



## 2020 Annual Activity Report



Greenfield • Independence • Loretto • Maple Plain • Medina • Minnetrista



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Cover Photograph:

*Baker Park Ravine*

*Drone survey post construction*

*Photo by Seth Bossert, Wenck Associates, May 27, 2020*



## ANNUAL ACTIVITY REPORT

*This annual activity report has been prepared by the Pioneer-Sarah Creek Watershed Management Commission in accordance with the annual reporting requirements of Minnesota Rules Chapter 8410.0150, Subps. 2 and 3. It summarizes the activities undertaken by the Commission during calendar year 2020.*

### PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

The Commission was established to protect and manage the natural resources of the Pioneer and Sarah Creek watersheds. It is a joint powers watershed organization formed as required under MN Statutes 103B.201-103B.255 and MN Rules Chapter 8410. A Board of Commissioners comprised of representatives appointed by the member communities was established as the governing body of the Commission. Its membership is comprised of the cities of Greenfield, Independence, Loretto, Maple Plain, Medina, and Minnetrista. The table in *Appendix 1* shows the names of the Commissioners appointed to serve in 2020.

### MEETINGS

The Commission meets on the third Thursday of the month at Maple Plain City Hall. The meetings are open to the public and visitors are welcome. Meeting notices, agendas, and approved minutes are posted on the Commission's website, [www.pioneersarahcreek.org](http://www.pioneersarahcreek.org). However, due to the COVID-19 pandemic, beginning in April 2020 the Commission met virtually via zoom.us. All other meeting criteria remained the same.

### STAFF AND CONSULTANTS

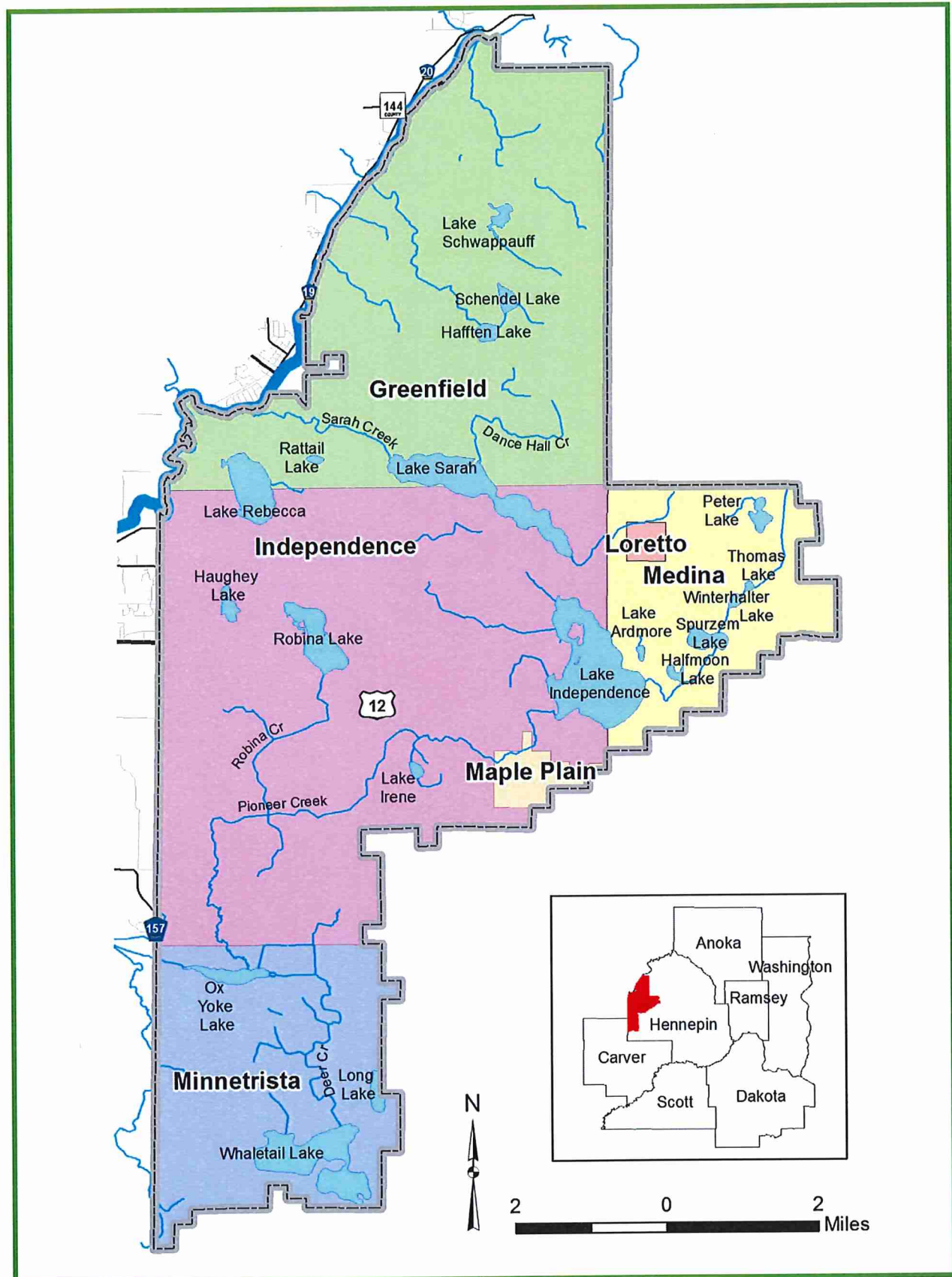
The Commission has no employees. Independent consultants perform technical, legal, administrative, and wetland services for the Commission and are selected biannually. The current staff and consultants are listed in *Appendix 1*.

### THE WATERSHED

Located entirely within western Hennepin County, the Pioneer-Sarah Creek watershed covers approximately 70.5 square miles and includes the watersheds of Pioneer Creek and Sarah Creek. The Crow River demarcates most of the northern boundary. Portions or all of the six member cities are within the legal boundaries of the Pioneer-Sarah Creek watershed and are listed in Table 1. A map of the watershed can be viewed on the next page.

### WATERSHED MANAGEMENT PLAN

The Commission's Fourth Generation Watershed Management Plan was approved by the Board of Water and Soil Resources (BWSR) for a period of six years on January 28, 2015. The Commission adopted the Plan on May 21, 2015.



**Table 1**  
**Area of Members within the Pioneer-Sarah Creek Watershed**

Local Government Unit	Area Within Watershed (Square Miles)	Percent of Watershed
Greenfield	21.5	30.5%
Independence	29.7	42.1%
Loretto	0.3	0.4%
Maple Plain	0.8	1.1%
Medina	7.5	10.7%
Minnetrista	10.7	15.2%
<b>TOTAL:</b>	70.5	100.0%

During 2020 the Commission developed its Fourth Generation Plan. It was approved by BWSR for a period of ten years on December 17, 2020 and adopted by the Commission on the same date.

During development of its Third Generation Plan, the Commission identified the following priorities to guide water resources planning and management functions:

- Educate the Commissioners and member City Councils and Planning Commissions regarding watershed and water resources management.
- Undertake a monitoring program to monitor water quality trends and to track progress toward meeting TMDLs.
- Partner with member cities and other parties to conduct subwatershed assessments and other studies to identify feasible and cost-effective Best Management Practices (BMPs) to protect and improve water quality.

On November 19, 2015, the Commission amended its Third Generation Watershed Management Plan to adopt a revision to the plan amendment process to conform to 2015 revisions to MN Rules 8410. In part, the revisions will allow the Commission to modify the CIP with only minimal need for plan amendments.

On July 20, 2017, the Commission adopted a second amendment to revise the costs associated with project IN-2 Hydrologic Restorations on the Pioneer-Sarah Creek 2015 Capital Improvement Program (CIP). The revision would update the estimated costs of the design and construction phases of the Baker Campground Ravine project.

On June 21, 2018, the Commission amended its Third Generation Plan to revise the CIP to remove twenty projects that have already been completed or will not move forward, to update the estimated costs/timing of three projects, to group nine projects into the category *Watershedwide Ongoing Opportunity-Based Projects*, and to add ten new projects.

### **LOCAL PLANS**

Local water management plans adopted by member cities pursuant to Minnesota Statutes, Section 103B.235 shall be consistent with the Commission's Watershed Management Plan. Local plans must

comply with MN Statutes, Section 103B.235 and MN Rules 8410 regarding local plan content. By year-end 2019 the Commission had reviewed and approved the local surface water plans of all the member cities.

## 2020 WORK PLAN IN REVIEW

Minnesota Rule 8410.0150 requires the Commission to submit to the Board of Water and Soil Resources a financial report, activity report and audit report for the preceding fiscal year. 8410.0150 Subp. 3 outlines the required content of the annual activity report. It includes an assessment of the previous year's annual work plan and development of a projected work plan for the following year.

The Commission's Third Generation Plan identifies issues, priorities, and goals for the six-year period 2015-2020. Following is a summary of the work undertaken by the Pioneer-Sarah Creek Watershed Management Commission in 2020 to meet the goals, objectives and projected work plan outlined in its 2019 *Annual Report*. The projected Work Plan was approved at the Commission's March 19, 2020 meeting.

### A. ONGOING TECHNICAL AND ADMINISTRATIVE PROGRAMS

1. Continue to review local development/redevelopment plans for conformance with the standards outlined in the Commission's Third Generation Watershed Management Plan.
  - a. Maintain the current flood profile of the creeks and their tributaries.
  - b. Maintain the post-development 2-year, 10-year, and 100-year peak rate of runoff at pre-development level for the critical duration precipitation event.
  - c. Maintain the post-development annual runoff volume at pre-development volume.
  - d. Prevent the loss of floodplain storage below the established 100-year elevation.

*In 2020, the Commission reviewed seven plans for conformance with its standards in 2020. Two projects each were in the cities of Greenfield, Medina, and Minnetrista, and one project was in the City of Independence. (Appendix 2)*

2. Continue to serve as the local government unit (LGU) for administering the Wetland Conservation Act (WCA) for the cities of Greenfield, Loretto and Maple Plain. *The Commission discontinued serving as the local government unit (LGU) for administering the Wetland Conservation Act (WCA) for the member cities effective January 1, 2020. The cities of Greenfield, Loretto and Maple Plain assumed that role on that date.*

3. Adopt a 2021 operating budget. *The Commission approved a \$141,800 operating budget for 2021 at their May 21, 2020 meeting. The total assessment to the cities (\$131,800) remained the same as in 2020. (Appendix 3)*

- a. Search for grant and other funds to supplement the regular budget. *The Commission participated in the Watershed-Based Implementation Funding meetings for the North Fork Crow and South Fork Crow major watershed areas to evaluate projects proposed by partners and allocate funding. As of December 31, 2020, projects and costs have been submitted but allocations*

had not been finalized. Allocations were finalized in January 2021 and include a total of \$180,063 for South Fork Crow and \$91,105 for North Fork Crow. The South Fork funding will be apportioned to three projects: Lake Independence SWA BMPs, Lake Rebecca SWA and Feasibility, and Spurzem Creek BMPs. The North Fork Crow funding will be used to update the Dance Hall Creek SWA and implement identified projects. The Commission also pursued Hennepin County Opportunity Grants to assist in funding the Ardmore Neighborhood projects and the Baker Park Ravine project.

b. Fund a capital improvement program to share in the cost of projects. *\$28,000 was allocated to fund capital projects in 2021.*

c. Budget for the expense of undertaking a Major Plan Amendment to extend the term of the Third Generation Plan. *This expense was not incurred in 2020, rather the funds were comingled with funds set aside for development of the Fourth Generation Plan.*

4. Continue to respond to recommendations included in the Board of Water and Soil Resources 2018 Level II Review and Assessment of the Commission's Progress toward its Third Generation Plan Objectives report.

a. Develop and implement a training plan for board members. *Staff began updating the Commissioner handbook in 2019 with the intent of beginning training in 2020. However, the onset of the COVID-19 pandemic put a pause on this endeavor.*

b. Make water quality data and trends easily accessible to the public. *Lake Report Cards were developed by Three Rivers Park District and made available on the Commission website. Stream data in a reader-friendly format was also uploaded to the website.*

c. Evaluate progress for the implementation of plan actions at a minimum of every two years, making sure to measure outcomes, not just outputs. Report on progress toward achieving resource improvement. *This information is being included in this report as well as uploaded to the Commission's website.*

5. Draft a 2020 Work Plan. *The Commission's 2020 Work Plan was approved at the Commission's March 19, 2020 meeting.*

6. Publish a 2019 Annual Activity Report summarizing the Commission's yearly activities and financial reporting. *The 2019 Annual Activity Report was approved by the Commission at their April 16, 2020 meeting and submitted to BWSR by the April 30 statutory deadline. The Commission's 2019 Audit Report was accepted by the Commissioners at their June 18, 2020 meeting and submitted to the state auditor online per compliance guidelines.*

7. Conduct the biennial solicitation of interest proposals for administrative, legal, technical and wetland consultants. *Pursuant to Minnesota Statute 103B.227.subd. 5., a solicitation of interest proposals was published in the January 14, 2019 issue of the State Register. Three responses to provide technical support, three responses to provide wetland consultant support, and one response each for legal and administrative support were received. The Commission voted to retain the current consultants for 2019-2020. The firm of Hakanson-Anderson was named to replace the Department of Environment and Energy of Hennepin County as the Commission's Technical Advisor in 2020.*

**B. WATER QUALITY AND QUANTITY**

1. Support the Commission's management goals for water quality. Continue to make progress to improve lakes and streams in the watershed as well as protect those that are not impaired. Improve water clarity in the impaired waters by 10% over the average of the previous ten years by 2023. *In 2020 a comparison of lake data over the previous 10-year period shows that sechhi disk readings have improved by over ten percent in eight out of nine lakes with enough data to perform a trend analysis. Improvements in water clarity are as follows: Lake Adrdmore-28%, Hafften Lake-23%, Lake Independence-43%, Lake Sarah East-36%, Lake Sarah West-38%, Spurzem Lake-38%, North Whaletail 16%, and South Whaletail 16%. In addition, five lakes had notable reductions in TP: Hafften Lake-15%, Lake Independence-10%, Lake Sarah West-18%, North Whaletail-23%, and South Whaletail-5%. Sufficient data was unavailable for Lake Sarah East.*

2. Foster implementation of BMPs in the watershed through technical and financial assistance.

a. Utilize the services of the University of Minnesota's agriculture specialist and Hennepin County's Rural Conservationist to promote, educate, and facilitate best management practices to target audiences. *Face-to-face contact with landowners and other target audiences was minimal in 2020 due to the COVID-19 pandemic.*

b. Identified projects eligible for the Hennepin County Natural Resources Grant program. *This is an on-going process the Commission provides to its member communities and land-owners. Projects are identified through subwatershed assessments and other various efforts. No projects were identified in 2020.*

3. Operate a monitoring program sufficient to characterize water quantity and quality and biotic integrity in the watershed and evaluate progress toward TMDL goals. Partner with Three Rivers Park District (TRPD) to conduct water quality monitoring in the watershed. Bring stream and lake monitoring efforts into line with the monitoring program outlined in the Third Generation Watershed Plan.

a. *Partnered with TRPD to conduct bi-weekly water quality monitoring of "sentinel lakes" (Independence, Sarah, Little Long, and both basins of Whaletail.) The water quality parameters that were collected at the surface for all of the lakes included total phosphorus, soluble reactive phosphorus, total nitrogen, and chlorophyll-a. Samples were also collected at the top of the hypolimnion and 1-m from the bottom for analysis of total phosphorus and soluble reactive phosphorus for the "deep lakes." Results of the monitoring program are cited on "Lake Report Cards," which are included in Appendix 4 and which will be posted to the Commission's website.*

b. Partnered with Three Rivers Park District (TRPD) to conduct flow and water quality monitoring at two selected sites on Pioneer Creek and Sarah Creek. There will also be water quality and flow monitoring at two additional sites that flow into Lake Independence. *Monitoring in 2020 occurred on Pioneer Creek at Copeland Road (PSC), Sarah Creek at County Road 92 (SCO), and Pioneer Creek at Pagenkopf Road (PSP). (Appendix 5)*

c. Participate in Metropolitan Council's Citizen Assisted Monitoring Program (CAMP). *Hafften Lake was monitored through the CAMP program in 2020. The 2020 CAMP report will be available in spring 2020 at <https://metro council.org/WastewaterWater/Services/Water-Quality-Management/Lake-Monitoring-Analysis.aspx>*

4. Support watershed residents and organizations as issues arise, providing general, technical and financial assistance where appropriate.

a. *Hennepin County Staff provided conservation and drainage management guidance to landowners as requested by them and Commission leadership. County staff will continue to offer these services on behalf of the Commission in future years.*

b. *In 2019, the Zuhrah Shrine Horsemen sent a letter to the City of Independence regarding a large wetland on their property, flooding, and infringement on their land. They requested the City and the Commission to perform a study to identify solutions to this problem. Field site visits were conducted in 2020, which were able to address the most immediate flooding concerns. A more comprehensive plan for addressing erosion and long-term flooding on the property has been incorporated into a subwatershed assessment for the greater Lake Rebecca Subwatershed, which the property lies within. That report will include an identification of conservation practices on the Zuhrah property and designs to install those practices. In addition, Hennepin County has engaged NRCS to assist in planning pasture and grazing management improvements as well as other conservation planning in 2021.*

## C. EDUCATION

1. Annually evaluate the proposed Education and Outreach program and establish education and outreach activities for the coming year, including goals and strategies identified in the WRAPS study. These later activities could be identified through a collaboration of the Technical Advisory Committee (TAC) and the Citizen Advisory Committee (CAC). A number of implementation strategies are identified in the Commission's Education and Outreach Plan found in Appendix E of the Third Generation Management Plan. *Reviewed and made more realistic and feasible strategies during the development of the Fourth Generation Plan. \$4,500 was included in the budget for education and educational events.*

2. Educate Commissioners, member City Councils, and Planning Commissions about watershed and water resources management. Sponsor watershed and water resources training opportunities such as NEMO (Nonpoint Education for Municipal Officials). *NEMO activities were not scheduled in 2020. The Commission will continue to be involved in NEMO whenever programs and activities become available.*

3. Continue membership in WaterShed Partners, a coalition of more than 70 public, private, and nonprofit organizations in the Twin Cities Metro area promoting public understanding that inspires people to act to protect water in their watershed through educational projects, networking, and resource sharing. Take a more active role in its activities. *Administrative staff regularly attended their meetings and brought forward information to the Commission regarding their activities and educational projects. Resources were shared on the Commission's website and on their Facebook page. The WaterShed Partner website, <http://cleanwatermn.org/about-us/>, describes opportunities to protect the environment: Clean up dog poop, Adopt-a-drain, Autumn raingarden maintenance tips, Tips to protect local waterways from runoff pollution, Organic lawn care, Salt tip*

*card, Green up your lawn not lakes and rivers, and many more.*

*During 2020 a subcommittee was formed to help identify educational components on which to concentrate in response to education requirements spelled out in the new MS4 permit. The permit focuses on topics such as dog waste and chloride use, associated model ordinances and signage.*

*A goal of encouraging Loretto and Maple Plain to participate in WaterShed Partners' Adopt-A-Drain program was not realized in 2020.*

4. Hennepin County and/or partners will provide monthly presentations to Board members during the Board Meeting to update them on relevant topics and opportunities for program and project implementation. *Hennepin County Staff attended monthly meetings and provided updates regarding projects where the County is partnering with residents, Three Rivers Park District, and the Commission to implement water quality improvement projects including shoreline restoration, gully stabilization, pasture management, and other projects.*

5. Participate with collaborative groups to pool resources to undertake activities in a cost-effective manner, promote interagency cooperation and collaboration, and promote consistency of messages. Use the Commission's, member cities', and educational partners' websites and newsletters, social media, co-ops, local newspapers, and cable TV to disseminate education materials to all stakeholders about actions they can take to protect and improve water quality. *This is an ongoing activity.*

6. Continue to maintain the Commission's website and Facebook page to provide news to residents of the watershed. *In 2020, 1,300 individual users accessed the website on 1,800 sessions. The pages most visited were: Home, Meeting Packets, Lake Sarah, Management Plan, Contact Us, Staff, Application Requirements, Locations and Maps, Commissioners, Meetings and Project Reviews.*

7. Provide opportunities for the public to learn about and participate in water quality activities. Enhance education opportunities for youth. Provide opportunities for bridge-building between stakeholders.

a. Promote river stewardship through the River Watch program. Encourage participation by local school students and their teachers. *Due to the COVID-19 pandemic, volunteer macroinvertebrate monitoring was not conducted in 2020.*

b. Work in partnership with Hennepin County's Agriculture Specialist to help build relationships with the agricultural community in the watershed in order to encourage TMDL implementation. *In 2020 Hennepin County Rural Conservation developed a work plan for outreach to the agricultural community to start implementation in 2021. Outreach will focus on areas of the agriculture community that have BPM's identified in local SWA's and general inquiries. Hennepin County Rural Conservation has a renewed relationship with NRCS to ensure the agricultural community has all the tools available to cover the needs of BMPs.*

c. Working in partnership with the Hennepin County Rural Conservationist, continue to work with landowners to help them become compliant with the MN Buffer Law. *The MN Buffer Law requires Staff to check each parcel in the County at least once every three years and spot check up to 15% of parcels. Hennepin County sectioned the County into thirds and will check 1/3*

each year. Hennepin County continues to work with landowners to ensure MN Buffer Law compliance. No major issues were present in the watershed in 2020, any violations were resolved, and Hennepin County will continue to monitor, educate, and support landowners and inquiries from BWSR.

d. In coordination with Hennepin County and TRPD, host up to two open houses annually to educate citizens on the Commission's functions and what project opportunities are available on their individual properties. *Due to the COVID-19 Pandemic, only one open house was held, virtually, on July 30, 2020. There were two attendees from the public. Public input on the Fourth Generation Management Plan was also solicited at this meeting.*

e. Work with Hennepin County to develop content-specific outreach materials related to the following topics: (1) Improving and maintaining soil health (includes cover crops); (2) Farm practices to maintain profitability while protecting water resources; (3) Manure management; (4) Financial resources for structural agricultural practices to protect water resources; (5) Wetland rules and regulations; (6) Opportunities for practices on lands under jurisdiction of the buffer law; and (7) Other general rural and urban outreach. *Drafting of these materials began in 2020 and will continue to completion in 2021.*

#### **D. STUDIES, PROJECTS AND CIPs**

1. Continue to support member cities as they identify studies and projects which benefit both the cities and the watershed.

a. The Lake Ardmore Neighborhood Projects will be constructed in 2020. *A shoreline stabilization was completed by the City of Medina in Lakeshore Park on Lake Independence. These projects are being funded by the Board of Water and Soil Resources pilot Watershed-Based Funding program.*

b. The Ardmore Channel Carp Barrier will be installed in 2020 to prevent carp movement between Ardmore Lake and Lake Independence. *The barrier was installed in November of 2020.*

2. Construction of the Baker Park Reserve Campground Ravine Stabilization project began in 2019. The project will stabilize a 2,200-foot channel that was severely eroded and identified as a significant source of sediment (300 tons/yr) and phosphorus loading (277 lbs/yr) flowing to Lake Independence. *Stabilization was substantially completed in mid-February of 2020 and approved for final completion after an on-site inspection confirmed seed germination in May 2020. It is anticipated that the average phosphorus loads to Lake Independence will be reduced by an estimated 134 pounds per year, accounting for 15% of the total watershed phosphorus load reductions required in the TMDL to meet state water quality standards. The project is a collaborative partnership among several different agencies. Supplemental funding was provided by grants from the Clean Water Legacy Fund (\$416,000) and Hennepin County (\$59,500), along with contributions from the Pioneer-Sarah Creek Commission (\$10,500), Three Rivers Park District (\$10,500), the cities of Medina and Independence (\$10,500 each), and the Lake Independence Citizens Association (LICA) (\$2500).*

3. Hennepin County will continue to respond to its 2019 postcard mailing to landowners in the watershed *and will conduct additional outreach in 2021. Postcards went out to*

*agricultural producers, residents living on large lots with a few animals and some acres, and residents living in the rural portion of the county pulled from tax rolls.*

3. Plans continue to move forward on the City of Loretto's connection to the Met Council Environmental System (MCES), a regional wastewater system. *Construction began in 2020 and will be fully completed in 2021.*

4. Coordinate with Hennepin County to complete one new subwatershed assessment in 2020 to identify additional project opportunities upstream of either Lake Sarah or Lake Independence. *Spurzem Creek, upstream of Lake Independence, was scheduled for a subwatershed assessment with preliminary desktop analysis and field work beginning in fall and early winter 2020. This assessment will be completed in 2021.*

5. Complete any remaining feasibility analyses to construct outstanding 2019 and 2020 CIP projects (as shown in CIP spreadsheet dated April 2018):

- a. Hydrologic Restoration 65 (Sarah-Independence SWA)
- b. JB Gully Stabilization (Sarah-Independence SWA) *Reviewed by Commission engineer. Project may be implemented in 2021.*
- c. Wetland Restoration 91 (Sarah-Independence SWA)
- d. Wetland Restoration 105 (Sarah-Independence SWA)
- e. Seasonal Pond 77 (Sarah-Independence SWA)
- f. Wetland Restoration 2 (Dance Hall Creek SWA) *Consider updating this SWA due to changing land use from Ag to rural residential.*

*The Commission will consider removing all wetland restorations identified in the SWAs to replace with projects with better cost benefits in 2021.*

6. Continue to identify upland and aquatic Watershed-wide TMDL implementation projects.

7. Prioritize BMPs identified in previously completed subwatershed assessments for implementation or further feasibility study. Continue to network with landowners to gain impetus toward completion of projects. *Work with Hennepin County, the City of Greenfield, and future property owners on potential projects and restoration of the old Leuer parcel.*

8. Under a joint powers agreement with the Three Rivers Park District, complete Curly-leaf Pondweed (CLPW) turion surveys in Lake Sarah during a five-year control program, complete annual aquatic plant surveys in Lake Sarah to monitor the response of native macrophytes to the CLPW control program, and complete annual water quality monitoring to determine the effectiveness of the CLPW control program in reducing phosphorus loading to the lake. *2020 was the third year of the second five-year JPA between the Commission and the Park District.*

9. Convene the Technical Advisory Committee for the purpose of receiving CIP applications from the member communities, reviewing them for validity, and recommendation to the Commission for incorporation on the Commission's Capital Improvement Program. *TAC meetings were also scheduled in 2020 as part of the development of the Fourth Generation Watershed Plan to add new and update current projects to the CIP.*

**10.** Prioritize capital projects in anticipation of funding during the next round of the Watershed-based Funding Project. *For the next biennium, BWSR's watershed-based funding will be distributed by major watershed instead of by county as it was for the pilot program. Pioneer-Sarah Creek falls within two major watersheds, the North Fork Crow and the South Fork Crow. Meetings between the organizations involved were held to determine how the funds will be distributed among the organizations. The total for the North Fork Crow watershed is \$91,000 and South Fork Crow is \$330,000. The Commission participated in these meetings and submitted projects. At year-end it was determined that the Pioneer-Sarah Creek Watershed Management Commission will receive the full \$91,105 North Fork Crow allotment and \$180,063 of the South Fork Crow allotment for projects to improve Lakes Sarah, Independence, and Rebecca, and all receiving waters downstream of them.*

*A Spurzem Creek Subwatershed Assessment is currently being conducted by Hennepin County staff. The Commission will pursue watershed-based implementation funding, as well as other funding, to implement projects identified in the SWA.*

**11.** Investigate providing cost-share assistance to landowners for implementation of projects that address erosion and reduce sediment and nutrient loading. State cost share funds, administered by Hennepin County, provides for reimbursement of up to 75% of the cost to construct a BMP. *As part of the Fourth Generation Plan, the Commission included language to adopt a cost-share program, making this policy more achievable in 2021.*

**12.** Partner with the DNR, USGS, MDH, and other agencies to educate the member cities and watershed community officials about groundwater issues and their relationship to stormwater management and surface water quality.

**a.** Develop and maintain a map showing the wellhead protection zones within its boundaries upon completion of a local wellhead protection plan for use in determining vulnerable areas that should be exempted from infiltration.

**b.** Develop and implement a program to provide technical and financial assistance to the member cities in identifying appropriate and cost-effective Best Management Practices to increase infiltration and groundwater recharge and reduce stormwater runoff. *This project of work was not undertaken in 2020.*

## **E. PLANNING**

**1.** Develop and approve the Fourth Generation Watershed Management Plan. *The Fourth Generation Plan establishes updated goals and policies for the lakes, streams, and wetlands in the watershed as well as sets forth priorities for action for the period 2021-2030. These include actions to protect and improve water quality in watershed lakes and streams, as well as preserve wetlands in the watershed. The Fourth Generation Plan was adopted at the Commission's December 17, 2020 meeting.*

**a.** The Commission will hold two to four Technical Advisory Committee (TAC) meetings over the first six months and is charged with helping to develop the Commission's Capital Improvement Plan. *TAC meetings were held on March 16, 2020 and May 29, 2020, for this purpose.*

b. The Commission will remain inclusive of citizen input about problems, issues, and needs in the watershed, and feedback on how the Commission should prioritize its actions and focus its resources. The Commission will also be responsive to citizens' valuable insight on education and outreach needs and opportunities. *The Commission may not utilize a formal CAC as part of the Fourth Generation Planning process, namely because there are not enough citizens willing to volunteer for this committee. Community input is always welcome. The Commission will invite the public to review and comment on the Fourth Generation Plan. After the Plan is completed, the Commission is open to the concept of a CAC if there are citizens willing to become involved. A community public input meeting for the Fourth Generation Plan was held on July 30, 2020 via Zoom. Two citizens attended.*

## FINANCIAL REPORTING

Appendix 3 includes the Commission's approved budget for 2020. The Commission's Joint Powers Agreement provides that each member community contributes toward the annual operating budget based on its share of the total market value of all property within the watershed. The 2020 assessments to the members are also found in Appendix 3.

A \$146,800 operating budget was approved by the Commission for 2020. \$6,000 was projected as proceeds from application fees, \$9,000 from interest income, and \$131,800 as assessments to members.

The Pioneer-Sarah Creek Watershed Management Commission maintains a checking account at US Bank for current expenses and rolls uncommitted monies to its account in the 4M Fund, the Minnesota Municipal Money Market Fund.

An amendment of Minnesota Rules, Chapter 8410 became effective on July 13, 2015. One of the revisions to the Rules extends the annual audit due date to 180 days after the end of the fiscal year, in the case of the Pioneer-Sarah Creek Commission, to June 30, 2020. The 2019 Audit Report, which was prepared by Johnson & Company, Ltd., Certified Public Accountants, is available for viewing on the Commission's website, [www.pioneersarahcreek.org](http://www.pioneersarahcreek.org).

The Commission follows Rule 54 of the Government Accounting Standard Board (GASB) to report Fund Balances. The fund balance classifications include:

- ≡ *Nonspendable* – amounts that are not in a spendable form. The Commission does not have any items that fit this category.
- ≡ *Restricted* – amounts constrained to specific purposes by their providers. One example would be ad valorem levy funds received from the County for capital improvement projects. The unused portion of these funds must be set aside in a restricted account for similar projects. Another example would be BWSR Legacy Grant proceeds where the funds are received prior to the onset of a project and where any unused portion must be returned to the grantor.
- ≡ *Committed* – amounts constrained to specific purposes by the Commission itself. An example would be residual funds carried over from one year to the next for Studies, Project Identification and Subwatershed Assessments.
- ≡ *Assigned* – amounts the Commission intends to use for specific purposes. Most line items in the Commission's Operating Budget fall under this category.

≡ *Unassigned* – amounts that are available for any purpose. These amounts are reported only in the general fund.

Amounts paid by the Commission per the 2019 Audit are categorized as follows:

General engineering	24,953
General administration	42,521
Education	1,700
Programs	15,980
Projects	127,400
Capital projects	<u>0</u>
Total	\$212,554

## 2021 PROJECTED WORK PLAN

Following is the projected work plan for 2021 as approved by the Commission at its February 18, 2021 meeting.

**A. WATER QUANTITY.** Continue to review local development/redevelopment plans for conformance with the standards outlined in the Commission's Fourth Generation Watershed Management Plan.

1. Maintain the post-development 2-year, 10-year, and 100-year peak rate of runoff at pre-development level for the critical duration precipitation event.
2. Maintain the post-development annual runoff volume at pre-development volume.
3. Prevent the loss of floodplain storage below the established 100-year elevation.

**B. WATER QUALITY.** Support the Commission's management goals for water quality. Continue to make progress to improve the lakes and streams in the watershed as well as protect those that are not impaired.

1. Complete Lake Rebecca subwatershed assessment and begin project implementation to maintain Lake Rebecca's non-impaired status.
2. Implement BMPs to improve water quality in Spurzem, Independence, and Sarah Lakes, making progress toward their removal from the list of Impaired Waters.
3. Improve water quality in the impaired lakes by 10% over the average of the previous 10 years by 2030.
4. Maintain or improve water quality in lakes and streams with no identified impairments.
5. Conduct a TMDL/WRAPS progress review every five years.
6. Foster implementation of Best Management Practices (BMPs) in the watershed through technical and financial assistance and through partnership development.

**C. GROUNDWATER**

1. Promote groundwater recharge by requiring abstraction/infiltration of runoff from new development and redevelopment.
2. Protect groundwater quality by incorporating wellhead protection study results into development and redevelopment Rules and Standards.

**D. WETLANDS**

1. Preserve the existing functions and values of wetlands within the watershed.
2. Promote wetland enhancement or restoration of wetlands in the watershed.

**E. OPERATIONS AND PROGRAMMING**

1. Adopt a 2022 operating budget.
  - a. Search for grant and other funds to supplement the regular budget.
  - b. Fund a capital improvement program to share in the cost of projects.
  - c. Use the Fourth Generation Plan as guidance to budget monitoring projects.
  - d. Allocate education funding.
2. Convene a TAC meeting at least annually to identify and prioritize Capital Improvement Program (CIP) projects and share information.
  - a. Develop and maintain a map showing the wellhead protection zones within its boundaries upon completion of a local wellhead protection plan for use in determining vulnerable areas that should be exempted from infiltration.
  - b. Develop and implement a program to provide technical and financial assistance to the member cities in identifying appropriate and cost-effective Best Management Practices to increase infiltration and groundwater recharge and reduce stormwater runoff.
3. Prepare and implement an annual monitoring plan and provide annual reporting.
  - a. Partner with Three Rivers Park District (TRPD) to conduct bi-weekly water quality monitoring of “sentinel lakes” – Independence, Sarah, Little Long, and both basins of Whaletail. The 2021 budget allows the monitoring of five lakes.
  - b. Partner with Three Rivers Park District (TRPD) to conduct flow and water quality monitoring at selected sites. The Commission has budgeted funds to monitor four sites in 2021.
  - c. Participate in Metropolitan Council’s Citizen Assisted Monitoring Program (CAMP). The Commission has budgeted funds to monitor one lake in 2021.
  - d. Partner with Hennepin County to obtain macroinvertebrate monitoring by student volunteers through the RiverWatch program.

e. Partner with Hennepin County Environment and Energy (HCEE) to participate in the Wetland Health Evaluation Program (WHEP), a citizen volunteer wetland monitoring program.

4. Develop cost-share policy for opportunistic projects including projects funded by Hennepin County or other grants.

5. Develop a schedule to create Lake Management Plans for Lakes Independence, Sarah, and Ardmore.

6. Develop a schedule of subwatershed assessments to identify potential high loading areas for prioritization and potential BMP implementation.

7. Begin TMDL review and update for one lake.

8. Review biennial interest proposals and select administrative, legal and technical consultants for 2021-2022

9. Publish 2020 Annual Activity Report.

#### **F. EDUCATION AND OUTREACH**

1. Partner with HCEE, TRPD and other entities to expand education and outreach activities.

2. Maintain the Commission website, [pioneersarahcreek.org](http://pioneersarahcreek.org), and Facebook page to provide news to the watershed residents including annual reports, lake and stream monitoring data, monthly meeting materials, project reviews, public notices, news releases, and other watershed- or city-related information. Participate in other forms of media: city newsletters, local newspapers, television, etc., to share useful information to stakeholders.

3. Convene Citizen Advisory Committees as needed to advise the Commission and assist in program development and implementation.

4. Provide education opportunities for Commissioners, elected and appointed officials, and other decision makers.

a. Complete handbook update.

5. Participate in collaborative groups to pool resources and undertake activities in a cost-effective manner, promote interagency cooperation, and promote consistency of messages.

6. Partner with HCEE and TRPD to undertake targeted education and outreach to landowners in the watershed.

7. Provide opportunities for the public to learn about and participate in water quality activities.

8. Enhance education opportunities for youth.

a. Explore opportunities for re-starting the RiverWatch program in a local school or with a Scout program.

Have a question about this report?

Need more information?

Want to know how to get involved?

Contact us: drop us an email, give us a call, we're happy to help:

<http://www.pioneersarahcreek.org/contact-us.html>



## **APPENDIX**

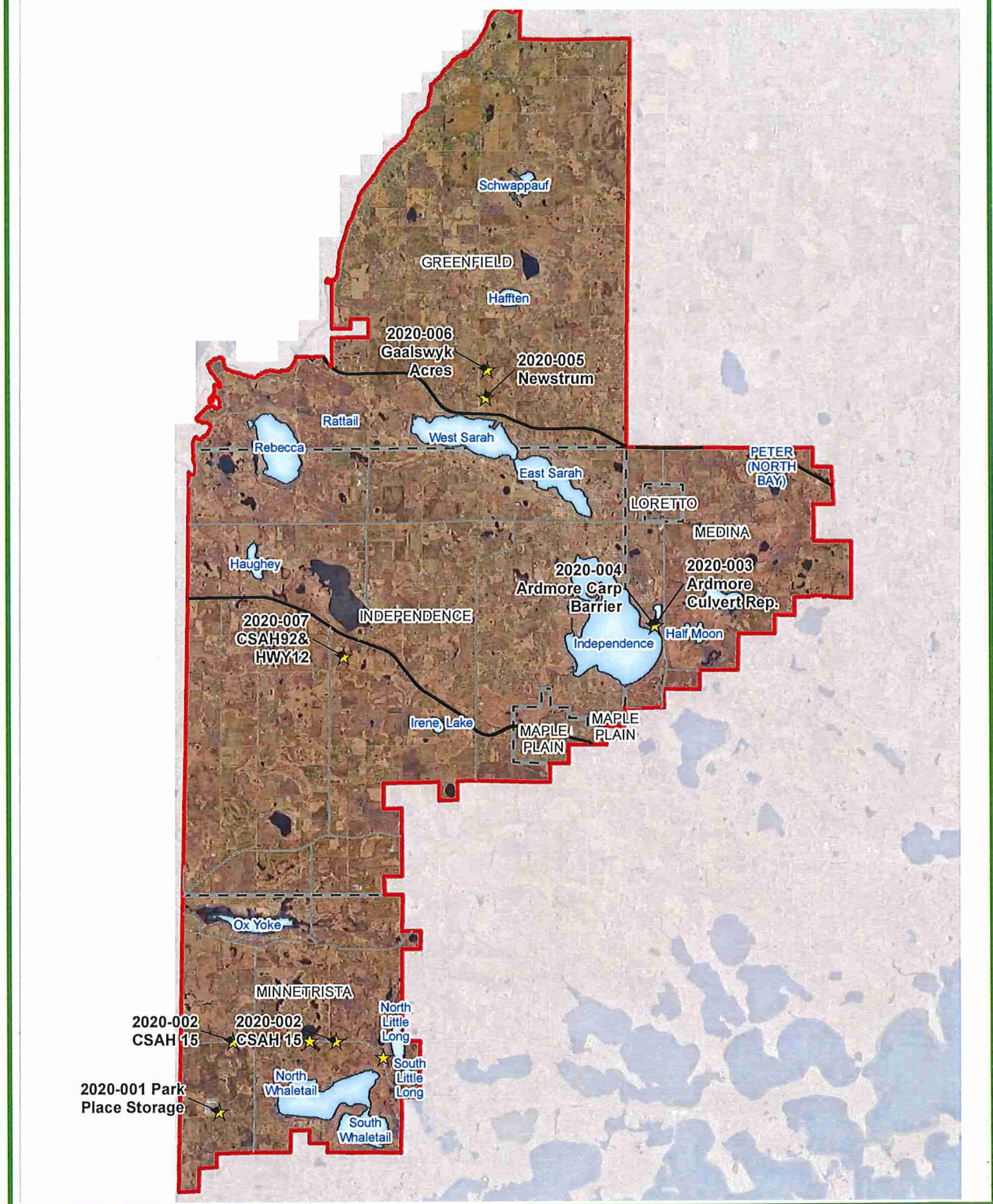
**2020 Commissioners**

<b>Member</b>	<b>Represented by</b>	<b>Responsibility</b>	<b>Phone/E-mail</b>
Greenfield	Mike Hoekstra 7060 State Highway 55 Greenfield, MN 55373		612.418.9674 mhoekstra@ci.greenfield.mn.us
Independence	Joe Baker 5580 Lake Sarah Heights Dr Independence, MN 55357	Chair Excomm	612.868.8702 joebaker149@gmail.com
Loretto	Brenda Daniels 150 Meadow Drive Loretto, MN 55357	Secretary Excomm	brenda199962@yahoo.com
Maple Plain	John Fay 5819 Three Oaks Avenue Maple Plain, MN 55359	Vice Chair Excomm	763.213.3271 jarrfay@mchsi.com
Medina	Pat Wulff 2865 Lakeshore Ave Maple Plain, MN 55359		763.479.2972 Rwulff106@gmail.com
Minnetrista	John Tschumperlin 7575 Susan Lane Mound, MN 55364	Treasurer Excomm	612.791.1114 jtschumperlin@ci.minnetrista.mn.us

## 2020 Consultants

Name	Affiliation	Responsibility	Phone/Email
Andrew Vistad	Hakanson-Anderson 3601 Thurston Avenue Anoka, MN 55303	Technical Advisor	763.852.0484 andrewv@HAA-inc.com
Kris Guentzel	Hennepin County Dept. of Env. and Energy	Water Resources Specialist TAC	612.596.1171 kristopher.guentzel@hennepin.us
Paul Stewart	701 Fourth Ave S, Suite 700 Minneapolis, MN 55415	Rural Conservation Specialist TAC	612.543.9409 Paul.Stewart@hennepin.us
Kirsten Barta		Rural Conservation Specialist	612.543.3373 Kirsten.barta@hennepin.us
Judie Anderson	JASS	Deputy Treasurer	763.553.1144
Amy Juntunen	3235 Fernbrook Lane	Administrator	judie@jass.biz
Beverly Love	Plymouth, MN 55447	Excomm, TAC	amy@jass.biz
Joel Jamnik	Campbell Knutson PA Grand Oak Office Center I 860 Blue Gentian Road #290 Eagan, MN 55121	Legal Counsel	beverly@jass.biz 651.234.6219 jjamnik@ck-law.com
Brian Vlach	Three Rivers Park District 12615 County Road 9 Plymouth, MN 55441	Water Quality TAC	763.694.7846 Bvlach@threeriversparkdistrict.org
Johnson & Co., Ltd.	3255 Fernbrook Lane Plymouth, MN 55447	Auditor	952.525.9500
Ed Matthiesen	Wenck Associates 7500 Highway 55 Suite 300 Golden Valley, MN 55427	Professional TAC	763.252.6851 ematthiesen@wenck.com

## 2020 Project Reviews



Project No.	2020 Project Reviews	City	Rule D Stormwater	Reviewed for				Rate Control (cfs) (pre- and post-development)			Net Change Nutrient Control (lbs./yr) (pre- and post-development)			Net change		
				Rule E Erosion Control	Rule F Floodplain	Rule G Wetland	Rule H Bridge/Culvert Crossing	Rule I Buffers	2-yr Pre vs Post	10-yr Pre vs Post	100-yr Pre vs Post	TP load #/yr reduction	TSS load #/yr reduction	Abstraction (c.f.)	Filtration/ biofiltration (c.f.)	Runoff Volume (af / yr)
2020-01	Project Name Park Place - Nike Storage	Minnetrista	x	x					7.46/0	18.83/0.55	56.57/5.75	12.6	2375.2		-95045	-0.7962
2020-02	CSAH 15/144 2020 Cold Inplace Recycling	Minnetrista	x	x			x		NC	NC	NC					
2020-03	2020 Ardmore Ave Culvert Replacement	Medina	x	x			x		NC	NC	NC					
2020-04	Lake Ardmore Fish Barrier	Medina	x	x					NC	NC	NC					
2020-05	Stacey Newstrum House and Barn	Greenfield		x				x								
2020-06	Gaalswyk Acres	Greenfield	x	x					61.7/49.3	130.9/92.9	295.8/153.9	0.6	235.1		8820	0.367
2020-07	CSAH 92 Safety Improvements	Independence	x	x	x		x	x	50.65/47.97	123.32/111.22	310.77/274.17	12.26	1218		37462	0

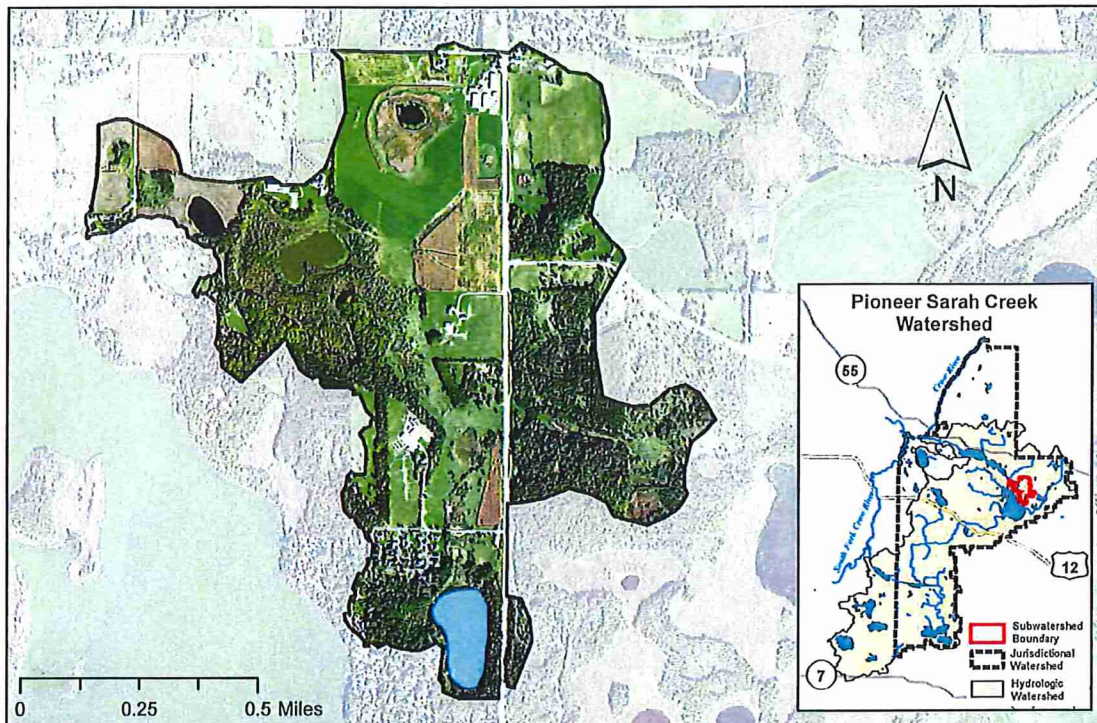
### 2019-2021 Operating Budgets

	2019 Budget	2020 Budget	2021 Budget	
<b>Revenues</b>				
Project Review Fees	4,000.00	6,000.00	6,000.00	
CIP Income	28,000.00	28,000.00	28,000.00	
Lake Sarah TMDL Imple	0.00	0.00	0.00	
Grant - Baker Park Ravine	0.00	0.00	0.00	
Watershed Based Funding				
Grant	0.00	0.00	0.00	
WCA Adm Fees	500.00	0.00	0.00	
Interest and Dividend Income	1,570.00	9,000.00	4,000.00	
<b>Total Revenues</b>	<b>134,070.00</b>	<b>146,800.00</b>	<b>141,800.00</b>	
<b>Expenses</b>				
Engineering/Consulting	24,190.00	47,000.00	35,200.00	
Administrative Expense	36,000.00	36,000.00	36,000.00	
Adm-Project Reviews	750.00	1,000.00	1,000.00	
Adm-CIP Mgmt	3,000.00	2,500.00	2,000.00	
WCA - Admin/Legal Exp	300.00	0.00	0.00	
Adm - Tech Support	550.00	800.00	750.00	
Legal Expense	500.00	500.00	500.00	
Audit Expense	4,500.00	4,500.00	4,500.00	
Insurance	3,500.00	3,100.00	2,800.00	
Website	1,800.00	1,800.00	1,800.00	
Adm - General Programs	500.00	0.00	0.00	
TAC Meetings	3,000.00	3,000.00	2,500.00	
Lakes Monitoring - TRPD	8,100.00	8,100.00	8,100.00	(5 Lakes)
Lakes Monitoring - CAMP	760.00	1,520.00	760.00	
Stream Monitoring	7,120.00	9,500.00	9,500.00	(4 Sites)
Education	4,500.00	4,000.00	4,000.00	
Education-Events	500.00	500.00	500.00	
Invertebrate Monitoring	500.00	1,000.00	750.00	
Grant Writing	1,000.00	1,000.00	1,000.00	
Third Gen Plan	1,000.00	10,000.00	0.00	
Management Plan - Admin	0.00	1,000.00	1,000.00	
Special Projects	4,000.00	2,000.00	0.00	
Fourth Gen Plan	0.00	10,000.00	0.00	
Capital Improvement Project	28,000.00	28,000.00	29,140.00	
Lake Sarah Implementation		0.00	0.00	
Baker Park Ravine		0.00	0.00	
<b>Total Expenses</b>	<b>134,070.00</b>	<b>176,820.00</b>	<b>141,800.00</b>	
<b>Net Income</b>	<b>\$ 0.00</b>	<b>(\$ 30,020.00)</b>	<b>\$ 0.00</b>	

**2019-2021 Member Assessments**

2019	2018 Market Value PSC Basin	Increase in MV over Prev Year	2019 Op Budget		Increase over Prev Year	
			%age	Amount	%age	Amount
Greenfield	368,183,516	-12.09%	25.49%	32,625.08	12.86%	(4,815.08)
Independence	558,624,135	3.96%	38.67%	49,500.20	3.04%	1,462.22
Loretto	61,598,085	10.60%	4.26%	5,458.26	9.62%	479.21
Maple Plain	118,116,948	8.15%	8.18%	10,466.45	7.20%	702.67
Medina	167,463,487	5.65%	11.59%	14,839.09	4.72%	669.10
Minnetrissa	170,530,950	12.02%	11.81%	15,110.91	11.04%	1,501.88
<b>TOTALS</b>	<b>1,444,517,121</b>	<b>0.89%</b>	<b>100.00%</b>	<b>128,000.00</b>	<b>0.00%</b>	<b>0.00</b>
2020	2019 Market Value PSC Basin	Increase in MV over Prev Year	2020 Op Budget		Increase over Prev Year	
			%age	Amount	%age	Amount
Greenfield	387,408,426	5.22%	25.78%	33,972.21	4.13%	1,347.12
Independence	577,654,920	3.41%	38.43%	50,655.10	2.33%	1,154.90
Loretto	64,646,640	4.95%	4.30%	5,668.92	3.86%	210.66
Maple Plain	124,712,551	5.58%	8.30%	10,936.16	4.49%	469.71
Medina	173,159,976	3.40%	11.52%	15,184.56	2.33%	345.47
Minnetrissa	175,423,480	15.23%	11.67%	15,383.05	1.80%	272.14
<b>TOTALS</b>	<b>1,503,005,993</b>	<b>4.05%</b>	<b>100.00%</b>	<b>131,800.00</b>	<b>2.97%</b>	<b>3,800.00</b>
2021	2020 Market Value PSC Basin	Increase in MV over Prev Year	2021 Op Budget		Increase over Prev Year	
			%age	Amount	%age	Amount
Greenfield	492,597,046	27.15%	29.66%	39,089.19	15.06%	5,116.98
Independence	598,303,894	3.57%	36.02%	47,477.37	-6.27%	(3,177.73)
Loretto	69,865,263	8.07%	4.21%	5,544.04	-2.20%	(124.89)
Maple Plain	132,270,685	6.06%	7.96%	10,496.11	-4.02%	(440.05)
Medina	180,132,527	4.03%	10.85%	14,294.11	-5.86%	(890.45)
Minnetrissa	187,757,641	10.10%	11.30%	14,899.18	-3.15%	(483.87)
<b>TOTALS</b>	<b>1,660,927,056</b>	<b>10.51%</b>	<b>100.00%</b>	<b>131,800.00</b>	<b>0.00%</b>	<b>0.00</b>

## Lake Ardmore Watershed Map



## Lake Ardmore Bathymetry



### Lake and Watershed Characteristics

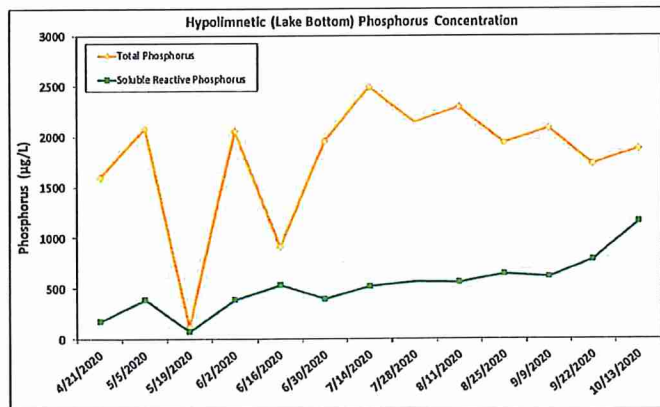
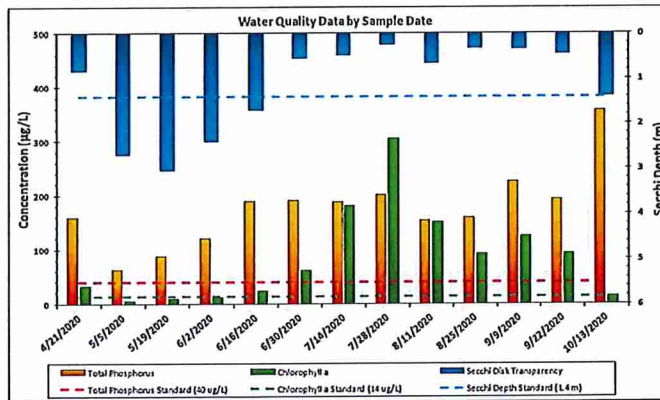
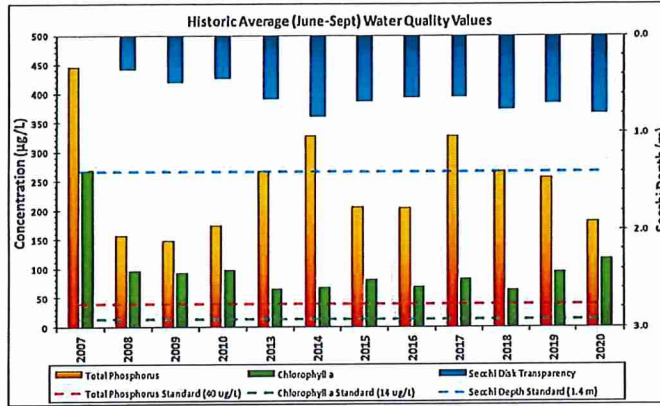
DNR #	27015300
Watershed Area	514 Acres
Lake Area	13.5 Acres
Percent Littoral Area	75%
Average Depth	9.4 ft.
Maximum Depth	24.4 ft.
Watershed Area:Lake Area	38:1
Impairment Classification	Needs Assessment
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/4/2017

This map is a compilation of data from various sources and is provided "as is" without warranty of any representation of accuracy, timeliness, or completeness. The user acknowledges and accepts the limitations of the Data, including the fact that the Data is dynamic and in a constant state of maintenance, correction, and update.

  
**Three Rivers**  
PARK DISTRICT

## Lake Ardmore

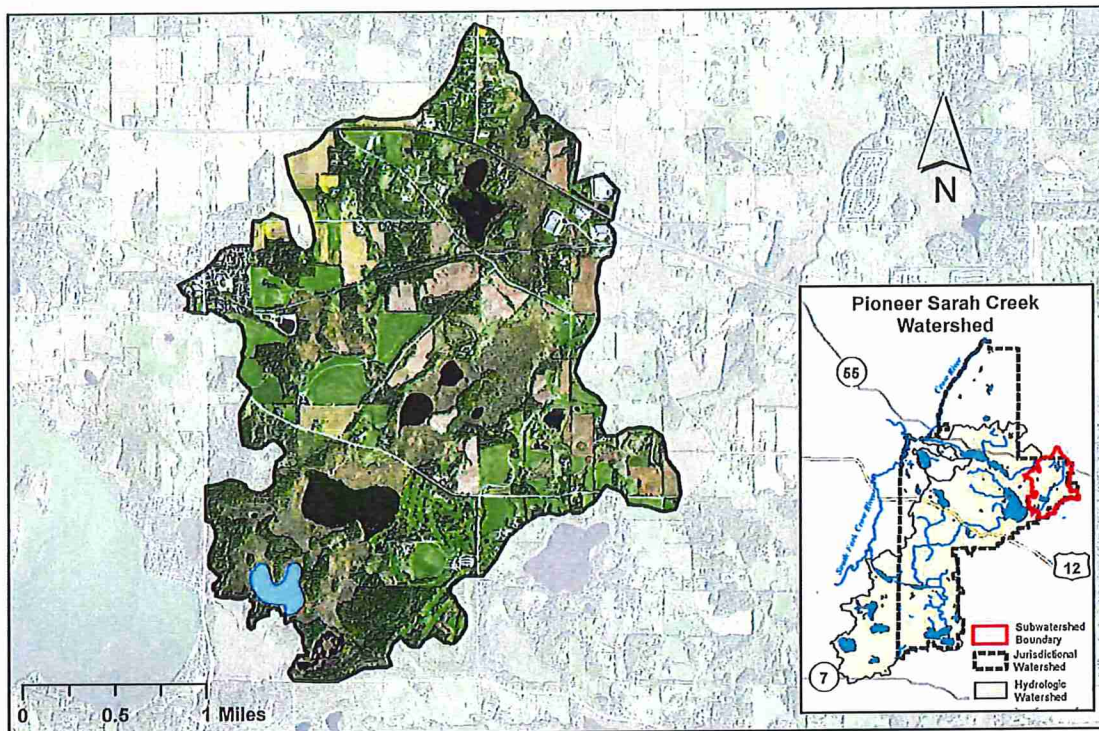


Ardmore Water Quality Report Card

Year	TP	Chl-a	Secchi	Avg Grade
2007	F		F	F
2008	F	F	F	F
2009	F	F	F	F
2010	F	F	F	F
2013	D	F	F	D
2014	D	D	D-	D
2015	F	F	F	F
2016	D	F	F	D
2017	F	F	F	F
2018	D	D	D-	D
2019	F	F	F	F
2020	F	F	D	F
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Half Moon Lake Watershed Map



## Half Moon Lake Bathymetry



### Lake and Watershed Characteristics

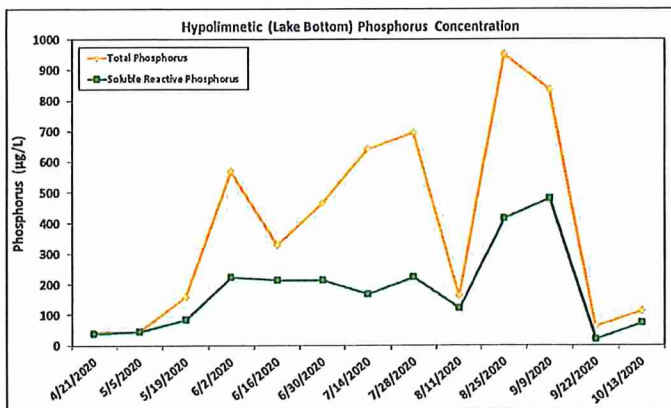
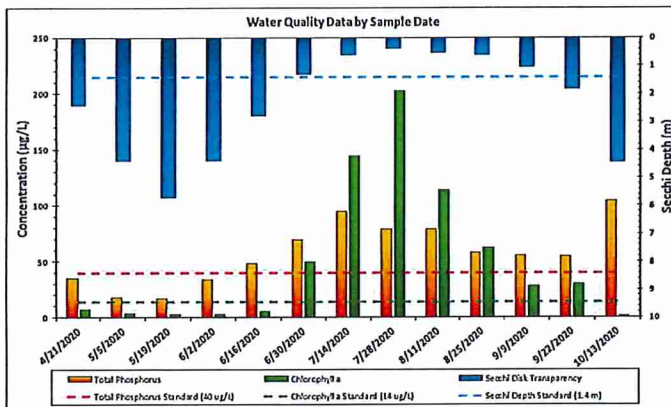
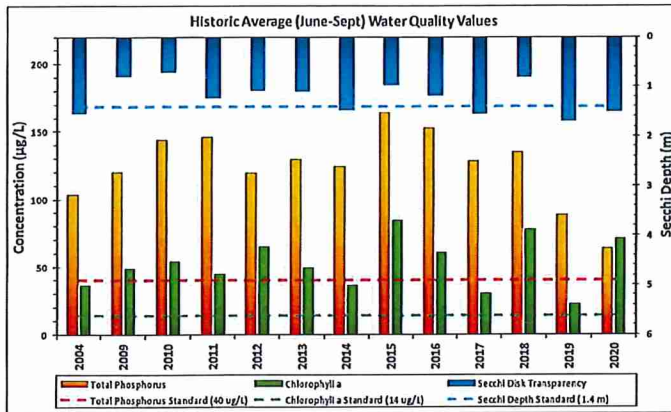
DNR #	27015200
Watershed Area	3,258 Acres
Lake Area	31.1 Acres
Percent Littoral Area	11%
Average Depth	13.4 ft.
Maximum Depth	30.3 ft.
Watershed Area:Lake Area	104.7:1
Impairment Classification	Proposed 2016
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/6/2017

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**Three Rivers**  
PARK DISTRICT

## Half Moon Lake

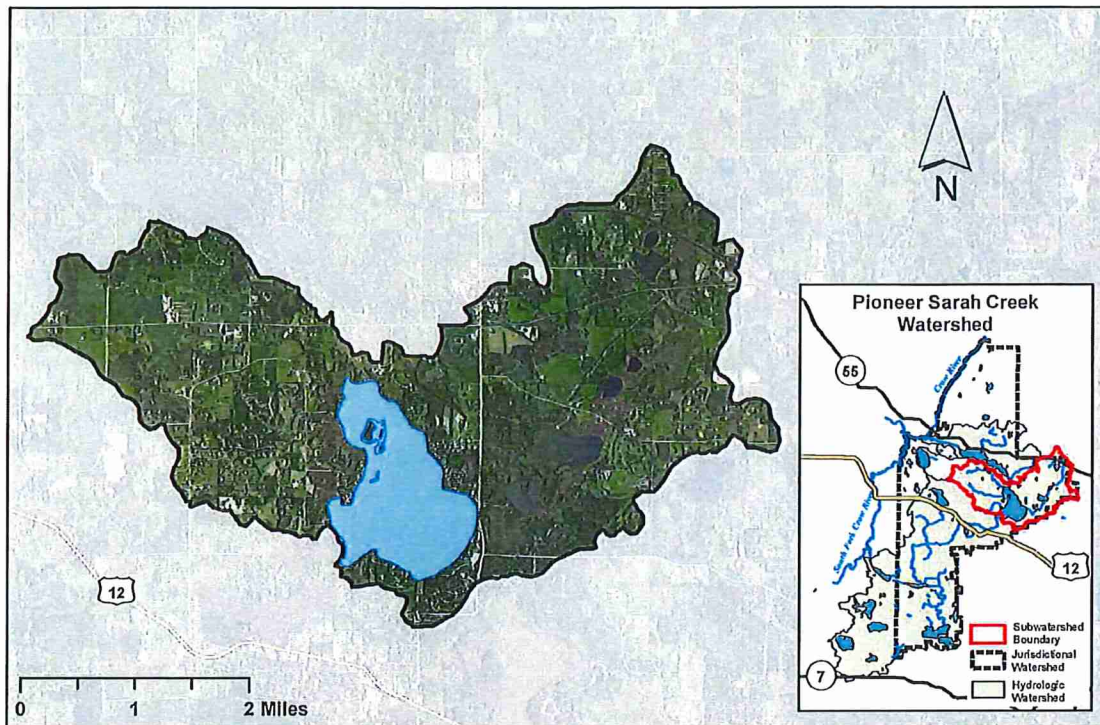


Half Moon Lake Water Quality Report Card

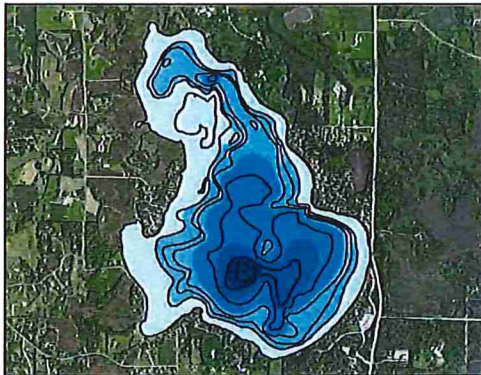
Year	TP	Chl-a	Secchi	Avg Grade
2004	D	C	C	C-
2009	D	D	D	D
2010	D	D	D	D
2011	D	C	C	C-
2012	D	D	D	D
2013	D	D	D	D
2014	D	C	C	C-
2015	F	F	D	F
2016	D	D	D	D
2017	D	C	C	C-
2018	D	F	D	D-
2019	D	C	C	C-
2020	C	D	C	C-
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Lake Independence Watershed Map



## Lake Independence Bathymetry



### Lake and Watershed Characteristics

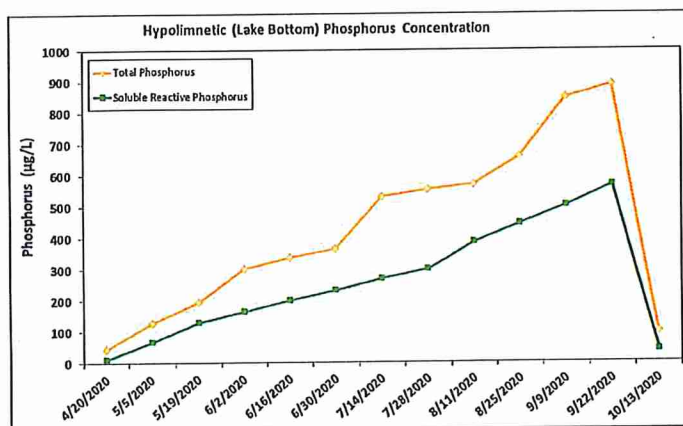
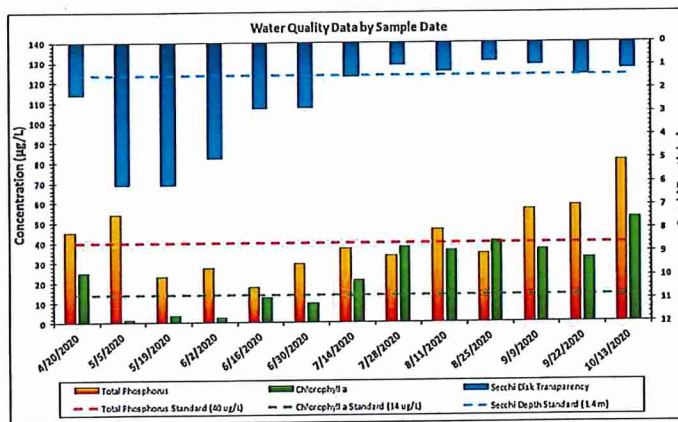
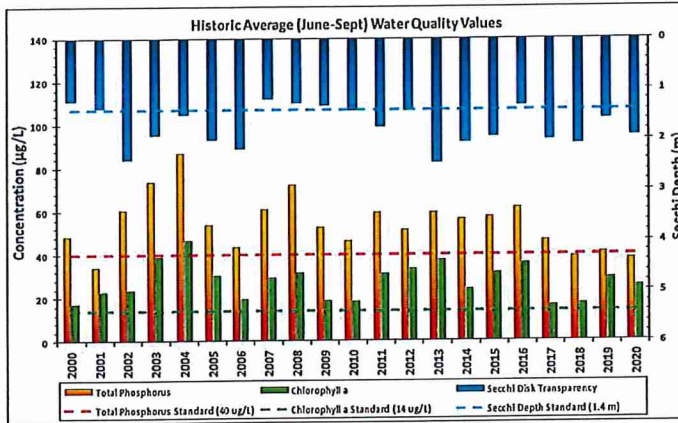
DNR #	27017600
Watershed Area	7,632 Acres
Lake Area	832 Acres
Percent Littoral Area	51%
Average Depth	15.9 ft.
Maximum Depth	58 ft.
Watershed Area:Lake Area	9.2:1
Impairment Classification	Excess Nutrients 2002
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/18/2018

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PARK DISTRICT

## Lake Independence

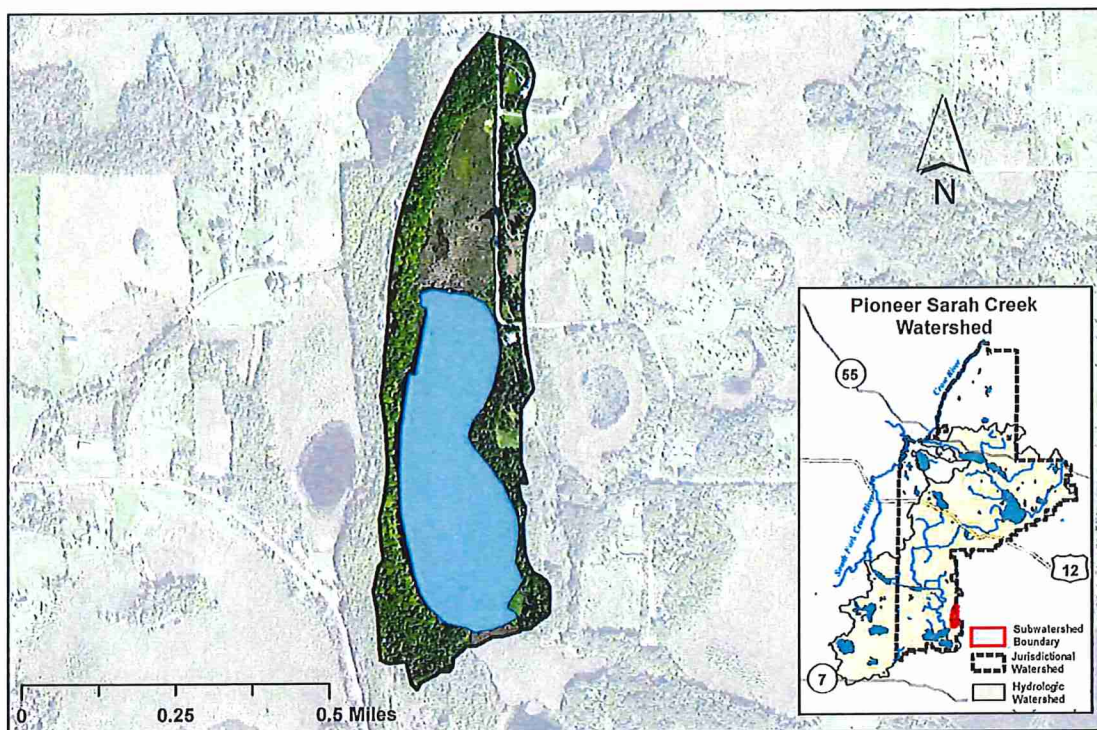


Lake Independence Water Quality Report Card

Year	TP	Chl-a	Secchi	Avg Grade
2000	C	B	C	C+
2001	C	C	C	C
2002	C	C	B	C+
2003	D	C	C	C-
2004	D	C	C	C-
2005	C	C	C	C
2006	C	B	C	C+
2007	C	C	D	C-
2008	D	C	C	C-
2009	C	B	C	C+
2010	C	B	C	C+
2011	C	C	C	C
2012	C	C	C	C
2013	C	C	B	C+
2014	C	C	C	C
2015	C	C	C	C
2016	C	C	C	C
2017	C	B	C	C+
2018	C	B	C	C+
2019	C	C	C	C
2020	C	C	C	C
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Little Long Lake Watershed Map



## Little Long Lake Bathymetry



### Lake and Watershed Characteristics

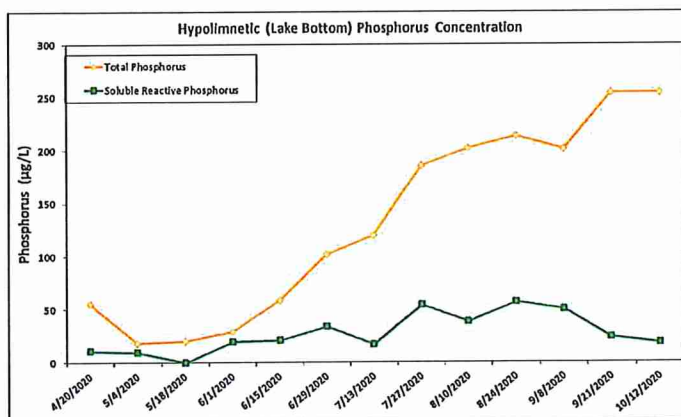
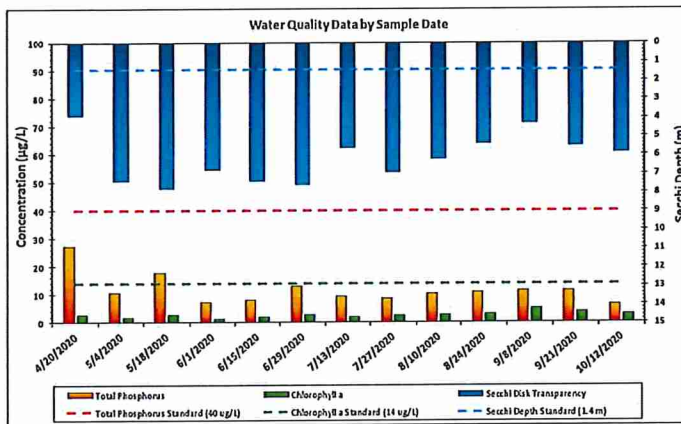
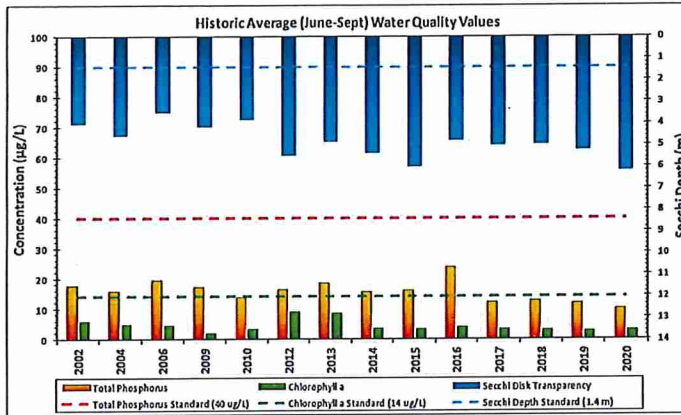
DNR #	27017900
Watershed Area	92 Acres
Lake Area	53.5 Acres
Percent Littoral Area	40%
Average Depth	27.8 ft.
Maximum Depth	80.5 ft.
Watershed Area:Lake Area	1.7:1
Impairment Classification	None
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/4/2017

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**Three Rivers**  
PARK DISTRICT

## Little Long Lake

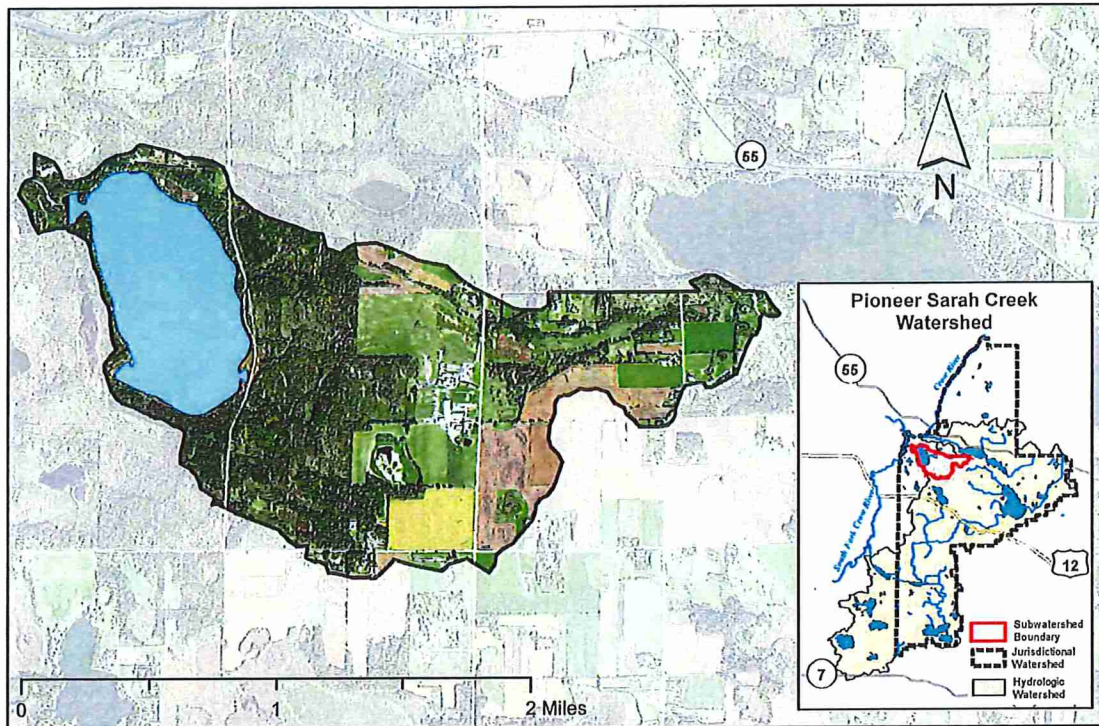


Little Long Lake Water Quality Report Card

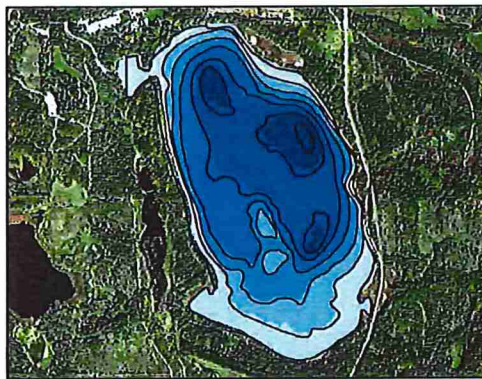
Year	TP	Chl-a	Secchi	Avg Grade
2002	A	A	A	A
2004	A	A	A	A
2006	A	A	A	A
2009	A	A	A	A
2010	A	A	A	A
2012	A	A	A	A
2013	A	A	A	A
2014	A	A	A	A
2015	A	A	A	A
2016	B	A	A	A-
2017	A	A	A	A
2018	A	A	A	A
2019	A	A	A	A
2020	A	A	A	A
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Lake Rebecca Watershed Map



## Lake Rebecca Bathymetry



### Lake and Watershed Characteristics

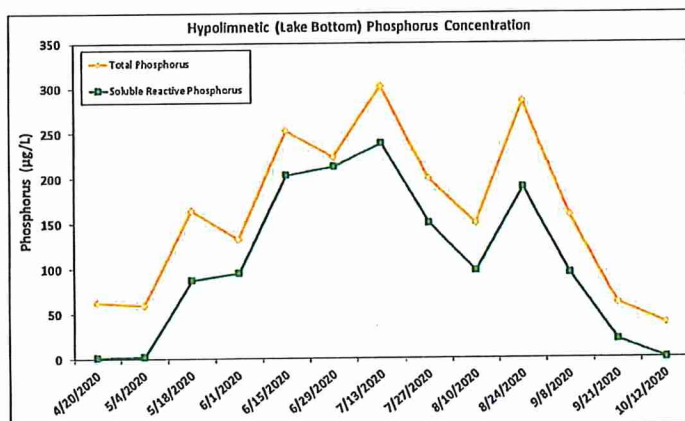
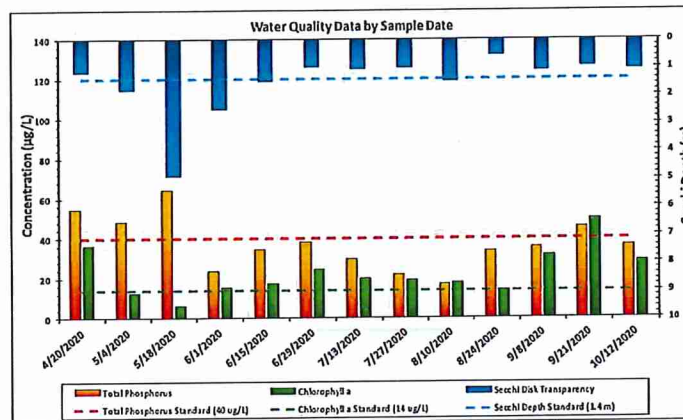
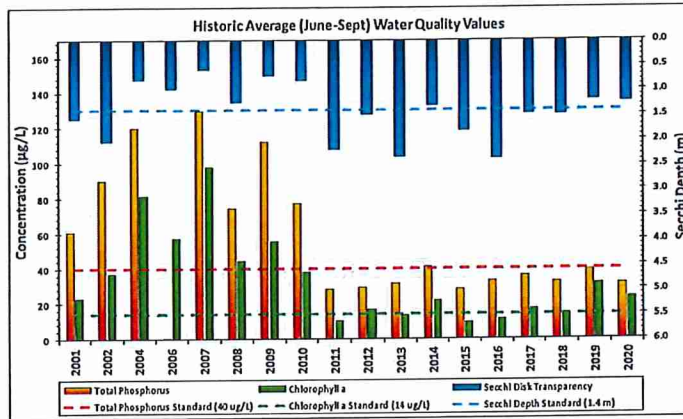
DNR #	27019200
Watershed Area	1,277 Acres
Lake Area	261 Acres
Percent Littoral Area	50%
Average Depth	14.4 ft.
Maximum Depth	31.1 ft.
Watershed Area:Lake Area	4.9:1
Impairment Classification	Excess Nutrients 2008
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/4/2017

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**Three Rivers**  
PARK DISTRICT

## Lake Rebecca

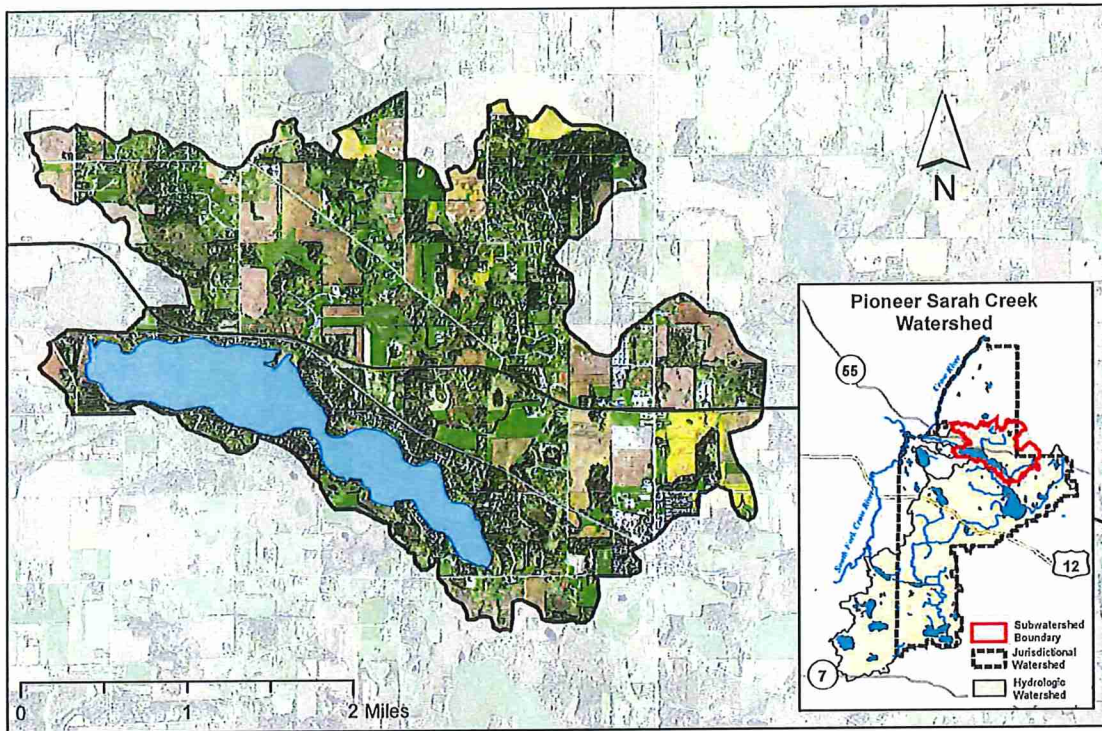


Lake Rebecca Water Quality Report Card

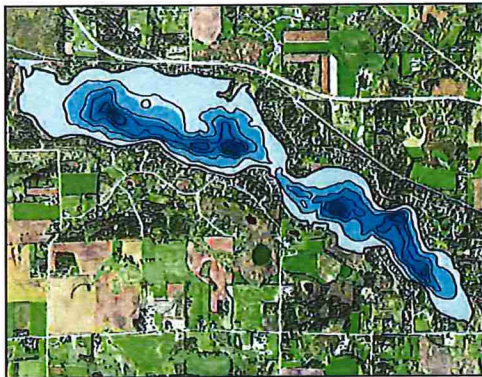
Year	TP	Chl-a	Secchi	Avg Grade
2001	C	C	C	C
2002	D	C	C	C-
2004	D	F	D	D-
2006	A	D	D	C
2007	D	F	F	F
2008	D	C	C	C-
2009	D	D	D	D
2010	D	C	D	D+
2011	B	B	B	B
2012	B	B	C	B-
2013	B	B	B	B
2014	C	C	C	C
2015	B	A	C	B
2016	C	B	B	B-
2017	C	B	C	C+
2018	C	B	C	C+
2019	C	C	C	C
2020	B	C	C	C+
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Lake Sarah Watershed Map



## Lake Sarah Bathymetry



### Lake and Watershed Characteristics

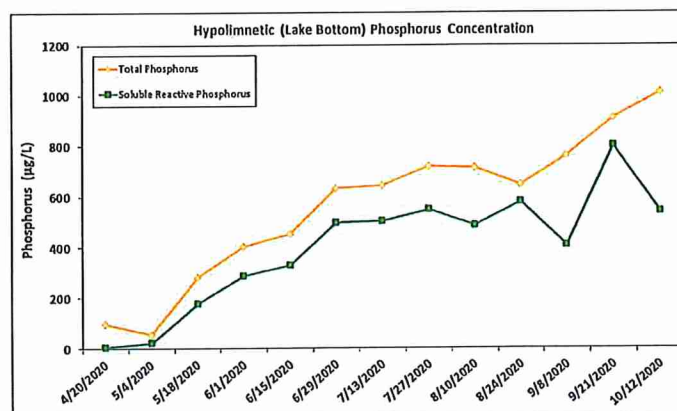
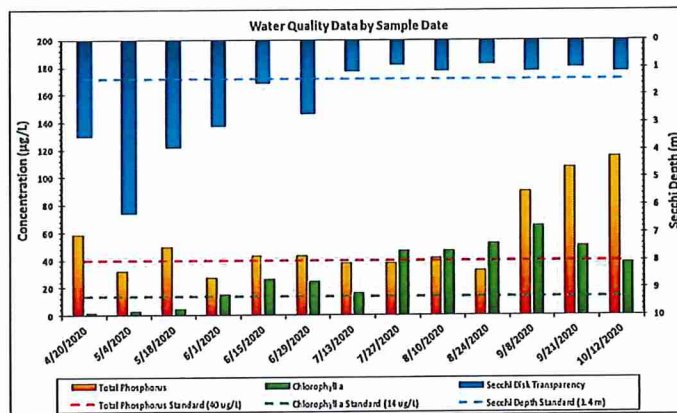
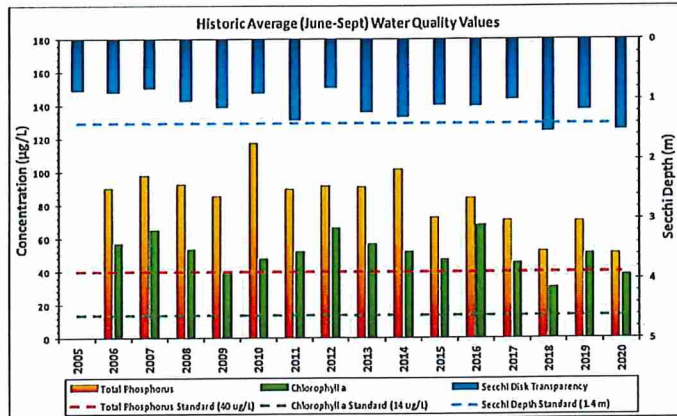
DNR #	27019100
Watershed Area	4,519 Acres
Lake Area	536 Acres
Percent Littoral Area	61%
Average Depth	13.7 ft.
Maximum Depth	49.9 ft.
Watershed Area:Lake Area	8.4:1
Impairment Classification	Excess Nutrients 2006
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/4/2017

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PARK DISTRICT

## Lake Sarah

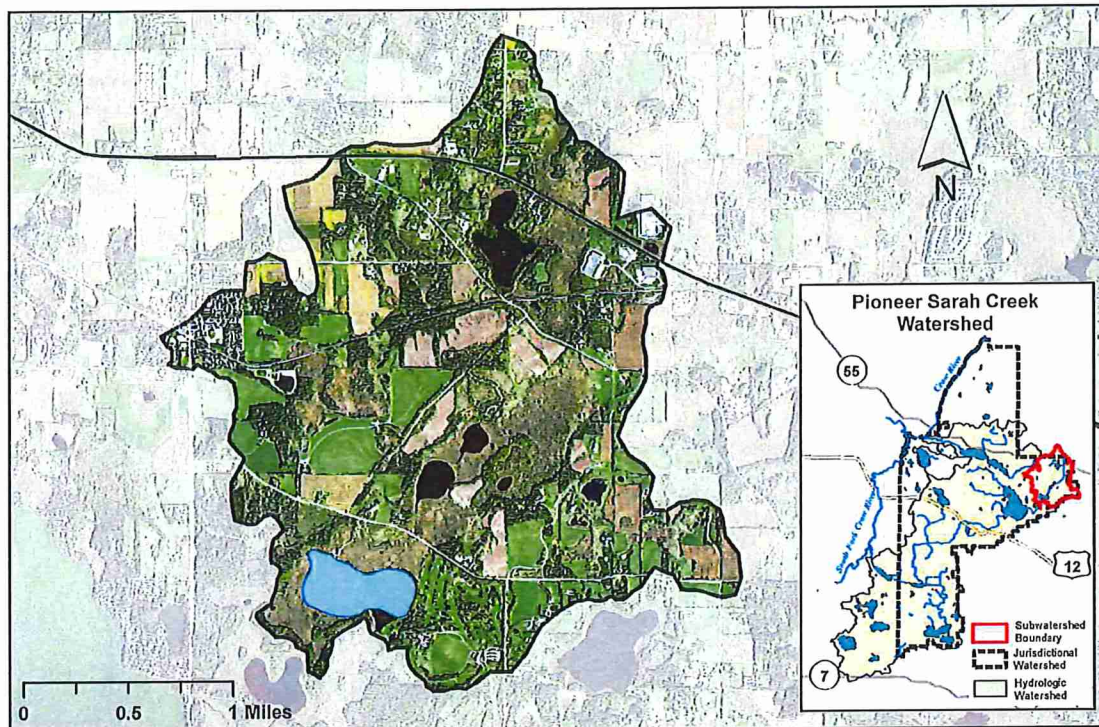


Lake Sarah Water Quality Report Card

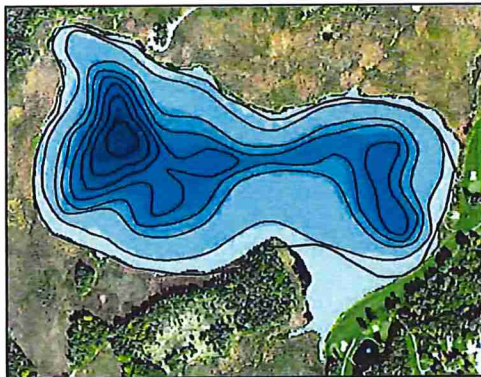
Year	TP	Chl-a	Secchi	Avg Grade
2005			D	D
2006	D	D	D	D
2007	D	D	D	D
2008	D	D	D	D
2009	D	C	D	D+
2010	D	C	D	D+
2011	D	D	C	D+
2012	D	D	D	D
2013	D	D	C	D+
2014	D	D	C	D+
2015	D	C	D	D+
2016	D	D	D	D
2017	D	C	D	D+
2018	C	C	C	C
2019	D	D	D	D
2020	C	C	C	C
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Spurzem Lake Watershed Map



## Spurzem Lake Bathymetry



### Lake and Watershed Characteristics

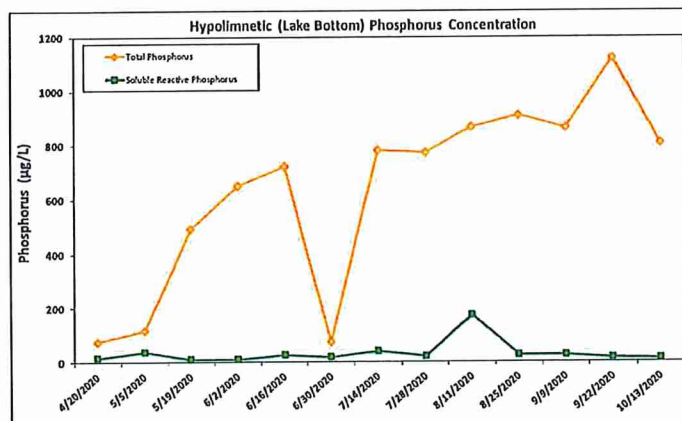
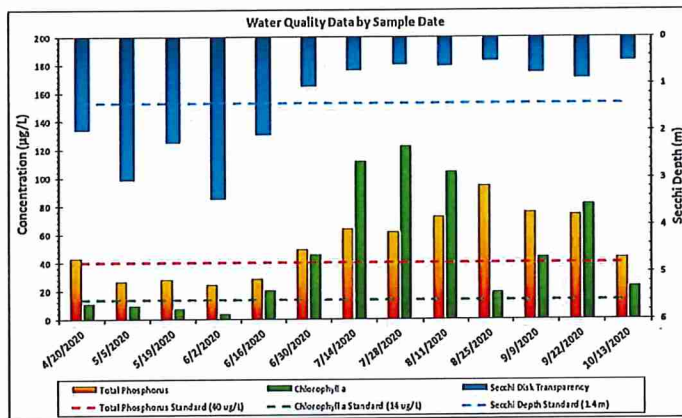
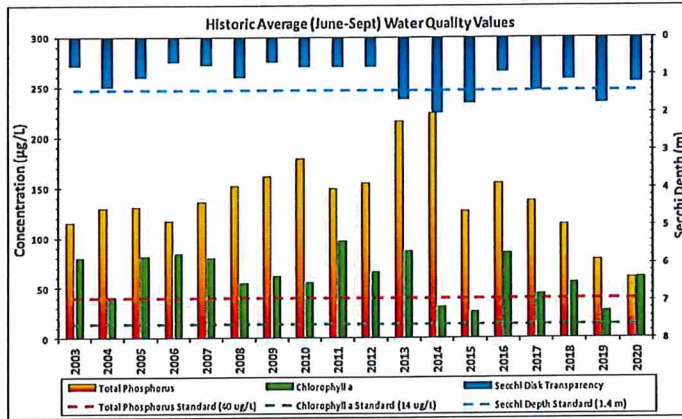
DNR #	27014900
Watershed Area	2,915 Acres
Lake Area	78.6 Acres
Percent Littoral Area	70%
Average Depth	11.1 ft.
Maximum Depth	37.4 ft.
Watershed Area:Lake Area	37.1:1
Impairment Classification	Excess Nutrients 2008
Classification	Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/4/2017

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PARK DISTRICT

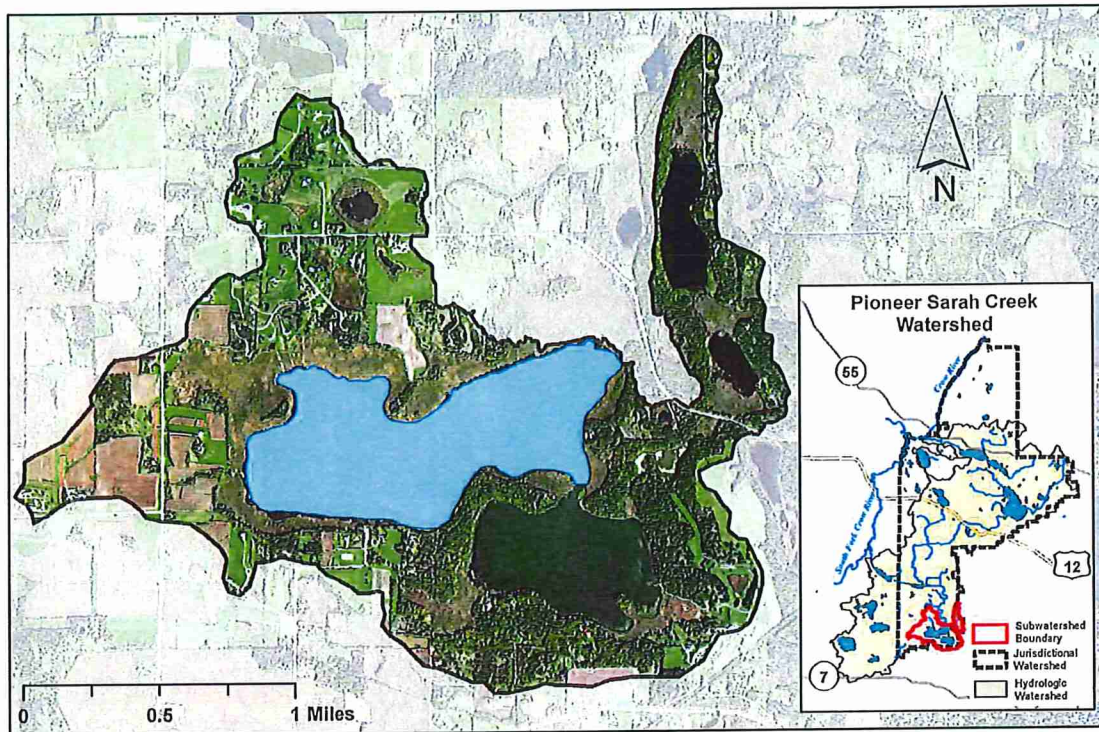
## Spurzem Lake



Year	TP	Chl-a	Secchi	Avg Grade
2003	D	F	D	D-
2004	D	C	C	C-
2005	D	F	D	D-
2006	D	F	F	F
2007	D	F	D	D-
2008	D	D	D	D
2009	F	D	F	F
2010	F	D	D	D-
2011	D	F	D	D-
2012	F	D	D	D-
2013	F	F	C	D-
2014	F	C	C	D+
2015	D	C	C	C-
2016	F	F	D	F
2017	D	C	C	C-
2018	D	D	D	D
2019	D	C	C	C-
2020	C	D	D	D+
MPCA Standard	C	B	C	C+

Met Council Grading System for Lake Water Quality

## Whaletail North Watershed Map



## Whaletail North Bathymetry



### Lake and Watershed Characteristics

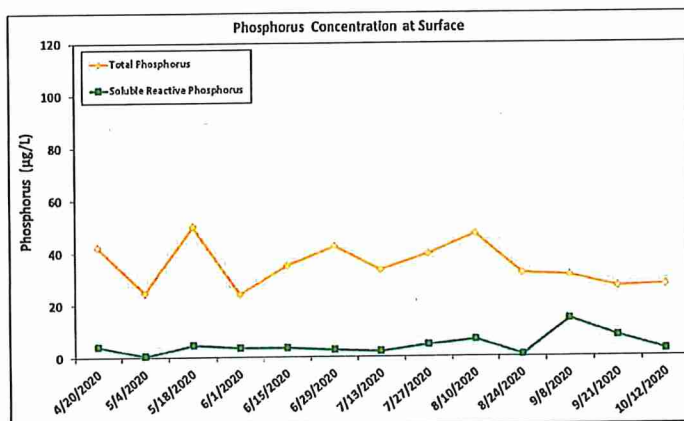
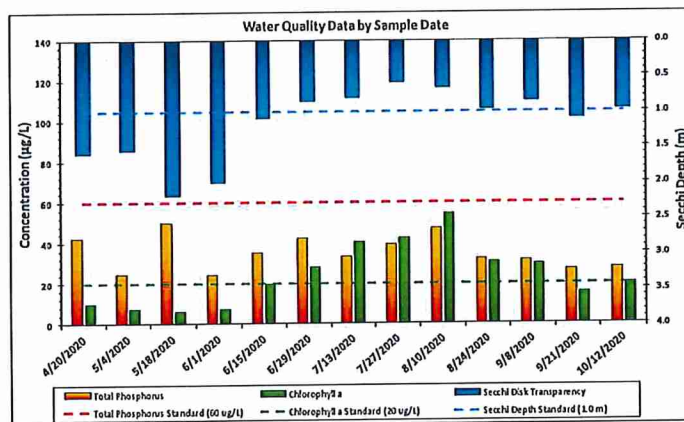
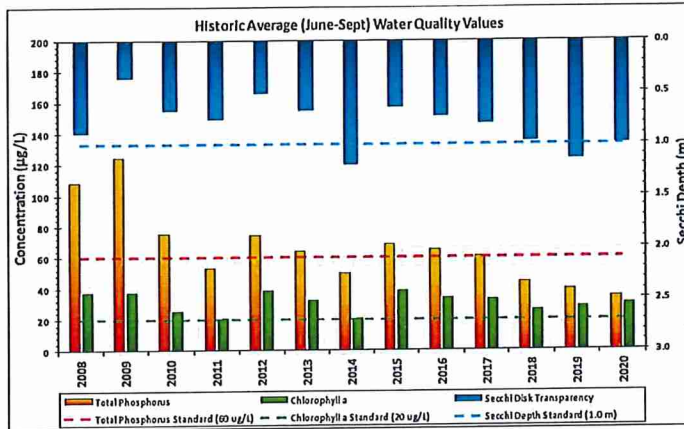
DNR #	27018401
Watershed Area	1,585 Acres
Lake Area	370 Acres
Percent Littoral Area	100%
Average Depth	5.2 ft.
Maximum Depth	10.3 ft.
Watershed Area:Lake Area	4.3:1
Impairment Classification	Proposed 2016
Classification	Provisional Shallow Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/6/2017

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## North Whaletail Lake

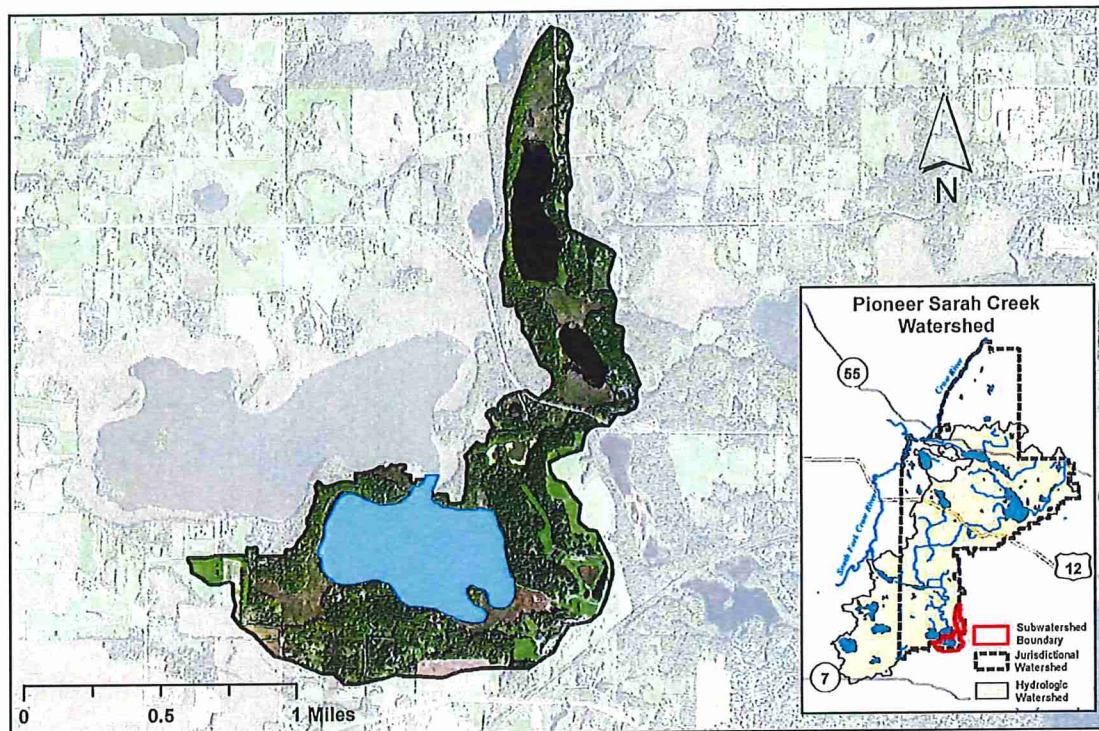


Whaletail North Water Quality Report Card

Year	TP	Chl-a	Secchl	Avg Grade
2008	D	C	D	D+
2009	D	C	F	D
2010	D	C	F	D
2011	C	C	D	C-
2012	D	C	F	D
2013	C	C	F	D+
2014	C	C	C	C
2015	D	C	F	D
2016	C	C	D	C-
2017	C	C	D	C-
2018	C	C	D	C-
2019	C	C	D	C-
2020	C	C	D	C-
MPCA Standard	C	C	D	C-

Met Council Grading System for Lake Water Quality

## Whaletail South Watershed Map



## Whaletail South Bathymetry



### Lake and Watershed Characteristics

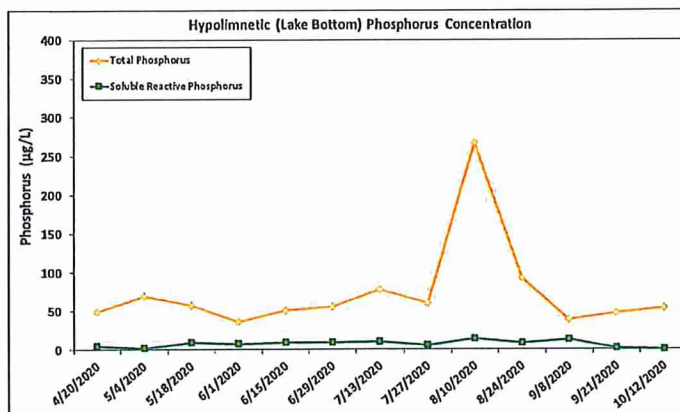
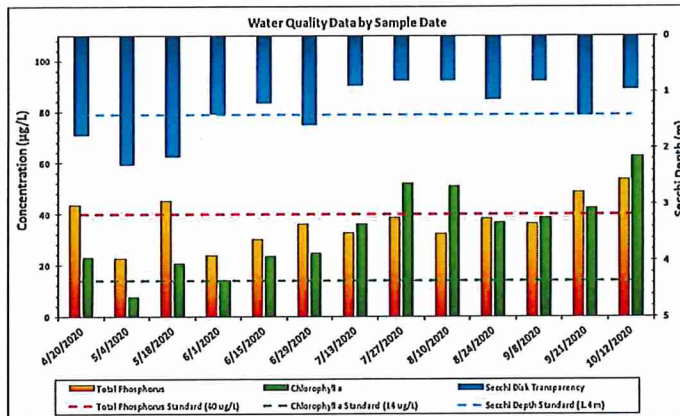
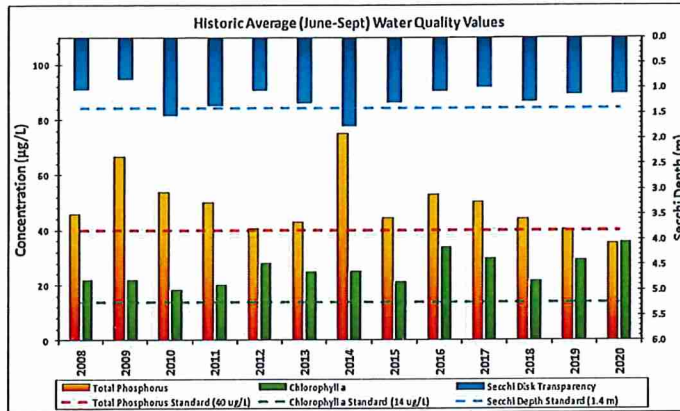
DNR #	27018402
Watershed Area	661 Acres
Lake Area	156 Acres
Percent Littoral Area	66%
Average Depth	12.1 ft.
Maximum Depth	23.3 ft.
Watershed Area:Lake Area	4.2:1
Impairment Classification	Proposed 2016
Classification	Provisional Deep Lake

Water Resource Department  
Map Created: 11/24/2017  
Revised Date: 12/6/2017

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## South Whaletail Lake



Whaletail South Water Quality Report Card

Year	TP	Chl-a	Secchi	Avg Grade
2000	D	B	D	C-
2001	C	C	D	C-
2003	C	C	C	C
2005	C	C	D	C-
2007	C	C	C	C
2008	C	C	D	C-
2009	C	C	D	C-
2010	C	B	C	C+
2011	C	C	C	C
2012	C	C	D	C-
2013	C	C	C	C
2014	D	C	C	C-
2015	C	C	C	C
2016	C	C	D	C-
2017	C	C	D	C-
2018	C	C	C	C
2019	C	C	D	C-
2020	C	C	D	C-
MPCA Standard	C	B	C	C+

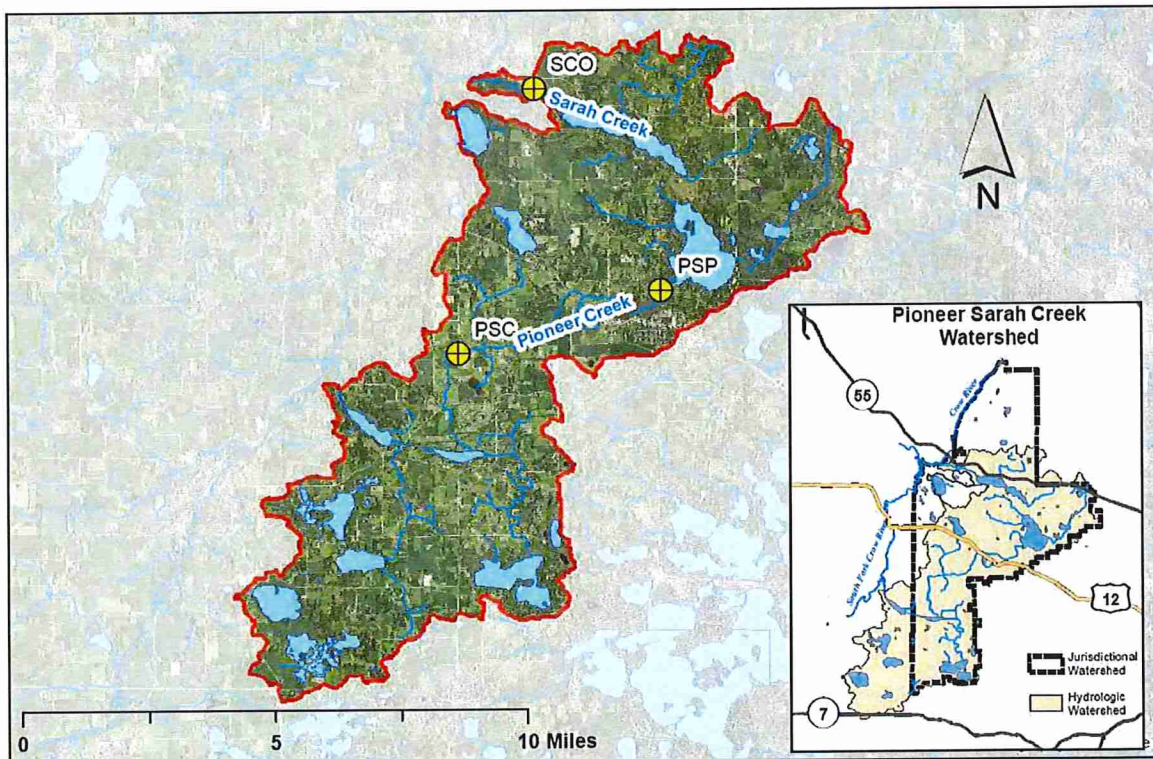
Met Council Grading System for Lake Water Quality



## Pioneer/Sarah Creek Stream monitoring - 2020

Monitoring occurred from April 7, 2020 to October 23, 2020. During the monitoring period, there were 19 inches of rain. Three sites were monitored for flow:

- SCO – Sarah Creek outlet at Hwy 92
  - Average flow: 3.7 cfs
  - Minimum flow: 0 cfs
  - Maximum flow: 25 cfs
- PSP – Pioneer Creek at Pagenkopf Road
  - Average flow: 5.0 cfs
  - Minimum flow: 0.58 cfs
  - Maximum flow: 9 cfs
- PSC – Pioneer Creek at Copeland Road
  - Average flow: 9.7 cfs
  - Minimum flow: 0.06 cfs
  - Maximum flow: 38 cfs



## 2020 Stream Monitoring

