-type: none"> ● Vehicles repaired and maintained indoors ● Floor drains in these facilities are connected to the sanitary sewer system
7	Vehicle storage and parking	B-1C B-4C	M-1	●	-	●	●	○			●	○	<ul style="list-style-type: none"> ● Outside vehicle storage drains to stormsewer
8	Vehicle washing	B-1D		●	●	○	○	●			○	○	<ul style="list-style-type: none"> ● Vehicle washing is performed indoors ● Washbays are connected to the sanitary sewer system
9	Metals recycling		M-11	-	-	-	-	-			-	-	<ul style="list-style-type: none"> ● Material stored in uncovered dumpsters
10	Refuse		M-13	●	●	-	-	-			-	-	
11	Waste oil and used anitfreeze		M-13 M-12	-	-	-	-	-			-	-	
12	Gasoline and diesel fuel dispensing		M-15 M-14	-	-	-	-	-			-	-	
13	Cold Patch	B-1B		-	-	-	-	-			-	-	
14	Tack for Asphalt	B-1A		-	-	-	-	-			-	-	
15	Pea gravel	B-1A		○	-	-	-	-			-	-	
16	Spray patch equipment	B-1A		-	-	-	-	-			-	-	
17	Snow plow storage		M-7 M-4	-	-	-	-	-			-	-	
18	Sweeper dumps/transfer location		M-5	●	●	-	-	-			-	-	
19	Salt / Sand storage 90% and 10% Salt	B-3		●	-	-	-	-			-	-	
20	Brine Solution tanks		M-10	-	-	-	-	-			-	-	



B-1D Vehicle Washing

6. Street Sweeping

- ▶ Clean Streets Clean Lakes Initiative
 - ▶ Weekly Sweeping with Parking Restrictions
 - ▶ 7,340 Tons Collected
 - ▶ Expanded Parking Restrictions Year Round
 - ▶ Vacuum Sweeper for 2023
 - ▶ 2022 Costs: \$2.45 million

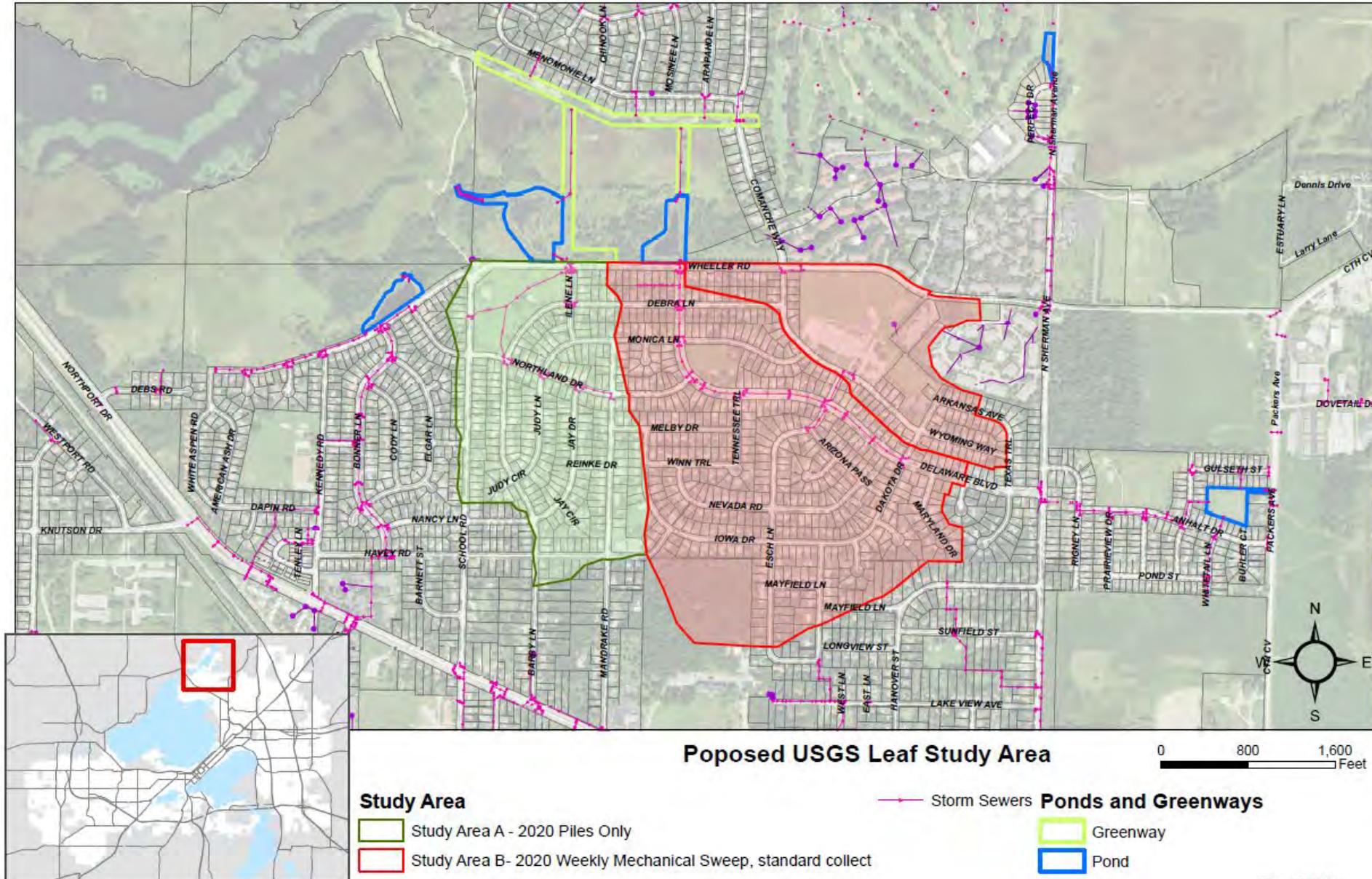


6. Leaf and Yard Waste Collection 2021

- ▶ Madison Collected:
 - ▶ 23,825 tons of leaves
 - ▶ 1,734 tons of yard waste in 2022
- ▶ Cost :
 - ▶ \$2.36 million for Leaves
 - ▶ \$928,000 for Yard Waste
- ▶ Ordinance prohibiting leaves in Street
 - ▶ 10.18 - COLLECTION OF REFUSE AND RECYCLING OF WASTE.
- ▶ Promotion of leaf removal from street
 - ▶ Text alerts
- ▶ USGS Study to assess impact of mechanical bi-weekly sweeping
 - ▶ 50% reduction compared to nothing



City of Madison - Leaf Study Continues



- 3 yrs
- Funded by Wisconsin League of Municipalities
- Study Goals
 - Mechanical sweeper between collections
 - Impact of detention basins

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Stormwater Utility

Stormwater Utility

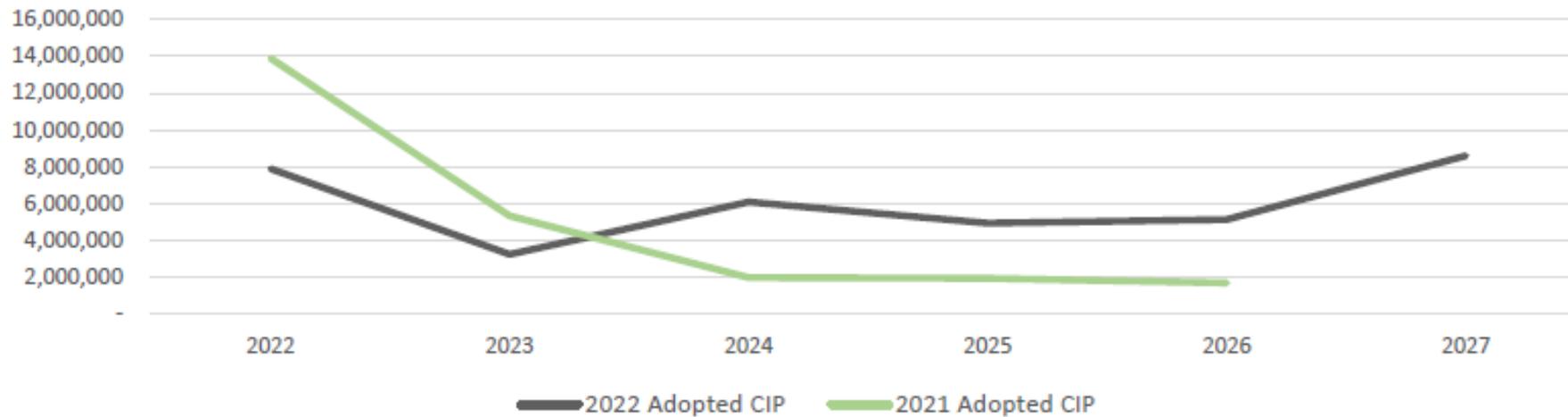
Capital Improvement Plan

Project Summary: Adopted

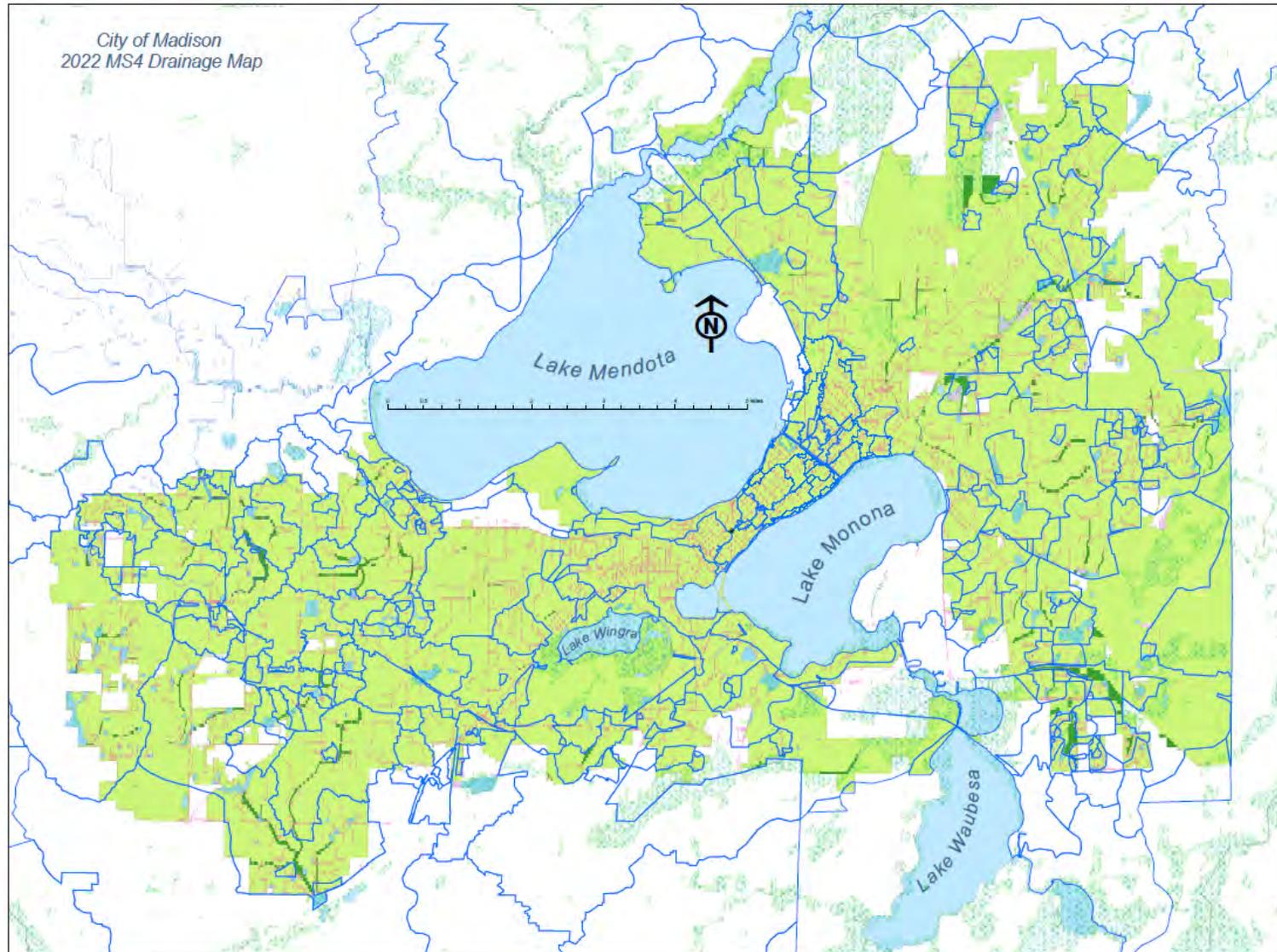
	2022	2023	2024	2025	2026	2027
Citywide Flood Mitigation	4,090,000	1,760,000	3,310,000	990,000	1,310,000	2,760,000
Storm Sewer System Improvements	232,000	210,000	190,000	195,000	195,000	210,000
Stormwater Quality System Improvements	3,045,000	985,000	2,125,000	3,285,000	3,155,000	5,075,000
Street Cleaning Equipment - Streets	533,000	300,000	470,000	470,000	493,000	563,000
	\$ 7,900,000	\$ 3,255,000	\$ 6,095,000	\$ 4,940,000	\$ 5,153,000	\$ 8,608,000

Changes from 2021 CIP

2022 Capital Improvement Plan
2021 Adopted vs. 2022 Adopted

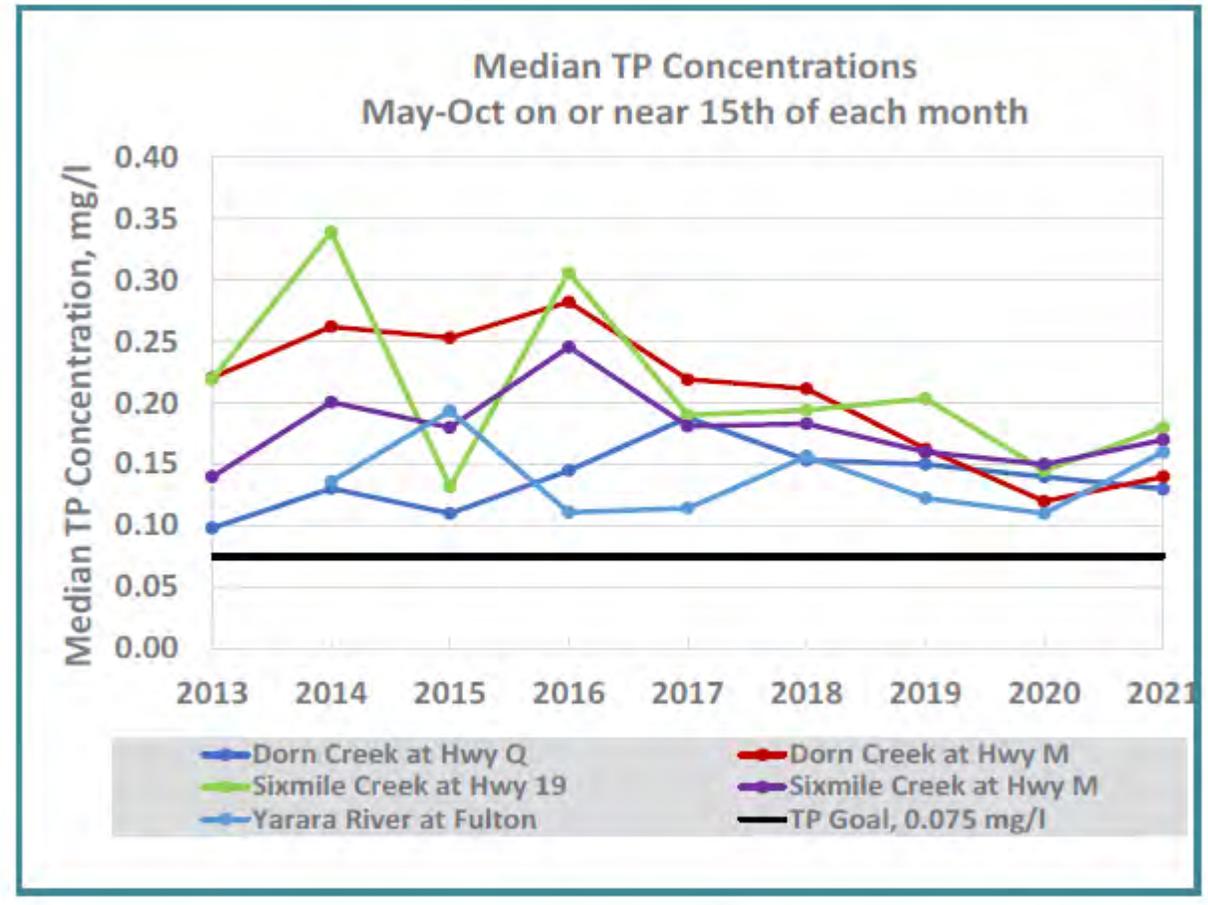


7. Drainage Map



8. Adaptive Management TMDL Compliance

- ▶ Madison Contributed
 - ▶ \$504,394 in 2022
 - ▶ Addresses 10,254 lb of TP
- ▶ Program is ahead of schedule
- ▶ 88,854 lb TP Captured vs 38,290 lb TP Goal for 2021
- ▶ TP \$/lb is lower than initially thought
- ▶ Ultimate Goal 104,000 lb
- ▶ Madison's MS4 produces 29,839 lb TP a year in the TMDL
- ▶ Currently Captures 7,877 lb annually
- ▶ Madison needs to capture an additional ~400,000 lb of TSS annually within the MS4 TMDL zone



Going Forward

- ▶ Continue Outreach and Education Efforts
- ▶ Green Infrastructure Pilot
 - ▶ Additional permeable pavement 2023
- ▶ Work to Reduce Phosphorus and TSS
 - ▶ Leaf Collection Study- Potential bonus year in 2024
 - ▶ Dry Pond SOC / sand filters
 - ▶ Watershed Study Proposed Solutions
 - ▶ Account for increased TSS and TP capture
- ▶ Improve and Expand Salt Certification - Increase Brine Usage
- ▶ Continue with Erosion Control Inspections and IDDE Education
- ▶ SWPPP Inspections into Cityworks