

Grand Glaize Creek 319 Watershed Plan

Stakeholder Update



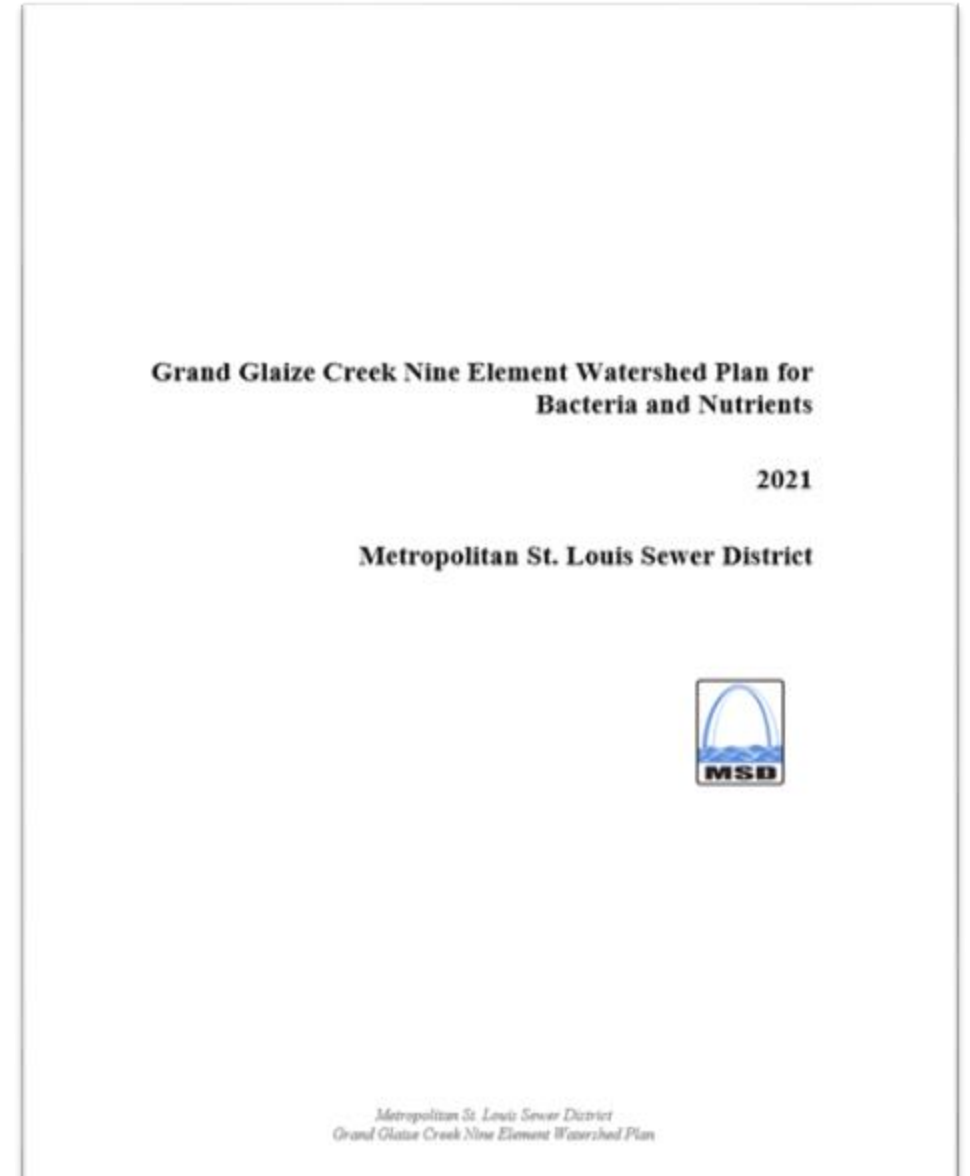
11/5/2021

Objectives

- 319 plan in place by Spring 2023 to grant funding
- Collecting data for the next iteration
- Source inventory
- Baseline loading results
- Management measures

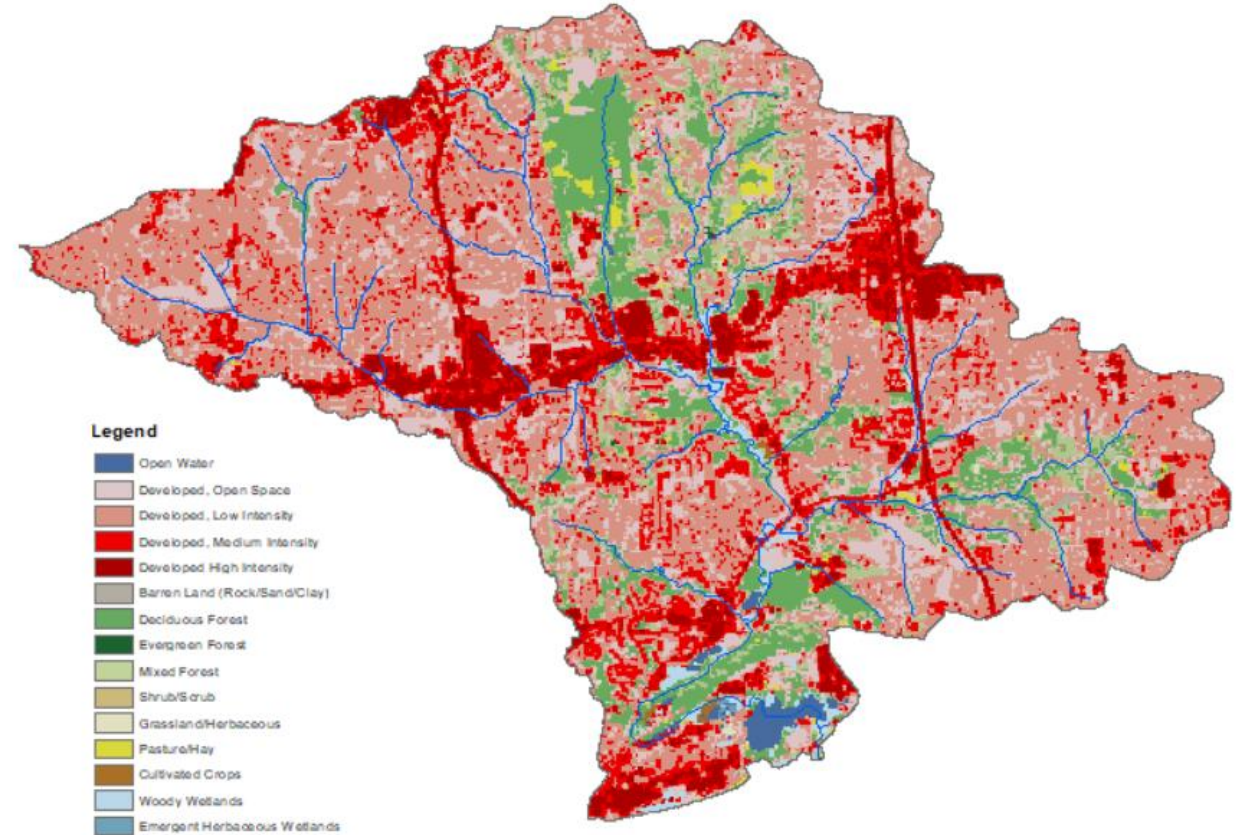
Watershed plan will incorporate the 9 element framework

1. Introduction
2. Characterize the Watershed
 - i. Geology, Physiology and Soils
 - ii. Rainfall and Climate
 - iii. Population
 - iv. Land Cover
3. Nine Element Plan
 - A. Identification of Causes of Impairment and Pollutant Sources
 - B. Estimated Pollutant Loadings and Expected Load Reductions
 - C. Nonpoint Source Management Measures
 - D. Technical and Financial Assistance
 - E. Information and Education
 - F. Implementation Schedule
 - G. Milestones
 - H. Assessment Criteria
 - I. Monitoring



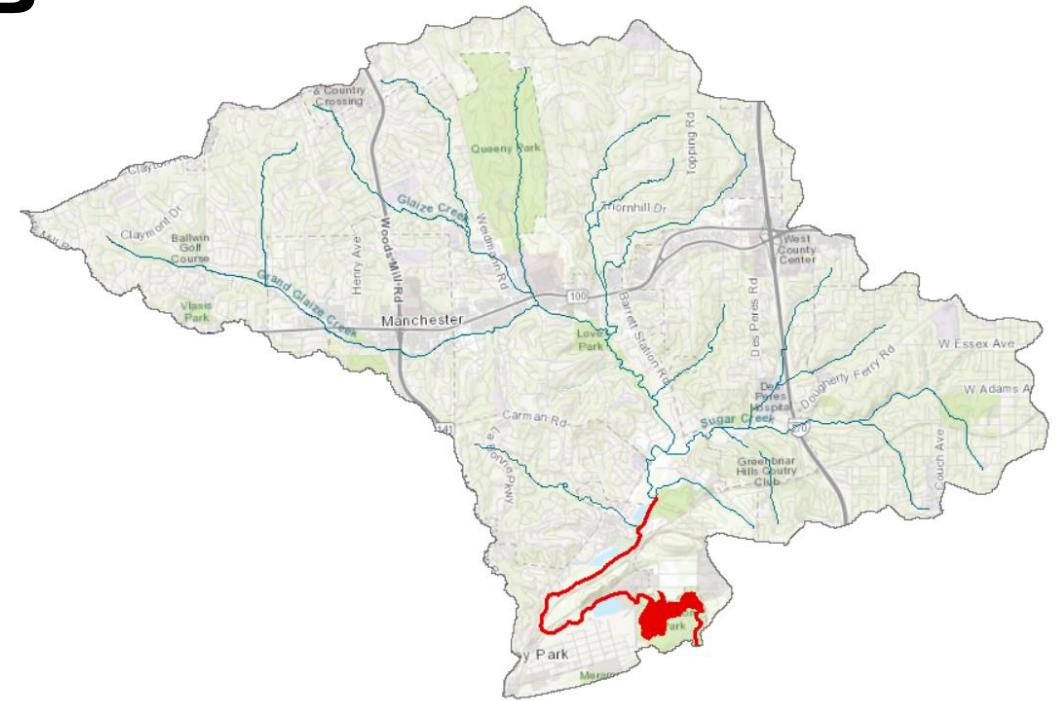
Grand Glaize is a highly urbanized watershed

- Size – 61.9 km²
- Population – 55,211 (2019 5-yr ACS)
- Soils – Predominantly Class C (clay soils with slow infiltration)
- Average Precipitation – 41.3 in/yr
- Land Use
 - Developed, Low Intensity – 44.8%
 - Developed, Med Intensity – 9.8%
 - Developed, High Intensity – 4.8%
 - Developed, Open Space – 19.9%
 - Deciduous Forest – 18.6%

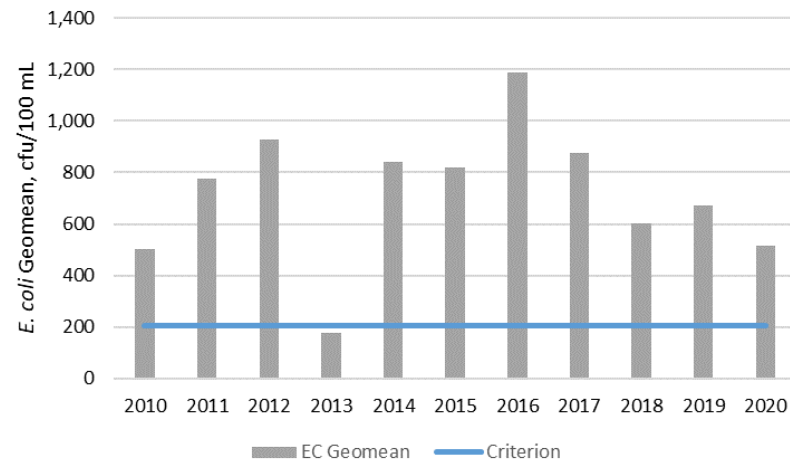


Plan will address *E. coli* and TP

| Waterbody (WBID) | Waterbody Size | Pollutant (year listed) | Impaired Use | Source of Impairment |
|---------------------------|----------------|-------------------------------|--|---------------------------------|
| Grand Glaize Creek (2184) | 4 miles | <i>E.coli</i> (2008) | Whole Body Contact-B | Urban Runoff/Storm Sewers |
| | | Chloride (2006) | Warm Water Aquatic Life | Urban Runoff/Storm Sewers |
| | | Mercury in Fish Tissue (2002) | Human-Health Protection (Fish Consumption) | Atmospheric Deposition – Toxics |
| Simpson Park Lake | 64 acres | Chl- <i>a</i> (2020) | Warm Water Aquatic life | NA |



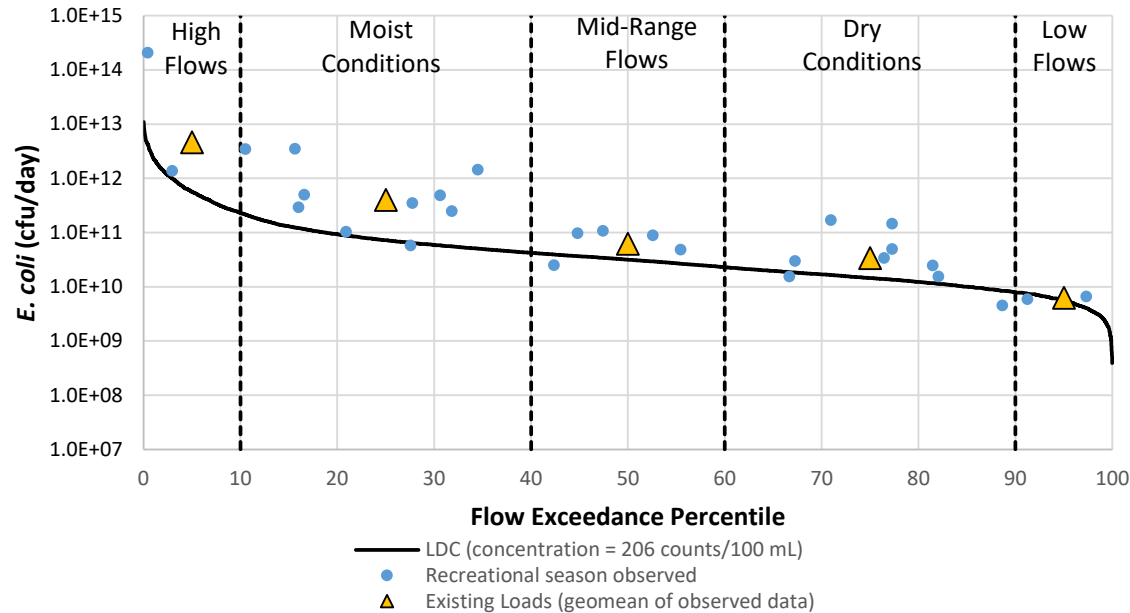
Grand Glaize Creek at Valley Park



Simpson Park Lake

| Year | Chlorophyll a, ug/L | Total Phosphorus, ug/L | Total Nitrogen, ug/L |
|----------------------|---------------------|------------------------|----------------------|
| 2015 | 46 | 86 | 795 |
| 2016 | 28 | 82 | 804 |
| 2017 | 21 | 57 | 700 |
| 2018 | 24 | 61 | 804 |
| 2019 | 34 | 102 | 904 |
| Impairment Threshold | 22 | -- | -- |
| Screenener | 13 | 40 | 733 |

E. coli baseline derived using data after 2016



Notes:

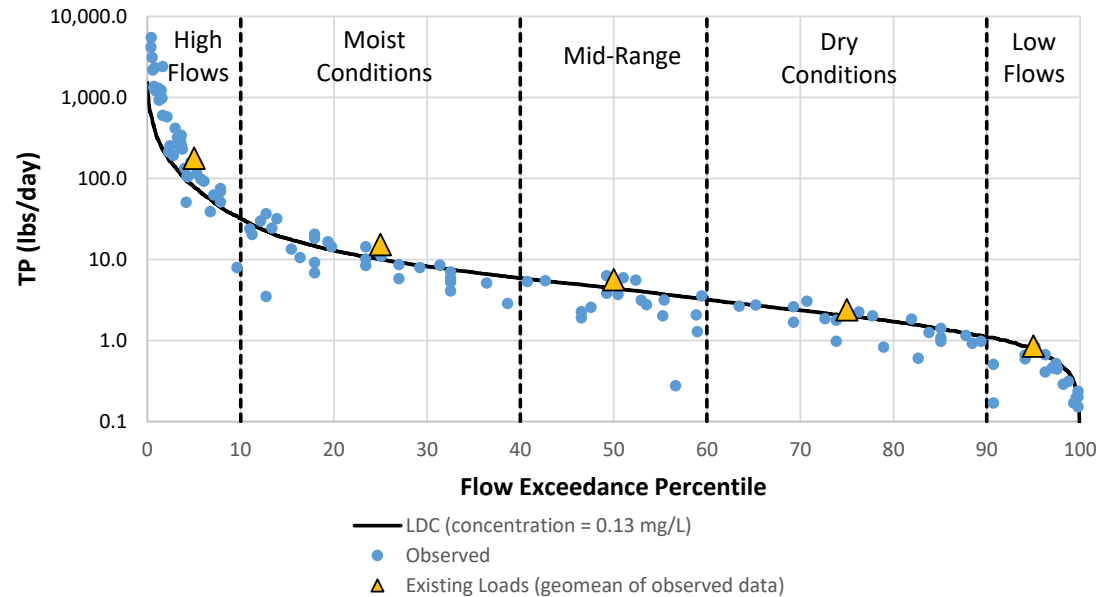
- Data from Valley Park station
- Limited *E. coli* data to after 2016 when final constructed SSO was removed
- Flow scaled up by a factor of 1.11

| Flow Regime | Flow Duration Interval | Median Flow, cfs | Geomean Conc. (#/100 mL) | Annualized Load (counts/year) | Percent Reduction to Meet <i>E. coli</i> Criterion |
|------------------|------------------------|------------------|-------------------------------------|-------------------------------|--|
| High Flows | 0-10% | 112 | 1,673 | 1.68E+14 | 87.7% |
| Moist Conditions | 10-40% | 14 | 1,134 | 4.38E+13 | 81.8% |
| Mid-Range Flows | 40-60% | 6 | 401 | 4.49E+12 | 48.6% |
| Dry Conditions | 60-90% | 3 | 477 | 3.69E+12 | 56.8% |
| Low Flows | 90-100% | 1 | 230 | 2.28E+11 | 10.4% |
| | | | Weighted Geomean ¹ = 630 | Total = 2.20E+14 | Weighted Average ² = 61% |

¹. Weighted geomean = $1,673^{0.1} * 1,134^{0.3} * 401^{0.2} * 477^{0.3} * 230^{0.1}$

². Weighted average = $0.877 * 0.1 + 0.818 * 0.3 + 0.486 * 0.2 + 0.568 * 0.3 + 0.104 * 0.1$

TP baseline accounts for MS4 measures and target reduction based on modeling



Notes:

- Data from Valley Park station
- TP not available after 2011
- Assumed 5% reduction to account for watershed improvements
- Flow scaled up by a factor of 1.11
- Target TP modeled in BATHTUB

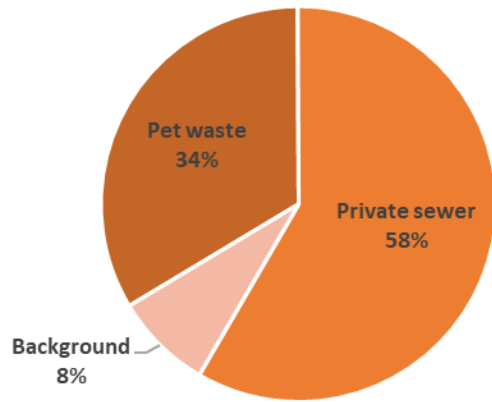
| Flow Regime | Flow Duration Interval | Median Flow, cfs | Geomean Conc. (mg/L) | Observed Load (lbs/day) | Annualized Load (lbs/yr) | Target Load ¹ (lbs/yr) |
|--|------------------------|------------------|----------------------|-------------------------|--------------------------|-----------------------------------|
| High Flows | 0-10% | 112 | 0.294 | 177 | 6,476 | 2,867 |
| Moist Conditions | 10-40% | 14 | 0.196 | 15 | 1,669 | 1,107 |
| Mid-Range Flows | 40-60% | 6 | 0.166 | 5.6 | 411 | 321 |
| Dry Conditions | 60-90% | 3 | 0.153 | 2.4 | 261 | 221 |
| Low Flows | 90-100% | 1 | 0.143 | 0.9 | 31 | 28 |
| Total (lbs/year) | | | | | 8,848 | 4,545 |
| Adjusted baseline load (lbs/year) ¹ | | | | | 8,406 | |
| Percent Reduction to Meet Target Load ² | | | | | | 46% |

¹ Total load reduced by 5% to account for watershed improvements since data were collected (e.g., removal of constructed SSOs and implementation of MS4 BMPs).

² Target load is based on an instream concentration of 0.13 mg/L.

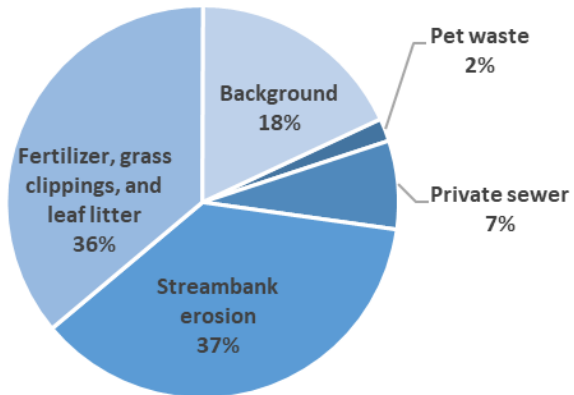
Element B – Estimated Source Contribution

E. coli



| Source | EC Load, cfu/yr | Percent |
|------------------|-----------------|---------|
| Pet waste | 7.37E+13 | 34% |
| Failing septic | 5.46E+13 | 25% |
| Private laterals | 7.39E+13 | 34% |
| Background | 1.76E+13 | 8% |
| Total | 2.20E+14 | |

Total Phosphorus



| Source | TP Load, lbs/yr | Percent |
|------------------------------|-----------------|---------|
| Pet waste | 158 | 1.9% |
| Failing septic | 612 | 7.3% |
| Streambank erosion | 3,084 | 37% |
| Lawn fertilizer & yard waste | 3,039 | 36% |
| Background | 1,513 | 18% |
| Total | 8,406 | |

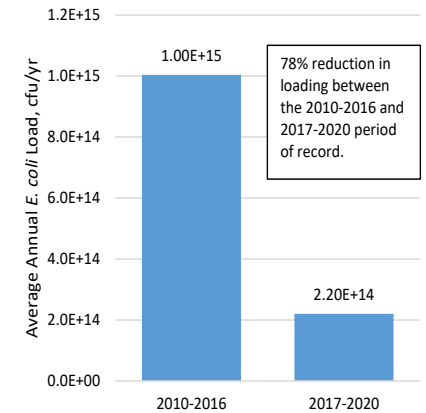
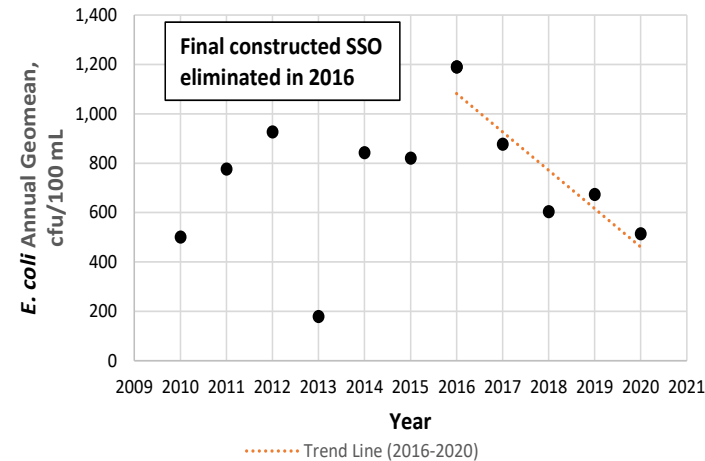
Pollutant sources addressed in watershed plan

- Point Sources
 - Municipal and Domestic Wastewater Permits
 - Site-Specific Industrial and Non-Domestic Wastewater Permits
 - Municipal Separate Storm Sewer System (MS4) Permits
 - General Wastewater and Non-MS4 Stormwater Permits
 - Illicit Straight Pipe Discharges
- Nonpoint Sources
 - Agricultural Runoff
 - Urban Runoff (non-MS4 permitted areas)
 - Onsite Wastewater Treatment Systems
 - Other

| Source | <i>E. coli</i> | TP |
|---|----------------|----|
| Pet waste | X | X |
| Private sewer (failing septic and laterals) | X | X |
| Streambank erosion | | X |
| Lawn fertilizer & yard waste | | X |
| Internal loading | | X |
| Background/Non-anthropogenic | X | X |

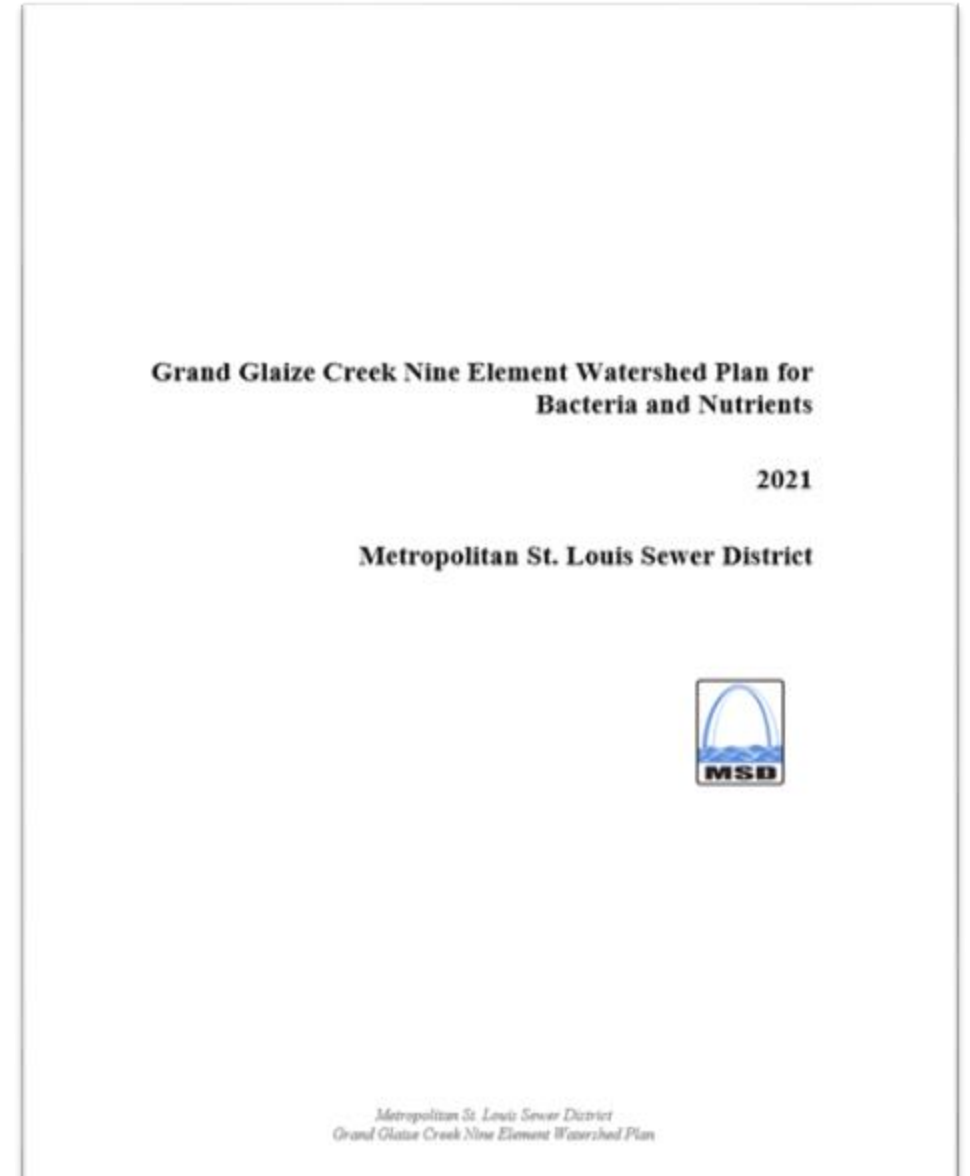
Management measures addressed in the watershed plan

- Consent Decree Requirements
- Phase II Stormwater Management Plan
- Additional Management Measures
 - Enhanced Education & Outreach
 - Sewer Lateral Program
 - Septic Tank Replacement & Cleanout
 - Streambank Stabilization
 - Armored Stabilization
 - Biostabilization
 - Simpson Park Lake Enhancements



Next Steps

1. Contact Information
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 - iii. Thomas Sottile: 335-2111, tsottile@stlmsd.com
2. Nine Element Plan
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Questions