Riley-Purgatory-Bluff Creek Watershed District

Board of Managers Regular Meeting

Wednesday, April 7, 2021 No Work Session Scheduled 7:00pm Regular Meeting

Virtual Meeting via ZOOM

https://us02web.zoom.us/j/86502422209

Agenda

1. **7:00pm Call to Order Board Meeting** — **Action**

2. **Approval of the agenda** — **Action**

3. **Introduction of new staff** — **Information**

4. **Public Hearing for Rule D and Rule F Amendment** — **Information**

5. **Matters of general public interest** — **Information**

   Welcome to the Board Meeting. Anyone may address the Board on any matter of interest in the watershed. Speakers will be acknowledged by the President; please come to the podium, state your name and address for the record. Please limit your comments to no more than three minutes. Additional comments may be submitted in writing. Generally, the Board of Managers will not take official action on items discussed at this time, but may refer the matter to staff for a future report or direct that the matter be scheduled on a future agenda.

6. **Reading and approval of minutes** — **Action**
   a. Board of Managers Special Meeting, February 4, 2021
   b. Board of Managers Special Meeting, February 18, 2021
   c. Board of Managers Special Meeting, February 22, 2021
   d. Board of Managers Regular Meeting, March 3, 2021
   e. Board of Managers Special Meeting, March 9, 2021
   f. Board of Managers Special Meeting, March 15, 2021

7. **Citizen Advisory Committee** — **Action**
   a. Report
   b. Confirm April Board CAC Representative

8. **Consent Agenda**
   (The consent agenda is considered as one item of business. It consists of routine administrative items or items where discussion isn't essential to understanding. Any manager may remove an item from the consent agenda for action.)
   a. Accept March Staff Report
   b. Accept March Engineer's Report
   c. Accept March Construction Inspection Report

d. Approve permit application #2020-066, Chase Bank as presented in the proposed board action of the permit report.
e. Approve permit application #2021-004, Silver Lake Water Quality project as presented in the proposed board action of the permit report.
f. Approve Silver Lake Land Use Agreement
g. Approve RPBCWD 2020 Annual Report for distribution to BWSR and the DNR
h. Award Silver Lake Water Quality Project as presented in the recommended board action section of the engineer's recommendation memo

9. Action Items **Action**

a. Pulled consent items
b. Accept February Treasurer's Report
c. Approve Paying of the Bills
d. Consider floodplain variance request for permit application #2021-005, Lake Place project.
e. Approve permit application #2021-005, Lake Place project as presented in the proposed board action of the permit report.
f. Approve Rule D and Rule F Regulatory Amendment with staff suggested response to comments
g. Authorize change to SRF contract to provide construction administration services for St. Hubert's Opportunity Project
h. Adopt Resolution 2021-003 allowing for use of stewardship Grant for various Shoreline Stabilization practices (Permitted)
i. Selection of Consultants

10. Discussion Items **Information**

a. Silver Lake Shorewood Street Reconstruction (Pedersen)
b. 2021 Work Plan (Koch)
c. Strategic Planning
d. Administrator Report
e. Manager Report

11. Upcoming Board Topics

a. Soil Plan Amendment
b. Workshop to Review the Ten Year Plan
c. Other

12. Upcoming Events **Information**

- CAC Meeting, April 19, 6pm Virtual
- MPCA Turfgrass Maintenance Training, April 20, 8:30 am Virtual
- MPCA Smart Salting for Parking Lots and Sidewalks,April 27, 9am Virtual
- Board of Managers monthly work session, May 5th, 5pm, Virtual

Please check www.rpbcwd.org for the most current meeting details.

Riley-Purgatory-Bluff Creek Watershed District

Memorandum Supporting and Providing Explanation of Revisions of Riley-Purgatory-Bluff Creek Watershed District

Rule D – Wetland & Creek Buffers

Rule F – Shoreline & Streambank Stabilization

February 3, 2020

This memorandum presents background on and explanation of amendments of the Riley-Purgatory-Bluff Creek Watershed District rules. The memo supports the RPBCWD Board of Managers' determination that the changes to the rules will improve the efficiency and cost-effectiveness of its regulatory program's efforts to protect water resources. It describes the basis for RPBCWD's determination that the effectiveness of the rules, as revised, reasonably outweighs the burden incurred by property owners in complying with the rules.

RPBCWD proposes to amend Rule F – Shoreline and Streambank Improvements.

Opportunities to comment

RPBCWD wishes to receive written or verbal comments on its proposed revisions. Interested persons and organizations can submit written comments on the revisions on or before the close of business on **March 22, 2021**. RPBCWD prefers submission of comments by email to Terry Jeffery, watershed planning coordinator, at tjeffery[at]rpbcwd.org. But comments also may be sent to Mr. Jeffery at the RPBCWD offices, 18681 Lake Drive East, Chanhassen MN 55317. Critique of the changes is most valuable when accompanied by a suggested alternative approach RPBCWD could take.

In addition to the written comment period, RPBCWD will hold a **public hearing** on the revisions at **6:30 p.m., on March 3, 2021, via zoom**. At the hearing, any interested person will have the opportunity to address the managers and staff concerning the proposed revisions.

The proposed changes may be revised in response to comments. In addition, this memo will be updated, as needed, to address comments received, and will be reissued in final form to support the managers' adoption of the final revisions to the rules and to provide property owners and project proposers with guidance and background on the rules.

The RPBCWD Board of Managers will consider adopting the revised rules at the regular meeting on **April 7, 2021**. When adopting the revised rules, the managers will set a date on which the amended rules will be effective throughout the watershed. RPBCWD has tentatively identified **April 8, 2021,** as the **target effective date**. Permit applications that are not complete as of the effective date will be subject to the amended rules, though an applicant who has submitted a complete application prior to that date may request to have the matter determined in accordance with the revisions.[1]

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[1] RPBCWD will administratively amend its watershed management plan to include the updated rules when they are adopted.

Rule F – Shoreline Maintenance Revision

RPBCWD's policy is that hard-armoring shorelines should be undertaken only when necessary to address erosion forces on a shoreline or streambank. But where a shoreline is already hard-armored (i.e., covered with riprap), RPBCWD policy is to ensure such installation is properly maintained to prevent degradation of the shoreline or streambank and resulting erosion and sedimentation of the subject waterbody. (Under existing language in paragraph 2.4, maintenance or in-kind replacement of existing public infrastructure on a shoreline or streambank is not subject to the Rule F requirements.)

In keeping with this policy, in 2018 Riley-Purgatory-Bluff Creek Watershed District amended its regulatory requirements to streamline the approval process for maintenance of such *existing* riprap installations. RPBCWD established a reduced set of requirements for a property owner whose project would not increase the width, depth or length of the stabilized area of their shoreline and would not disturb underlying soils. In subsequently reviewing applications and subject sites with property owners, RPBCWD has found that some amount of underlying soil disturbance is inherent to and necessary for the maintenance of riprapped shorelines. Given this, the streamlined permitting framework was not achieving its intended purposes of encouraging property owners to ensure that their shoreline stabilizations continued to protect against erosion and sedimentation. Also, the extent of disturbance of underlying soils necessary to maintain a hard-armored shoreline does not warrant the articulation of a need for the stabilization (subsection 3.1 of the rule) since the stabilized shoreline is already in place, nor does it require a complete assessment of erosion intensity (subsection 3.2). They are required only when an applicant proposes installation of a new or expansion of a shoreline stabilization. The principal thrust of the proposed new revisions to the rule is to allow maintenance of shoreline stabilizations in their present form without needing to demonstrate need or assess erosion intensity. (Applicants still must provide those section 4.0 exhibits needed for RPBCWD to assess compliance with the applicable criteria of section 3.3.)

The proposed change to Rule D – removing the term "fast-track" – is ministerial, revising a cross-reference to the subsection 3.4 option for approval of shoreline maintenance projects.

The streamlined permitting applies only to shorelines – not streambanks – and the specification of rule provisions that apply only to one or the other is accomplished by adding "streambanks" in relevant places throughout the rule. These additions clarify, but do not change, the operation of the rule (i.e., no new requirements are being added to either shoreline or streambank stabilizations).

The streamlined permitting process also applies only when a property owner is undertaking maintenance that does not change the form of the stabilization. That is, it applies only when a hard-armored (riprapped) shoreline is being maintained as hard-armored, bioengineered as bioengineered, and naturalized as naturalized.

RPBCWD support for bioengineered stabilizations

While the revised shoreline-maintenance terms are out for review and comment, RPBCWD will be assessing whether new policy provisions – e.g., cost-share program criteria – are needed to support property owners who wish to stabilize their shorelines with bioengineering or a mixture of bioengineering and vegetation. RPBCWD will affirm its support – and make resources available – for property owners who wish to transition from full or partial hard-armoring to fully or partially naturalized stabilizations.

Shoreline and streambank stabilization projects differ from any other regulated land-disturbing activity in that RPBCWD *wants* property owners to undertake such projects because shorelines and streambanks that are instable are sources of sediment and pollutant loading to water bodies. Further, RPBCWD's resource-improvement goals are furthered by landowner projects that move from hard-armoring, which does not provide habitat or other benefits beyond preventing erosion, to more natural shorelines, which do. At the same time, RPBCWD needs to ensure that bioengineering will effectively stabilize a shoreline or streambank, which means that it is important to require property owners to subject their plans to RPBCWD's regulatory analysis generally and to complete an Erosion Intensity Scoresheet (Rule F subsection 3.2a) or sheer-stress calculation (Rule F subsection 3.2b) specifically. This unique conjunction of interests requires careful balancing of fairness to all property-owner applicants by requiring *all* of those who wish to install a new or different stabilization to comply with the rules and receive a permit (at the applicant's cost), with support for naturalizing projects through cost-share funds for construction or in-kind assistance of staff.

RPBCWD is eager to hear any ideas stakeholders have for striking such a balance, as well as concerns about its efforts to do so. RPBCWD staff will be reaching specifically to the members of its Technical Advisory Committee for insights on this balancing effort, which inherently involves ensuring that public funds are applied only to fulfill public purposes and goals.

RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
RULES

Adopted as revised ~~December 11, 2019~~

Rule D – Wetland and Creek Buffers

1 Policy

It is the policy of the Board of Managers to ensure the preservation of the natural resources, recreational, habitat, water treatment and water storage functions of water resources. This rule is intended to:

- Support municipal enforcement of the Wetland Conservation Act and the policy of no net loss in the extent, quality and ecological diversity of existing wetlands in the watershed.
- Preserve vegetation and habitat important to fish, waterfowl and other wildlife while also minimizing negative impacts of erosion.
- Require buffers around wetlands, water basins and watercourses affected by land-disturbing activities.
- Ensure the preservation of the natural resources, habitat, water treatment and water storage functions of wetlands, water basins and watercourses.
- Maintain wetland integrity and prevent fragmentation of wetlands.
- Prevent erosion of shorelines and streambanks, and foster the use of natural materials for the protection, maintenance and restoration of shorelines and streambanks.

2 Regulation

2.1 Compliance with the criteria in section 3 of this rule is required for any activity that requires a permit under Rule B – Floodplain Management and Drainage Alterations, Rule E – Dredging and Sediment Removal, Rule F – Shoreline and Streambank Stabilization, except sand blanketing, Rule G – Waterbody Crossings and Structures or Rule J – Stormwater Management. The requirements of the rule apply to property:

a encompassing or adjacent to a public watercourse, public waters wetland or other protected wetland in the watershed; or

b encompassing or adjacent to any other watercourse within a High-Risk Erosion Area, unless the applicant submits data demonstrating a Stream Power Index rating of 3 or less and an absence of any significant existing erosion.

2.2 The requirements of this rule do not apply to:

a incidental wetlands;

b to wetlands that are disturbed solely by utility improvements or repairs that are the subject of a no-loss determination from the relevant Wetland Conservation Act Local Government Unit; or

c to projects approved under the ~~fast-track~~ maintenance provisions of Rule F, paragraph 3.4.

3 Criteria

3.1 **Buffer area.** Buffer must be created or maintained:

a Around a wetland disturbed by land-disturbing activity regulated by the District;

b on that portion of the edge of a wetland that is downgradient from land-disturbing activity regulated by the District; and

c on streambank downgradient from the land-disturbing activity regulated by the District and 50 feet from each of the upstream and downstream extent of the disturbance.

3.2 **Buffer width**. Buffer must be created or maintained upgradient of regulated features in accordance with the following criteria:

a Wetland values will be determined in accordance with Appendix D1, which is incorporated into and made a part of this rule.

b Subject to paragraphs 3.2c through g, buffers must extend:

i An average of 80 feet from the delineated edge of an exceptional value wetland, minimum 40 feet;

ii An average of 60 feet from the delineated edge of a high value wetland, minimum 30 feet;

iii an average 40 feet from the delineated edge of a medium value wetland,[1] minimum 20 feet;

iv an average 20 feet from the delineated edge of a low value wetland,[1] minimum 10 feet;

v an average of 50 feet from the centerline of a public waters watercourse, minimum 30 feet;

vi an average of 50 feet from the thalweg of any watercourse within a High-Risk Erosion Area, minimum 30 feet.

c **Steep slopes.** Where a buffer encompasses all or part of a slope averaging 18 percent or greater over a distance of 50 feet or more upgradient of the regulated feature, calculated using a reasonably precise topographic surface model, the buffer will extend to the width specified under section 3.2a or to the top of the slope, whichever is greater. An existing contour alteration or artificial structure on a slope constitutes a break in slope only if it will indefinitely dissipate upgradient runoff velocity and trap upgradient pollutant loadings.

d **Existing single-family residential properties:** Paragraphs a through c do not apply. When required on an existing single-family home property, buffer must extend an average of 20 feet from the delineated edge of a wetland or OHW of a watercourse, minimum 10 feet.

e **Buffer averaging.** Buffer width may vary, provided that the minimum buffer width is maintained at all points, there is no reduction in total buffer area, and the buffer provides wetland and habitat protection at least equivalent to a buffer of uniform width. Buffer wider than 200 percent of the applicable width calculated in accordance with above provisions will be excluded from the buffer-averaging calculation. Buffer width may not be averaged on a steep slope.

f Buffer is only required on the property owned by the applicant that is the subject of the District permit, and is required where the regulated feature is either on or within the applicable buffer width of the subject property.

g Buffer required for linear projects will be limited in width to the extent of available right-of-way.

3.3 Buffer areas must be planted with native vegetation and maintained to retain natural resources and ecological value. Existing buffer areas preserved in compliance with this rule must be managed in a naturalized condition to encourage growth of native vegetation and eliminate invasive species. Buffer vegetation must not be cultivated, cropped, pastured, mowed, fertilized, subject to the placement of mulch or yard waste, or otherwise disturbed, except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, mowing for purposes of public safety, temporary disturbance for placement or repair of buried utilities, or other actions to maintain or improve buffer quality and performance, each as approved by the District in advance in writing or when implemented pursuant to a written maintenance plan approved by the District.

a Diseased, noxious, invasive or otherwise hazardous trees or vegetation may be selectively removed from buffer areas and trees may be selectively pruned to maintain health.

b Pesticides and herbicides may be used in accordance with Minnesota Department of Agriculture rules and guidelines.

c No fill, debris or other material will be placed within a buffer.

d No structure or impervious cover (hard surface) may be created within a buffer area, except that boardwalks, sidewalks and trails designed for nonmotorized use may be constructed within a buffer area as long as the minimum and average buffer widths are maintained from the regulated feature. Stormwater-management facilities may be constructed within buffer area. Plans and specifications must be approved by the District prior to construction. Existing impervious surface that will not otherwise be disturbed need not be removed.

i Hydrants, utility manholes, piers, docks, canoe racks, information kiosks, signage, retaining walls and benches may be located within a buffer in a public park.

e A pervious path or boardwalk, not more than 12 feet wide, may be created or maintained to provide access to a regulated feature or within the required buffer area outside the minimum buffer width. Access paths or boardwalks may not be located where or constructed such that concentrated runoff will flow to the regulated feature.

3.4 Buffer will be indicated by permanent, free-standing markers at the buffer's upland edge installed in accordance with a plan and specifications providing:

a Installation date, which must be set to ensure protection of buffer area during and after land-disturbing activities;

b text in material conformity with a design and text provided by the District;

c location(s) for markers, at a minimum along each lot line, with additional markers at an interval of no more than 200 feet and, for subdivisions, on each lot of record to be created.

On public land or right-of-way, the monumentation requirement may be satisfied by the use of a marker flush to the ground or breakaway markers of durable material.

3.5 Before any work subject to District permit requirements commences, buffer areas and maintenance requirements must be documented in a declaration or other document approved by the District and recorded in the office of the county recorder or registrar. On public land or right-of-way, buffer areas and maintenance requirements may be documented in a written agreement with the District in lieu of a recorded document.

3.6 In establishing buffer pursuant to this rule, the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) must be minimized to the maximum extent possible.

5 Temporary alterations

Temporary alteration of buffer areas permitted under this rule or in writing by the District must comport with the requirements of this section.

5.1 Compliance with District Rule C – Erosion Prevention and Sediment Control is required, irrespective of the area or volume of earth to be disturbed.

5.2 Buffer zones and the location and extent of vegetation disturbance will be delineated on the erosion control plan.

5.3 Alterations must be designed and conducted to ensure only the smallest amount of disturbed ground is exposed for the shortest time possible. Mulches or similar materials must be used for temporary soil coverage and permanent native vegetation established as soon as possible.

5.4 Fill or excavated material may not be placed to create an unstable slope.

6 Roads and utilities

A structure, impervious cover or right-of-way maintained permanently in conjunction with a crossing of a waterbody or wetland may be constructed and maintained in buffer area that would otherwise be required under this rule. The structure, impervious cover or right-of-way must be designed to minimize the area of permanent vegetative disturbance. Minimization includes, but is not limited to, approach roads and rights-of-way that are perpendicular to the crossing and of a minimum width consistent with use and maintenance access needs.

6.1 All work will be conducted in accordance with section 4 of this rule.

7 Shoreline or streambank improvements

A shoreline or streambank improvement subject to District Rule F, including a sand blanket, is excepted from the prohibitions of subsection 3.2, provided the improvement complies with District Rule F – Shoreline and Streambank Stabilization. The applicable buffer width may overlap shoreline or streambank improvements other than a sand blanket.

8 Required information and exhibits

The following exhibits must accompany the permit application:

8.1 One 11 inch-by-17 inch plan set , and electronic files in a format acceptable to the District, as well as a plan set 22 inches by 34 inches if requested by the District.

8.2 For work on any property subject to this rule:

a A scaled site plan showing existing conditions, including the following elements:

i Topographic contours at two-foot intervals;

ii Existing streets, roads and trails;

iii Existing structures and facilities;

iv Extent of regulated feature as delineated in the field;

v Location of existing trees and tree masses;

vi Soil types and locations.

b A scaled proposed site plan showing proposed development that include the following elements:

i Topographic contours showing finished grade at two-foot intervals;

ii Proposed streets, parking, trails and sidewalks;

iii Location of proposed structures and facilities;

iv Extent of regulated feature and associated buffers as delineated in the field;

v Location of major landscaping including those existing trees and tree masses to be retained.

vi Property lines and corners and delineation of lands under ownership of the applicant

vii Street rights-of-way;

viii Utility easements;

8.2 For projects on properties on which wetlands are located, exhibits must be submitted as follows:

a For existing single-family home properties encompassing all or part of a wetland: A wetland delineation.

b For all other properties encompassing all or part of a wetland: A wetland delineation, type determination, and function and values assessment of any regulated wetland using the Minnesota Routine Assessment Method (MnRAM) or another wetlands-assessment method approved by the District. The delineation and function and values assessment must be conducted by a certified wetland delineator and supported by the following documentation:

i Identification of the methods used;

ii Identification of presence or absence of normal circumstances or problem conditions;

iii Wetland data sheets, or a report, for each sample site, referenced to the location shown on the delineation map. In each data sheet/report applicant must provide the reasoning for satisfying, or not satisfying each of the technical criteria and why the area is or is not a wetland;

iv A delineation map showing the size, locations, configuration and boundaries of wetlands in relation to identifiable physical characteristics, such as roads, fence lines, waterways or other identifiable features;

v The location of all sample sites and stakes/flags must be accurately shown on the delineation map.

8.3 For properties adjacent to but not encompassing any portion of a wetland, the District will determine the need for wetland buffer and applicable buffer width using best available data, including any wetland functions and values data submitted by the applicant.

Appendix D1 – Wetlands Definitions

"Exceptional value wetlands" are those meeting one or more of the following rating levels, as determined by application of the current edition of the Minnesota Routine Assessment Method (MnRAM) or another wetlands-assessment method approved by the District.

Function or Value	**Rating**
Vegetative Diversity	Exceptional
Wildlife Habitat	Exceptional
Amphibian Habitat AND Vegetative Diversity	High High
Fish Habitat	Exceptional
Shoreline Habitat	High
Aesthetics/education/recreation/cultural AND Wildlife Habitat	Exceptional High
Stormwater Sensitivity AND Vegetative Diversity	Exceptional Medium or greater
Vegetative Diversity AND Maintenance of Hydrologic Regime	High High

"High value wetlands" are those meeting one or more of the following rating levels, as determined by application of the current edition of MnRAM or another wetlands-assessment method approved by the District.

Function or Value	**Rating**
Vegetative Diversity	High
Wildlife Habitat	High
Amphibian Habitat	High
Fish Habitat	High
Shoreline Protection	Medium
Aesthetics/education/recreation/cultural AND Wildlife Habitat	High Medium
Stormwater Sensitivity AND Vegetative Diversity	High Medium or greater
Vegetative Diversity AND Maintenance of Hydrologic Regime	Medium High or greater

"Medium value wetlands" are those that do not qualify as high value wetlands but that meet one or more of the following rating levels, as determined by application of the current edition of MnRAM or another wetlands-assessment method approved by the District.

Function or Value	**Rating**
Vegetative Diversity	Medium
Wildlife Habitat	Medium
Amphibian Habitat AND Vegetative Diversity	Medium Medium
Fish Habitat	Medium
Shoreline Habitat	Low
Aesthetics/education/recreation/cultural AND Wildlife Habitat	Medium Low
Stormwater Sensitivity	Medium

"Low value wetlands" are those that do not qualify as "exceptional," "high," or "medium" wetlands.

Rule F – Shoreline and Streambank Stabilization

1 Policy

It is the policy of the Board of Managers to prevent erosion of shorelines and streambanks, and to foster the use of natural materials and bioengineering for the maintenance and restoration of shorelines and streambanks.

2 Regulation

A permit from the District is required to install or maintain an improvement to stabilize a shoreline or streambank, including but not limited to riprap, a bioengineered installation, a sand blanket or a retaining wall, on any watercourse or a public water. ~~Maintenance of an existing stabilization improvement may be approved under the fast-track application provisions in paragraph 3.4 below.~~ No District permit under this rule is required for:

2.1 Activities conducted pursuant to a project-specific permit from the state Department of Natural Resources, but the District buffer requirements apply to activity that would otherwise require a District permit;

2.2 activities in incidental wetlands or for utility improvements or repairs that are the subject of a no-loss determination from the relevant LGU;

2.3 removing accumulated sediment from a water basin; or

2.4 maintenance or in-kind replacement of existing public infrastructure on non-public waters that does not increase the length, width or depth of the existing infrastructure.

3 Criteria

Except for shoreline maintenance that qualifies for approval under paragraph 3.4 below, a permit will be issued on demonstration by the applicant of compliance with the applicable criteria in subsections 3.1 through 3.3.

3.1 An applicant for a permit under this rule must demonstrate a need to prevent erosion or restore an eroded shoreline or streambank,~~[1]~~ unless the proposed improvement is designed to restore natural shoreline or streambank.

3.2 **Sequencing.** Stabilization practices must be consistent with the erosion intensity or shear stress rating calculated for the property proposed to be stabilized. The District will approve proposed stabilization practices in accordance with the applicable sequencing priority:

a **Shoreline erosion intensity calculation**. Applications for shoreline stabilization must include a completed RPBCWD Erosion Intensity Scoresheet[2]

~~[1] All references to "shoreline" in these rules should be read to refer to both shoreline and streambank, except where context clearly requires distinction between the two.~~

[2] The Erosion Intensity Scoresheet is incorporated into and a part of these rules. It may be obtained from the District office or the permitting section of the District website: www.RPBCWD.org. The website

to determine the erosive energy ranking for the site (low, medium, high). The proposed shoreline stabilization practice must be consistent with the shoreline erosion energy rating calculated.

i Low-energy site means a site where the erosion intensity score is 47 or less. Low energy shorelines may be stabilized using bioengineering stabilization practices.

ii Medium-energy site means a site where the erosion intensity score is 48 to 67. Medium energy shorelines may be stabilized using a combination bioengineering and vegetated riprap stabilization practices.

iii High energy site means a site where the erosion intensity score is greater than 67. High energy sites may be stabilized with riprap and vegetated riprap practices.

b **Streambank shear stress calculation.** Applications for streambank stabilization must include a shear stress calculation for the site.[3] The proposed streambank stabilization practice must be consistent with the shear stress calculated.

i Low energy streambanks are those where the shear stress calculated is less than or equal to 2.5 pounds per square foot and may be stabilized using bioengineering practices.

ii Medium energy streambanks are those where the shear stress calculated is between 2.5 and 5 pounds per square foot and may be stabilized using a combination of riprap and bioengineering.

iii High energy streambanks are those where the shear stress calculated is greater than 5 pounds per square foot and may be stabilized using riprap and vegetated riprap.

c Design flexibility. The District may approve alternative stabilization techniques if the applicant provides sufficient evidence from an engineer registered in Minnesota to demonstrate that the proposed stabilization practice represents the minimal-impact solution with respect to all other reasonable alternatives. A detailed alternatives analysis must be provided.

3.3 **Design criteria.**

a Vegetative, bioengineered and hard-armored stabilization.

i Live plantings must be native aquatic vegetation and/or native upland plants.

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also provides guidance on how to complete the scoresheet. The scoresheet may be periodically updated, on approval of the RPBCWD Board of Managers, to account for improved understanding of shoreline-erosion factors.

3 Shear stress must be calculated in a manner consistent with the Natural Resources Conservation Service's National Engineering Handbook (including Technical Supplement 14I: Streambank Soil Bioengineering); Stability Thresholds for Stream Restoration Materials published by the U.S. Army Corps of Engineers; NRCS Engineering Field Handbook Streambank and Shoreline Protection (Chapter 16); or Wisconsin Supplement Engineering Field Handbook Chapter 16 Streambank and Shoreline Protection. The RPBCWD website – www.rpbcwd.org – provides guidance on how to calculate shear stress.

ii The finished, stabilized slope of any shoreline or streambank will not be steeper than 3:1 (horizontal to vertical) waterward of the OHW except where necessary:

(a) to match existing slopes and certified by registered professional engineer for continued slope stability, or;

(b) for bridges, culverts and other structures regulated under Rule G – Waterbody Crossings and Structures.

iii Horizontal encroachment from a shoreline or streambank will be the minimal amount necessary to permanently stabilize the shoreline or streambank and will not unduly interfere with water flow or navigation. No riprap or filter material may be placed more than 6 feet waterward of the OHW. Streambank riprap may not reduce the cross-sectional area of the channel or result in a stage increase at or upstream of the installation.

iv The design of any shoreline or streambank erosion protection will reflect the engineering properties of the underlying soils and any soil corrections or reinforcements necessary. The design will conform to engineering principles for dispersion of wave energy and resistance to deformation from ice pressures and movement, considering prevailing winds, fetch and other factors that induce wave energy.

b **Riprap**~~.~~

i Riprap to be used in shoreline or streambank erosion protection must be sized appropriately in relation to the erosion potential of the wave or current action of the particular waterbody, but in no case will the riprap rock average less than six inches in diameter or more than 30 inches in diameter. Riprap will be durable, natural stone and of a gradation that will result in a stable ~~shoreline embankment~~slope. Stone, granular filter and geotextile material will conform to standard Minnesota Department of Transportation specifications, except that neither limestone nor dolomite will be used for shoreline or streambank riprap, but may be used at stormwater outfalls. All materials used must be free from organic material, soil, clay, debris, trash or any other material that may cause siltation or pollution.

ii Riprap must be placed to conform to the natural alignment of the shoreline or streambank.

iii A transitional layer consisting of graded gravel, at least six inches deep, and an appropriate geotextile filter fabric will be placed between the existing shoreline or streambank and any riprap. The thickness of riprap layers should be at least 1.25 times the maximum stone diameter. Toe boulders, if used, must be at least 50 percent buried.

iv Riprap must not cover emergent vegetation, unless authorized by a Department of Natural Resources permit.

v Riprap must not extend higher than the top of bank or two feet above the 100-year high water elevation, whichever is lower.

vi Placement of riprap for cosmetic purposes alone is prohibited.

c **Retaining walls.** Retaining walls extending below the OHW of a waterbody are prohibited, except where:

i there is a demonstrable need for a retaining wall in a public improvement project, and

ii the design of the retaining wall has been certified by a registered engineer.

d **Sand blankets**. The following standards apply to sand blanketing:

i The sand or gravel used must be clean prior to being spread. The sand must contain no toxins or heavy metals and must contain no weed infestations such as, but not limited to, water hyacinth, alligator weed, and Eurasian watermilfoil, or animal infestations such as, but not limited to, zebra mussels or their larva.

ii The sand layer must not exceed six inches in thickness, 50 feet in width along the shoreline~~ or streambank~~, or one-half the width of the lot, whichever is less, and may not extend more than 10 feet waterward of the ordinary high water level.

iii Only one installation of sand or gravel to the same location may be made during a four-year period. After the four years have passed since the last blanketing, the location may receive another sand blanket. No more than two applications may be made at an individual project site.

Public beaches. Beaches operated by public entities and available to the public must be maintained in a manner that represents the minimal impact to the environment, relative to other reasonable alternatives, but otherwise are exempt from the criteria in paragraphs (b) and (c) of this section.

e In installing or maintaining any shoreline or streambank stabilization, the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) must be minimized to the maximum extent possible.

3.4 **~~Fast-track m~~Maintenance**. ~~Notwithstanding the requirements and criteria in subsections 3.1 to 3.3, where an applicant can establish that a shoreline stabilization practice was constructed before February 1, 2015, or after that date in compliance with a duly issued District permit, t~~The District will issue a permit for maintenance of ~~the practice~~ an existing shoreline stabilization in its established form if the stabilization was installed before February 1, 2015, or after that date in compliance with a duly issued District permit on submission by ~~as long as~~ the applicant of ~~submits~~ plans documenting that the maintenance work will not increase the length of the stabilization along the shoreline and will ~~the length, width or depth of the practice, and will not disturb underlying soils~~ comply with all applicable criteria of subsection 3.3.

4 Required information and exhibits.

The following exhibits will accompany the permit application:

4.1 One 11 inch-by-17 inch plan set, and electronic files in a format acceptable to the District, as well as a plan set 22 inches by 34 inches if requested by the District.

4.2 A site plan, including:

- a Documentation, including at a minimum photographs, of existing erosion or the potential for erosion;
- b a survey locating the existing OHW level ~~contour~~, existing shoreline/streambank, floodplain elevation and location of property lines;
- c elevation contours of the upland within 15 feet of the OHW level and referenced to accepted datum; and
- d plan view of locations and lineal footage of ~~the~~ any proposed riprap.

The plan must show the location of an upland baseline parallel to the shoreline with stationing. The baseline will be staked in the field by the applicant and maintained in place until project completion. Baseline origin and terminus each must be referenced to three fixed features, with measurements shown and described on the plan. Perpendicular offsets from the baseline to the OHW must be measured and distances shown on the plan at 20-foot stations. The plan will be certified by a registered engineer or landscape architect.

4.3 A construction plan and specifications certified by a registered engineer or landscape architect, showing:

- a A sequencing analysis in compliance with section 3.2;
- b materials to be used, including the size(s) of any riprap to be used;
- c cross section detailing the proposed riprap, if any, drawn to scale, with the horizontal and vertical scales noted on the drawing. The detail should show the finished riprap slope, transitional layer design and placement, distance waterward of the riprap placement and OHW.
- d Description of the underlying soil materials.
- e Material specifications for stone, filter material and geotextile fabric.

4.4 For sites involving aquatic plantings, a separate Aquatic Plant Management permit will be obtained from the Department of Natural Resources.

- a This provision does not apply to slope protection projects using woody species such as willow and dogwood.

4.5 An erosion control and site restoration plan.

4.6 For an application for a sand blanket, the following exhibits are required:

- a Site plan showing property lines, delineation of the work area, existing elevation contours of the adjacent upland area, ordinary high-water elevation, and 100-year high water elevation (if available). All elevations must be reduced to NGVD (1929 datum).
- b Profile, cross sections and/or topographic contours showing existing and proposed elevations in the work area. (Topographic contours should be at intervals not greater than 1.0 foot).
- c A completed Sand Blanket Permit Application form.

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

February 4, 2021, RPBCWD Board of Managers Special Meeting

PRESENT:

Managers:	Jill Crafton, Treasurer
	Larry Koch
	Dorothy Pedersen, Vice President
	Dick Ward, President
	David Ziegler, Secretary
Staff:	Claire Bleser, RPBCWD Administrator
	Amy Bakkum, Administrative Assistant
Other attendees:	Sharon Klumpp, consultant

Note: this meeting was held remotely via meeting platform Zoom pursuant to Minnesota Statutes Section 13D.021 and state mandates in response to Covid-19.

1. Call to Order

Ms. Bakkum explained that she would initiate the Zoom meeting and then leave until notified that the meeting adjourned.

President Ward called to order the Thursday, February 4, 2021, Board of Managers Special Meeting at 10:00 a.m. The meeting was held remotely via meeting platform Zoom.

2. Closed Session

President Ward asked for a motion to go into closed session. Manager Crafton moved that the Board go into closed session, seconded by Manager Pedersen.

Manager Koch objected to the Board's process and stated that he did not think the Board was following the proper method to go into closed session. He stated that he felt that the public should have access before the Board goes into closed into closed session and they currently do not have that access.

<u>Upon a roll call vote, the motion carried 4-1 as follows:</u>

Manager	*Action*
Crafton	Aye

Koch	Nay
Pedersen	Aye
Ward	Aye
Ziegler	Aye

Whereupon the Board went into closed session. Dr. Bleser joined the meeting at approximately 10:45 a.m.

3. Adjournment

Manager Pedersen moved to adjourn this meeting, seconded by Manager Crafton.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

The meeting adjourned at 11:43 a.m.

Respectfully submitted,

David Ziegler, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

February 18, 2021, RPBCWD Board of Managers Special Meeting

PRESENT:

Managers: Jill Crafton, Treasurer
Larry Koch
Dorothy Pedersen, Vice President
Dick Ward, President
David Ziegler, Secretary

Staff: Claire Bleser, RPBCWD Administrator

Note: this meeting was held remotely via meeting platform Zoom pursuant to Minnesota Statutes Section 13D.021 and state mandates in response to Covid-19.

1. Call to Order

Ms. President Ward called to order the Thursday, February 18, 2021, Board of Managers Special Meeting at 10:00 a.m. The meeting was held remotely via meeting platform Zoom.

2. Discussion

President Ward asked for a motion to go into closed session. Manager Crafton moved that the Board go into closed session, seconded by Manager Ziegler.

Manager Koch stated several objections as points of order for the meeting. He stated that he felt that the public did not have access to the special meeting; he quested whether the notice contained sufficient detail and requested that legal counsel be consulted regarding the detail of the meeting notice; and he stated that the meetings of February 4 and 18 did not appear on the District's calendar and noted that the District offices are closed.

Administrator Bleser stated that staff is in the office and that the notices were distributed through the District's email system last Thursday or Friday, and that notice was circulated through email to those who have asked to be notified of District meetings. The managers discussed the purpose of the meeting, including whether it included a discussion forum pursuant to the mid-monthly meeting concept discussed previously.

President Ward stated that due to the difference of opinion as to what the board's intent was for the February 18 meeting, he was inclined to request that legal counsel listen to the recording of the board's February 4 meeting. The board would adjourn the February 18 meeting, and President Ward would connect with legal counsel to prepare to provide proper notice for the board's next step. Manager Crafton withdrew her motion that the board go into closed session, and Manager Ziegler withdrew his second. Manager Koch moved that President Ward contact legal counsel to review proper notice and agenda for the closed and open items for the meeting. Manager Ziegler seconded the motion.

<u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

3. Adjournment

Manager Koch moved to adjourn this meeting, seconded by Manager Crafton.

<u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

The meeting adjourned at 10:20 a.m.

Respectfully submitted,

David Ziegler, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

February 22, 2021, RPBCWD Board of Managers Special Meeting

PRESENT:

Managers:	Jill Crafton, Treasurer
	Larry Koch
	Dorothy Pedersen, Vice President
	Dick Ward, President
	David Ziegler, Secretary
Staff:	Amy Bakkum, Administrative Assistant
	Claire Bleser, RPBCWD Administrator
Other attendees:	Ellen Hinrichs

Note: this meeting was held remotely via meeting platform Zoom in abidance with state mandates in response to Covid-19.

1. Call to Order

President Ward called to order the Monday, February 22, 2021, Board of Managers Special Meeting at 1:00 p.m. The meeting was held remotely via meeting platform Zoom.

2. DISC Profile Workshop Led by Ellen Hinrichs

Administrator Bleser said this workshop is part of the District's focus and efforts on improving communication. She introduced Ellen Hinrichs, workshop facilitator. Ms. Hinrichs explained this workshop will explore the managers' individual styles and how those styles combined create the culture of the RPBCWD Board of Managers. She explained the goals of the workshop are to learn how one's communication style affects others, learn the value of appreciating communication style differences, utilize the DISC model to read the behaviors of others, analyze a team map, and discuss strategies for working more effectively together.

Ms. Hinrichs led the managers through exercises and discussion. She highlighted characteristics of highly functional teams as described in Patrick Lencioni's book Five Dysfunctions of a Team, including the characteristics of trust, healthy conflict, commitment, accountability, and results focus. The managers reviewed and discussed their individual styles based on the DISC profile as well as benefits and drawbacks of the styles. Ms. Hinrichs shared about how the managers' styles set a culture for the group, and she talked about the characteristics of the group's culture. She said she will share the requested PowerPoint slides with the managers. She encouraged the group to continue to think about the information learned from this exercise and consider how the group can apply the learnings to strengthen the group's culture and communication effectiveness.

3. Adjournment

Manager Crafton moved to adjourn the special meeting. Manager Ziegler seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

The special meeting adjourned at 3:06 p.m.

Respectfully submitted,

____

David Ziegler, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

March 3, 2021, RPBCWD Board of Managers Monthly Meeting

PRESENT:

Managers:	Jill Crafton, Treasurer	
	Larry Koch	
	Dorothy Pedersen, Vice President	
	Dick Ward, President	
	David Ziegler, Secretary	
Staff:	Amy Bakkum, Administrative Assistant	
	B. Lauer, Education and Outreach Coordinator	
	Claire Bleser, RPBCWD Administrator	
	Terry Jeffery, Watershed Planning Manager	
	Josh Maxwell, Water Resources Coordinator	
	Louis Smith, Attorney, Smith Partners	
	Scott Sobiech, Engineer, Barr Engineering Company	
Other attendees:	Shanna Braun, Barr Engineering	Sharon McCotter
	Elizabeth Henley	Marilyn Torkelson

Note: this meeting was held remotely via meeting platform Zoom in abidance with state mandates in response to Covid-19.

1. Call to Order

President Ward called to order the Wednesday, March 3, 2021, Board of Managers Regular Monthly Meeting at 7:00 p.m. The meeting was held remotely via meeting platform Zoom.

2. Approval of Agenda

Manager Ziegler moved to approve the agenda. Manager Crafton seconded the motion. Manager Koch requested moving off the Consent Agenda items 9a– Accept March Staff Report , 9e – Authorize Solicitation to go out for bid for Silver Lake Water Quality Project, 9f – Authorize Execution of Silver Lake Water Quality Project, 9g – Approve Silver Lake Land Use Agreement, and 9h – Authorize Solicitation to go out for bid for Saint Hubert Water Quality Project Pending Legal Approval, and he requested amending item 9d to read Approve Payment of Final Pay App and Close Out of the Scenic Heights Elementary School Forest Restoration Project. He requested adding to the agenda Approval of an Interim Administrator, Transfer of Positions to the Interim Administrator, Authorize a Search for a District Administrator, Inform BWSR to that Effect, and

Direct Administrator Bleser and the Interim Administrator to take whatever actions needed for the Interim Administrator to efficiently take over that role. He requested adding an agenda item about registering for the Minnesota virtual legislative event. President Ward said the discussion about the interim Administrator and transfer of positions is going to be a long discussion and is on the agenda for the Board's March 9th meeting and he doesn't support adding it to tonight's agenda. Manager Koch remarked he thinks it would be a mistake not to add it to tonight's agenda.

Attorney Smith stated Mr. Jeffery would like an agenda item added regarding Recording Declarations for the Chanhassen Wetland Project.

Manager Ziegler accepted the friendly amendment to add the agenda item on recording declarations for the Chanhassen Wetland Project, to remove from the Consent Agenda and add to Discussion items 9a, 9e, 9f, 9g, and 9h, and to revise item 9d to become Approve Payment of Final Pay App and Close Out of the Scenic Heights Elementary School Forest Restoration Project. Manager Koch reminded the Board of his request to add an agenda item about registering for the Minnesota virtual legislative event. Manager Ziegler accepted it as a friendly amendment as well. Manager Crafton agreed to the friendly amendments.

<u>Upon a roll call vote, the motion carried 5-0</u> as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

3. Summary of Closed Personnel Meeting

Manager Pedersen reported the meeting did not proceed due to an issue Manager Koch brought to the Board's attention regarding the public notice process for the meeting. Manager Koch said there were several meetings held prior to the meeting that did not take place and actions were taken in those meetings. He said the actions taken at those meetings should be summarized.

Manager Pedersen asked Attorney Smith for clarification on what information should be reported tonight. Attorney Smith responded this is the occasion to report on the closed meetings held in the interim since the last meeting of the Board, which was February 3. Manager Koch said the Board took action vis a vis Dr. Bleser, and he thinks it's the Board's obligations to report on that action. Manager Pedersen said her understanding is that regarding an employment matter, the managers were only to report the individual's rating and the increase or lack of increase [salary]. Attorney

Smith stated the items Manager Pedersen mentioned are items typically included in a summary of a closed meeting for the purposes of a performance evaluation.

Manager Koch suggested Manager Pedersen and himself have a discussion with Attorney Smith and have him review the recordings to determine if there are other items that need be disclosed and provide an opinion to the Board. Manager Koch moved to direct Attorney Smith to review the recordings from the closed meeting and provide an opinion to the Board as to what information should be included in the Board's summary of the closed personnel meeting. Manager Crafton seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

4. Matters of General Public Interest

No matters of general public interest were raised.

5. Reading and Approval of Meeting Minutes

a. February 3, 2021, RPBCWD Board of Managers Monthly Meeting

Manager Ziegler moved to approve the minutes as presented. Manager Pedersen seconded the motion. Manager Koch noted an edit on line 65 to delete the extra "and" and an edit on line 107 to change "aren't to "are not." Managers Ziegler and Pedersen agreed by consent to Manager Koch's friendly amendment to the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

6. CAC

a. CAC Report

Ms. Sharon McCotter reported the CAC unanimously elected Heidi Groven as CAC Chair and Jim Boettcher as CAC Vice Chair. She said the CAC amended its bylaws stating new CAC members serve an initial two-year commitment. Ms. McCotter asked if the Board needs to vote on approving the CAC's bylaws. There was a discussion about the Board's role with the CAC's bylaws. Attorney Smith said in general the CAC operates in developing its own bylaws, but the CAC wants to always be operating in terms of communication with the Board of Managers. He said he understands the spirit of the CAC's interest in a two-year commitment. However, Attorney Smith stated, he doesn't think it's an appropriate topic for the CAC because it is the Board of Managers that makes the CAC appointments. Attorney Smith stated he wouldn't be comfortable with a bylaw that would constrain the authority of the Board to make appointments. Attorney Smith said he suggests this point about serving an initial two-year commitment be taken as a recommendation from the CAC, and the Board would keep this recommendation in mind as the Board goes through its annual appointments process. Ms. McCotter said it is the CAC's goal to have the recommendation that appointees serve an initial two-year commitment be documented.

Ms. McCotter reported on items the CAC discussed, including Google Jam Board, a tool for brainstorming, and St. Hubert's School ground water conservation. She noted that the CAC's recommendations are in the Board's meeting packet.

7. Consent Agenda

Manager Koch moved to approve the Consent Agenda [as amended in agenda item 2]. Manager Crafton seconded the motion. The Consent Agenda included items 9b – Accept March Engineer's Report, 9c – Accept March Construction Report, and 9d – Approve Final Pay App and Close Out of the Scenic Heights School Forest Restoration Project.

<u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

8. Action Items

a. Items Pulled from Consent Agenda

i. Accept March Staff Report

Manager Koch requested a presentation to the Board on the Riley Purgatory summit and data. He asked if staff knows how much time staff spends on the Wetland Conservation Act annual reporting that the District submits to BWSR. Mr. Jeffery provided details. Manager Koch moved to accept the March staff report. Manager Pedersen seconded the motion.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

ii. Authorize Solicitation to Go Out for Bids for Silver Lake Water Quality Project

Manager Koch asked if these bid documents contain limitations on retainage. He said he believes the District's position should be to only have the retainage limitations required by law. Engineer Sobiech responded the retainage language is similar to the limitation language used in the District's prior contract documents, and the District's Legal Counsel has done a thorough review of the contract documents. Engineer Sobiech stated the Engineer is following the recommendation of the District's Legal Counsel. Attorney Smith said he believes the District contract follows statutory requirements on retainage. He said he can review the bid documents and report back to the Board. Manager Koch said he would like the District's Legal Counsel and Engineer to review the bid documents and report back.

Manager Koch stated he has read the statute and didn't see any basis for including in District contracts language limiting retainage to 50%. He said he thinks that limitation should be removed, and he asked for that limitation to be removed. He commented he doesn't like to be asked to approve documents that aren't provided to him for review.

Manager Pedersen moved to authorize solicitation to go out for bids for the Silver Lake Water Quality Project on the condition that Manager Koch's question on retainage be resolved before bids are released. Manager Ziegler seconded the motion.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

iii. Authorize Board President to Execute Silver Lake Cooperative Agreement

Manager Koch asked if the Cooperative Agreement was included in the Board's meeting packet. Mr. Jeffery said it likely was not included, and he reminded the Board it approved the Cooperative Agreement in July 2020. Mr. Jeffery said the Board had authorized Administrator Bleser to execute the agreement, and the City-signed document lists President Ward as the signatory instead of Dr. Bleser. Mr. Jeffrey noted everything else in the agreement is unchanged. Mr. Jeffery asked the Board to approve President Ward signing the agreement.

Manager Koch moved to authorize the Board President to execute the agreement in the form it was approved at a prior District meeting. Manager Crafton seconded the motion. Attorney Smith said Resolution 20-02 is in the meeting packet and he understands the motion is to adopt the resolution. Managers Koch amended his motion to adopt Resolution 20-02. Manager Crafton accepted the friendly amendment.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye

Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

iv. Approve Silver Lake Land Use Agreement

Manager Koch asked if the Agreement was included in the Board's meeting packet. Mr. Jeffery said it should have been included in the meeting packet. He provided background on the project and said staff has provided the agreement to the landowner regarding access to the property. Mr. Jeffery explained the agreement is still in the hands of the landowner for execution.

Manager Koch moved to table this item until the agreement comes back to the District from the landowner and to direct Attorney Smith that if there is a response from the landowner to review it and bring it to the Board at its next meeting. Manager Crafton seconded the motion.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

v. Authorize Solicitation to go out for Bids for Saint Hubert Water Quality Project Pending Legal Approval

Manger Koch said he wasn't impressed with what SRF provided the District, and he asked what provisions are in the bid package regarding retainage. There was a discussion about the project timeline and impacts if the Board tables this item until its March 9th meeting.

Manager Koch moved to table this item until the Board's March 9th meeting, direct staff to review contracts and prepare a response to his question regarding retainage and bring the information and this item back to the Board at its March 9th meeting. President Ward seconded the motion. President Ward noted the

District's March 9th special meeting notice would need to be revised to include this item. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

b. Accept January Treasurer's Report

Manager Crafton stated the report has been reviewed in accordance with internal controls and procedures. She moved to accept the January Treasurer's Report. Manager Pedersen seconded the motion.

Manager Koch noted several items in the fund analysis have expended more than approximately 8%, or one-twelfth, of those items' budgets for 2021 and asked the District Administrator to comment and speak to whether the spending indicate those items will be over budget for the year. There was discussion about specific budget line items and reasons for their year-to-date totals, such as the purchase of a District vehicle as reflected in the data collection and monitoring budget. Manager Koch provided his opinion about accounting practices for acquisition of vehicles and asked staff to follow up with the accountant or auditor regarding his position.

He remarked the Board approved revising the table of multi-year projects, and he isn't sure the schedule presented with the January report meets what the Board and staff discussed. He said he will look into it further and bring it up again at a future meeting.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

c. Paying of Bills

Manager Crafton moved to pay the bills. Manager Ziegler seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

d. Approve Recording of the Declaration of the Two Properties

Manager Koch moved to approve the recording of the declarations on the properties as described by Mr. Jeffery and authorize District officers to sign any necessary documents to record the declarations. Manager Pedersen seconded the motion. Manager Koch amended his motion to authorize the District Administrator to sign the documents. Manager Pedersen agreed to the friendly amendment. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

e. Registration for Virtual Legislative Event

Manager Koch moved to authorize registration for the virtual legislative event. Manager Pedersen seconded the motion.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

9. Discussion Items

a. My Water Pledge

Manager Pedersen explained the City of Shorewood has pledged to try to decrease groundwater use. She said and the Shorewood mayor has promoted the initiative to residents and the city. Manger Pedersen reported she referred this topic to Administrator Bleser because it may be something the new District groundwater staff member could piggyback on to for the District to help other cities in the watershed plan a similar initiative as well as help the City of Shorewood with its initiative.

b. Hennepin County Climate Action Plan

Manager Pedersen said she sent this item over to Administrator Bleser last week. Manager Pedersen said the plan is a large document and addresses how the county will address climate change in a wide scope of areas, and the County was seeking comments on the plan by today. She said she reviewed the plan and sent comments from her as an individual. Manager Crafton said she sent her individual comments in as well.

c. Silver Lake Shorewood Street Reconstruction Plan

Manager Pedersen said the managers have received a map of the storm sewers, and she talked about the City of Shorewood's project to re-do several roads directly around Silver Lake. Ms. Pedersen explained she talked to the Shorewood City Engineer, who said the City has requested District help to put in a monitor that connects to the holding pond that drains into Silver Lake to monitor how sediment and phosphorous are being controlled. Manager Pedersen said it seems like a once-in-a-lifetime opportunity because of the road reconstruction project. She wondered if the monitoring station has ever been put in and if not, whether the District could assist the City with the monitoring station and if the District could help the City look at a more adequate filtration system for those two locations.

Mr. Jeffery said if the project the City is proposing is a full reconstruction, the City will be required under the District's regulatory program to treat that water. He said the City could apply for a District cost-share grant for a BMP if the project is more of a mill and overlay project.

The Board directed Mr. Jeffery to contact the City of Shorewood for more information and report back to the Board. Administrator Bleser said regarding the monitoring request Manger Pedersen referenced, at that time the District did not have the equipment. Administrator Bleser explained that since that time, the District has been working with the City of Shorewood on continuing the District's monitoring of the non-impacted stormwater pond that didn't get iron filings as part of the University of Minnesota's research. She said that stormwater pond was monitored this past summer.

Manager Pedersen said she has the layout about how the water flows into the lake, and it was provided by one of Shorewood's previous City Engineers. She said she would like to provide that layout to Mr. Jeffery, and she would like him to ask about the monitoring when he is talking with the City about the street project and filters.

d. 2021 Work Plan

Manager Koch asked the Board to consider how staff resignations will impact the District's 2021 work plan. He noted he isn't sure the Board adopted a 2021 work plan and if not, the Board should adopt one. He thinks work plan impact is an important topic to include on the agenda for the Board's March 9th meeting. Manager Koch commented he wants to know what impact, if any, the resignations of staff will have on the work plan. President Ward said this topic could be discussed at the Board's March 9th meeting.

e. Administrator Report

Administrator Bleser reported staff is conducting the hiring process for the Groundwater Stewardship Coordinator position and the Education and Outreach Coordinator position.

f. Managers' Report

The managers recognized and thanked Administrator Bleser and Ms. Lauer for their work and efforts on behalf of the District. President Ward highlighted that before most of the current managers, aside from Manager Crafton, were serving the District, the District was pretty small and had no employees and no administrator. He said the Board at that time brought Dr. Bleser on board as the District Administrator, and she has led this organization for a period of years and has brought it from a small entity to what it is today. President Ward stated the District is well respected and under Dr. Bleser's administration has completed many projects. He thanked her for all her efforts and wished her well on her next opportunity.

Manager Pedersen agreed with his remarks. Manager Crafton stated the District Board hired Dr. Bleser in 2012, and by 2016 the District was recognized by the Department of Natural Resources as outstanding watershed district of the year. Manager Crafton noted Dr. Bleser has taken the District into a whole other level of professionalism, and the staff has been a great team and has really moved the District forward.

Manager Koch thanked Dr. Bleser for all her efforts on behalf of the District and its constituents. He said it's pretty amazing what has been accomplished in this period of time through Dr. Bleser's leadership. Manager Koch thanked her for the work and for the information she has provided him on projects in the District. He wished Dr. Bleser well in her future endeavors. He said in his experience, things almost always turn out for the best.

Manager Koch congratulated Ms. B Lauer and thanked her for her efforts. He said going back to school was one of the best things he ever did, and he congratulated B on taking the initiative to expand her career. Manager Koch wished her the best of luck. Manager Pedersen said congratulations to Ms. Lauer, and President Ward said it sounds like an incredible opportunity. Manager Crafton added that the lakeshore webinar Ms. Lauer put on was amazing.

Manager Ziegler thanked Dr. Bleser for her many years of service to the District and the amazing amount of work she and District staff have accomplished. He congratulated Ms. Lauer.

10. Upcoming Board Topics

President Ward listed upcoming Board topics and events. Manager Koch noted the Board has a special meeting on March 9th.

11. Upcoming Events

- CAC Meeting, March 15, 2021, 6:00 p.m., virtual
- Board of Managers Monthly Work Session, April 7, 2021, 5:00 p.m., virtual
- Board of Managers Public Hearing and Regular Meeting, April 7, 2021, 7:00 p.m., virtual

12. Adjournment

Manager Crafton moved to adjourn the meeting. Manager Ziegler seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

The meeting adjourned at 8:21 p.m.

Respectfully submitted,

David Ziegler, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

March 9, 2021, RPBCWD Board of Managers Special Meeting

PRESENT:

Managers: Jill Crafton, Treasurer
Larry Koch
Dorothy Pedersen, Vice President
Dick Ward, President
David Ziegler, Secretary

Staff: Amy Bakkum, Administrative Assistant
Claire Bleser, RPBCWD Administrator
Zach Dickhausen, Water Resources Technician II
Terry Jeffery, Watershed Planning Manager
B Lauer, Education and Outreach Coordinator
Josh Maxwell, Water Resources Coordinator
Louis Smith, Attorney, Smith Partners
Scott Sobiech, Engineer, Barr Engineering Company

Other attendees: Andrew Aller, Bill Satterness
Leah Gifford, Laurie Susla

Note: this meeting was held remotely via meeting platform Zoom in abidance with state mandates in response to Covid-19.

1. Call to Order

President Ward called to order the Tuesday, March 9, 2021, Board of Managers Regular Monthly Meeting at 10:00 a.m. The meeting was held remotely via meeting platform Zoom.

President Ward reminded the Board that at a previous Board meeting, the Board directed Attorney Smith to review the District recordings of two closed meetings for Administrator Bleser's performance review.

Manager Koch stated he believes holding today's special meeting violates Minnesota Statute 103D.315 Subdivision 10 because written notice was not provided as required by statute. He described communications he had with staff and legal counsel regarding the statute. Manager Koch noted his difference of opinion compared to Attorney Smith's opinion on the matter. Manager Koch detailed his interpretation of state statute, again noted his communication to Dr. Bleser through email, and he asked that his email to Dr. Bleser be included in the record. He said the subject matter of tonight's meeting is way too important for him not to participate, so he will waive his objection so the Board can take care of the appointment of an administrator, which is an important issue. He stated he expects the District to comply with state statute going forward. President Ward responded duly noted.

President Ward summarized the February 18, 2021, Board of Managers special meeting, stating the Board held a duly noticed special meeting on February 18, 2021, and went into closed session to evaluate the performance of the District Administrator. President Ward stated that in the session, the Board of Managers identified areas of the Administrator's successful performance and presented an initial work plan for developing, improving, and expanding the District Administrator's role and functions in the following areas: staff development, leadership and support of the Board of Managers, local government partnerships, financial management, and reporting workplan modifications and opportunities. The Board of Managers did not finalize the conclusions of this performance evaluation or make a change in the District Administrator's salary because the District Administrator resigned on February 19, 2021, before the performance evaluation process was concluded.

Attorney Smith noted that the February 4, 2021, Board of Managers special meeting was not a closed meeting, as the meeting was called to order and there was a motion to close the meeting, followed by a lengthy discussion about the agenda, and the meeting concluded without a vote on closing the meeting. He said for purposes of the Open Meeting Law, the February 4, 2021, meeting was not a closed meeting. Attorney Smith said minutes of the February 4th meeting should be on the agenda for an upcoming Board meeting.

Manager Koch stated he disagrees with the summary of the February 18th meeting because it omitted important information about Board's discussion and a vote in closed session. Manager Koch said in his opinion meeting summaries should accurately reflect what actually occurred at the meetings.

2. Approval of Agenda

Manager Ziegler moved to approve the agenda. Manager Koch seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

3. Resignation of Claire Bleser as District Administrator

President Ward said the Board needs to acknowledge and accept the resignation submitted by Dr. Bleser. Manager Koch said he forwarded to Dr. Bleser a series of resolutions and asked her to share the resolutions on the meeting screen. He moved to adopt the resolutions and he read into the record the resolutions of the Board to accept Dr. Bleser's resignation from the role of District Administrator effective on the appointment of an interim administrator or 5:00 p.m. on March 15, 2021, whichever is earlier; Claire Bleser's employment by the District shall terminate as of 5:00 p.m., March 15, 2021. Manager Ziegler seconded the motion.

There was manager discussion of the resolutions.

<u>Upon a roll call vote, the motion failed 1-4 as follows:</u>

Manager	*Action*
Crafton	No
Koch	Aye
Pedersen	No
Ward	No
Ziegler	No

Manager Pedersen moved to accept Dr. Bleser's resignation as she submitted to the District. Manager Crafton seconded the motion. <u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

4. Interim District Administrator, Responsible Authority, and Other Appropriate Delegations

President Ward summarized the issues to discuss, including an interim District Administrator, the authority to grant the interim District Administrator, and any other appropriate delegations to designate to the interim District Administrator.

Manager Koch said in his opinion it's pretty clear that the person with the most information about the District is Mr. Jeffery, and Mr. Jeffery is the logical candidate. Manager Koch said he understands that Mr. Jeffery would be willing to accept the appointment in the interim, and then the District would need to send out requests for hiring in that position. Manager Koch provided his rationale for his recommendation.

Manager Pedersen commented there is an opportunity here for the Board to look at how the administrator role functions. She raised her concerns about adding the function of running the District onto staff since the District is short staffed already. Manager Pedersen spoke in favor of the Board finding a well-qualified interim administrator and spending time considering the functions of the administrator.

Manager Ziegler remarked Engineer Sobiech has resources at Barr Engineering and could serve as interim administrator and transfer his engineering duties to professionals experienced in that capacity, providing time for the Board to conduct a proper search for an administrator.

Manager Koch responded that to be frank that idea is crazy because Dr. Bleser's last day is March 15th, only six days away. He said going outside the District when Mr. Jeffery is available is quite frankly crazy.

There was discussion about the amount of work Engineer Sobiech and Barr Engineering do to support the District's projects and the level of experience he has in developing and managing the District's projects. Managers talked about the different functions of the Administrator, including managing District projects as well as managing District staff and District operations. The Board talked about the option of Mr. Jeffery in the role of interim administrator and the option of Engineer Sobiech in the role.

President Ward summarized a conversation he had with Attorney Smith about possible ways the Board could proceed. President Ward described Attorney Smith's ideas, including considering contacting Mr. Jeff Spartz, who had previously served as an interim administrator for another watershed organization. President Ward provided background on Mr. Spartz' experience and summarized communications President Ward has had with Mr. Spartz. President Ward added that Dr. Bleser may be willing to consider helping the District in some capacity during the transition period.

Managers weighed in on the various ideas presented.

Manager Koch moved to appoint Terry Jeffery as interim administrator. The motion died due to a lack of a second.

There was discussion about Barr Engineering's experience acting in the capacity of watershed administration, Mr. Jeffery's willingness to serve as interim administrator, the opportunity for bringing in an outside person to make recommendations on the District's organizational structure and effectiveness, and the idea of bringing in an outside person as a consultant instead of the interim administrator.

Manager Pedersen moved to appoint Engineer Sobiech as interim administrator until the Board could interview Mr. Jeff Spartz. Manager Ziegler seconded the motion with the friendly amendment that the Board consider hiring Dr. Bleser as a consultant for up to six months. Manager Pedersen agreed to the friendly amendment. Manager Koch moved to amend the motion to appoint Mr. Jeffery as interim administrator, extend a solicitation to Barr Engineering to come back with a contract and authorization for Mr. Sobiech to serve as District Administrator, to compensate Dr. Bleser on an hourly basis for the next 30 days, and request a proposal from Mr. Spartz. He noted the Board can't hire anyone without a contract. The motion died due to lack of a second. Manager Ziegler withdrew the portion of his friendly amendment that specified six months. Manager Koch made a motion to amend that the solicitation or hiring of Mr. Sobiech be tabled until the Board receive a proposal and authorization from Barr Engineering authorizing him to take on that position. The motion to amend died due to lack of a second. President Ward made a motion to amend to propose that he and Attorney Smith negotiate with Barr Engineering a proposal for this Board to hire Engineer Sobiech as interim administrator for the District and he and Attorney Smith will bring that proposal back to the Board for its consideration. Manager Koch seconded the motion. President Ward said the Board will need to hold a special meeting on or by March 15th for the Board to consider the proposal. There was discussion about continuing this meeting, meaning the agenda would be confined to the agenda items for this meeting, on or by March 15 instead of ordering a special meeting. Manager Koch asked for a clarification of the motion. He said his understanding of President Ward's amendment to the motion is that Barr Engineering's proposal of Engineer Sobiech serving as interim administrator would be brought to the Board at the continuation of this meeting for the Board to consider and vote on. President Ward said yes, that is the case. Manager Koch said if the vote to appoint Engineer Sobiech as District Administrator is coming before the Board at the meeting continuation, then Manager Koch votes yes to President Ward's motion to amend, and otherwise Manager Koch votes no.

<u>Upon a roll call vote, the motion to amend carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

President Ward asked for the roll call vote on the amended motion. Manager Koch stated the motion the Board just voted on supplants the original motion and asked for the motion to be reiterated. Manager Pedersen said the motion is that the Board is appointing Engineer Sobiech as the temporary interim Administrator. Manager Koch clarified that the Board is requesting Engineer Sobiech to serve as temporary interim Administrator. Manager Koch moved to table this until the meeting continuation. Manager Ziegler stated there is a motion on the floor. Manager Koch said it appears to him if the Board approves the amended motion, it would be overriding what the Board just approved in its motion to amend.

Attorney Smith stated the motion on the table as amended would provide there would be an invitation to Barr Engineering for serving as interim administrator, that President Ward and Attorney Smith are authorized to work through a proposal with Barr Engineering to bring back to the Board for its consideration at a future Board meeting, and the Board will extend an invitation for Mr. Spartz to provide information as an interim administrator, and Dr. Bleser would be available as a consultant on an hourly basis. Manager Crafton stated this motion isn't what she though the Board was voting on. She clarified that the vote isn't to appoint Scott Sobiech as interim administrator. Manager Pedersen and President Ward said that is what the Board is voting on. Manager Koch said no that is not what Attorney Smith said. Manager Koch said the Board is voting on solicitating a proposal from Barr Engineering and Mr. Spartz for interim administrator services and a proposal from Dr. Bleser about consulting with the District on an hourly basis. Attorney Smith confirmed Manager Koch's clarification of the motion on the table.

<u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

5. Solicitation of Applications for District Administrator

Manager Koch suggested the Board direct staff to prepare a solicitation for applications for the Board to review at and discuss the same time the Board review proposals from Barr Engineering and Mr. Spartz for the position of interim administrator. The motion died due to lack of a second.

Manager Pedersen moved to table the solicitation of applications for the District Administrator. Manager Crafton seconded the motion. Manager Koch stated his motion directed staff to draft a solicitation for the Board's review, and then the Board will have something to review.

Upon a roll call vote, the motion made by Manager Pedersen, seconded by Manager Crafton carried 4-1 as follows:

Manager	*Action*
Crafton	Aye
Koch	No
Pedersen	Aye
Ward	Aye
Ziegler	Aye

6. Transition Plan Regarding End of Employment of Claire Bleser

President Ward moved to hire Dr. Bleser as a part-time employee at her existing hourly rate for a period of up to 30 days. Manager Crafton seconded the motion. The Board discussed the motion on the table. Manager Koch moved to amend the motion to appoint Mr. Jeffery as interim administrator until the Board appoints someone different. The motion died due to lack of a second.

There was further discussion about transitioning the District Administrator's authority and continuing Dr. Bleser's authority as a part-time employee. Attorney Smith said the important thing to be clear about in this motion is that Dr. Bleser would, after March 15, continue with the authority of the District Administrator until such time as the Board appoints a District Administrator. Administrator Bleser said her understanding has been that the Board might be interested in retaining her as a consultant after March 15 to help with the transition and be available for questions and she had not been aware that the Board would suggest she become a part-time employee after March 15. She said she would need to think about this proposal. Dr. Bleser clarified she would prefer to be a consultant to the District and be available as needed. Manager Crafton withdrew her motion. President Ward withdrew his motion.

Manager Ziegler moved to appoint Mr. Jeffery to take on the responsibilities of interim administrator in the event there is an interim period from Dr. Bleser's last day as District Administrator until such time as other arrangements can be made for a more permanent interim administrator. Manager Koch seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye

Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

7. Authorize Silver Lake Land Use Agreement

Mr. Jeffery reported staff is still working with the Kendrick family, who are the property owners, He said the Kendricks have not gotten back to Mr. Jeffery as to whether they approve the agreement. Mr. Jeffery said the agreement was drafted by Attorney Welch of Smith Partners. Mr. Jeffery said he believes the agreement protects the interests of the watershed as well as those of the Kendricks. He stated the project is not dependent upon that portion of the work, although it makes for cleaner bidding to not have to separate it out in the contract later.

Manager Koch asked if there is any reason this agreement must be authorized now as opposed to waiting until the Board's April meeting. Mr. Jeffery said the District is set to go out for bid on March 29; however, staff wouldn't authorize start of work until after the April meeting. Engineer Sobiech said waiting until the Board's April meeting to act on the agreement would be acceptable in terms of construction impacts.

Manager Koch moved to table this item until the Board's next regular meeting contingent on the Board being presented the agreement for review and approval. Manager Ziegler seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

8. Authorize Solicitation of Bids for Saint Hubert Water Quality Project Pending Legal Approval

Attorney Smith reminded the Board it directed him to do a legal review regarding the question of retainage. He said legal counsel provided a memorandum to the Board and staff. Manager Koch said he missed the memo and asked Attorney Smith to summarize it.

Attorney Smith said the memo was delivered in an email from Michael Welch of Smith Partners. Attorney Smith summarized the memorandum.

Manager Koch said he received no memo from Mr. Welch. Manager Koch asked what the District's contract states regarding retainage. Engineer Sobiech responded the language in the current contact states the District will retain 5% up until the 50% mark of construction. He said if the contractor is performing satisfactorily, the District would then stop holding additional retainage and the 5% of the 50% would be held until final completion of the project, unless the Board chooses to release part of it. Engineer Sobiech said the District has the option to require the 5% all the way through the completion of the project.

Manager Koch said he thinks the District's position should be to retain the discretion to keep the retainage all the way through and that when the Board comes to these points in projects, the Board can make a specific decision to release the retainage. Manager Koch moved that the District contracts contain a provision whereby the District has the authority to retain the retainage all the way through and at the District's discretion release the retainage as it sees fit. The motion died due to lack of a second.

Manager Ziegler moved to authorize the solicitation of bids for Saint Hubert Water Quality Project with comments as provided. Manager Crafton seconded the motion.

<u>Upon a roll call vote, the motion carried 4-1 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	No
Pedersen	Aye
Ward	Aye
Ziegler	Aye

President Ward asked Administrator Bleser to forward the memorandum from Attorney Welch to Manager Koch.

9. Meeting Continuation

Manager Pedersen moved to continue this meeting on Monday, March 15 at 10:00 a.m. Manager Ziegler seconded the motion. Manager Koch moved to amend the motion to continue the meeting at 5:00 p.m. on Monday, March 15. Manager Pedersen and Manager Ziegler agreed to the friendly amendment.

<u>Upon a roll call vote, the motion carried 5-0 as follows:</u>

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

At 11:42 a.m., the meeting concluded, to be continued at 5:00 p.m. on Monday, March 15.

Respectfully submitted,

David Ziegler, Secretary

MEETING MINUTES

Riley-Purgatory-Bluff Creek Watershed District

March 15, 2021, RPBCWD Board of Managers Continuation of 3/9/21 Special Meeting

PRESENT:

Managers:	Jill Crafton, Treasurer
	Larry Koch
	Dorothy Pedersen, Vice President
	Dick Ward, President
	David Ziegler, Secretary
Staff:	Amy Bakkum, Administrative Assistant
	Terry Jeffery, Watershed Planning Manager
	Josh Maxwell, Water Resources Coordinator
	Louis Smith, Attorney, Smith Partners
	Scott Sobiech, Engineer, Barr Engineering Company

Note: this meeting was held remotely via meeting platform Zoom in abidance with state mandates in response to Covid-19.

1. Call to Order

President Ward called to order the continuation of the Board's Tuesday, March 9, 2021, Board of Managers Special meeting at 5:00 p.m. The meeting was held remotely via meeting platform Zoom. President Ward reminded the Board it approved the meeting agenda at the March 9th meeting, and he highlighted that as part of the agenda item about the Interim District Administrator, the Board will discuss the Minnesota Attorney General's opinion as well as the proposal from Barr Engineering Company.

Attorney Smith conducted a roll call to document manager attendance as follows:

Manager	*Action*
Crafton	Present
Koch	Present
Pedersen	Present
Ward	Present
Ziegler	Present

2. Interim District Administrator; Responsible Authority; Other Appropriate Delegations

Attorney Smith reported on the Minnesota Attorney General's response to the District's inquiry regarding Dr. Bleser's access to recordings of the Board's closed meetings. Attorney Smith reminded the Board the opinion of the District's Legal Counsel had been that the recordings are available for access by Dr. Bleser. Attorney Smith said the Attorney General concurred. Attorney Smith said the remaining question is whether the Board would like to seek further review of that question by going to court for declaratory judgement action. He said he doesn't recommend proceeding in that manner because of the cost and likely outcome. Attorney Smith said if the Board is inclined to proceed to grant access in response to Dr. Bleser's request, the Board should do so through acting on a motion.

Manager Koch moved that in consideration of the opinion from the Minnesota Attorney General and the opinion of Smith Partners, the Board authorizes the disclosure of the recordings of the closed minutes to Claire Bleser. Manager Ziegler seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

President Ward reminded the Board that at its March 9th meeting, the Board appointed Mr. Jeffery interim administrator and invited Barr Engineering Company to submit a proposal to aid in the transition for a period of time. President Ward reported Barr Engineering submitted a proposal, which has been forwarded to the managers.

Manager Ziegler said it seems like the Barr Engineering proposal gets complicated due to potential conflict of interest and due to that, there are things Barr wouldn't be able to do that the District Administrator has been doing. He said it would be simpler for the District to go with Mr. Jeffery as the interim administrator with full support from Barr as needed. Manager Crafton agreed with Manager Ziegler's comment.

Manager Koch moved to adopt the resolution he drafted, which resolves that Barr Engineering is authorized to provide Terry Jeffery with such support and assistance as Mr. Jeffery deems necessary or advisable during his transition as the interim District Administrator, with such support and assistance to be provided in accordance with the terms of the current contract between Barr and the District. Manager Pedersen asked for the District Counsel's opinion on the resolution. Attorney Smith said the Board could consider specifying the length of time of the authorization.

Manager Crafton said she agrees with specifying the length of time as well as setting a term limit for the appointment of the interim administrator. Manager Koch said he doesn't see the necessity of setting a time frame.

Manager Ziegler seconded Manager Koch's motion.

Attorney Smith asked Engineer Sobiech if the services listed in Barr Engineering's proposal would fall under the current contract between the District and Barr. Engineer Sobiech said he believes all the services in the proposal can fall under that same general contract. Manager Koch thanked Engineer Sobiech and Barr Engineering for the proposal and its level of detail. President Ward offered a friendly amendment that this appointment would be for a period of six months, so until September 15, and Mr. Jeffery would receive an additional stipend of $1,500 for each of the six months until September 15. Managers Ziegler and Koch accepted the friendly amendment.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

Mr. Jeffery commented he is aware of several themes that resonate with the managers including communication, transparency, doing the District's best work, putting the best talent in the right staff positions to make best use of their skills, and customer service. He said he is committed to doing the work improve communication and making progress in these areas, and he appreciates the Board's trust in him with the charge of interim administrator.

4. Transition Plan Regarding End of Employment of Claire Bleser

Mr. Jeffery said he is comfortable that he and Ms. Amy Bakkum with the support of Engineer Sobiech are ready to assume the duties transitioned to them.

Manager Koch moved to appoint Mr. Jeffery to all the positions of the District Administrator and give him all the duties and responsibilities currently held by Claire Bleser, including duties as the responsible authority, and a signatory over the District's financial accounts and to authorize the District's officers to execute documents necessary to carry out appropriate Board actions. Manager Ziegler seconded the motion. Attorney Smith pointed out that the District Administrator isn't a signatory over the District's financial accounts. Manager Ziegler and Manager Koch agreed to amend the motion to remove the authorization of Terry Jeffery as a signatory of the District's financial accounts. The managers agreed to the change to the motion by unanimous consent.

Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

President Ward said he reviewed the proposed contract for services by Dr. Bleser to the District at an hourly rate for a period of 30 days with a maximum number of hours. Manager Koch moved to authorize Interim Administrator Jeffery to enter into a consulting agreement with Dr. Bleser at the rate of $185.00 per hour subject to Attorney Smith reviewing the contract and making sure the interests of the District are protected, including protections such as indemnification. Manager Ziegler seconded the motion and noted the proposed contract includes language limiting the number of consulting hours by Dr. Bleser to 40 hours.

Attorney Smith said typically we would use for any consultant a short-form professional services agreement that the District establishes. He said the Board needs to consider what kind, if any, of insurance the District requires Dr. Bleser to have such as automobile insurance.

Upon a roll call vote, the motion carried 4-1 as follows:

Manager	*Action*
Crafton	No
Koch	Aye

Pedersen	Aye
Ward	Aye
Ziegler	Aye

5. Solicitation of Applications for District Administrator

Manager Koch suggested Interim Administrator Jeffery draft a solicitation of applications and present it to the Board at its next meeting. Manager Crafton said she thinks the District needs to take time to build consensus and have more clarity about what the District wants to be and what kind of culture and strategy it wants. She said she thinks the Board needs to participate in an assessment process and build consensus. The managers discussed the length of time it could take to find a permanent Administrator and the possibility of using a consultant to facilitate the Board defining the role of the Administrator. Manager Crafton said she would like to wait a month before taking such steps, and she said she wants to make sure the District staff members know what a great job they do and the confidence she has in their work and abilities.

Manager Koch moved to lay over this agenda item until the Board April monthly meeting. Manager Ziegler seconded the motion. Upon a roll call vote, the motion failed 2-3 as follows:

Manager	*Action*
Crafton	No
Koch	Aye
Pedersen	No
Ward	No
Ziegler	Aye

Manager Koch moved to lay over the motion indefinitely. Manager Ziegler seconded the motion with the friendly amendment to lay this agenda item over until the May meeting. Manager Koch agreed to the friendly amendment. Upon a roll call vote, the motion carried 3-2 as follows:

Manager	*Action*
Crafton	No
Koch	Aye
Pedersen	No
Ward	Aye
Ziegler	Aye

The Board directed staff to place an appropriate thank you to Dr. Bleser and B. Lauer on the District's website.

6. Adjournment

Manager Pedersen moved to adjourn the meeting. Manager Koch seconded the motion. Upon a roll call vote, the motion carried 5-0 as follows:

Manager	*Action*
Crafton	Aye
Koch	Aye
Pedersen	Aye
Ward	Aye
Ziegler	Aye

The meeting adjourned at 5:52 p.m.

Respectfully submitted,

____

David Ziegler, Secretary

RPBCWD February Staff Report

Administration		Staff update	Partners
Accounting and Audit	Coordinate with Accountants for the development of financial reports. Coordinate with the Auditor. Continue to work with the Treasurer to maximize on fund investments.	Staff Bakkum and Interim Administrator Jeffery compiled the monthly treasurer's report electronically. Staff Bakkum and Interim Administrator Jeffery have been working with AEM on the yearly audit.	
Administration		Interim Administrator Jeffery is working with BWSR to determine status of existing grants. Interim Administrator Jeffery has been reaching out to accounting, payroll, auditors, insurance providers, and building security as way of introduction and to understand current operations and statuses as well as to update log in and administrator privileges. Interim Administrator Jeffery has begun reaching out to City Administrators, Public Works Directors, and Community Development Directors to introduce himself and open dialogue. Interim Administrator Jeffery has been contacted by MCWD about a significant portion of the area around Lotus Lake being misclassified as MCWD when it is clearly within the revised (and former) RPBCWD boundary. He is trying to determine if it is an issue with Carver County Land Records, GIS, or BWSR. Interim Administrator Jeffery has provided the 2019 and 2020 RPBCWD Financials to Link Logistic Real Estate as required by our lease for their lenders request. Interim Administrator Jeffery is working with ESRI to make certain there are adequate GIS licenses for field inspections and desktop applications. Staff Bakkum acted as contact point for advertised RFPs and relayed questions to Interim	

		Administrator Jeffery as needed. Proposals were submitted to Staff Bakkum by March 24 and compiled for review.	
Hiring		Liz Forbes began March 29, 2021 as the new Grant Coordinator. RPBCWD staff have reviewed the applicant pool for the Grant Coordinator position and found eleven well qualified applicants wishing to be considered for the Education and Outreach Coordinator position. Interviews will begin the week of April 12th.	Nine Mile Creek Watershed District CCWMO Barr Engineering
Annual Report	Compile, finalize and submit an annual report to agencies	The 2020 Annual Report is included in your packet. It is due to the BWSR and DNR Commissioner before the 1st of May	
BWSR	Discuss Targeted Watershed Grant Distribution	Working with BWSR to closeout grants.	9-Mile WD Eden Prairie BWSR Bloomington Chanhassen Carver Co. Hennepin Co. LMRWD

			Minnetonka Waconia
DEI	Diversity, Equity and Inclusion	No action has taken place on DEI. The E&O job description does ask applicant to have an understanding of DEI and several applicants have applicable experience and education.	Metro Watershed Partners
Human Resources	General Human Resources	No new updates	
Internal Policies	Work with Governance Manual and Personnel Committees to review bylaws and manuals as necessary	No new update	
Advisory	Engage with the Technical Advisory Committee on water conservation, chloride management and emerging topics Engage with the Citizen Advisory Committee on water conservation, annual budget and emerging topics.	The CAC did not hold their regular meeting on March 15 as it was unclear if the Special Meeting of the Board of Managers would conclude in time. They did convene briefly to wish Staff Lauer and Administrator Bleser well.	

Local SWMP		No change.	
MAWD		No update.	
District-Wide			
Regulatory Program	Review regulatory program to maximize efficiency. Engage Technical Advisory Committee and Citizen Advisory Committee on possible rule changes. Implement a regulatory program.	The new public interface is up and running for the permit database and application. You can view that here: [MS4 Permit Software (ms4front.net)] A total of 23 permits have been received using the new system. Staff and HEI are still working through a few bugs in the process and the submittal of materials. Ten permits have been received since the March Regular Meeting of the Board of Managers. Four administrative permits for erosion control only have been issued since the March meeting. Two were for directional drilling of gas pipeline, one was for the replacement of a flared end section, and one for the installation of a swimming pool on an existing lot of record. The new inspection tool is up and running. The database is now populated with the permits from 2020 and 2021 and 2019 permits are currently being imported. With road restrictions going on, several sites mobilized, and spring construction season is underway. The Noble Hill project in Eden Prairie has garnered a lot of attention from community members and environmental advocacy groups. Engineer Sobiech is reviewing the submittal and Interim District Administrator Jeffery is fielding phone calls and emails from the community and advocacy groups.	

Aquatic Invasive Species	Review AIS monitoring program Develop and implement Rapid Response Plan as appropriate Coordinate with LGUs and keep stakeholders aware of AIS management activities. Manage and maintain the aeration system on Rice Marsh Lake Riley Chain of Lakes Carp Management Purgatory Chain of Lakes Carp Management Review AIS inspection program. Keep abreast in technology and research in AIS. Zebra mussel adult and veliger monitoring.	The aeration unit on Rice Marsh Lake was turned off this month. During the last sampling event in early March, Dissolved Oxygen levels were below 1mg/L indicating a winterkill. Staff have been looking into the possibility of an additional surface agitator unit to be placed in the lake in combination with the existing system due to the frequency of kills recently. Staff will purchase 1,000 bluegills to stock – 800 Rice Marsh Lake and 200 in Purgatory Creek Recreational Area. These stockings should prevent carp from having a successful recruitment year. Staff were notified of a significant goldfish population in the stormwater pond closest to the Eden Prairie Outdoor Center. A trial removal event was conducted and 196 were captured in 40 minutes using backpack electrofishing. Staff are looking to purchase a large seine net to improve capture efficiencies.	City of Chanhassen City of Eden Prairie University of Minnesota MN DNR Carver County
Cost-Share	Schedule and coordinate site visits. Review applications and recommend implementation. Evaluate program.	Staff Forbes has begun in this new position and is reviewing applications that have been submitted. She will begin scheduling site visits for mid-April. The Shorewood City Engineer spoke with Interim Administrator Jeffery about an interested in partnering with RPBCWD on a cost share project to install sump manholes and SAFL Baffles in several catch basin manholes (CBMH) in the Sweetwater Curve neighborhood east of Silver Lake.	Carver County Soil and Water Conservation District

Data Collection	Continue Data Collection at permanent sites. Identify monitoring sites to assess future project sites.	Staff completed the 2020 water resources report. WOMP stations: samples were collected 3 times this month for the Metropolitan Council. Staff conducted regular lake monitoring on the Riley Chain of Lakes (RCL) early this month - Lucy, Ann, Susan, Rice Marsh. This is the first year of the three-year monitoring effort for RCL (rotate then for 3 years to PCL). The Interim Report for Mitchell Lake, Lake Riley Subwatershed Assessment Report was completed and submitted to city partners this month (stormwater pond project). Chanhassen motorboat operation permit was received this month. Most lake level sensors were installed this month. The remaining units will be installed in early April.	Metropolitan Council City of Eden Prairie University of MN City of Chanhassen MNDNR City of Minnetonka
District Hydrology and Hydraulics Model	Coordinate maintenance of Hydrology and Hydraulics Model. Coordinate model update with LGUs if additional information is collected. Partner and implement with the City of Bloomington on Flood Evaluation and Water Quality Feasibility.	District Staff, Barr Engineering, and Eden Prairie staff have been in discussions about updates to the District's stormwater model within the City (both Purgatory Creek and Riley Creek models). District staff will most likely collect water levels in some key ponds for model validation.	City of Bloomington City of Minnetonka City of Eden Prairie City of Deephaven City of Shorewood.

Education and Outreach	Implement Education & Outreach Plan, review at year end. Manage partnership activities with other organizations. Coordinate Public Engagement with District projects.	The shoreline management webinar conducted February 24th has been uploaded in its entirety to the District's YouTube page. Advertisement of this has been posted to the District website and Facebook. Staff Bakkum spoke with staff at Nine Mile Creek WD to coordinate a Turfgrass Maintenance training. This training has been scheduled for April 20th. Staff Bakkum spoke with staff at the MPCA and Nine Mile Creek WD to coordinate a Smart Salting for Parking Lots training. This training has been scheduled for April 27th. Staff Bakkum continues to receive inquiries via the District website's "Contact Us" form. Staff Bakkum determines next steps and forwards questions on to consultants and staff when appropriate. Staff Bakkum continues to edit and update the website, seeking assistance from website consultant as necessary. Staff Toavs is compiling a list of Adopt-A-Dock volunteers in preparation for the delivery of monitoring plates to volunteers. Tree saplings have been ordered through Carver County SWCD and will be installed into gravel beds in mid-late April.	Adopt a drain: City of Eden Prairie, City of Minnetonka, City of Bloomington, Hamline University, Nine Mile Creek Watershed District, MPCA, Fortin Consulting
Groundwater Conservation	Work with other LGUs to monitor, assess, and identify gaps. Engage with the Technical Advisory Committee to identify potential projects. Develop a water conservation program (look at Woodbury model)	Staff Lauer worked with a graphic design consultant to create a design concept for a Water Conservation Guide.	Metropolitan Council City of Eden Prairie City of Shorewood City of Bloomington City of Minnetonka City of Chanhassen

Lake Vegetation Management	Work with the University of Minnesota or Aquatic Plant Biologist, Cities of Chanhassen and Eden Prairie, lake association, and residents as well as the Minnesota Department of Natural Resources on potential treatment. Implement herbicide treatment as needed. Secure DNR permits and contracts with herbicide applicators. Lakes the District is monitoring for treatment include: Lake Susan, Lake Riley, Lotus Lake, Mitchell Lake, Red Rock Lake and Staring Lake. Work with Three Rivers Park District for Hyland Lake	Staff gathered input from the Riley/Purg Summit and will be scheduling point intercept vegetation surveys and spring herbicide application surveyssoon. Below is a list of what is proposed to be treated - what herbicide will be used - likelihood of treatment (spring delineation will determine): • CLP - Red Rock - Diquat - Yes • CLP - Mitchell - Diquat - Yes • CLP - Lotus - Diquat - TBD • CLP - Riley - Diquat - TBD • CLP - Susan - Diquat - Likely • CLP - Staring - Diquat - TBD Jacob Olson (Graduate Research Assistant) and Ray Newman (Professor) - University of Minnesota. The 2020 Annual Plant Report was completed and submitted to the District. Additional historical data from past plant surveys was also sent. Grant period with Ray Newman is ending in June.	City of Eden Prairie City of Chanhassen University of Minnesota MNDNR

Opportunity Projects	Assess potential projects as they are presented to the District	No new updates	ISG Staring Lake Outdoor Center The Preserve Association
Total Maximum Daily Load	Continue working with MinnesotaPollution Control Agency on theWatershed Restoration And Protection Strategies (WRAPS). Engage the Technical Advisory Committee.	No new updates	MPCA
Repair and Maintenance Grant	Develop and formalize grant program.	No new updates	
University of Minnesota	Review and monitor progress on University of Minnesota grant. Support Dr John Gulliver and Dr Ray Newman research and coordinatewith local partners. Keep the manager abreast to progress inthe research. Identify next management steps.	The City of Eden Prairie applied iron filings on Bren pond at the end of February. This is a continuation of the 2020 iron filings project to assess the effectiveness of iron filingson locking phosphorus in pond sediments. The results from the two ponds treated in 2020 were inconclusive. The Gulliver Lab will continue to monitor all three ponds through this summer.	Stormwater ponds partners: Bloomington, Chanhassen, Eden Prairie, Minnetonka, Shorewood, University of MN,

			Wenck, and Limnotech.
Watershed Plan	Review and identify needs for amendments.	Staff Jeffery is working on the Soil Plan Amendment	
Wetland Conservation Act (WCA)	Administer WCA within the Cities of Shorewood and Deephaven. Represent the District on Technical Evaluation Panel throughout the District	No WCA applications have been received in Deephaven. No WCA applications have been received in Shorewood.	City of Shorewood City of Deephaven City of Chanhassen City of Eden Prairie MCWD BWSR DNR ACOE
Wetland Management	Assess known existing wetlands, identify previously unknown wetlands, and identify potential restoration and rehabilitate wetlands and wetland requiring additional protection.	Staff Jeffery, Staff Dickhausen and staff Nicklay continue updating the MNRAM Access database. As the weather warms and things start to green up, field MNRAMs will begin. Final tweaks have been made to the MNRAM application to allow for easier export/import and to tailor the scoring rubric to reflect RPBCWD Rule D.	City of Chanhassen City of Eden Prairie Hennepin County Carver County MNDNR BWSR USFWS
Hennepin County Chloride Initiative	Phase 1: Develop a plan to target commercial and association-based sources or chloride pollution - businesses, malls, HOAs, property management companies and the private applicators that they hire. We will hire a consultant to facilitate focus groups with private applicators, as well as those that execute contracts with private applicators. These focus groups will help identify needs and barriers for our target audience. The	HCCI met March 3rd to discuss a potential project and an update on a proposed winter maintenance management plan template. Staff Bakkum met with Laura Jester (BCWMC) and Steve Christopher (BWSR) to discuss the HCCI workplan and grant status. Staff Bakkum coordinated with graduate student to finalize chloride technical report. Report will be reviewed by members of HCCI group before official release in May. Next meeting is scheduled for May 4th.	

	consultant will compile information into a plan for implementation.		
Lower Minnesota Chloride Cost-Share Program	The Lower Minnesota River Watersheds are coming together to offer cost-share grants.	The review committee approved an application from the City of Chaska who seek to upgrade two of their snowplows with high-performing segmented plow blades, reducing their need to salt as frequently.	LMRWD, RBWMO, NMCWD
Bluff Creek One Water			
Bluff Creek Tributary Restoration	Implement and finalize restoration. Monitor Project.	On hold till Spring.	City of Chanhassen
Wetland Restoration at 101	Remove 3 properties from flood zone, restore a minimum 7 acres and as many as 16 acres of wetlands, connect public with resources, reduction of volume, rate, pollution loads to Bluff Creek	Plans are being developed for the wetland restoration. Staff Jeffery is finalizing the documents for final payment from the DNR Flood Hazard Mitigation grant received for the purchase and demolition of the properties.	City of Chanhassen MN DNR Carver County
Riley Creek One Water			
Lake Riley Alum	Continuing to monitor the Lake.	Coring will occur in the fall of 2021 to assess the effectiveness of the alum application. Summer monitoring will continue.	
Lake Susan Improvement Phase 2	Complete final site stabilization and spring start up. Finalize and implement E and O for the project. Monitor project.	No new updates	City of Chanhassen Clean Water Legacy Amendment
Lake Susan Spent Lime	2021 startup and monitoring.	No new updates.	City of Chanhassen
Lower Riley Creek Stabilization	Coordinate agreement and acquire easements if needed for the	On hold till Spring.	City of Eden Prairie Lower MN River Watershed District

	restoration of Lower Riley Creek reach D3 and E. Implement Project. Continue Public Engagement for project and develop signage of restoration.		
Rice Marsh Lake Alum Treatment	Continuing to monitor the Lake.	*No new updates.*	City of Eden Prairie City of Chanhassen
Rice Marsh Lake Watershed Load Project 1	Conduct feasibility. Develop cooperative agreement with City of Chanhassen	Resolution included in board packet	City of Chanhassen
Upper Riley Creek	Work with City to develop scope of work(in addition to stabilizing the creek can we mitigate for climate change) Conduct feasibility Develop cooperative agreement with the City of Chanhassen Order ProjectStart design	Interim Administrator Jeffery and Engineer Sobiech will be presenting the project to the Chanhassen City Council at their 4/12/21 Regular Meeting.	City of Chanhassen
Middle Riley Creek	Work with Bearpath HOA/Golf Course to develop scope of work (in addition tostabilizing the creek can we mitigate for climate change and provide for animproved recreational experience) Draft feasibility report Develop cooperative agreement with Bearpath	Engineer and staff are continuing to work with Bearpath.	Bearpath Neighborhood Association. CIty of Eden Prairie Dept. of Natural Resources
St Hubert Water Quality Project		Interim Administrator Jeffery followed up with BWSR and the grant is in place. Advertisement for bids were sent to the newspapers and posted on our website. The bid opening is tentatively set for May 5^{th}.	CCSWCD Metropolitan Council City of Chanhassen

Purgatory Creek One Water	[redacted]	[redacted]	[redacted]
PCRA Berm		Staff will meet with Wenck Engineering to finalize the plan on the repair of berm and modifications to the overflow structure after changes were made from the last meeting. Next steps will then be scheduled.	City of Eden Prairie
Duck Lake Water Quality Project	Work with the City to implementneighborhood BMP. Identify neighborhood BMP to help improve water resources to DuckLake. Implement neighborhood BMPs.	No Change	City of Eden Prairie
Lotus Lake – Internal Load Control	Monitor treatment and plantpopulations.	In 2021, staff will add phosphorus monitoring at a second location on Lotus Lake in the east bay. This will allow staff to better assess the alum treatment effectiveness across Lotus Lake.	
Scenic Heights	Continue implementing restorationeffort. Work with the City of Minnetonka and Minnetonka School District on Public Engagement for project as well as signage.	Final pay app for the project is being processed this month.	Minnetonka Public School District City of Minnetonka Hennepin County
Silver Lake Restoration	Order project Design Project Work with the City of Chanhassen forDesign, cooperative agreement and implementation	Bid opening was held on March 29th. The packet contains the Engineer's recommendation of contractor.	City of Chanhassen
[redacted]	[redacted]	[redacted]	[redacted]

Professional Development	• Staff Forbes and Staff Dickhausen attended the BWSR Spring Training event.

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BARR

Memorandum

To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers and District Administrator
From: Barr Engineering Co.
Subject: Engineer's Report Summarizing March 2021 Activities for April 7, 2021, Board Meeting
Date: March 29, 2021

The purpose of this memorandum is to provide the Riley-Purgatory-Bluff Creek Watershed District (RPBCWD) Board of Managers and the District Administrator with a summary of the activities performed by Barr Engineering Co., serving in the role of District Engineer, during March 2021.

General Services

a. Coordinated with city of Chanhassen public works director on the city's upcoming reconstruction of Dakota Lane with the district's Rice Marsh Lake water quality improvement project. The City request that the District consider incorporation of a manhole replacement, at the city's cost, into the water quality project to improve project implementation efficiency.

b. Working with Counsel Welsh to develop a cooperative agreement for the Rice Marsh Lake water quality improvement project.

c. Assisted SRF with questions about RPBCWD bidding process, specification review, and permitting process for the St Hubert's School project.

d. Participated in two second round interviews for the district's grant coordinator position on March 1st and provided feedback in follow-up meeting.

e. Took part in a March 16th meeting with Interim Administrator Jeffery to discuss the wetland assessment project. The discussion was focused on wetland hydrology and potential metrics for assessing flood control and stream protection benefits of wetlands as part of the rubric being developed to improve wetland assessments in RPBCWD.

f. Met with Interim Administrator Jeffery and RPBCWD staff on March 17th to regroup about grant funding, main points of contact for projects, programs, and administrative efforts. We used the list of administrator duties attached to Barr proposal to guide the discussion and identify role and responsibilities.

g. Received a call from Ann Miller, Chanhassen resident, near the proposed Silver Lake Water Quality project. She expressed a desire for there to be a public access to Silver Lake through the passive city park.

h. Participated in the March 29th meeting with Interim Administrator Jeffery and Manager/Treasurer Crafton to discuss auditor questions about capital improvement projects.

i. Discussions with Interim Administrator Jeffry and Counsel Welsch about potential stewardship grant policy revision to allow shoreline stabilization project to be eligible for grant funds.

j. Coordination with President Ward and Counsel Smith on managers request for a proposal for administration services.

k. Participated in a March 25th virtual meeting with Interim Administrator Jeffery, Counsel Smith and President Ward to review the April 7th draft meeting agenda.

l. Coordinated with District legal counsel Welch on standard RPBCWD retainage language for capital improvement project contracting.

m. Provided information to support revisions to the draft cooperative agreement with Bearpath for the Middle Riley Restoration Creek Project now that the design has reach 90%. Also working with Counsel Smith to begin drafting temporary construction access agreements with the homeowner's association (owner of the private streets) and two private residences.

n. Continued working on refining the MNRAM database to enhance the import and export of data as well as the incorporation of RPBCWD's wetland value logic associated with Rule D.

o. Review MPCA's draft crediting framework for manufactured treatment devices. Coordinated with Interim Administrator Jeffery to submit comments on RPBCWD behalf. In general, the framework is a three-tier approach relying on the State of Washington's Technology Assessment Protocol - Ecology (TAPE) program (third party field monitoring, testing, and data analysis) to support credited TSS and TP removals. Only devices that received General Use Level Designation (GULD) by TAPE would be credited for pollutant reductions. This is similar to RPBCWD's approach outlined in the RPBCWD Regulatory Guidance document. The comments provided indicate support for the proposed system and highlight the need for 1) understanding treated versus bypass flow to estimate annual reductions, 2) additional translation to local climatic conditions, 3) future adjustments as regional data become available, and 4) support for pursuing a Minnesota Stormwater Council or other grant to perform a monitoring study of stormwater MTDs in Minnesota.

p. Participated in the March 3rd workshop presenting Upper Riley Creek Ecological Enhancement Plan.

q. Compiled additional information and supporting data for the Upper Riley Creek Ecological Enhancement Plan in response to manager questions. Summarized information in email to Administrator Bleser. Also provided a link to draft plan for distribution to managers.

r. Participated in the March 3rd regular Board of Managers meeting.

s. Participated in the March 9th special Board of Managers meeting.

t. Participated in the March 15th special Board of Managers meeting.

u. Prepared Engineer's Report for engineering services performed during March 2021.

v. Miscellaneous discussions and coordination with Administrator Bleser about the project staffing, grant tracking, potential additional support during administrator transition, and upcoming Board meeting agenda.

w. Miscellaneous discussions and coordination with Interim Administrator Jeffery about the regulatory program, assistance during administrator transition, and upcoming Board meeting agenda.

Permitting Program

a. *Permit 2020*-051: BIOLYPH Parking – This project is a 0.55-acre parking lot expansion at the BIOLYPH building in Chaska, MN. The permit triggers RPBCWD's Erosion Prevention and Sediment Control Rule (Rule C) and Stormwater Management Rule (Rule J). Stormwater management facilities include an underground storage system with hydrodynamic separators and a rainwater harvest and reuse system. Reviewed the March 12th revised submittal Provided review comments on March 26th requesting additional information on the water quality computations, abstraction computations, opinion of cost for the stormwater features and informing the applicant the submittal remain incomplete because water quality computations and rainwater reuse computations have not been received.

b. *Permit 2020-066: Chase Bank*– This project consists of redevelopment of a 0.62-acre site into a Chase Bank building and associated parking at 928 Prairie Center Drive, Eden Prairie, MN. Hydrodynamic separators (i.e., Hydro International's Downstream Defenders), an underground stormwater storage unit, rainwater harvest and reuse facility, and a proprietary stormwater treatment unit (Hydro International's Up Flo Filter) will provide volume control, water quality, and rate control. The project triggers the erosion prevention and sediment control rule and the stormwater management rule. Participated in a March 23rd conference call with the applicant's engineer to discuss review comments and potential design revisions. Reviewed revised submittal and draft a permit report for consideration at the April 7th regular meeting.

c. *Permit 2020-060: Christian Brothers Automotive*– This project proposed construction of an auto care center and associated parking areas on Crossroads Boulevard in Chanhassen, MN. A subsurface stormwater management facility is proposed to provide volume control, water quality, and rate control. The project triggers the erosion prevention and sediment control rule and the stormwater management rule. Reviewed the March 5th revised submittal and provided review comments to the applicant on March 19th indicating the application remains incomplete because the following were not provided: stormwater modeling in the native electronic format, site specific infiltration testing, and an engineers' opinion of cost for the stormwater facility.

d. *Permit 2020-070 Lake Place*– This project consists of constructing a new apartment building, parking lot, drive, sidewalks, and related utilities at 1361 Lake Drive West in Chanhassen. A combination of a surface biofiltration basin and a subsurface stormwater management system will provide stormwater rate, volume and water quality control. The project triggers the floodplain management rule, erosion prevention and sediment control rule, wetland and creek buffer rule, and the stormwater management rule. Reviewed revised submittal materials and draft a permit report, including variance analysis, for consideration at the April 7th regular meeting.

e. *Permit 2021-004: Silver Lake Water Quality Improvement Project* – This project consists of drainage improvements to Pleasantview Road and the ravine/channel on the south end of Silver Lake in the city of Chanhassen, MN. The project triggers the floodplain management and drainage alteration, erosion prevention and sediment control, and wetland and creek buffers rules. Reviewed the January 27th submittal and informed the applicant the submittal was incomplete because the submittal was missing information relative the floodplain management rule. Reviewed revised permit submittal and prepared a permit report for consideration at the April 7th meeting.

f. *Permit 2021-008: Minnetonka High School Momentum Building Addition* – This project consists of proposed building addition located at 18301 Highway 7 in Minnetonka. Site improvements include construction of a building addition, new sidewalks, grading, landscaping, and related utilities. A subsurface stormwater management system will provide stormwater rate, volume, and water quality control. The project triggers the erosion prevention and sediment control rule and the stormwater management rule. Reviewed March 19th and 25th revised submittals. Notified the applicant that the submittal is complete but revisions are needed to the stormwater management facility to achieve the required abstraction and water quality treatment.

g. Miscellaneous preapplication calls from applicant with questions about rule applicability and criteria.

h. Miscellaneous conversations with Watershed Planning Manager Jeffery about rules, permit database status, shoreline rule revision, new permitting database bugs/fixes, which permits will be reviewed by staff versus Barr, and rule application.

Data Management/Sampling/Equipment Assistance

a. Prepared, loaded, and verified 2 RMB laboratory (RMB) reports.

b. Prepared, loaded, and verified 2020 Eden Prairie Lake Data.

Task Order 6: WOMP Station Monitoring

Purgatory Creek Monitoring Station at Pioneer Trail

a. Prep for 2021 monitoring season – equipment mobilization and maintenance.

b. Site visit to check on ice conditions.

c. Download and review data.

d. Set up Survey 123 with new forms.

Purgatory Creek Monitoring Station at Valley View Rd

a. Download and review data.

b. Prep for 2021 monitoring season – equipment mobilization and maintenance.

c. Site visits to check on ice conditions.

Task Order 14b: Lower Riley Creek Final Design

a. No activity in March.

Task Order 21B: Bluff Creek Stabilization Project

a. No activity in March.

Task Order 24: Duck Lake Water Quality Improvement Project

a. No activity in March.

Task Order 24B: Silver Lake Water Quality Improvement Project

a. Development Issued for Bid construction plan set based on review with district and city staff.
b. Development of complete bid package including technical specifications, front-end documents, and construction plans.
c. Bidding coordination including advertisement for bid, upload and management of virtual bidding on Quest CDN.
d. Development of Addendum 1 based on comments received from City of Chanhassen staff, including updates to the traffic control plan and revisions to site access.
e. Coordination of signatures on City of Chanhassen permits.
f. Conducting bid opening on 3/29/2021 and prepared award recommendation memo.

Task Order 26: Stormwater Model Update and Flood-Risk Area Prioritization Identification for the Bloomington Portion of Purgatory Creek

a. Draft report documenting the process for developing the prioritization framework, source information, and initial prioritized list of flood-prone areas was provided to RPBCWD, city of Bloomington, and NMCWD for review. Barr will provide a final version of the report after comments are received and revisions to the document have been made to address the comments.

Task Order 28B: Rice Marsh Lake (RM_12a) Water Quality Improvement Project

a. Development of 60% drawings and proposed conditions modeling.
b. Development of permitting report to meet District requirements.
c. Development of technical specifications and preliminary engineer's opinion of probable cost.
d. Coordinating with City of Chanhassen's neighborhood street reconstruction project.

Task Order 29B: Middle Riley Creek (Reach R3) Stabilization Project Design

a. Barr provided 90% plan set to Bearpath and RPBCWD March 19th , and has submitted permit applications to MN DNR and RPBCWD.
b. Additional permit applications to the USACE and City of Eden Prairie are scheduled to be submitted the in early-April.
c. Pending review and feedback from Bearpath, as well as permitting agencies, the tentative timeline includes presenting a bid package with updated drawings, specifications, and cost estimate to the board for approval and authorization to solicit bids at the May 5th board meeting.

d. Construction is still tentatively slated for September 2021, with the goal of finishing the tee areas by October 1st, and stream work construction wrapping up in November/December 2021.

Task Order 30B: Pioneer Trail Wetland Restoration Project

a. Development of preliminary plan sheets and optimization of the proposed wetland restoration design to reduce bounce in the wetland, decrease peak flows to downstream Bluff Creek, and increase native wetland vegetation.

b. Working on vegetation plantings and layout as part of 60% design

c. Design revision to not require re-route of stormsewer beneath Pioneer Trail. The revised design was discussed with District staff and approved.

d. 60% design drawings and OPC to send to District for review in early April.

Task Order 032A: Upper Riley Creek Ecological Enhancement Plan

a. Presented the Ecological Enhancement Plan at the March 3 Board Workshop and provided follow-up information in response to the Board's questions for consideration in ordering the project to advance for design.

Task Order 033: Wetland Assessment – Phase 1

a. Completed internal discussion to develop an approach to address community resilience, hydrology and cultural resources.

b. Began drafting field data collection needs and methodologies to support the framework.

c. Continued building example framework to demonstrate the ranking scheme and metrics.

Task Order 035: Eden Prairie Stormwater Model Update and Flood-Risk Area Prioritization

a. Requested information from the City of Eden Prairie including GIS files for the City's storm sewer system and subwatershed divides. Staff began subdividing watershed divides for Riley Creek and Purgatory Creek. It is anticipated that next month draft subwatershed divides will be provided to City and District staff for review.

b. Requested input from City staff regarding locations that are prone to frequent inundation and stormwater ponds that should be monitored this summer. Monitoring data collected for these locations will be used in 2022 for validating model simulation results. Model validation is an important process of verifying that the updated model accurately characterizes runoff from the watershed before the model is used to simulate design rainfall events. We anticipate input from City staff regarding monitoring locations next month.

c. The schedule for this task order extends through 2022. In 2021 work will focus on updating the District's stormwater models for Riley Creek and Purgatory Creek to include additional detail within Eden Prairie. In 2022, work will include model validation, simulation of design events, inundation mapping, identification and prioritization of flood prone areas, and documentation.

PROJECT NAME	PERMIT #	DATE INSPECTED	COMPLIANT	DATE TO COMPLY	FOLLOW UP	NOTES
Mission Hills Senior Living	2015-002	3/26/2021	YES			
LaMettry's Motorplex	2015-035		CLOSED			
Saville West Subdivision	2015-036		CLOSED			
Arbor Glen	2015-050		CLOSED			
SWLRT	2016-017	3/26/2021	YES			
County Rd 61	2016-032					
Kopesky 2nd Addition	2017-001		CLOSED			
Tweet Pediatric Dental	2017-029	3/31/2021	YES			
Fawn Hills	2017-047	3/31/2021	YES			
O'Reilly	2017-072	3/26/2021	NO			Full catch basin bags, perimeter controls missing/damaged, lots of sediment on pavement
Avienda	2018-016		YES			
Smith Village	2018-044					
CSAH 61 - Peterson Borrow	2018-047	3/31/2021	YES			
Bluff Creek Tributary	2018-056	3/31/2021	YES			
Lower Riley Creek Stabilization	2018-062	3/31/2021	YES			
Castle Ridge	2018-066	3/26/2021	NO	4/2/2021		Silt fence maintenance especially south perimeter, small sediment release into small wetland just nort of NW entrance along Columbine Rd, rock entrance maintanence
Ground Storage Reservoir	2018-074	3/26/2021	YES			
The Park	2019-001	3/26/2021	YES			
Shelangoski Home	2019-002	3/26/2021	YES			
Stable Path	2019-003	3/31/2021	NO	4/2/2021		sediment tracking, perimeter controls need maintenance
Duck Lake Rd	2019-004		Pending			
Beverly Hills	2019-007	3/31/2021	NO	4/2/2021		All perimeter controls need maintenance, sediment tracking, unprotected stockpiles
Westwind Plaza: Chase Bank	2019-011	3/11/2021	NO	4/2/2021		Missing most perimeter controls, all catchbasins w/out protection, some sediment runoff on pavement, unstabilized soil
6650 Pawnee Dr	2019-017	3/26/2021	NO	4/9/2021		bare soil on slope ne corner
6657 Deerwood Dr	2019-018	3/26/2021	YES			
Sheldon Place Townhomes	2019-019	3/26/2021	YES			
Woodcrest	2019-022		PENDING			
Minnetonka Library Improvemen	2019-023	3/26/2021	YES			
Conifer Heights	2019-024	3/15/2021	NO	4/2/2021		Unprotected stockpile, rock entrance mainenance, heavy tracking on road, silt fence repairs
LifeTime Parking Expansion	2019-028	3/31/2021	YES			
Sheldon Ave Storm Sewer	2019-029	3/31/2021	YES			
Applebees Parking Lot	2019-032	3/26/2021	NO			
Lion's Tap	2019-034	3/31/2021	YES			
TH 101	2019-042	3/31/2021	YES			
Cedarcrest Stables	2019-043	3/31/2021	NO	4/2/2021		All curb BMPs and rock entrances need maintenance, heavy tracking on streets
EPPS-CMS Addition	2019-048	3/26/2021	YES			
Berrospid Addition	2019-051	3/26/2021	YES			
5545 Kipling Ave	2019-052	3/26/2021	YES			work finished
Moments of Chanhassen	2020-003	3/26/2021	YES			work not started
Doan Home (Dove Ct)	2020-004	3/26/2021	YES			
TH 5 Regional Trail	2020-007	3/26/2021	YES			
Eden Ridge, LLC	2020-008	3/26/2021	NO	4/2/2021		Silt fence and perimeter control maintenance, no protection on catch basins, bare soil
Ginder Home	2020-010	3/31/2021	YES			
Mntka HS 2020 Parking Lot EXP	2020-011	NA	Pending			

PROJECT NAME	PERMIT #	DATE INSPECTED	COMPLIANT	DATE TO COMPLY	FOLLOW UP	NOTES
Deerfield Trail	2020-018	3/25/2021	YES			no activity, no BMPs
CR 101 Paving	2020-019	NA	Pending			
UHG Tech Drive Pipe Replacement	2020-028	3/25/2021	NO	4/2/2021		Perimeter control, erosion around one catchbasin
CORTRUST Bank	2020-029	NA	PENDING			
Prairie Heights	2020-031	3/26/2021	NO	4/2/2021		Silt fence breach small sed. Release south property line bottom of hill, 2 catch basins BMPs collapsed need repair, some landscape blankets need to be put back in place
Honeysuckle	2020-035	3/25/2021	YES			
Jones Shoreline	2020-038	3/26/2021	NO	4/9/2021		Needs controls along street and bottom of slope, some sediment runoff in gutter, landscape blanket damaged,
Eliasen rip rap	2020-041	3/25/2021	YES			
Brady Home - Cedarcrest	2020-042	3/25/2021	YES			
GBM Realty Parking Lot	2020-043	3/25/2021	NO	4/9/2021		Perimeter controls missing around sidewalk construction and mailbox pad, unstabilized soil west and south around parking lot
Barry Home	2020-044	3/25/2021	YES			
Galpin Project	2020-045	3/25/2021	No	4/2/2021		tracking
Parkhurst Addition	2020-050	NA	PENDING			
Biolyph Parking Lot Addn	2020-051	NA	PENDING			
CR 3 Culvert Replacement	2020-053	3/25/2021	YES			
Minnetonka Care Center	2020-054	3/25/2021	YES			No activity
Minnetonka High School 2021 Arts Center Parking Lot Addition	2020-056	NA	PENDING			
Bluff 25 Culvert Rehab Project	2020-057	3/25/2021	NO	4/2/2021		Rock entrance maintenance, tracking on road
Eagle Ridge Dr Drain Tile	2020-058	NA	PENDING			
Billings Pool	2020-059					
Christian Brothers Automotive	2020-060	3/25/2021	No activity			
Purgatory Creek Estates 2nd Addition	2020-061	NA	PENDING			
481 Bighorn	2020-062	3/25/2021	YES			
Emerson SSC Chilled Water System Improvements	2020-063	3/25/2021	YES			
Wetterling	2020-064	3/25/2021	YES			
Terry Pine Coffee	2020-065	3/25/2021	No activity			
Chase Bank	2020-066	3/25/2021	No activity			
Conifer Heights Storm Sewer Improvements	2020-067	3/15/2021	YES			
Mntka HS Einer Anderson	2020-068	NA	PENDING			
Prairie Heights	2020-069	NA	PENDING			
Lake Place Apartments	2020-070	NA	PENDING			
Woodbridge Marsh Pond Maintenance	2020-071	NA	PENDING			
Earhart Wetland Alteration Permit	2020-072	NA	PENDING			
Auto Care World	2021-001	3/26/2021	YES			No activity
Fifield Pool	2021-002	NA	PENDING			
Neil Lake Rd NGPL	2021-003	NA	PENDING			
Silver Lake WQ Improvement	2021-004	3/5/2021	YES			No activity
Lake Place Apartments	2021-005	NA	PENDING			
TeBrake Swimming Pool	2021-006	NA	PENDING			
TH 5 NGBL	2021-007	3/25/2021	YES			
Mntka HS Momentum Bldg Addn	2021-008	NA	PENDING			

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
18681 Lake Drive East
Chanhassen, MN 55317
952-607-6512
www.rpbcwd.org

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2020-066

Considered at Board of Managers Meeting: April 7, 2021

Received complete: November 23, 2020 (RPBCWD extended the application-review period by 60 days on January 6, 2021 and the RPBCWD approved the applicant's request for a second extension until April 22, 2021)

Applicant:	Chase Bank
Consultant:	Kimley-Horn, Brian Wurdeman
Project:	Chase Bank Building – The applicant proposes the demolition of an existing building and parking lot and construction of a new Chase Bank building and associated parking areas, landscaping, and utilities. Stormwater management facilities include hydrodynamic separators (i.e., Hydro International's Downstream Defenders), an underground stormwater storage unit, rainwater harvest and reuse facility, and a proprietary stormwater treatment unit (Hydro International's Up Flo Filter) to provide volume control, water quality, and rate control.
Location:	928 Prairie Center Drive, Eden Prairie, MN
Reviewer:	Heather Hlavaty P.E. and Scott Sobiech P.E., Barr Engineering

Board Action

Manager _______ moved and Manager _______ seconded adoption of the following resolutions based on the permit report that follows and the presentation of the matter at the April 7, 2021 meeting of the managers:

Resolved that the application for Permit 2020-066 is approved, subject to the conditions and stipulations set forth in the Recommendations section of the attached report.

Resolved that on determination by the RPBCWD administrator that the conditions of approval have been affirmatively resolved, the RPBCWD president or administrator is authorized and directed to sign and deliver Permit 2020-066 to the applicant on behalf of RPBCWD.

Upon roll call vote, the resolutions were adopted, ______.

Applicable Rule Conformance Summary

Rule	Issue		Conforms to RPBCWD Rules?	Comments
C	**Erosion Control Plan**		See Comment	See Rule Specific Permit Condition C1.
J	**Stormwater Management**	Rate	Yes	
		Volume	Yes	
		Water Quality	Yes	
		Low Floor Elev.	Yes	
		Maintenance	See Comment	See Rule Specific Permit Condition J1.
		Chloride Management	See Comment	See stipulation #4.
		Wetland Protection	Yes	
L	**Permit Fee Deposit**		Yes	$3,000 received November 13, 2020
M	**Financial Assurances**		See Comment	The financial assurance is calculated at $200,695

Background

The project proposes the demolition of an existing building and parking lot followed by construction of a new Chase Bank building, remote ATM, and associated parking. The project proposes construction of hydrodynamic separators (i.e., Hydro International's Downstream Defenders), an underground stormwater storage unit, rainwater harvest and reuse facility, and a proprietary stormwater treatment unit (Hydro International's Up Flo Filter) to provide stormwater quantity, volume and rate control.

The project site information is summarized below:

Project Site Information	Area (acres)
Total Site Area	0.64
Existing Impervious	0.52
Disturbed Impervious Area	0.52 (100%)
Proposed Impervious Area	0.50
Change in Impervious Area	-0.02 (2% decrease)
Regulated Impervious Area	0.50
Total Disturbed Area	0.64

The following materials were reviewed in support of the permit request:

1. Permit Application received November 6, 2020 (RPBCWD extended the application-review period by 60 days on January 6, 2021 and the RPBCWD approved the applicant's request for a second extension until April 22, 2021)
2. Stormwater Management Report dated October 30, 2020 (revised March 18, 2021)
3. Project Plan Set (10 sheets) dated October 23, 2020 (revised March 18, 2021)
4. ALTA/NSPS Land Title Survey received on November 6, 2021
5. Electronic HydroCAD models received on November 6, 2021 (revised March 23, 2021)
6. Electronic MIDS models received on November 23, 2021 (revised March 18, 2021)
7. Geotechnical Boring Logs by Element Materials Technology dated October 23, 2020
8. Response to RPBCWD Comments on November 6, 2020 submittal received on November 23, 2020
9. Project narrative for the property 928 Prairie Center Drive by The Architects Partnership, LTD dated December 18, 2020
10. Flood plan and exterior architectural drawings developed by The Architects Partnership, LTD dated December 18, 2020
11. Trip Generation & Drive Through Memo by Kimley-Horn to the City of Eden Prairie dated December 18, 2020
12. Geotechnical Evaluation Report by Element Materials Technology dated November 20, 2020
13. Lighting plan by Facility Solutions Group dated December 17, 2020
14. Phase I ESA developed by Apex Companies, LLC dated July 15, 2020
15. HydroCAD Output Drainage Summary Tables received on August 18, 2020 (revised September 21, 2020)
16. Response to RPBCWD Comments on December 4, 2020 submittal received on December 18, 2020
17. Word document of Legal Descriptions for surrounding parcels received on December 21, 2020
18. Engineers Opinion of Probable Cost for Stormwater Management Facilities dated February 15, 2021 (revised on March 18, 2021)
19. Response to RPBCWD Comments on December 23, 2020 submittal received on February 15, 2021
20. Response to RPBCWD Comments on February 3, 2020 submittal received on March 18, 2021
21. Hydro International Water Quality Filter Details and TAPE performance evaluations received on March 18, 2021

<u>Rule Specific Permit Conditions</u>

Rule C: Erosion Prevention and Sediment Control

Because the project will alter more than 50 cubic yards of material, the project must conform to the requirements in the RPBCWD Erosion Prevention and Sediment Control rule (Rule C, Subsection 2.1).

The erosion and sediment control plans prepared by Kimley-Horn include installation of perimeter control, inlet protection for storm sewer catch basins, a rock construction entrance, protection of stormwater management facilities, placement of a minimum of 6 inches of topsoil, decompaction of pervious areas compacted during construction, and retention of native topsoil onsite.

C1. The Applicant must provide the name and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.

Rule J: Stormwater Management

Because the project will alter 0.64 acres of land-surface area, and disturb more than 50% of existing impervious area, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.3) for all the impervious surface on the site.

The project proposes construction of hydrodynamic separators (i.e., Hydro International's Downstream Defenders), an underground stormwater storage unit, rainwater harvest and reuse facility, and a proprietary stormwater treatment unit (Hydro International's Up Flo Filter) to provide stormwater quantity, volume and rate quality control. Stored runoff will be used for irrigation of pervious areas on site.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The Applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below.

Modeled Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
City Storm Sewer System	2.3	1.5	3.6	2.1	6.5	6.2	0.3	0.3

The proposed stormwater management plan will provide rate control in compliance with the RPBCWD requirements for the 2-, 10-, and 100-year events. Thus, the proposed project meets the rate control requirements in Rule J, Subsection 3.1a.

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from the new and disturbed impervious surface of the parcel. An abstraction volume of 1,996 cubic feet is required from the 0.50 acres (21,980 square feet) of regulated impervious area.

The Geotechnical Report prepared by Element Materials Technology on November 20, 2020 shows high groundwater on site as shallow as 4 feet below grade. In addition, a Phase I Environmental Site Assessment (ESA) conducted by Apex Companies, LLC on July 15, 2020 identified a Recognized Environmental Condition (REC) in the form of a former fuel station and dry cleaner which were in close proximity and up-gradient to the development parcel. The Engineer concurs that the soils information and presence of high groundwater show that the abstraction standard in Subsection 3.1 of Rule J cannot practicably be met, the site is considered a restricted site and stormwater runoff volume must be managed in accordance with Subsection 3.3 of Rule J.

For restricted sites, subsection 3.3 of Rule J requires rate control in accordance with subsection 3.1.a and that abstraction and water-quality protection be provided in accordance with the following sequence: (a) Abstraction of 0.55 inches of runoff from site impervious surface determined in accordance with paragraphs 2.3, 3.1 or 3.2, as applicable, and treatment of all runoff to the standard in paragraph 3.1c; or (b) Abstraction of runoff onsite to the maximum extent practicable and treatment of all runoff to the standard in paragraph 3.1c; or (c) Off-site abstraction and treatment in the watershed to the standards in paragraph 3.1b and 3.1c. The engineer concurs that the 243 cubic feet of abstraction provided by the applicant's proposed rainwater harvest and reuse system is the maximum extent practicable, in accordance with subsection 3.3.b, because of high observed groundwater at the site.

The table below summarizes the volume abstraction required and the volume abstraction achieved by the proposed stormwater management facilities on site. The proposed project is in conformance with Rule J, Subsection 3.3.b.

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
0.55	998	0.13	243

Because the proposed stormwater reuse system requires consistent use at a specified rate to meet District requirements, performance monitoring for the site will be required to ensure that the project provides the proposed volume abstraction.

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. The applicant is proposing to use hydrodynamic separators (i.e., Hydro International's Downstream Defenders), an underground stormwater storage unit, rainwater harvest and reuse facility, and a proprietary stormwater treatment unit (Hydro International's Up Flo Filter) to achieve the required TP and TSS removals. The MIDs calculator was used to estimate the TP and TSS removals. The results of this modeling are summarized in tables below showing the annual TSS and TP removal requirements are achieved and that there is no net increase in TSS and TP leaving the site. The engineer concurs with the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

Annual TSS and TP removal summary

Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr)	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	171	154 (90%)	154 (90%)
Total Phosphorus (TP)	0.94	0.57 (60%)	0.65 (69%)

Summary of net change in TSS and TP leaving the site

Pollutant of Interest	Existing Site Loading (lbs/yr)	Proposed Site Load after Treatment (lbs/yr)	Change (lbs/yr)
Total Suspended Solids (TSS)	177	17	-160
Total Phosphorus (TP)	0.98	0.29	-0.68

Low floor Elevation

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation of a waterbody or stormwater management facility. No stormwater management system may be constructed or reconstructed in a manner that brings the low floor elevation of an adjacent structure into noncompliance according to Rule J, Subsection 3.6.

The low floor elevation of the proposed building and the adjacent stormwater management feature are summarized below. The proposed project is in conformance with Rule J, Subsection 3.6.

Low Floor Elevation of Existing Building (feet)	100-year Event Flood Elevation of Stormwater Facility (feet)	Freeboard (feet)
844.75	841.40	3.35

Maintenance

Subsection 3.7 of Rule J requires the submission of a maintenance plan. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed. The stormwater management facilities include the underground storage facility, the Hydro International Downstream Defenders and Up Flo Filter, and the rainwater harvest and reuse system and thus maintenance will need to be provided in accordance with the manufacturers guidance/manual. The Applicant must provide a draft maintenance and inspection declaration in conformance with Rule J, Subsection 3.7, for approval by RPBCWD staff prior to recordation. To conform to the RPBCWD Rule J the following revisions are needed:

J1. Permit applicant must provide a maintenance and inspection declaration as required by Rule J, Subsection 3.7. A maintenance declaration template is available on the permits page of the RPBCWD website (http://www.rpbcwd.org/permits/). A draft declaration must be provided for District approval prior to recordation as a condition of issuance of the permit.

Wetland Protection

Because runoff from this site is directly tributary to a downstream, off-site medium value wetland, the project must comply with the wetland protection criteria in Rule J, Subsection 3.10

In accordance with Rule J, subsection 3.10a, there is no proposed activity subject to Rule J that will alter the site in a manner that increases the bounce in water level, duration of inundation, or change the runout elevation in the subwatershed, for the wetland receiving runoff from the land disturbing activities. Because the applicant's HydroCAD model results demonstrate, and the engineer concurs, that the proposed flow rate and volumes flowing towards the off-site wetland are less than the under existing conditions, the bounce and inundation will not increase, thus the project meets the Bounce and Inundation criterion.

Rule J, Subsection 3.10b requires that treatment of runoff to medium value wetlands archive 90 percent total suspended solids removal and 60 percent total phosphorus removal. MIDS modeling results show the proposed subsurface stormwater management system provides 90% TSS and 69% TP removals, thus the engineer finds that the proposed project is in conformance with Rule J, Subsection 3.10b.

Chloride Management

Subsection 3.8 of Rule J requires the submission of chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan. To close out the permit and release the $5,000 in financial assurance held for the purpose of chloride management, the permit applicant must provide a chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan at the site.

Rule L: Permit Fee Deposit:

The RPBCWD permit fee schedule adopted in February 2020 requires permit applicants to deposit $3,000 to be held in escrow and applied to cover the $10 permit-processing fee and reimburse RPBCWD for permit review and inspection-related costs and when a permit application is approved, the deposit must be replenished to the applicable deposit amount by the applicant before the permit will be issued to cover actual costs incurred to monitor compliance with permit conditions and the RPBCWD Rules. A permit fee deposit of $3,000 was received on November 13, 2020.

Rule M: Financial Assurance:

Rules C: Silt fence and silt dikes: 790 L.F. x $2.50/L.F. = ... $1,975

Inlet protection: 6 x $100 = ... $600

Rock Entrance: 1 x $900 = ... $900

Restoration: 0.64 acres x $2,500/acre = ... $1,600

Rules G & J: Stormwater Management Facility: $137,900 x 125% of engineer's opinion of cost= $172,375

Chloride Management Plan: $5,000 .... $5,000

Contingency (10%) $18,245

Total Financial Assurance $200,695

Applicable General Requirements:

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. Construction must be consistent with the plans, specifications, and models that were submitted by the applicant that were the basis of permit approval. The date(s) of the approved plans, specifications, and modeling are listed on the permit. The grant of the permit does not in any way relieve the permittee, its engineer, or other professional consultants of responsibility for the permitted work.
4. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
5. The issuance of this permit does not convey any rights to either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
6. In all cases where the doing by the permittee of anything authorized by this permit involves the taking, using or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements or interests, the permittee, before proceeding therewith, must acquire all necessary property rights and interest.
7. RPBCWD's determination to issue this permit was made in reliance on the information provided by the applicant. Any substantive change in the work affecting the nature and extent of applicability of RPBCWD regulatory requirements or substantive changes in the methods or means of compliance with RPBCWD regulatory requirements must be the subject of an application for a permit modification to the RPBCWD.

8. If the conditions herein are met and the permit is issued by RPBCWD, the applicant, by accepting the permit, grants access to the site of the work at all reasonable times during and after construction to authorized representatives of the RPBCWD for inspection of the work.

Findings

1. The proposed project includes the information necessary, plan sheets, and erosion control plan for review.
2. The proposed project will conform to Rules C and J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval, contingent upon:

1. Continued compliance with General Requirements
2. Financial Assurance in the amount of $200,695.
3. Applicant providing the name and contact information of the individual responsible for erosion and sediment control at the site.
4. Receipt in recordation a maintenance declaration for the operation and maintenance stormwater management facilities. The declaration must also include a stormwater reuse monitoring and reporting plan as well as an exhibit showing the area to be irrigated. Drafts of all documents to be recorded must be approved by the District prior to recordation.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, the pretreatment manholes and subsurface stormwater facility conform to design specifications and function as intended and approved by the District. As-built/record drawings must be signed by a professional engineer licensed in Minnesota and include, but not limited to:
    a. the surveyed bottom elevations, water levels, and general topography of all facilities;
    b. the size, type, and surveyed invert elevations of all stormwater facility inlets and outlets;
    c. the surveyed elevations of all emergency overflows including stormwater facility, street, and other;
2. Providing the following additional close-out materials:
    a. Documentation that disturbed pervious areas remaining pervious have been decompacted per Rule C.2c criteria
3. The work on the Chase Bank development under the terms of permit 2020-066, if issued, must have an impervious surface area and configuration materially consistent with the approved plans. Design that differs materially from the approved plans (e.g., in terms of total impervious area) will need to be the subject of a request for a permit modification or new permit, which will be subject to review for compliance with all applicable regulatory requirements.

4. To close out the permit and release the $5,000 in financial assurance held for the purpose of the chloride management, the permit applicant must provide a chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan at the site.

5. Replenish the permit fee deposit to the original amount or such lesser amount as the RPBCWD administrator deems sufficient within 45 days of receiving notice that such deposit is due in order to cover continued actual costs incurred to monitor compliance with permit conditions and the RPBCWD Rules.

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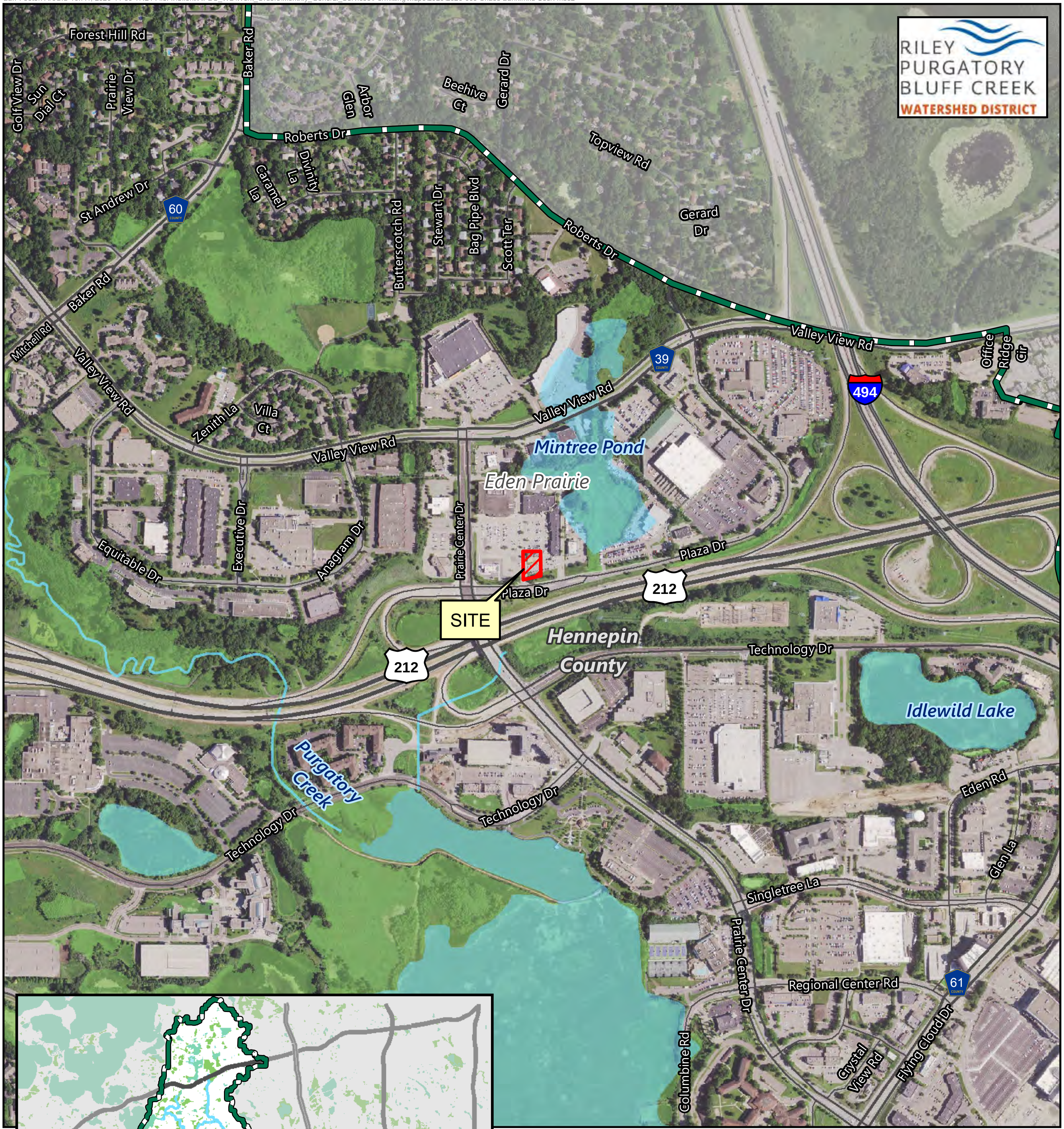

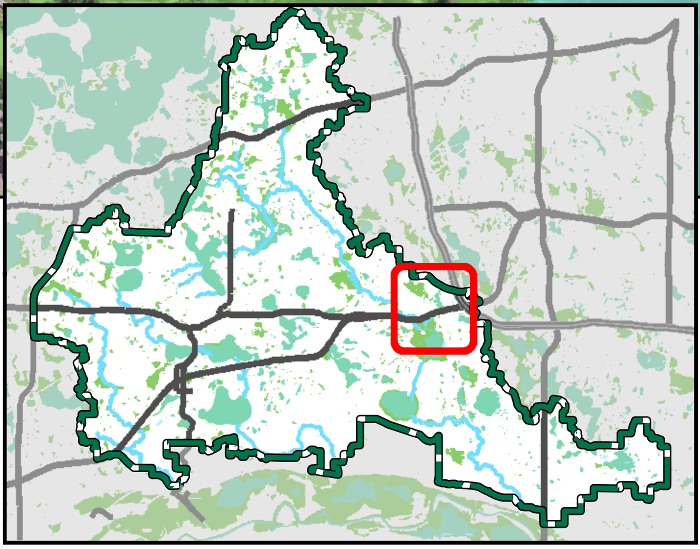

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Feet

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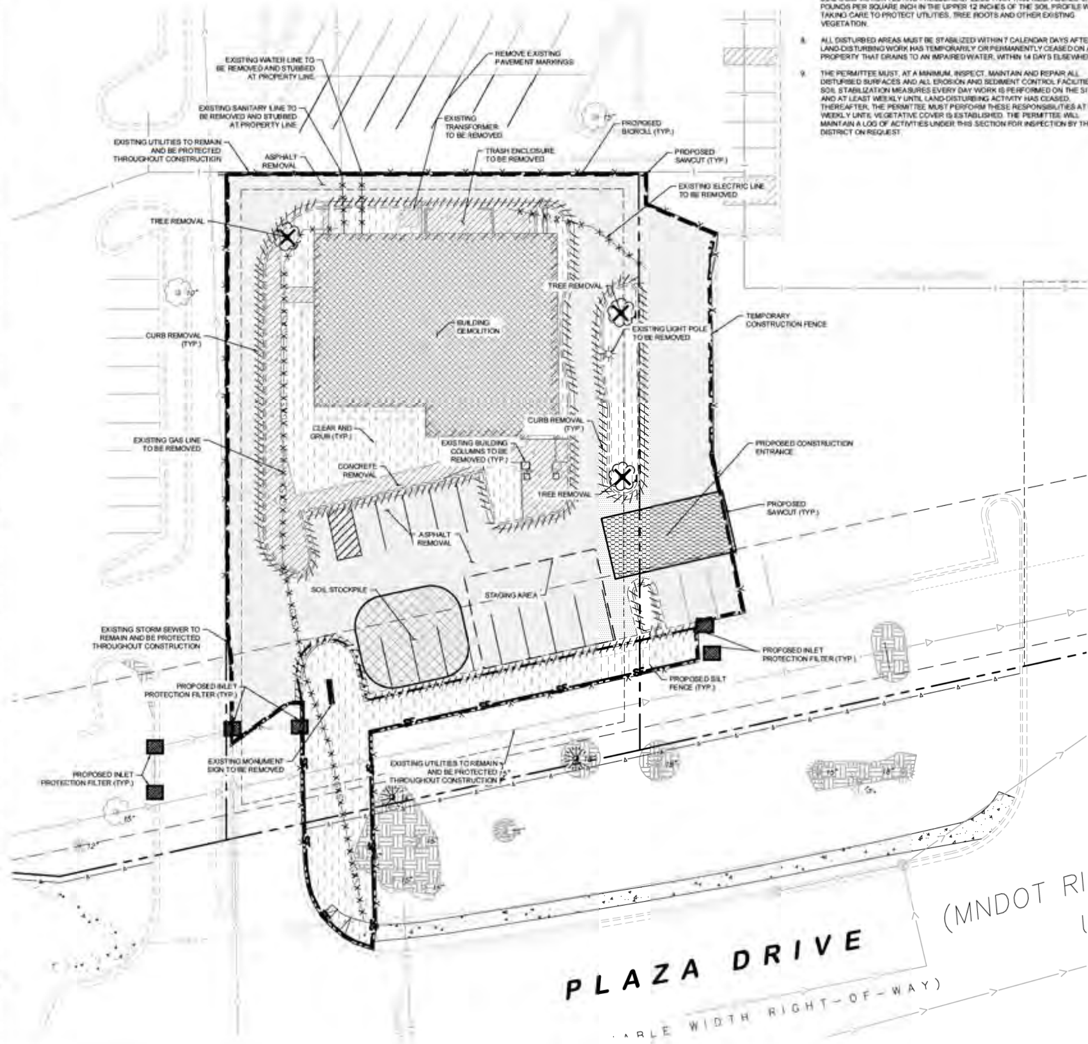
Permit Location Map

CHASE BANK

Permit 2020-066

Riley Purgatory Bluff Creek Watershed District



RPBCWD EROSION CONTROL PLAN NOTES

1. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE.
2. ADDITIONAL MEASURES, SUCH AS HYDRAULIC MULCHING AND OTHER PRACTICES AS SPECIFIED BY THE DISTRICT MUST BE USED ON SLOPES OF 3:1 (H:V) OR STEEPER TO PROVIDE ADEQUATE STABILIZATION.
3. FINAL SITE STABILIZATION MEASURES MUST SPECIFY THAT AT LEAST SIX INCHES OF TOPSOIL OR ORGANIC MATTER BE SPREAD AND INCORPORATED INTO THE UNDERLYING SOIL DURING FINAL SITE TREATMENT WHEREVER TOPSOIL HAS BEEN REMOVED.
4. CONSTRUCTION SITE WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, LITTER AND SANITARY WASTE MUST BE PROPERLY MANAGED.
5. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE MAINTAINED UNTIL COMPLETION OF CONSTRUCTION AND VEGETATION IS ESTABLISHED SUFFICIENTLY TO ENSURE STABILITY OF THE SITE, AS DETERMINED BY THE DISTRICT.
6. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE REMOVED UPON FINAL STABILIZATION.
7. SOIL SURFACES COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF THE SOIL PROFILE WHILE TAKING CARE TO PROTECT UTILITIES, TREE ROOTS AND OTHER EXISTING VEGETATION.
8. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN 7 CALENDAR DAYS AFTER LAND-DISTURBING WORK HAS TEMPORARILY OR PERMANENTLY CEASED ON A PROPERTY THAT DRAINS TO AN IMPAIRED WATER, WITHIN 14 DAYS ELSEWHERE.
9. THE PERMITTEE MUST, AT A MINIMUM, INSPECT, MAINTAIN AND REPAIR ALL DISTURBED SURFACES AND ALL EROSION AND SEDIMENT CONTROL FACILITIES AND SOIL STABILIZATION MEASURES EVERY DAY WORK IS PERFORMED ON THE SITE AND AT LEAST WEEKLY UNTIL LAND-DISTURBING ACTIVITY HAS CEASED. THEREAFTER, THE PERMITTEE MUST PERFORM THESE RESPONSIBILITIES AT LEAST WEEKLY UNTIL VEGETATIVE COVER IS ESTABLISHED. THE PERMITTEE WILL MAINTAIN A LOG OF ACTIVITIES UNDER THIS SECTION FOR INSPECTION BY THE DISTRICT ON REQUEST.

EROSION CONTROL PLAN NOTES

1. ALL PERIMETER SILT FENCE AND ROCK CONSTRUCTION ENTRANCES SHALL BE INSTALLED PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL CONSTRUCT DRAINAGE BASINS PRIOR TO SITE GRADING.
3. THE CONTRACTOR SHALL INSTALL CATCH BASIN EROSION CONTROL MEASURES.
4. WITHIN TWO WEEKS (14 DAYS) OF SITE GRADING, ALL DISTURBED AREAS SHALL BE STABILIZED WITH SEED, SOD, OR ROCK BASE. REFER TO LANDSCAPE PLANS FOR MATERIALS.
5. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CITY, STATE, AND WATERSHED DISTRICT PERMITS.
6. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING THE REMOVAL OF SILT IN FRONT OF SILT FENCES DURING THE DURATION OF THE CONSTRUCTION.
7. ANY EXCESS SEDIMENT IN PROPOSED BASINS SHALL BE REMOVED BY THE CONTRACTOR.
8. REMOVAL ALL EROSION CONTROL MEASURES AFTER VEGETATION IS ESTABLISHED.
9. THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS AND SHALL SWEEP ADJACENT STREETS AS NECESSARY IN ACCORDANCE WITH CITY REQUIREMENTS.
10. IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS.

SEQUENCE OF CONSTRUCTION:

UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: TRAILER, PARKING, LAYDOWN, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC., IMMEDIATELY DENOTE THEM ON THE SITE MAPS AND NOTE ANY CHANGES IN LOCATION AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.

BMP AND EROSION CONTROL INSTALLATION SEQUENCE SHALL BE AS FOLLOWS:

1. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE.
2. INSTALL UTILITIES, UNDERDRAINS, STORM SEWERS, UNDERGROUND SYSTEM, CURBS AND GUTTERS.
3. INSTALL APPROPRIATE INLET PROTECTION AT ALL STORM SEWER STRUCTURES AS EACH INLET STRUCTURE IS INSTALLED.
4. PERMANENTLY STABILIZE AREAS TO BE VEGETATED AS THEY ARE BROUGHT TO FINAL GRADE.
5. PREPARE SITE FOR PAVING.
6. PAVE SITE AND INSTALL STRIPING.
7. INSTALL APPROPRIATE INLET PROTECTION DEVICES FOR PAVED AREAS AS WORK PROGRESSES.
8. COMPLETE GRADING AND INSTALLATION OF PERMANENT STABILIZATION OVER ALL AREAS.
9. OBTAIN CONCURRENCE WITH THE CIVIL ENGINEERING CONSULTANT THAT THE SITE HAS BEEN FULLY STABILIZED THEN:
   1. REMOVE ALL REMAINING TEMPORARY EROSION ADN SEDIMENT CONTROL DEVICES
   2. STABILIZE ANY AREAS DISTURBED BY THE REMOVAL OF BMPS.

DEMOLITION PLAN NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR THE DEMOLITION, REMOVAL, AND DISPOSAL (IN A LOCATION APPROVED BY ALL GOVERNING AUTHORITIES) ALL STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE STRUCTURES, UTILITIES, ETC. SUCH THAT THE IMPROVEMENTS ON THE PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL PER THE PROJECT DOCUMENTS.
2. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL DEBRIS FROM THE SITE AND DISPOSING THE DEBRIS IN A LAWFUL MANNER. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. CONTRACTOR SHALL PROVIDE COPIES OF THE PERMIT AND RECEIPTS OF DISPOSAL OF MATERIALS TO THE OWNER AND OWNERS REPRESENTATIVE.
3. THE CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICES TO ADJACENT PROPERTIES AT ALL TIMES. UTILITY SERVICES SHALL NOT BE INTERRUPTED WITHOUT APPROVAL FROM THE CONSTRUCTION MANAGER AND COORDINATION WITH THE ADJACENT PROPERTIES AND/OR THE CITY.
4. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
5. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR LOCATIONS OF EXISTING UTILITIES WITHIN ALL AREAS OF PROPOSED WORK.
6. ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AS THE EXACT LOCATION, OR AS ANY OBSTACLES THAT MAY OCCUR ON THE SITE. VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PRECEDING WITH THE WORK.
7. ELECTRICAL, TELEPHONE, CABLE, WATER, FIBER OPTIC, AND/OR GAS LINES NEEDING TO BE REMOVED OR RELOCATED SHALL BE COORDINATED WITH THE AFFECTED UTILITY COMPANY. ADEQUATE TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY IS NECESSARY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE. CONTRACTOR SHALL PAY CLOSE ATTENTION TO EXISTING UTILITIES WITHIN ANY ROAD RIGHT-OF-WAY DURING CONSTRUCTION.
8. CONTRACTOR MUST PROTECT THE PUBLIC AT ALL TIMES WITH FENCING, BARRICADES, ENCLOSURES, ETC. (AND OTHER APPROPRIATE BEST MANAGEMENT PRACTICES) AS APPROVED BY THE CONSTRUCTION MANAGER. MAINTENANCE OF TRAFFIC CONTROL SHALL BE COORDINATED IN ACCORDANCE WITH EDEN PRAIRIE, HENNEPIN COUNTY AND MNDOT.
9. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES DURING CONSTRUCTION, AND SHALL NOTIFY ALL PROPERTIES IF ACCESS WILL BE INTERRUPTED OR ALTERED AT ANY TIME DURING CONSTRUCTION.
10. PRIOR TO DEMOLITION OCCURRING, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED.
11. CONTRACTOR MAY LIMIT SAW-CUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
12. THE CONTRACTOR SHALL COORDINATE WATER MAIN WORK WITH THE FIRE DEPT. AND THE CITY WATER DEPARTMENT TO PLAN PROPOSED IMPROVEMENTS AND TO ENSURE ADEQUATE FIRE PROTECTION IS CONSTANTLY AVAILABLE TO THE SITE THROUGHOUT THIS SPECIFIC WORK AND THROUGH ALL PHASES OF CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ARRANGING/PROVIDING ANY REQUIRED WATER MAIN SHUT OFFS WITH THE CITY OF EDEN PRAIRIE DURING CONSTRUCTION. ANY COSTS ASSOCIATED WITH WATER MAIN SHUT OFFS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATION WILL BE PROVIDED.
13. REFER TO SURVEY FOR ALL EXISTING INVERT AND RIM ELEVATIONS.
14. ALL UTILITIES SHOWN ARE EXISTING UTILITIES.
15. IN THE EVENT A WELL IS FOUND, THE CONTRACTOR SHALL CONTACT THE ENGINEER AND OWNER IMMEDIATELY. ALL WELLS SHALL BE SEALED BY A LICENSED WELL CONTRACTOR IN ACCORDANCE WITH ALL STATE OF MN REQUIREMENTS.
16. IN THE EVENT THAT UNKNOWN CONTAINERS OR TANKS ARE ENCOUNTERED, THE CONTRACTOR SHALL CONTACT THE OWNER AND/OR OWNERS REPRESENTATIVE IMMEDIATELY. ALL CONTAINERS SHALL BE DISPOSED OF AT A PERMITTED LANDFILL PER THE PROJECT DOCUMENTS.
17. CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY EXISTING DRAINTILE IS ENCOUNTERED ON SITE. NO ACTIVE DRAINTILE SHALL BE REMOVED WITHOUT APPROVAL FROM THE ENGINEER.

LEGEND

- ROCK ENTRANCE
- EROSION CONTROL BLANKET
- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- SAFETY FENCE
- BIOROLL
- PROPERTY LINE
- REMOVE BITUMINOUS SURFACE
- REMOVE CONCRETE SURFACE
- REMOVE BUILDING
- CLEARING & GRUBBING
- FULL DEPTH SAWCUT
- REMOVE TREE
- REMOVE CONCRETE CURB & GUTTER
- REMOVE UTILITY LINES
- FILL & ABANDON UTILITY LINES
- LIMITS OF CONSTRUCTION
- EXISTING OVERHEAD POWER LINE
- EXISTING CHAINLINK FENCE
- EXISTING J-BARRIER
- EXISTING RETAINING WALL
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- EXISTING GAS MAIN
- EXISTING UNDERGROUND TELEPHONE
- EXISTING UNDERGROUND CABLE
- EXISTING CONTOUR
- EXISTING CURB & GUTTER
- EXISTING SIGN
- EXISTING FLARED END SECTION
- EXISTING STORM MANHOLE
- EXISTING STORM CATCHBASIN
- EXISTING GAS METER
- EXISTING POST INDICATOR VALVE
- EXISTING WELL
- EXISTING AUTOMATIC SPRINKLER
- EXISTING ROOF DRAIN
- EXISTING GATE VALVE
- EXISTING HYDRANT
- EXISTING METAL COVER
- EXISTING ELECTRICAL METER
- EXISTING AIR CONDITIONER
- EXISTING TELEPHONE MANHOLE
- EXISTING CABLE BOX
- EXISTING GUY WIRE
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- EXISTING TREE
- EXISTING TREE LINE

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

PRELIMINARY - NOT FOR CONSTRUCTION

No.	REVISIONS	DATE	BY
3	CITY & RPBCWD RESUBMISSION	03/18/2021	MTL
2	CITY & RPBCWD RESUBMISSION	02/15/2021	MTL
1	CITY & RPBCWD RESUBMISSION	12/20/2020	MTL

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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.

BRIAN M. WURDEMAN

DATE 10/23/2020 LIC. NO. 50113

KHA PROJECT	160094010
DATE	10/23/2020
SCALE	AS SHOWN
DESIGNED BY	MTL
DRAWN BY	MTL
CHECKED BY	BMW

DEMO & EROSION CONTROL PLAN

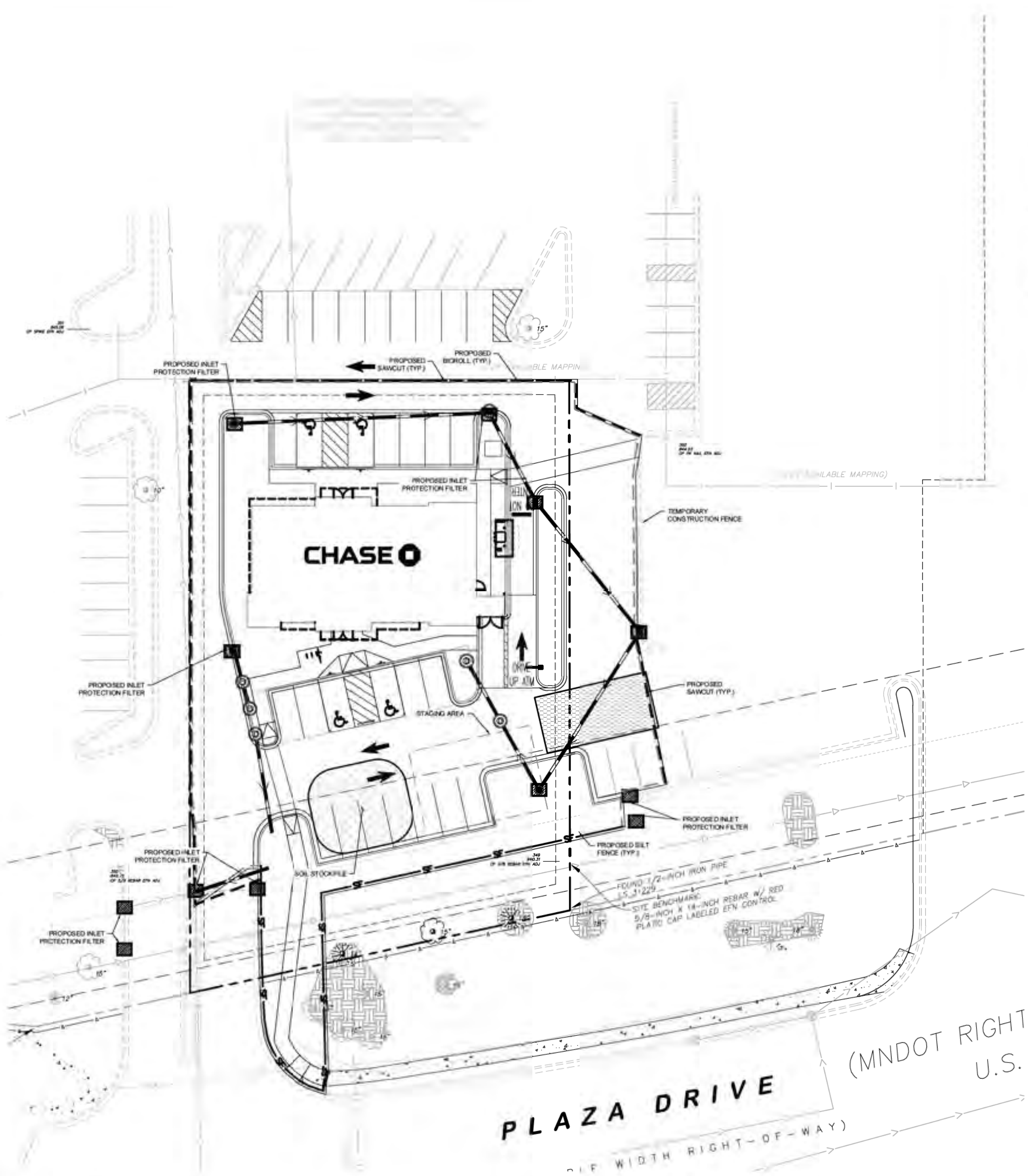
CHASE BANK

PREPARED FOR

THE ARCHITECTS PARTNERSHIPS

EDEN PRAIRIE MN

SHEET NUMBER
C400



LEGEND

- ROCK ENTRANCE
- EROSION CONTROL BLANKET
- INLET PROTECTION
- SILT FENCE
- LIMITS OF DISTURBANCE
- SAFETY FENCE
- BIOROLL

SITE COMPACTION NOTES

1. THE CONTRACTOR SHALL ENSURE ALL SOIL SURFACE COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE:
   1.1. A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF SOIL OR
   1.2. A BULK DENSITY OF LESS THAN 1.4 GRAMS PER CUBIC CENTIMETER OR 87 POUNDS PER CUBIC FOOT IN THE UPPER 12 INCHES OF SOIL.

IN ADDITION, UTILITIES, TREE ROOTS AND OTHER EXISTING VEGETATION MUST BE PROTECTED UNTIL FINAL REVEGETATION OR OTHER STABILIZATION OF THE SITE.

2. STABILIZATION OF DISTURBED AREAS MUST BEGIN IMMEDIATELY WHENEVER LAND-DISTURBING ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME WITHIN SEVEN CALENDAR DAYS ON A PROPERTY THAT DRAINS TO AN IMPAIRED WATER. WITHIN 14 DAYS ELSEWHERE.

EROSION CONTROL PLAN NOTES

1. ALL PERIMETER SILT FENCE AND ROCK CONSTRUCTION ENTRANCES SHALL BE INSTALLED PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL CONSTRUCT DRAINAGE BASINS PRIOR TO SITE GRADING.
3. THE CONTRACTOR SHALL INSTALL CATCH BASIN EROSION CONTROL MEASURES.
4. WITHIN TWO WEEKS (14 DAYS) OF SITE GRADING, ALL DISTURBED AREAS SHALL BE STABILIZED WITH SEED, SOD, OR ROCK BASE. REFER TO LANDSCAPE PLANS FOR MATERIALS.
5. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CITY, STATE, AND WATERSHED DISTRICT PERMITS.
6. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES, INCLUDING THE REMOVAL OF SILT IN FRONT OF SILT FENCES DURING THE DURATION OF THE CONSTRUCTION.
7. ANY EXCESS SEDIMENT IN PROPOSED BASINS SHALL BE REMOVED BY THE CONTRACTOR.
8. REMOVAL ALL EROSION CONTROL MEASURES AFTER VEGETATION IS ESTABLISHED.
9. THE CONTRACTOR SHALL REMOVE ALL SOILS AND SEDIMENT TRACKED ONTO EXISTING STREETS AND PAVED AREAS AND SHALL SWEEP ADJACENT STREETS AS NECESSARY IN ACCORDANCE WITH CITY REQUIREMENTS.
10. IF BLOWING DUST BECOMES A NUISANCE, THE CONTRACTOR SHALL APPLY WATER FROM A TANK TRUCK TO ALL CONSTRUCTION AREAS.

SEQUENCE OF CONSTRUCTION:

UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: TRAILER, PARKING, LAYDOWN, PORTA-POTTY, WHEEL WASH, CONCRETE WASHOUT, FUEL AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC., IMMEDIATELY DENOTE THEM ON THE SITE MAPS AND NOTE ANY CHANGES IN LOCATION AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.

BMP AND EROSION CONTROL INSTALLATION SEQUENCE SHALL BE AS FOLLOWS:

1. TEMPORARILY SEED, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 7 DAYS OR MORE.
2. INSTALL UTILITIES, UNDERDRAINS, STORM SEWERS, UNDERGROUND SYSTEM, CURBS AND GUTTERS.
3. INSTALL APPROPRIATE INLET PROTECTION AT ALL STORM SEWER STRUCTURES AS EACH INLET STRUCTURE IS INSTALLED.
4. PERMANENTLY STABILIZE AREAS TO BE VEGETATED AS THEY ARE BROUGHT TO FINAL GRADE.
5. PREPARE SITE FOR PAVING.
6. PAVE SITE AND INSTALL STRIPING.
7. INSTALL APPROPRIATE INLET PROTECTION DEVICES FOR PAVED AREAS AS WORK PROGRESSES.
8. COMPLETE GRADING AND INSTALLATION OF PERMANENT STABILIZATION OVER ALL AREAS.
9. OBTAIN CONCURRENCE WITH THE CIVIL ENGINEERING CONSULTANT THAT THE SITE HAS BEEN FULLY STABILIZED THEN:
   1. REMOVE ALL REMAINING TEMPORARY EROSION ADN SEDIMENT CONTROL DEVICES.
   2. STABILIZE ANY AREAS DISTURBED BY THE REMOVAL OF BMPS.

RPBCWD EROSION CONTROL PLAN NOTES

1. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE.
2. ADDITIONAL MEASURES, SUCH AS HYDRAULIC MULCHING AND OTHER PRACTICES AS SPECIFIED BY THE DISTRICT MUST BE USED ON SLOPES OF 3:1 (H:V) OR STEEPER TO PROVIDE ADEQUATE STABILIZATION.
3. FINAL SITE STABILIZATION MEASURES MUST SPECIFY THAT AT LEAST SIX INCHES OF TOPSOIL OR ORGANIC MATTER BE SPREAD AND INCORPORATED INTO THE UNDERLYING SOIL DURING FINAL SITE TREATMENT WHEREVER TOPSOIL HAS BEEN REMOVED.
4. CONSTRUCTION SITE WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, LITTER AND SANITARY WASTE MUST BE PROPERLY MANAGED.
5. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE MAINTAINED UNTIL COMPLETION OF CONSTRUCTION AND VEGETATION IS ESTABLISHED SUFFICIENTLY TO ENSURE STABILITY OF THE SITE, AS DETERMINED BY THE DISTRICT.
6. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE REMOVED UPON FINAL STABILIZATION.
7. SOIL SURFACES COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF THE SOIL PROFILE WHILE TAKING CARE TO PROTECT UTILITIES, TREE ROOTS AND OTHER EXISTING VEGETATION.
8. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN 7 CALENDAR DAYS AFTER LAND-DISTURBING WORK HAS TEMPORARILY OR PERMANENTLY CEASED ON A PROPERTY THAT DRAINS TO AN IMPAIRED WATER, WITHIN 14 DAYS ELSEWHERE.
9. THE PERMITTEE MUST, AT A MINIMUM, INSPECT, MAINTAIN AND REPAIR ALL DISTURBED SURFACES AND ALL EROSION AND SEDIMENT CONTROL FACILITIES AND SOIL STABILIZATION MEASURES EVERY DAY WORK IS PERFORMED ON THE SITE AND AT LEAST WEEKLY UNTIL LAND-DISTURBING ACTIVITY HAS CEASED. THEREAFTER, THE PERMITTEE MUST PERFORM THESE RESPONSIBILITIES AT LEAST WEEKLY UNTIL VEGETATIVE COVER IS ESTABLISHED. THE PERMITTEE WILL MAINTAIN A LOG OF ACTIVITIES UNDER THIS SECTION FOR INSPECTION BY THE DISTRICT ON REQUEST.

PRELIMINARY - NOT FOR CONSTRUCTION

No.	REVISIONS	DATE	BY
3	CITY & RPBCWD RE-SUBMISSION	03/15/2021	MTL
2	CITY & RPBCWD RESUBMISSION	02/15/2021	MTL
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Kimley»Horn
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BRIAN M. WURDEMAN, PE
DATE 10/23/2020 LIC. NO. 53113

KHA PROJECT 160094010
DATE 10/23/2020
SCALE AS SHOWN
DESIGNED BY MTL
DRAWN BY MTL
CHECKED BY BMW

EROSION AND SEDIMENT CONTROL PLAN - PHASE 2

CHASE BANK
PREPARED FOR
THE ARCHITECTS PARTNERSHIPS
EDEN PRAIRIE MN

SHEET NUMBER
C401

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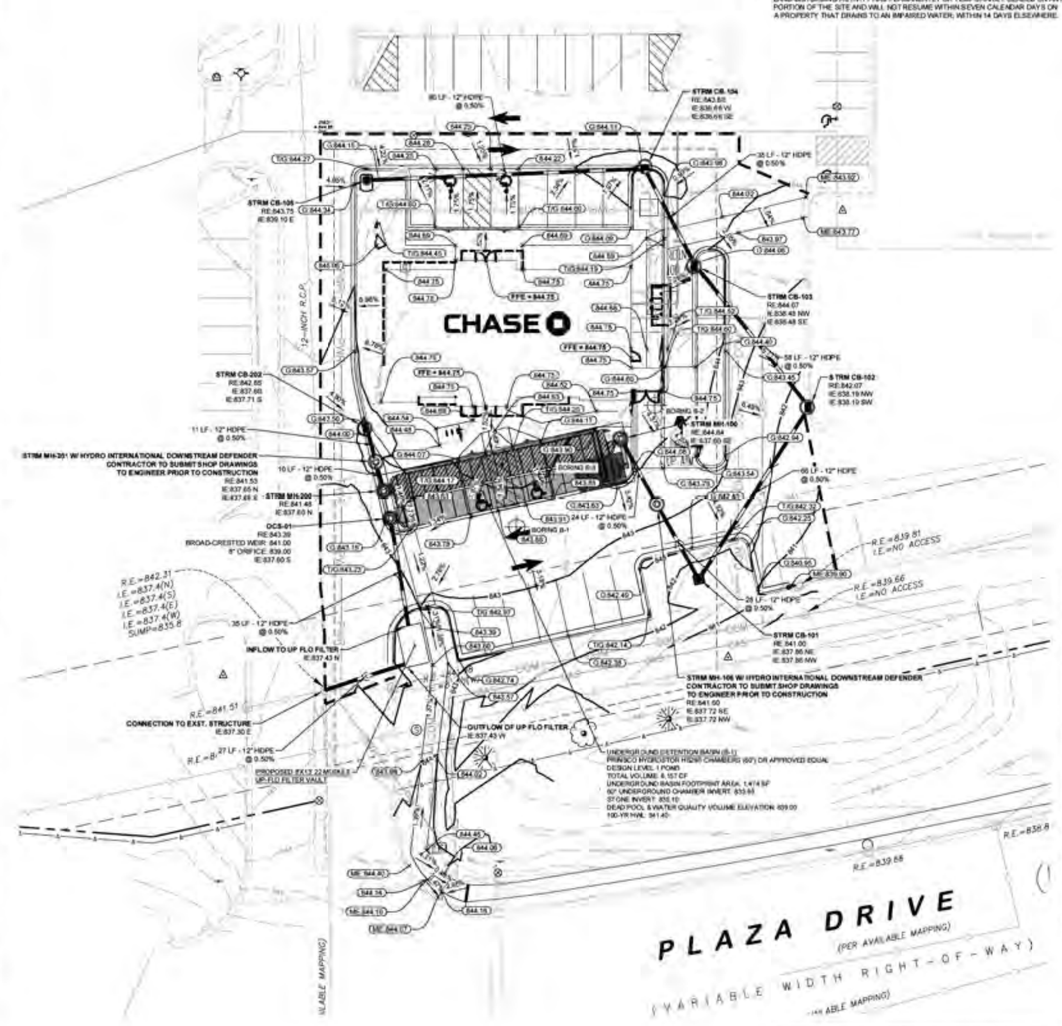
SITE COMPACTION NOTES

1. THE CONTRACTOR SHALL ENSURE ALL SOIL SURFACE COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE:
   1.1. A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF SOIL OR
   1.2. A BULK DENSITY OF LESS THAN 1.4 GRAMS PER CUBIC CENTIMETER OR 87 POUNDS PER CUBIC FOOT IN THE UPPER 12 INCHES OF SOIL.

IN ADDITION: UTILITIES, TREE ROOTS AND OTHER EXISTING VEGETATION MUST BE PROTECTED UNTIL FINAL REVEGETATION OR OTHER STABILIZATION OF THE SITE.

2. STABILIZATION OF DISTURBED AREAS MUST BEGIN IMMEDIATELY WHENEVER LAND-DISTURBING ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME WITHIN SEVEN CALENDAR DAYS ON A PROPERTY THAT DRAINS TO AN IMPAIRED WATER; WITHIN 14 DAYS ELSEWHERE.



STORMWATER HARVESTING SYSTEM REQUIREMENTS

1. SYSTEM SHALL DESIGNED BY A CERTIFIED IRRIGATION CONTRACTOR OR LICENSED LANDSCAPE ARCHITECT.
2. THE SYSTEM, INCLUDING PUMPS, CONTROLLERS, CONNECTIONS, AND IRRIGATION LINE PLACEMENT MUST BE SUBMITTED FRO REVIEW AND APPROVAL BY CITY STAFF.
3. THE SYSTEM MUST INCLUDE A CONNECTION TO MUNICIPAL WATER AS A BACK UP IRRIGATION SOURCE - THIS CONNECTION MUST INCLUDE AN AIR GAP OR OTHER BACKFLOW PREVENTION PRACTICE AND CLEARLY SHOWN ON THE PLANS.
4. MUNICIPAL WATER CANNOT BE PUMPED INTO POND TO BE LATER PUMPED INTO THE IRRIGATION SYSTEM.
5. PRIVATE IRRIGATION WELLS AS A BACK-UP IRRIGATION SOURCE ARE NOT ALLOWED.
6. IRRIGATION HEADS MUST BE PLACED A MINIMUM 6" FROM BACK OF CURB, TRAIL, SIDEWALK OR OTHER HARD SURFACE.
7. EPA APPROVED SMART CONTROLLERS MUST BE USED.
8. PROVIDE DETAIL RELATED TO THE PUMP AND CONTROLLER INCLUDING DETAILED RELATED TO THE FLOAT SYSTEM AS WELL AS CLEARLY IDENTIFYING PROTECTION/SCREENING FOR THE SYSTEM INTAKE IN THE POND AND LOCATION OF INTAKE IN THE POND (ELEVATION AND GENERAL LOCATION).
9. THE SYSTEM SHOULD BE DESIGNED TO INCLUDE AN EXTERIOR METER LOCATION ON THE SYSTEM THAT ALLOWS FOR CITY STAFF TO DETERMINE THE HOURS OF USE OR GALLONS PUMPED FROM THE POND FOR REPORTING PURPOSES TO THE DNR.
10. CHECK VALVES SHOULD BE CLEARLY NOTED WHERE NECESSARY, ROTORS SHOULD BE PRESSURE REGULATED TO 45 PSI AND SPRAYS OPERATED AT 30 PSI.

STORMWATER MANAGEMENT NOTES

1. REQUIRED DEAD POOL VOLUME: 1,152 CUBIC FEET
   REQUIRED WATER QUALITY VOLUME: 2,747 CUBIC FEET
   TOTAL REQUIRED PERMANENT POOL VOLUME: 3,900 CUBIC FEET
2. UNDERGROUND BASIN WILL BE LINED WITH IMPERMEABLE LINER.
3. THE UNDERGROUND DETENTION BASIN PROVIDES 4,095 CUBIC FEET OF PERMANENT POOL VOLUME WHICH EXCEEDS THE 3,900 CUBIC FEET REQUIREMENT TO MEET THE REQUIREMENTS.
4. BASIN EXCAVATION SHALL BE HELD 1' ABOVE THE BOTTOM OF THE BASIN UNTIL THE CONTRIBUTING DRAINAGE AREAS WITH EXPOSED SOILS HAVE BEEN FULLY STABILIZED AND BITUMINOUS BASE COURSE INSTALLED ON THE CONTRIBUTING AREAS.
5. DIVERT UPLAND DRAINAGE AREAS TO PREVENT RUNOFF FROM ENTERING THE EXCAVATED CELL OR INTO THE WORK AREA.
6. CARE MUST BE TAKEN TO AVOID CONTAMINATION OF ENGINEERED SOILS WITH SEDIMENT, IN-SITU OR TOPSOIL DURING AND AFTER INSTALLATION. MATERIALS MUST BE SEGREGATED.
7. INSTALLATION WITH DRY SOIL CONDITIONS IS CRITICAL TO PREVENT SMEARING. SCHEDULE WORK FOR PERIODS OF DRY WEATHER.
8. DO NOT LEAVE FILTRATION AREAS AND/OR PERIMETER SLOPE EXPOSED OVERNIGHT. SECURE THE AREA FROM RISK OF PRECIPITATION DAMAGES AT THE END OF EVERY WORK DAY. IN THE EVENT OF RAIN, TAKE ACTION TO DIVERT STORMWATER AWAY FROM WORK AREA AND TEMPORARILY COVER ALL EXPOSED SOILS WITH FILTER FABRIC OR IMPERMEABLE SHEETING.
9. IN THE EVENT THAT THE SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, REMOVE SEDIMENT PRIOR TO INITIATING THE NEXT STEP IN THE BASIN CONSTRUCTION PROCESS.
10. EXCAVATE SEDIMENT BUILT UP DURING CONSTRUCTION AFTER STABILIZATION OF UPSTREAM AREAS AND BEFORE PLACEMENT OF HYDRAULIC SOIL STABILIZER TYPE SPECIAL.
11. STOCKPILING OF MATERIAL SHALL NOT BE ALLOWED IN PROPOSED BASIN.
12. ALL BASINS CONSTRUCTION ACTIVITIES SHALL BE COMPLETED DURING DRY SOIL CONDITIONS.
13. ALL WET PONDS SHALL BE PROTECTED DURING CONSTRUCTION OPERATIONS.

STORMWATER POND REQUIREMENTS	
REQUIREMENT	**PROPOSED**
DEAD STORAGE OF AT LEAST 1800 CUBIC FEET PER ACRE OF DRAINAGE AREA DEAD POOL VOLUME = 1800 CF X 0.64 AC = 1,152.45 CF REQUIRED + WATER QUALITY VOLUME IS GREATER THAN 1.5" OF IMPERVIOUS AREA WATER QUALITY VOLUME = 1.5" X 21,979.99 SF = 2,747 CF REQUIRED = PERMANENT POOL VOLUME REQUIRED = 3,900 CF	PERMANENT POOL VOLUME PROVIDED = 4,095 CF
POND'S PERMANENT STORAGE VOLUME MUST BE A MINIMUM OF 3-FEET	3.9 FEET
FLOW PATH LENGTH TO POND WIDTH RATIO 3:1 TO 10:1	BASIN LENGTH = 75.89' BASIN WIDTH = 19.42' RATIO = 3.9:1
WET EXTENDED DETENTION OR MULTI-CELL SYSTEM	WET EXTENDED DETENTION POND

LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED STORM MANHOLE (SOLID CASTING)
- PROPOSED STORM MANHOLE (ROUND INLET CASTING)
- PROPOSED STORM MANHOLE/ CATCH BASIN (CURB INLET CASTING)
- PROPOSED STORM SEWER CLENOUT
- PROPOSED FLARED END SECTION
- PROPOSED RIPRAP
- PROPOSED STORM SEWER
- PROPOSED STORM SEWER
- (100.00) PROPOSED SPOT ELEVATION
- (HP 0.0) PROPOSED HIGH POINT ELEVATION
- (LP 0.0) PROPOSED LOW POINT ELEVATION
- (G 0.00) PROPOSED GUTTER ELEVATION
- (T 0.00) PROPOSED TOP OF CURB ELEVATION
- (T/G 0.0) PROPOSED FLUSH PAVEMENT ELEVATION
- (ME 0.0) MATCH EXISTING ELEVATION
- (EOF 0.0) PROPOSED EMERGENCY OVERFLOW
- 0.0% PROPOSED DRAINAGE DIRECTION
- 0.00% PROPOSED ADA SLOPE

GRADING PLAN NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY OF EDEN PRAIRIE SPECIFICATIONS AND BUILDING PERMIT REQUIREMENTS.
2. CONTRACTOR TO CALL GOPHER STATE CALL ONE @ <1-800-252-1166> AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION/CONSTRUCTION FOR UTILITY LOCATIONS.
3. STORM SEWER PIPE SHALL BE AS FOLLOWS:
   RCP PER ASTM C-76
   HDPE: 0" - 10" PER AASHTO M-252
   HDPE: 12" OR GREATER PER ASTM F-2306
   PVC SCH. 40 PER ASTM D-1785
   STORM SEWER FITTINGS SHALL BE AS FOLLOWS:
   RCP PER ASTM C-76, JOINTS PER ASTM C-361, C-990, AND C-443
   HDPE PER ASTM 3212
   PVC PER ASTM D-3034, JOINTS PER ASTM D-3212
4. CONTRACTOR TO FIELD VERIFY THE LOCATIONS AND ELEVATIONS OR EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO THE START OF SITE GRADING. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER OF ANY DISCREPANCIES OR VARIATIONS.
5. SUBGRADE EXCAVATION SHALL BE BACKFILLED IMMEDIATELY AFTER EXCAVATION TO HELP OFFSET ANY STABILITY PROBLEMS DUE TO WATER SEEPAGE OR STEEP SLOPES. WHEN PLACING NEW SURFACE MATERIAL ADJACENT TO EXISTING PAVEMENT, THE EXCAVATION SHALL BE BACKFILLED PROMPTLY TO AVOID UNDERMINING OF EXISTING PAVEMENT.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HORIZONTAL AND VERTICAL CONTROL.
7. CONTRACTOR SHALL EXCAVATE DRAINAGE TRENCHES TO FOLLOW PROPOSED STORM SEWER ALIGNMENTS.
8. GRADES SHOWN ARE FINISHED GRADES. CONTRACTOR SHALL ROUGH GRADE TO SUBGRADE ELEVATION AND LEAVE STREET READY FOR SUBBASE.
9. ALL EXCESS MATERIAL, BITUMINOUS SURFACING, CONCRETE ITEMS, ANY ABANDONED UTILITY ITEMS, AND OTHER UNSTABLE MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF THE CONSTRUCTION SITE.
10. REFER TO THE UTILITY PLAN FOR SANITARY SEWER MAIN, WATER MAIN SERVICE LAYOUT AND ELEVATIONS AND CASTING / STRUCTURE NOTATION.
11. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF PAVEMENTS AND CURB AND GUTTER WITH SMOOTH UNIFORM SLOPES TO PROVIDE POSITIVE DRAINAGE.
12. INSTALL A MINIMUM OF <4" CLASS 5> AGGREGATE BASE UNDER CURB AND GUTTER AND CONCRETE SIDEWALKS.
13. UPON COMPLETION OF EXCAVATION AND FILLING, CONTRACTOR SHALL RESTORE ALL STREETS AND DISTURBED AREAS ON SITE. ALL DISTURBED AREAS SHALL BE RE-VEGETATED WITH A MINIMUM OF <4" OF TOPSOIL>.
14. ALL SPOT ELEVATIONS/CONTOURS ARE TO GUTTER / FLOW LINE UNLESS OTHERWISE NOTED.
15. GRADING FOR ALL SIDEWALKS AND ACCESSIBLE ROUTES INCLUDING CROSSING DRIVEWAYS SHALL CONFORM TO CURRENT ADA STATE/NATIONAL STANDARDS. IN NO CASE SHALL ACCESSIBLE RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2%. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5%. IN NO CASE SHALL ACCESSIBLE PARKING STALLS OR AISLES EXCEED 2% (1.5% TARGET) IN ALL DIRECTIONS. SIDEWALK ACCESS TO EXTERNAL BUILDING DOORS AND GATES SHALL BE ADA COMPLIANT. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF ADA CRITERIA CANNOT BE MET IN ANY LOCATION PRIOR TO PAVING. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR A.D.A COMPLIANCE ISSUES.
16. MAINTAIN A MINIMUM OF 0.5% GUTTER SLOPE TOWARDS LOW POINTS.
17. CONTRACTOR TO PROVIDE 3" INSULATION BY 5' WIDE CENTERED ON STORM PIPE IF LESS THAN 4' OF COVER IN PAVEMENT AREAS AND LESS THAN 3' OF COVER IN LANDSCAPE AREAS.
18. ALL STORM SEWER CONNECTIONS SHALL BE GASKETED AND WATER TIGHT INCLUDING MANHOLE CONNECTIONS.
19. ALL STORM SEWER PIPE SHALL BE AIR TESTED IN ACCORDANCE WITH THE CURRENT PLUMBING CODE.
20. MAINTAIN A MINIMUM OF 1.25% SLOPE IN BITUMINOUS PAVEMENT AREAS, 0.5% SLOPE IN CONCRETE PAVEMENT AREAS.
21. CONTRACTOR SHALL REVIEW PAVEMENT GRADIENT AND CONSTRUCT "IN FALL CURB" WHERE PAVEMENT DRAINS TOWARD GUTTER, AND "OUTFALL" CURB WHERE PAVEMENT DRAINS AWAY FROM GUTTER.

IRRIGATION USEAGE METER

PROPOSED UNDERGROUND SYSTEM WILL BE USED FOR IRRIGATION REUSE. AN IRRIGATION USAGE METER WILL BE PROVIDED FOR ON-SITE MEASUREMENTS AND IS REQUIRED FOR ANNUAL DOCUMENTATION TO THE WATERSHED DISTRICT

LANDSCAPE AREA SPECIFICATIONS

6" OF PROPOSED DECOMPACTED TOPSOIL ABOVE 12" REHABILITATED ENGINEERED SOIL MEDIA. MNDOT SPEC. 3877 FILTER TOPSOIL BORROW, MODIFIED TO HAVE A MIXTURE BY VOLUME OF 80% SAND COVER MEETING GRADATION REQUIREMENTS OF SPEC. 3126 "FINE AGGREGATE FOR PORTLAND CEMENT CONCRETE" AND 20% MNDOT GRADE 2 COMPOST. CONTRACTOR IS TO NOT COMPACT PROPOSED LANDSCAPE AREAS

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

PRELIMINARY - NOT FOR CONSTRUCTION

CHASE BANK
PREPARED FOR
THE ARCHITECTS PARTNERSHIPS
EDEN PRAIRIE MN

GRADING & DRAINAGE PLAN

KHA PROJECT	160094010
DATE	10/23/2020
SCALE	AS SHOWN
DESIGNED BY	MTL
DRAWN BY	MTL
CHECKED BY	BMW

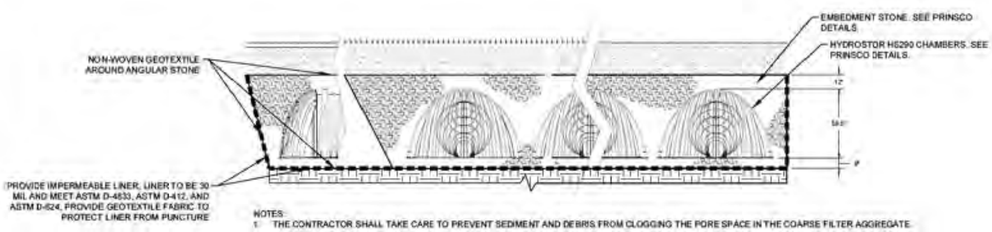
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
767 EUSTIS STREET, SUITE 100, ST. PAUL, MN 55114
PHONE: 651-645-4197
WWW.KIMLEY-HORN.COM

No.	REVISIONS	DATE	BY
1	CITY & RPBCWD RESUBMISSION	12/22/2020	MTL
2	CITY & RPBCWD RESUBMISSION	02/15/2021	MTL
3	CITY & RPBCWD RE-SUBMISSION	03/16/2021	MTL

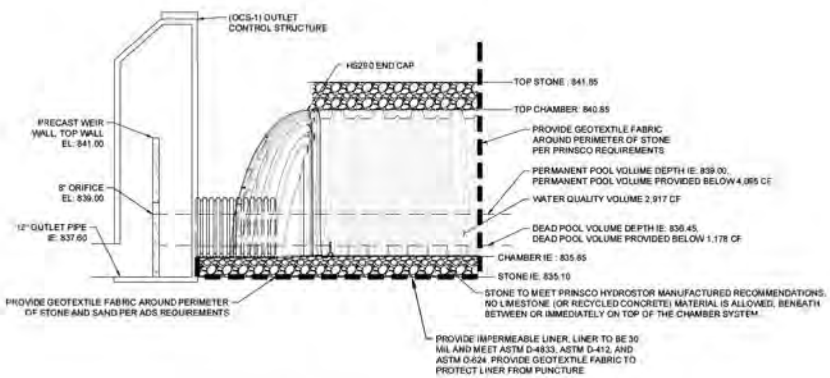
SHEET NUMBER
C600

K:\TWC_LDEV\THE ARCHITECTS PARTNERSHIP\Eden Prairie - Chase Bank\3 Design\CAD\PlanSheets\C5-GRADING PLAN.dwg March 23, 2021 - 11:24am



NOTES:
1. THE CONTRACTOR SHALL TAKE CARE TO PREVENT SEDIMENT AND DEBRIS FROM CLOGGING THE PORE SPACE IN THE COARSE FILTER AGGREGATE.

TYPICAL SECTION - PRINSCO HYDROSTOR HS290 - DETENTION



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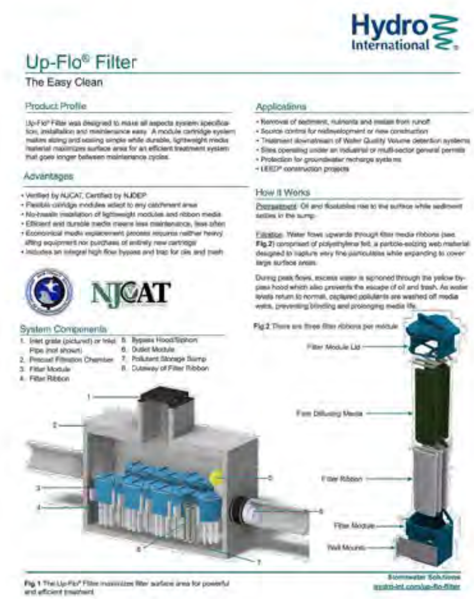

PRELIMINARY - NOT FOR CONSTRUCTION

No.	REVISIONS	DATE	BY
3	CITY & RPBCWD RESUBMISSION	03/15/2021	MTL
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KHA PROJECT 160094010
DATE 10/23/2020
SCALE AS SHOWN
DESIGNED BY MTL
DRAWN BY MTL
CHECKED BY BMW

GRADING & DRAINAGE DETAILS

CHASE BANK
PREPARED FOR
THE ARCHITECTS PARTNERSHIPS
EDEN PRAIRIE MN

SHEET NUMBER
C601

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

18681 Lake Drive East
Chanhassen, MN 55317
952-607-6512
www.rpbcwd.org

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2021-004

Considered at Board of Managers Meeting: April 7, 2021

Received complete: February 22, 2021

Applicant:	Riley Purgatory Bluff Creek Watershed District
Representative:	Jennifer Koehler, Barr Engineering Co.
Project:	The project proposes drainage improvements along Pleasantview Road, ravine/channel stabilization and regrading, small detention basin, and the addition of five (5) iron-enhanced ditch check dams along the channel. The goal of the project is to improve water quality in Silver Lake.
Location:	680 Pleasantview Rd, Chanhassen, Minnesota 55317
Reviewer:	Dallen Webster, EIT; and Scott Sobiech, PE; Barr Engineering Co.

Proposed Board Action

Manager _______________ moved and Manager ____________ seconded adoption of the following resolutions based on the permit report that follows and the presentation of the matter at the April 7, 2021 meeting of the managers:

Resolved that the application for Permit 2021-004 is approved, subject to the conditions and stipulations set forth in the Recommendations section of the attached report;

Resolved that on determination by the RPBCWD administrator that the conditions of approval of the permit have been affirmatively resolved, the RPBCWD president or administrator is authorized and directed to sign and deliver to the applicant, Permit 2021-004 on behalf of RPBCWD.

Upon vote, the resolutions were adopted, _______ [VOTE TALLY].

Applicable Rule Conformance Summary

Rule	Issue	Conforms to RBPCWD Rules?	Comments
A	**Procedural Requirements**	See comment.	See rule-specific permit condition A1.
B	**Floodplain Management and Drainage Alterations**	Yes.	
C	**Erosion Control Plan**	See comment.	See rule-specific permit condition C1.
D	**Wetland and Creek Buffers**	Yes.	
G	**Waterbody Crossings and Structures**	See comment.	See rule-specific permit condition G1.

Rule	Issue		Conforms to RBPCWD Rules?	Comments
J	**Stormwater Management**	Rate	Yes	
		Volume	See Comment	See Rule Specific Permit Condition J1 & See Stipulation #3
		Water Quality	Yes	
		Low Floor Elev.	Yes	
		Maintenance	Yes	
		Chloride Management	Yes	
		Wetland Protection	Yes	
L	**Permit Fee Deposit**		NA	Governmental Agency.
M	**Financial Assurance**		NA	Governmental Agency.

Background

The drainage area to the project location includes large lot residential areas to the northwest that drain to existing curb cuts along Pleasantview Road. Drainage from the curb cuts flows down a steep slope and ultimately to a small, intermittently flowing ravine that discharges north to Silver Lake. Because of the uncontrolled flow, the banks and sides of the ravine are eroded, and the channel is incised several feet on the upstream end under existing conditions.

The proposed work will take place in the City of Chanhassen-owned Pleasantview Park under a cooperative agreement between RPBCWD and the city, and on an adjacent private single-family residential parcel, for which rights to use are pending. The proposed project features include Pleasantview Road drainage improvements including the addition of curb and gutter, catch basin inlets, and storm sewer, ravine/channel stabilization and regrading, small detention basin, and the addition of five (5) iron-enhanced ditch check dams along the ravine. The proposed project does not change drainage patterns in the subwatershed nor does it increase impervious area. Runoff in the ravine discharges to a wetland on the southern shore of Silver Lake, which ultimately discharges to Silver Lake and then Purgatory Creek.

The project site information is summarized in Table 1.

Table 1. Project site information

Project Site Information	Area (acres)
Total Site Area	0.32
Existing Site Impervious	0.02
Post Construction Site Impervious	0.02
New (Increase) in Site Impervious Area	0.0
Sidewalk and Trial Exempt Impervious Area (acres)	0.0
Disturbed impervious surface (acres)	0.02
Total Disturbed Area	0.27

Exhibits:

1. Permit application dated January 27, 2021 (Notified applicant on February 19, 2021 that submittal was incomplete, revised materials completing the application received February 24, 2021)
2. Project Plan set dated January 8, 2021 (revised February 5, 2021 and February 12, 2021)
3. Stormwater Report memo dated February 5, 2021 (revised February 22, 2021 and March 31, 2021)
4. Wetland Delineation and MnRAM Assessment Report dated June 11, 2020 (revised November 6, 2020)
5. Existing and Proposed XPSWMM Models received February 24, 2021
6. P8 Proposed Conditions Model received February 24, 2021
7. Review Responses dated February 24, 2021 (i.e., the applicant's responses to the February 19th incomplete notice/review comments)

Rule Specific Permit Conditions

Rule A: Procedural Requirements

The project permit application and associated documents were submitted for review January 27, 2021. A cooperative agreement authorizing use of the city-owned portion of the project area has been provided, but no authorization to use the adjacent privately owned parcel has been submitted. To conform to RPBCWD Rule A requirements, the following revisions are needed:

A1. A complete permit application includes all required information, exhibits, and fees and must be authorized by all property owners (Rule A, Subsection 2.3). Please provide written documentation demonstrating the remaining necessary property rights to perform the proposed work.

Rule B: Floodplain Management and Drainage Alterations

The proposed earth work and site grading is above of the ordinary high-water level and 100-year flood level of Silver Lake but below 100-year flood elevation contours along the ravine, which meets the RPBCWD definition of a watercourse. Because the project will involve the alteration of surface flows below the 100-year flood elevation of the ravine by changing land contours, the project must conform to the requirements set forth by the RPBCWD Floodplain Management and Drainage Alterations rule (Rule B, Subsection 2.2).

Because the project does not propose new or reconstructed structures, the low floor elevation requirements set forth by Rule B, Subsection 3.1 do not impose requirements on the project.

The project will result in 112 cubic yards of fill and 210 cubic yards of cut below the 100-year floodplain of the ravine. The project will result in a net increase is floodplain storage of 98 cubic yards. Because the project results in a net increase in storage below the 100-year flood elevation, the project conforms to the requirements set forth by Rule B, Subsection 3.2.

In order demonstrate the project is not reasonably likely to have offsite adverse impacts the applicant provided a comparison of existing and proposed discharge rate for the 2-, 10-, and 100-year events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below.

Modeled Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
East Along Pleasant View	0.5	0.0	1.7	0.0	5.3	5.0	0.0	0.0
To Downgradient Wetland	11.3	7.4	25.9	20.0	57.2	55.6	2.9	2.9

The engineer concurs with the XPSWMM modeling results showing that the proposed project does not increase the rate of stormwater discharge above existing conditions east along Pleasantview Road or to Silver Lake. According to the plans, the addition of the curb and gutter and storm sewer along Pleasantview Road will eliminate the uncontrolled flows from the roadway to the ravine. The proposed grading, check dams along the ravine channel, and vegetation reestablishment will help control flows, reduce velocities, and reduce erosion within the channel. The engineer concurs with the modeling submitted by the applicant which shows the total sediment load reduction from the ravine stabilization ranges from 4,200 to 12,400 lbs/yr, depending on the erosion rate. The total phosphorus (TP) load reduction from the ravine stabilization ranges from 2.1 to 6.2 lbs/yr with an additional ~1.6 lbs/yr of TP removal from the watershed runoff from Pleasantview. Because implementation of the plans will provide a reduction in pollutant loading and show that discharges rates are reduced, the proposed alterations are not likely to cause adverse impacts and project conforms to Rule B, Subsection 3.3.

Because the project does not propose an enclosed structure and the plans show the impervious surface associated with the modifications of Pleasantview Road for the storm sewer addition is more than 50 feet from the ravine, the proposed project conforms to the Creekside restrictions criteria set forth by Rule B, Subsection 3.4. See Rule C analysis of the applicants submitted erosion control plan to conform with Rule B, Subsection 3.5. A note on the plans indicates that activities must be conducted to minimize the potential transfer of aquatic invasive species conforming to Rule B, Subsection 3.6.

Rule C: Erosion Prevention and Sediment Control

Because the project will involve the alteration and removal of 50 cubic yards or more of earth, the project must conform to the requirements set forth by the RPBCWD Erosion Prevention and Sediment Control rule (Rule C, Subsection 2.1a).

The erosion control plan prepared by Barr Engineering includes installation of silt fence, sediment control logs, a rock berm construction entrance, daily inspection, staging areas, construction implementation schedule, placement of a minimum of 6 inches of topsoil, decompaction of areas compacted during construction, and retention of native topsoil onsite to the greatest extent possible. To conform to RPBCWD Rule C requirements, the following revisions are needed:

C1. The Applicant must provide the name, address and phone number of the individual who will remain liable to the District for performance under this rule and maintenance of erosion and sediment-control measures from the time the permitted activities commence until vegetative cover is established. This information is required prior to issuance of the permit.

Rule D: Wetland and Creek Buffers

Because the proposed work triggers a permit under RPBCWD Rule B and there are two delineated wetlands (wetland A and B) protected by the state Wetland Conservation Act downgradient from the proposed construction activities, Rule D, Subsections 2.1a and 3.1 require buffers on the edges of the wetlands that are downgradient from the land-disturbing activities (a wetland map is provided below for reference). No disturbance of the wetlands is proposed.

Using the MNRAM functions and values assessment dated June 11, 2020, Wetland A was determined to be medium value and Wetland B was determined to be exceptional value. The land-disturbing activities are located upgradient from the medium value wetland requiring a 40-foot average, 20-foot minimum buffer width (Rule D, Subsection 3.2b.iii) and upgradient of from the exceptional value wetland requiring a 80-foot average, 40-foot minimum buffer width (Rule D, Subsection 3.2b.i). The buffer widths from the project Plan Set are summarized in Table 2 below and demonstrate that the minimum and average buffers widths conform to Rule D, subsection 3.2b.

Table 2. Wetland Buffer Analysis Summary

Wetland ID	RPBCWD Wetland Value	Required Minimum Width[1] (ft)	Required Average Width[1] (ft)	Provided Minimum Width (ft)	Provided Average Width (ft)
Wetland A	Medium	20	40	40	40
Wetland B	Exceptional	40	80	80	80

[1] Average and minimum required buffer width under Rule D, Subsection 3.2.b.

The plan requires revegetating disturbed areas within the proposed buffer with native vegetation, thus conforming with Rule D, Subsection 3.3. The Project Plan set shows that proposed buffer sign locations will conform with Rule D, subsection 3.2. A note is included on the plan sheet indicating the project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible conforming to Rule D, Subsection 3.6.

Subsection 3.5 of Rule D requires the submission of a maintenance declaration. The District and city of Chanhassen entered into a cooperative agreement for long-term project maintenance, including maintenance of the buffer areas.

Rule G: Waterbody Crossings and Structures

Because the project will place rock check dams in contact within the bed and banks of the ravine, which meets RPBCWD's definition of a watercourse, the project requires conformance with RPBCWD's Waterbody Crossings and Structures Rule (Rule G). The criteria in subsections 3.1, 3.5 and 3.7 are relevant to the project.

This work provides a public benefit for Silver Lake, a public water of the state, and addresses a need for stabilization of the watercourse itself by placing the check dams along the watercourse to slow the movement of flows in order to promote infiltration, reduce erosion, and reduce the pollutant load entering the downstream wetland and Silver Lake (Rule G, Subsections 3.1a & b)

RPBCWD completed a 2018 feasibility study for this area which analyzed five alternatives. The following table, taken from the 2018 feasibility study, summarizes the alternatives investigated.

Conceptual Design	Estimated Annual TP Reduction (lbs/yr)(1)	Wetland Impacts (acre)(6)	Upland Impacts (acre) (6)	Number of Impacted Trees(3,6)	Engineer's Opinion of Probable Cost ($)(4)	Anticipated Maintenance Cost over 30-year lifecycle ($)(5)	Annual Cost per Pound TP Removed ($/lbs TP/yr)(2)
	A	B	C	D	E	F	G = (E+F) / A / 30
Conceptual Design 1 Iron-Enhanced Filtration Basin	5.2 – 6.7	~0.2(3)	0.8	~65	$328,000 ($263,000 – $492,000)	$91,700 ($76,400 – $137,500)	$2,350 ($1,670 – $4,040)
Conceptual Design 2 Ditch Checks with Iron-Enhanced Sand	2.6 – 4.7	~0.2(3)	0.6	~35	$122,000 ($98,000 – $183,000)	$58,000 ($46,400 – $87,000)	$1,640 ($1,020 – $3,460)
Conceptual Design 3 Modular Wetland System	3.3 – 4.8	~0.2(3)	0.7	~44	$363,000 ($291,000 – $545,000)	$46,500 ($38,800 – $69,800)	$3,370 ($2,280 – $6,210)
Conceptual Design 4 Kraken Filter	2.9 – 4.4	~0.2(3)	0.6	~40	$321,000 ($257,000 – $482,000)	$212,500 ($177,100 – $318,800)	$4,870 ($3,230 – $9,200)
Conceptual Design 5 StormTree Filter	3.3 – 4.8	~0.2(3)	0.7	~44	$332,000 ($266,000 – $498,000)	$40,400 ($33,600 – $60,600)	$3,070 ($2,070 – $5,640)

Note(s):

(1) Estimated annual total phosphorus (TP) reduction is the removal with the BMP and ravine stabilization, the BMP performance was evaluated over a 30-year period (1986-2015).
(2) Based on a 30-year period. Includes estimated costs for permitting, engineering, and construction; and estimated annual operation and maintenance costs.
(3) A wetland delineation, topographic survey, and tree survey were performed on May 31, 2018.
(4) Estimate includes all BMP and ravine stabilization costs.
(5) Anticipated annual maintenance cost includes filter inspections, replacement and maintenance of filter media, replacement and maintenance of filter components, and BMP vegetation.
(6) Impacts to wetland area, upland area, and number of trees are approximate and will be optimized during the next phase of design.

The feasibility study determined that Option 2 would minimize impacts on wetlands and adjacent upland trees while improving the water quality of the downstream resources by reducing erosion and pollutant loading. Because the proposed design further minimized the potential for adverse impact by eliminating all work within the wetland, flattening the ravine slopes to 3:1, and maintaining a similar channel bottom width, the proposed design represents the minimal impact solution (Rule G, subsection 3.5a).

Picture 1 Existing Ravine Erosion

In addition, the engineer concurs that ravine is highly eroded with the majority of the ravine afflicted with exposed soils and providing minimal ecological function (see photo to the left). The intended purpose of the rock ditch check structures is to stabilize the ravine, reduce erosion, and reduce pollutants reaching the downstream water resources. The plans show the bottom width of the proposed ditch check is similar to the existing ravine and the side slope will be graded to a stable 3:1 slope, thus minimizing the encroachment (Rule G, subsection 3.5b).

The Rule B analysis provided above demonstrates the project complies with district's floodplain rule as required by Rule G, subsection 3.5c.

The proposed grading, check dams along the ravine channel, and vegetation reestablishment will help control flows, reduce velocities, and reduce erosion within the channel. The engineer concurs with the modeling submitted by the applicant which shows the total sediment load reduction from the ravine stabilization ranges from 4,200 to 12,400 lbs/yr, depending on the erosion rate. The total phosphorus (TP) load reduction from the ravine stabilization ranges from 2.1 to 6.2 lbs/yr with an additional ~1.6 lbs/yr of TP removal from the watershed runoff from Pleasantview. Because implementation of the plans will provide a reduction in pollutant loading and show that discharges rates are reduced, the proposed alterations are not likely to cause adverse impacts and project conforms to Rule G, Subsection 3.5d.

The project plans and specifications indicate the banks will be immediately stabilized after completion of permitted work and revegetated as soon as growing conditions allow (Rule G, Subsection 3.7b). A note is included on the plan sheet indicating the project will be constructed so as to minimize the potential transfer of aquatic invasive species (e.g., zebra mussels, Eurasian watermilfoil, etc.) to the maximum extent possible (Rule G, Subsection 3.7c).

Rule G, Subsection 3.7d requires compliance with the applicable criteria in subsections 3.3 of Rule F. Construction drawings submitted show the finished, stabilized side slopes of the ravine will not be steeper than 3:1 as required by Rule F, Subsection 3.3a (ii). Drawings confirm the proposed ditch checks will follow the existing alignment of the watercourse (Rule F, Subsection 3.3a (iii)). The project proposes the use field stone riprap for the construction of the ditch checks with an average size of 6 inches in diameter (MNDOT Class II Riprap). Because the proposed riprap can withstand flow velocities of between 5-10 feet per second, which is slightly greater than the anticipated velocities (3-5 fps), the check dam design is consistent with the erosion intensity for the flow in ravine at this location, thus conforming to Rule F, Subsection 3.3a(iii). Because the ditch check purpose and design is different than typical riprap installation, Rule F, Subsection 3.3b does not impose requirements on this permit.

The proposed work will take place in the City of Chanhassen-owned Pleasantview Park under a cooperative agreement between RPBCWD and the city. The cooperative agreement calls for the development of a maintenance plan post-construction. As part of the agreement the city will be responsible for routine maintenance of the project, the proposed project conforms with Rule G, Section 5.

To conform to the RPBCWD Rule G the following revisions are needed:

G1. A note must be added to the drawings indicating no activity in the watercourse between March 15 and June 15.

Rule J: Stormwater Management

Because the redevelopment project will alter 0.27 acres of land-surface area, and the work in the ROW is part of a larger "redevelopment" project to stabilize the ravine, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.3) for all the disturbed impervious surface on the site.

The proposed project features include Pleasantview Road drainage improvements including the addition of curb and gutter, catch basin inlets, and storm sewer, ravine/channel stabilization and regrading, small detention basin, and the addition of five (5) iron-enhanced ditch check dams along the ravine which provide runoff volume abstraction, water quality treatment, and rate control.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below. The proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

Modeled Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
East Along Pleasant View	0.5	0.0	1.7	0.0	5.3	5.0	0.0	0.0

To Downgradient Wetland	11.3	7.4	25.9	20.0	57.2	55.6	2.9	2.9

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from the impervious surface of the site. An abstraction volume of 90 cubic feet is required from the 1000 square feet of regulated impervious area. Pretreatment of runoff prior to entering the detention basin is provided by a sump manhole to conform to Rule J, Subsection 3.1b.2.

Soils in the upland portion of the project area below the proposed detention basin was primarily identified as sandy loam. The MN Stormwater Manual indicates an infiltration rate of 0.8 inches per hour for sandy loam. While the stormwater report lists a suggested infiltration rate of 0.8 inches per hour based on soil classification, infiltration or hydraulic conductivity testing has not yet been completed at the bottom of the infiltration facilities, as required by Rule J, Subsection 3.1.b.ii.c. The applicant must submit documentation verifying the infiltration capacity of the soils and that the volume control capacity is calculated using the measured infiltration rate prior to project close-out. If infiltration capacity is less than the rate needed to conform with the volume abstraction requirement in subsection 3.1b, design modifications to achieve compliance with RPBCWD requirements will need to be submitted (in the form of an application for a permit modification or new permit).

Groundwater was not observed during the soil borings. No water has been observed in this ravine, whose bottom ranging from approximately 909.0 down to 904.0, during periods between rain events. Additionally, the observations of the ground surface in the wetland downstream, ranging from approximately 904.0 down to 900.0, is also dry during period between rain events. This suggests that the groundwater is below elevation 900.0. The bottom of the proposed basin at the storm sewer outlfall is at an elevation of 910.5 feet. This indicates that groundwater is at least 3 feet below the bottom of the proposed stormwater management systems (Rule J, Subsection 3.1.b.ii.2).

The proposed stormwater facilities provide adequate surface area to drawdown the abstraction volumes within the required 48-hour period, thus conforming with Rule J, Subsection 3.1.b.ii.3, assuming the infiltration rates are consistent with design assumptions.

The following table summarizes the abstraction analysis.

Required Abstraction Depth (inches)	Required Abstraction Volume (cubic feet)	Provided Abstraction Depth (inches)	Provided Abstraction Volume (cubic feet)
1.1	90	1.5	109

The engineer concurs with the submitted information and finds that the proposed project will conform with Rule J, Subsection 3.1.b. However, the following revision is needed to clarify the proposed construction drawings with the narrative provided:

J1. Permit applicant must provide updated construction drawings clarifying the retention depth in the proposed basin align with the design intent present in the stormwater narrative memo.

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant provide volume abstraction in accordance with 3.1b or least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. Because the BMPs proposed by the applicant provide more volume abstraction than is require by 3.1b and the engineer concurs with the modeling, the engineer finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

Low floor Elevation

Because the project does not involve the construction or reconstruction of any buildings, Rule J, subsection 3.6a does not impose requirements on the project.

Stormwater management facilities must be constructed at an elevation and location that ensure no habitable structure will be brought into noncompliance with the low floor criteria according to Rule J, subsection 3.6b. The following table summarizes the low floor analysis for the existing habitable structures adjacent to the proposed stormwater facilities. Because the provided freeboard is greater than the required, the elevation and location of the proposed stormwater facility meets the requirement in Rule J, Subsection 3.6.b.

Adjacent Habitable Structure	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Freeboard (feet)
6285 Ridge Road	930[1]	913.1	16.9

[1] Estimated as 10 feet lower than the lowest adjacent ground from topography data

Maintenance

Subsection 3.7 of Rule J requires the submission of a maintenance agreement. The proposed work will take place in the City of Chanhassen-owned Pleasantview Park under a cooperative agreement between RPBCWD and the city. The cooperative agreement calls for the development of a maintenance plan post-construction. As part of the agreement the city will be responsible for routine maintenance of the project, the proposed project conforms with Rule J, Section 3.7.

Chloride Management

Subsection 3.8 of Rule J requires the submission of chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan. The City of Chanhassen is responsible for the roadway maintenance and provided a chloride management plan in conformance with the criteria.

Wetland Protection

In accordance with Rule J, subsection 3.10a, there is no proposed activity that will alter the site in a manner that increases the bounce in water level, duration of inundation, or change the runout elevation in the subwatershed, for the wetland receiving runoff from the land disturbing activities. Because the applicant's model results demonstrate, and the engineer concurs, that the proposed flow rate and volumes flowing towards the off-site wetland are less than the under existing conditions, the bounce and inundation will not increase, thus the project meets the Bounce and Inundation criterion.

Rule J, Subsection 3.10b requires that the treatment of runoff to the exceptional value wetland archive 90 percent total suspended solids removal and 75 percent total phosphorus removal. P8 modeling results are summarized in tables below showing the annual TSS and TP removal requirements are achieved, thus the engineer finds that the proposed project is in conformance with Rule J, Subsection 3.10b.

Annual TSS and TP removal summary

Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr)	Provided Load Reduction (lbs/yr)[1]
Total Suspended Solids (TSS)	24	22 (90%)	4,200 to 12,400 (>100%)
Total Phosphorus (TP)	0.1	0.075 (75%)	3.7 to 7.8 (>100)%

[1] Because the stormwater facilities treat runoff from more area than the site and ravine stabilization features reduce the bank erosion, the proposed site improvements are anticipated to remove more than the required load reductions.

Applicable General Requirements:

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of work.
2. Construction shall be consistent with the plans and specifications approved by the District as a part of the permitting process. The date of the approved plans and specifications is listed on the permit.
3. Construction must be consistent with the plans, specifications, and models that were submitted by the applicant that were the basis of permit approval. The date(s) of the approved plans, specifications, and modeling are listed on the permit. The grant of the permit does not in any way relieve the permittee, its engineer, or other professional consultants of responsibility for the permitted work.
4. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
5. The issuance of this permit does not convey any rights to either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
6. In all cases where the doing by the permittee of anything authorized by this permit involves the taking, using or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements or interests, the permittee, before proceeding therewith, must acquire all necessary property rights and interest.
7. RPBCWD's determination to issue this permit was made in reliance on the information provided by the applicant. Any substantive change in the work affecting the nature and extent of applicability of RPBCWD regulatory requirements or substantive changes in the methods or means of compliance with RPBCWD regulatory requirements must be the subject of an application for a permit modification to the RPBCWD.
8. If the conditions herein are met and the permit is issued by RPBCWD, the applicant, by accepting the permit, grants access to the site of the work at all reasonable times during and after construction to authorized representatives of the RPBCWD for inspection of the work.

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The proposed project will conform to Rules A, B, C, D, G and J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval of the permit contingent upon:

1. Continued compliance with General Requirements.
2. The applicant providing the name and contact information of the general contractor responsible for the site.
3. The applicant providing written documentation demonstrating the necessary property rights and permissions to perform the proposed work or revised the proposed work on the drawings to align with the obtained property rights.
4. Receipt of revised drawings or specifications indicating no activity in the watercourse between March 15 and June 15.
5. Permit applicant providing updated construction drawings clarifying the retention depth in the proposed basin aligns with the design intent presented in the stormwater narrative memo.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule C, Subsection 3.3 the permit holder will be responsible for the inspection, maintenance and effectiveness of all erosion prevention and sediment control facilities, features and techniques. The permittee must inspect all erosion prevention and sediment control facilities and soil stabilization measures to ensure integrity and effectiveness until final site stabilization.
2. Per Rule D, Subsection 3.4.a. the plans and specifications must identify the installation date, which must be set to ensure protection of buffer area during and after land-disturbing activities. This information is required to be submitted by the contractor once the contractor has been determined.
3. Per Rule J, Subsection 3.1.b.ii measured infiltration capacity of the soils at the bottom of the infiltration systems must be provided. The applicant must submit documentation verifying the infiltration capacity of the soils and that the volume control capacity is calculated using the measured infiltration rate. If infiltration capacity is less than needed to conform with the volume abstraction requirement in subsection 3.1b, design modifications to achieve compliance with RPBCWD requirements will need to be submitted for the engineer’s review

SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MINNESOTA

MINNESOTA COUNTY MAP

GOPHER STATE ONE CALL:
CALL BEFORE YOU DIG:
1-800-252-1166

CONTACTS:

PROJECT OWNER:
Riley Purgatory Bluff Creek Watershed District

WATERSHED DISTRICT PROJECT MANAGER:
Claire Bleser
Riley Purgatory Bluff Creek Watershed District
Phone: 952-607-6512
Email: cbleser@rpbcwd.org

RPBCWD ENGINEER:
Scott Sobiech, PE
Barr Engineering Co.
Phone: 952-832-2755
Email: ssobiech@barr.com

PROJECT ENGINEER:
Jennifer Koehler, PE
Barr Engineering Co.
Phone: 952-832-2750
Email: jkoehler@barr.com

CITY REPRESENTATIVES:
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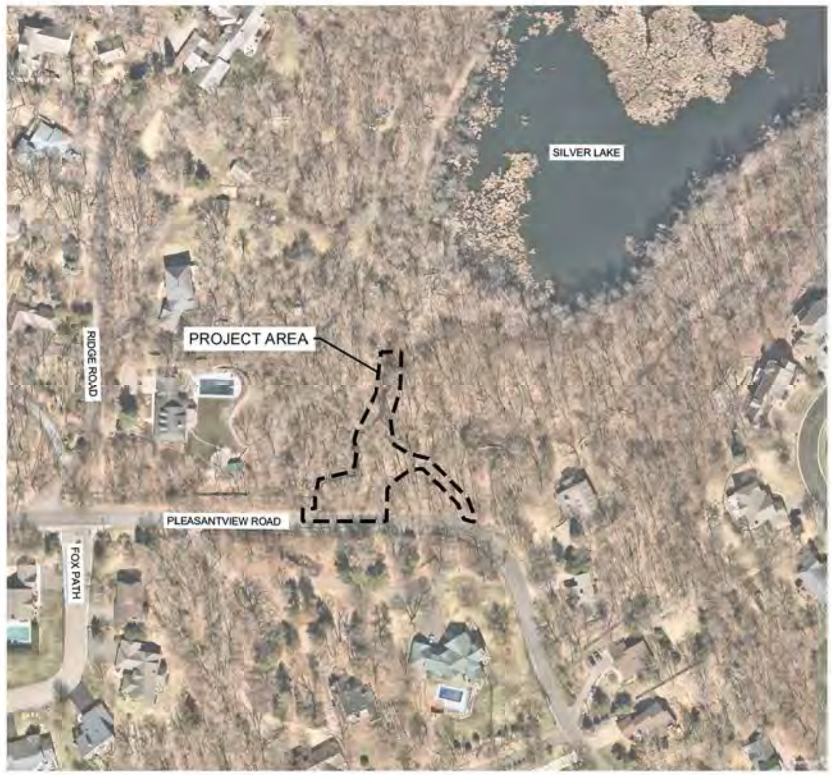
Phone: 952-227-1166
Email: munmacht@ci.chanhassen.mn.us

Matt Petite
Phone: 952-227-1166
Email: mpetite@ci.chanhassen.mn.us



PROJECT AREA

0 50 100
SCALE IN FEET

SHEET NO.	DESCRIPTION
G-01....	SITE LOCATION & SHEET INDEX
C-01....	TRAFFIC CONTROL PLAN
C-02....	EXISTING CONDITIONS, REMOVALS AND TEMPORARY EROSION CONTROL PLAN
C-03....	EROSION CONTROL DETAILS
C-04....	PROPOSED CONDITIONS PLAN & PROFILE
C-05....	DETAILS
C-06....	DETAILS
C-07....	IRON ENHANCED CHECK DAM SECTION & PROFILE
C-08....	RESTORATION PLAN
C-09....	RESTORATION DETAILS
C-10....	RESTORATION DETAILS
C-11....	RESTORATION DETAILS

GENERAL NOTES:

1. TOPOGRAPHIC SURVEY INFORMATION SHOWN IN THIS PLAN SET IS DATA FROM: SURVEY CONDUCTED BY BARR ENGINEERING CO. IN NOVEMBER 2019, SURVEY CONDUCTED BY CITY OF CHANHASSEN AND 2018 LIDAR TOPOGRAPHY.
2. IMAGERY: COPYRIGHT NEARMAP LIMITED AND CARVER COUNTY, MINNESOTA, 2019.
3. HORIZONTAL DATUM AND COORDINATE SYSTEM: CARVER COUNTY COORDINATES NAD83 HARN, US SURVEY FEET.
4. VERTICAL DATUM: NAVD88.
5. UTILITIES SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY BASED ON AVAILABLE DATA AND DO NOT REFLECT A COMPREHENSIVE INVENTORY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING UTILITIES.

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CLIENT							
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CONSTRUCTION							
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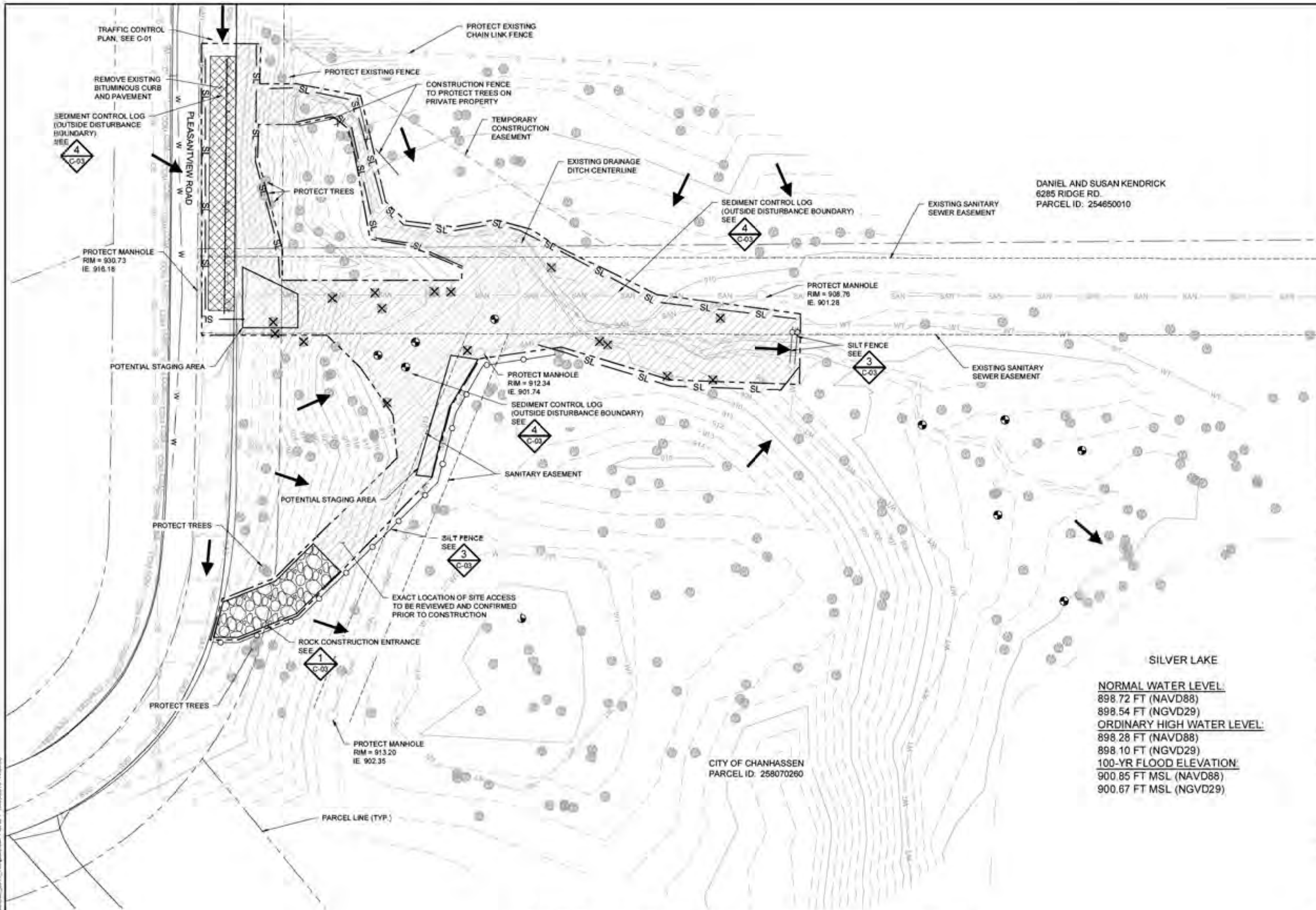
Scale	AS SHOWN
Date	02/12/2021
Drawn	EPF
Checked	SAS
Designed	JAK1
Approved	JAK1

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MN

SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT
SITE LOCATION & SHEET INDEX

BARR PROJECT No. 23270053.14
CLIENT PROJECT No.
DWG. No. G-01
REV. No. C



1 PLAN: EXISTING CONDITIONS, REMOVALS, AND TEMPORARY EROSION CONTROL

0 20 40
SCALE IN FEET

LEGEND

- EXISTING FIVE-FOOT CONTOUR
- EXISTING ONE-FOOT CONTOUR
- PROPERTY LINE
- EXISTING SANITARY SEWER EASEMENT
- EXISTING DRAINAGE DITCH
- EXISTING DELINEATED WETLAND
- EXISTING OPEN WATER
- EXISTING GAS LINE
- EXISTING SANITARY SEWER
- EXISTING TELEPHONE LINE
- EXISTING WATER SERVICE LINE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING STRUCTURAL FENCE
- EXISTING TREE
- EXISTING OVERHEAD POWER POLE
- EXISTING MANHOLE
- EXISTING WATER SERVICE VALVE
- EXISTING GATE VALVE
- CONSTRUCTION LIMITS
- SEDIMENT CONTROL LOG
- SILT FENCE
- EXISTING TREE (REMOVAL)
- CLEARING AND GRUBBING AREA (APPROX.)
- HAND AUGERED SOIL INVESTIGATION LOCATIONS
- FLOW DIRECTION

EROSION & SEDIMENT CONTROL NOTES:

1. NATURAL TOPOGRAPHY AND SOIL CONDITIONS MUST BE PROTECTED, INCLUDING RETENTION ONSITE OF NATIVE TOPSOIL TO THE GREATEST EXTENT POSSIBLE. ANY NATIVE TOPSOIL THAT IS STRIPPED AND STOCKPILED FOR REUSE ONSITE SHOULD BE TEMPORARILY COVERED WITH MULCH UNTIL REPLACED ONSITE.
2. ADDITIONAL MEASURES, SUCH AS HYDRAULIC MULCHING AND OTHER PRACTICES AS SPECIFIED BY THE DISTRICT MUST BE USED ON SLOPES OF 3:1 (H:V) OR STEEPER TO PROVIDE ADEQUATE STABILIZATION.
3. FINAL SITE STABILIZATION MEASURES MUST INCORPORATE AT LEAST SIX INCHES OF TOPSOIL AS SPECIFIED INTO THE UNDERLYING SOIL DURING FINAL SITE TREATMENT WHEREVER TOPSOIL HAS BEEN REMOVED.
4. CONSTRUCTION SITE WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, LITTER AND SANITARY WASTE MUST BE PROPERLY MANAGED.
5. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE MAINTAINED UNTIL COMPLETION OF CONSTRUCTION AND VEGETATION IS ESTABLISHED SUFFICIENTLY TO ENSURE STABILITY OF THE SITE, AS DETERMINED BY THE DISTRICT.
6. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MUST BE REMOVED UPON FINAL STABILIZATION.
7. SOIL SURFACES COMPACTED DURING CONSTRUCTION AND REMAINING PERVIOUS UPON COMPLETION OF CONSTRUCTION MUST BE DECOMPACTED TO ACHIEVE:
   A. A SOIL COMPACTION TESTING PRESSURE OF LESS THAN 1,400 KILOPASCALS OR 200 POUNDS PER SQUARE INCH IN THE UPPER 12 INCHES OF THE SOIL.
   B. A BULK DENSITY OF LESS THAN 1.4 GRAMS PER CUBIC CENTIMETER OR 87 POUNDS PER CUBIC FOOT IN THE UPPER 12 INCHES OF SOIL.
8. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN 7 CALENDAR DAYS AFTER LAND-DISTURBING WORK HAS TEMPORARILY OR PERMANENTLY CEASED ON A PROPERTY THAT DRAINS TO AN IMPAIRED WATER, WITHIN 14 DAYS ELSEWHERE.
9. THE PERMITTEE MUST, AT A MINIMUM, INSPECT, MAINTAIN AND REPAIR ALL DISTURBED SURFACES AND ALL EROSION AND SEDIMENT CONTROL FACILITIES AND SOIL STABILIZATION MEASURES EVERY DAY WORK IS PERFORMED ON THE SITE AND AT LEAST WEEKLY UNTIL LAND-DISTURBING ACTIVITY HAS CEASED. THEREAFTER, THE PERMITTEE MUST PERFORM THESE RESPONSIBILITIES AT LEAST WEEKLY UNTIL VEGETATIVE COVER IS ESTABLISHED. THE PERMITTEE WILL MAINTAIN A LOG OF ACTIVITIES UNDER THIS SECTION FOR INSPECTION BY THE DISTRICT ON REQUEST.
10. AS SHOWN, THESE ARE THE MINIMUM EROSION AND SEDIMENT CONTROL MEASURES NEEDED FOR THE SITE.
11. ACTIVITIES MUST BE CONDUCTED SO AS TO MINIMIZE THE POTENTIAL TRANSFER OF AQUATIC INVASIVE SPECIES (e.g. ZEBRA MUSSELS, EURASIAN WATERMILFOIL, ETC.) TO THE MAXIMUM EXTENT POSSIBLE.

GENERAL NOTES:

1. ALL PROJECT STAGING WILL OCCUR WITHIN PROJECT DISTURBANCE LIMITS. MATERIAL AND EQUIPMENT SHALL NOT BE STORED ON PLEASANTVIEW ROAD.

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SIGNATURE ______
DATE ______ LICENSE # ______

CLIENT							
BID							
CONSTRUCTION							
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	DATE RELEASED						

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Fax: (952) 832-2601
www.barr.com

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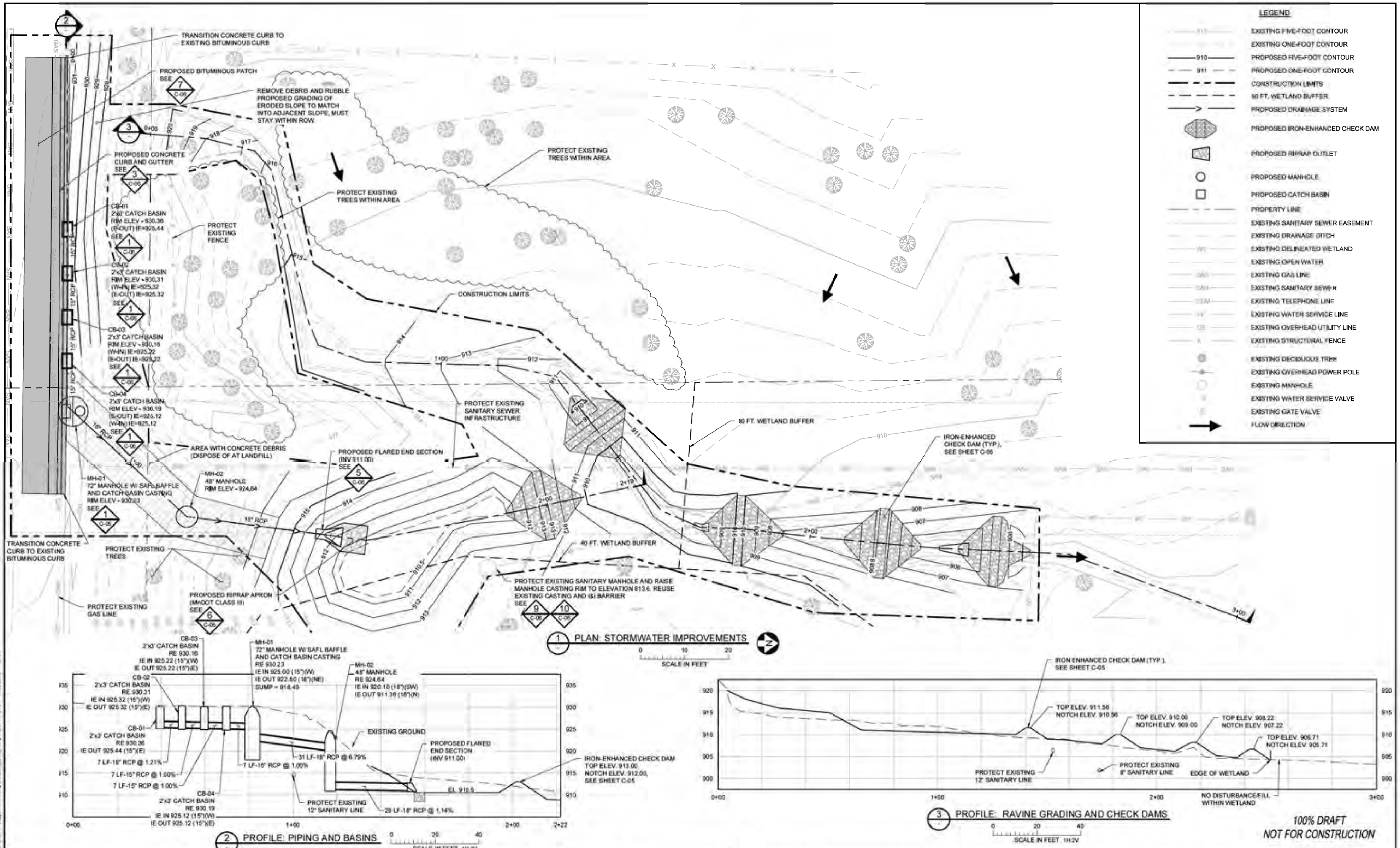
Date	02/12/2021
Drawn	EPF
Checked	SAS
Designed	JAK1
Approved	JAK1

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MN

SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT

EXISTING CONDITIONS, REMOVALS, AND TEMPORARY EROSION CONTROL

BARR PROJECT No.	23270053.14
CLIENT PROJECT No.	
DWG. No.	C-02
REV. No.	C



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DATE LICENSE #

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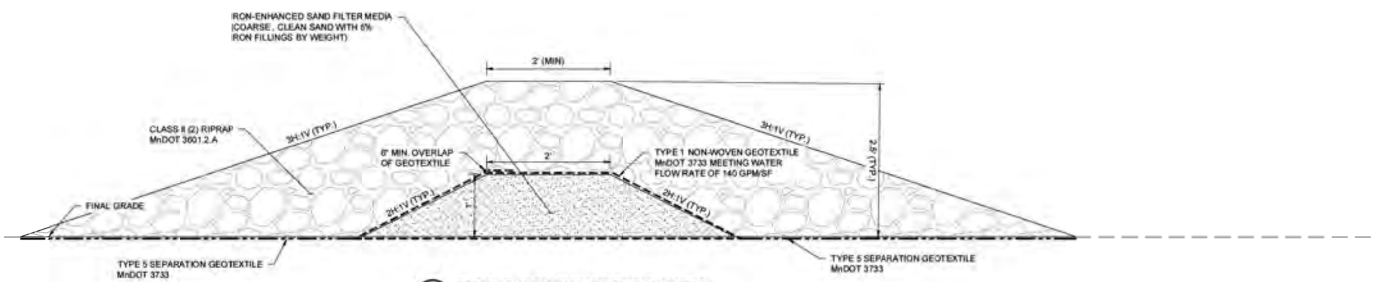
Approved	JAK1

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MN

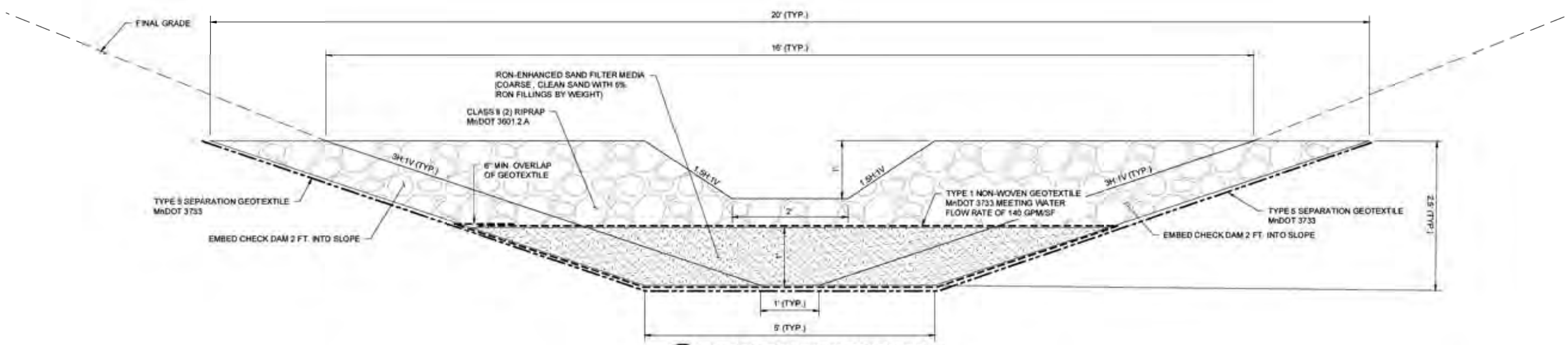
SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT
PROPOSED CONDITIONS PLAN & PROFILE

BARR PROJECT No. 23270053.14
CLIENT PROJECT No.
DWG. No. C-04 REV. No. C



1 PROFILE: IRON-ENHANCED CHECK DAM

0 1 2
SCALE IN FEET



2 SECTION: IRON-ENHANCED CHECK DAM

0 1 2
SCALE IN FEET

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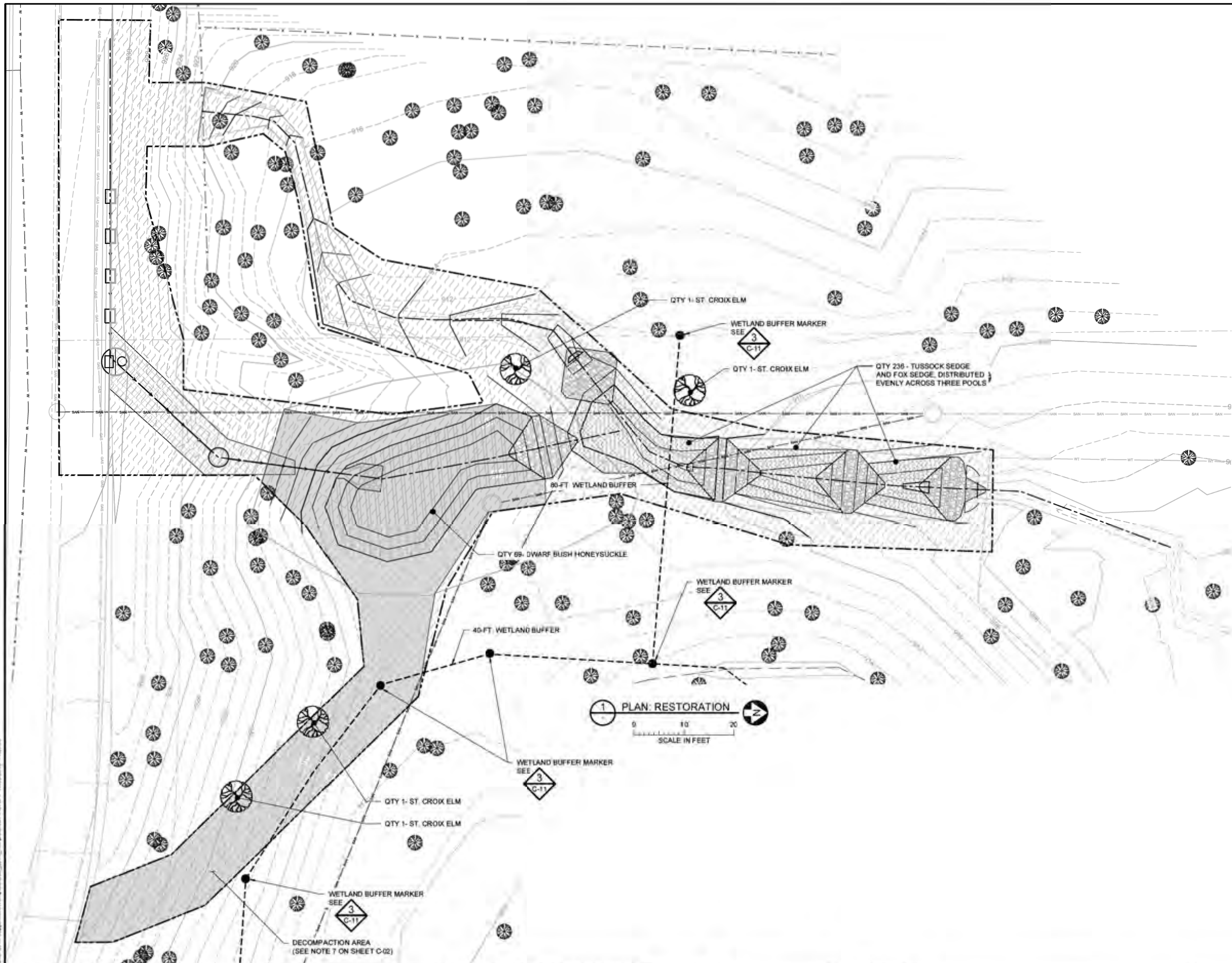
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

CHANHASSEN, MN

SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT

IRON-ENHANCHED CHECK DAM SECTION & PROFILE

BARR PROJECT No. 23270053.14
CLIENT PROJECT No.
DWG. No. C-07
REV. No. C



LEGEND

- FINAL FIVE-FOOT CONTOUR
- FINAL ONE-FOOT CONTOUR
- CONSTRUCTION LIMITS
- DRAINAGE SYSTEM
- IRON-ENHANCED CHECK DAM
- RIPRAP OUTLET
- EXISTING TREE TO BE PRESERVED
- PROPOSED TREE PLANTING
- RIPARIAN SOUTH & WEST SEED MIX (MnDOT 34-261)
- SHRUB PLANTING
- SEDGE PLANTING

NOTES:

1. EROSION CONTROL BLANKET CATEGORY 3N2S (WOOD FIBER) SHALL BE PLACED ON ALL SEEDED AREAS.

Planting Schedule

Common Name	Scientific Name	Size	Spacing	Quantity
Trees				
St. Croix Elm	*Ulmus americana 'St. Croix'*	#15 Container		4
		Total		**4**
Shrubs				
Dwarf Bush Honeysuckle	*Diervilla lonicera*	#1 Container	48" OC	69
		Total		**69**
Perennials				
Fox Sedge	*Carex vulpinoidea*	Plug	24" OC	118
Tussock Sedge	*Carex stricta*	Plug	24" OC	118
		Total		**236**

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CONSTRUCTION							
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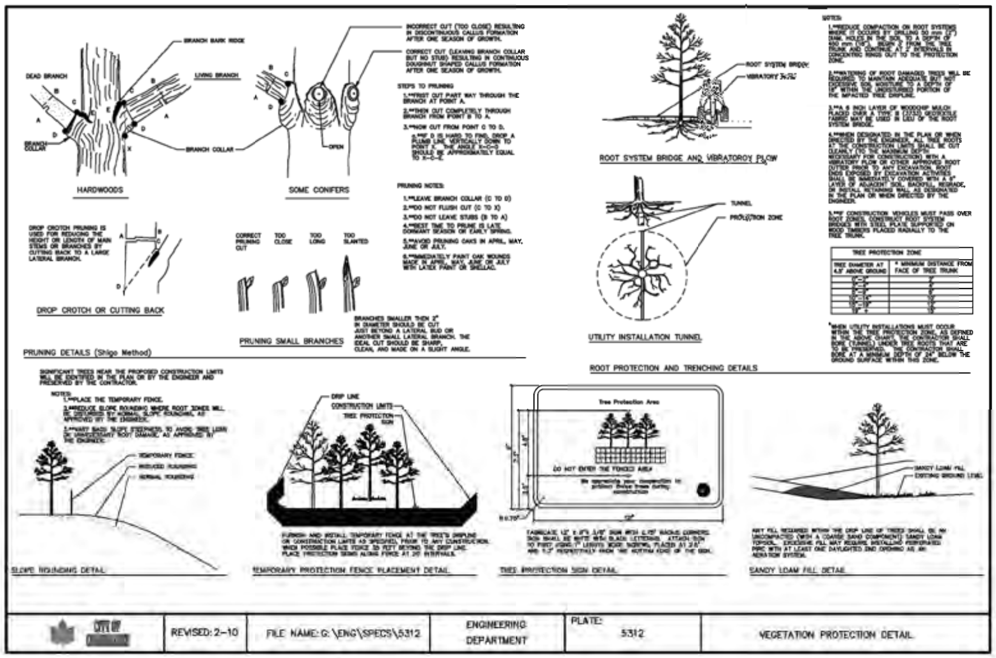
RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MN

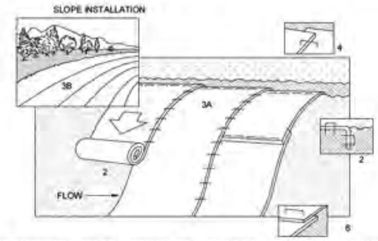
SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT

RESTORATION PLAN

BARR PROJECT No. 23270053.14
CLIENT PROJECT No.
DWG. No. C-08
REV. No. C



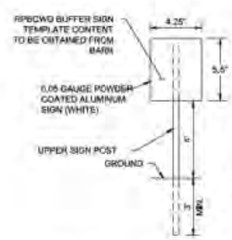
DETAIL: VEGETATION PROTECTION



NOTES:

1. REFER TO MANUFACTURER RECOMMENDATIONS FOR STAPLE PATTERNS FOR SLOPE INSTALLATIONS.
2. PREPARE SOIL BY LOOSENING TOP 1-2 INCHES AND APPLY SEED (AND FERTILIZER WHERE REQUIRED) PRIOR TO INSTALLING BLANKETS. GROUND SHOULD BE SMOOTH AND FREE OF DEBRIS.
3. BEGIN (A) AT THE TOP OF THE SLOPE AND ROLL THE BLANKETS DOWN OR (B) AT ONE END OF THE SLOPE AND ROLL THE BLANKETS HORIZONTALLY ACROSS THE SLOPE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 6" OVERLAP, WITH THE UPHILL BLANKET ON TOP.
5. WHEN BLANKETS MUST BE SPLICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
6. BLANKET MATERIALS SHALL BE AS SPECIFIED OR AS APPROVED BY ENGINEER.

2 DETAIL: EROSION CONTROL BLANKET - INSTALLATION
NOT TO SCALE



NOTE:

1. SIGNS TO BE INSTALLED AT LOCATIONS IN TABLE ON SHEET G-02.
2. CONTRACTOR TO OBTAIN SIGN DESIGN FROM BARR PRIOR TO MAKING SIGNS.
3. BOLTS SHALL BE TAMPER PROOF.
4. POSTS SHALL BE PAINTED GREEN, 3 LB/FT

3 DETAIL: BUFFER SIGN INSTALLATION
NOT TO SCALE

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Project Office: BARR ENGINEERING CO. 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435

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Date	02/12/2021
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Checked	SAS
Designed	JAK1
Approved	JAK1

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
CHANHASSEN, MN

SILVER LAKE WATER QUALITY IMPROVEMENT PROJECT
RESTORATION DETAILS

BARR PROJECT No. 23270053.14
CLIENT PROJECT No.
DWG. No. C-11
REV. No. C

Water Resources Report

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
2020 ANNUAL REPORT

protect. manage. restore.

Executive Summary

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) had a successful water quality sampling season in 2020, completing a full year of sample collection and data analysis. This effort was made possible through multiple partnerships with municipalities and organizations based within the watershed. The results from the 2020 sampling effort are presented in this report.

2020 LAKE SUMMARY

During the 2020 monitoring season, 13 lakes and two high value wetlands were monitored throughout the District. Regular water quality lake sampling was conducted on each lake approximately every two weeks throughout the growing season (June-September). In addition to regular lake sampling, the District monitored water levels on each lake, assessed carp populations on seven waterbodies, and collected zooplankton and phytoplankton populations in five lakes. Staff were able to remove 201 common carp from the Purgatory Creek Recreation Area during the spring spawning run in attempt to reduce overall carp numbers in the system. The District also monitored public access points and analyzed water samples for the presence of zebra mussels in these 14 waterbodies. Although Lotus Lake was listed for zebra mussels in 2018, only eDNA tested positive and no adults or veligers were found. A second application of alum was applied to Lake Riley in 2020. Herbicide treatments for curly leaf pondweed were carried out on Lotus Lake, Mitchell Lake, Riley Lake, Hyland Lake, and Red Rock for curly leaf pondweed.

Surface water samples were collected, analyzed, and compared to standards set by the Minnesota Pollution Control Agency (MPCA) to assess overall lake health. Figure i displays lakes sampled in 2020 that met or exceeded the MPCA lake water quality standards for Chlorophyll-a (Chl-a), Total Phosphorus (TP), and Secchi Disk depth during the growing season (June-September). The MPCA has specific standards for both ‘deep’ lakes (Lake Ann, Lotus Lake, Lake Riley, and Round Lake) and ‘shallow’ lakes (Duck Lake, Hyland Lake, Lake Idlewild, Lake Lucy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake) (MPCA 2016).

In 2020, Lake Ann, Lake Lucy, Lake Riley, Rice Marsh Lake, Hyland Lake, Round Lake, and Duck Lake met all three MPCA standards. The Riley Chain of Lakes showed improvement since 2019 with Lake Lucy meeting all standards in 2020. Lake Riley had the highest recorded summertime secchi disk average (4.64 m) since data collection began in the 1970s. Rice Marsh Lake continued to meet all standards following the alum treatment which occurred in 2018. Lake Susan did not meet the TP and Chl-a standard. Silver Lake of the Purgatory Chain of Lakes met all standards in 2018, but similarly to 2019, did not meet and increased in both Chl-a and TP levels in 2020. Lotus, Mitchell, and Red Rock Lakes had reduced water quality in 2020, failing to meet all three water quality standards. Hyland Lake had excellent water quality in 2020 which can be attributed to the alum treatment in 2019. Idlewild and McCoy high value wetlands did not meet the TP standard and Staring Lake improved slightly by meeting the TP standard in 2020. All lakes met the proposed nitrate/nitrite water quality standard and chloride standard.

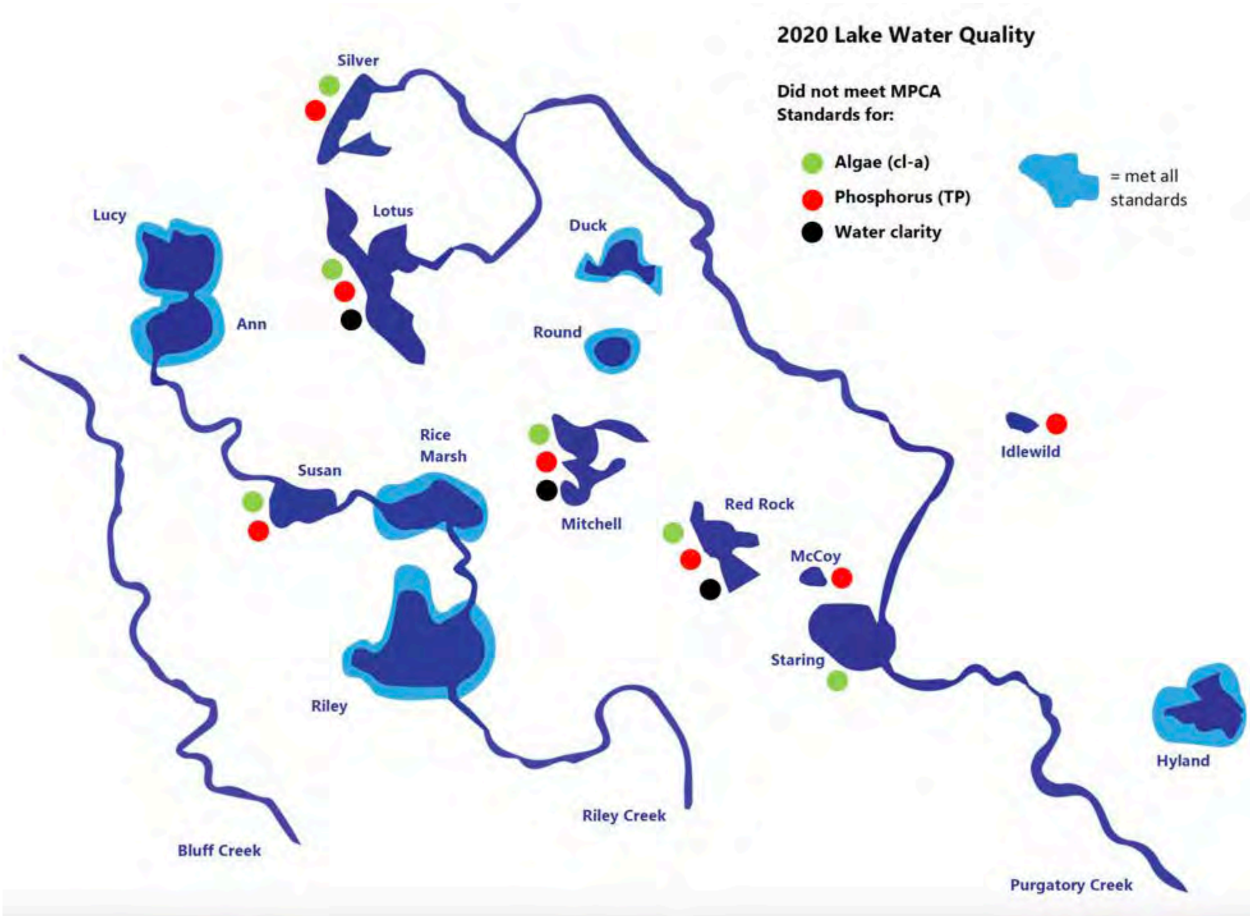

Figure i 2020 Lake Water Quality

Summary of the lake water quality data collected in 2020 by the Riley Purgatory Bluff Creek Watershed District as compared to the Minnesota Pollution Control Agency Water Quality Standards. Chlorophyll-a (green), Total Phosphorus (orange), and Secchi Disk depth (black) during the growing season (June-September) for both 'deep' lakes or lakes >15 ft deep and < 80% littoral area (Lake Ann, Lotus Lake, Lake Riley, and Round Lake), and 'shallow' lakes or lakes <15 ft deep and >80% littoral area (Duck Lake, Hyland Lake, Lake Idlewild, Lake Lucy, Lake McCoy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake). The corresponding dots next to each lake indicate which water quality standard was not met and lakes surrounded by blue met all water quality standards.

2020 STREAM SUMMARY

In 2020, the District and its partners collected water quality samples and performed data analysis on 23 different sampling sites along Riley Creek (six sites), Bluff Creek (six sites), and Purgatory Creek (twelve sites). During the 2020 creek monitoring season (April-September) water chemistry and turbidity were regularly measured at the 18-regular water quality creek monitoring sites every two weeks. Water samples were collected to assess nutrient (TP, OP, CL, and Chl-a) and total suspended sediment (TSS) concentrations. Creek flow was calculated from velocity measurements taken at consistent creek cross sections at each water quality monitoring location. Staff deployed automated sampling units on upper Bluff to assess pollutant loads and the potential for restoration projects. The District collected macroinvertebrates at all five Bluff Creek regular water quality monitoring sites in 2020. The lower sections of Purgatory Creek and uppermost reach of Bluff Creek were assessed and updated using the Creek Restoration Action Strategy (CRAS) evaluation. Overall, most stream sections scored by the CRAS were similar to years past with the exception of Reach 2 of Purgatory Creek which reduced water quality trends negatively impacted scores.

The summary for all three creeks is based on water quality parameters developed by the MPCA in 2014 for Eutrophication and TSS as well as impairment status for fish and macroinvertebrates. The parameters measured during the summer growing season (April-September) and the associated MPCA water quality limits for streams located in the Central River Region include: Dissolved Oxygen (DO) daily minimum > 4 mg/L, summer season average TP < 0.1 mg/L, TSS < 10% exceedance of 30 mg/L limit during the summer season, summer season average Chl-a <18 ug/L, and summer season average pH < 9 su and >6 su (MPCA, 2016).

Regular creek sampling sites R5 and R3 met all MPCA water quality standards assessed in 2020 (Figure ii), down from 4 sites in 2019 (P3, P4, P5 and R3). The overall number of water quality standard impairments increased from 2019 to 2020; Bluff had ten (previously nine), Riley had six (previously seven), and Purgatory had eleven (previously seven). Once again, TP was the water quality standard causing the most impairments in 2020 with nine of the 18 sites not meeting the standard (summer average <0.1 mg/L). TSS impairments decreased from seven impairments in 2019 to six 2020. Bluff Creek remained the stream with the most impaired water quality for its size, as previously seen between 2015-2019. The impairments included TP across all sites, as well as TSS across three sites, DO at B5, and a fish impairment at B1. All sites met the pH water quality limits in 2020 (< 9 su and >6 su). Unlike in 2015-2018, P2 met the Chl-a standard (summer average <18 ug/L) and no other site exceeded the standard. Macroinvertebrate impairments by the MPCA included lower Purgatory and Riley Creek.

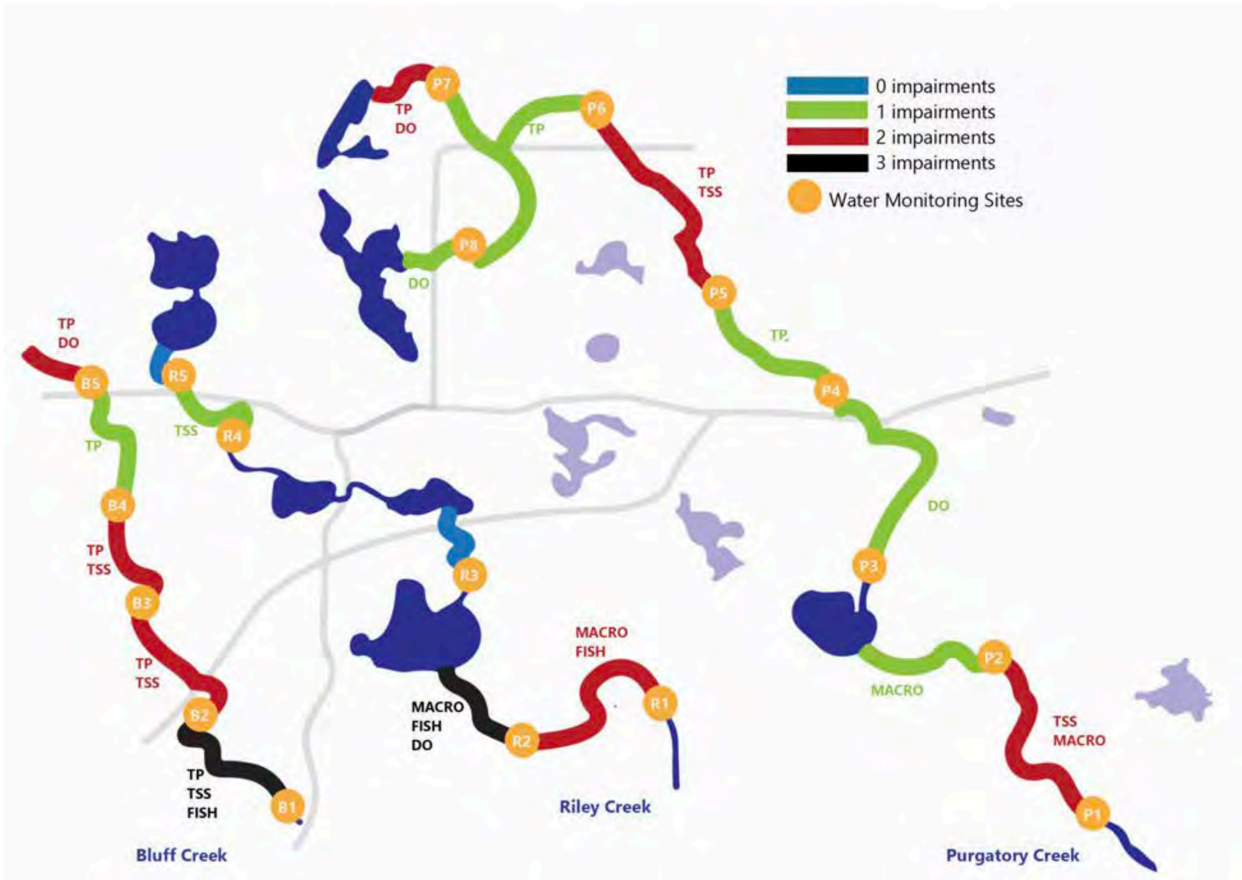

Figure ii 2020 Stream Water Quality

Summary of stream water quality data collected on Bluff Creek, Riley Creek, and Purgatory Creek in 2020 by the Riley Purgatory Bluff Creek Watershed District as compared to the Minnesota Pollution Control Agency (MPCA) Water Quality Standards. A total of 18 water monitoring locations (orange circles) were sampled and information gathered from the individual sites were applied upstream to the next monitoring location. The summer season (April-September) eutrophication and total suspended solids water quality standards used in this assessment included: Dissolved Oxygen (DO) daily minimum > 4 mg/L, average Total Phosphorus (TP) < 0.1 mg/L, Total Suspended Solids (TSS) < 10% exceedance of 30 mg/L limit, average Chlorophyll-a (CHLA) <18 ug/L, average pH < 9 su and > 6 su. The corresponding labels next to each stream section indicate which water quality standard were not met.

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Acronyms & Abbreviations

Ac	Acre
BMP	Best Management Practice
cBOD	5-day Carbonaceous Biochemical Oxygen Demand
Cf	Cubic feet
Cfs	Cubic feet per second
Chl-a	Chlorophyll-a
Cl	Chloride
CPUE	Catch Per Unit Effort
CRAS	Creek Restoration Action Strategy
CS	Chronic Standard
DO	Dissolved Oxygen
E. coli	*Escherichia coli*
EP	Eden Prairie
EPA	Environmental Protection Agency
EWM	Eurasian Watermilfoil
Ft	Foot/Feet
FWSS	Freshwater Scientific Services
GPS	Global Positioning System
Ha	Hectare
HAB	Harmful Algal Bloom
IBI	Index of Biological Integrity
In	Inch
Kg	Kilogram
L	Liter
Lb	Pound
M	Meter
MCWD	Minnehaha Creek Watershed District
METC	Metropolitan Council
Mg	Milligram
mL	Milliliter
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MS	Maximum Standard
MS4	Municipal Separate Storm Sewer System
NA	Not Available
NCHF	North Central Hardwood Forest
NH_3	Ammonia
NO_2	Nitrite
NO_3	Nitrate
NOAA	National Oceanic and Atmospheric Administration
NURP	National Urban Runoff Program
NWS	National Weather Service
OHWL	Ordinary High-Water Level
ORP	Oxidation Reduction Potential
Ortho-P	Orthophosphate
PAR	Photosynthetic Active Radiation
PCL	Purgatory Chain of Lakes
RCL	Riley Chain of Lakes
RPBCWD/District	Riley Purgatory Bluff Creek Watershed District
Sec	Second
Sp.	Species
SRP	Soluble Reactive Phosphorus

TDP	Total Dissolved Phosphorus
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TMDL	Total Maximum Daily Load
TPA	Total Phytoplankton Abundance
TP	Total Phosphorus
TRPD	Three Rivers Park District
TSS	Total Suspended Solids
UAA	Use and Attainability Assessment
UMN	University of Minnesota-St. Paul Campus
WD	Watershed District
WIDNR	Wisconsin DNR
WMO	Watershed Management Organization
YOY	Young of Year

1 Introduction and Overview

The Riley Purgatory Bluff Creek Watershed District was established on July 31st, 1969, by the Minnesota Water Resources Board acting under the authority of the watershed law. The District is located in the southwestern portion of the Twin Cities Metropolitan Area. It consists of a largely developed urban landscape and encompasses portions of Bloomington, Chanhassen, Chaska, Deephaven, Eden Prairie, Minnetonka, and Shorewood (**Figure 1-1**). This total area for the watershed is close to 50 square miles located in both Hennepin and Carver Counties and includes three smaller sub watersheds: Riley Creek Watershed, Purgatory Creek Watershed, and Bluff Creek Watershed.

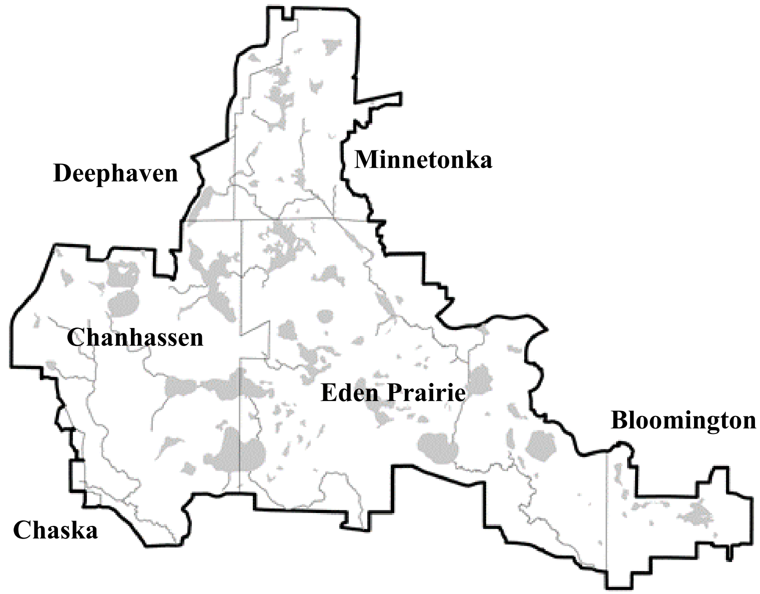


Figure 1-1 Riley Purgatory Bluff Creek Watershed District Boundary

Data collection and reporting are the foundation for the RPBCWD's work. Regular, detailed water quality monitoring provides the District with scientifically reliable information that is needed to decide if water improvement projects are needed and how effective they are in the watershed. Data collection remains a key component of the District's work as we strive to de-list, protect, and improve the water bodies within the watershed. The purpose of this report is to summarize the water quality and quantity results collected over the past year, which can be used to direct the District in managing our water resources.

Through partnerships with various cities, Three Rivers Park District (TRPD), the University of Minnesota (UMN), Metropolitan Council (METC), and Carver County, water quality data was collected on 13 lakes, two high value wetlands (Lake Idlewild and Lake McCoy), and 22 creek sites in the District. The 22 creek sites include six on Bluff Creek, six on Riley Creek, and ten on Purgatory Creek. Neil Lake, which is within the watershed boundaries, have not been part of the District's sampling regime. Each partner was responsible for monitoring certain parameters of their respective lakes/streams and reporting their findings, allowing for more time and attention to be given to each individual water resource (**Table 1-1**).

Water quality and water quantity was monitored at each stream site during the field season (April-September) approximately twice a month. The METC also has continuous monitoring stations near the outlet of each creek as part of its Watershed Outlet Monitoring Program (WOMP) or long-term monitoring program which identifies pollutant loads entering the Minnesota River. District EnviroDIY stations were also installed at some stream locations to gather more information. In addition to water quality monitoring, creek walks were also conducted to gather more information about the current stream conditions in the District. This information was included in the Creek Restoration Action Strategy (CRAS), which was developed by the District to identify and prioritize future stream restoration sites. Bank pin data was collected near each of the water quality monitoring sites to measure generalized sedimentation and erosion rates across all three streams. Macroinvertebrates were collected at all Bluff Creek water quality sites in September.

Lakes were also monitored bi-weekly during the summer growing season (June-September) for water quality. Lake levels were continuously recorded from ice out to ice in. Lake water samples were also collected in early summer and analyzed for the presence of zebra mussel veligers. Additionally, during every sampling event, boat launch areas and zebra mussel monitoring plates were scanned for adult zebra mussels. Zooplankton and phytoplankton samples were also collected on five lakes to assess the overall health of the population as it applies to fishery health and water quality. Plant surveys and herbicide treatments were also conducted to assess overall health of the plant community and to search/treat for invasive plants. Common Carp have been identified as being detrimental to lake health and are continually monitored by the District. In the summer of 2020, eight stormwater ponds were also monitored and sampled bi-weekly as a part of a cooperative study with the University of Minnesota and partner cities. Winter monitoring occurred on the Purgatory Chain of Lakes as well as four separate stormwater ponds in 2020. Extending the monitoring activities into the winter months can provide key insights into ways to improve water quality during the summer months. Winter monitoring also allows us to evaluate the influence of chloride levels in our lakes. The data collection and reporting events were tracked throughout the year and can be seen in **Table 1-2**. In addition to lakes and streams, multiple specialty projects were monitored to evaluate their effectiveness at preventing or contributing pollutant loads to the watershed.

Table 1-1 District Water Resource Sampling Partnerships

Water Resource	RPBCWD	Three Rivers Park District	Eden Prairie	University of MN	Metropolitan Council	Carver County
Duck Lake	■		■			
Hyland Lake	■	■				
Lake Ann	■					■
Lake Idlewild	■					
Lake Lucy	■					
Lake Riley	■			■		
Lake Susan	■			■		■
Lotus Lake	■					■
McCoy	■		■			
Mitchell Lake	■		■			
Red Rock Lake	■		■			
Rice Marsh Lake	■					
Round Lake	■		■			
Silver Lake	■					
Staring Lake	■			■		
Bluff Creek	■				■	
Purgatory Creek	■				■	
Riley Creek	■		■		■	

Table 1-2 Monthly Field Data Collection Locations

Water Resource	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lake Ann					■	■	■	■	■	■		
Duck Lake	■	■	■		■	■	■	■	■	■		
Hyland Lake	■	■	■		■	■	■	■	■	■	■	
Lake Idlewild	■	■	■		■	■	■	■	■	■		
Lotus Lake	■	■	■		■	■	■	■	■	■		
Lake Lucy					■	■	■	■	■	■		
McCoy					■	■	■	■	■	■	■	
Mitchell Lake	■	■	■		■	■	■	■	■	■	■	
Red Rock Lake	■	■	■		■	■	■	■	■	■		
Rice Marsh Lake	■	■	■		■	■	■	■	■	■		
Round Lake	■	■	■		■	■	■	■	■	■	■	
Lake Riley					■	■	■	■	■	■		
Staring Lake	■	■	■		■	■	■	■	■	■		
Lake Susan					■	■	■	■	■	■		
Silver Lake	■	■	■		■	■	■	■	■	■		
Bluff Creek	■	■	■	■	■	■	■	■	■	■	■	■
Purgatory Creek	■	■	■	■	■	■	■	■	■	■	■	■
Riley Creek	■	■	■	■	■	■	■	■	■	■	■	■

*Water Level Sensors were placed on all lakes.

2 Methods

Water quality and quantity monitoring entails the collection of multi-probe sonde data readings, water samples, zooplankton samples, phytoplankton samples, macroinvertebrate samples, zebra mussel veliger samples, and physical readings, as well as recording the general site and climactic conditions at the time of sampling. Listed in the following sections are the methods and materials, for both lake and stream monitoring, used to gather the water quality and quantity data during the 2020 field-monitoring season. **Table 2-1** identifies many of the different chemical, physical, and biological variables analyzed to assess overall water quality.

Table 2-1 Sampling Parameters

Parameter	Analysis	Summer Lakes	Winter Lakes	Streams	Reason for Monitoring
Total Phosphorus	Wet	■	■	■	Nutrient, phosphorus (P) controls algae growth
Orthophosphate	Wet	■	■	■	Nutrient, form of P available to algae
Chlorophyll-a, pheophytin	Wet	Surface	Surface	■	Measure of algae concentration
Ammonia as N	Wet	■	■		Nutrient, form of nitrogen (N) available to algae
Nitrate + Nitrite as N	Wet	■	■		Nutrient, also oxygen substitute for bacteria
Total Kjeldahl Nitrogen	Wet	■			Nutrient, sum of nitrogen bound in organics
Calcium	Wet	■			Measure of water hardness
Total Alkalinity, adjusted	Wet	Surface	Surface		Measure of ability to resist drop in pH
Total Suspended Solids	Wet			■	Measure of the solids in water (block light)
Chloride	Wet	■	■	■	Measure of chloride ions, salts in water
Temperature	Sonde	■	■	■	Impacts biological and chemical activity in water
pH	Sonde	■	■	■	Impact chemical reactions (acidic or basic)
Conductivity	Sonde	■	■	■	Ability to carry an electrical current (TSS & Cl)
Dissolved Oxygen	Sonde	■	■	■	Oxygen for aquatic organisms to live
Macroinvertebrates	Wet			■	Organisms fluctuate due to environmental variables
Oxidation Reduction Potential	Sonde	■	■	■	Tracks chemistry in low or no oxygen conditions
Phycocyanin	Sonde	■	■		Pigment, measures cyanobacteria concentration
Phytoplankton	Wet	■			Organisms fluctuate due to environmental variables
Photosynthetic Active Radiation	Sonde	■	■		Measure of light available for photosynthesis
Turbidity	Sonde			■	Measure of light penetration in shallow water
Secchi disk depth	Observation	■	■		Measure of light penetration in deeper water
Transparency Tube	Observation			■	Measure of light penetration into shallow water
Zooplankton	Wet	■			Organisms fluctuate due to environmental variables
Zebra Mussel Veligers	Wet	■			Larval form of zebra mussels/plate checks (AIS)

2.1 Water Quality Sampling

The monitoring program supports the District's 10-year water management plan to delist waters from the MPCA's 303d Impaired Waters list. The parameters monitored during the field season help determine the sources of water quality impairments and provide supporting data that is necessary to best design and install water quality improvement projects.

Multi-probe sondes (Hach Lake DS-5/Stream MS-5; YSI EXO3) were used for collecting water quality measurements across both streams and lakes. Sonde readings measured include temperature, pH, dissolved oxygen, conductivity, photosynthetic active radiation (PAR), oxidation reduction potential (ORP), and phycocyanin. Secchi disk depth readings were recorded at the same time as sonde readings were collected at all lake sampling locations. When monitoring stream locations, transparency, turbidity (Hach 2100Q), and flow measurements (Flow Tracker) were collected. General site conditions related to weather and other observations were recorded as well. A list of the variety of parameters monitored during each sampling event can be seen in **Table 2-1**.

At each lake monitoring location, multiple water samples are collected using a Van Dorn, or depth integration sampler, for analytical laboratory analysis. For Duck, Idlewild, Rice Marsh, Silver, and Staring Lakes, water samples were collected at the surface and bottom due to the shallow depths (2-3 m). For all other lakes within the District, water samples were collected at the surface, middle (when stratified), and bottom of the lake. Lakes are monitored at the same location on each sampling trip, typically at the deepest location of the lake. All samples are collected from whole meter depths except for the bottom sample, which is collected 0.5 meters from the lake bottom to prevent disrupting the sediment. The surface sample is a composite sample of the top two meters of the water column. The middle sample is collected from the approximate midpoint of the temperature/dissolved oxygen change (>1-degree Celsius change) or thermocline. Pictures and climatic data are collected at each monitoring site. Water quality information collected in the winter is collected utilizing the same procedures as in the summer. Zooplankton samples were collected using a 63 micrometer Wisconsin style zooplankton net and Phytoplankton samples were collected using a 2 m integrated water sampler on Lake Susan, Lotus Lake, Staring Lake, Lake Riley, and Rice Marsh Lake. Zooplankton are collected by lowering the net to a depth of 0.5 meters from the bottom at the deepest point in the lake and raised slowly. Zebra mussel veliger samples were collected on all lakes using the same zooplankton sampling procedures but collected at three sites and consolidated before being sent to a lab for analysis. A Zeiss Primo Star microscope with a Zeiss Axiocam 100 digital camera was used to monitor zooplankton populations, scan for invasive zooplankton, and to calculate Cladoceran-grazing rates on algae.

Water quality samples collected during stream monitoring events were collected from the approximate middle (width and depth) of the stream in ideal flow conditions or from along the bank when necessary. Both water quality samples and flow monitoring activities were performed in the same section of the creek during each sampling event. Stream velocity was calculated at 0.3 to 1.5-foot increments across the width of the stream using the FlowTracker Velocity Meter at each sampling location. If no water or flow was observed, only pictures and climatic data were collected. Macroinvertebrate samples were collected on one stream per year on a rotating basis. A D-net was used to sample macroinvertebrates and each habitat type was sampled proportional to the amount of habitat in each reach. The activities associated with the monitoring program are described in **Table 2-2**.

Table 2-2 Basic Water Quality Monitoring Activities

Pre-Field Work Activities	Calibrate Water Quality Sensors (sonde) Obtain Water Sample Bottles and Labels from Analytical Lab Prepare Other Equipment and Perform Safety Checks Coordinate Events with Other Projects and Other Entities
Summer Lake – Physical and Chemical	Navigate to Monitoring Location Read Secchi Disk Depth and Record Climatic Data Record Water Quality Sonde Readings at Meter Intervals Collect Water Samples from Top, Thermocline, and Bottom
Summer Lake – Biological	Collect Zooplankton Tow (pulling a net) from Lake Bottom to Top Collect Phytoplankton Tow (2 m surface composite sample) Collect Zebra Mussel Veliger Tow (pulling a net) from Lake Bottom to Top at Multiple Sites
Winter Lakes	Navigate to Monitoring Location Record Ice Thickness Read Secchi Disk Depth and Record Climatic Data Record Water Quality Sonde Readings at Meter Intervals Collect Water Samples from Top and Bottom
Streams – Physical, Chemical, and Biological	Navigate to Monitoring Location Measure Total Flow by Measuring Velocity at 0.3 to 1 Foot Increments across Stream Record Water Quality Sonde Measurements from Middle of Stream Read Transparency Tube and Perform Turbidity Test Collect Water Samples from Middle of Stream Collect macroinvertebrate samples (D-net collection across representative habitat types) Collect Climatic Data and Take Photos
Post-Field Work Activities	Ship Water Samples to Analytical Lab Enter Data, Perform Quality Control Checks, and Format Data for Database Clean and Repair Equipment Reporting and Summarizing Data for Managers, Citizens, Cities, and Others

2.2 Analytical Laboratory Methods

RMB Environmental Labs, located in Bloomington, MN, is the third-party company that is responsible for conducting the analytical tests on the water samples that were collected by the District staff. The methods used by the laboratory to analyze the water samples for the specified parameters are noted in **Table 2-3**. Zebra mussel veliger samples were also sent to RMB Labs for analysis.

Additional samples were sent to the Metropolitan Council (METC), St. Paul, MN. These samples included quality samples for the Watershed Outlet Monitoring Program (WOMP) program. METC allows staff to bring samples in on a Friday which is not possible with RMB because samples must be shipped. Additionally, macroinvertebrate samples were sent to Dean Hansen of the University of Minnesota and all phytoplankton samples were sent to Margaret Rattei at Barr Engineering for identification.

Table 2-3 RMB Environmental Laboratories Parameters and Methods Used for Analyses

Parameter	Standard Method
Alkalinity	EPA 310.2 , SM 2320 B-2011
Ammonia	EPA 350.1 Rev 2.0 or Timberline Ammonia-001
Nitrogen, Nitrate & Nitrite	EPA 353.2 Rev 2.0
Chlorophyll-a	SM 10200H
Total Phosphorus	EPA 365.3
Orthophosphate	EPA 365.3
Chloride	SM 4500-Cl E-2011
Total Kjeldahl Nitrogen	EPA 351.2 or Timberline Kjeldahl Nitrogen-001
Calcium	EPA 200.7

3 Water Quality Standards

In 1974, the Federal Clean Water Act set forth the requirements for states to develop water quality standards for surface waters. In 2014, specific standards were developed for eutrophication and TSS for rivers and streams. In Minnesota, the agency in charge of regulating water quality is the Minnesota Pollution Control Agency (MPCA). Water quality monitoring and reporting is a priority for the District to determine the overall health of the water bodies within the watershed boundaries. The District's main objectives are to prevent a decline in the overall water quality within lakes and streams and to prevent water bodies from being added to the 303d Impaired Water Bodies list (MPCA). The District is also charged with the responsibility to take appropriate actions to improve the water quality in water bodies that are currently listed for impairments.

There are seven ecoregions within Minnesota; the RPBCWD is within the Northern Central Hardwood Forest (NCHF) ecoregion. Rural areas in the NCHF are dominated by agricultural land and fertile soils characterize the ecoregion. For most water resources in the region, phosphorus is the limiting (least available) nutrient within lakes and streams, meaning that the available concentration of phosphorus often controls the extent of algal growth. The accumulation of excess nutrients (i.e., TP and Chl-a) in a waterbody is called eutrophication. This relationship has a direct impact on the clarity and recreational potential of our lakes and streams. Water bodies with high phosphorus concentrations and increased levels of algal production have reduced water clarity and limited recreational potential.

All lakes sampled in the district are considered Class 2B surface waters. The MPCA states that this class of surface waters should support the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. They should also be suitable for aquatic recreation of all kinds, including bathing. This class of surface water is not protected as a source of drinking water. For more detailed information regarding water quality standards in Minnesota, please see the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters for the Determination of Impairment, 305(b) Report, and 303 (d) List of Impaired Waters. These resources provide information to better understand the water quality assessment process and the reasoning behind their implementation.

3.1 Lakes

The MPCA has specific standards for both 'deep' lakes (lakes >15 ft deep and < 80% of the total lake surface area able to support aquatic plants – littoral area), and 'shallow' lakes (lakes <15 ft deep and >80% littoral area. Except for chlorides, summer growing season (June-September) averages of the parameters listed in **Table 3-1** for each lake and are compared to the MPCA standards to determine the overall state of the lake. The standards are set in place to address issues of eutrophication or excess nutrients in local water bodies. Water samples are collected and sent to an analytical lab to assess concentrations of TP, Chl-a, and chlorides. If result values are greater than the standards listed in **Table 3-1**, the lake is considered impaired. Secchi disk readings are collected to measure the transparency, or visibility, in each lake. A higher individual reading corresponds to increased clarity within the lake (this indicates the Secchi Disk was visible at a deeper depth in the water column).

Chlorides (Cl) are of increasing concern in MN, especially during the winter when road salt is heavily used. Targeted sampling occurs during the winter, early spring melting periods when salts are being flushed through our waterbodies, and monthly during the summer to set a base line. The Cl standard is the same for both deep lakes and shallow lakes. **Table 3-1** includes both the Cl chronic standard (CS) and a maximum standard (MS). The CS is the highest water concentration of Cl to which aquatic life, humans, or wildlife can be exposed to indefinitely without causing chronic toxicity. The MS is the highest concentration of Cl in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality.

Table 3-1 MPCA Water Quality Standards for Shallow and Deep Lakes

Parameter	Shallow Lakes Criteria	Deep Lakes Criteria
Total Phosphorus (mg/L)	$\leq$ 0.060	$\leq$ 0.040
Chlorophyll-a (ug/L)	$\leq$ 20	$\leq$ 14
Secchi Disk (m)	$\geq$ 1	$\geq$ 1.4
Chloride Chronic Standard (mg/L)	230	230
Chloride Maximum Standard (mg/L)	860	860

3.2 Streams

Table 3-2 displays water quality parameters developed by the MPCA in 2014 for eutrophication and TSS. The standards include some parameters the District has not yet incorporated into their monitoring procedures that may eventually be added in the future. All streams sampled in the District are considered Class 2B surface waters. The MPCA states that this class of surface waters should support the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. They should also be suitable for aquatic recreation of all kinds, including bathing. This class of surface water is not protected as a source of drinking water. For more detailed information regarding water quality standards in Minnesota, please see the MPCA's Guidance Manual for Assessing the Quality of Minnesota Surface Waters for the Determination of Impairment, 305(b) Report, and 303 (d) List of Impaired Waters. These resources provide information to better understand the water quality assessment process and the reasoning behind their implementation.

Eutrophication pollution is measured based upon the exceedance of the summer growing season average (May-September) of TP levels and Chl-a (seston), five-day biochemical oxygen demand (cBOD, amount of DO needed by organisms to breakdown organic material present in a given water sample at a certain temperature over a five-day period), diel DO flux (difference between the maximum DO concentration and the minimum daily DO concentration), or summer average pH levels. Streams that exceed phosphorus standard but do not exceed the Chl-a (seston), cBOD, diel DO flux, or pH standard meet the eutrophication standard. The District added Chl-a to its monthly sampling regime in 2015 to account for the polluted condition when Chl-a (periphyton) concentration exceeds 18 ug/L. The daily minimum DO concentration for all Class 2B waters cannot dip below 4 mg/L to achieve the MPCA standard, which was used in the analysis for this report.

Table 3-2 MPCA Stream Water Quality Standards

MPCA Standard	Parameter	Criteria
Eutrophication	Phosphorus	≤ 100 ug/L
	Chlorophyll-a (seston)	≤ 18 ug/L
	Diel Dissolved Oxygen	≤ 3.5 mg/L
	Biochemical Oxygen Demand	≥ 2 mg/L
	pH Max	≤ 9 su
	pH Min	≥ 6.5 su
Total Suspended Solids	TSS	≤ 30 mg/L

TSS is a measure of the amount of particulate (soil particles, algae, etc.) in the water. Increased levels of TSS can be associated with many negative effects including nutrient transport, reduced aesthetic value, reduced aquatic biota, and decreased water clarity. For the MPCA standard, TSS concentrations are assessed from April through September and cannot exceed 30 mg/L more than 10 percent of the time during that period.

4 Water Quality Data Collection

To improve water quality within the watershed, the District conducts studies to root out key sources of pollution or other negative variables that impact our lakes and streams. Once identified, the District will often monitor these locations and eventually act to improve the water resource if the data confirms the suspicion. Below is a summary of each special project/monitoring and an overall summary of the water quality data the District has collected in 2020.

4.1 2020 Lakes Eutrophication Water Quality Summary

Chlorophyll-a

The 2020 growing season Chl-a mean concentrations for all lakes sampled within the District are shown in **Figure 4-1**. Of the three main eutrophication lake water quality standards (Chl-a, TP, Secchi), Chl-a was the nutrient with the most site impairments in 2020. Overall, nine of the 15 lakes sampled in 2020 met the MPCA Chl-a standards for their lake classification (six lakes met standard in 2018 and 2019): Lake Ann, Lake Riley, Round Lake, Duck Lake, Lake Idlewild, Lake Lucy, Rice Marsh Lake, and Lake McCoy (new in 2020).

Four lakes sampled within the District are categorized as ‘deep’ by the MPCA (>15 ft deep, < 80% littoral area): Lake Ann, Lotus Lake, Lake Riley, and Round Lake. The MPCA standard for Chl-a in deep lakes (< 14 ug/L) was met by Lake Ann, Lake Riley, and Round Lake. Lake Riley had the lowest summer Chl-a average of all lakes sampled (2.8 ug/l). Similar to 2019, Lotus Lake did not meet the standard and had Chl-a average concentrations were more than double the MPCA standard at 34 ug/l (an increase of 1 ug/L from 2019). The remainder of the lakes sampled in 2020 are categorized as ‘shallow’ by the MPCA (<15 ft deep, >80% littoral area): Duck Lake, Hyland Lake, Lake Lucy, Lake McCoy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake. Water quality metrics on Lake Idlewild and Lake McCoy, classified as a high-value wetlands, were compared to MPCA shallow lake standards. The water quality standard for shallow lakes (< 20 ug/L) was met by Duck Lake, Hyland Lake, Lake Idlewild, Lake Lucy, Lake McCoy, and Rice Marsh Lake in 2020. Lake Lucy improved to meeting the standard in 2020 with a reduction in Chl-a concentrations of 17 ug/L. Mitchell Lake, Red Rock Lake, Silver Lake, and Staring Lake had Chl-a values 1.5-2 times the MPCA standard.

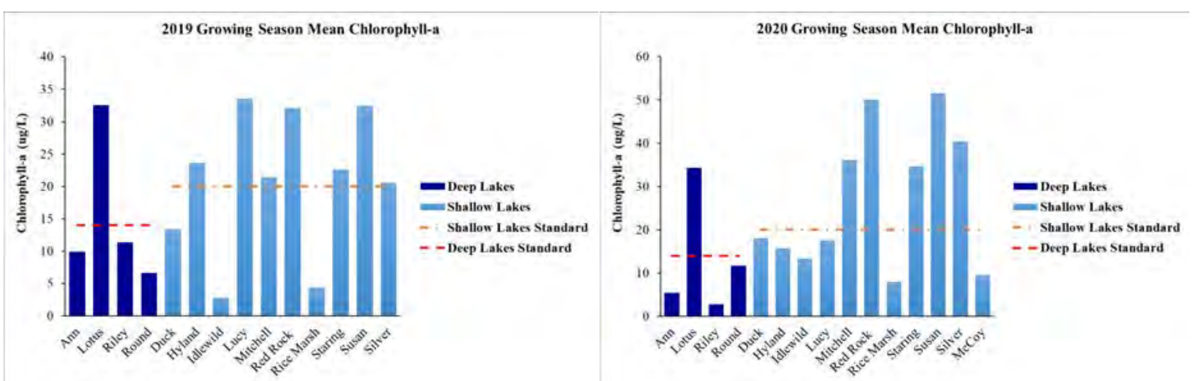


Figure 4-1 2019-2020 Lake Growing Season Mean Chlorophyll-a

Lakes growing season (June-September) mean chlorophyll-a concentrations (ug/L) for shallow (lakes <15 ft. deep, >80% littoral area-light blue bars) and deep lakes (lakes >15 ft. deep, <80% littoral area-dark blue bars) in the Riley Purgatory Bluff Creek Watershed District during 2020. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for Chlorophyll-a for shallow (<20 ug/L-orange dashed line) and deep lakes (<14 ug/L-red dashed line).

Total Phosphorous

The TP growing season averages for all lakes sampled within the District in 2020 are shown in **Figure 4-2**. Overall, eight of the 15 lakes sampled met the MPCA total phosphorus standard for their lake classification in 2020: Lake Ann, Lake Riley, Round Lake, Duck Lake, Lake Hyland, Lake Lucy, Rice Marsh Lake, and Staring Lake. This represents a decrease from 11 of 14 sampled lakes that met the standard in 2019.

The MPCA standard for TP in deep lakes (<0.040 mg/L) was met by Lake Ann, Lake Riley, and Round Lake. TP concentrations in Lotus Lake, which met the standard in 2019, increased by 18% and did not meet the standard in 2020 (0.0416 mg/L). Lake Riley had the lowest summertime average TP concentration across all lake sampled in 2020 (0.0178 mg/L). For shallow lakes, the MPCA TP standard (<0.060 mg/L) was met by Duck Lake, Hyland Lake, Lake Lucy, Rice Marsh Lake, and Staring Lake in 2020. Despite having met the standard in 2019, Lake Susan, Mitchell Lake, and Lake Idlewild increased to just above the standard (0.067 mg/L, 0.061 mg/L, 0.062 mg/L respectively). Red Rock (0.086 mg/L) and Silver Lake (0.116 mg/L) were well above the MPCA standard. Silver Lake had the largest increase in 2020 and had the highest average summertime TP concentrations.

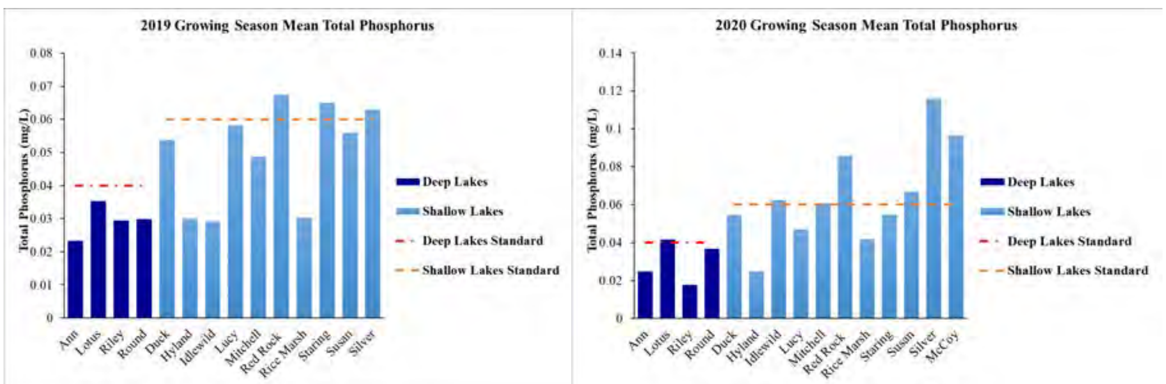


Figure 4-2 2019-2020 Lakes Growing Season Mean Total Phosphorus

Lakes growing season (June-September) mean total phosphorus concentrations (mg/L) for shallow (lakes <15 ft. deep, >80% littoral area-light blue bars) and deep lakes (lakes >15 ft. deep, <80% littoral area-dark blue bars) in the Riley Purgatory Bluff Creek Watershed District during 2020. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for Total Phosphorus for shallow (<0.060 mg/L-orange dashed line) and deep lakes (<0.040 mg/L-red dashed line).

Secchi Disk

The 2020 secchi disk growing season means for all District lakes sampled are shown in **Figure 4-3**. Overall, eleven of the 15 lakes sampled met the MPCA secchi disk standard for their lake classification in 2020: Lake Ann, Lake Riley, Round Lake, Duck Lake, Lake Hyland, Lake Idlewild, Lake Lucy, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake. This represents a decrease from all lakes sampled achieving the standard in 2019.

The MPCA standard for secchi disk depth/water clarity for deep lakes (> 1.4 m) was met by Ann, Riley, and Round. Lotus met the standard in 2019 (1.54 m) but had reduced water clarity in 2020 (1.24 m). Ann and Round remained relatively stable from 2019 with secchi disk averages remaining between 2 and 2.5 m. Lake Riley had the highest summer average for all lakes sampled in 2020 and the average was the highest recorded since 1971 on the lake (4.64 m). For shallow lakes, the MPCA standard was not met by Mitchell and Red Rock in 2020. Red Rock had the lowest (worst) secchi reading at 0.66 m which was down from 1.11 m. Duck, Hyland, Idlewild, Silver, and Lucy had secchi readings near 2 m and Rice

Marsh was reduced from 2.6 m in 2019 to 2.2 m in 2020. Lake McCoy had depths less than 1 m and water clarity was to the lake bottom. Lake Staring and Lake Susan were just above the standard in 2020 (1.03 m).

More information about lake nutrient and water clarity data can be seen in the Fact Sheets located in **Exhibit I** and Nutrient Summary Table in **Exhibit F**.

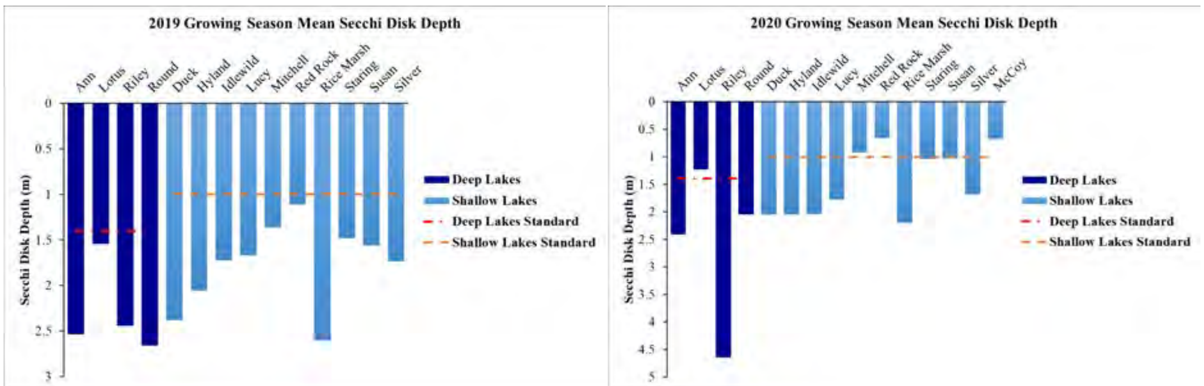


Figure 4-3 2019-2020 Lakes Growing Season Mean Secchi Disk Depth

Lakes growing season (June-September) mean secchi disk depths (m) for shallow (lakes <15 ft. deep, >80% littoral area-light blue bars) and deep lakes (lakes >15 ft. deep, <80% littoral area-dark blue bars) in the Riley Purgatory Bluff Creek Watershed District during 2020. The dashed lines represent the Minnesota Pollution Control Agency water quality standards for secchi disk depths for shallow (>1 m-orange dashed line) and deep lakes (>1.4 m-red dashed line).

4.2 Alum Treatments

Alum (aluminum sulfate) is a compound derived from aluminum, the earth's most abundant metal. Alum has been used in water purification and wastewater treatment for centuries and in lake restoration for decades. Many watershed management plans recommend that some lakes be treated with the alum to improve their water quality. An alum treatment provides a safe, effective, and long-term control of the quantity of algae in our lakes, by trapping the nutrient phosphorus in sediments. Algal growth is directly dependent on the amount of phosphorus available in the water. Phosphorus enters the water in two ways:

- Externally: from surface runoff entering the water or from groundwater.
- Internally: from the sediments on the bottom of the lake.

Phosphorus already in the lake settles to the bottom and is periodically re-released from the sediments back into the water. Even when external sources of phosphorus have been significantly reduced through best management practices, the internal recycling of phosphorus within a lake can still support explosive algal growth. Alum is used primarily to control this internal loading of phosphorus from the sediments of the lake bottom. The treatment is most effective when it occurs after external sources of phosphorus have been actively controlled. Internal phosphorus loading is a large problem in Twin Cities Metropolitan Area lakes because of historic inputs of phosphorus from the urban storm water runoff. Phosphorus in runoff has concentrated in the sediments of urban lakes as successive years of algal blooms have died and settled to the lake bottoms. This phosphorus is recycled from the lake sediments into the overlying waters, primarily during summer periods, when it contributes to the growth of nuisance algal blooms.

Alum is applied by injecting it directly into the water several feet below the surface. On contact with water, alum becomes floc, or aluminum hydroxide (the principal ingredient in common antacids such as Maalox). This fluffy substance settles to the bottom of the lake. On the way down, it interacts with phosphorus to form an aluminum phosphate compound that is insoluble in water. Phosphorus in the water is trapped as aluminum phosphate and can no longer be used as food by algae. As the floc settles downward through the water, it also collects other suspended particles in the water, carrying them down to the bottom and leaving the lake noticeably clearer. On the bottom of the lake, the floc forms a layer that acts as a kind of phosphorus barrier by combining with (and trapping) the phosphorus as it is released from the sediments. This reduces the amount of internal recycling of phosphorus in the lake. An alum treatment can last 10–20 years or even longer, depending on the level of external phosphorus loading to the lake. The less phosphorus that enters the lake from external sources after it is applied, the more effective the treatment will be for a longer period.

A list of the alum treatments completed in the District can be found in **Table 4-1**. Treatments are split into two doses to ensure the entirety of the lake is being treated effectively. District staff and its partners have continued to monitor phosphorous levels within treatment lakes to evaluate the success of the treatment and to assess when a second dose might be needed. More information about Lake Riley, Lotus Lake, Rice Marsh Lake, Round Lake, and Hyland Lake nutrient and water clarity data can be seen in the Fact Sheets located in **Exhibit I** and Nutrient Summary Table in **Exhibit F**.

Table 4-1 Aluminum Sulfate Treatments in RPBCWD

Lake	First Dose	Second Dose
Riley	5/5/2016	6/11/2020
Lotus	9/18/2018	TBD
Rice Marsh	9/21/2018	TBD
Round	11/15/2012	10/24/2018
Hyland	6/3/2019	TBD

Figure 4-4 through **Figure 4-8** illustrates total phosphorus (TP) levels prior to treatment, through the end of the 2020 growing season for all lakes that received an alum treatment. As seen across all lakes, after alum was applied, TP levels within each lake declined considerably for both the surface and lake bottom. In all cases, in the years following the alum treatment, lakes met the MPCA water quality standard for TP

(exception – 2013 Round Lake and 2020 Lotus Lake). In addition, often both Secchi and Chlorophyll-a levels were improved which led to some lakes meeting all three water quality standards after treatment (Hyland, Rice Marsh, Riley, and Round). In **Table 4-2** the percent reduction of surface and bottom growing season values of total phosphorous pre- and post-alum treatment can be seen across all lakes. Utilizing two years of post-treatment data, it appears Rice Marsh and Hyland Lake were very effective alum treatments with phosphorus reductions of 52% and 66% respectively. Despite having a smaller reduction in total phosphorus at the surface, Round Lake had reductions in lake bottom total phosphorus comparable with the other treated lakes (84% (dose 1) and 94% (dose 2) for Round Lake). In 2020, Lake Riley received the second dose of alum which led to an overall reduction of 61% surface and 92% bottom phosphorous reductions compared to pre alum years. Lake Riley had a historically good water quality year in 2020 with record secchi disk depths of 4.6 m. After the first dose, water quality in Lotus Lake did not resound as well as the other lakes (only 19% surface and 46% bottom). This may be due to the very high phosphorous release rates observed from the sediment cores taken. A second dose would further reduce the release rates. The shallower areas of the lake may also have higher release rates and may be contributing to the high phosphorus levels. The District will monitor TP and OP in both deep water basins that received alum (south and east) in Lotus Lake to gauge phosphorus release rates in the east basin. Additional sediment coring will also most likely occur before the second alum application. Overall, the results indicate that alum applications are effective and can drastically reduce phosphorous levels within a lake. Staff will continue to monitor each lake to determine second dose application and gauge temporal success of each treatment.

Table 4-2 Aluminum Sulfate Effectiveness on Lake Surface and Bottom Total Phosphorous

Surface TP		Dose 1			Dose 2	
Lake	Years	Average TP Pre	Average TP Post	% Reduction	Average TP Post	% Reduction
Riley	2009-2020	0.0458	0.0270	41	0.0178	61
Lotus	2017-2020	0.0475	0.0386	19	Not Complete	
Rice Marsh	2017-2020	0.0767	0.0365	52		
Round	2008-2020	0.0420	0.0379	10	0.0333	21
Hyland	2017-2020	0.0810	0.0274	66	Not Complete	

Bottom TP		Dose 1			Dose 2	
Lake	Years	Average TP Pre	Average TP Post	% Reduction	Average TP Post	% Reduction
Riley	2014-2020	0.6357	0.1707	73	0.0496	92
Lotus	2017-2020	0.3245	0.1739	46	Not Complete	
Rice Marsh	2017-2020	0.1483	0.0330	78		
Round	2010-2020	0.9504	0.1540	84	0.0548	94
Hyland	No Data					

*D1=dose 1; D2= dose 2

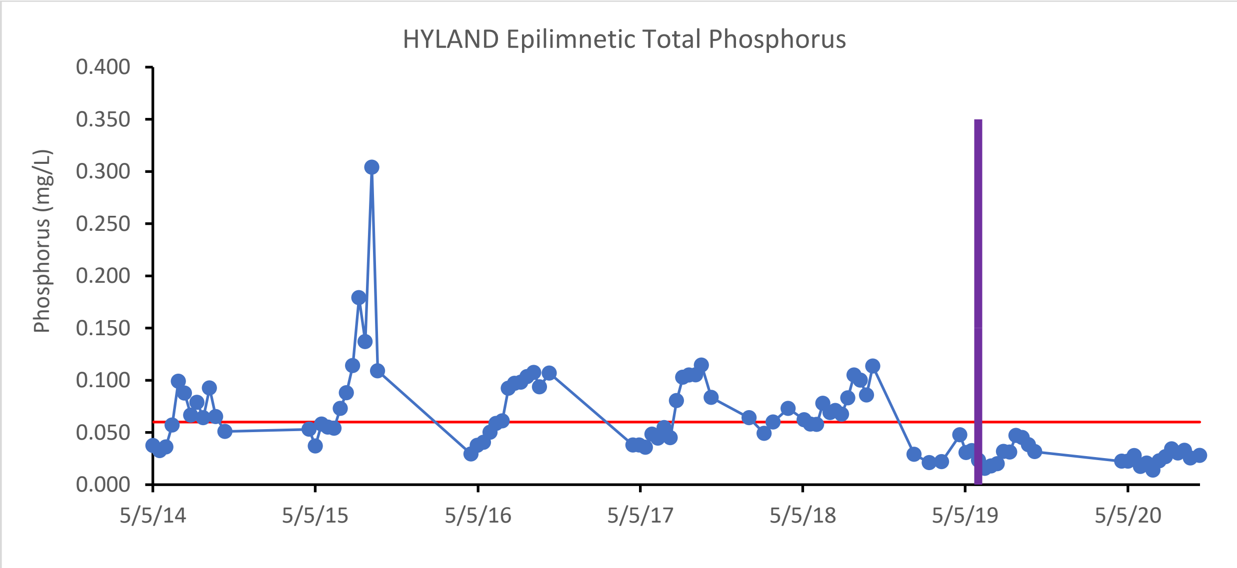


Figure 4-4 Hyland Lake Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Hyland Lake between May 5, 2014 and October 13, 2020. The aluminum sulfate (Alum) treatment occurred on June 3, 2019 (indicated by vertical bar). The graph displays TP levels (mg/L) measured from 2 m composite samples taken at the lake surface and the MPCA water quality standard for TP is represented by the horizontal red line (0.06 mg/L).

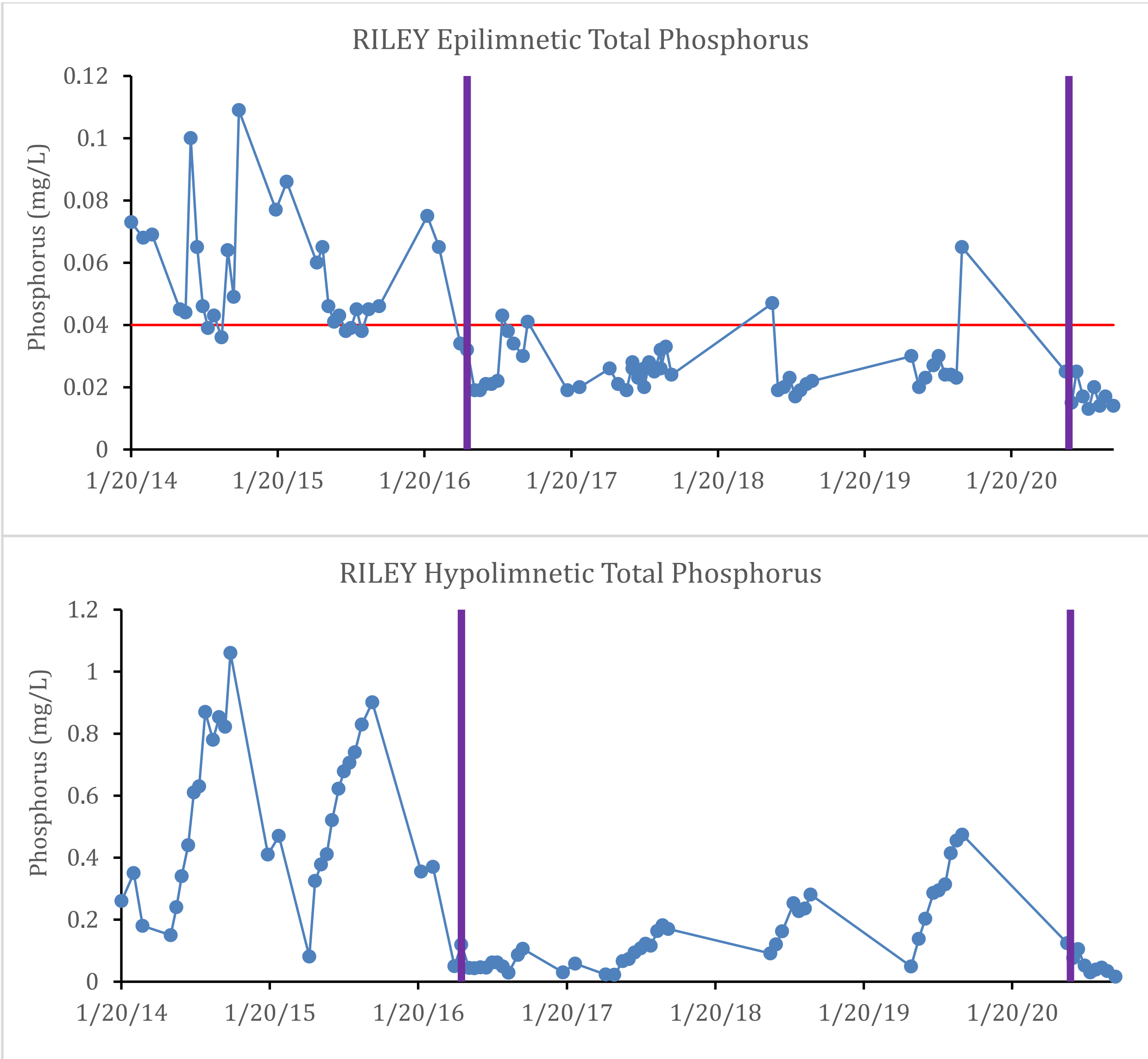
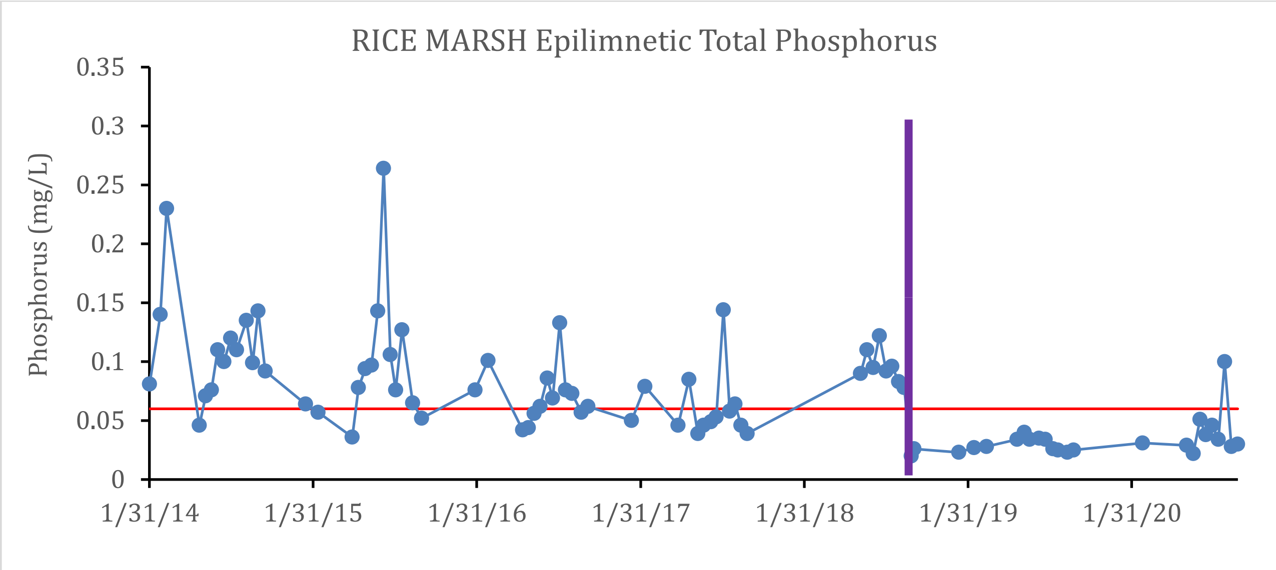


Figure 4-5 Lake Riley Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Lake Riley between January 20, 2014 and September 30, 2020. The aluminum sulfate (Alum) treatments occurred on May 5, 2016 and June 11, 2020 (indicated by vertical bar). The upper graph displays TP levels (mg/L) measured from 2 m composite samples taken at the lake surface and the lower graph displays the TP levels (mg/L) measured from samples taken 0.5-1 m above the sediment near the deepest point in the lake. The MPCA water quality standard for TP is represented in the upper graph by the horizontal red line (0.04 mg/L).



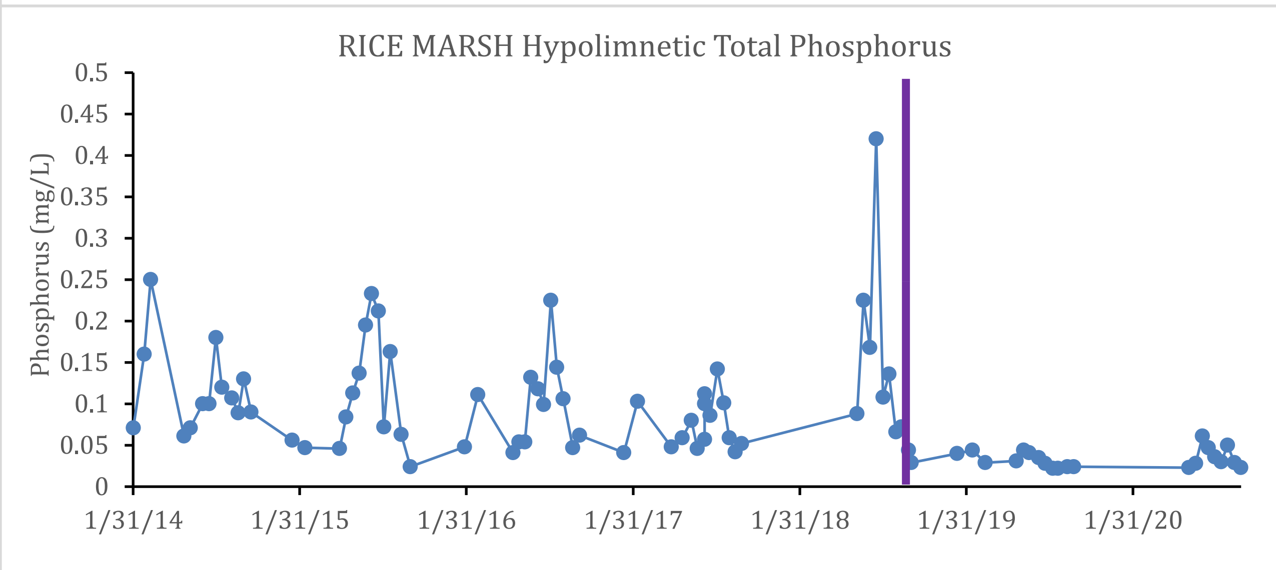


Figure 4-6 Rice Marsh Lake Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Rice Marsh Lake between January 31, 2014 and September 23, 2020. The aluminum sulfate (Alum) treatment occurred on September 21, 2018 (indicated by vertical bar). The upper graph displays TP levels (mg/L) measured from 2 m composite samples taken at the lake surface and the lower graph displays the TP levels (mg/L) measured from samples taken 0.5-1 m above the sediment near the deepest point in the lake. The MPCA water quality standard for TP is represented in the upper graph by the horizontal red line (0.06 mg/L).

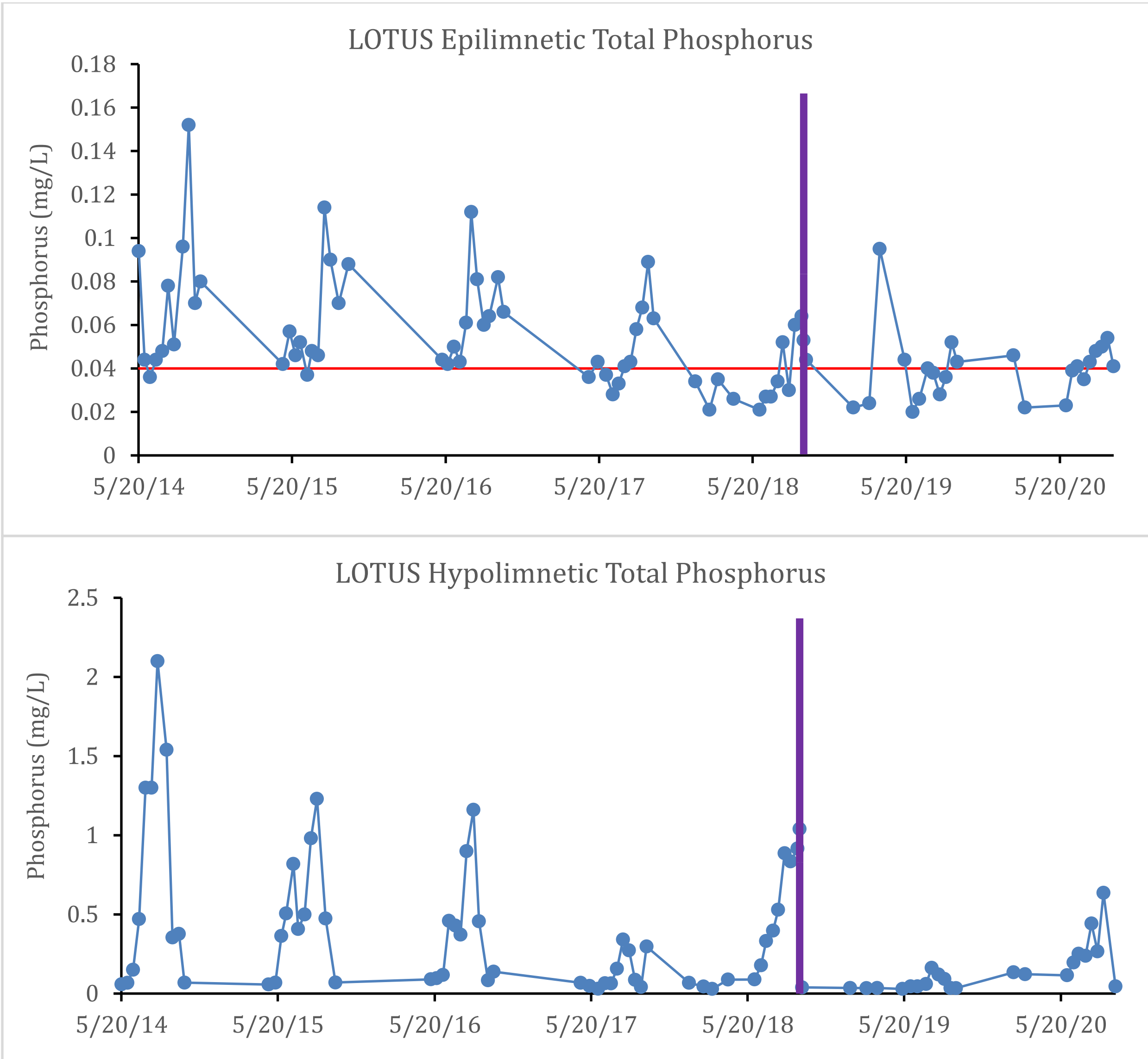


Figure 4-7 Lotus Lake Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Lotus Lake between May 6, 2014 and September 24, 2020. The aluminum sulfate (Alum) treatment occurred on September 18, 2018 (indicated by vertical bar). The upper graph displays TP levels (mg/L) measured from 2 m composite samples taken at the lake surface and the lower graph displays the TP levels (mg/L) measured from samples taken 0.5-1 m above the sediment near the deepest point in the lake. The MPCA water quality standard for TP is represented in the upper graph by the horizontal red line (0.04 mg/L).

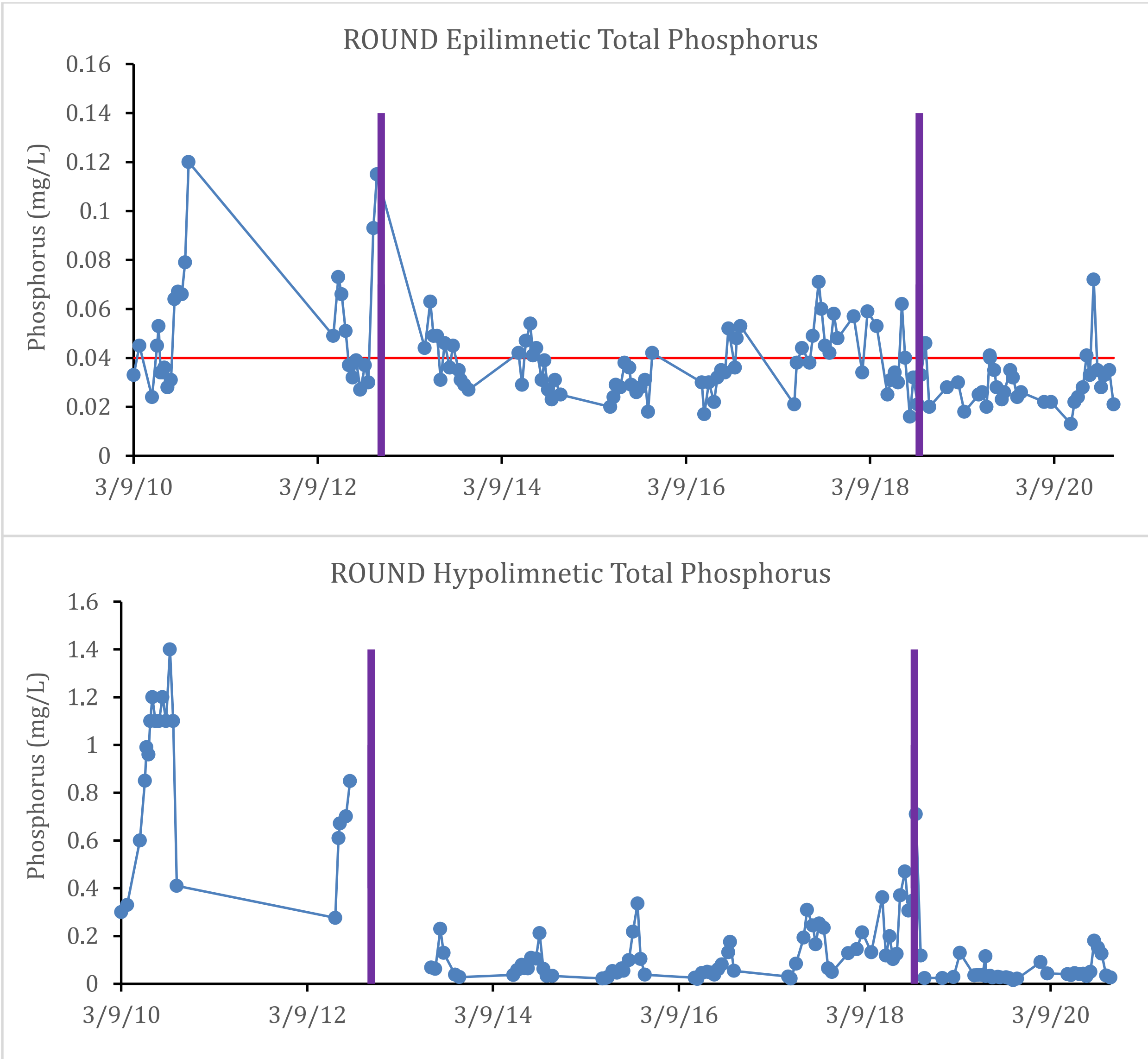


Figure 4-8 Round Lake Total Phosphorus Levels pre- and post- Alum Treatment

Total phosphorus levels (TP) in Round Lake between March 9, 2010 and October 30, 2020. The aluminum sulfate (Alum) treatments occurred on November 15, 2012 and October 24, 2018 (indicated by vertical bars). The upper graph displays TP levels (mg/L) measured from 2 m composite samples taken at the lake surface and the lower graph displays the TP levels (mg/L) measured from samples taken 0.5-1 m above the sediment near the deepest point in the lake. The MPCA water quality standard for TP is represented in the upper graph by the horizontal red line (0.04 mg/L).

4.3 Chloride Monitoring

Figure 4-9 Heavy Salt Application

Increasing chloride (Cl) levels in water bodies are becoming of greater concern within the state of Minnesota. It takes only one teaspoon of road salt to permanently pollute five gallons of water, as chlorides do not break down over time. At high concentrations, Cl can also be harmful to fish, aquatic plants, and other aquatic organisms. The MPCA Cl Chronic Standard (CS, highest water concentration of Cl to which aquatic life, humans, or wildlife can be indefinitely exposed without causing chronic toxicity) is 230 mg/L for class 2B surface waters (all waters sampled within the district, excluding storm water holding ponds). The MPCA Cl Maximum Standard (MS, highest concentration of Cl in water to which aquatic organisms can be exposed for a brief time with zero to slight mortality) is 860 mg/L for class 2B surface waters.

The District has been monitoring salt concentrations in our lakes and ponds since 2013 and will continue monitoring efforts to identify high salt concentration areas and to assess temporal changes in salt concentrations. In 2019, staff carried out Cl sampling in lakes and streams every other week during the spring, switching to monthly sampling in summer/fall/winter. In 2020, winter monitoring included the Purgatory Chain of Lakes (Lotus, Silver, Duck, Round, Mitchell, Red Rock, Staring, and Hyland), the Upper and Lower Purgatory Creek Recreation Area (UPCRA and LPCRA), Rice Marsh Lake, and a chain of ponds that drain the City of Eden Prairie Center to Purgatory Creek. During sampling, staff collected a surface 2 m composite sample (when possible) and a bottom water sample to be analyzed for Cl. Since 2013, except for multiple samples taken from Idlewild, every sample taken from the RCL and PCL, has fallen below the MPCA CS of 230 mg/L (**Figure 4-10**, **Figure 4-11**). In 2020, Idlewild did meet the chloride standard, but it often exceeded the standard in the past. The maximum concentration measured in Idlewild was from a bottom sample taken in March of 2019 which measured 390 mg/L. The only other lake that had chloride concentrations above the standard was Staring Lake in 2018. Multiple bottom concentrations exceeded the standard, however the average (top/bottom) did not. Overall, Cl levels have stayed relatively consistent within lakes year-to-year.

Figure 4-12 shows Cl levels within the four stormwater ponds, which includes all sampling events since 2013. Except for two sampling events, all samples taken from Pond K (top of the chain) exceed the class 2B MS. This includes 2013 samples which exceeded the maximum chloride concentrations the lab equipment can measure. Most samples taken from Eden Pond greatly exceed the class 2B CS, some exceeding the class 2B MS. In the spring of 2015, staff were no longer able to take accurate water samples on Pond B due to low water levels, so, sampling began on Pond A located directly upstream. In 2018, due to inconsistencies with getting samples without disturbing sediment, staff reverted again to sampling Pond A in place of Pond B for multiple monitoring events. It is important to note that these stormwater ponds are not classified as class 2B surface waters by the MPCA and so the standards do not apply. Moving from upstream to downstream (Pond K to Pond B) it appears that the ponds are retaining much of the chloride they are receiving from the surrounding watershed during the winter even during melting events. This is preventing high chloride levels from reaching Purgatory Creek. During significant rain events in the spring, chloride most likely is flushed downstream at a larger scale than in the winter or during normal water level periods.

Staff will rotate the winter monitoring of Cl to the Riley Chain of Lakes in 2021 which will include: Lucy, Ann, Susan, Rice Marsh, and lake Riley, along with the stormwater ponds draining Eden Prairie Center. Once-a-month Cl sampling will continue as part of the monthly sampling SOP's during the regular growing season on both lakes and streams. More information on chloride concentrations can be seen in the Nutrient Summary Table in **Exhibit F**.

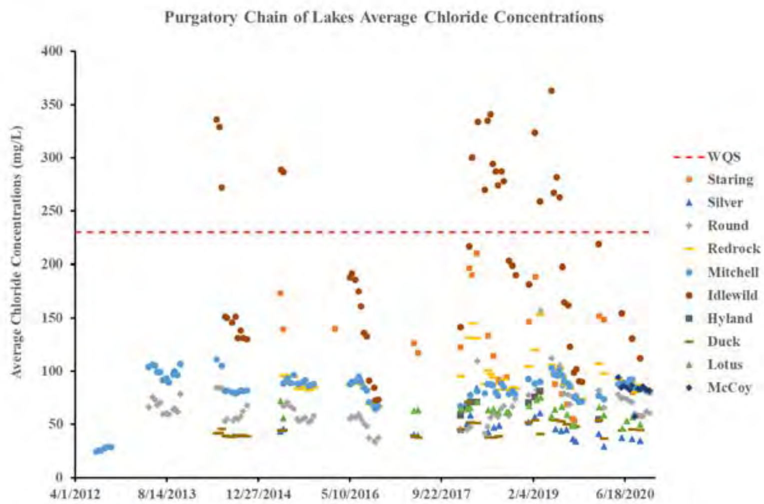


Figure 4-10 2013-2020 Chloride Levels within the Purgatory Chain of Lakes

All average chloride sampling results (mg/L) on the Purgatory Chain of Lakes from 2013-2020. The MPCA chloride chronic standard for class 2B waters (230mg/L) is indicated by the red line.

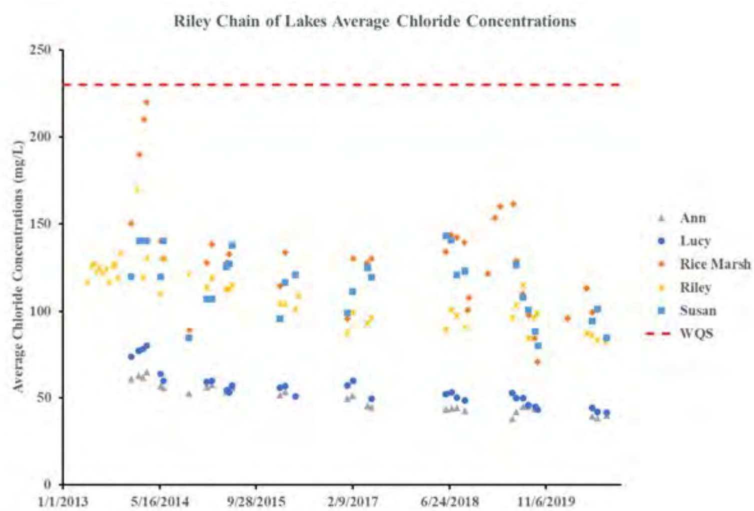


Figure 4-11 2013-2020 Chloride Levels within the Riley Chain of Lakes

All average chloride sampling results (mg/L) on the Riley Chain of Lakes from 2013-2020. The MPCA chloride chronic standard for class 2B waters (230mg/L) is indicated by the red line.

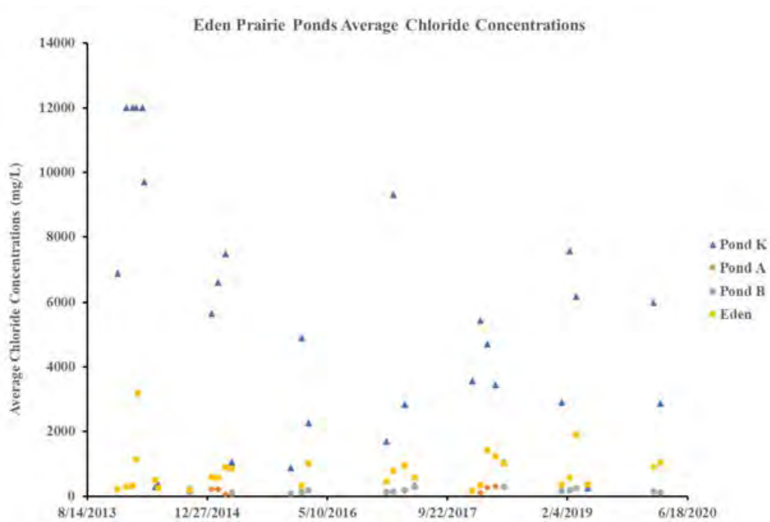


Figure 4-12 2013-2020 Chloride Levels within EP Stormwater Ponds

All average chloride results (mg/L) on stormwater ponds draining the City of Eden Prairie Center to Purgatory Creek from 2013-2020.

4.4 Nitrogen Monitoring

The toxicity of nitrates to aquatic organisms has been a growing concern in MN over the last decade. Nitrate (NO_3), the most available form of nitrogen for use by plants, can accumulate in lakes and streams since aquatic plant growth is not limited by its abundance. While nitrate has not been found to directly contribute to eutrophication of surface waters (phosphorus is the main cause of eutrophication) and is not a MPCA water quality standard, studies have found that nitrate can cause toxicity in aquatic organisms. In 2010, the MPCA released the Aquatic Life Water Quality Standards Technical Support Document for Nitrate: Technical Water Quality Standard Amendments to Minn. R. chs. 7050 and 7052 (still in the draft stage for external review) to address concerns of the toxicity of nitrate in freshwater systems and develop nitrate standards for class 2B and 2A systems. Sources of excess nitrate in freshwater systems are linked to human activities that release nitrogen into water. The draft chronic standard (CS) of 4.9 mg/L nitrate-N.

Once a month during regular sampling, staff collects a surface 2 m composite and a bottom water sample to be analyzed for nitrate+nitrite and ammonia+ammonium. In 2019, staff added Total Kjeldahl Nitrogen (TKN) to its monthly sampling regime. Organic-N levels are determined in a laboratory method called Total Kjeldahl Nitrogen (TKN). This measures the combination of organic N and ammonia+ammonium. Organic-N can be biologically transformed to ammonium and then to nitrate and nitrite forms. Because of this, monitoring for TKN could provide important supplemental data if staff observe increases in harmful forms of N in the future. Three Rivers Park District conducts water sampling on Hyland Lake and shares data with the District. Their lab tests do not specifically test for nitrogen as nitrate+nitrite or ammonia, therefore, nitrogen data on Hyland only includes TKN. The District monitors for nitrates in lakes as a part of its regular sampling regime. The District tests for nitrates in the form of nitrate+nitrite (the combined total of nitrate and nitrite, **Table 4-3**). This lab also tests for ammonia in the form of ammonia+ammonium. All lakes in the District met the draft nitrate CS. It is also important to note that the lab equipment used to test for nitrate has a lower limit of 0.03 mg/L. Therefore, it is possible that some of the samples contained less than 0.03 mg/L nitrate; because of this, actual average nitrate levels in District lakes may be lower than what measured (**Table 4-3**).

Ammonia (NH_3), a more toxic nitrogen-based compound, is also of concern when discussing toxicity to aquatic organisms. It is commonly found in human and animal waste discharges, as well as agricultural fertilizers in the form of ammonium nitrate. When ammonia builds up in an aquatic system, it can accumulate in the tissues of aquatic organisms and eventually lead to death. The MPCA does have standards for assessing toxicity of ammonia; the CS of ammonia in class 2B is 0.04 mg/L. RMB Environmental Lab water sample testing methods measures for ammonia in the form of ammonia+ammonium. The lab lower limit for these samples is 0.04 mg/L. The lower limit for sample data provided by the City of Eden Prairie for Red Rock, Round, McCoy, and Mitchell Lakes is 0.16 mg/L. Due to these limits, some of the average levels of Ammonia+Ammonium provided in **Table 4-3** may be lower than what is given. In lakes and streams, ammonium (NH_{4+}) is usually much more predominant than ammonia (NH_3) under normalized pH ranges. Ammonium is less toxic than ammonia, and not until pH exceeds 9 will ammonia and ammonium be present in about equal quantities in a natural water system (as pH continues to rise beyond 9, ammonia becomes more predominant than ammonium). **Table 4-3** shows ammonia+ammonium average levels in each lake during the growing season. These numbers are not of concern at this point seeing that pH levels were normal throughout the 2020 growing season and because lab testing measures the combination of ammonia and ammonium. This suggesting that most of nitrogen found in these tests was from the less toxic compound ammonium.

Table 4-3 2020 Lakes Summer Average of Nitrogen

2020 growing season (June-September) averages of nitrate+nitrite, ammonia, and total kjeldahl nitrogen levels for District lakes. The MPCA proposed chronic standard (CS) is included in the table (orange). The NH4 (CS) standard should not be directly compared to lake values (see text). Lower limit of lab analysis of nitrate+nitrite is 0.03 mg/L and ammonia+ammonium is 0.04 mg/L.

Lake	Average Nitrate-N	Average Ammonia+Ammonium	Total Kjeldahl Nitrogen
MPCA	4.90 mg/L	*0.04 mg/L NH4	-
Ann	0.030	0.794	1.513
Duck	0.030	0.063	0.821
Hyland			0.663
Idlewild	0.030	0.060	0.591
Lotus	0.030	1.377	3.200
Lucy	0.030	1.578	1.745
McCoy	0.050	0.160	1.475
Mitchell	0.050	0.194	1.688
Red Rock	0.050	0.169	1.863
Rice Marsh	0.030	0.069	0.840
Riley	0.032	0.541	0.970
Round	0.050	0.160	1.100
Silver	0.030	0.095	1.127
Staring	0.030	0.304	1.463
Susan	0.033	0.566	1.588

4.5 Lake Water Levels

In-Situ Level Troll 500, 15-psig water level sensors, as well as METER Environment Hydros 21 water level sensors, have been placed on most lakes throughout the watershed district to monitor water quantity and assess yearly and historical water level fluctuations. These sensors are mounted inside a protective PVC pipe that are attached to a vertical post and placed in the water. A staff gauge, or measuring device, is also mounted to the vertical post, and surveyed by District staff to determine the elevation for each level sensor. Once the water elevation is established, the sensors record continuous water level monitoring data every 15 minutes from ice out until late fall. New in 2018, staff built and deployed two EnviroDIY stations run by EnviroDIY Mayfly circuit boards on Rice Marsh Lake and Lake Riley. In 2020 staff built and deployed these same types of stations on both Lake Susan and Lake McCoy. These units were housed in a Pelican brand waterproof case which were mounted to one of the District's standard level sensor posts/staff gauges. These stations were outfitted with the Hydros 21 water level sensors, a solar panel, as well as a radio which allowed for remote communication with the station for real-time viewing of elevation/data.

Lake level data is used for developing and updating the District's models, which are used for stormwater and floodplain analysis. Monitoring the lake water levels can also help to determine the impact that climate change may have on lakes and land interactions in the watershed. Lake level data is also used to determine epilimnetic zooplankton grazing rates (located in section 4.8). Lake level data is submitted to the Minnesota Department of Natural Resources (MNDNR) at the end of each monitoring season and historical data specific to each lake can be found on MNDNR website using the Lakefinder database. See **Exhibit A** for figures showing historical lake level data. In both the Lakefinder database and in **Exhibit A**, the Ordinary High-Water Level (OHWL) is displayed so water levels can be compared to what is considered the "normal" water level for each lake. The OHWL is used by governing bodies like the RPBCWD for regulating activities that occur above and below this zone.

In 2020, lake level measurements were collected on 14 lakes in the District and two high value wetlands (Lake Idlewild and Lake McCoy) (**Table 4-4**). This was the first year Lake McCoy had water levels monitored. Staring Lake experienced the greatest seasonal water level change over the 2020 season, increasing 0.757 ft from sensor placement to the last day of recording (Oct. 29). Lake Susan had the largest range of fluctuation through 2020, having a low elevation of 880.923 ft, and a high of 882.753 ft (1.830 ft difference). On average, lake levels increased by 0.396 ft over the 2020 season. The average fluctuation range across all lakes was 1.226 ft.

Table 4-4 Lake Water Levels Summary

The 2020 (March-November) and historical recorded lake water levels (ft) for all monitored lakes within the Riley Purgatory Bluff Creek Watershed District. 2020 data includes the overall change in water level, the range of elevation fluctuation, and the highest and lowest recorded elevations. Historical data includes the highest and lowest historical recorded levels and the date they were taken.

	2020 Lake Water Level Data				Historical Lake Water Levels			
Lake	Seasonal Flux	Flux Range	High level	Low level	Highest Level	Date	Lowest Level	Date
Ann	0.239	0.815	956.977	956.162	957.930	2/18/98	952.800	9/28/70
Duck	0.240	0.720	914.299	913.579	916.120	6/20/14	911.260	11/10/88
Hyland	0.761	1.250	817.066	815.816	818.733	6/23/14	811.660	12/2/77
Idlewild	0.239	1.000	854.554	853.554	854.641	5/20/17	853.100	1/7/85
Lotus	0.127	0.901	896.414	895.513	897.080	7/2/92	893.180	12/29/76
Lucy	0.373	0.934	957.235	956.301	957.683	6/20/14	953.290	11/10/88
McCoy	0.553	0.974	824.082	823.108				
Mitchell	0.322	1.371	872.516	871.145	874.215	6/29/14	865.870	7/25/77
Red Rock	0.258	1.276	841.403	840.127	842.702	7/13/14	835.690	9/28/70
Rice Marsh	0.546	1.594	876.697	875.102	877.256	6/23/14	872.040	8/27/76
Riley	0.728	1.161	865.460	864.299	866.855	6/20/14	862.000	2/1/90
Round	0.717	2.082	881.329	879.247	884.260	8/17/87	875.290	7/25/77
Silver	-0.133	0.839	900.360	899.521	901.030	6/20/12	894.780	6/6/72
Staring	0.757	1.648	815.829	814.181	820.000	7/24/87	812.840	2/12/77
Susan	-0.185	1.830	882.753	880.923	884.226	6/19/14	879.420	12/29/76
Average	0.369	1.226						

4.6 Galpin Blvd Bluff Creek Crossing

Bluff Creek is listed on the 2002 and 2004 Minnesota Section 303(d) List of Impaired Waters due to impairment of turbidity and low fish Index of Biological Integrity (IBI) scores. Turbidity in water is caused by suspended sediment, organic material, dissolved salts, and stains that scatter light in the water column making the water appear cloudy. Excess turbidity can degrade aesthetic qualities of water bodies, can harm aquatic life, and have greater thermal impacts from increased sediment deposition in the stream. Primary sources contributing TSS within the Bluff Creek Watershed are streambank and bluff erosion, as well as poorly vegetated ravines and gullies (Barr 2013). These sources of sediment are contributing excess TSS loadings, mobilized by stormwater runoff from the watershed under high flow conditions. In addition, total phosphorous levels across all five Bluff Creek water quality sites are consistently above then MPCA water quality standard from year to year (≤ 0.1 mg/L). The Creek Restoration Action Strategy identified subreaches B5B and B5C near Galpin Road as sites that could benefit from restoration/stabilization and therefore reduce downstream nutrient and sediment loading.

When a project is identified RPBCWD staff will often monitor a site before and after the project is implemented. This is to confirm a project is warranted and to monitor the effectiveness of a project. In 2019 and 2020, staff placed an automated sampling unit at the culvert under Galpin Road. This was done to better quantify rain event nutrient loading from upstream sources from Bluff Creek. Analyzing the "first flush" of a storm event is important because these events are when water pollution entering storm drains in areas with high proportions of impervious surfaces is typically more concentrated compared to the remainder of the storm. Water samples were collected and analyzed for total dissolved phosphorus (TDP), ortho-phosphorous (OP), total phosphorus (TP), total suspended solids (TSS), and Chlorophyll-a (Chl-a) in 2020. The automated water-sampling unit also estimated flow of the creek at that point.

In 2019 and 2020, total phosphorus levels at the upper Bluff Creek site during storm events were high compared to the MPCA standards, as seen in **Figure 4-13**. As seen in **Table 4-5**, the average TP across 17 samples was 0.525 mg/L in 2019 and 0.425 mg/L in 2020. This level is over four times the MPCA eutrophication water quality standard for class 2B streams (≤ 0.1 mg/L TP). Across both years, all TP samples collected measured above the MPCA standard with the highest TP concentration having occurred in early August in 2019 at 1.77 mg/L and 1.12 mg/L in mid-October of 2020. The TDP average in 2019 was 0.135 mg/L with the highest measurement of 0.237 mg/L (**Table 4-5**). OP average in 2020 was 0.094 mg/L with the highest measurement of 0.168 mg/L. The average amount of TSS across the 17 samples taken was 84.6 mg/L in 2019. The average amount of TSS across the 15 samples taken was 26.4 mg/L in 2019. To achieve the MPCA TSS stream water quality standard, a stream may not exceed 30 mg/L TSS more than 10% of the time. Across all the sampling events, nine of the 17 samples taken in 2019 were above 30 mg/L TSS and only five of the fifteen samples taken in 2020 were above the standard (**Figure 4-14**). Four of the six in 2019 and five of six in 2020 Chl-a samples collected were less than the MPCA eutrophication water quality standard of ≤ 18 ug/L Chl-a (**Table 4-5**). It is important to remember that these samples are targeted samples, representative of the initial flush of water and pollutants that occurs during a rain event, and do not represent season-long pollutant levels in Bluff Creek. Therefore, a direct comparison to the MPCA water quality standards is cautioned.

Table 4-5 2019 and 2020 Galpin Road Bluff Creek Crossing Nutrient Loading Summary
Galpin Road Bluff Creek Crossing Total Dissolved Phosphorus (mg/L), Ortho-phosphorous (mg/L), Total Phosphorus (mg/L), Chlorophyll-a (ug/L), and Total Suspended Solids (mg/L) max, min, and average concentrations from random grab samples and an automated, level triggered and flow-paced samples in 2019 and 2020. The Minnesota Pollution Control Agency water quality standards are also included.

Parameter	Minimum	Maximum	2019 Average	2020 Average	MPCA Water Quality Standards
TP (mg/L)	0.11	1.77	0.525	0.425	≤ 0.1
TDP (mg/L)	0.025	0.237	0.135		
OP (mg/L)	0.031	0.168		0.094	
Chl-a (ug/L)	1.6	32	11.562	32	≤ 18
TSS (mg/L)	4.1	800	84.6	26.4	≤ 30

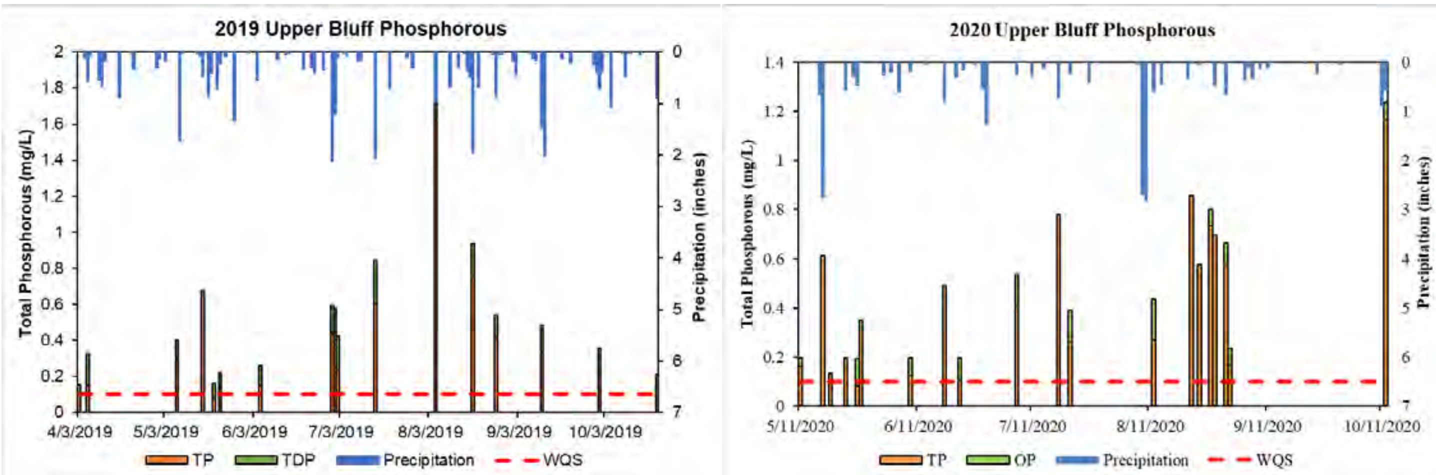


Figure 4-13 2019 and 2020 Upper Bluff Creek Phosphorus

The Total Dissolved Phosphorus (TDP) and Total Phosphorus (TP) concentrations (mg/L) from Bluff Creek under Galpin Blvd from 2019 and 2020 automated, level triggered, flow-paced samples. Dashed line represents the Minnesota Pollution Control Agency standard for TP in class 2B creeks (≤ 0.1 mg/L).

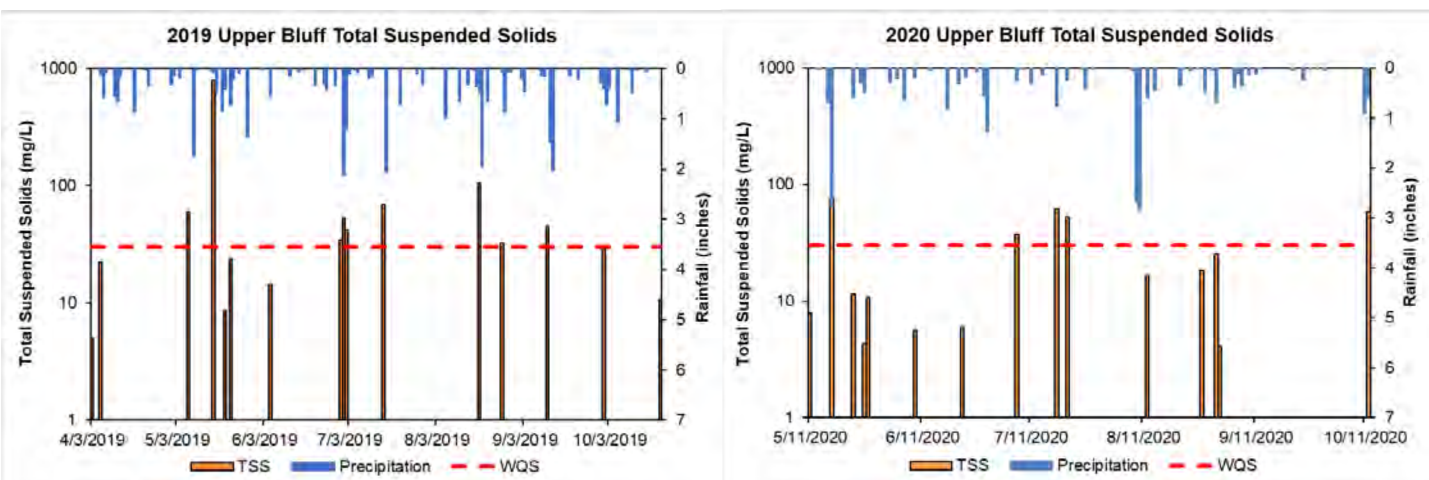


Figure 4-14 2019 and 2020 Upper Bluff Creek Total Suspended Solids

Total Suspended Solids (TSS) concentrations (mg/L) from Bluff Creek under Galpin Blvd from 2019 and 2020 automated, level triggered, flow-paced sampler. Dashed line represents the Minnesota Pollution Control Agency standard for TSS in class 2B creeks (≤ 30 mg/L TSS no more than 10% of the time).

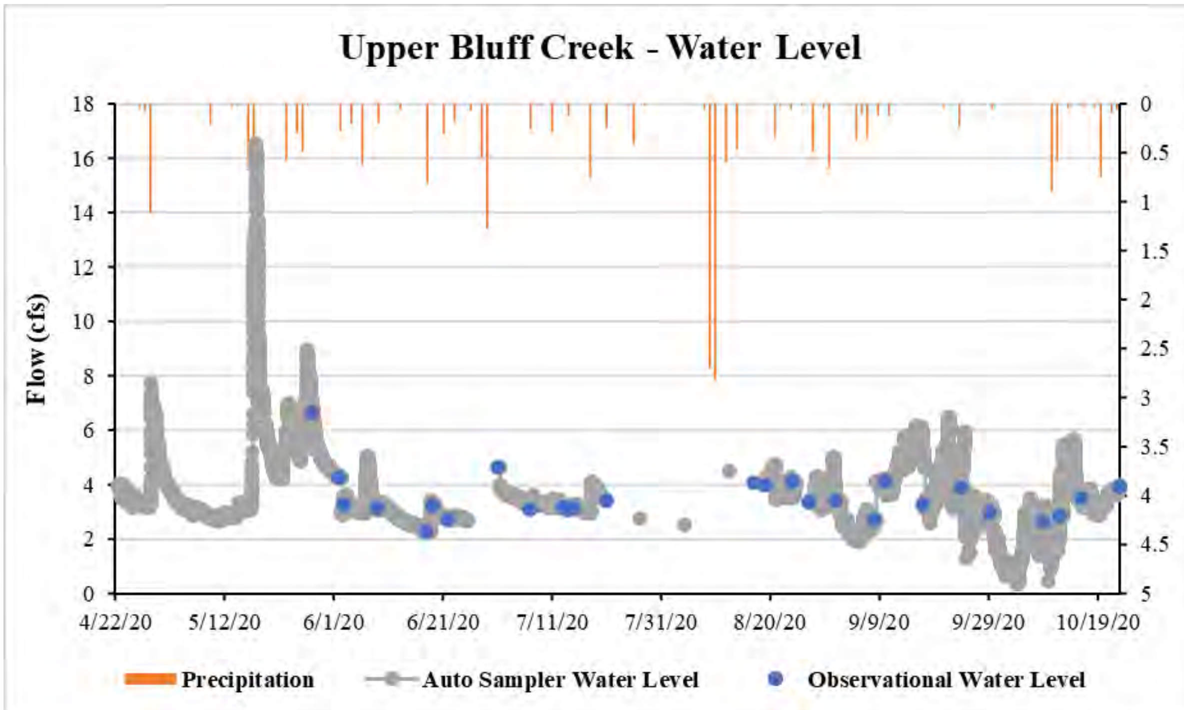


Figure 4-15 2020 Upper Bluff Creek Water Levels

Autosampler and Visual Water Levels from Bluff Creek under Galpin Blvd from 2020.

4.7 The Creek Restoration Action Strategy

The RPBCWD developed the Creek Restoration Action Strategy (CRAS) to prioritize creek reaches, sub-reaches, or sites, in need of stabilization and/or restoration. The District has identified eight categories of importance for project prioritization including: infrastructure risk, erosion and channel stability, public education, ecological benefits, water quality, project cost, partnerships, and watershed benefits. These categories were scored using methods developed for each category based on a combination of published studies and reports, erosion inventories, field visits, and scoring sheets from specific methodologies. Final tallies of scores for each category, using a two-tiered ranking system, were used to prioritize sites for restoration/remediation. More information on the CRAS can be found on the District's website: www.rpbcwd.org. The CRAS was finalized/adopted in 2015, updated in April of 2017, and published in the Center for Watershed Protection Science Bulletin in 2018. A severe site list was developed which was updated to include results from 2020 (not official) can be seen in **Table 4-6**.

Table 4-6 Severe Reaches Identified by the Creek Restoration Action Strategy

Reach	Subreach	Tier 2 Rank	Tier 2 Score	Tier 1 Rank	Tier 1 Score	Location	Status
R2	R2E	1	44	2	26	Middle Third between Dell Road and Eden Prairie Road	Complete
P1	P1E	2	44	4	22	1,350 feet DS of Wild Heron Point to Burr Ridge Lane	
B1	B1D	3	42	1	26	475 feet US of Great Plains Blvd to Great Plains Blvd	
R4	R4D	4	42	7	22	Railroad Bridge to Powers Blvd	Planning
B5	B5C	5	40	3	24	Galpin Boulevard to West 78th Street	Planning
B1	B1B	6	38	8	22	2,150 feet DS of Pioneer Trail to 300 feet US of Bluff Creek Park	
BT3	BT3A	7	38	5	22	Audubon Road to Pioneer Trail	Complete
R2	R2D	8	34	6	22	Upper Third between Dell Road and Eden Prairie Road	Complete

Streams are monitored biweekly between May and September for nutrients and flow. This data is used to assess water quality across each stream which is then incorporated into the CRAS. Results from the 2020 data can be seen in **Exhibit E** 2020 Creek Seasonal Sonde & Flow Data and **Exhibit G** 2020 Stream Nutrient Summary Table. As part of CRAS, stream reaches are walked on a rotational basis after the initial assessment was completed. This will allow staff to evaluate changes in the streams and update the CRAS accordingly. In 2019 staff walked Reach. 7 of Purgatory Creek and parts of Reach 3, 4, and 5. In 2020 staff walked Reach 1 and 2 of Purgatory Creek and Reach 5 of Bluff Creek. Staff conducted Modified Pfankuch Stream Stability Assessments, MPCA Stream Habitat Assessments (MSHA), took photos, and recorded notes of each subreach to assess overall stream conditions. In addition to creek walks, staff also checked bank pins which were installed in 2015 and 2018 near all the regular water quality sites. The bank pins were installed at "representative" erosion sites to evaluate general erosion rates for each reach. Changes to the CRAS based upon 2020 creek walks can be seen in **Table 4-7** and in our Fact Sheets in **Exhibit I**. A summary of the 2020 creek walks can be seen in the section below.

In addition to CRAS scoring and measuring bank pins, staff also collected macroinvertebrates at all five Bluff Creek sites in 2020 (Purgatory Creek in 2019). Biological monitoring can often detect water quality problems that water chemistry analysis misses or underestimates. Chemical pollutants, agricultural runoff, hydrologic alterations, and other human activities have cumulative effects on biological communities over time. The condition of these communities represents the condition of their aquatic environment. The 2020 data was not available for this report.

Table 4-6 2020 Creek Restoration Action Strategy Updates

Tier I and Tier II scores for the Creek Restoration Action Strategy for 2017 and the corresponding updates from 2020 for subreaches within P1, P2, and B5.

Reach	Subreach	Location	2017 Tier I Scores	2020 Tier I Scores	Tier II Scores
B5	B5A	Ridgeview Road Recreational Trail to 985 feet US of Galpin Boulevard	16	14	28
B5	B5B	985 feet US of Galpin Boulevard to Galpin Boulevard	22	20	34
B5	B5C	Galpin Boulevard to West 78th Street	24	24	40
P2	P2A	Purgatory Creek Conservation Area to Staring Lake	14	18	30
P2	P2B	Staring Lake to Flying Cloud Drive	16	18	34
P2	P2C	Flying Cloud Drive to Creek Knoll Road	16	18	30
P2	P2D	Creek Knoll Road to 1,725 feet DS of Creek Knoll Road	14	18	28
P2	P2E	1,725 feet DS of Creek Knoll Road to Homeward Hills Road	14	18	28
P1	P1A	Homeward Hills Road to 1,250 feet DS of Homeward Hills Road	16	18	26
P1	P1B	1,250 feet DS of Homeward Hills Road to Pioneer Trail	20	20	36
P1	P1C	Pioneer Trail to 2,950 feet DS of Pioneer Trail	18	20	30
P1	P1D	2,950 feet DS of Pioneer Trail to 1,350 feet DS of Wild Heron Point	18	18	32
P1	P1E	1,350 feet DS of Wild Heron Point to Burr Ridge Lane	24	22	44
P1	P1F	Burr Ridge Lane to 1,250 feet US of Riverview Road	22	20	34
P1	P1G	1,250 feet US of Riverview Road to Riverview Road	16	18	22

BLUE=GOOD
YELLOW=MODERATE
ORANGE=POOR
RED=SEVERE

In 2021, staff will finish the second complete walk of Bluff Creek and update accordingly. CRAS updates and potential additional monitoring for 2021 include:

- Placement of additional bank pins at sites that align with upcoming projects.
- Walk additional 1st order tributaries that have not been assessed.
- LRAS

- Assessing additional ravine erosion areas.
- Using the stream power index (SPI) to identify and assess potential areas of erosions upstream of wetland, creeks, and lakes.
- Installing EnviroDIY stations near areas of concern or where information is lacking.
- Utilize CRAS2 to advance creek stability assessments.
- Potentially add macroinvertebrates Index of Biotic Integrity to CRAS scoring methodology.

Bluff Creek – Reach 5 – Subreach A/B/C – Ridgeview Road Recreational Trail to Highway 5
Reach 5 of Bluff Creek begins at the recreational walking trail off Ridgeview way and stretches downstream to the stream intersection with 78th Street West (approximately 0.6 stream miles). This includes three subreaches. This stream reach begins out of a wet prairie/emergent wetland and ends in deciduous forest. The surrounding land use is primarily residential housing apartments along the left bank and roadways (West 78th Street and Highway 5) along the right bank. The slope gradient was <20% which increased slightly in subreach C. The stream crosses under Galpin Boulevard and begins and ends at recreational walking trails. Subreach A and B have been channelized and straightened with limited channel development (riffle, run, pool). Subreach C had more sinuosity and channel development but had significantly more erosion. The habitat scores for the top two subreaches were low with little to no habitat for aquatic organisms. The most predominant substrate type present in the stream was silt which transitioned to more sand in Subreach C. In Subreach A the primary in stream habitat was overhanging vegetation while Subreach B and C had lots of woody debris. The stream is narrow and generally low flows with some periods of intermittent flows during dry years. Erosion in subreach B is high and higher yet in Subreach C. Subreach C has considerable erosion occurring on both banks and is continuously incised by 1 m. This, along with multiple large erosion sites along the outside bends, lead to Subreach C having the highest (worst) stream stability. Areas to watch include the large continuous erosion areas downstream of Galpin (mostly outside bends) and the two large gully formations caused by gutter drains in subreach C. Subreach B was upgraded to poor condition and C remained an excellent candidate for restoration due to the degraded state.

Purgatory Creek – Reach P2 - Subreach A – Purgatory Creek Recreational Area to Staring Lake
Subreach A of Reach 2 of Purgatory Creek begins at the Purgatory Creek Recreational Area and extends downstream to Staring Lake (approximately 0.75 stream miles). This section of the stream passes through deciduous forests and apartment complexes and has a low slope gradient (<30%). The stream crosses under Anderson Lakes Parkway, Staring Lake Parkway, and a walking trail bridge crosses the stream below Staring Lake Parkway and at the Staring Lake Outdoor Center. The stream is paralleled by a recreational trail along the right bank for almost the entirety of the subreach. The creek is very straight with almost no channel development (riffle, run, pool) and is generally wide with uniform depth. This shifts to a more natural stream channel and increased habitat downstream after Staring Lake Parkway near the Outdoor Center. There is one main (artificial) riffle under Anderson Lakes Parkway that provides significant habitat along with sparse woody debris present within the channel. Woody debris increases significantly below Staring Lake Parkway. The entire subreach had banks incised between 0.1-0.25 m with some downstream sections increasing to 0.75 m. Even with the incising the stream was fairly stable. There were no major concerns facing the infrastructure in this subreach besides some older stormwater culverts that are in significant disrepair.

Purgatory Creek – Reach P2 – Subreach B/C/D/E - Staring Lake to Homeward Hills
The subreachs begin at Staring Lake and end at Homeward Hills Road (approximately 1.93 stream miles). The upland vegetation along these subreachs shifted between deciduous trees and grasses. Slope gradients in this section were mainly <30% and continuous erosion (incising) was common. Stream habitat was overall fair. Woody debris and undercut banks being were the dominant types of habitat. The substrate was dominated by sand/silt with areas of gravel. The creek was fairly sinuous with mostly fair/poor

channel development. The high Pfankuch scores associated with the subreaches B and C correspond to the amount of depositional material along the stream perimeter, the movability of the stream bed, and the continuous incising. Stream habitat was more available in these subreaches than upstream but was still lacking. Areas to watch include the stormwater culvert in subreach E.

Purgatory Creek – P1 – Subreach A/B/C/D/E/F/G- Homeward Hills Road to Riverview Road

Reach 1 of Purgatory Creek begins at Homeward Hills and stretches downstream to Riverview Road (approximately 4 stream miles). This section of the stream passes through predominantly deciduous forests and has residential housing located along both banks (most often set back). Overall, the slope gradient was generally steep ranging between 40 and 60%. The stream crosses under Pioneer Trail and has a recreational trail along most of the length of the stream which crosses at several points in the upper section. The creek is very sinuous with considerable channel development (riffle, run, pool sequences). Erosion in this section at places was severe, along with significant amounts of woody debris present within the channel. Most of the subreachs were incised between 0.25 and 0.5 m. Serious mass wasting and erosion occurred across all subreaches but was specifically extreme and concentrated in reach P1E. Many older stormwater culverts were in disrepair across all the subreaches. Many of the serious erosion sites had residential housing at the top of the slope. These areas have the potential to eventually threaten the houses present. The habitat in the subreach was fair to good.

Bank Pins

In addition to creek walks, staff have also checked bank pins yearly since they were installed in 2015 near all the regular water quality sites. The bank pins were installed at "representative" erosion sites to evaluate erosion rates for each reach. Staff measured the amount of exposed bank pin or sediment accumulation if buried in 2016 through 2020 (2018-2020 measurements shown in **Table 4-8**). From this, staff can quantify estimates of lateral bank recession rates. Engineering firm Wenck Associates, Inc. also installed bank pins at 11 sites on lower Riley Creek (south of Lake Riley) and Purgatory Creek (south of Riverview Road) in 2008 and 2010, to monitor bank loss and quantify lateral recession rates (Wenck, 2017). From their monitoring results, Wenck was able to track the potential effectiveness of upstream bank repairs on bank-loss-reduction at the Purgatory Creek sites. Results from monitoring the Riley Creek bank pins informed Wenck's recommendation to the City of Eden Prairie to prioritize several reaches for stabilization. In 2018, staff added pins at representative erosion sites near the following regular creek monitoring sites (if pins were installed on the left bank, it is denoted here as LB; RB denotes pins installed on the right bank): 2 pins on LB at R4, 3 pins on RB and 3 pins on LB at R2, 3 pins on RB at B4, 3 pins on RB and 3 pins on LB at B3, 2 pins on RB at B2, and 1 pin on LB at P6. District staff will continue to monitor the bank pins/bank loss at our 18 regular monitoring sites.

- In 2018, reach R5 had the highest estimated lateral loss (8.99 in/year) while reach B3 had the highest bank loss per one yard stretch of creek (3.66 ft3).
- In 2019, reach R3 had the highest estimated lateral loss (12.96 in/year) while reach R2 had the highest bank loss per one yard stretch of creek (6.93 ft3).
- In 2020, reach B4 had the highest estimated lateral loss (11.56 in/year) and the highest bank loss per one yard stretch of creek (5.47 ft3).

Table 4-7 2018-2020 Bank Pin Data

Average lateral stream bank loss per year and the estimated bank volume loss for a one-yard section of streambank at each of the 18 regular creek monitoring sites from 2018-2020. Negative values denote areas of bank where there was sediment deposition. Empty cells denote sites where pins were not found. Orange-highlighted cells denote sites where bank pins were added on one or both banks in 2018. * Values of P1 in 2019 are averages from the left bank; right bank pins were not measured in 2019. P1 measurements in 2020 account for bank loss over a two-year period; the average estimated yearly lateral loss and bank loss per one yard from 2019-2020 is 3.23 in/year and 5.365 ft^3/year respectively. ** The right bank heights used to calculate these values were taken from previous years' measurements.

	Average Lateral Loss (in/year)			Estimated bank loss per one yard stretch of creek (ft3)		
	2018	2019	2020	2018	2019	2020
R5	8.99	9.45	1.31	2.41	2.58	0.85
R4	0.42	4.44	1.77	0.25	1.97	0.66
R3	5.31	12.96	7.44	3.18	5.71	3.00
R2	--	6.45	2.15	--	6.93	2.12
R1	2.96	5.35	1.79	1.23	2.71	0.78
P8	0.55	2.99	0.58	0.12	0.93	0.22
P7	2.02	3.40	-	2.48	3.22	-
P6	0.73	5.39	2.00	0.35	1.95	0.79
P5	0.77	3.41	1.58	0.41	2.09	0.88
P4	0.83	2.09	1.36	0.27	**0.69	0.20
P3	0.94	1.96	0.66	0.51	1.38	0.44
P2	0.50	6.36	4.29	0.24	3.21	1.87
P1	0.38	*0.83	*6.46	0.46	*0.82	*10.73
B5	-0.79	1.78	1.16	-0.23	0.89	0.58
B4	5.58	11.45	11.56	3.66	6.59	5.47
B3	--	3.29	1.77	--	1.84	0.83
B2	3.00	*7.00	5.56	1.25	*4.08	3.19
B1	-0.67	5.54	-	-0.25	3.45	-

4.8 Zooplankton and Phytoplankton

In 2019, five lakes were sampled for both zooplankton and phytoplankton: Lake Riley, Rice Marsh Lake, Lake Susan, Lotus Lake, and Staring Lake. Zooplankton play an important role in a lake's ecosystem, specifically in fisheries and bio control of algae. Healthy zooplankton populations are characterized by having balanced densities (number per m^2) of three main groups of zooplankton: Rotifers, Cladocerans, and Copepods. The Sedgwick-Rafter Chamber (SRC) was used for zooplankton counting and species identification. A two mL sub-sample was prepared in which all zooplankton were counted and identified to the genus and/or species level. The sample was scanned at 10x magnification to identify and count zooplankton using a Zeiss Primo Star microscope. Cladocera images were taken using a Zeiss Axiocam 100 digital camera and lengths were calculated in Zen lite 2012. The District analyzed zooplankton populations for the following reasons:

1. Epilimnetic Grazing Rates (Burns 1969): The epilimnion is the uppermost portion of the lake during stratification where zooplankton feed. Zooplankton can be a form of bio control for algae that may otherwise grow to an out-of-control state and therefore influence water clarity.
2. Population Monitoring (APHA, 1992): Zooplankton are a valuable food source for planktivorous fish and other organisms. The presence or absence of healthy zooplankton populations can determine the quality of fish in a lake. Major changes in a lake (significant reduction in common carp, winter kills, large scale water quality improvement projects, etc.) can change zooplankton populations drastically. By ensuring that the lower parts of the food chain are healthy, we can protect the higher ordered organisms.
3. Aquatic Invasive Species Monitoring: Early detection of water fleas is important to ensure these organisms are not spread throughout the District. These invasive species outcompete native zooplankton for food and grow large spines which make them difficult for fish to eat.

The Sedgwick-Rafter Chamber (SRC) was used for phytoplankton counting and species identification. A one mL aliquot of the sample was prepared using a Sedgewick Rafter cell. Phytoplankton were identified to genus level. The sample was scanned at 20x magnification to count and identify phytoplankton species using a Carl Zeiss Axio Observer Z1 inverted microscope equipped with phase contrast optics and digital camera. Higher magnification was used as necessary for identification and micrographs. The District analyzed phytoplankton populations for the following reasons:

1. Population Monitoring: Phytoplankton are the base of the food chain in freshwater systems and fluctuate throughout the year. By ensuring that the lower parts of the food chain are healthy, we can protect the higher ordered organisms such as macroinvertebrates and fish.
2. Toxin Producers and Algae Blooms: Some phytoplankton produce toxins that can harm animals and humans, or cause water to have a fowl taste or odor (*Microcystis, Aphanizomenon, Dolichospermum, Planktothrix, and Cylindrospermopsis)*. Monitoring these organisms can help us take the proper precautions necessary and identify possible sources of pollution. Just because toxic algae are found in a lake does mean it could cause harm. Specific conditions must be met for the algae to become toxic.

Lake Riley

In 2020, all three groups of zooplankton were captured in Lake Riley (**Exhibit A**) with 18% of the zooplankton captured Cladocera, up from 6% in 2019. Unlike in 2019 rotifers were the least abundant zooplankton sampled in 2020 (**Figure 4-16**). This may be due to zebra mussels increasing in number which can consume the smaller rotifers. The number of rotifers identified in 2020 slowly increased with the highest number observed during the last September sampling event. Both Copepod and Cladoceran numbers decreased through the season. Copepods were the most abundant zooplankton captured in 2020, specifically larval nauplii. Although only four sampling events occurred in 2020 as opposed to five in previous years total Cladocera numbers were down (200 thousand). Total Cladoceran counts in 2019 were up slightly from 2018, but still less than what was seen in 2016 and 2017 (around 450 thousand). This reduction by half may be due to the continuing increase in water clarity caused by alum treatment, which leads to increased predation on zooplankton populations. Additionally, zebra mussels were discovered in 2018 which could also be contributing to the increase in water clarity and the removal of phytoplankton (Cladoceran food source). The most numerous Cladocera found in Riley was *Daphnia pulex,* which has a broad range of habitats and can be found in lakes ranging from ultra-oligotrophic to eutrophic. Cladocera consume algae and have the potential to improve water quality if they are abundant in large numbers. Due to the lower numbers of Cladocera in both 2019 and 2020, grazing rates were near 0% across all sampling dates.

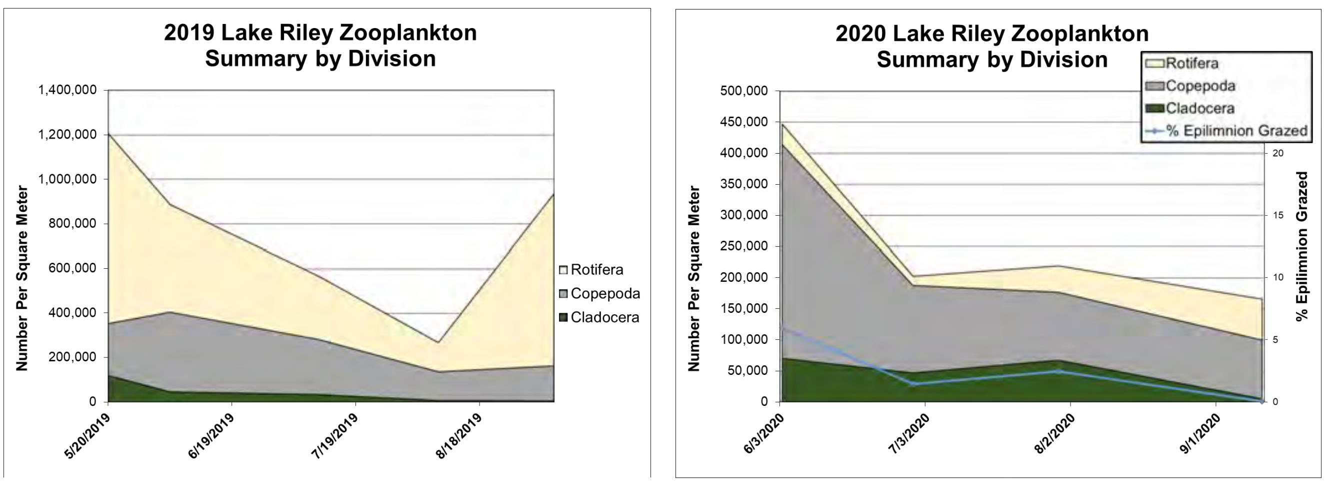


Figure 4-16 2019 & 2020 Lake Riley Zooplankton Counts (#/m²).

During the summer of 2020, staff collected four phytoplankton samples on Lake Riley (**Exhibit D**). The 1997 to 2020 total historical abundance and the 2020 seasonal abundance of phytoplankton is presented in **Figure 4-17**. The dominant phytoplankton across all sample dates was Chlorophyta specifically *Chlamydomonas globose* or green algae. Both Cryptophyta and Cyantophyta were the second most abundant class of phytoplankton. Cyanophytes, also known as cyanobacteria or blue-green algae, are a group of free-living bacteria that obtain energy through photosynthesis. Under favorable conditions large, toxic blooms of cyanobacteria can occur. In 2019, Chlorophyta (primarily *Chlamydomonas globose*) was also abundant, however Chrysophyta was the most dominant class of phytoplankton.

Historically, phytoplankton numbers have been declining since 2019 and are now significantly lower than previously seen. This is likely due to the zebra mussel population expansion and alum treatment which first occurred in 2018. Before 2019, potentially harmful blue-green algae were the dominant phytoplankton in Lake Riley.

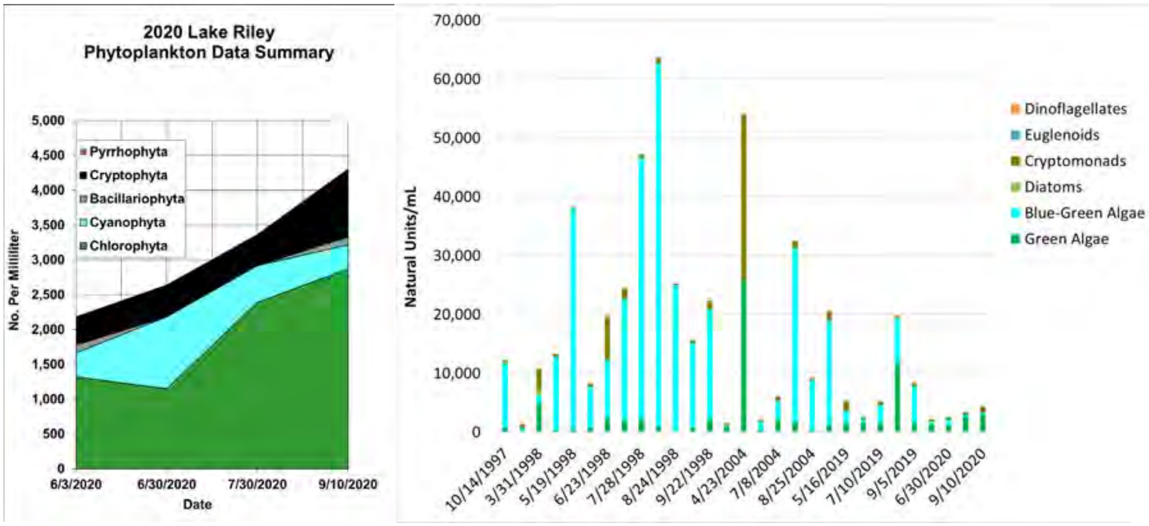


Figure 4-17 1997-2020 Lake Riley Phytoplankton Historical & Seasonal Abundance (#/mL).

Lotus Lake

In 2020, all three groups of zooplankton were present in Lotus Lake (**Exhibit C**). In 2020, rotifers were the most abundant zooplankton sampled and increased steadily throughout the growing season (**Figure 4-18**). Copepod numbers varied between sampling events throughout 2020 with the highest number captured in June (309 thousand). Cladoceran followed a similar trend to rotifers by steadily increasing from 34 thousand in early June to 173 thousand in September. This is down from Cladocerans in 2019 in September when they reached their highest numbers at 362 thousand. The increased fall Cladocera numbers can be attributed to an abundance of *Daphnia retrocurva* and *Diaphanosoma leuchtenbergianum. Daphnia retrocurva* is known for its large, curved helmet it develops in late spring-to-summer to reduce predation by planktivorous fish and invertebrates.

Large Cladocera consume algae and, if enough are present in a lake, they have the potential to improve water quality. The estimated epilimnetic grazing rates observed in 2018 ranged from 6% to 19%. In 2019 the rates were very low ranging from near 0% to under 5% and rates were near 0% in 2020 (**Figure 4-18**).

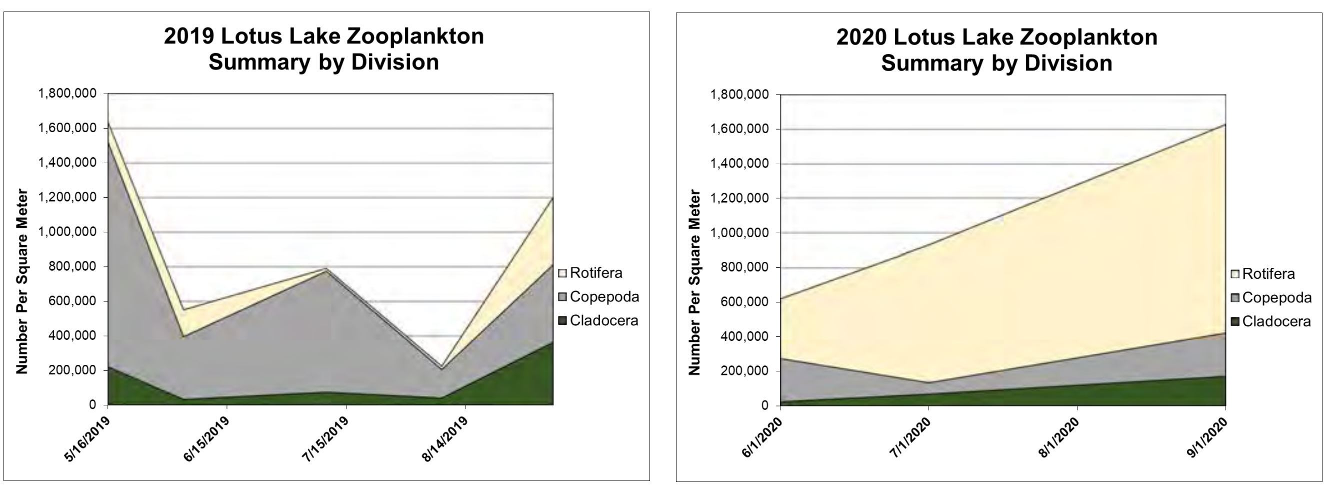


Figure 4-18 2019 & 2020 Lotus Lake Zooplankton Counts (#/m²).

During the summer of 2020, staff collected four phytoplankton samples on Lotus Lake (**Exhibit D**). The abundance of phytoplankton across all sampling dates is presented **Figure 4-19**. In 2019 Cyanophyta (primarily *Aphanizomenon flos-aquae*) was dominant in August and September, with a massive spike occurring in early August. Aphanizomenon are a potential producer of cylindrospermopsin, anatoxins, and saxitoxins. This trend matched what was seen in 2020 with *Aphanizomenon flos-aquae* the most consistently dominant species and a spike of *Cylindrospermopsis raciborskii and Anabaenopsis raciborskii* in August and September. These species can produce similar toxins to Aphanizomenon. Historically, blue green algae have comprised a large population of phytoplankton sampled, but since 2004 have they have been the dominant phytoplankton group observed (**Figure 4-19**).

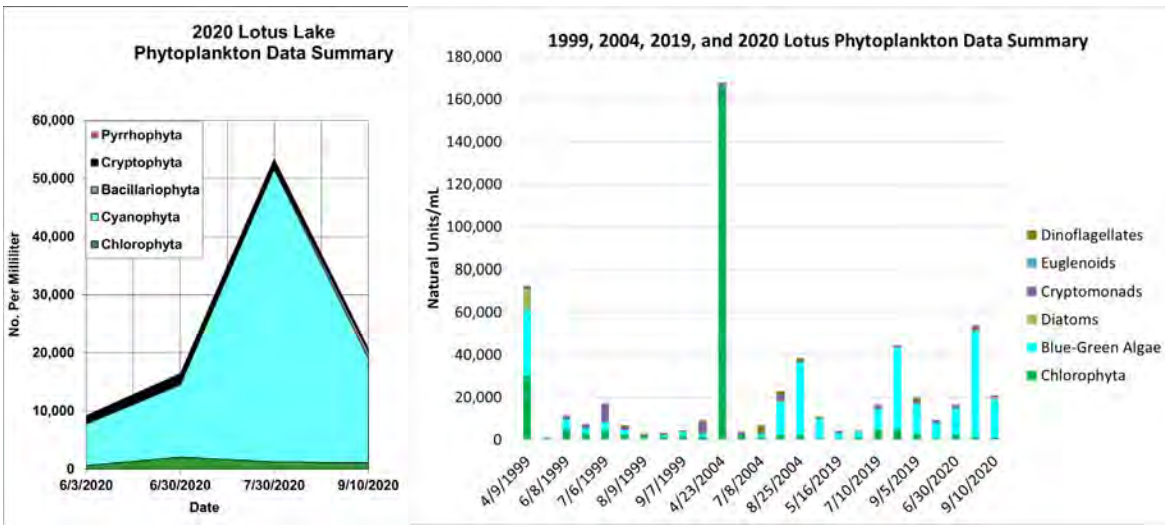


Figure 4-19 1999-2020 Lotus Lake Phytoplankton Historical & Seasonal Abundance (#/mL).

Lake Susan

Similar to 2018 and 2019, rotifers were the most abundant zooplankton captured in Lake Susan in 2020 with *Keratella sp.* being dominant. (**Exhibit A**). The rotifer population was variable over the 2019 sampling events with the highest abundances observed in September. In 2020, rotifer numbers were less variable with the highest concentration occurring in August. Copepod numbers declined from an early high of 436 thousand average across the first two sampling events, dropping about 200 thousand for the rest of the season in 2020 (**Figure 4-20**). Overall, Cladocera numbers were low relative to the other taxa (5.5% of zooplankton), around 50 thousand down from an average 100 thousand individuals per sampling event in 2019. The highest Cladocera population recorded in 2020 was in September when *Daphnia retrocurva* were captured in high numbers.

The estimated epilimnetic grazing rates upon algae observed in 2018 ranged from 0% to 11% and around 1% in 2019. In 2020, grazing rates were again 1% or lower. This is mainly due to the very limited number of Cladocera present in all the samples collected.

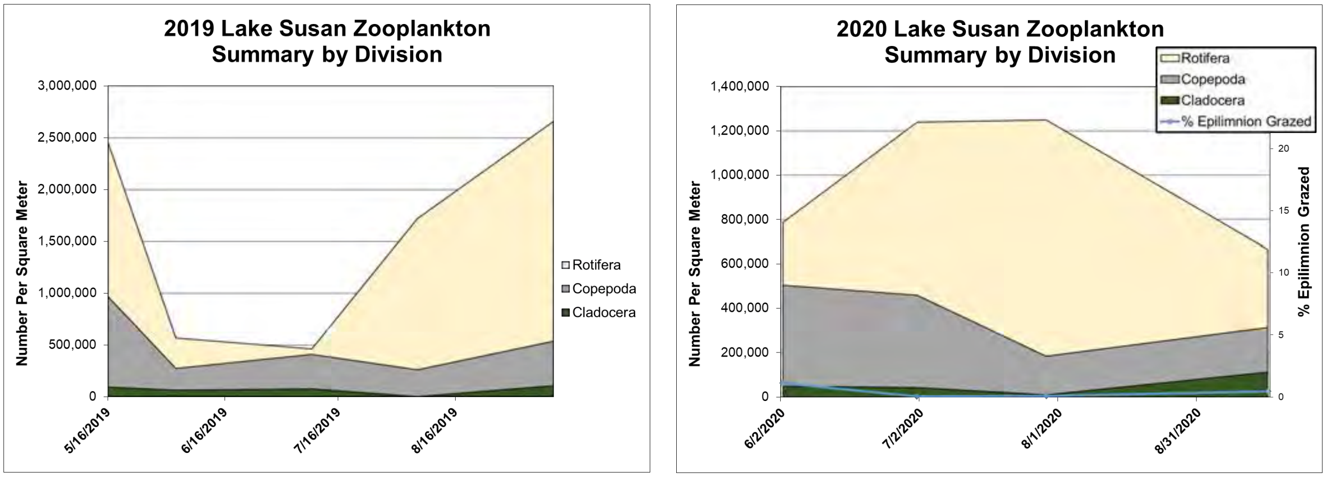


Figure 4-20 2019 & 2020 Lake Susan Zooplankton Counts (#/m²).

During the summer of 2020, staff collected four phytoplankton samples on Lake Susan (**Exhibit D**). The abundance of phytoplankton by Class is presented in **Figure 4-21**. Similar to 2019, Cyanophyta and Chlorophytes were the co-dominate phytoplankton groups in 2020. Chlorophyta are a division of green mostly unicellular or simple filamentous algae, which are free-floating or are present in large aggregations in stagnant water, such as ponds and lakes. Similar to 2019, a large spike in the population of Cyanobacteria caused it to become the dominant phytoplankton species in July and August making up 89% of the Total Phytoplankton Abundance (TPA). Similar to what was seen in Lotus Lake, *Cylindrospermopsis raciborskii and Anabaenopsis raciborskii* were the most abundant phytoplankton overall. These phytoplankton are a potential producer of cylindrospermopsin, anatoxins, and saxitoxins.

Historically, the trend of Chlorophyta and Cyanobacteria being the two dominant types of phytoplankton has persisted. Cryptomonads were also commonly found across most years. Recently in 2019 and 2020, the Blue Green Algae populations have increased significantly which is of concern since they can be harmful. Numerous water quality projects have been partially implemented around Lake Susan and others are projected to be completed soon. These water quality improvements will hopefully reduce potentially harmful algal blooms as seen in other lakes.

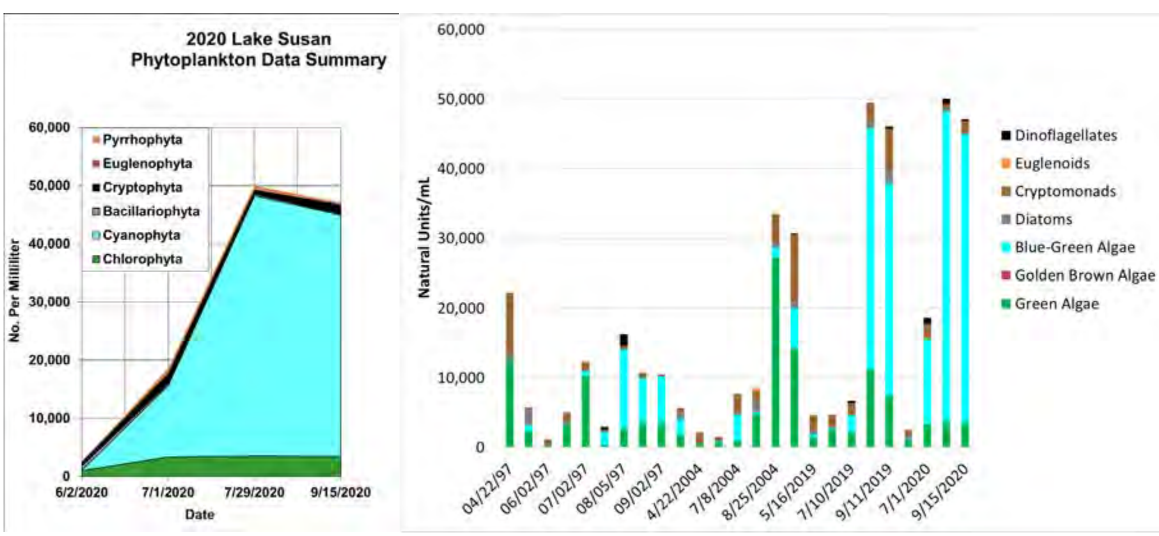


Figure 4-21 1997-2020 Lotus Lake Phytoplankton Historical & Seasonal Abundance (#/mL).

Rice Marsh Lake

In 2020, all three groups of zooplankton were captured in Rice Marsh Lake (**Exhibit C**), of which 17% of the population was comprised of Cladocerans, up from 8% in 2019 and 13% in 2018. As expected, rotifers were the most abundant zooplankton sampled in 2020, specifically *Polyarthra sp.* (**Figure 4-22**). Similar to 2019, a majority of the rotifers captured were from the first sampling event (May-June 90% in 2019 and June 67% in 2020). Copepod densities were lowest in June at 76 thousand and remained relatively stable thereafter averaging 292 thousand. Across all sampling dates the Cladoceran community was dominated by small-bodied zooplankton, consisting of mainly *Bosmina longirostris, Ceriodaphnia sp*., and *Chydorus sphaericus.*

The estimated epilimnetic grazing rates of Cladocera observed in 2018 ranged from near 0% to 23% on and 2% to 39% in 2019 (**Figure 4-22**). In 2020, the highest July grazing rate of 15% was linked with the highest density of smaller Cladocerans and the presence of the larger bodied *Diaphanosoma leuchtenbergianum*. Similar to 2019, the most common Cladocera captured in Rice Marsh Lake in 2020 was *Bosmina longirostris* which are commonly found in bog lakes such as Rice Marsh Lake.

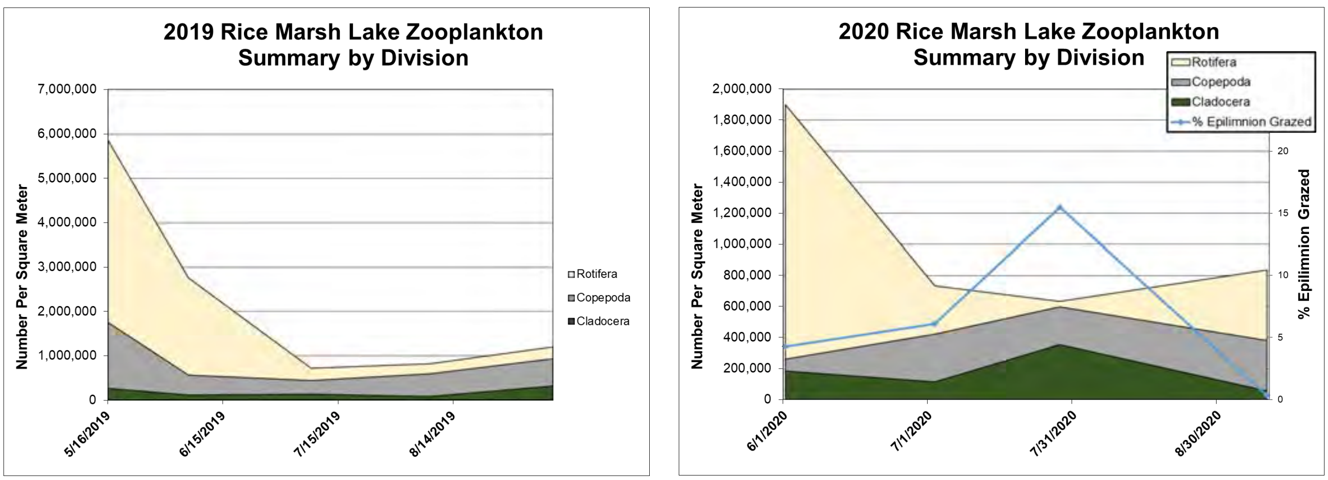


Figure 4-22 2019 & 2020 Rice Marsh Lake Zooplankton Counts (#/m²).

During the summer of 2020, staff collected four phytoplankton samples on Rice Marsh Lake (**Exhibit D**). Abundance of phytoplankton by Class for Rice Marsh Lake is presented in **Figure 4-23**. Historically, Cyanobacteria have been limited in Rice Marsh Lake. Cryptomonads and Green Algae have dominated the phytoplankton community in the past, including in 2020. *Chlamydomonas globosa* and *Cryptomonas erosa* were the most dominant species in 2020. Generally, all phytoplankton species steadily declined from the beginning to the end of the year.

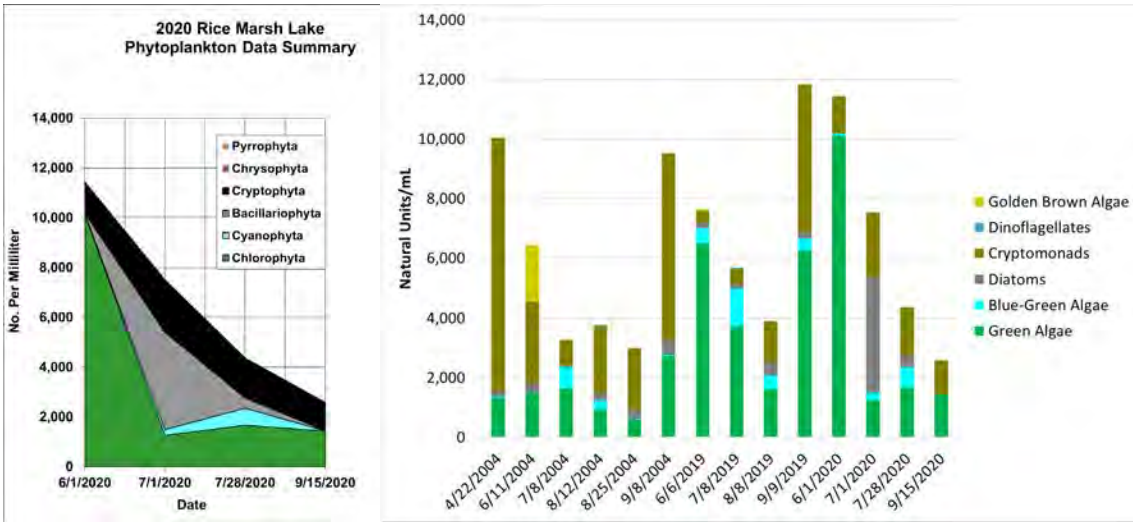


Figure 4-23 2004-2020 Rice Marsh Lake Phytoplankton Historical & Seasonal Abundance (#/mL).

Staring

In 2020, all three groups of zooplankton were present in Staring Lake (**Exhibit C**). Similar to 2019, the June sampling event had the highest number organisms across all groups (**Figure 4-24**). In 2019, Rotifer numbers experienced a significant spike to near 2.5 million in June, and an average of 500 thousand for the remainder of the year. In 2020, rotifer averaged 163 thousand for the first 2 sampling dates and spiked in September at 544 thousand. The dominant Rotifer species was *Keratella cochlearis*, which occurs worldwide in virtually all bodies of water whether fresh, marine, or brackish. Copepod numbers were roughly steady at an average of 440 thousand per sampling event in 2019 but were reduced in 2020. In 2019, Cladoceran numbers generally remained above 200 thousand except in July and August when they dipped below 100 thousand. In 2020, the Cladocera population was lower averaging only 75 thousand. The most abundant Cladocera were *Daphnia galeata mendotae* which are most commonly found in mesotrophic to eutrophic lakes such as Staring.

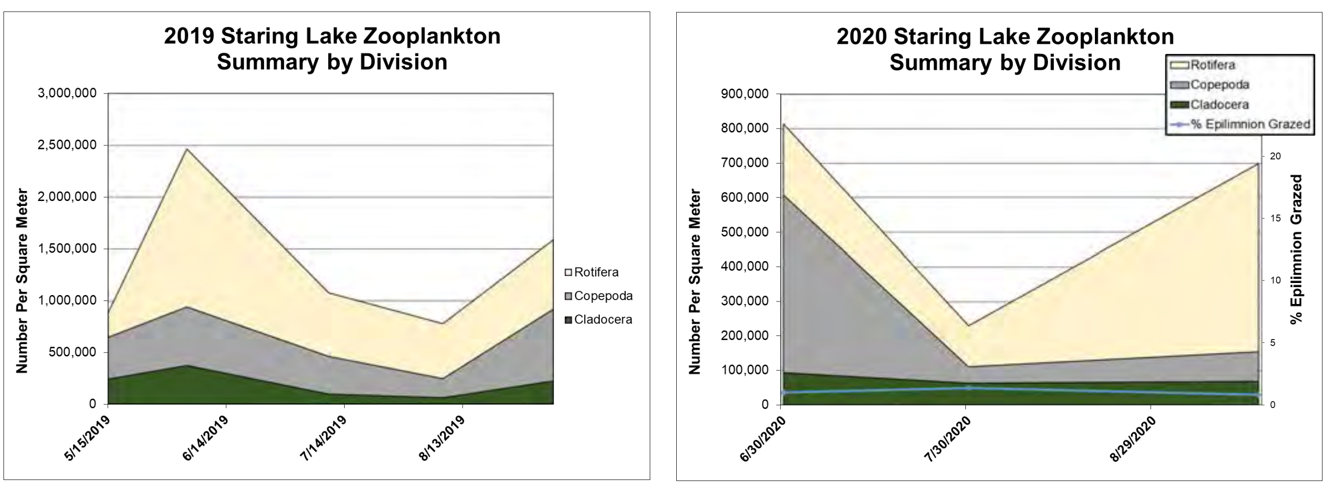


Figure 4-24 2019 and 2020 Staring Lake Zooplankton Counts (#/m²).

Large Cladocera consume algae and may have the potential to improve water quality when present in large densities. The estimated epilimnetic grazing rates observed in 2018 ranged from 2% to 24%. The 2019 and 2020 grazing rates were much lower at 1-4% and 0-1.4% respectively (**Figure 4-24**).

During the summer of 2020, staff collected three phytoplankton samples on Staring Lake (**Exhibit D**). Abundance of phytoplankton by Class are presented in **Figure 4-25**. Cyanophyta was the most dominate zooplankton across all sampling events. As seen in other blue green algae dominated District Lake in 2020, Cylindrospermopsis raciborskii and Anabaenopsis raciborskii were the most prevent species. The 2020 data matched the historical trend of Blue-green Algae dominated phytoplankton population. In 2019 the phytoplankton community was more diverse and balanced.

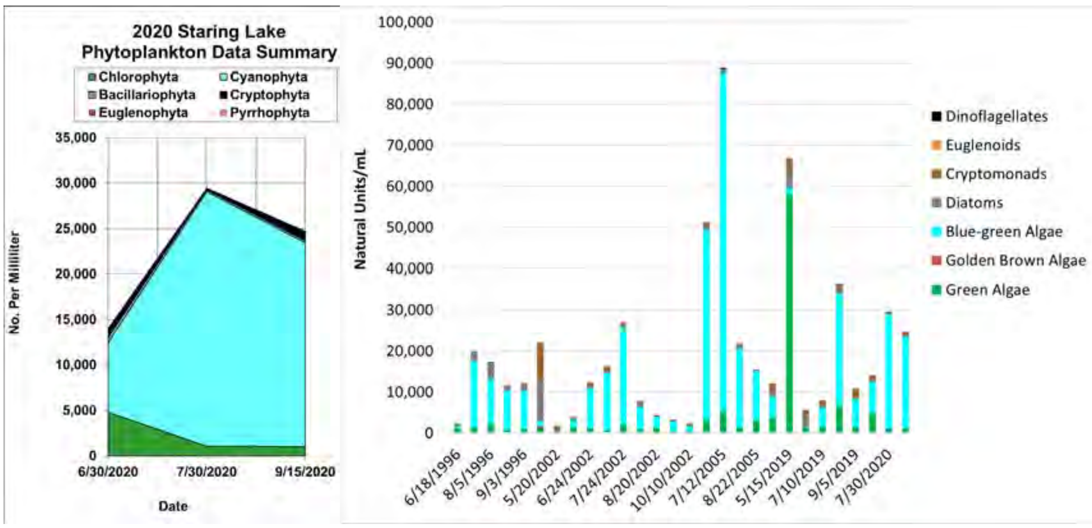


Figure 4-25 1996-2020 Staring Lake Phytoplankton Historical & Seasonal Abundance (#/mL).

4.9 Lake Susan Spent-Lime Treatment System

Figure 4-26 Spent Lime Treatment System

Lake Susan is an 88-acre lake next to Lake Susan Park. It is an important resource in the city of Chanhassen and the Riley Purgatory Bluff Creek Watershed District. The lake is a popular recreational water body used for boating and fishing. Lake Susan is connected to four other lakes by Riley Creek. It receives stormwater runoff from 66 acres of land around it, as well as stormwater that enters two upstream lakes (Lake Ann and Lake Lucy). The stormwater entering the lake carries debris and pollutants, including the nutrient phosphorus. Phosphorus is a nutrient that comes from sources such as erosion, fertilizers, and decaying leaves and grass clippings. Excess phosphorus can cause cloudy water and algal blooms in lakes. Removing phosphorus from stormwater is a proven way to improve the water quality of lakes and streams.

In 2016, an innovative spent lime filtration system was constructed along a tributary stream draining a wetland on the south-west corner of Lake Susan (**Figure 4-26**). Based on system performance of the one other experimental spent lime filter site in the eastern Twin Cities area, modeling simulations based on available water quality measurements suggested the Lake Susan system had the potential to remove up to 45 pounds of phosphorus annually from water entering the lake. This would result in improved water quality and recreational opportunities. Spent lime is calcium carbonate that comes from drinking-water treatment plants as a byproduct of treating water. Instead of disposing of it, spent lime can be used to treat stormwater runoff. When nutrient-rich water flows through the spent lime system, the phosphorus binds to the calcium. The water flows out of the spent lime system, leaving the phosphorus behind.

Figure 4-27 Spent Lime/Sand Mixture Column Testing

Observation and monitoring data collected by District staff in 2016 - 2018, indicated inconsistent system performance and periods of extended inundation, which deviated from the original design parameters. District staff worked with Barr to review monitoring data and identify potential shortcomings the system (e.g., monitoring, materials, influent, changed conditions, etc.) During 2018, it was discovered that the spent lime media appeared to be significantly restricting flow of water through the filter. District and Barr staff conducted field testing of the filtration capacity of the spent lime and discovered that the spent lime structure had degraded into a clay-like consistency, thus essentially preventing water from filtering through the media. During the summer of 2019, District staff completed laboratory column testing for mixtures of spent lime and sand. Column testing indicated that mixing spent lime with sand improves the filtration capacity of the media, while still removing phosphorus. **Figure 4-27** is a photograph of the column testing completed by District staff during 2019. The testing revealed the following key points:

- Filtering water through sand washed to MNDOT standard specifications (washed sand) results in phosphorus export from the test columns.
- Water filtered through the various spent lime/pool sand mixtures elevated the pH in the effluent water, thus supporting the chemical reaction to precipitate phosphorus (i.e., remove phosphorus).

• Filtration rates through the various spent lime/pool sand mixtures appears relatively unchanged after 114 days of inundation and continuous flow for 10 days did not reduce drain times.

• Initial testing of plaster sand obtained from a local pit also results in phosphorus export from the material.

• Total phosphorus removals where generally higher the larger the content of spent lime in the mixture (**Figure 4-28**).

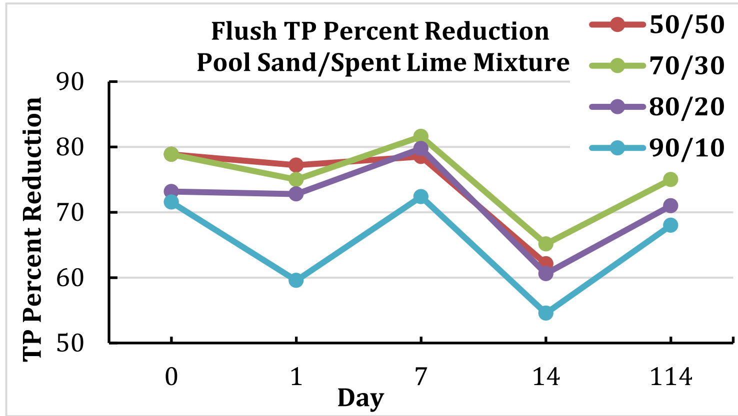


Figure 4-28 Pool Sand/Spent Lime Mixture Column Testing Phosphorus Removals

The laboratory testing completed by District staff was used to guide modifications to the spent lime system to improve filtration capacity and performance of the system. Modifications included the replacement of the deteriorated spent lime with a mixture of 70% plaster sand and 30% spent lime, replacement of the underdrain slotted piping, and the installation of an automated water control structure and solar panel.

In 2020, water samples were collected and analyzed for total dissolved phosphorus (TDP), total phosphorus (TP), total suspended solids (TSS), ortho phosphorous (OP), and Chlorophyll-a (Chl-a) between 2020. TP was initially collected with other parameters added in August. The unit was brought online on 5/28/2020 and sampled Mondays and Fridays for 4 hours. On 6/23/2020, a month of testing and the addition of a stop log, the unit was changed to sample on Monday, Wednesday, and Friday for 5-hour periods. This was to increase the amount of water being treated. Overall, a total of 18 TP samples were collected over the summer yielding an average TP reduction of 62% (**Figure 4-29**, **Table 4-9**). The maximum reduction occurred in early July and removed 91% of the phosphorous. For TDP, TSS, OP, Chl-a, reductions were around 50% with some variability. It should be noted that although the system was functioning properly, outflows were still very high (0.193 mg/l). This indicated that the wetland system draining through the system may need additional treatment to further reduce TP loading to Lake Susan. Staff will continue to monitor the system in 2021 to ensure performance.

Table 4-8 2020 Lake Susan Spent Lime Treatment System Nutrient Removals

Analyte	N	Min	Mean	Max
TDP (mg/l)	6	36	53	65
TP (mg/l)	18	16	62	91
TSS (mg/l)	6	5	46	78
OP (mg/l)	3	46	49	55
CHLA (mg/l)	4	28	59	78

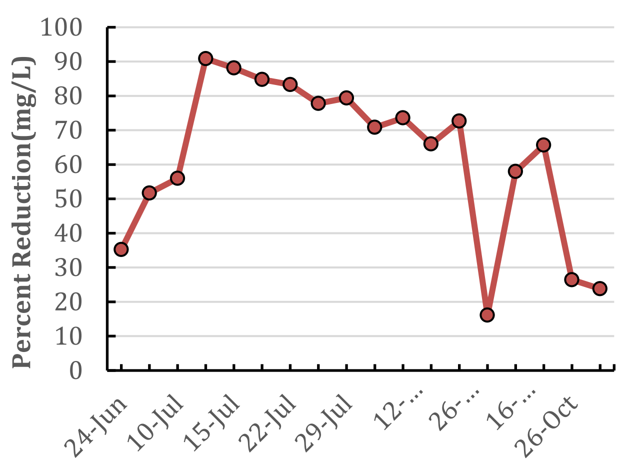


Figure 4-29 2020 Total Phosphorous Percent Reduction - Lake Susan Spent Lime Treatment System

4.10 Stormwater Ponds

Stormwater ponds are the most commonly used method for controlling pollutants, such as phosphorus, which are found in stormwater runoff. Phosphorus pollution is the primary component influencing eutrophication in freshwater resources. Excess phosphorus can lead to increased algal growth, turbid water, and loss of biodiversity and desirable aquatic habitat. Urban watersheds, like the Riley-Purgatory-Bluff Creek Watershed, typically export 5 to 20 times the amount of phosphorus than less developed watersheds due to an increase in the amount of impervious cover (streets, sidewalks, and driveways) and surface runoff for a watershed (Athayde et al. 1983, Dennis 1985). Potential sources of phosphorus pollution in the Riley Purgatory Bluff Creek Watershed District include stormwater runoff, sediment erosion, grass clippings, lawn fertilizer, and pet waste.

Figure 4-30 EnviroDIY Pond Continuous Monitoring Station

The Riley-Purgatory-Bluff Creek Watershed District stormwater pond project (RPBCWD 2014) began in 2010, with initial data collection conducted in the summers of 2010 and 2011 and the second phase beginning in 2012-2013. The purpose of the project was to ascertain if stormwater ponds were possible sources of pollution within the District and identify ponds with exceptionally high total phosphorus concentrations that could be targeted for remediation projects. With assistance of city partners, a total of 119 ponds were sampled across Bloomington, Chanhassen, Eden Prairie, Minnetonka, and Shorewood. In both 2012 and 2013, average total phosphorus levels were higher than the MPCA estimated typical total phosphorus range (0.1 mg/L to 0.25 mg/L) for effluent (outgoing) stormwater in all five of the cities sampled. This data served as a critical baseline for research carried out in 2019 and 2020.

The University of Minnesota, City of Eden Prairie (Wenck), and Limnotech used the previous stormwater pond study to launch additional research projects in 2018-2020 in attempt to understand the chemical/ physical/biological complexity of stormwater ponds. On January 24th, 2020, RPBCWD held its first stormwater pond summit to get all interested/invested partners together to discuss current/ongoing/future research going on with stormwater ponds. On January 20th, 2021 the second stormwater was held and expanded upon what was learned from the original studies as well as helped guide future direction.

Staff and partners had similar approaches to monitoring; ponds were selected and monitored biweekly to collect nutrient and pond vertical profile data. The selected ponds varied in size, design, depth, and watershed load, and encompassed a good representation of what currently exists in the District. Sediment cores were collected on many ponds to evaluate phosphorus release and identify the chemical makeup of each sediment layer. Continuous monitoring also occurred on a number of ponds which included monitoring the surface and bottom of each pond for some or all the following parameters: wind, water level, conductivity, temperature, and DO. RPBCWD staff worked with staff from the environmental engineering/science consultant firm Limnotech to implement EnviroDIY technology into everyday District water monitoring and data collection (**Figure 4-30**). Most of the data from each study is currently being evaluated but the following information is a summary of the research being carried out in the District:

John Gulliver Lab – University of MN - Internal Phosphorus Loading in Stormwater Ponds - Remediation Utilizing Iron Filings – Sediment Phosphorous Release and Characterization

- Ponds are stratified at a depth of 1-2 feet and the bottom sediment is pulling oxygen out of the water (zero oxygen at the bottom for 85% of the year in most ponds). Sediment releases phosphorus because of lack of oxygen. Many of the ponds that are stratified are sheltered which suggests the trees are most likely reducing pond mixing. TP might not be the best way to measure phosphorus in the pond, because of duckweed soaking it up and concentrating phosphorous.

- The three study ponds all released phosphorus under anoxic conditions with two of the ponds also releasing phosphorus when oxygen was available. 30%-60% of phosphorus available from sediments in all the ponds was considered mobile (readily able to be used by algae or move out of system).
- Possible remediation options include treating ponds (iron filings), artificial mixing (aeration), selective withdrawal (water draining from different locations within the water column), reduce sheltering (tree removal), and/or dredging and source control (removing phosphorous from landscape before it reaches the pond).
- Results from 15 different ponds show there is a significant range of phosphorus release possible based upon seasonal changes in oxic and anoxic flux. In 2020, ponds released significantly more phosphorus than in 2019 which is hypothesized to be the result of drier conditions.
- Poornima Natarajan discussed possible predictors of the phosphorus flux from the sediment. They included measuring redox sensitive phosphorous, total releasable phosphorus, total sedimentary phosphorous, sediment oxygen exposure, and total organic content.
- The use of iron filings in stormwater ponds has been successfully tested by the University of Minnesota in improving water quality under lab conditions. The District, Cities, and the UMN worked together and applied iron filings to 2 ponds (**Figure 4-31**), which will be expanded to 3 in 2021, to test this innovative approach. Initial results from 2020 monitoring data shows variability in the results. Some ponds appeared to have some reductions, but others had little change. This variability can be partially explained by the seasonal variability in stormwater ponds which may be caused by different climatic conditions. UMN will continue monitoring activities in 2021.

Figure 4-31 Minnetonka Iron Filings Application

Jacque Finlay – University of Minnesota – Understanding Phosphorous Release in Urban Ponds - Stormwater Pond Research Overview

- Ponds are unexpectedly anoxic, promoting phosphorus release. Road salt accumulation may be part of why ponds stratify. Road salt sinks, accumulates, and persists. In ponds less than 3 ft and there is no spatial chloride variation across the pond. However, deeper ponds have considerable spatial variations with high chloride concentrations common from January to July. Some variability in chloride concentrations depend on precipitation patterns (i.e., lots of snow = lots of salt application). Ponds located in commercial areas had the highest salt concentrations.
- Water temperature stratification occurs early on in the spring in ponds – not a lot of wind caused mixing throughout the year. Ponds with 100% coverage by duckweed had very low oxygen levels. New ponds that are open and shallow had mixing occurring. Older and saltier ponds had low oxygen levels.
- Phosphorus concentrations are highly variable temporally (examples from MWMO-Kasota East Pond). Mass phosphorous balance testing was conducted on three ponds to determine how each pond was performing (inputs and outputs of phosphorous). Ponds variated in retention of phosphorus, were all anoxic almost all year, and had variable in phosphorus inputs and outputs. Overall, two ponds decreased and one increased in total phosphorous concentrations from inlet to outlet.

- Vinicius Taguchi discussed his literature review of fountain impacts on stormwater ponds to aerate and eliminate stratification. The literature review found that fountains do not serve as functional aeration units as only the area immediately around the fountain is affected.
- Duckweed and phosphorus - Finlay suggested that a feedback loop between duckweed and phosphorous does exist and that they are not independent.
- Last summer duckweed in several ponds was measured for phosphorus (mass of P per mass of dried duckweed). This was used to come up with a total mass of duckweed P for the whole pond based on the ratio of sampled area to pond surface area (sampled area = net sampler size [area] * number of samples). With the assumption that the duckweed could access P in the upper ~0.5 m of the water column (concentration of duckweed TP mg/L = total mass of duckweed P / volume of the pond from water surface to depth of 0.5 m), it was estimated that ~50% of the pond's upper water column TP was contained within the duckweed and the other half was in the water. This has implications in sampling by underestimating TP in ponds as currently the duckweed is "moved", or water is sampled under the duckweed layer. In the original pond study, water was grabbed at the surface, which included duckweed, and then was filtered through a screen. This may have captured a more complete TP picture in ponds. Ben Janke redesigned a pond outlet to essentially skim the duckweed to prevent it from moving downstream to reduce phosphorus loading.
- An undergrad removed duckweed on a very small/shallow pond to see the effect on pond stratification and phosphorous. The pond responded with an immediate increase in oxygen down to sediment surface and phosphorus concentration dropped.

Anthony Aufdenkampe – Limnotech - Mechanisms Driving Phosphorus Recycling in Constructed Stormwater Ponds: Implications for Management (stormwater.pca.state.mn.us)

- Anthony Aufdenkamps conducted a literature search on if ponds export phosphorous, if phosphorous removal efficiencies are less than design targets, and if influent/effluent studies were available (very limited). For over three decades, constructed stormwater ponds have been designed and maintained to maximize sedimentation and minimize scour during storm periods (EPA's Nationwide Urban Runoff Program (NURP)). However, we know that other mechanisms within a pond (fluxes) that are important to understand and include. These fluxes include inputs to the pond, sedimentation, mixing in the pond, sediment resuspension, internal loading, biological uptake and decay, groundwater exchange, and finally what is exported from the pond.
- Is it time to rethink pond design? Incorporate physical/geochemical/biological processes, consider temporal dynamics (storm events), and optimize mean annual load reductions in ponds rather than single inter-storm interval. Is it time to rethink pond monitoring? Focus on inlet outlet loads with continuous monitoring stations to capture all pond dynamics.
- Adapt the GLM (general lakes model)-AED2 to fit ponds with continuous pond data provided by EnviroDIY units and continuous nitrate and phosphorous analyzer at pond inlet and outlets. The goal is to develop a defensible designed model and provide maintenance recommendations for constructed stormwater ponds to maximize phosphorus retention. The model will have a sensitivity analysis of different drivers & factors to ensure performance and will eventually be used to simulate different design, retrofit and maintenance scenarios w/ input from stormwater practitioners. Develop a pond phosphorus management web tool for everyone to use.

Anne Wilkinson – Wenck – Harmful Algal Blooms in Stormwater Ponds

- Stormwater pond systems are preferred by Harmful Algal Blooms (HAB) because they are high in nutrients, warm, and have limited mixing. In this assessment, it was found that stormwater ponds experienced cyanobacteria blooms in late summer (the presence of cyanobacteria does not necessarily indicate toxicity). District staff measured Chlorophyll-a and Phycocyanin during field monitoring which was used to gauge HAB presence.

- Mitigating the HAB risk could be done by discouraging public access, increasing public outreach, promoting short water residence time, reducing DP and internal loading, and increasing mixing potential. More research is needed in this field to better understand the extent of risks of HAB in stormwater ponds.
- Wilkinson stated that because duckweed takes up all of the sunlight on the pond's surface even the most buoyant algae are not able to compete with high duckweed cover.

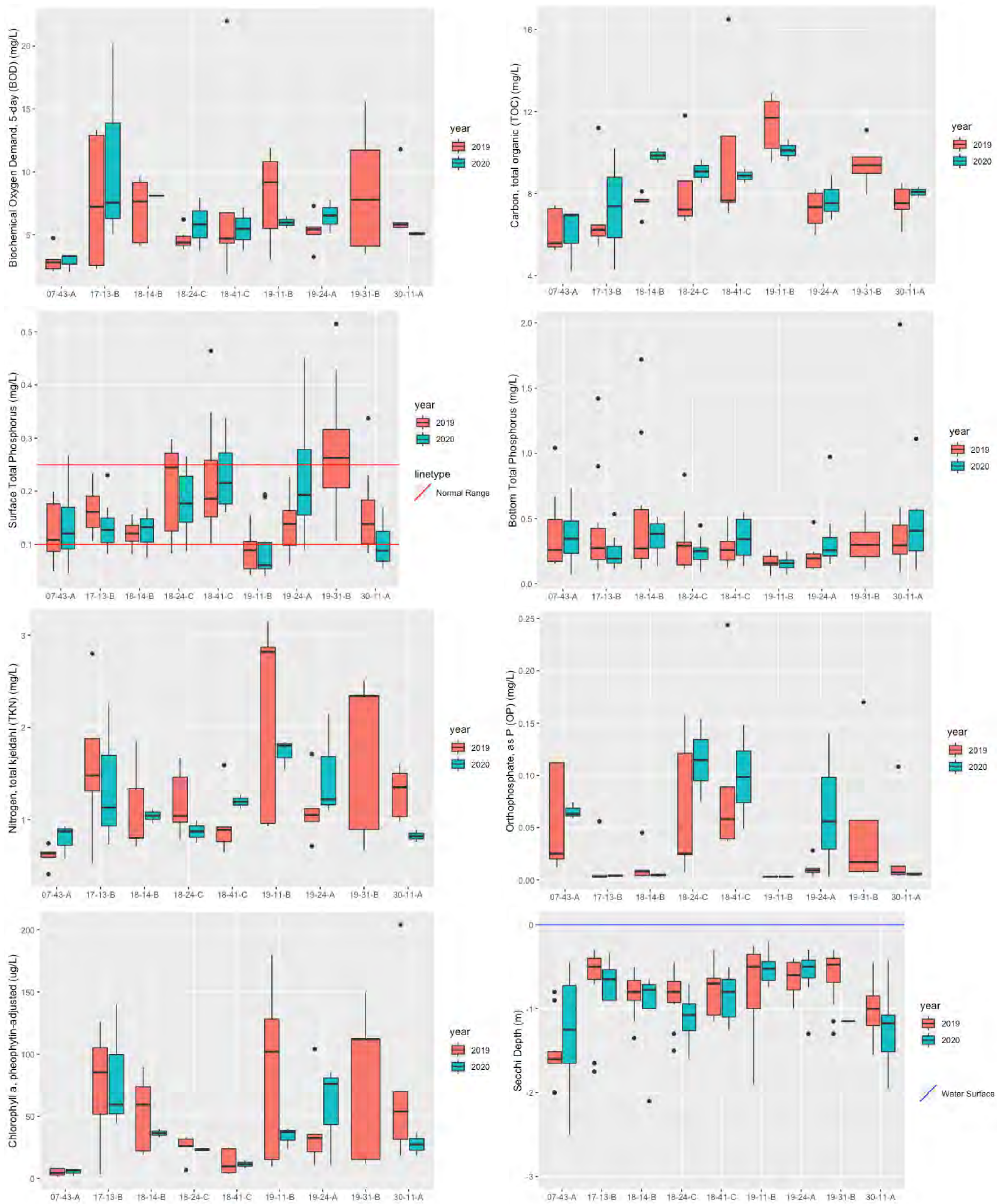
Joe Bischoff – Barr – RPBCWD Pond Assessment

- Pond phosphorous levels averaged concentrations around 200 ug/L but had maximum concentrations that were very high. This suggests levels are highly dependent on episodic events (i.e rain events or lack of). High phosphorus levels could be driven by high particulate seen within the ponds. Chl-a samples and phycocyanin levels indicate ponds have harmful algal blooms. All nine ponds sampled were anoxic significant portion of the year, even large ponds that should have a better chance of mixing. Sheltering around the ponds may be a main driver in reducing pond mixing and therefore increasing anoxia.
- Measured anaerobic phosphorous release in sediment cores and did not see much variation across all ponds including other pond studies that have previously been conducted in the area. Pond sediment phosphorous release rates were between 4-8 mg/m2/day and most phosphorous is iron bound.
- Overall, the ponds are still effective at removing P, but some are better than others and could be improved. The ponds with higher release rates could be targeted for BMP's to improve removal efficiencies. Need to develop framework to determine which ones are performing badly so we can target treatment.
- A CE-QUAL model has been developed to identify drivers of pond anoxia and develop hypotheses to determine the role of reaeration, biochemical oxygen demand (BOD), and sediment oxygen demand (SOD). This modeling, while not intended for scenario analysis, could develop hypotheses to manage drivers of anoxia- mainly BOD and SOD in larger ponds- and determine the role of sheltering- particularly in smaller ponds.

Stormwater Pond Research Avenues

- Creation of a Stormwater Pond Decision Tree
- Quick Assessment for Identifying High Risk Ponds
- More Efficient Stormwater Pond Function – Design and Retrofits/Mitigation
- Assessment/Revision of Current Nationwide Urban Stormwater Ponds (NURP) Standards
- Refinement of Current Stormwater Pond Modeling
- More Investigation of Biological and Sediment Oxygen Demands Role in the Functionality of Stormwater Ponds.
- Constructed Ponds vs Converted Natural Wetlands and the Relevance Sediment Plays

Table 4-9 2019-2020 Stormwater Pond Summary



5 Aquatic Invasive Species

5.1 AIS Management

Due to the increase in spread of Aquatic Invasive Species (AIS) throughout the state of Minnesota, staff completed an AIS early detection and management plan in 2015. As part of the plan, an AIS inventory for all waterbodies within the District was completed and a foundation was set up to monitor invasive species that are currently established within District waters (**Table 5-2**). Early detection is critical to reduce the negative impacts of AIS and to potentially eliminate an invasive species before it becomes fully established within a waterbody. Effective AIS management of established AIS populations will also reduce negative impacts and control their further spread. The RPBCWD AIS plan is adapted from the Wisconsin Department of Natural Resources (WIDNR, 2015), Minnehaha Creek Watershed District (MCWD, 2013), and the Minnesota Department of Natural Resources (MNDNR, 2015a) Aquatic Invasive Species Early Detection Monitoring Strategy. The goal is to not only assess AIS that currently exist in RPBCWD waterbodies, but to be an early detection tool for new infestations of AIS. **Table 5-1** identifies AIS monitoring/management that occurred in 2020, excluding common carp management.

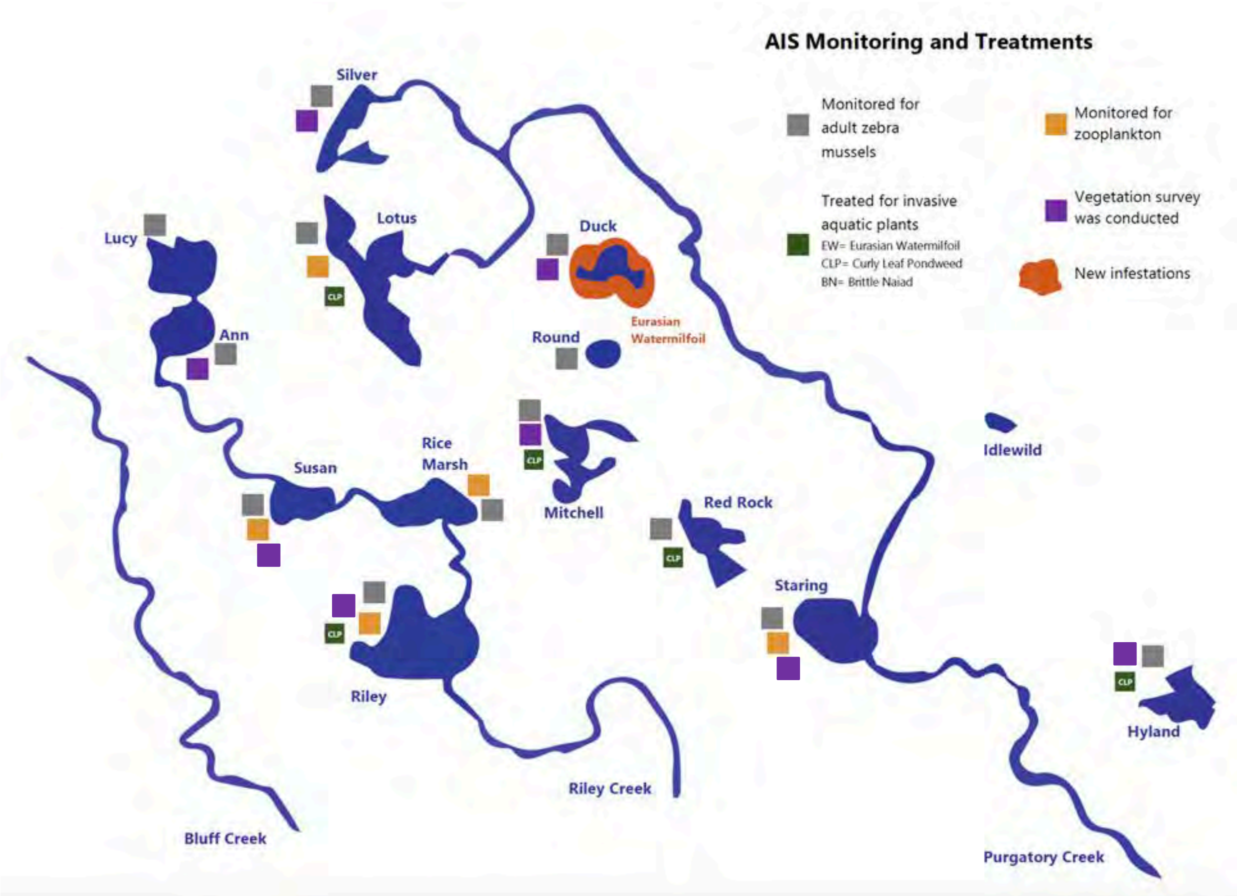


Table 5-1 2020 Aquatic Invasive Species Summary

Aquatic Invasive Species (AIS) work conducted in 2020 within the Riley-Purgatory-Bluff Creek Watershed District. Symbols indicate zebra mussel monitoring plates and/or monthly public boat launch scans (grey), zooplankton and phytoplankton sampling conducted (orange), herbicide treatments occurred (green), point intercept vegetation surveys (purple). The orange outline around a lake indicates a new AIS found. All lakes received juvenile mussel sampling; none were found by the District accept in Lake Riley.

Table 5-2 Aquatic Invasive Species Infested Lakes

Lake Names	Infested Waters	Brittle Naiad	Eurasian Watermilfoil	Curlyleaf Pondweed	Purple Loosestrife	Common Carp	Zebra Mussels
Ann	X	x	x	x	x	x	
Lotus	X	x	x	x	x	x	x
Lucy	X		x	x	x	x	
Red Rock	X		x	x	x		
Rice Marsh	X			x	x	x	
Riley	X		x	x	x	x	x
Silver	X			x	x		
Staring	X	x	x	x		x	
Susan	X	x	x	x	x	x	
Duck	X		**x**	x	x		
Mitchell	X		x	x	x		
Round	X	x	x	x			
Hyland	X			x			

X – Indicates new infestation.

5.2 Aquatic Plant Management

Aquatic plant surveys are important because they allow the District to map out invasive plant species for treatment, locate rare plants for possible protection, create plant community/density maps which evaluate temporal changes in vegetation community, identify the presence of new AIS within water bodies, and they can assess the effectiveness of herbicide treatments. Aquatic plant surveys have been conducted on a rotational basis within RPBCWD to ensure all lakes have received adequate assessments. As projects arise, or issues occur, additional plant surveys are conducted to aid in the decision-making process. The most comprehensive aquatic plant survey is called a point intercept method. This survey utilizes sample points arranged in a uniform grid across the entire lake which can vary in number depending on the lake size. At each designated sample location, plants are collected using a double-headed, 14-tine rake on a rope. For each rake sample, the rake is dragged over the lake bottom for approximately 5 ft before retrieving. Roving surveys are also used when species of concern are in question. This survey method involves driving around the lake, visually scanning the shallows, and marking every plant found using a handheld GPS device. Herbicide treatments have been shown to reduce and control aquatic invasive plants to a manageable level, which may in turn allow for native plants to increase in abundance.

In 2020, point intercept surveys were conducted Duck Lake (EP), Hyland Lake (TRPD) Mitchell Lake, Lake Ann, Silver Lake (FRSS), Lake Staring, Lake Riley, and Lake Susan (UMN). The District will continue to monitor the aquatic plant communities within our lakes and use herbicide treatments to manage aquatic invasive plants to sustain healthy aquatic communities into the future. In the early spring of 2020, herbicide treatments were carried out on Lotus Lake, Mitchell Lake, Riley Lake, Hyland Lake, and Red Rock for curly leaf pondweed. No Eurasian watermilfoil or brittle naiad treatments occurred.

Brittle Naiad

Brittle naiad (*Najas minor*) is a species native to Europe, western Asia, and northern Africa that has been introduced to the United States. The concern with Brittle Naiad is that it can form dense mats that can outcompete native plants. These dense communities can disrupt fish and waterfowl habitat, choking out plants which animals depend on for survival and potentially decreasing dissolved oxygen levels upon its decomposition. Brittle naiad is a resilient plant; it can survive in some polluted and eutrophic waters and can reproduce by fragmentation. The plant is most apparent in late summer/early fall when many recreational boaters are off the water. With that said, brittle naiad is a very new AIS and not much is known about its effects in Minnesota. So far, the plant has appeared in small, dispersed stands across the infested lakes, but has had limited expansion to date. The exception is in the Lower Purgatory Creek Recreational Area where the plant has taken over. It may have been more successful in the LPCRA due to the good water clarity, shallow and uniform depths, highly organic sediments, and the highly fluctuating water levels. The highly fluctuating water levels make it difficult for many native plants to establish, which does not occur in relatively stable lake water levels. In the RPBCWD, Lotus, Ann, Staring, and Susan were scanned for the plant. District staff have been monitoring brittle naiad population since it in new to MN and its potential damage is unknown. The results from these surveys can be seen in this section.

Lake Ann Brittle Naiad

Freshwater Scientific Services, LLC surveyed the aquatic plant community of Lake Ann on August 2, 2017 using the point-intercept survey method. During the 2017 survey Brittle Naiad was discovered at one location in the northeast corner of the lake near the public swimming beach and dock. The immediate area surrounding where the plants were found was surveyed intensively to identify if there were more plants present, however none were found. The District immediately treated the 0.25 ac area as part of the rapid response plan in attempt to slow or stop the plant from spreading. On September 28th, 2018 RPBCWD staff conducted another brittle naiad roving survey to assess treatment results (). During the

scan staff drove a shallow and deep lap around the lake and searched for the presence of the plant. Plants were found near the location of the swimming dock and beach, similar to where they were found in 2017, however multiple extensive stands were present. Additionally, plants were found along the west shoreline and near the public access, equipment rental dock, and public beach (southeast). The results of the assessment suggested that brittle naiad was more widely distributed than it was in the 2017 survey.
In 2020, staff again conducted a roving survey and found similar results from the 2018. Overall, there were two main areas where brittle naiad was found: (1) NE corner on either side of the beach area and (2) alont the western shore. While the overall number of plants appeared to be reduced, the two main areas were very robust and established stands. Unlike in other lakes in the District, the main stands were found in 6-8 feet of water. Staff will continue to monitor the population moving forward.

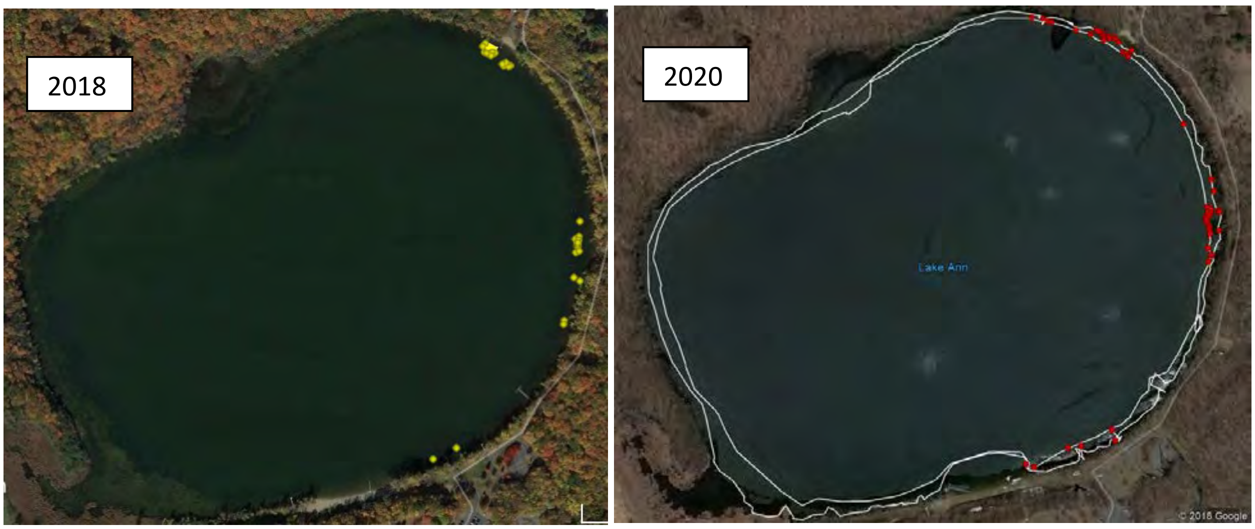


Figure 5-1 2018 & 2020 Lake Ann Brittle Naiad Maps.

Lotus Lake Brittle Naiad

On September 26, 2017, Riley Purgatory Bluff Creek Watershed District staff found brittle naiad located on both sides of the public boat access on the south side of Lotus Lake. The plants were found during a routine aquatic invasive species (AIS) inspection of the boat launch. These inspections, conducted bimonthly, consist of staff searching the area around the boat launch for various types of aquatic invasive species for 5 minutes. The searches are conducted at each regular water quality sampling event. Since most AIS enter a lake through the public access this is the most likely location to find AIS. Staff immediately reported the occurrence of brittle naiad to Aquatic Invasive Species Specialist of the Minnesota Department of Natural Resources. Staff extended the inspection to a full scan of the lake, mapping the position of every observed brittle naiad occurrence with a handheld GPS device. An effective treatment area was determined in the fall, an herbicide was applied to the lake in an area totaling 2.42 acres across.

On September 24th and 26th of 2018, RPBCWD staff conducted brittle naiad roving surveys to determine the effectiveness of the herbicide and to see if the plant had spread throughout the lake. Results of the survey can be seen in **Table 5-3**. Based on the 2018 brittle naiad scan, it appeared the overall plant distribution had been reduced in the treatment areas. Plants were found on both sides of the public access, similar to where stands of plants were most dense in 2017, however the number and area occupied by the plants was reduced considerably. Additionally, no rooted plants were found on the southwest side of the lake. More plants were found scattered along the south east shoreline and into the east bay which may have been missed during the 2017 survey. Brittle naiad was observed growing between 0.5 to three feet of water. Its absence from deeper water was likely due to limited water clarity in Lotus Lake.

Table 5-3 2018 & 2019 Lotus Lake Brittle Naiad Maps

District staff again carried out the visual roving survey in 2019, marking each plant discovered. The results of the scan can be seen in **Table 5-3**. Overall, the 2019 results were very similar to what was seen in 2018. The plant was found in almost all areas where it was found in 2018, however it again appeared to be reduced in density. It has not been determined what would cause reductions in density. Staff did not conduct a scan in 2020 but did notice very few plants near the boat launch where it had been previously the densest on the lake. Carver County staff did conduct a point intercept survey early on July 8th, 2020 and only found a single plant.

Staring Lake Brittle Naiad

In 2015 Brittle Naiad was first discovered on Staring Lake at a single location along the northwest corner of the lake as indicated in **Figure 5-2**. It is not surprising that this occurred due to the fact that the species was found extensively in Purgatory Creek Recreation Area which is located upstream of Staring Lake. This fact, combined with the increased water clarity due to carp control may have allowed the plant to become established. After the discovery, the immediate area was treated in attempt to eliminate the plant from the lake. The following years after the lake was surveyed by the Unversity of MN via point intercept survey and no brittle naiad plants were found.

In the fall of 2019, staff decided to conduct a roving survey as we had completed on multiple other lakes to see if we could detect brittle naiad. **Figure 5-2** shows the results of that survey. Staff did locate a number of plants scattered across the lake. The most brittle naiad was located in the northwest corner near the Purgatory Creek outlet and 2015 plant location. In ths location the plant was the most abundant plant and was dense, limiting other native vegeatation growth. It should be noted that the sediment found in this location was rich in organic matter which matches what can be seen in the Purgatory Creek Recreational Area where brittle naiad in dominant. In addition, there was a smaller location of dense plants located along the south shoreline. In 2020 staff went out and conducted another roving survey which was made difficult due to the shallow water and dense coontail and eurasian watermilfoil. During the survey staff only found brittle naaid plants in the south location and could not locate any single plants previously found or in the northeast corner where it appeared most dense in 2019. From this year to year variabilty, brittle naiad may have trouble competing with other native vegetation due to its later emergence.

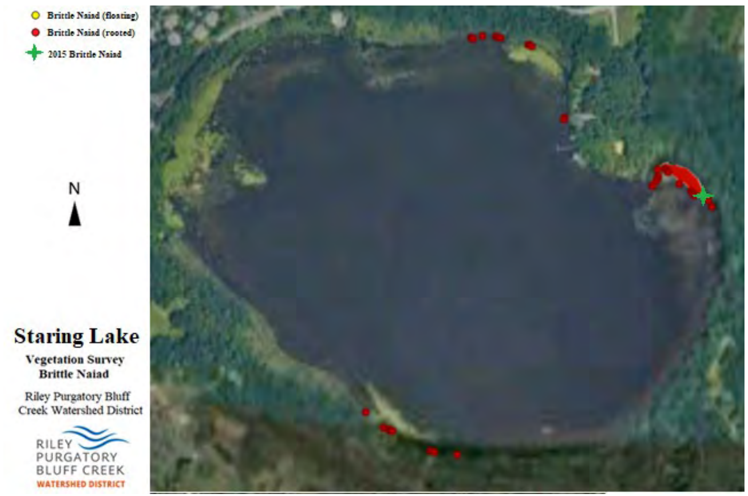


Figure 5-2 2019 Staring Lake Brittle Naiad Map

Lake Susan Brittle Naiad

During the University of MN 2019 August point intercept plant survey of Lake Susan, brittle naiad was detected at two points on Lake Susan. Both points were on the southern-most shore but relatively far apart (**Figure 5-4**). Later in September, RPBCWD staff went out and conducted a roving survey and searched to collect a voucher specimen in order to list the lake as infested with the MNDNR. Staff completed a survey and only found four small brittle naiad plants on the southwest location.

In 2020, staff conducted a roving survey Lake Susan to determine if any established areas of brittle naiad were missed or if the population expanded (**Figure 5-3**). During the survey staff found one additional location on the east side of the lake. In both locations, the plants seemed to be in less than 2 feet of water and were dense populations.

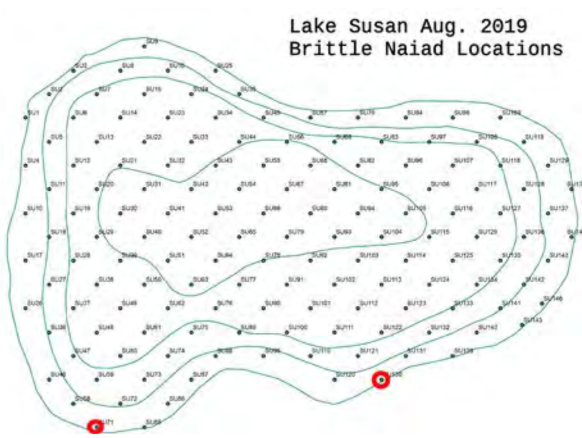


Figure 5-4 2019 Lake Susan Brittle Naiad Map

Figure 5-3 2020 Lake Susan Brittle Naiad Map

5.3 Common Carp Management

Figure 5-5 Captured Common

The RPBCWD, in cooperation with the University of Minnesota (UMN), (UMN), has been a key leader in the development of successful carp management strategy for lakes within the state of Minnesota. Following the completion of the Riley Chain of Lakes (RCL) Carp Management Plan drafted by the UMN in 2014 (Bajer et al., 2014), and the Purgatory Creek Carp Management Plan drafted in 2015 (Sorensen et al., 2015), the District took over monitoring duties from UMN. Carp can be detrimental to lake water quality. They feed on the bottom of the lake, uprooting aquatic plants and resuspending nutrients in the sediment. Adult carp are monitored within RPBCWD by conducting three, 20-minute electrofishing transects on each lake, three times each year between late July and early October (totaling three hours per lake). If the total biomass estimate of carp is above 100 kg/h, the population is considered harmful to lake water quality and the District would need to consider management. Young of the year (YOY) carp are monitored by conducting five, 24-hour small mesh fyke net sets between August and September. Capture of YOY carp during this sampling, suggests successful recruitment has occurred, and monitoring efforts should be increased on that water body. At that point, the District would also consider further management action.

Trap Netting

District staff completed trap net surveys on Staring Lake, Lake Lucy, Rice Marsh Lake, the Upper Purgatory Creek Recreational Area (UPCRA), and the Lower Purgatory Recreation Area (LPCRA) in 2020. As is true with many lakes during late summer located within the Twin Cities' metro area, the RCL and PCL inshore fish community was dominated by bluegill sunfish. Other species that were abundant included pumpkinseed sunfish, black crappies, and bullhead species. Of the lakes sampled in 2020, Rice Marsh Lake had the highest number of bluegills captured averaging 165 fish per net, which is slightly down from 234 fish/net in 2019. These numbers indicate a full recovery from the 2018/2019 winterkill (**Figure 5-6**). Additionally, catch per unit effort (CPUE) of bluegills in Lake Lucy of 79 bluegills/net in 2020 is down slightly from 2019 (CPUE=111.6), but also indicates a recovery from the winterkill that occurred in 2017/2018 (**Figure 5-6**). The LPCRA had the lowest bluegill abundance with only 3 bluegills/net captured. Additionally, both the total number of fish captured (from 2,169 in 2019 to 87 in 2020) and species (from 15 in 2019 to 10 in 2020) decreased in LPCRA indicating a winterkill most likely occurred (**Figure 5-6**).

Large predatory fish including northern pike and largemouth bass were also captured via fyke netting in low numbers across the lakes. The largest pike was captured in UPCRA and measured 39.85 inches. The most diverse fish population was observed in UPCRA where 11 different species were captured. A full summary table of the fish captured for each lake can be found in **Exhibit B**. No YOY carp were captured in any of the lakes during fyke net surveys in 2020. The lack of young individuals captured in lakes indicates that 2020 was a poor recruitment year for common carp overall. Overall, 17 YOY

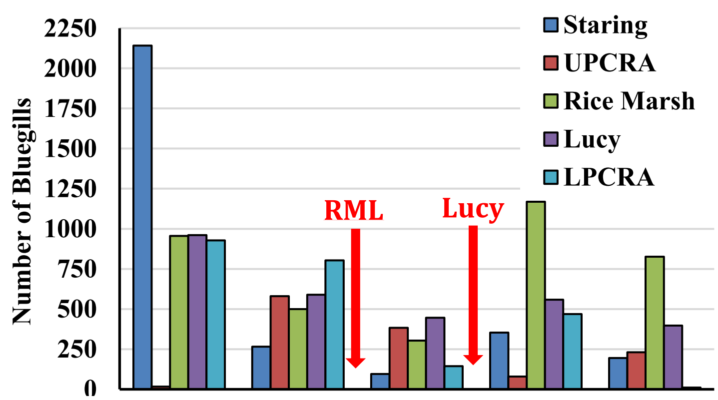


Figure 5-6 2016-2020 Bluegill Trap Net Catches
The red arrows indicate when winter kills occurred.

carp were captured during fyke netting on the LPCRA as compared to five in 2019. This increase in YOY carp indicates some recruitment did occur, however the number captured is still well below the numbers seen at the beginning of carp management in PCL.

Electrofishing

Lake Susan, Lake Riley, Lake Susan Park Pond (LSPP) were the lakes electrofished from the RCL in 2020. Staring Lake, and the Purgatory Recreation Area were surveyed via electrofishing in 2020. Lake Riley was sampled but only on one date which yielded no common carp. Since 2012, Lake Riley has consistently seen biomass estimates less the 50 kg/ha (**Table 5-4**). In 2020, the common carp biomass estimate was 42 kg/ha in Lake Susan (**Table 5-5**), which is up from 2016 (31 kg/ha) and 2017 (24 kg/ha). Comparing the past three years of available electrofishing data (**Table 5-4**), the carp population estimates have remained low and stable, with only slight year to year variability. Lake Susan Park Pond was again electrofished in 2020 and continues to be a congregation area for common carp within the RCL system. In 2017 the biomass estimate for carp was 404 k/ha and in 2020 it was 336 kg/ha. Fish are moving into LSPP during spring high water and become trapped as water levels recede. This has presented a management opportunity within the RCL lakes as carp in LSPP are more easily captured due to the shallow nature and limited area carp have to escape. This also is most likely an explanation as to why the biomass estimates are so high and suggests that the population in the pond is most likely being overestimated. The pond is deep enough as to prevent winterkill and has an established bluegill population to prevent carp recruitment via egg predation. The District will continue monitoring and removing carp from LSPP in addition to the recommended management actions established RCL management plan.

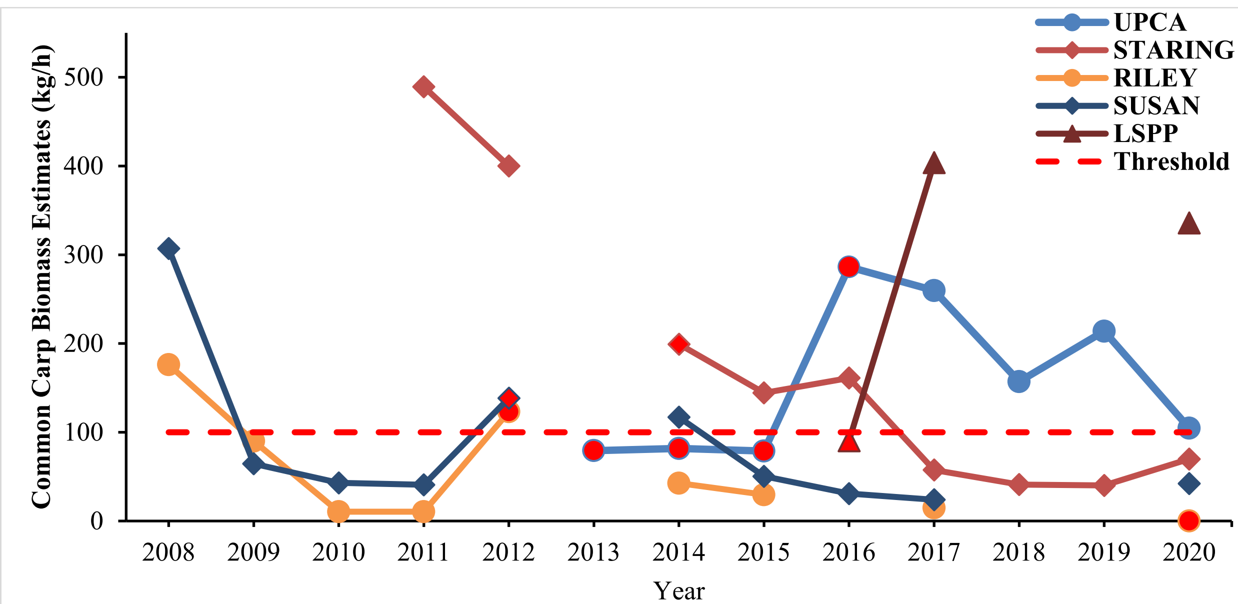


Table 5-4 2020 Common Carp Biomass Estimates

Of the PCL lakes, Staring Lake and the Purgatory Recreation Area were surveyed via electrofishing in 2020. As seen in (**Table 5-4**), the adult common carp biomass estimates have been decreasing in Staring Lake over the past four years. In 2017 the carp biomass estimate was below the threshold at 62 kg/ha. In 2018, it was lower still at 41 kg/ha and in 2019 the estimate was 40 kg/h. In 2020, the population estimate did increase to 69 kg/ha (**Table 5-5**). These fish captured consisted of individuals from the 2014/2015-year class, which was the last major recruitment year for common carp in the system. Electrofishing has not occurred in the LPCRA the past few years due to access issues and the amount of brittle naiad present in the system. In 2020, the UPCRA again had a carp biomass estimate that exceeded the biomass threshold but was greatly reduced to 105 kg/ha (**Table 5-5**). This number is down from the past three years 260 kg/ha-2017, 157 kg/ha-2018, and 214 kg/ha in 2019 (**Table 5-4**). Since the UPCRA area is essentially the top of the system (fish cannot travel to Silver Lake and Lotus Lake), and has a deeper-water refuge, fish move to this location. The fluctuations in Staring and UPCRA can be explained by removals happening in the system and fish migrating between the systems. Due to the shallowness of the system, winter seining would have limited effectiveness at capturing carp in UPCRA and LPCRA. Additionally, winter seining may yield limited success in Staring Lake due to the low number of carp estimated in the system. Capture rates in the recreational area can be highly variable as the U of MN biomass estimates were based on lakes and not flow through wetlands. Staff will continue to monitor the carp population and remove fish in 2021.

Table 5-5 2020 Common Carp Biomass Estimates

Lake	Fish per Hour	Density per Hectare	Average Weight (kg)	Carp Biomass (kg/ha)
Lake Susan Park Pond	35.15	168.60	1.99	335.89
Riley	0	0	0	0
Staring	8.98	45.32	1.54	69.84
Susan	1.38	9.54	4.42	42.17
Upper Purg Rec Area	17.62	86.03	1.22	104.67

*Lower Purgatory Creek Recreational Area not sampled.

PCL Spring Removals

In 2020, the physical carp barrier on Purgatory Creek between Staring Lake and the LPCRA was closed later than usual in early June, due to Covid-19 and early June rain events. The later closure most likely allowed carp to move freely during the spring spawning event. The City of Eden Prairie opened, cleaned, and closed the fish barrier multiple times during the year due to high water levels in the Purgatory Creek Recreational Area. At times, the barrier was held open for an extended period (up to 1 week). During this time, fish could move freely throughout the system.

During the spring of 2020 spawning run, staff utilized an electrofishing boat and a backpack electrofishing unit combined with block nets to remove common carp (**Figure 5-7**). Boat electrofishing was added in UPCRA because in 2019 carp were seen congregating in large groups. Backpack electrofishing and block nets were utilized in the channel upstream of the barrier and at the breach in the berm that separates the Upper and Lower Purgatory Creek Recreational Area. Most of the fish were captured via backpack electrofishing at the breached berm site. This breach allows water to short circuit

Figure 5-7 Common Carp Removal at PCRA

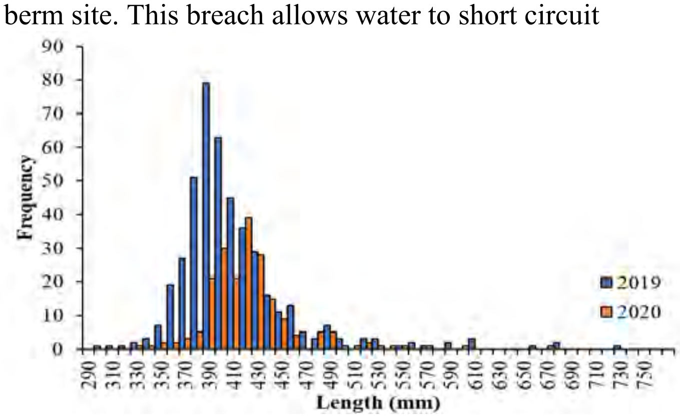


Figure 5-8 2019-2020 Length Frequency of PCRA Spring Removals

the overflow structure. Water is always flowing at this location which leads to carp concentrating in the shallow water near the breach before trying to move upstream. The sheet piling, combined with the consistent flow, has eroded the downstream side of the berm, causing a drop that impedes carp movement. A block net was anchored on the downstream side of the flow at the breach and then stretched around the congregating carp, trapping them against the berm and net. Staff used an electrofishing backpack to easily remove the trapped fish. During the heavy spawning run, staff repeated the process, sometimes up to three times a day, taking about an hour each time from installation of the net to completion of removal. Utilizing these gear types, a total of 201 carp were removed in 2020 vs 441 carp in 2019 and 1,901 carp in 2018. Most of the fish removed were from the 2015-year class, in which approximately 3000 YOY carp had entered Lake Staring from LPCRA and started to grow rapidly (Sorensen et al., 2015). This year class was a result of the last major recruitment event that occurred in the system thus far **Figure 5-8**. The major removal rate discrepancy between 2018 and 2020 can be attributed to the very low water levels seen in 2020 and the later installation of the barrier due to Covid-19. Low water levels prevent fish from congregating as much and the barrier being open allowed fish to move freely which may have reduced large podding. In 2019, most of the carp were removed on May 7th, when the water level at the barrier was 37.5 inches in depth (based on the installed staff gauge), and when the temperature was 17.2 degrees Celsius (**Figure 5-7**). In 2020, the main carp removal event occurred on June 29th, when the water level was 39 inches and the water temperature was 22 degrees Celsius. District staff have been working with the City of Eden Prairie to stabilize the berm and correct/improve the regular overflow location to allow staff to utilize the location for future carp removal events. Staff may utilize electrofishing after dark in 2021 to improve capture efficiency.

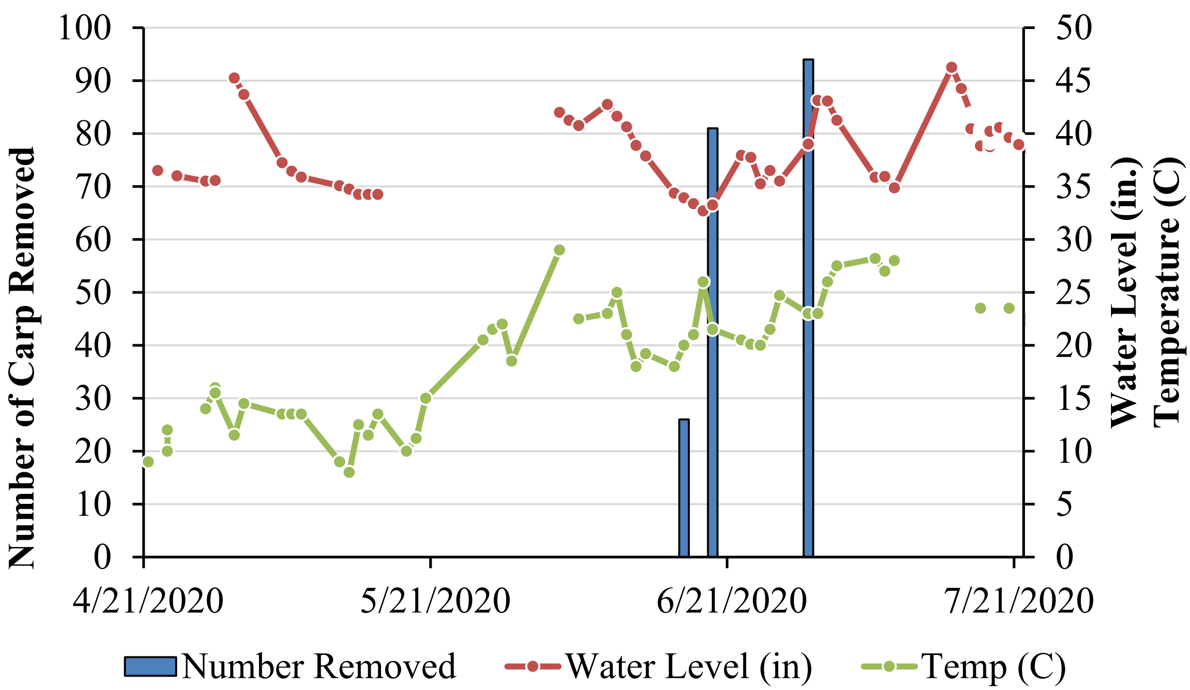


Figure 5-9 Purgatory Creek Recreational Area Common Carp Removal vs Environmental Variables

5.4 Zebra Mussels

Zebra mussels are native to Eastern Europe and Western Russia and were introduced to the United States. Zebra mussels can cover equipment in the water, clog water intakes, cut bare feet, smother native mussels by covering them, and they can fundamentally change the food web of a lake by extensively filtering out phytoplankton to which many aquatic animals need (MNDNRb 2015). Treatment methods available to date are considered experimental and have not been effective in eradicating zebra mussels from a lake once they are introduced. The District continued to monitor for adult and veliger zebra mussels in 2020. The District conducted veliger sampling from June to July on 13 lakes and a high-value wetland to detect the presence of zebra mussels. Each lake was sampled once, apart from Lotus Lake which was sampled twice. RMB Environmental Labs processed the samples and found zebra mussel veligers on only lake Riley in 2020. Adult zebra mussel presence was assessed using monitoring plates that were hung from all public access docks, as well as some private docks of residents participating in the District's Adopt-a-Dock program. Monitoring plates were checked monthly and no mussels were found across all lakes except for lake Riley in 2020. Additionally, public accesses were scanned for approximately five to ten minutes during each regular water quality sampling period (bi-weekly). Staff visually searched rocks, docks, sticks, and vegetation for adult zebra mussels. Adult zebra mussels were only found at Lake Riley in 2020.

Riley

On October 22, 2018, RPBCWD staff confirmed zebra mussels on Lake Riley after a lake service provider discovered some zebra mussels while pulling docks and lifts. Previously, no zebra mussels had been found in the lake during the regular monitoring season, which included all the different monitoring efforts. The zebra mussels appeared to be widespread across the lake at low densities. Mussels were found of varying sizes suggesting that reproduction in Lake Riley had occurred. In 2019 zebra mussels were found on all plates deployed ranging in number from 69 mussels to 5,717 mussels/plate. This indicates a robust and expanding population that is well established across the lake. In 2020, adopt-a-dock volunteers captured zebra mussels of all sizes and the plates were fully covered in most cases. Actual zebra mussel counts/plate have not been completed.

Lotus

On August 30, 2019, 5 zebra mussel veligers were found in veliger tows collected by Carver County from the public access of Lotus Lake (**Figure 5-10**). No zebra mussel veligers were found in samples collected on June 20, 2019 or September 10, 2019 by the RPBCWD. Additional in-lake searching occurred on October 9, 2020 by RPBCWD staff. No adult zebra mussels were found during the search. An additional veliger tow was collected on October 10, 2019 and eDNA samples were taken at 4 locations. On October 24, 2019 staff from DNR, Carver County and the RPBCWD surveyed pulled docks on shore around the lake and found 5 zebra mussels ranging in size from 6-16 mm on a single boat lift footing in the east bay (**Figure 5-10**). After the October survey, the eDNA results were complete and indicated zebra mussel eDNA was present near the boat launch sample and the east bay sample near where the adults were captured. Based on the collected information, Lotus Lake was added to the Infested Waters List for zebra mussels for 2019. In 2020, veliger tows were again collected twice in the spring, but yield no zebra mussel veligers. Both boat launch and mussel plate checks (expanded to 11 plates) yielded no adult

Figure 5-10 2019 Lotus Lake Zebra Mussel Map

mussels. Staff visually searched for mussels twice in 2020, once in august and once in October after docks were pulled. No mussels were found. The eDNA results for 2020 was positive for the deep-water area near the boat launch only. Staff will continue to monitor for zebra mussels in 2021.

The chemical and physical makeup of a lake determines the suitability of that lake to support zebra mussels. Like many organisms, there is a wide range of suitable conditions in which zebra mussels can survive. Optimal conditions are conditions in which there are no limiting variables that are controlling an organism's ability to grow and reproduce within a system. **Table 5-6**, lists the different variables associated with zebra mussels that the District currently measured in 2018 for Lake Riley and in 2019 for Lotus Lake. In **Table 5-6**, the criteria used to determine the level of infestation by zebra mussels in North America (Mackie and Claudi 2010) with the variables being arranged from greatest to least importance for determining suitability for zebra mussels. For consistency, all variables included in the analysis were measured during the summer growing season (June-September) and include only the top two meters for the lakes. The different variables can be grouped into three categories:

- Chalk variables which are needed for shell formation.
- Trophic (nutrient) variables which are associated with growth and reproductive success.
- Physical variables or basic lake variables that limit where zebra mussels can live in a lake.

Calcium concentrations in were estimated based on average monthly alkalinity samples. The estimated calcium concentrations in Lotus and Riley were similar to actual calcium concentrations collected from all other lakes in the Riley Chain. Comparing all lakes in the District with the calcium threshold established by Mackie and Claudi 2010, only Round and Hyland have less than optimal calcium concentrations (>30mg/L) for zebra mussels. Alkalinity and pH are associated with calcium concentrations and were both highly suitable for sustaining zebra mussels in both lakes. The nutrient variables for Lake Riley were at moderate levels for zebra mussel suitability, however both TP and Chl-a concentrations were near the upper end of the moderate infestation threshold. Lotus Lake nutrient data indicates minimal growth parameters for zebra mussel growth. This indicates the zebra mussel population may not be as significant. Steve McComas found Chlorophyll concentrations directly impacted zebra mussel populations in Lake Minnetonka bays. Areas of the lake with optimal chlorophyll conditions experienced significant reductions in chlorophyll concentrations after infestation. This was followed by a zebra mussel dieback, occurring three to four years after the first mussels were found (McComas 2018). Physical variables all scored high for zebra mussel suitability in Riley and Lotus. These variables all change with depth, however optimal conditions for each were present in both lakes. Hard structure suitability was estimated as moderately suitable for zebra mussels in both lakes. In 2016, it was found that 98% of the zebra mussel population in Lake Minnetonka were mostly juveniles and were found on submerged aquatic plants (McComas 2018). That said, it was hypothesized that many of those individuals died off and the main source of zebra mussel year to year recruitment may be from smaller, but dense groups of adults spread on isolated hard structure in slightly deeper portions of the lake. Hard structure in both lakes included predominantly rock and woody debris and is hypothesized to not be limiting for zebra mussels.

Based on the results in **Table 5-6**, the suitability of Lake Riley to support a robust and expansive zebra mussel population is high. These results were confirmed by mussel counts on adopt-a-dock volunteers. Once large zebra mussel populations become established, it is hypothesized that Chl-a and TP will decrease, and water clarity will increase due to zebra mussel filtering rates. In Lotus Lake **Table 5-6** indicates a slow growing or limited population to the minimal growth nutrient levels.

Table 5-6 Suitability for Zebra Mussels in Lake Riley and Lotus Lake

	LAKE	RILEY	LOTUS
Shell Formation	Calcium (mg/L)	44	56
	Alkalinity (mg/L)	112	158
	pH	8.69	7.88
Trophic Variables	TP (mg/L)	0.018	0.042
	Chl-a (ug/L)	28	34.3
	secchi (m)	4.64	1.2
Physical Variables	Temp (deg C)	24.69	22.74
	DO (mg/L)	8.79	8.82
	Cond (uS/cm)	483.7	461.73
	Hard Structure	n/a	n/a

*Mackie and Claudi 2010
BLUE=Minimal Infestation Potential
ORANGE= Moderate Infestation Potential
RED=Massive Infestation Potential

6 Lake and Creek Fact Sheets

The Riley Purgatory Bluff Creek Watershed District has included in this report informational fact sheets for the lakes and creeks that were monitored during the 2020 sampling season (**Exhibit I**). The lake fact sheets include: Lake Ann, Duck Lake, Hyland Lake, Lake Idlewild (high value wetland), Lotus Lake, Lake Lucy, Lake McCoy (high value wetland), Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Lake Riley, Round Lake, Silver Lake, Staring Lake, and Lake Susan. The creek fact sheets include: Bluff Creek, Purgatory Creek, and Riley Creek.

Each lake fact sheet includes a summary of the historical water quality data collected as related to the MPCA water quality parameters: Secchi Disk depth, Total Phosphorus, and Chlorophyll-a. Each creek fact sheet includes a summary of the most current Creek Restoration Acton Strategy assessment, which includes the analysis of infrastructure risk, water quality, stream stability/erosion, and habitat. Lake or creek characteristics, stewardship opportunities, and information about what the District is doing in and around local water bodies is also described in each fact sheet.

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8 Exhibits

Exhibit A *Historical Lake Level Graphs*

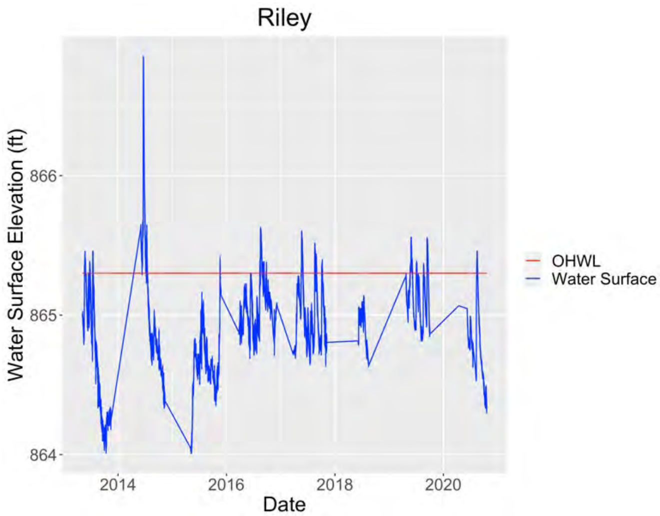


Figure A-1: Plot showing the water surface elevation on Lake Riley from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 865.3 ft).

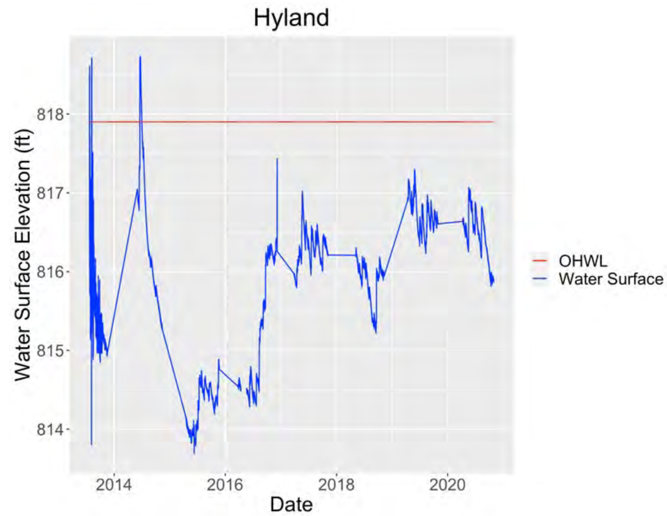


Figure A-4: Plot showing the water surface elevation on Hyland Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 817.9 ft).

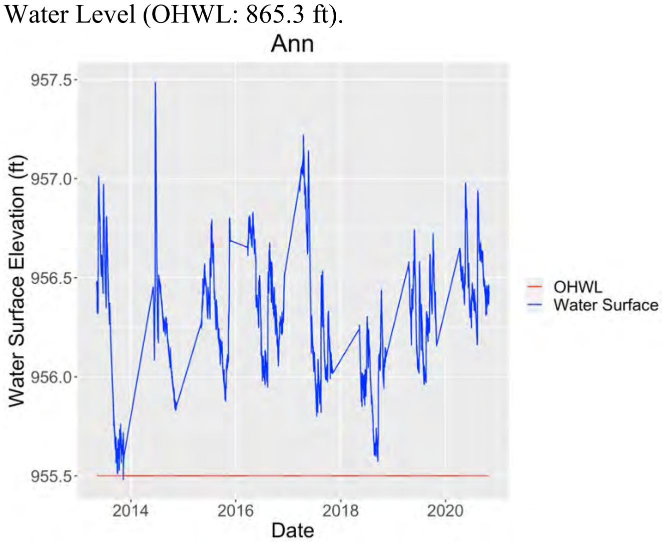


Figure A-2: Plot showing the water surface elevation on Lake Ann from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 955.5 ft).

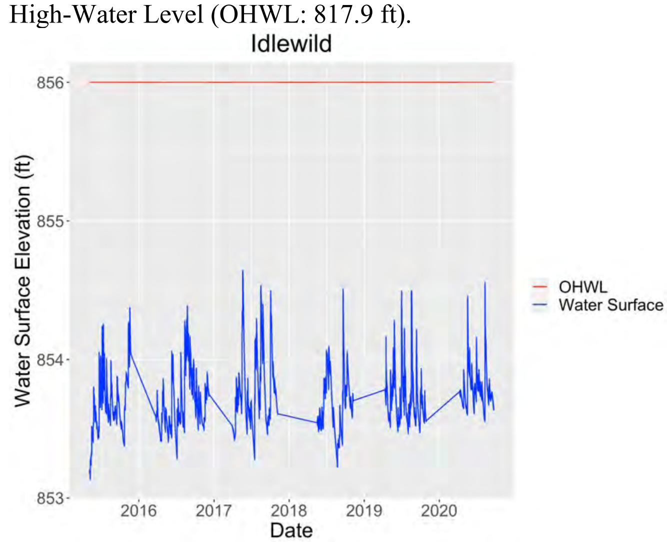


Figure A-5: Plot showing the water surface elevation on Lake Idlewild from 2015 to 2020 as well as the Ordinary High-Water Level (OHWL: 856 ft).

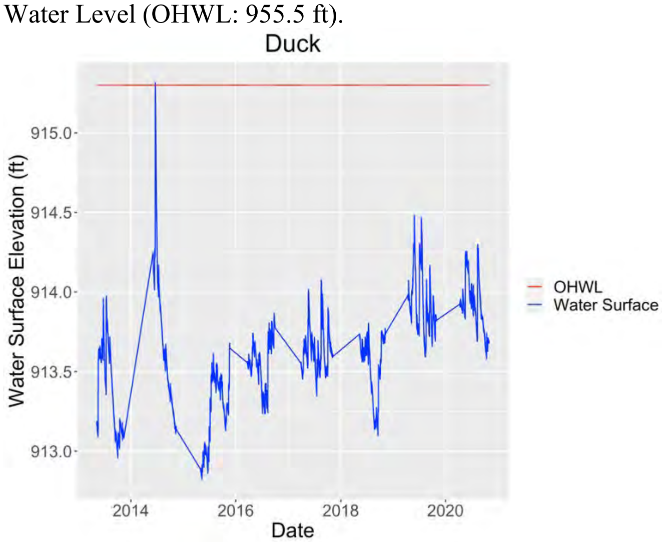


Figure A-3: Plot showing the water surface elevation on Duck Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 915.3 ft).

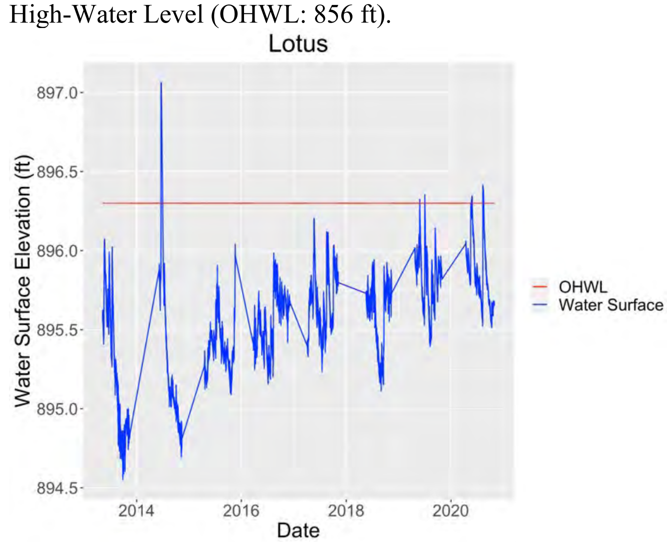


Figure A-6: Plot showing the water surface elevation on Lotus Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 896.3 ft).

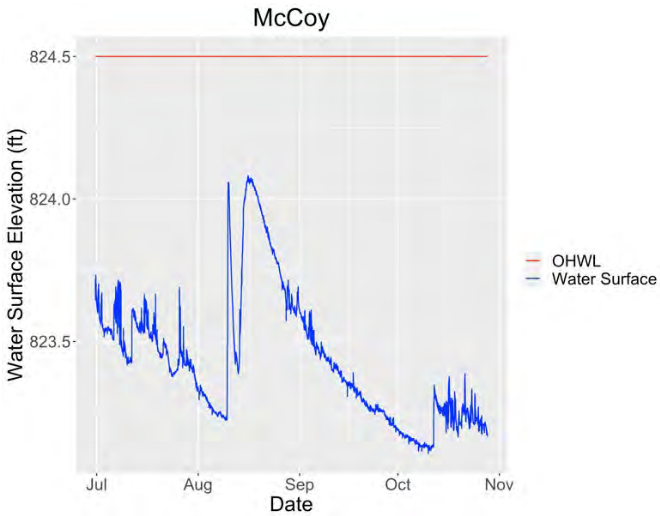


Figure A-7: Plot showing the water surface elevation on Lake McCoy during 2020 as well as the Ordinary High-Water Level (OHWL: 824.5 ft).

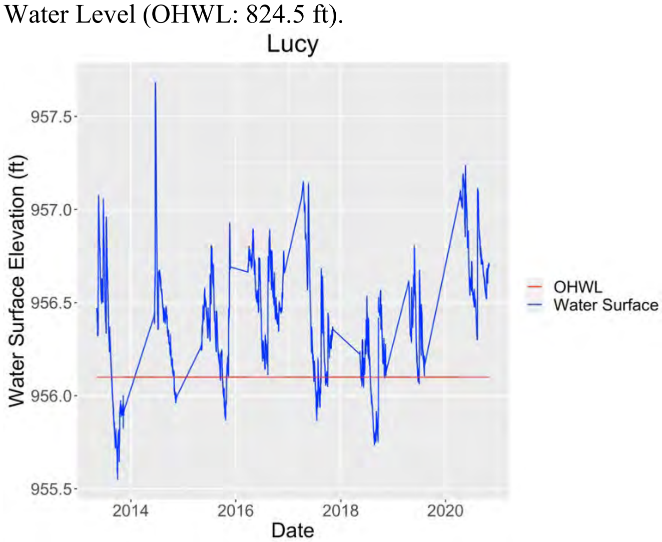


Figure A-8: Plot showing the water surface elevation on Lake Lucy from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 956.1 ft).

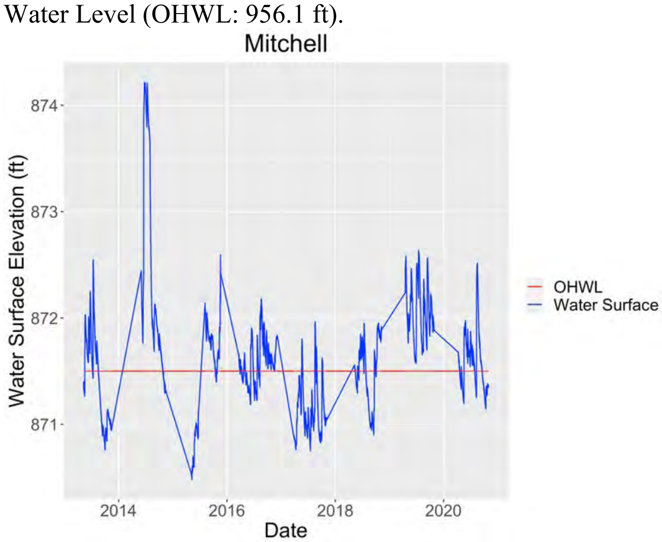


Figure A-9: Plot showing the water surface elevation on Lake Mitchell from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 871.5 ft).

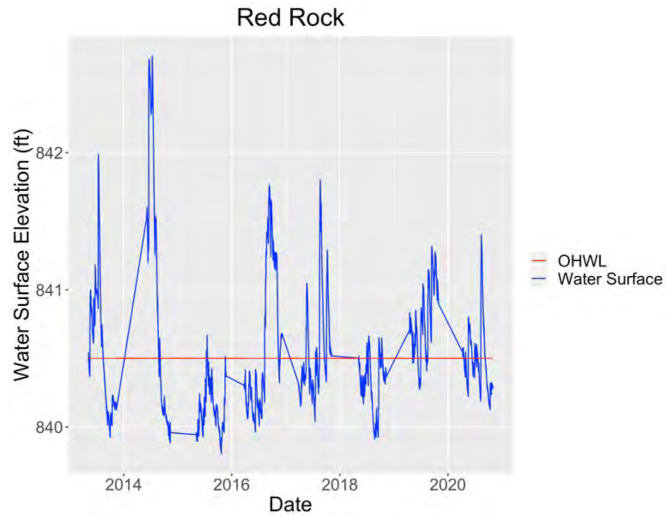


Figure A-10: Plot showing the water surface elevation on Red Rock Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 840.5 ft).

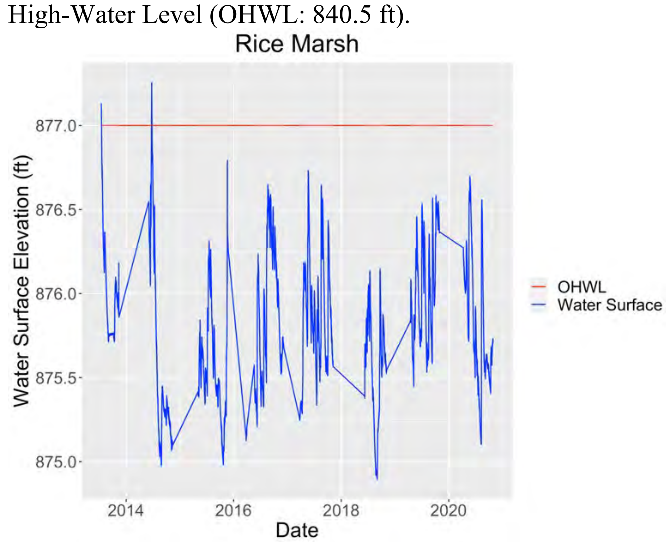


Figure A-11: Plot showing the water surface elevation on Rice Marsh Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 877 ft).

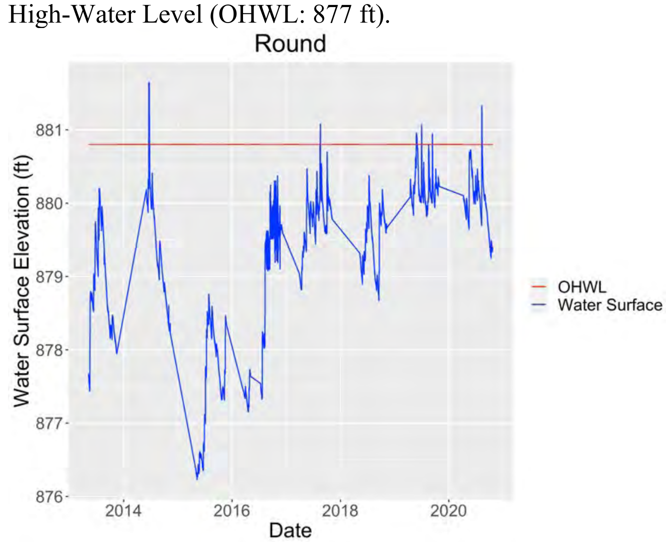


Figure A-12: Plot showing the water surface elevation on Round Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 880.8 ft).

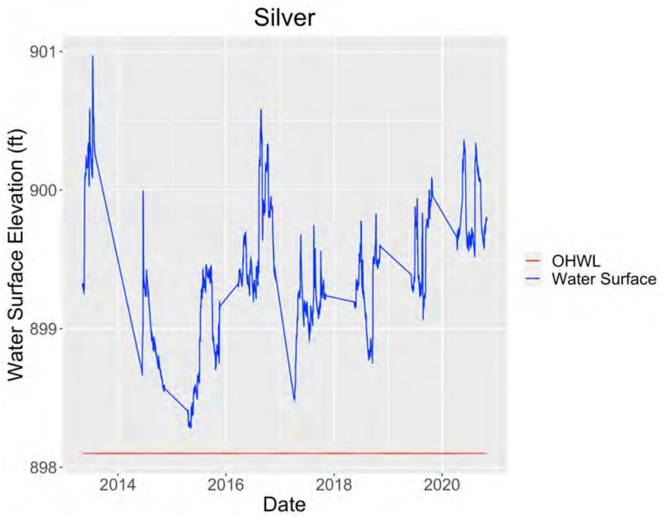


Figure A-13: Plot showing the water surface elevation on Silver Lake from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 898.1 ft).

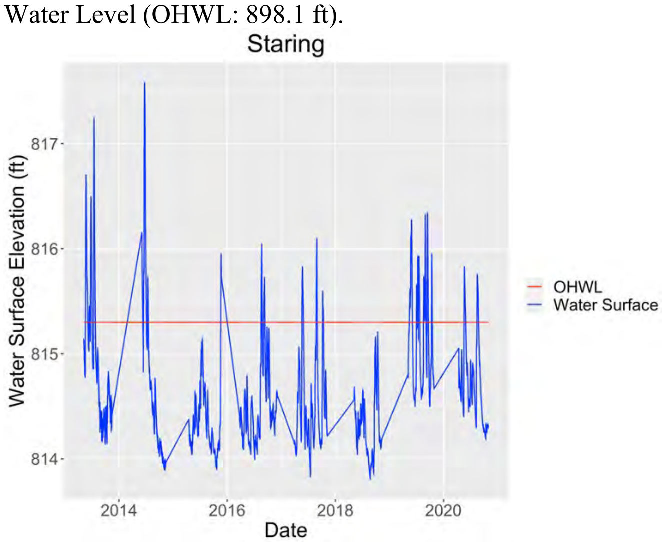


Figure A-14: Plot showing the water surface elevation on Lake Mitchell from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 815.3 ft).

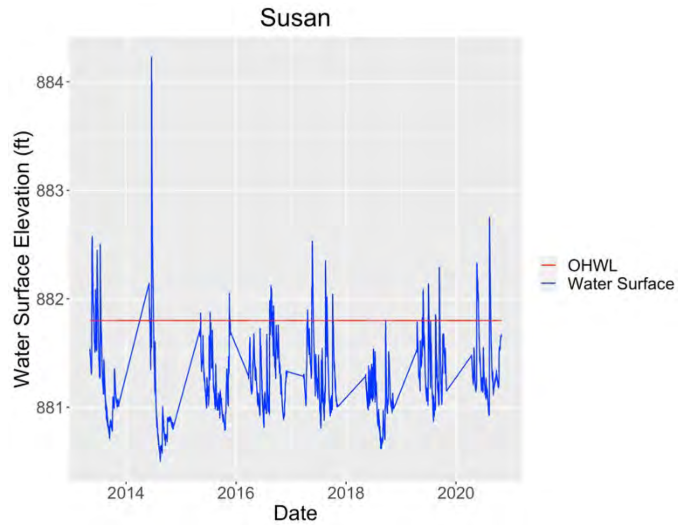


Figure A-15: Plot showing the water surface elevation on Lake Susan from 2013 to 2020 as well as the Ordinary High-Water Level (OHWL: 881.8 ft)

Exhibit B *2020 Trap Net Summary Data*

Table B3: 2020 **Lake Lucy** trap net data

Species	Number of fish caught in each category (inches)											
	0-5	6-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	Total	2020 Fish/Net
Black Crappie			4	3								7	1.4
Bluegill Sunfish	296	90	11									397	79.4
Hybrid Sunfish	4	7										11	2.2
Largemouth Bass	1											1	0.2
Northern Pike	1	1		2	3		3	2				12	2.4
Pumpkinseed	64	19	1									84	16.8
Yellow Bullhead	1	3	5	19	9							37	7.4
Yellow Perch	1	2		1	1							5	1

Table B4: 2020 **Lower Purgatory Creek Recreational Area** fyke net data

Species	Number of fish caught in each category (inches)												
	0-5	6-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	Total	2020 Fish/Net
Black Bullhead	2											2	0.5
Bluegill Sunfish	10	1										11	2.75
Common Carp	16	1										17	4.25
Golden Shiner	3											3	0.75
Green Sunfish	2											2	0.5
Hybrid Sunfish	8											8	2
Largemouth Bass	8											8	2
Pumpkinseed	34											34	8.5
Yellow Bullhead				1								1	0.25
Yellow Perch	1											1	0.25

Table B5: 2020 **Rice Marsh Lake** fyke net data

Species	Number of fish caught in each category (inches)												
	0-5	6-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	Total	2020 Fish/Net
Black Crappie	8	6		1								15	3
Bluegill Sunfish	634	183	9									826	165.2
Largemouth Bass		2	2	1								5	1
Northern Pike					1	3	3	1	1			9	1.8
Pumpkinseed	50	11		1								62	12.4
Yellow Bullhead		5	22	22	2							51	10.2

Table B6: 2020 **Upper Purgatory Creek Recreational Area** fyke net data

Species	Number of fish caught in each category (inches)											
	0-5	6-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	Total	2020 Fish/Net
Black Bullhead	1	3	3									7	1.75
Black Crappie	117	26	10	1								154	38.5
Bluegill Sunfish	220	11										231	57.75
Green Sunfish	2											2	0.5
Hybrid Sunfish	2	1										3	0.75
Largemouth Bass	21	2			2							25	6.25
Northern Pike								1		1		2	0.5
Pumpkinseed	29											29	7.25
White Sucker					3							3	0.75
Yellow Bullhead	2	7	45	8								62	15.5
Yellow Perch	7											7	1.75

Table B7: 2020 **Staring Lake** fyke net data.

Species	Number of fish caught in each category (inches)												
	0-5	6-7	8-9	10-11	12-14	15-19	20-24	25-29	30-34	35-39	40-44	Total	2020 Fish/Net
Black Bullhead			1									1	0.2
Bluegill Sunfish	187	8										195	39
Green Sunfish	46											46	9.2
Pumpkinseed	31											31	6.2
Yellow Bullhead			2	1								3	0.6
Yellow Perch	1											1	0.2

Exhibit C *2020 Zooplankton Summary Data*

Table C1: 2020 **Lake Riley** Zooplankton Counts (#/m²)

DIVISION	TAXON	6/3/2020 #/m2	6/30/2020 #/m2	7/30/2020 #/m2	9/10/2020 #/m2
CLADOCERA	*Daphnia galeata mendotae*	0	0	0	5,537
	Daphnia pulex	70,631	28,252	67,504	0
	Immature Cladocera	0	18,835	0	0
	CLADOCERA TOTAL	**70,631**	**47,087**	**67,504**	**5,537**
COPEPODA	*Cyclops sp. / Mesocyclops sp.*	9,417	4,709	25,314	0
	Nauplii	306,068	98,883	67,504	71,987
	Calanoida	28,252	37,670	16,876	22,150
	COPEPODA TOTAL	**343,737**	**141,262**	**109,695**	**94,137**
ROTIFERA	*Asplanchna sp.*	4709	0	0	0
	Brachionus sp.	14126	14126	16876	49837
	Filinia longiseta	4709	0	0	0
	Lecane sp.	0	0	0	5537
	Monostyla sp.	9417	0	25314	11075
	ROTIFERA TOTAL	**32,961**	**14,126**	**42,190**	**66,450**
	TOTALS	**447,330**	**202,476**	**219,389**	**166,124**

Table C2: 2020 **Staring Lake** Zooplankton Counts (#/m²)

DIVISION	TAXON	6/30/2020 #/m2	7/30/2020 #/m2	9/15/2020 #/m2
CLADOCERA	*Bosmina longirostris*	4,709	23,845	5,726
	Ceriodaphnia sp.	14,126	0	5,726
	Chydorus sphaericus	9,417	23,845	17,177
	Daphnia galeata mendotae	42,379	7,948	17,177
	Daphnia retrocurva	0	0	17,177
	Diaphanosoma leuchtenbergianum	23,544	7,948	5,726
	CLADOCERA TOTAL	**94,175**	**63,587**	**68,710**
COPEPODA	*Cyclops sp. / Mesocyclops sp.*	42,379	7,948	28,629
	Nauplii	428,495	0	51,532
	Calanoida	42,379	39,742	5,726
	COPEPODA TOTAL	**513,252**	**47,690**	**85,887**
ROTIFERA	*Asplanchna priodonta*	4,709	0	0
	Filinia longiseta	9,417	0	0
	Keratella cochlearis	54,358	79,483	469,517
	Kellicottia sp.	12,544	15,897	0
	Polyarthra sp.	20,907	0	28,629
	UID Rot	104,534	23,845	45,807
	ROTIFERA TOTAL	**206,469**	**119,225**	**543,953**
	TOTALS	**813,895**	**230,502**	**698,550**

Table C3: 2020 **Lotus Lake** Zooplankton Counts (#/m²)

DIVISION	TAXON	6/2/2020 #/m2	6/30/2020 #/m2	7/30/2020 #/m2	9/10/2020 #/m2
CLADOCERA	*Bosmina longirostris*	0	0	27,800	8,664
	Chydorus sphaericus	17,177	0	0	0
	Daphnia galeata mendotae	17,177	18,684	0	0
	Daphnia retrocurva	0	0	18,534	95,305
	Diaphanosoma leuchtenbergianum	0	4,671	23,167	69,313
	CLADOCERA TOTAL	**34,355**	**23,355**	**69,501**	**173,281**
COPEPODA	*Cyclops sp. / Mesocyclops sp.*	17,177	46,711	13,900	60,648
	Nauplii	197,541	163,487	27,800	147,289
	Calanoida	94,476	42,040	23,167	43,320
	COPEPODA TOTAL	**309,194**	**252,237**	**64,868**	**251,258**
ROTIFERA	*Asplanchna sp.*	180,363	0	0	0
	Filinia longiseta	17,177	0	0	0
	Keratella quadrata	25,766	0	574,541	788,430
	Kellicottia sp.	0	0	50,967	181,945
	Polyarthra sp.	0	0	4,633	0
	Conochilus sp.	51,532	345,659	0	190,610
	UID Rot	0	0	166,802	43,320
	ROTIFERA TOTAL	**274,839**	**345,659**	**796,944**	**1,204,306**

TOTALS	**618,388**	**621,251**	**931,312**	**1,628,845**

Table C4: 2020 **Lake Susan** Zooplankton Counts (#/m²)

DIVISION	TAXON	6/2/2020 #/m2	7/1/2020 #/m2	7/29/2020 #/m2	9/15/2020 #/m2
CLADOCERA	*Bosmina longirostris*	0	9,794	0	0
	Ceriodaphnia sp.	0	9,794	0	0
	Chydorus sphaericus	0	0	0	5,161
	Daphnia galeata mendotae	49,724	24,485	0	0
	Daphnia retrocurva	0	0	0	98,055
	Diaphanosoma leuchtenbergianum	0	0	9,794	10,322
	CLADOCERA TOTAL	**49,724**	**44,074**	**9,794**	**113,537**
COPEPODA	*Cyclops sp. / Mesocyclops sp.*	16,575	44,074	29,382	46,447
	Nauplii	439,231	352,590	142,015	144,502
	Calanoida	0	19,588	4,897	10,322
	COPEPODA TOTAL	**455,805**	**416,252**	**176,295**	**201,270**
ROTIFERA	*Asplanchna priodonta*	0	4,897	0	0
	Filinia longiseta	0	0	14,691	0
	Keratella sp.	107,736	563,164	239,957	165,145
	Keratella quadrata	0	4,897	0	0
	Kellicottia sp.	16,575	14,691	29,382	113,537
	Polyarthra sp.	157,460	122,427	4,897	0
	Conochilus sp.	0	68,559	0	0
	UID Rot	0	0	773,739	72,251
	ROTIFERA TOTAL	**281,771**	**778,636**	**1,062,667**	**350,932**
	TOTALS	**787,300**	**1,238,962**	**1,248,756**	**665,739**

Table C5: 2020 **Rice Marsh Lake** Zooplankton Counts (#/m²)

DIVISION	TAXON	6/1/2020 #/m2	7/2/2020 #/m2	7/28/2020 #/m2	9/9/2020 #/m2
CLADOCERA	*Bosmina longirostris*	160,323	28,478	256,306	35,259
	Ceriodaphnia sp.	0	71,196	33,225	17,629
	Chydorus sphaericus	0	14,239	4,746	0
	Daphnia ambigua/parvula	16,876	0	0	0
	Daphnia galeata mendotae	8,438	0	0	0
	Diaphanosoma leuchtenbergianum	0	0	61,703	4,407
	CLADOCERA TOTAL	**185,637**	**113,914**	**355,980**	**57,296**
COPEPODA	*Cyclops sp. / Mesocyclops sp.*	33,752	33,225	9,493	57,296
	Nauplii	42,190	270,545	199,349	264,442
	Calanoida	0	4,746	33,225	4,407
	COPEPODA TOTAL	**75,942**	**308,516**	**242,067**	**326,146**
ROTIFERA	*Asplanchna priodonta*	0	156,631	4,746	4,407
	Lecane sp.	0	9,493	0	4,407
	Monostyla sp.	0	0	4,746	61,703
	Keratella cochlearis	936,623	47,464	0	13,222
	Keratella quadrata	8,438	0	0	0
	Kellicottia sp.	8,438	0	0	0
	Polyarthra vulgaris	683,482	99,674	28,478	370,219
	ROTIFERA TOTAL	**1,636,982**	**313,263**	**37,971**	**453,960**
	TOTALS	**1,898,561**	**735,692**	**636,018**	**837,401**

Exhibit D *2020 Phytoplankton Summary Data*

Table D1: 2020 **Lotus Lake** Phytoplankton #/mL

	6/3/2020	6/30/2020	7/30/2020	9/10/2020
Class	**#/mL**	**#/mL**	**#/mL**	**#/mL**
Chlorophyta	632	2,068	1,233	1,034
Chrysophyta	0	0	0	0
Cyanophyta	7,122	12,406	50,347	17,977
Bacillariophyta	57	230	284	1,149
Cryptophyta	1,378	1,723	1,517	632
Euglenophyta	0	0	0	0
Pyrrhophyta	0	0	190	115
Total	9,190	16,427	53,570	20,907

Table D2: 2020 **Staring Lake** Phytoplankton #/mL

	6/30/2020	7/30/2020	9/15/2020
Class	**#/mL**	**#/mL**	**#/mL**
Chlorophyta	4,825	1,091	1,034
Chrysophyta	0	0	0
Cyanophyta	7,639	27,971	22,400
Bacillariophyta	574	230	230
Cryptophyta	976	172	1,034
Euglenophyta	0	0	0
Total	14,014	29,522	24,697

Table D3: 2020 **Riley** Phytoplankton #/mL

	6/3/2020	6/30/2020	7/30/2020	9/10/2020
Class	**#/mL**	**#/mL**	**#/mL**	**#/mL**
Chlorophyta	1,321	1,149	2,391	2,872
Chrysophyta	0	0	0	0
Cyanophyta	345	1,034	528	345
Bacillariophyta	115	0	0	115
Cryptophyta	402	459	445	976
Euglenophyta	0	0	0	0
Euglenophyceae		57		
Total	2,183	2,642	3,365	4,308

Table D4: 2020 **Rice Marsh** Lake Phytoplankton #/mL

	6/1/2020	7/1/2020	7/28/2020	9/15/2020
Class	**#/mL**	**#/mL**	**#/mL**	**#/mL**
Chlorophyta	10,109	1,264	1,666	1,436
Chrysophyta	0	0	0	0
Cyanophyta	57	230	689	0
Bacillariophyta	0	3,906	402	0
Cryptophyta	1,264	2,125	1,608	1,149
Total	11,430	7,524	4,365	2,585

Table D4: 2020 **Susan** Lake Phytoplankton #/mL

	6/2/2020	7/1/2020	7/29/2020	9/15/2020
Class	**#/mL**	**#/mL**	**#/mL**	**#/mL**
Chlorophyta	1,034	3,389	3,565	3,466
Chrysophyta	0	0	0	0
Cyanophyta	115	12,234	44,704	41,503
Bacillariophyta	689	287	289	85
Cryptophyta	689	1,895	771	1,691
Euglenophyta	0	0	0	85
Pyrrhophyta	0	804	674	254
Total	2,527	18,609	50,002	47,082

Exhibit E *2020 Creek Seasonal Sonde & Flow Data*

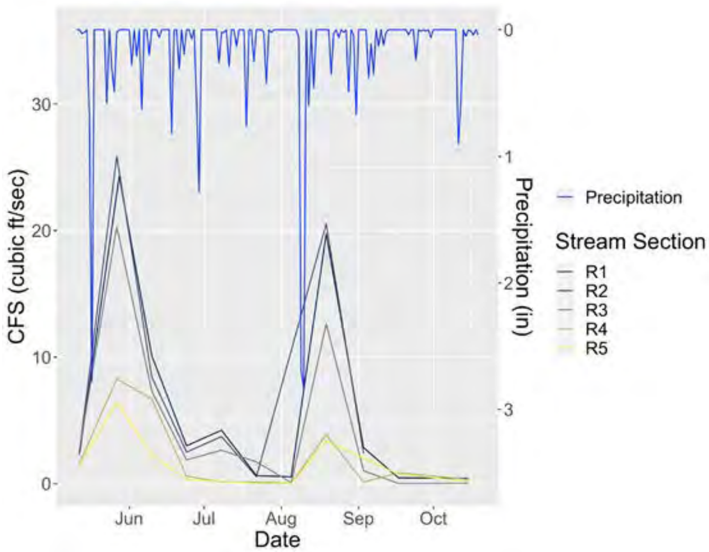


Figure E-1. Shows the flow is cubic feet per second on Riley Creek during 2020 from May through October separated by stream section. Also, shown is the precipitation during this time in inches.

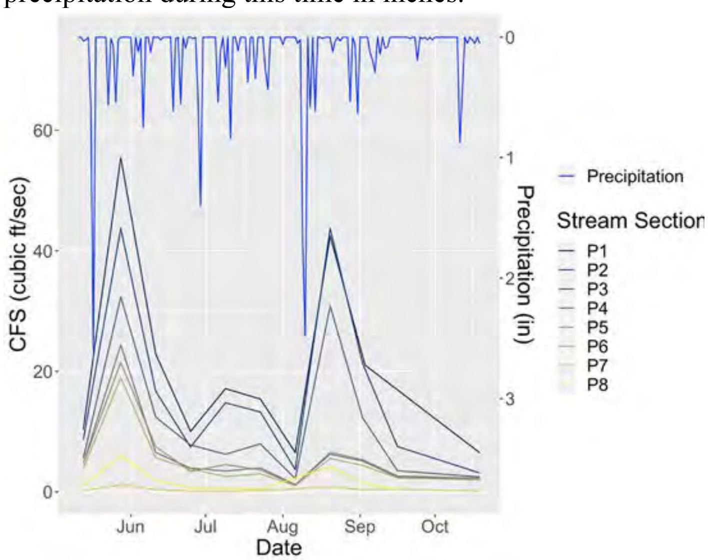


Figure E-2. Shows the flow is cubic feet per second on Purgatory Creek during 2020 from May through October separated by stream section. Also, shown is the precipitation during this time in inches.

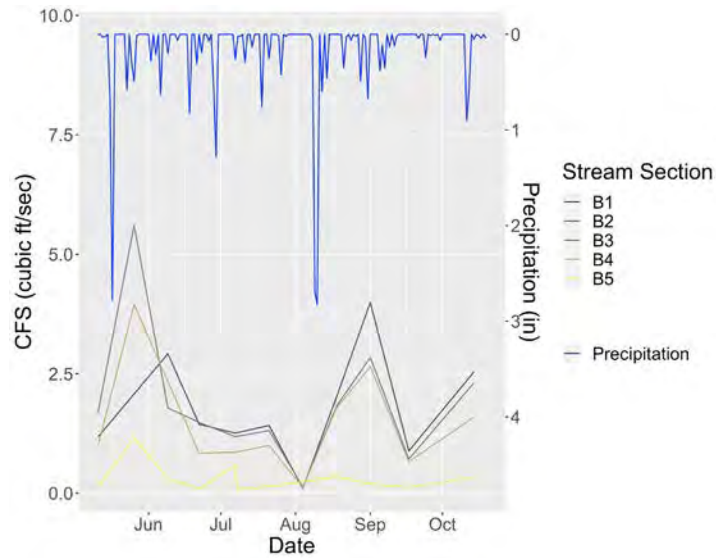


Figure E-3. Shows the flow is cubic feet per second on Bluff Creek during 2020 from May through October separated by stream section. Also, shown is the precipitation during this time in inches.

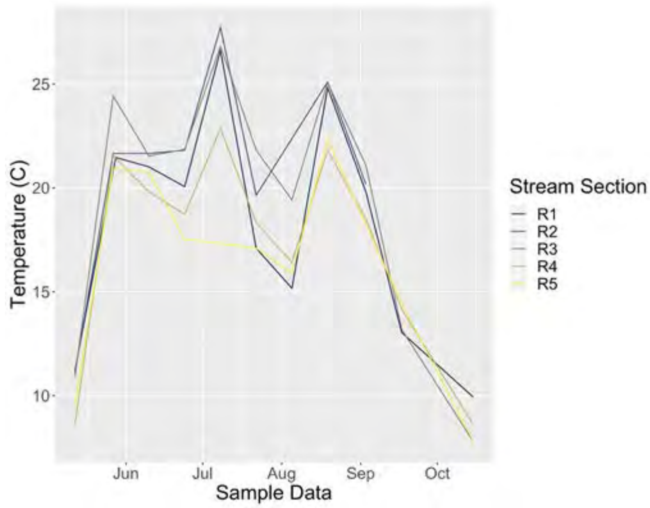


Figure E-4. Shows the temperature in Celsius on Riley Creek in 2020 from May to October separated by stream section.

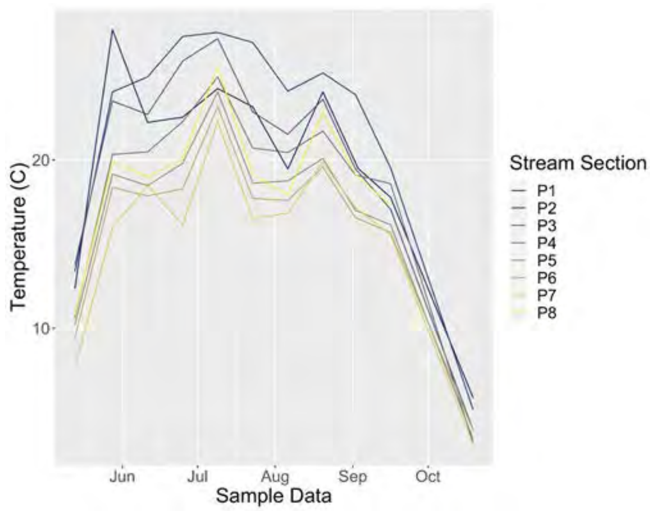


Figure E-5. Shows the temperature in Celsius on Purgatory Creek in 2020 from May to October separated by stream section.

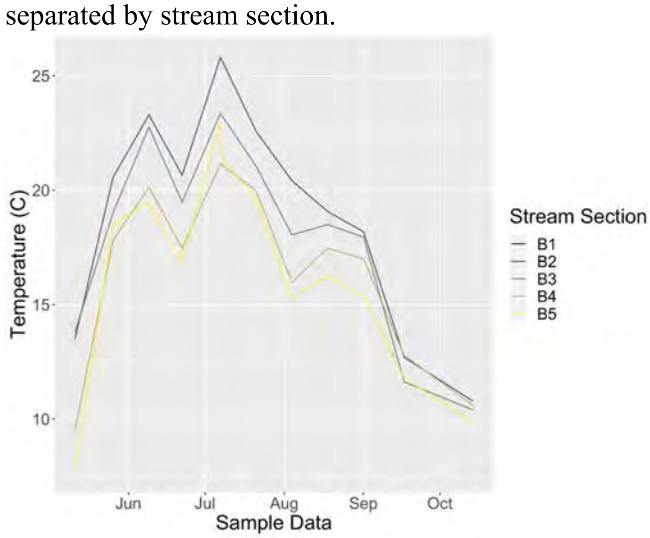


Figure E-6. Shows the temperature in Celsius on Bluff Creek in 2020 from May to October separated by stream section.

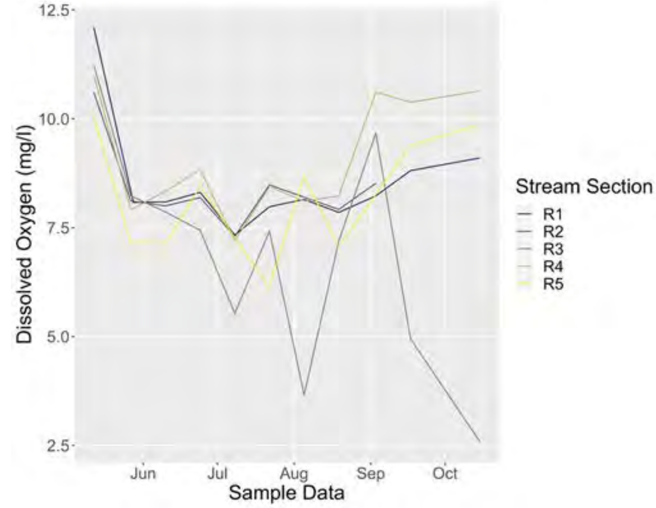


Figure E-7. Shows the dissolved oxygen in mg/l on Bluff Creek in 2020 from May to October separated by stream section.

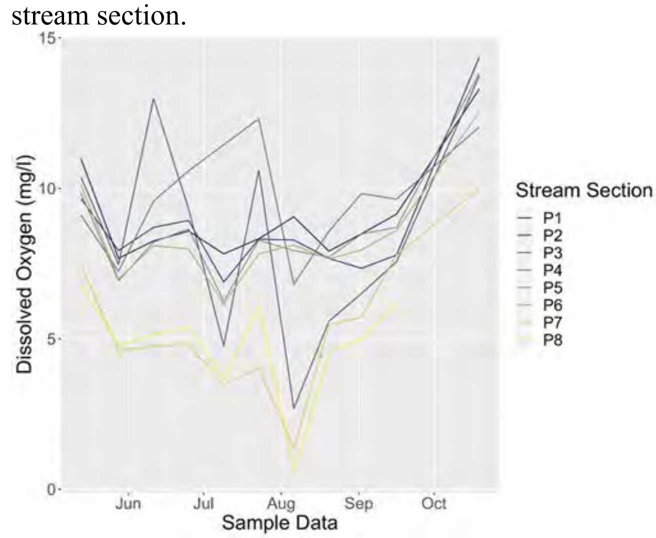


Figure E-8. Shows the dissolved oxygen in mg/l on Purgatory Creek in 2020 from May to October separated by stream section.

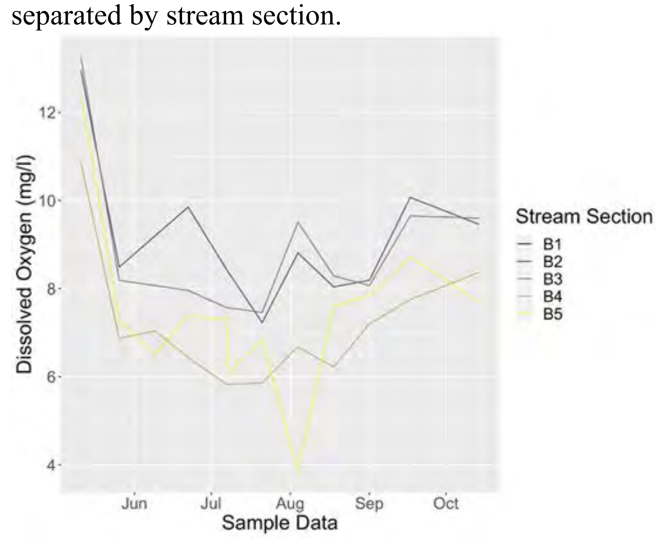


Figure E-9. Shows the dissolved oxygen in mg/l on Bluff Creek in 2020 from May to October separated by stream section.

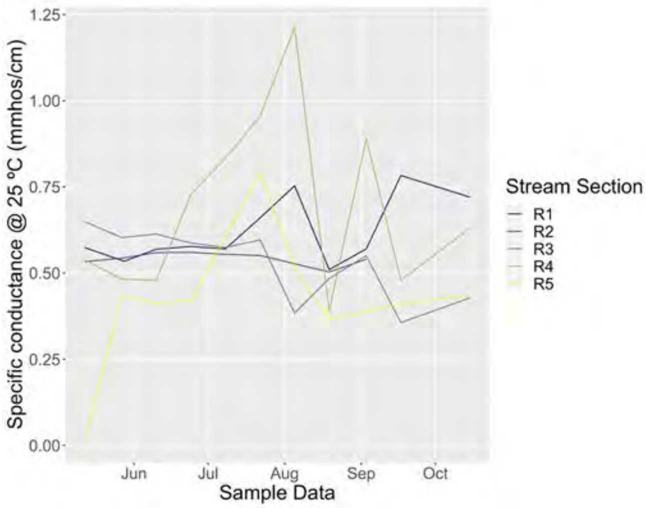


Figure E-10. Shows the conductivity in mmhos/cm on Riley Creek in 2020 from May to October separated by stream section.

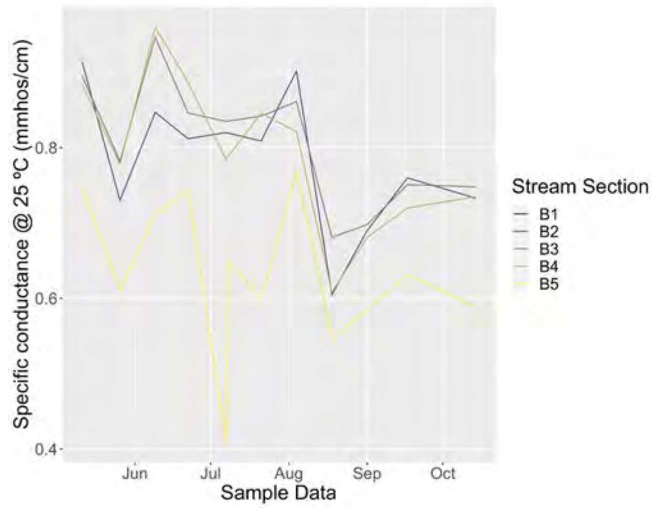


Figure E-12. Shows the conductivity in mmhos/cm on Bluff Creek in 2020 from May to October separated by stream section.

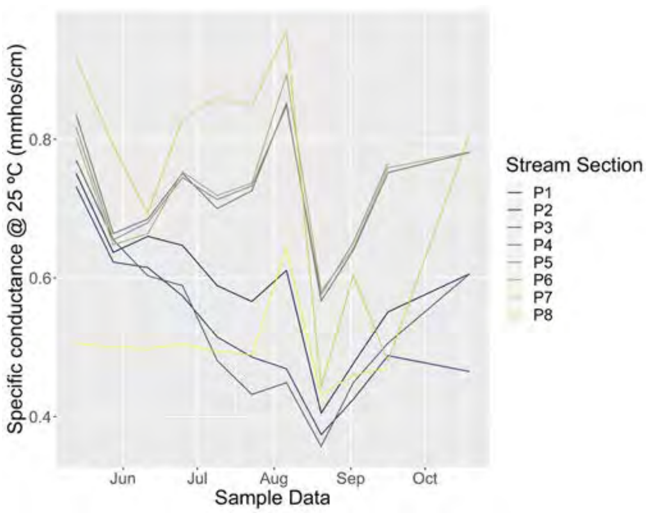


Figure E-11. Shows the conductivity in mmhos/cm on Purgatory Creek in 2020 from May to October separated by stream section.

Exhibit F *2020 Lake Nutrient Data Summary Table*

Figure F-1. Shows the average values for all nutrients analyzed in lakes during the growing season (June-September) 2020. Each lake is separated by top, middle, and bottom and all values are in mg/l.

Lake	Location	Total ALK	Ca	Cl-	Chl a	Fe	NH3	NO2/NO3	TN	TKN	OP	TP	TSS
Ann	Top	153		39	0.0054		0.065	0.030		0.82	0.0033	0.025	
Ann	Middle										0.0284	0.091	
Ann	Bottom			39			1.523	0.030		2.21	0.1848	0.625	
Duck	Top	84	20	45	0.0180		0.060	0.030		1.06	0.0034	0.055	
Duck	Bottom		21	45			0.065	0.030		0.58	0.0030	0.046	
Hyland	Top				0.0158				0.66		0.0024	0.025	
Idlewild	Top	59	19	132	0.0133		0.060	0.030		0.76	0.0070	0.062	
Idlewild	Bottom		19	132			0.060	0.030		0.42	0.0056	0.041	
Lotus	Top	158	54	48	0.0343		0.062	0.030		1.06	0.0031	0.042	
Lotus	Middle			53			0.163	0.030		0.98	0.0030	0.040	
Lotus	Bottom		58	55			3.940	0.030		6.45	0.1689	0.274	
Lucy	Top	190		43	0.0175		0.074	0.030		1.10	0.0064	0.047	
Lucy	Middle										0.0067	0.066	
Lucy	Bottom			42			3.081	0.030		2.38	0.1330	0.529	
McCoy	Top	122		81	0.0096	0.641	0.160	0.050		1.48	0.0170	0.097	4.2
McCoy	Bottom				0.0027						0.0120	0.058	
Mitchell	Top	99		87	0.0362	0.161	0.194	0.050		1.69	0.0070	0.061	7.8
Mitchell	Middle				0.0286						0.0071	0.064	
Mitchell	Bottom				0.0169						0.0152	0.224	
Red Rock	Top	113		87	0.0501	0.189	0.169	0.050		1.86	0.0071	0.086	8.6
Red Rock	Middle				0.0365						0.0076	0.088	
Red Rock	Bottom				0.0190						0.0075	0.189	
Rice Marsh	Top	122	40	98	0.0080		0.070	0.030		0.88	0.0036	0.042	
Rice Marsh	Bottom		42	100			0.072	0.030		0.80	0.0031	0.036	
Riley	Top	112	44	83	0.0028		0.073	0.030		0.48	0.0031	0.018	
Riley	Middle			84			0.154	0.030		0.50	0.0030	0.016	
Riley	Bottom		46	87			1.106	0.034		1.69	0.0271	0.058	
Round	Top	46		66	0.0117	0.054	0.160	0.050		1.10	0.0075	0.037	2.8
Round	Middle				0.0100						0.0081	0.045	
Round	Bottom				0.0087						0.0076	0.083	
Silver	Top	136	36	36	0.0404		0.088	0.030		1.25	0.0056	0.116	
Silver	Bottom		36	36			0.103	0.030		1.01	0.0033	0.059	
Staring	Top	131	62	78	0.0347		0.067	0.030		1.34	0.0060	0.055	
Staring	Middle										0.0065	0.043	
Staring	Bottom		68	80			0.541	0.030		1.59	0.0161	0.097	

Figure F-1. Shows the average values for all nutrients analyzed in lakes during the growing season (June-September) 2020. Each lake is separated by top, middle, and bottom and all values are in mg/l.

Lake	Location	Total ALK	Ca	Cl-	Chl a	Fe	NH3	NO2/NO3	TN	TKN	OP	TP	TSS
Susan	Top	128		94	0.0515		0.107	0.034		1.37	0.0039	0.067	
Susan	Middle										0.0065	0.082	
Susan	Bottom			94			1.024	0.033		1.80	0.0590	0.298	

Exhibit G *2020 Stream Nutrient Summary Table*

Figure G-1. Shows the average value of all nutrients analyzed in creeks during 2020 by each nutrient's specified timeframe separated by section. Chlorophyll a (Chl a), Orthophosphate (OP) and Total Phosphorous (TP) is the averages of all values collected from May through September. Total suspended solids (TSS) are the average of values collected from April through September. Chloride (Cl-) is the average of all values collect year-round.

Stream	Stream Section	Cl- (mg/l)	Chl a (ug/l)	OP (mg/l)	TP (mg/l)	TSS (mg/l)
Bluff	UB	46.3	11.84	0.09550	0.4065	24.15
Bluff	B5	53.4	3.65	0.08909	0.1751	8.57
Bluff	B4	107.1	4.47	0.10520	0.2482	9.85
Bluff	B3	107.3	7.43	0.09740	0.2004	12.22
Bluff	B2	106.5	6.46	0.10360	0.1641	10.12
Bluff	B1	96.0				
Purgatory	P8	48.0	9.83	0.02800	0.0964	27.15
Purgatory	P7	89.0	3.90	0.05430	0.1130	14.95
Purgatory	P6	84.7	5.71	0.05770	0.1031	5.14
Purgatory	P5	82.5	4.29	0.06030	0.1468	17.47
Purgatory	P4	84.8	8.12	0.05540	0.1247	11.54
Purgatory	P3	86.3	8.88	0.01810	0.0648	9.46
Purgatory	P2	77.2	18.95	0.00440	0.0500	7.89
Purgatory	P1	88.1	11.53	0.01720	0.0741	15.53
Riley	R5	39.5	5.25	0.03050	0.0549	9.21
Riley	R4	121.8	6.36	0.04490	0.1080	17.98
Riley	R3	83.5	13.52	0.03260	0.0761	5.47
Riley	R2	75.9	2.04	0.00838	0.0238	8.03
Riley	R1	64.8	2.59	0.02430	0.0693	11.86

Exhibit H *2020 Lake Temp and Dissolved Oxygen Profiles*

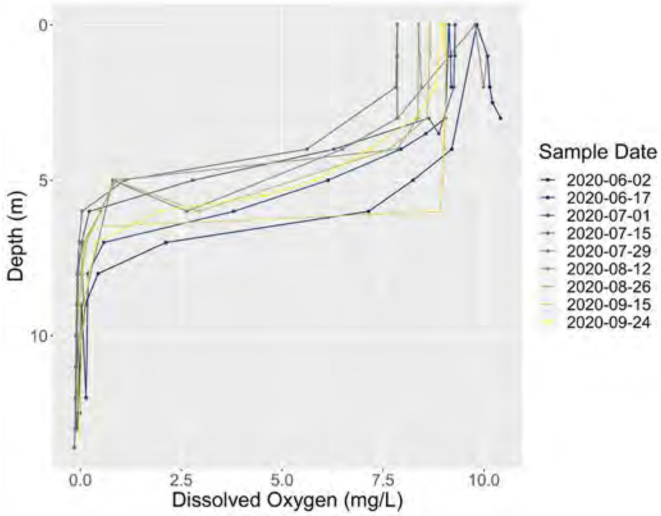


Figure H-1. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Ann during 2020.

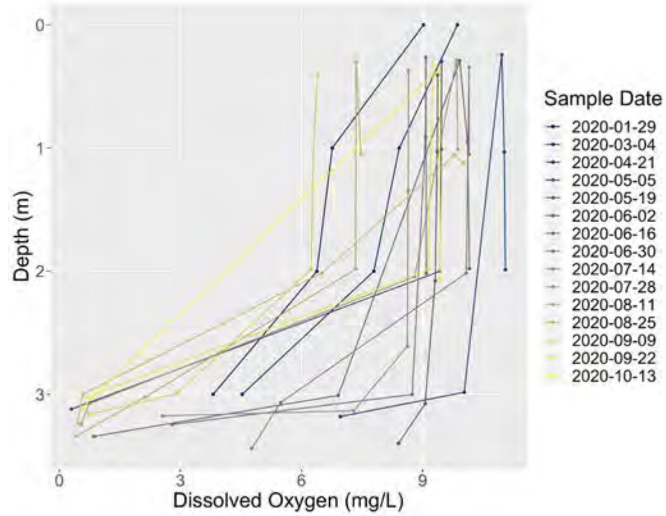


Figure H-3. Shows dissolved oxygen (DO) in mg/l throughout the water column in Hyland Lake during 2020.

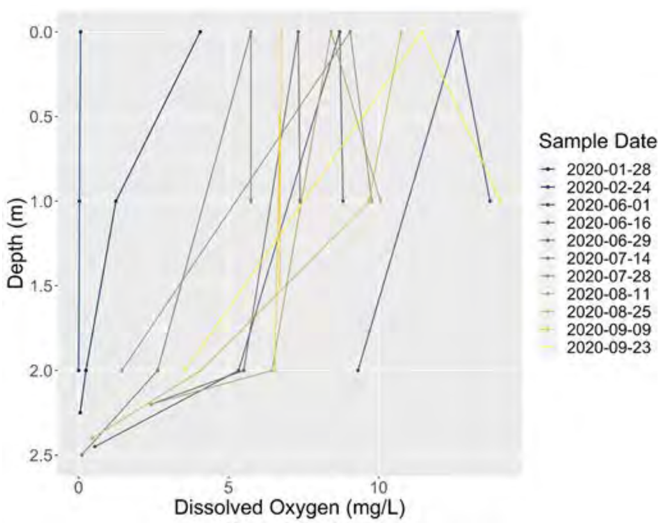


Figure H-2. Shows dissolved oxygen (DO) in mg/l throughout the water column in Duck Lake during 2020.

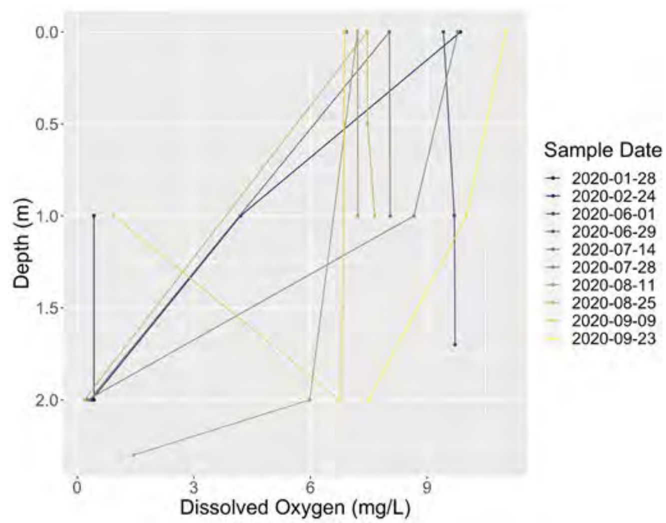


Figure H-4. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Idlewild during 2020.

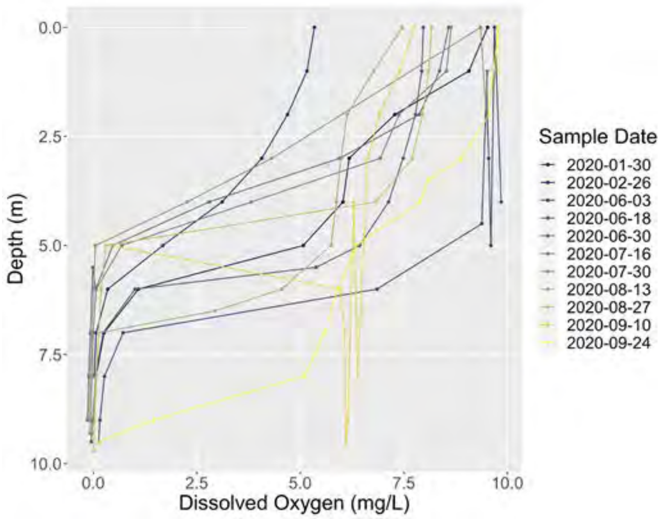


Figure H-5. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Lucy during 2020.

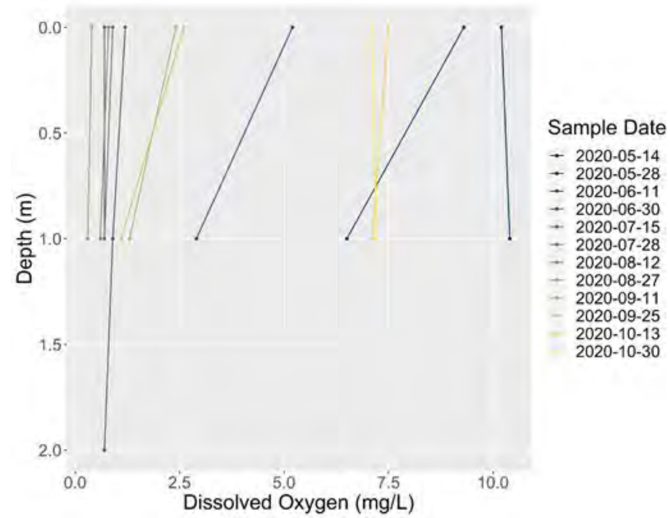


Figure H-7. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake McCoy during 2020.

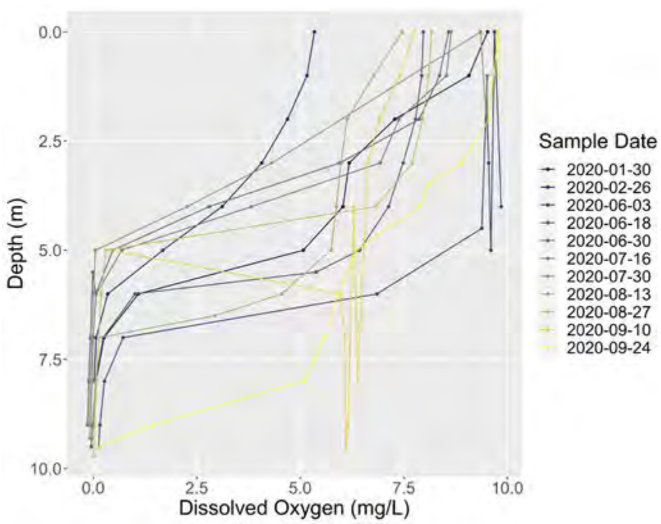


Figure H-6. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lotus Lake during 2020.

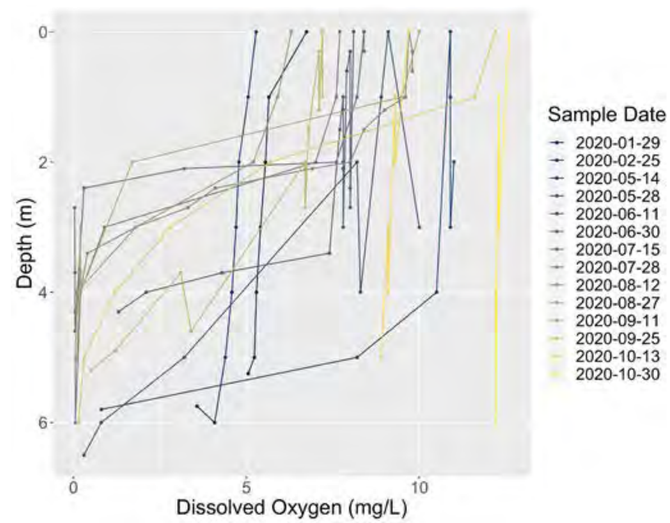


Figure H-8. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Mitchell during 2020.

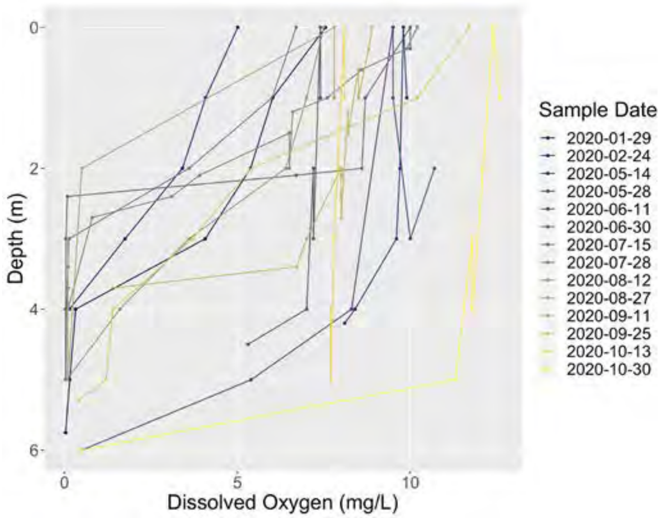


Figure H-9. Shows dissolved oxygen (DO) in mg/l throughout the water column in Red Rock Lake during 2020.

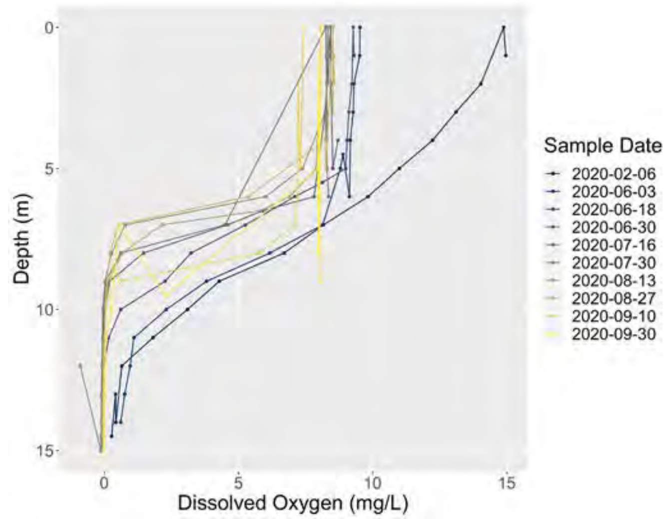


Figure H-11. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Riley during 2020.

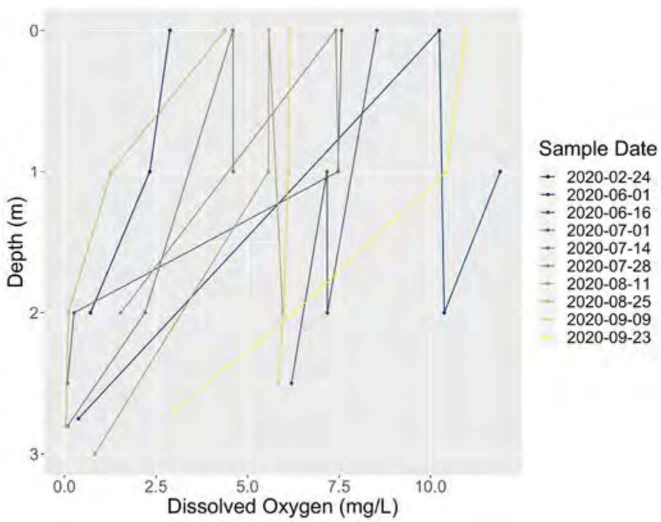


Figure H-10. Shows dissolved oxygen (DO) in mg/l throughout the water column in Rice Marsh Lake during 2020.

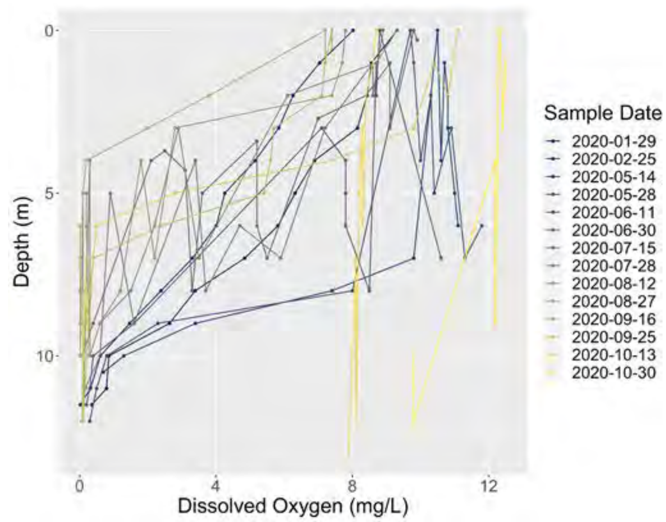


Figure H-12. Shows dissolved oxygen (DO) in mg/l throughout the water column in Round Lake during 2020.

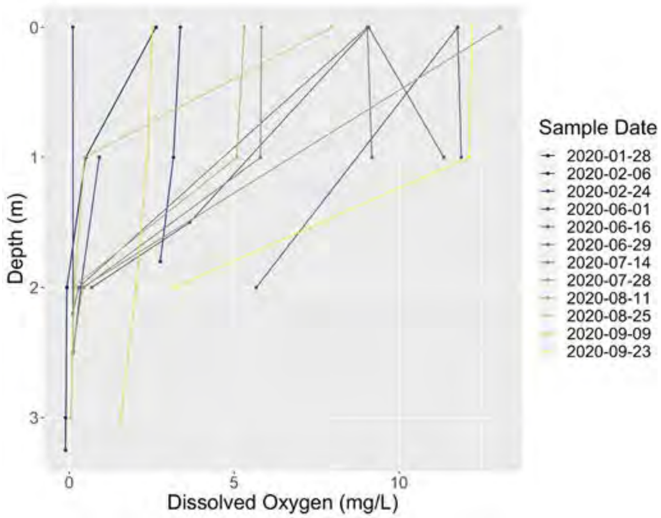


Figure H-13. Shows dissolved oxygen (DO) in mg/l throughout the water column in Silver Lake during 2020.

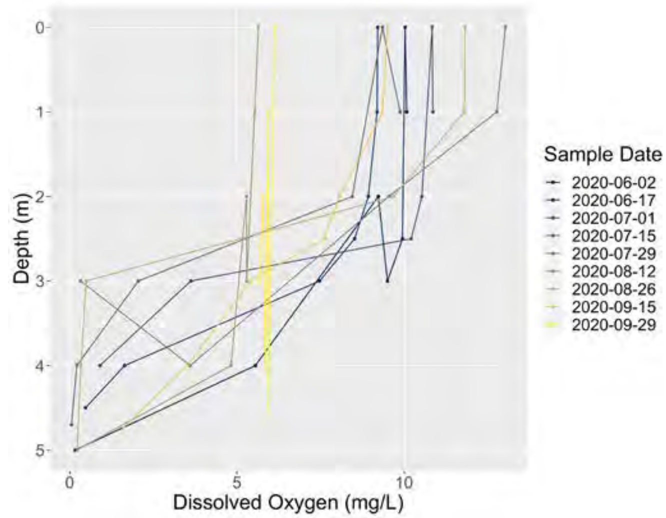


Figure H-15. Shows dissolved oxygen (DO) in mg/l throughout the water column in Lake Susan during 2020.

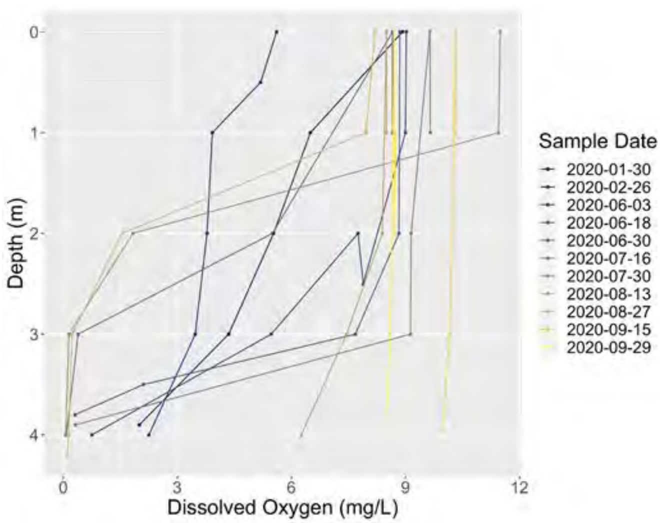


Figure H-14. Shows dissolved oxygen (DO) in mg/l throughout the water column in Staring Lake during 2020.

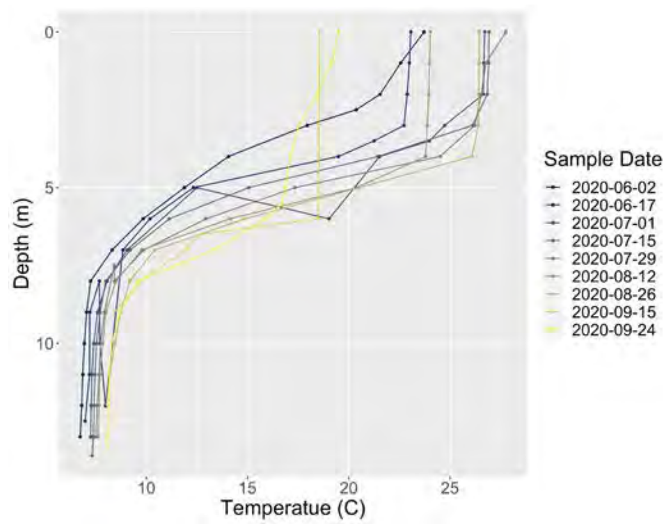


Figure H-16. Shows Temperature in Celsius throughout the water column in Lake Ann during 2020.

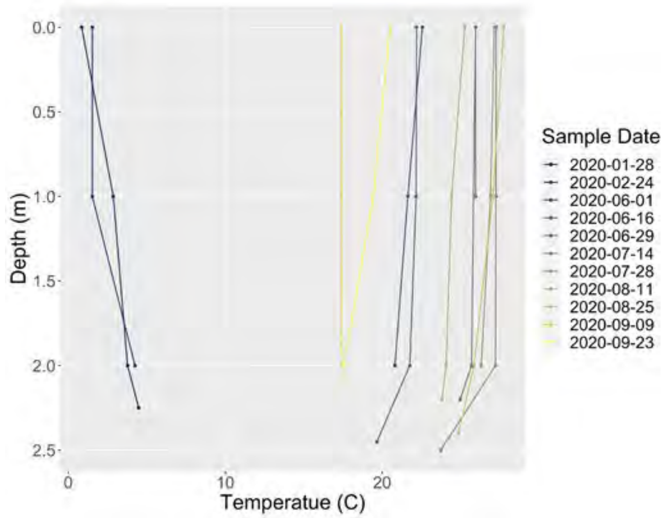


Figure H-17. Shows Temperature in Celsius throughout the water column in Duck Lake during 2020.

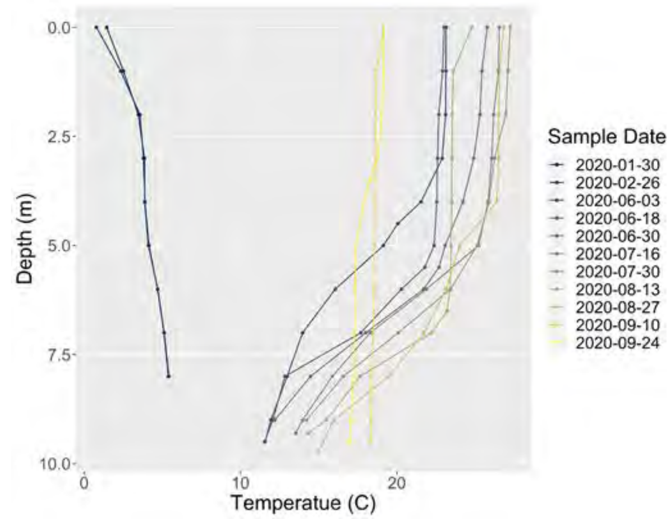


Figure H-20. Shows Temperature in Celsius throughout the water column in Lotus Lake during 2020.

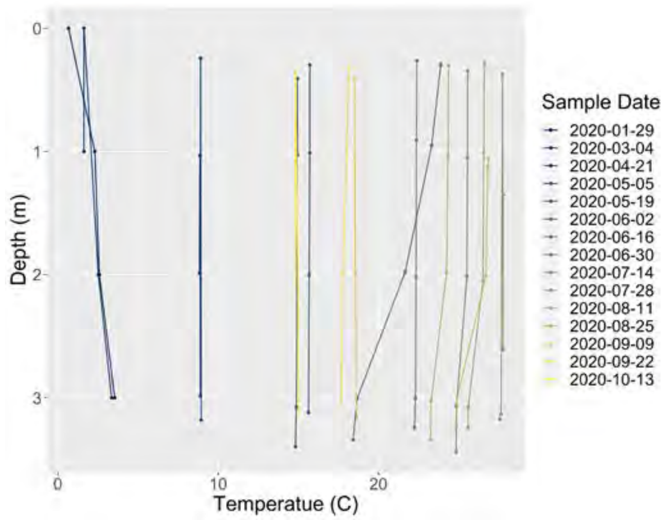


Figure H-18. Shows Temperature in Celsius throughout the water column in Hyland Lake during 2020.

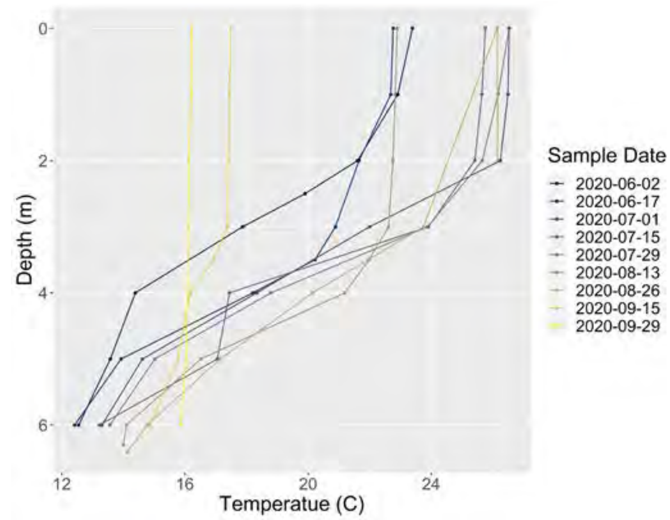


Figure H-21. Shows Temperature in Celsius throughout the water column in Lake Lucy during 2020.

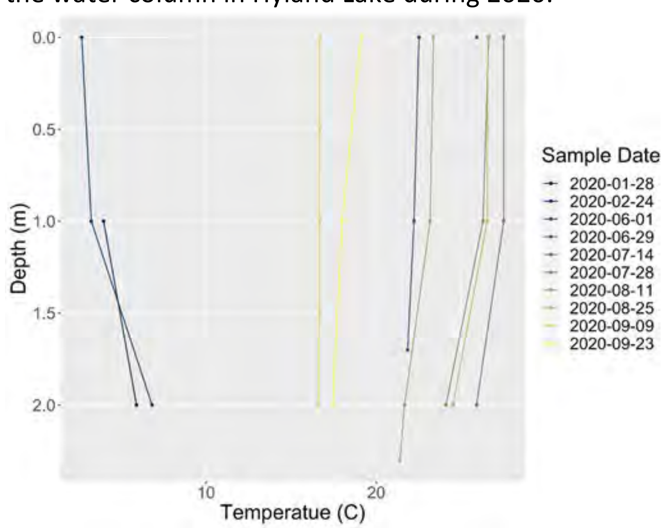


Figure H-19. Shows Temperature in Celsius throughout the water column in Lake Idlewild during 2020.

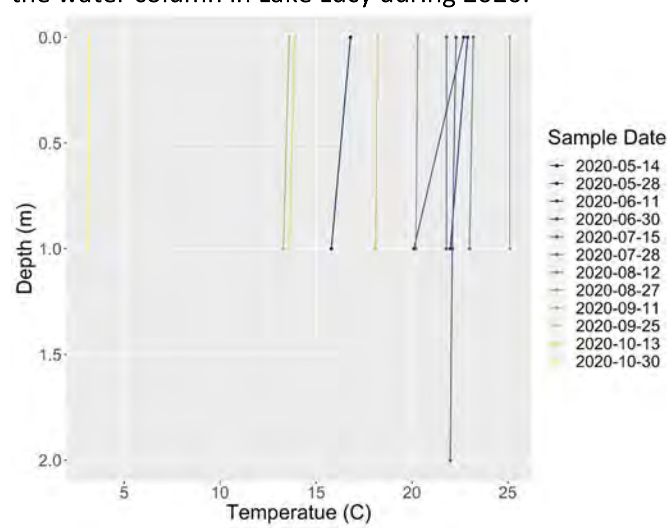


Figure H-22. Shows Temperature in Celsius throughout the water column in Lake McCoy during 2020.

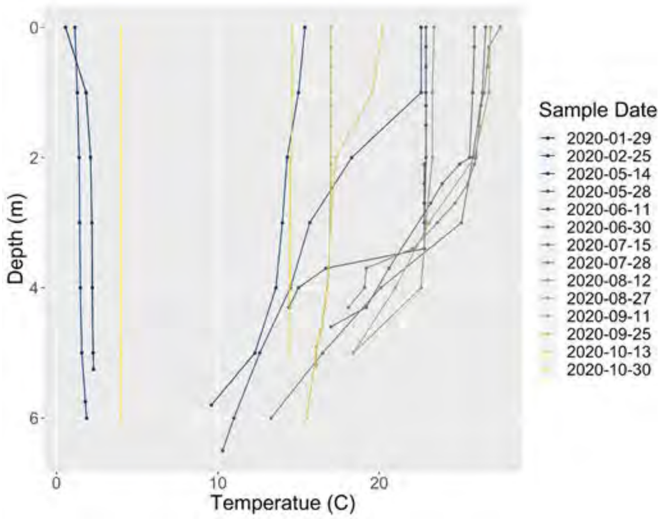


Figure H-23. Shows Temperature in Celsius throughout the water column in Mitchell Lake during 2020.

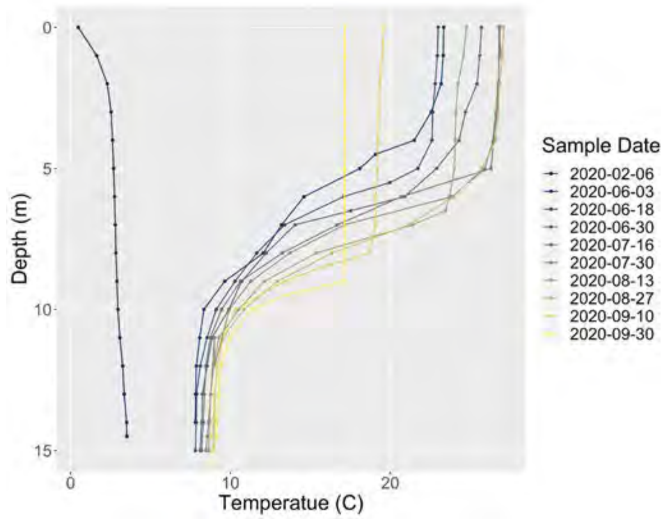


Figure H-26. Shows Temperature in Celsius throughout the water column in Lake Riley during 2020.

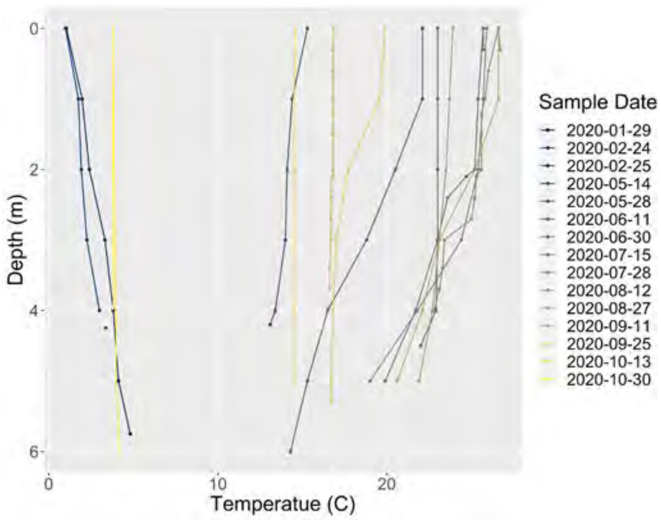


Figure H-24. Shows Temperature in Celsius throughout the water column in Red Rock Lake during 2020.

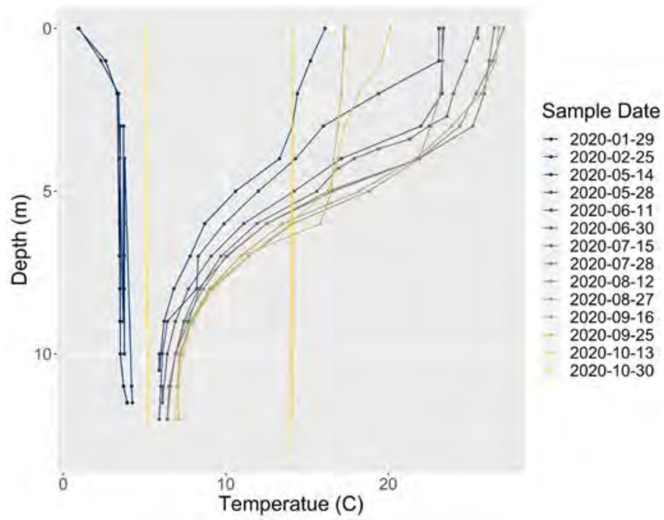


Figure H-27. Shows Temperature in Celsius throughout the water column in Round Lake during 2020.

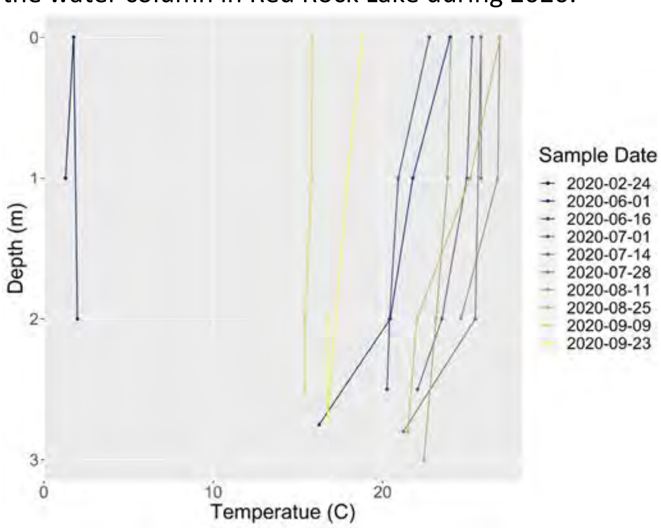


Figure H-25. Shows Temperature in Celsius throughout the water column in Rice Marsh Lake during 2020.

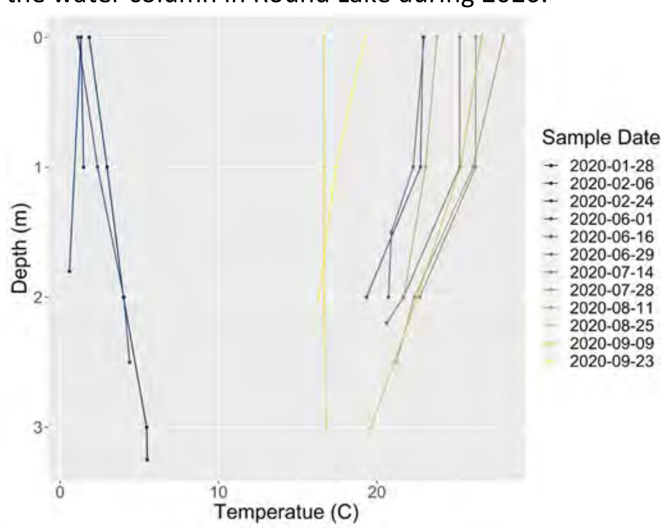


Figure H-28. Shows Temperature in Celsius throughout the water column in Silver Lake during 2020.

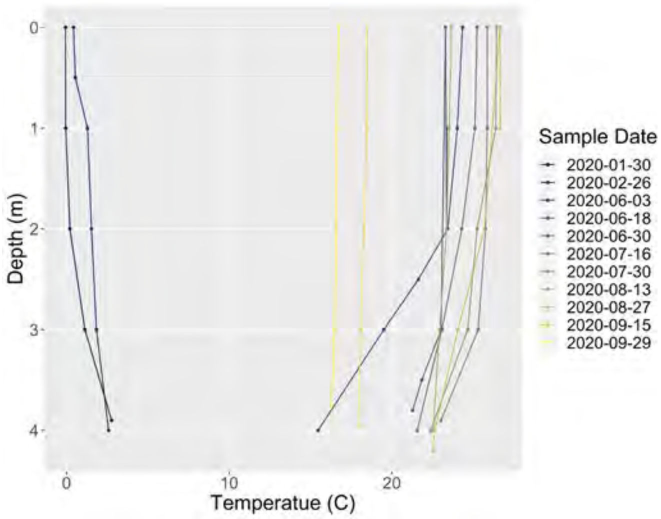


Figure H-29. Shows Temperature in Celsius throughout the water column in Staring Lake during 2020.

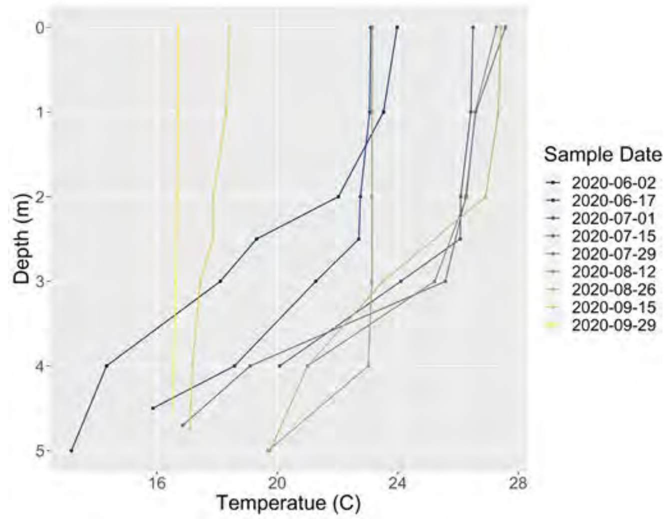


Figure H-30. Shows Temperature in Celsius throughout the water column in Lake Susan during 2020.

Exhibit I *2020 Lake and Creek Fact Sheets*

RILEY
PURGATORY
BLUFF CREEK
WATERSHED DISTRICT

2020

ANNUAL REPORT

TABLE OF CONTENTS

CONTACTS

The RPBCWD is governed by a five-person board of managers, advised by a Citizens Advisory Committee (CAC) and Technical Advisory Committee (TAC), and its daily operations are carried out by a team of employees and consultants. Contact information for each is listed below.

BOARD OF MANAGERS

The board of managers are listed by their position, and with their appointing county and term end-date noted. Four managers are appointed by the Hennepin County Commissioners and one by the Carver County Commissioners. They serve three-year terms. In 2020, managers Pedersen and Ward were reappointed.

President (right)
Dick Ward - Hennepin 7/31/23
8625 Endicott Trail
Eden Prairie, MN 55347
Home: (612) 759-9150
Email: dickward@rpbcwd.org

Vice President (middle)
Dorothy Pedersen – Hennepin 7/31/23
6155 Ridge Road
Shorewood, MN 55331
Home: (952) 933-2141
Email: dpedersen@rpbcwd.org

Treasurer (far right)
Jill Crafton - Hennepin 7/31/21
10351 Decatur Avenue South
Bloomington, MN 55438
Home: (952) 944-5583
Email: jcrafton@rpbcwd.org

Secretary (left)
David Ziegler - Hennepin 7/31/22
16729 Baywood Terr.
Eden Prairie, MN 55346
Home: (952) 905-1889
Email: dziegler@rpbcwd.org

Manager (far left)
Larry Koch – Carver 7/31/21
471 Bighorn Drive
Chanhassen, MN 55317
Home: (612) 210-5001
lkoch@rpbcwd.org

CITIZEN ADVISORY COMMITTEE

The CAC is a volunteer advisory board comprised of community members. As representatives of citizen interests, members support the district's board of managers in their mission to protect, manage, and restore water resources. They provide recommendations to aid decision making, communicate concerns from the public, and help educate the community. The board of managers annually appoints members to the CAC. The 2020 CAC members were:

Chair Lori Tritz Eden Prairie	*Member* Samir Penkar Eden Prairie	*Member* Kim Behrens Minnetonka	*Member* Pete Iverson Eden Prairie
Vice Chair Sharon McCotter Chanhassen	*Member* Scott Bryan Chanhassen	*Member* Vanessa Nordstrom Chanhassen	*Member* Terry Jorgenson Eden Prairie
Secretary Marilynn Torkelson Eden Prairie	*Member* Barry Hofer Eden Prairie	*Member* Joan Palmquist Eden Prairie	*Member* Heidi Groven Chanhassen
Member Jim Boettcher Chanhassen	*Member* Matt Lindon Eden Prairie	*Member* Jan Neville Eden Prairie	*Member* Michelle Frost Eden Prairie

To contact members of the CAC, email CAC@rpbcwd.org

TECHNICAL ADVISORY COMMITTEE

The technical advisory committee (TAC) includes representatives of cities, counties, state and other agencies. Agencies represented on the committee vary from the Metropolitan Council to the Minnesota Department of Natural Resources, and local cities. They provide technical advice on district projects and programs, including its regulatory program. The board of managers annually appoints members to the TAC. The 2020 TAC members were:

Name and position	*Organization*	*Address*
Steve Christopher *Board Conservationist* (651) 296-2633	Board of Water and Soil Resources	520 Lafayette Road North Saint Paul, MN 55155
Matt Lindon *Citizen Advisor*	Citizen Advisory Committee	9026 Belvedere Drive Eden Prairie, MN 55347
Paul Moline (952) 361-1825	Carver County	Government Center 600 East Fourth Street Chaska, MN 55318
Mike Wanous *Administrator* (952) 466-5230	Carver County Soil & Water Conservation District	11360 Highway 212, Suite 6, Cologne, MN 55322
Bryan Griudl/Steve Gurney *Water Resources Engineer* (952) 563-4867	City of Bloomington	1700 West 98th Street Bloomington, MN 55431
Renae Clark/ Jason Wedel *Water Resources Coordinator/ Public Works Director* (952) 227-1168/ (952) 227-1169	City of Chanhassen	7700 Market Boulevard P.O. Box 147 Chanhassen, MN 55317
Matt Clark *City Engineer* (952) 448-9200	City of Chaska	One City Hall Plaza Chaska, MN 55318
Robert Bean Jr. *Water Resources Engineer* (952) 448-8838 x2607	City of Deephaven (Bolton & Menk, Inc.)	2638 Shadow Lane, Suite 200 Chaska, MN 55318
Leslie Stovring/ Patrick Sejkora *Water Resources Coordinator/ Water Resource Engineer* (952) 949-8327	City of Eden Prairie	8080 Mitchell Road Eden Prairie, MN 55344
Leslie Yetka/Sarah Schwieger *Water Resources Engineering Coordinator* (952) 939-8233	City of Minnetonka	14600 Minnetonka Boulevard Minnetonka, MN 55343

Bill Alms (763) 231-4845	City of Shorewood (WSB Engineering)	701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416
Karen Gallas *Land & Water Unit* (612) 348-2027	Hennepin County	701 Fourth Ave S, Suite 700, Minneapolis, MN 55415
Linda Loomis *District Administrator* (763) 545-4659	Lower Minnesota River Watershed District	6677 Olson Memorial High- way Golden Valley, MN 55427
Joe Mulcahy *Water Resources*	Metropolitan Council	390 North Robert Street St. Paul, MN 55101
Lucas Youngsma/ Taylor Huinker *Area Hydrologist* (651) 259-5790	Minnesota Department of Natural Resources	1200 Warner Road St. Paul, MN 55106
Jordan Donatelle *Watershed Division* (651) 757-2837	Minnesota Pollution Con- trol Agency	520 Lafayette Rd. N. St. Paul, MN 55155
Melissa Jenny/Ryan Malterud *Senior Project Manager* (651)290-5286	US Army Corps of Engi- neer	St. Paul District Regulatory Branch 180 Fifth Street East, Suite 700 St. Paul, Minnesota 55101- 1678

Other staff members from agencies or local government units are welcome to join us at our meetings.

EMPLOYEES AND CONSULTANTS

The watershed district employs five full time staff and two temporary staff members.

Left to right: B Lauer, Josh Maxwell, Claire Bleser, Mat Nicklay, Terry Jeffery, Zach Dickhausen, Amy Bakkum, Maya Swope (former), not pictured Tim Toavs

Administrator
Claire Bleser, PhD
cbleser@rpbcwd.org
952-687-1348

Watershed Planning Manager
Terry Jeffery
tjeffery@rpbcwd.org
952-807-6885

Education and Outreach Coordinator
B Lauer
blauer@rpbcwd.org
952-607-6481

Permit and Soil Technician
Mat Nicklay
mnicklay@rpbcwd.org

Water Resource Coordinator
Josh Maxwell
jmaxwell@rpbcwd.org
952-607-6486

Water Resource Technician II
Zach Dickhausen
zdickhausen@rpbcwd.org
952-607-6036

Water Resources Technician
Tim Toavs
ttoavs@rpbcwd.org

Administrative Assistant
Amy Bakkum
abakkum@rpbcwd.org
952-607-6026

The District also contracts with consultants to provide engineering, legal, accounting, and auditing services.

District engineer
Scott Sobiech, BARR Engineering Co
4300 Market Pointe Drive, 200
Edina, MN 55435
Telephone: (952) 832-2755
Facsimile: (952) 832-2601
Email: ssobiech@barr.com

Legal
Louis Smith, Smith Partners PLLP
Old Republic Title Building
400 Second Avenue South, Suite 1200
Minneapolis, MN 55401
Telephone: (612) 344-1400
Facsimile: (612) 344-1550

Accounting
Nancy Martinson, Redpath and Company
4810 White Bear Parkway
White Bear Lake, MN 55110
Telephone: (651) 426-5844
Email: pmoeller@hlbtr.com

Auditing
Justin Nilson, Abdo, Eick and Meyers
5201 Eden Avenue Ste 250
Edina, MN 55436
Telephone: (952) 715-3011
Email: justin.nilson@aemcpas.com

INTRODUCTION

When it rains, water that falls on the landscape follows a natural path downstream to a waterbody or watercourse. This area of land is the body's watershed. Anything that happens within a watershed impacts the lakes, creeks, wetlands, or ponds it feeds. Watershed districts are special units of government with boundaries based on watersheds, and are charged with protecting and improving our communities' water resources.

The Riley-Purgatory-Bluff Creek Watershed District (District) was established on July 31, 1969, by the Minnesota Water Resources Board acting under the authority of the Minnesota Watershed Act of 1955. Watershed districts are led by district residents and water professionals who focus on managing local water resources. Districts partner with local communities to identify top priorities and plan, implement, and mange efforts, which protect and improve local water resources. Watershed districts educate and engage residents in protecting and improving local water resources, and the efforts they undertake benefit the quality and quantity of water in local, as well as downstream watersheds and communities.

Even though the District is mostly developed, prior to settlement, the District was covered predominantly by oak forest interrupted by wet prairie and marsh. Small areas of upland deciduous forest covered the far western part of the watershed, while river bottom forest occupied the south boundary of the watershed along the Minnesota River. Areas of maple-basswood forest and oak forest remain adjacent to the lower reaches of Bluff Creek and Riley Creek and are some of the District's unique features.

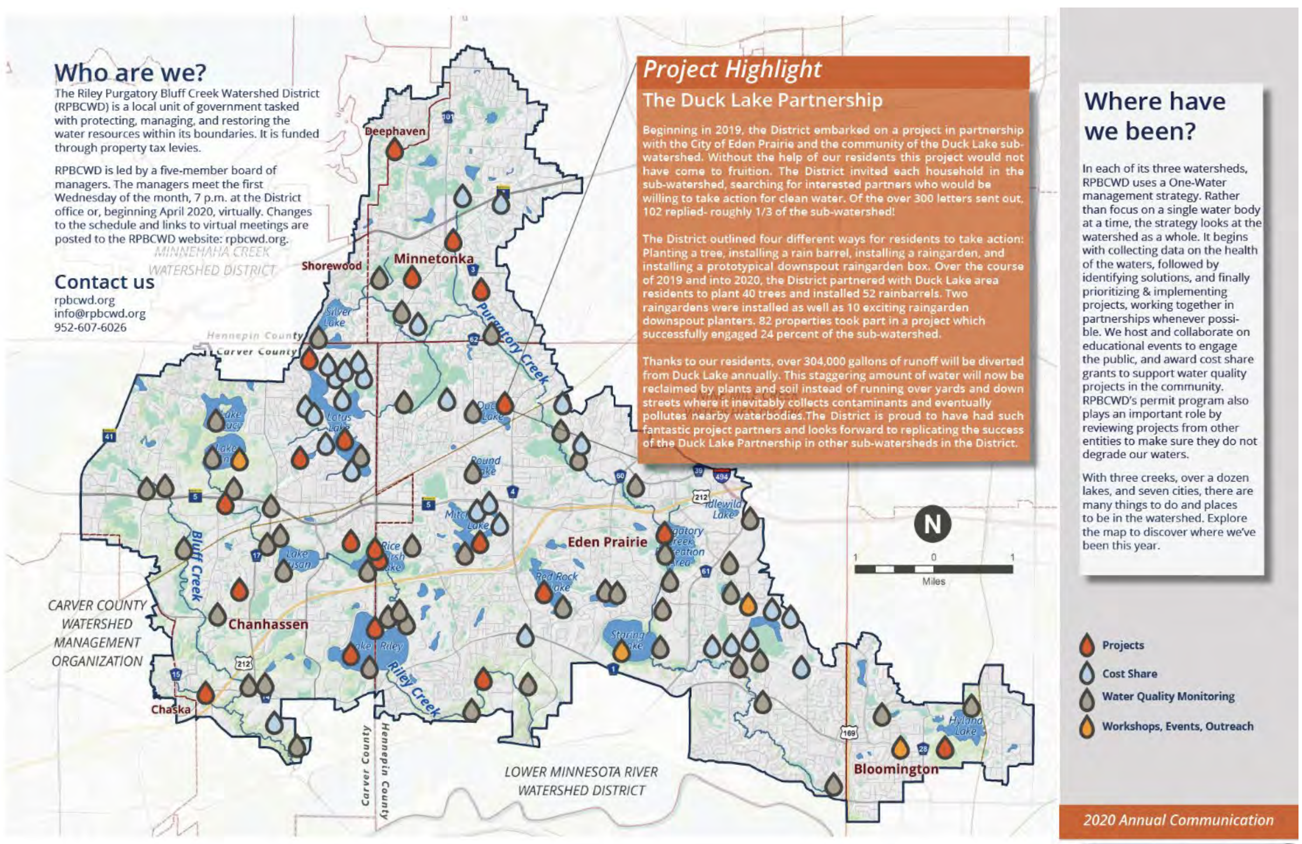
The following report is a summary of District activities in 2020.

2020 SUMMARY

Each year, the watershed district creates a work-plan with goals and objectives for its projects and programs. The plan is a guide for the year, and a way to track progress. This summary describes the district's accomplishments toward fulfilling its 2020 work-plan. The map below highlights the locations of projects, cost-share grants, data collection, and education and outreach activities.

The summary has nine sections:

Administration & Planning
Regulatory
Aquatic Invasive Species
Incentive Program
Data Collection
Education & Outreach
Bluff Creek Watershed
Purgatory Creek Watershed
Riley Creek Watershed



ADMINISTRATION & PLANNING

The District's administration and planning efforts are integral to achieve the goals set by the RPBCWD Plan and the Board of Managers. Effective execution of RPBCWD projects, programs, and other strategies requires sound fiscal management, adequate staff capacity and expertise, and planning efforts that are informed by past performance and adaptable to an evolving future.

ANNUAL COMMUNICATION

Every year, the District creates and distributes an annual communication. This publication contains general watershed district information, highlights from the year, and ways that the community can engage in the District's work.

This year, the annual communication was a 4-page document. The Annual Communication was sent out electronically to the District's mailing list. These were also sent to local leaders, placed at local gathering spaces like city centers and libraries, and handed out at community events.

A copy of the communication can be found at:
http://rpbcwd.org/library/annual-reports-and-communications/

BIENNIAL SOLICITATION OF INTEREST PROPOSALS

Under Minnesota Statutes §103B.227, subd 5, the District must issue a biennial solicitation for legal, technical, and other professional services. The District issued a formal solicitation for accounting, engineering, and legal service in 2019. The District retained Redpath and Company as its accountant and Smith Partners, PLLP as its legal counsel. BARR Engineering was selected as District Engineer. Included in our pool of consultant were Wenck Associates, Limnotech, SRF, HDR, ISG, Houghton Engineering Inc and HTPO. Next solicitation will be issued in 2021. Abdo, Eick and Meyers conducted the District's annual financial audit. The next solicitation of services will be in 2021.

EVALUATION OF CAPITAL IMPROVEMENT PROGRAM

As part of the District's development of the 2018 10-year management plan, the District has evaluated and prioritized all District capital improvement project. Out of 175 projects identified, the District with input from our partners was able to identify 34 projects to be implemented within the next 10 years beginning in 2018. One new project Lake Riley Alum was identified for the 2020 year in addition to completing projects that were active in 2019. Please find below the status of the projects:

	Anticipated Substantial Completion	Status of Project 2020 Year End
Bluff Creek		
Bluff Creek Tributary	2020	Substantially Complete Ongoing Vegetation Establishment Period
Chanhassen High School	Completed 2019	Collaborating with the ISD 112
Wetland Restoration at Pioneer	2022	Feasibility completed Design 20% Completion

Riley Creek		
Lake Riley - Alum Treatment	2020	Second Alum Dose Complete Monitoring
Lake Susan Water Quality Improvement Phase 2 *	Completed 2019	Completed
Rice Marsh Lake in-lake Phosphorus Load	Completed 2018	Monitoring
Rice Marsh Lake Water Quality Improvement Phase 1	2021	Feasibility Complete
Riley Creek Restoration (Reach E and D3)	2020	Substantially Complete Ongoing Vegetaiton Estab-lishment Period
Lake Riley & Rice Marsh Lake Subwatershed Assessment	2020	90% completion
Upper Riley Creek Stabilization	Delayed to 2022	Ecological Enhancement Plan 90% Complete Collaborating with the city of Chanhassen
Middle Riley Creek*	2021	Design 60% Complete
St. Hubert Water Quality Project*	2021	Design 60% Complete
Purgatory Creek		
Lotus Lake Kerber Pond Ravine	2020	Feasibility Complete
Purgatory Creek Rec Area-Berm/retention area - feasibil-ity/design	2021	Design 60% Complete Collaborating with the City of Eden Prairie
Lotus Lake in-lake Phosphorus Load Control	Completed 2018	Monitoring
Silver Lake Restoration	2021	Design 90% Complete
Scenic Heights	2020	Completed
Hyland Lake in-lake Phosphorus Load Control	2019	Completed
Mitchell Lake Subwatershed Assessment	2020	90% completion
Duck Lake Watershed Load	2021	Substantially Complete Ongoing Vegetation Estab-lishment Period

*As to date all projects identified in the 10-Year Plan are implemented or in the process to be im-plemented. St Hubert Catholic School Water Quality Project was added as part of the District's opportunity project. Middle Riley Creek Restoration was moved up from 2025 as the District's has a willing and financial partner (Bear Path Golf Course) ready to move on the restoration in 2021.

STATUS OF LOCAL PLAN ADOPTION AND IMPLEMENTATION

The District has received and approved all Local Surface Water Management Plans. The Cities of Eden Prairie, Minnetonka and Chanhassen all indicated their desire to assume regulatory responsibility of RPBCWD rules. Chanhassen did provide some language to update local controls for review but has not yet provided an adequate revision of local controls to demonstrate "equally protective." Therefore, RPBCWD will continue to administer their regulatory program in all municipalities.

FINANCIAL STATUS

The District's fund balance and financial status are included in the District's Annual Audit. The Annual Audit is included as Appendix D to this report. The District's audited financial report was prepared by Abdo, Eick and Meyers a certified public accounting firm. As required by Minnesota Rules §8410.0150, subp. 2, the Audited Financial Report includes classification and reporting of revenues and expenditures, a balance sheet, an analysis of changes in final balances, and all additional statements necessary for full financial disclosures. The 2020 Audited Financial Report may be found on our website at http://www.rpbcwd.org/library/annual-reports-andcommunications/.

2020 ANNUAL AUDIT

The District's annual audit can be found at the following website:
http://rpbcwd.org/library/annual-reports-and-communications/

2020 ANNUAL BUDGET

The District adopted its 2020 Annual Budget in September 2019. The table on the next page is the RPBCWD's budget at year end.

	2020 Budget	Fund Transfers	Revised 2020 Budget	Current Month	Year-to-Date	Year-to Date Percent of Budget
REVENUES						
Plan Implementation Levy	$3,703,000.00	-	$3,703,000.00	1,787,541.27	$3,703,882.09	100.02%
Market Value Credit	$0.00	-	$0.00	35.39	69.90	—
Permit	25,000.00	-	25,000.00	3,050.00	65,340.15	261.36%
Grant Income	346,719.00	-	346,719.00	-	75,950.00	21.91%
Investment Income	75,000.00	-	75,000.00	(21,371.63)	29,893.13	39.86%
Past Levies	3,699,097.00	-	3,699,097.00	-	-	0.00%
Miscellaneous Income	-	-	-	385.00	4,173.84	—
Reimbursements	-	-	-	3,200.00	122,404.05	—
Partner Funds	612,698.00	-	612,698.00	-	-	0.00%
TOTAL REVENUE	**$8,461,514.00**	-	**$8,461,514.00**	**$1,772,840.03**	**$4,001,713.16**	**47.29%**
EXPENDITURES						
Administration						
Accounting and Audit	$42,000.00	-	$42,000.00	$3,828.74	$49,707.09	118.35%
Advisory Committees	5,000.00	-	5,000.00	405.56	743.04	14.86%
Insurance and bonds	20,000.00	-	20,000.00	(7,064.00)	11,223.00	56.12%
Engineering Services	109,000.00	-	109,000.00	8,694.00	94,823.69	86.99%
Legal Services	84,000.00	-	84,000.00	8,634.62	102,911.95	122.51%
Manager Per Diem/Expense	20,000.00	-	20,000.00	3,160.19	19,480.80	97.40%
Dues and Publications	14,000.00	-	14,000.00	(1,316.67)	10,959.33	78.28%
Office Cost	150,000.00	-	150,000.00	2,341.95	152,360.21	101.57%
Permit Review and Inspection	135,000.00	-	135,000.00	7,715.84	165,084.41	122.28%
Permit and Grant Database	39,900.00	-	39,900.00	-	23,500.00	58.90%
Professional Services	-	-	-	-	14,234.50	—
Recording Services	17,000.00	-	17,000.00	-	10,614.48	62.44%
Staff Cost	600,000.00	-	600,000.00	37,820.61	497,946.27	82.99%
Subtotal	**$1,235,900.00**	-	**$1,235,900.00**	**$64,220.84**	**$1,153,588.77**	**93.34%**
Programs and Projects						
District Wide						
10-year Management Plan	$5,000.00	-	$5,000.00	$2,693.30	$16,589.56	331.79%
AIS Inspection and early response	85,000.00	-	85,000.00	50,106.00	52,912.46	62.25%
Cost-share	398,723.00	-	398,723.00	8,209.05	141,988.05	35.61%
Data Collection and Monitoring	192,000.00	-	192,000.00	16,444.70	203,130.01	105.80%
Community Resiliency	63,130.00	-	63,130.00	438.00	27,071.57	42.88%
Education and Outreach	123,000.00	-	123,000.00	7,790.80	106,166.14	86.31%
Plant Restoration - U of M	58,762.00	-	58,762.00	11,245.37	37,149.24	63.22%
Repair and Maintenance Fund *	267,730.00	-	267,730.00	-	55,189.58	20.61%
Wetland Management*	165,685.00	-	165,685.00	18,546.50	54,436.82	32.86%
Groundwater Conservation*	179,750.00	-	179,750.00	185.85	305.85	0.17%
Lake Vegetation Implementation	125,937.00	-	125,937.00	4,312.35	42,854.23	34.03%
Opportunity Project*	287,501.00	-	287,501.00	-	13,666.29	4.75%
Stormwater Ponds - U of M	79,985.00	-	79,985.00	-	32,820.96	41.03%
Hennepin County Chloride Initiative	114,830.00	-	114,830.00	-	21,859.46	19.04%
Lower Minnesota Chloride Cost-Share	217,209.00	-	217,209.00	-	-	0.00%
Subtotal	**$2,364,242.00**	-	**$2,364,242.00**	**$119,971.92**	**$806,140.22**	**34.10%**
Bluff Creek						
Bluff Creek Tributary*	$65,037.00	-	$65,037.00	$13,569.00	$69,785.91	107.30%
Wetland Restoration at Pioneer	308,674.00	-	308,674.00	4,399.30	93,389.14	30.25%
Subtotal	**$373,711.00**	-	373,711.00	**$17,968.30**	**$163,175.05**	**43.66%**
Riley Creek						
Lake Riley - Alum Treatment*	$305,000.00	-	$305,000.00	-	$257,114.74	84.30%
Lake Susan Water Quality Improvement - Phase 2	-	-	-	-	278.83	—
Rice Marsh Lake in-lake phosphorus load	60,568.00	-	60,568.00	624.58	14,931.84	24.65%
Rice Marsh Lake Water Quality Improvement Phase 1	300,000.00	-	300,000.00	-	15,852.50	5.28%
Riley Creek Restoration (Reach E and D3)	1,773,623.00	-	1,773,623.00	22,396.39	1,959,724.76	110.49%
Lake Riley & Rice Marsh Lake Subwatershed Assessment	29,961.00	-	29,961.00	-	33,851.77	112.99%
Upper Riley Creek Stabilization	1,100,000.00	(250,000.00)	850,000.00	4,658.50	47,974.52	5.64%
Middle Rice Creek	-	268,900.00	268,900.00	1,034.00	76,537.65	28.46%
Lake Ann Wetland Restoration	150,000.00	(100,000.00)	50,000.00	-	-	0.00%
St. Hubert Water Quality Project	-	100,000.00	100,000.00	1,810.98	59,291.79	59.29%
Subtotal	**$3,719,152.00**	**$18,900.00**	3,738,052.00	**$30,524.45**	**$2,465,558.40**	**65.96%**
Purgatory Creek						
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	$50,000.00	-	$50,000.00	-	$15,101.28	30.20%
Lotus Lake in-lake phosphorus load control	104,106.00	-	104,106.00	-	24,880.41	23.90%
Silver Lake Restoration - Feasibility Phase 1	255,931.00	-	255,931.00	6,410.50	48,723.36	19.04%
Scenic Heights	55,459.00	-	55,459.00	-	3,418.50	6.16%
Hyland Lake in-lake phosphorus load control	1,388.00	-	1,388.00	-	-	0.00%
Duck Lake watershed load	125,422.00	-	125,422.00	1,097.50	93,301.99	74.39%
Mitchell Lake Subwatershed Assessment	46,203.00	-	46,203.00	-	52,071.47	112.70%
Lotus Lake Kerber Pond	30,000.00	-	30,000.00	-	15,620.50	52.07%
Subtotal	**$668,509.00**	**$0.00**	$668,509.00	**$7,508.00**	**$253,117.51**	37.86%
Reserve	**$100,000.00**	**($18,900.00)**	81,100.00	-	-	0.00%
TOTAL EXPENDITURE	**$8,461,514.00**	**$0.00**	**$8,461,514.00**	**$240,193.51**	**$4,841,579.95**	**57.22%**
EXCESS REVENUES OVER (UNDER) EXPENDITURES	**$0.00**	**$0.00**	**$0.00**	**$1,532,646.52**	**($839,866.79)**	

*Denotes Multi-Year Project - See Table 2 for details

10-YEAR MANAGEMENT PLAN

In 2018, the District's 10-year management plan was adopted. This was preceded by a 2-year process that required a lot of data, analysis and prioritization, and input from stakeholders like city and state organizations, and the community. The plan guides all the District's actions, from monitoring to water quality projects, over a 10-year period. In 2020, the following amendments were made to the plan:

2021 WORKPLAN

Administration	
Accounting and Audit	Coordinate with Accountant for the development of financial reports. Coordinate with the Auditor. Continue to work with the Treasurer to maximize on fund investments.
Internal Policies	Work with Governance Manual and Personnel Committees to review bylaws and manuals as necessary. Work with Board to develop communication plan.
Advisory Committees	Engage with the Technical Advisory Committee on water conservation, chloride management and emerging topics. Engage with the Citizen Advisory Committee on water conservation, annual budget and emerging topics. Facilitate recruitment of CAC members for 2022.
Employee Management	Hire Outreach Manager, Education and Outreach Coordinator, Water Resources Technician, Administrator and interns as necessary. Conduct performance reviews. Coordinate with Payroll Officer. Maintain cohesive and efficient workplace environment. Update personnel handbook incorporating best management practices.
Municipal Interactions	Engage with Municipalities to raise awareness and increase buy into District led projects.
Office Management	Maintain office operational.
Insurance and Safety	Maintain District Insurance and Employee Safety Program.
Regulatory Program	Ensure permitting database is functioning. Engage Technical Advisory Committee and Citizen Advisory Committee on possible rule changes. Implement and review regulatory program.

District Wide	
Aquatic Invasive Species	Review AIS monitoring program. Develop and implement Rapid Response Plan as appropriate. Coordinate with LGUs and keep stakeholders aware of AIS management activities. Manage and maintain the aeration system on Rice Marsh Lake as per the Riley Chain of Lakes Carp Management Plan. Keep abreast in technology and research in AIS.
Cost-Share	Review applications and recommend implementation. Continue to increase stewardship base.
Data Collection	Continue Data Collection in permanent sites. Identify monitoring sites to assess future project sites. Review updates to the field CRAS analysis. Develop shoreline health index.
Community Resiliency	Coordinate maintenance of Hydrology and Hydraulics Model – and build higher resolution.
Education and Outreach	Implement Education & Outreach Plan, review at year end. Manage partnership activities with other organizations. Coordinate Public Engagement with District projects.
Groundwater Conservation	Manage Water Conservation Grant Program Engage with the Technical Advisory Committee to identify potential projects. Develop Water Conservation Education Program.
Lake Vegetation Management	Work with the University of Minnesota or Aquatic Plant Biologist, Cities of Chanhassen and Eden Prairie, lake association, and residents as well the Minnesota Department of Natural Resources on potential treatment. Implement herbicide treatment as needed. Secure DNR permits and contract with herbicide applicator. Lakes the District is monitoring for treatment include: Lake Susan, Lake Riley, Lotus Lake, Mitchell Lake, Red Rock Lake and Staring Lake. Develop Lotus Lake vegetation management plan. Work with Three Rivers Park District for Hyland Lake.
Opportunity Projects	Assess potential projects as they are presented to the District.
Total Maximum Daily Load	Continue working with Minnesota Pollution Control Agency on the Watershed Restoration and Protection Strategies (WRAPS).

	Engage the Technical Advisory Committee.
Repair and Maintenance Grant	Develop and formalize grant program.
University of Minnesota	Review and monitor progress on University of Minnesota grant. Support Dr. John Gulliver and Dr. Ray Newman research and coordinate with local partners. Keep the manager abreast to progress in the research. Identify next management steps.
Watershed Plan	Update as necessary.
Wetland Management	Identify potential restoration/rehabilitate wetlands and wetland requiring protection. Build on the work from 2020.
Bluff Creek One Water	
Chanhassen High School Re-use	Continue to monitor system.
Wetland Restoration and Flood Mitigation	Continue design for restoration. Begin restoration efforts.
Bluff Creek Tributary Restoration	Finalize restoration. Continue vegetation establishment efforts
Bluff Creek R5 Restoration	Conduct feasibility study. Develop cooperative agreement with the City of Chanhassen. Order Project. Begin design.
Riley Creek One Water	
Lake Riley Alum	Continue to monitor.
Lake Susan Improvement Phase 1	Continue to monitor spent lime treatment facility.
Lake Susan Improvement Phase 2	Continue to monitor system.
Lower Riley Creek Stabilization	Complete restoration and monitor. Continue vegetation establishment efforts.
Rice Marsh Lake Alum Treatment	Continue to monitor.
Rice Marsh Lake Watershed Load Project 1	Conduct Design and implement water quality project. Develop cooperative agreement with City of Chanhassen.
Lake Riley and Rice Marsh Lake subwatershed Assessment	Continue working on project. Complete reporting requirements.
Upper Riley Creek	Develop cooperative agreement with the City of Chanhassen.

	Order project. Start design.
Purgatory Creek One Watershed	
Duck Lake Raingarden Project	Complete Duck Lake Partnership. Continue vegetation establishment efforts.
Hyland Lake Internal Load control	Monitor Hyland Lake Alum application. Coordinate with Three Rivers Park District and the City of Bloomington.
Lotus Lake – Internal Load Control	Continue Monitoring.
Silver Lake Restoration	Implement restoration project.
Scenic Heights	Continue Monitoring.
Mitchell Lake Subwatershed	Continue working on project. Complete reporting requirements.
Lotus Lake- Kerber pond	Coordinate with the City of Chanhassen on project timeline.
Professional Services	
Presentations	Present District findings at local, regional and national conferences.
MAWD	Participate and Represent the District.
North American Lake Management Society	Participate and Represent the District.
Watershed Partners	Participate and Represent the District.
TC-WaMOdOG	Participate and Represent the District.

REGULATORY PROGRAM

Regulation plays an important role in preventing and mitigating water resource issues. The regulatory program sets standards that must be met by entities that develop or otherwise disturb land throughout the District.

The District's Board of Managers adopted the regulatory program on November 5 of 2014 and implementation of the regulatory program went into effect in January of 2015. In response to stakeholder comments, the District has modified the regulatory program in 2018 and 2019. The regulatory program assures that there are consistent protections for water resources from development pressures throughout the watershed.

Since the District reinstituted its regulatory program in 2015, 406 applications have been submitted to the District. This includes 73 for the 2020 calendar year and 21 thus far in 2021.

The program includes thirteen rules, A-N, (rule I was eliminated with the 2018 revisions) which can be viewed in detail on the District's website: rpbcwd.org/permits/.

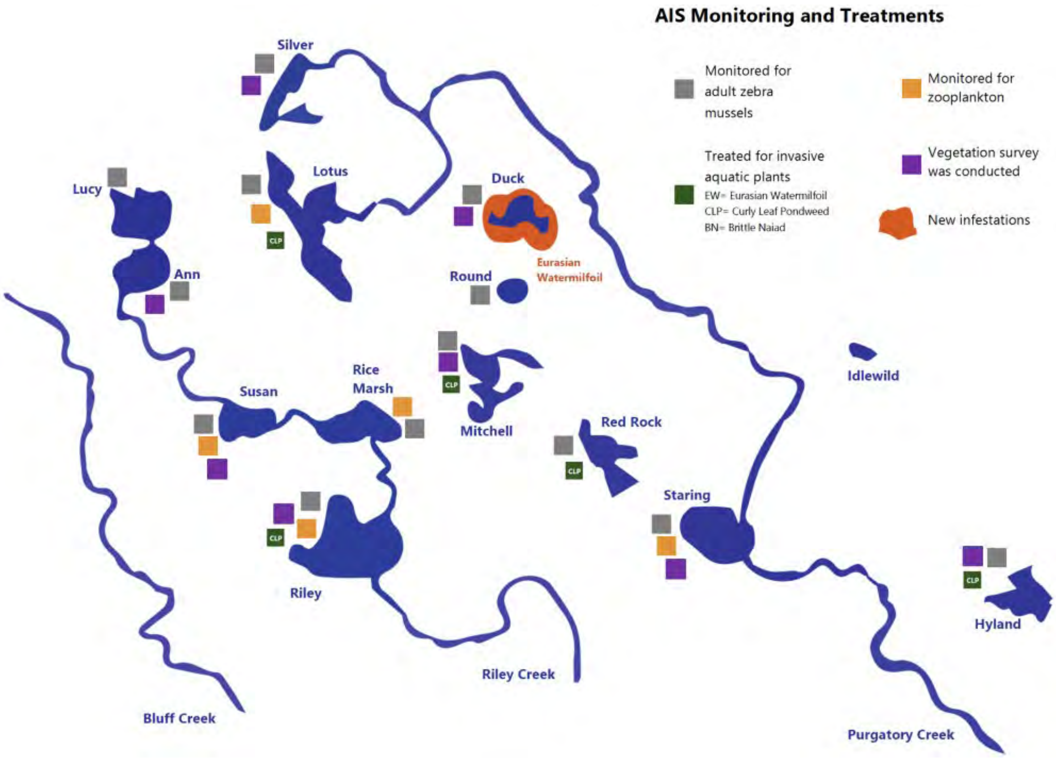
AQUATIC INVASIVE SPECIES

The District understands the importance of AIS monitoring, inspections, and preventions. The District also recognizes that it is more cost effective to prevent an infestation than to restore a resource after an AIS has established itself. The AIS program is to help support AIS inspections, AIS monitoring and rapid responses to a new infestation. More information on aquatic invasive species can be seen in the 2020 Water Resources Report http://rpbcwd.org/library/annual-reports-and-communications/.

AQUATIC INVASIVE SPECIES

Inspecting and implementing early response to protect and maintain the ecology of water resources.

The District understands the importance of AIS monitoring, inspections, and preventions. The District also recognizes that it is more cost effective to prevent an infestation than to restore a resource after an AIS has established itself. The AIS program is to help support AIS inspections in both the City of Chanhassen and Eden Prairie, AIS monitoring and rapid responses to a new infestation.



The District, with help of 28 volunteers, monitored our lakes for zebra mussels. Unfortunately, Zebra Mussels were detected in Lotus Lake. The District worked with the MN DNR and Carver County to determine the extent of spread and identify if rapid response could occur. However, the spread was too large. In 2019, a new infestation of brittle naiad was found in Lake Susan.

The District continues to manage carp in the Riley Creek Watershed through our aeration unit on Rice Marsh Lake. We are currently identifying a solution for Purgatory Creek.

Don't Forget!

Clean, Drain, Dry

Help keep our waters safe from these invaders by pulling the plug, wiping it clean and letting it dry.

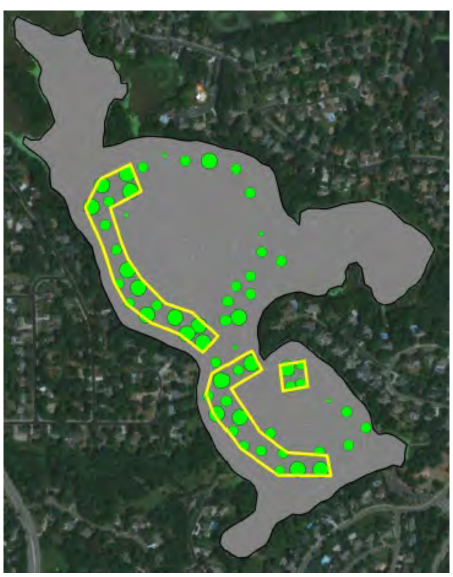
LAKE VEGETATION MANAGEMENT

In 2020, the District conducted herbicide treatments on aquatic invasive species on Lotus Lake, Mitchell Lake, Red Rock Lake, and Lake Riley.

Lake Vegetation Management

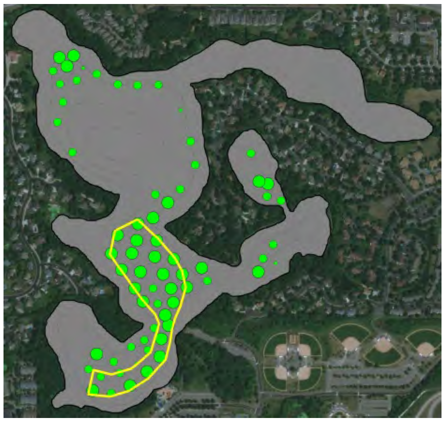
Lotus Lake

As part of a restoration effort post-carp removal and after the alum treatment, the District has been monitoring and targeting herbicide treatments for curlyleaf pondweed. In 2020, the District conducted one herbicide treatment on Lotus Lake totaling 12.8 acres for curlyleaf pondweed. The treatment is part of an effort to restore the native vegetation post carp removal and management. The District will continue to monitor and assess the need for herbicide treatments for this invasive species. The District will be surveying the aquatic plant community to determine if there is a need to treat in 2021.



Red Rock Lake

Red Rock Lake is classified as a shallow lake by the Minnesota Pollution Control Agency. In 2015, the District along with the city of Eden Prairie completed a public engagement process to develop a plant management plan for Red Rock Lake. Part of the plan identified the need for managing curlyleaf pondweed and as such the District has taken leadership in managing for this invasive plant. Thirteen acres were treated for curlyleaf pondweed. The District will be surveying the aquatic plant community to determine if there is a need to treat in 2021.



Mitchell Lake

Mitchell Lake is classified as a shallow lake by the Minnesota Pollution Control Agency. To promote the health of a native plant population the District has taken leadership in managing for curlyleaf pondweed. Thirteen acres were treated for curlyleaf pondweed. The District will be surveying the aquatic plant community to determine if there is a need to treat in 2021.

Lake Riley

As part of a restoration effort post-carp removal and after the alum treatment, the District has been monitoring and targeting herbicide treatments for curlyleaf pondweed. In 2020, the District conducted one herbicide treatment on Lake Riley totaling 16 acres for curlyleaf pondweed. The treatment is part of an effort to restore the native vegetation post carp removal and management. The District will continue to monitor and assess the need for herbicide treatment for this invasive species. The District will be surveying the aquatic plant community to determine if there is a need to treat in 2021.

CHLORIDE

The District is the fiscal agent and project lead for two chloride initiative: Hennepin County Chloride Initiative (HCCI) and the Lower Minnesota Chloride Grant. Both programs target chloride pollution. The first phase of the HCCI gathered input from applicators to understand barriers and needs from the industry.

In 2019, the HCCI used a mixed-methods approach, combining qualitative data gathered from stakeholder interviews and quantitative data gathered through an online survey. Interviews were conducted with 12 private salt applicators in and around Hennepin County. Quantitative data were collected through a self-administered online survey distributed initially to 369 winter maintenance professionals and distributed further using snowball sampling. Findings will be published in a white paper in 2020.

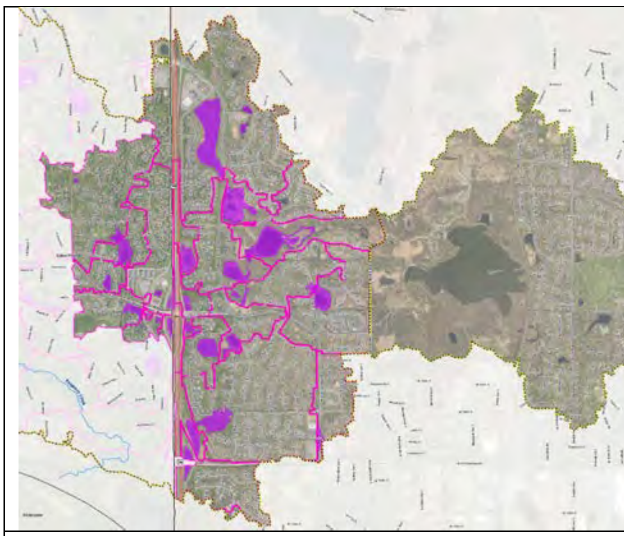
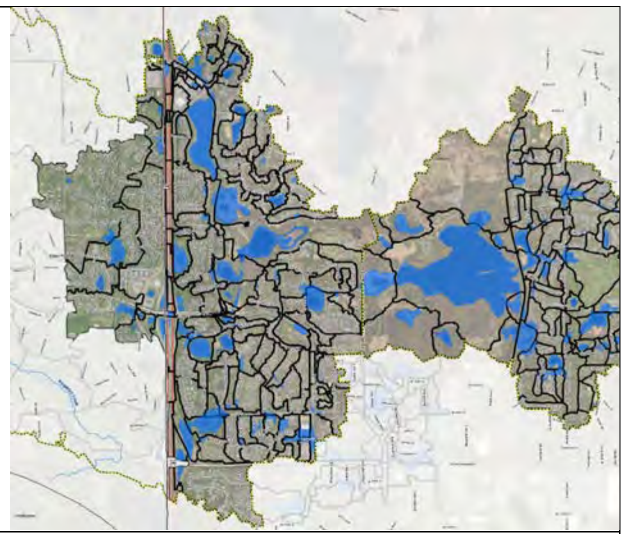
The Lower Minnesota Chloride Grant partners several times in 2019 to discuss next steps and findings from conferences and individuals engage with chloride. It was determined that the initiative would hold off in the launching the grant program until the HCCI had conducted their research identifying needs and barriers. It is anticipated that the grant will be launched in 2020.

CLEAN WATER LAND & LEGACY AMENDMENT

DISTRICT FLOODPLAINS

In 2016, the Districted completed a floodplain vulnerability evaluation to identify flood-risk areas along the creeks. One of the outcomes was identifying flood-risk areas and road crossings riparian to the creeks during a series of rainfall events. Following the evaluation, Technical Advisory Committee (TAC) members indicated it would be beneficial if the District's stormwater model included additional detail throughout the watershed and could be used to better identify flood-risk areas that are not adjacent to the creeks.

In 2019, the District partnered with the City of Bloomington to incorporate more detailed information in the Purgatory Creek and Hyland Lake subwatersheds and develop a framework to prioritize future evaluation of flood-risk reduction projects. Updates to the model included refining the watershed divides, previously developed to regional stormwater ponds, to neighborhood ponds as shown on the next page.

	
Purgatory Creek watershed - BEFORE • 15 subwatersheds • Average watershed size of 75 acres • 6 potentially flood-prone structures for Atlas 14 100-year event	Purgatory Creek watershed - AFTER • 128 subwatersheds • Average watershed size of 8 acres • 50 potentially-flood prone structures for Atlas 14 100-year event • 151 potentially-flood prone structures for Mid-21st Century 100-year event

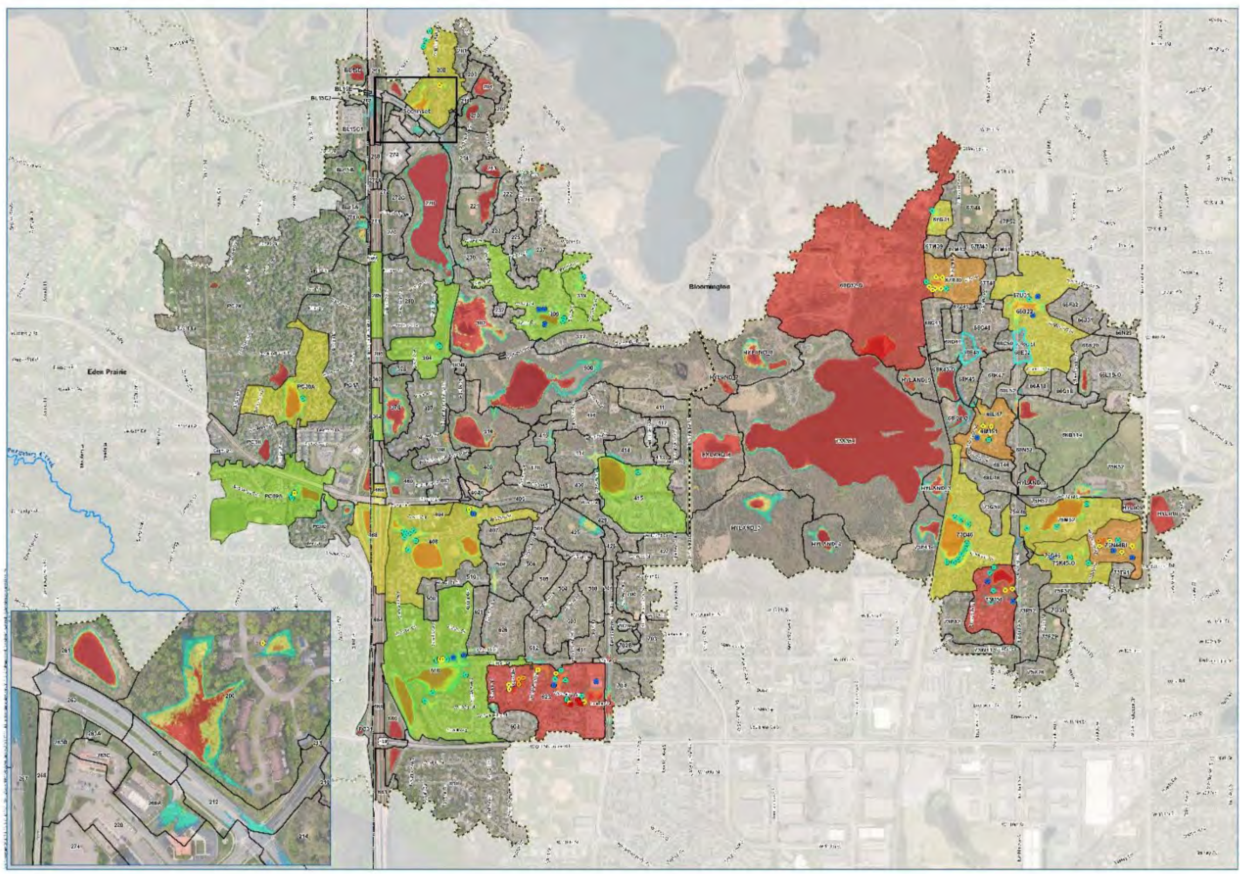
The District requested input from the TAC regarding how to prioritize evaluating flood-risk mitigation for the flood-prone areas. The TAC identified six categories that should be considered when prioritizing future evaluation.

1. Number of impacted structures
2. Frequency of flooding

3. Social Vulnerability Index
4. Project Efficiency
5. Multiple Benefits
6. Critical Infrastructure

The District and City developed a framework and scoring methodology to prioritize each area within Purgatory Creek. In 2021, the District will continue to apply the prioritization framework throughout the watershed by partnering with the City of Eden Prairie. The District will also continue to identify partnership opportunities with member cities to add detail to the stormwater model to identify flood-risk areas that are not adjacent to the creeks.

Prioritized areas in the Hyland Lake Subwatershed



GROUNDWATER CONSERVATION

In the spring of 2020, the District officially launched the Groundwater Conservation Program. After extensive stakeholder engagement, the District decided to approach groundwater conservation with a three-pronged approach. The district provided grant funding to five out of seven cities in our District to support the formation of water efficient technology rebate programs. The District in collaboration with Nine Mile Creek Watershed District is spearheading an education collaborative. The main goal of this group is to provide city partners with educational materials that can accompany rebate programs. The third component of the program is a smart water meter pilot program. This program has been launched in collaboration with the City of Minnetonka. All components have been successfully launched and are actively supporting the conservation of groundwater within the District and beyond.

GROUNDWATER CONSERVATION GRANTS FOR CITIES

EDUCATION COLLABORATIVE

SMART METER PILOT PROGRAM

INCENTIVE PROGRAM

The District has four incentive programs. The Watershed Stewardship Grant Program funds and supports community projects that protect, improve, and increase awareness to water resources. The Educator Mini-Grant provide funds to educators to engage their students in an activity relating to our water resources. The Action Grant program provides small grants for team projects and activities that help protect clean water. The repair and maintenance program helps cover some of the normal and routine maintenance cost.

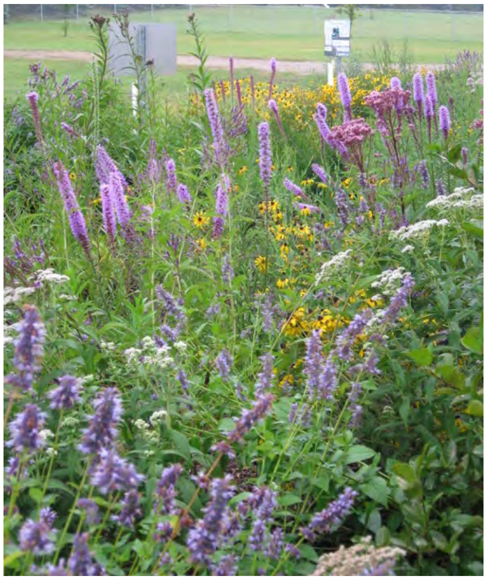
WATERSHED STEWARDSHIP GRANT PROGRAM

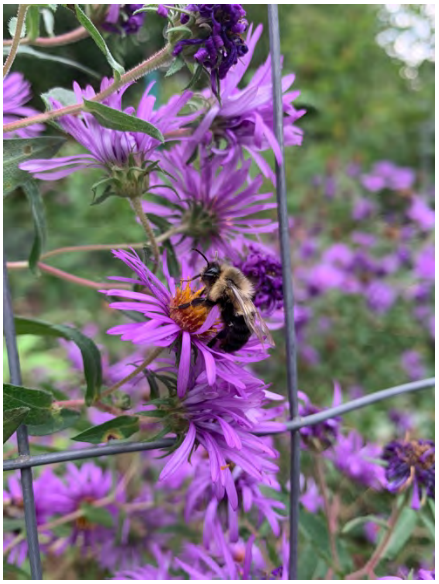
Funding and support for community projects that protect, improve, and increase awareness of water resources.

The Watershed Stewardship Grant Program, formerly known as The Cost-Share Program, provides technical assistance for projects that protects and conserve water resources. Ideal projects increase public awareness of the vulnerability of local water resources and solutions to improve them.

In 2020, the Watershed District's Watershed Stewardship Grant Program funded 30 projects, including habitat restorations, invasive species removals, shoreline buffers, infrastructure upgrades, and a rain garden. 720,000 square feet of native habitat was restored.

District staff adapted the program to ensure that staff, consultants, and residents remained safe from the Covid-19 pandemic while still getting potential grantees the technical advice they need. The Watershed Stewardship Grant Program has been growing exponentially since 2018, more than doubling the number of grants awarded each year.





EDUCATOR MINI-GRANTS

The District supports educators in their efforts to connect their students with our water resources. The Covid-19 Pandemic presented a set of unique difficulties for educators. As is such, the District only received three applications for mini-grants in 2020. The approved grants included requests to purchase a set of binoculars to observe wildlife around a lake behind a school. Other requests were for winter gear including gloves, jackets, snow pants and boots to enable students to comfortably explore outdoors during cold winter months. In total, an estimated 200 students benefited from grants awarded by the District.

ACTION GRANTS

Action grants are small, simple grants for projects to protect clean water. They are designed to help members of the community install fun, easy projects as a way to grow awareness, and the community in our watershed. The Covid 19 pandemic made it difficult for groups to work collaboratively on projects, a hallmark of the program. The District received no applications for action grants in 2020.

REPAIR & MAINTENANCE FUND

In 2020, no funds were requested by cities for the repair and maintenance of stormwater infrastructure.

DATA COLLECTION

The District understands that data collection and decisions based on sound science are critical to the success of this Plan. Because of the dynamic and ever-changing nature of the water resources, the District operates an extensive lake and stream management program. This program is intended to improve the District's understanding and inform sound decision making to protect and enhance the surface and groundwater resources in the District. Generally, the program includes:

- Data Collection (monitoring)
- Analysis (e.g., research, studies, etc.)

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) had a successful water quality sampling season in 2020, completing a full year of sample collection and data analysis. This effort was made possible through multiple partnerships with municipalities and organizations based within the watershed. The results from the 2020 sampling effort are presented in this report.

2020 LAKE SUMMARY

During the 2020 monitoring season, 13 lakes and two high value wetlands were monitored throughout the District. Regular water quality lake sampling was conducted on each lake approximately every two weeks throughout the growing season (June-September). In addition to regular lake sampling, the District monitored water levels on each lake, assessed carp populations on seven waterbodies, and collected zooplankton and phytoplankton populations in five lakes. Staff were able to remove 201 common carp from the Purgatory Creek Recreation Area during the spring spawning run in attempt to reduce overall carp numbers in the system. The District also monitored public access points and analyzed water samples for the presence of zebra mussels in these 14 waterbodies. Although Lotus Lake was listed for zebra mussels in 2018, only eDNA tested positive and no adults or veligers were found. A second application of alum was applied to Lake Riley in 2020. Herbicide treatments for curly leaf pondweed were carried out on Lotus Lake, Mitchell Lake, Riley Lake, Hyland Lake, and Red Rock for curly leaf pondweed.

In 2020, Lake Ann, Lake Lucy, Lake Riley, Rice Marsh Lake, Hyland Lake, Round Lake, and Duck Lake met all three MPCA standards. The Riley Chain of Lakes showed improvement since 2019 with Lake Lucy meeting all standards in 2020. Lake Riley had the highest recorded summertime secchi disk average (4.64 m) since data collection began in the 1970s. Rice Marsh Lake continued to meet all standards following the alum treatment which occurred in 2018. Lake Susan did not meet the TP and Chl-a standard. Silver Lake of the Purgatory Chain of Lakes met all standards in 2018, but similarly to 2019, did not meet and increased in both Chl-a and TP levels in 2020. Lotus, Mitchell, and Red Rock Lakes had reduced water quality in 2020, failing to meet all three water quality standards. Hyland Lake had excellent water quality in 2020 which can be attributed to the alum treatment in 2019. Idlewild and McCoy high value wetlands did not meet the TP standard and Staring Lake improved slightly by meeting the TP standard in 2020. All lakes met the proposed nitrate/nitrite water quality standard and chloride standard.

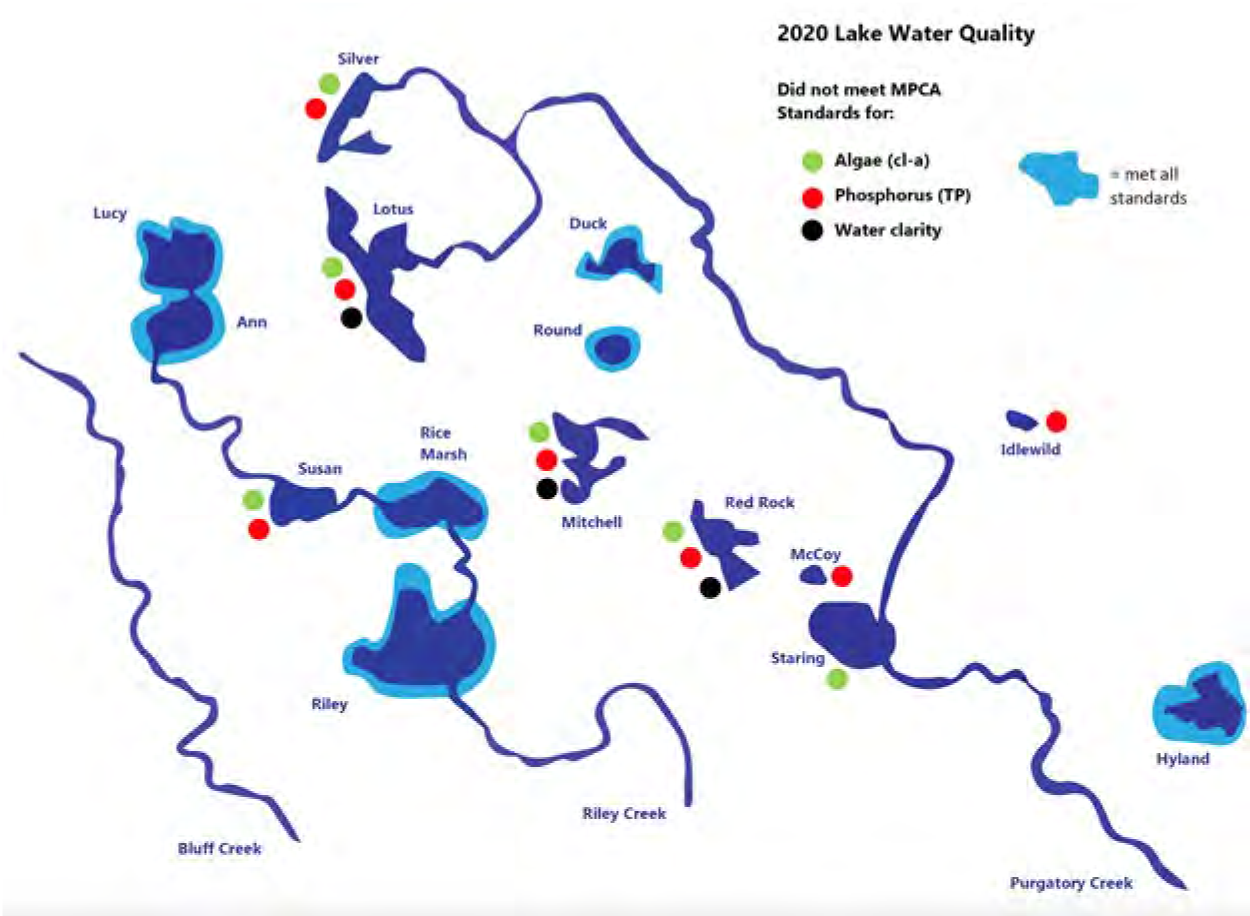


Figure *i* ***2020 Lake Water Quality***

Summary of the lake water quality data collected in 2020 by the Riley Purgatory Bluff Creek Watershed District as compared to the Minnesota Pollution Control Agency Water Quality Standards. Chlorophyll-a (green), Total Phosphorus (orange), and Secchi Disk depth (black) during the growing season (June-September) for both 'deep' lakes or lakes >15 ft deep and < 80% littoral area (Lake Ann, Lotus Lake, Lake Riley, and Round Lake), and 'shallow' lakes or lakes <15 ft deep and >80% littoral area (Duck Lake, Hyland Lake, Lake Idlewild, Lake Lucy, Lake McCoy, Mitchell Lake, Red Rock Lake, Rice Marsh Lake, Staring Lake, Lake Susan, and Silver Lake). The corresponding dots next to each lake indicate which water quality standard was not met and lakes surrounded by blue met all water quality standards.

2020 STREAM SUMMARY

In 2020, the District and its partners collected water quality samples and performed data analysis on 23 different sampling sites along Riley Creek (six sites), Bluff Creek (six sites), and Purgatory Creek (twelve sites). During the 2020 creek monitoring season (April-September) water chemistry and turbidity were regularly measured at the 18-regular water quality creek monitoring sites every two weeks. Water samples were collected to assess nutrient (TP, OP, CL, and Chl-a) and total suspended sediment (TSS) concentrations. Creek flow was calculated from velocity measurements taken at consistent creek cross sections at each water quality monitoring location. Staff deployed automated sampling units on upper Bluff to assess pollutant loads and the potential for restoration projects. The District collected macroinvertebrates at all five Bluff Creek regular water quality monitoring sites in 2020. The lower sections of Purgatory Creek and uppermost reach of Bluff Creek were assessed and updated using the Creek Restoration Action Strategy (CRAS) evaluation. Overall, most stream sections scored by the CRAS were similar to years past with the exception of Reach 2 of Purgatory Creek which reduced water quality trends negatively impacted scores.

Regular creek sampling sites R5 and R3 met all MPCA water quality standards assessed in 2020 (Figure ii), down from 4 sites in 2019 (P3, P4, P5 and R3). The overall number of water quality standard impairments increased from 2019 to 2020; Bluff had ten (previously nine), Riley had six (previously seven), and Purgatory had eleven (previously seven). Once again, TP was the water quality standard causing the most impairments in 2020 with nine of the 18 sites not meeting the standard (summer average <0.1 mg/L). TSS impairments decreased from seven impairments in 2019 to six 2020. Bluff Creek remained the stream with the most impaired water quality for its size, as previously seen between 2015-2019. The impairments included TP across all sites, as well as TSS across three sites, DO at B5, and a fish impairment at B1. All sites met the pH water quality limits in 2020 (< 9 su and >6 su). Unlike in 2015-2018, P2 met the Chl-a standard (summer average <18 ug/L) and no other site exceeded the standard. Macroinvertebrate impairments by the MPCA included lower Purgatory and Riley Creek.

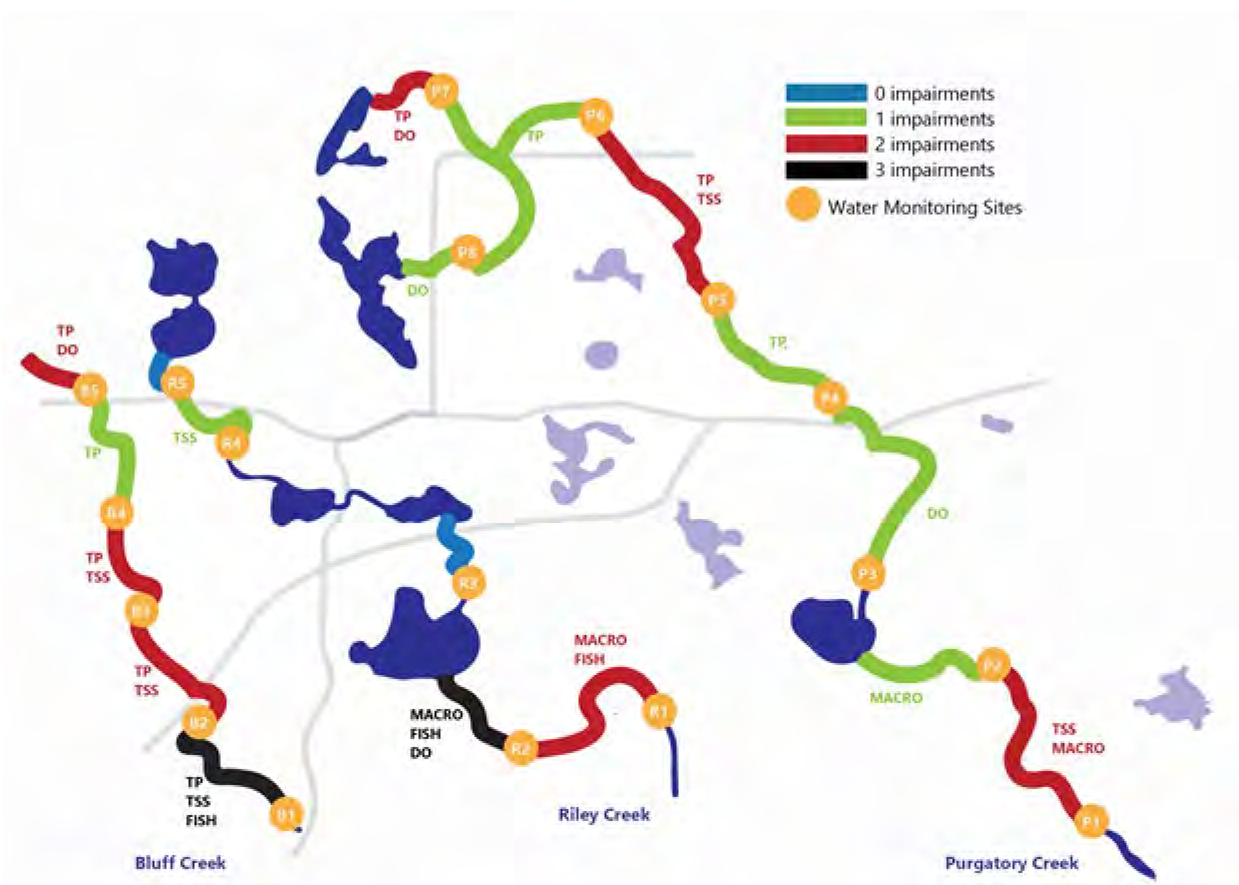


Figure ii 2020 Stream Water Quality

Summary of stream water quality data collected on Bluff Creek, Riley Creek, and Purgatory Creek in 2020 by the Riley Purgatory Bluff Creek Watershed District as compared to the Minnesota Pollution Control Agency (MPCA) Water Quality Standards. A total of 18 water monitoring locations (orange circles) were sampled and information *gathered from the individual sites were applied upstream to the next monitoring location. The summer season (April-September) eutrophication and total suspended solids water quality standards used in this assessment included: Dissolved Oxygen (DO) daily minimum > 4 mg/L, average Total Phosphorus (TP) < 0.1 mg/L, Total Suspended Solids (TSS) < 10% exceedance of 30 mg/L limit, average Chlorophyll-a (CHLA) <18 ug/L, average pH < 9 su and > 6 su. The corresponding labels next to each stream section indicate which water quality standard were not met.*

The full text of the report can be found at:
http://rpbcwd.org/library/annual-reports-and-communications/

EDUCATION & OUTREACH

Community-scale problems require community-scale actions, and water quality is an issue that affects and belongs to all. The District's education and outreach (E&O) programs aim to fulfill its clean water objectives by fostering a community of stewards.

The goal of these programs is to improve water quality by leveraging the power of an engaged community to effect meaningful change. To accomplish this, the E&O programs strive to increase awareness, grow stewardship, and build capacity to achieve a shared goal of protecting clean water.

In 2020, the District continued implementation of the E&O Plan, though the program was heavily impacted by the Covid-19 pandemic. District staff worked diligently to move events and gatherings to an online space. The following pages describe the District's E&O programs and major activities in 2020.

VOLUNTEER PROGRAM

Fostering stewardship and growing capacity through fun, impactful volunteer opportunities.

The watershed district's volunteer program supports its mission to protect, manage, and restore waters resources by engaging community members in stewardship opportunities. The district strives to create meaningful experiences for volunteers, while growing its own capacity to protect clean water. The 2020 program encountered unique difficulties presented by the Covid-19 pandemic. In order to keep staff and volunteers safe, in person events were cancelled after March 2020. included three ongoing programs – Adopt a Dock, Service Learners, and a tree giveaway.

Adopt a Dock

Adopt a Dock is a citizen science initiative. Lakeshore residents to monitor for aquatic invasive species.

Tree Giveaway

Staff built a gravel bed tree nursery at our office and helped over 100 trees grow deep roots over the summer. This increases the odds of tree success once they are planted in the ground.

Service Learners

Service learners are college students or other community members who gain first-hand experience at the district through volunteering.

In 2020, the watershed district's volunteer program engaged community members through three different opportunities and four events:

112
Trees given away

34
AIS plates distributed

LOCAL LEADERS PROGRAM

Engaging and supporting appointed, elected, and informal leaders in the shared work of protecting clean water.

This effort offers educational programming, provides resources, and creates effective tools to assist and enable community leaders to make informed decisions regarding water resources. It may include activities such as participating in the University of Minnesota Extension's NEMO program (Nonpoint source Education For Municipal Officials), presentations to city councils and commissions, and watershed tours or workshops.

Due to the Covid-19 pandemic, the District was not able to engage with local leaders in 2020.

YOUTH OUTREACH PROGRAM

Creating meaningful childhood experiences connected to water resources to inspire the next generation of water stewards.

The youth outreach program seeks to create meaningful childhood experiences connected to water resources and increase understanding and stewardship of water resources in children and their families. In 2020, the ways in which the District engages youth had to change with the emergence of the Covid-19 pandemic. Although staff were able to carry out activities such as school visits and community fairs in the first coupe months of the year, after March, engagement moved online. Staff worked to develop tools for teachers to use in virtual teaching as well as activities for children to engage with while staying safe at home.

Educator Mini-Grants

The mini-grant program offers funding to educators for projects that or activities related to water resources. Three projects were approved for funding in 2020 including proposals for binoculars and winter gear.

Online Engagement

As school moved online, The District shifted our attention to supporting educators in their efforts to teach about the outdoors and water resources using online tools. We also promoted the online version of Junior Watershed Explorer Activity Book.

Community Events

The district seeks out and responds to requests to present at youth and family events. In 2020 staff attended multiple events such as a climate action fair and the Lake Ann Feb Fest.

In 2020, the watershed district's youth outreach program engaged children and their families by:

3 mini-grant projects

217 directly engaged

6 activities & events

CONTINUING EDUCATION

Educational opportunities for community members to grow their water resource and best practices knowledge.

The District offers continuing education which may take many forms. In 2020, the District adapted the Continuing Education program to function within the midst of a pandemic. Though some events were held in person in the first months of the year, we shifted towards the use of webinars and online trainings.

Webinars

The District offers trainings and other opportunities for residents interested in creating healthier landscapes. In 2020, the District held a number of online webinars ranging in topic from lakeshore management, soil health, ecosystem services and more!

Turf & Winter Maintenance Training

Through District funding and through a Minnesota Pollution Control Agency Grant, the District offers certification trainings for turfgrass and winter maintenance professionals. In 2020, the District hosted two smart salting workshops for winter maintenance professionals and one smart salting workshops for property managers.

MN Landscape Association

Staff set up a booth in partnership with the Hennepin County Chloride Initiative to directly engage with winter snow and ice professionals. Data collected from a survey hosted at the booth was used to inform the Collaborative's net steps.

In 2020, the watershed district's continuing education program served the community through:

237 participants

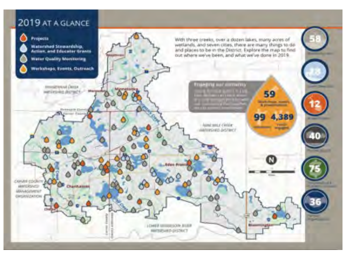
11 Trainings & events

COMMUNICATIONS PROGRAM

Engaging the public through diverse communication methods from event tabling to social media and publications.

The communication program encompasses both passive and active communications. Active communications include direct connections between district staff and representatives, and the community. Passive communications include press releases and advertisements with both traditional and social media, as well as print materials and interpretive signage. The district also continuously maintains and updates a website (rpbcwd.org), which hosts a variety of resources including permit and grant information, a calendar of events, news releases, board meeting information, ways to get involved, and more. The Communications program provided our most valuable channel for engagement in the midst of the Covid-19 pandemic.

Annual Communication



Each year, the district prepares and distributes a communication about the work it does in the community.

Fact sheets

Water quality fact sheets tell the story of each lake and creek in the watershed. They were distributed in print and online.

Media

Electronic newsletters and press releases are written throughout the year. Social media platforms are also utilized. In 2020, staff published 94 social media posts.

Postcards and Direct Mailings

The District utilizes direct mailings and postcards to provide residents with information and updates regarding projects near them. In 2020 staff sent over 600 postcards.

In 2020, the watershed district's communications program engaged the community and raised awareness through:

94
Social Media Posts

600+
Postcards sent

Green Corps update

The Minnesota GreenCorps program is a statewide initiative, coordinated by the Minnesota Pollution Control Agency, to preserve and protect Minnesota's environment while training a new generation of environmental professionals. The program places AmeriCorps members with host organizations around the state to assist communities and local governments in addressing a variety of statewide needs including reducing water runoff and improving water quality. Members serve for eleven months and work towards specific goals with the help of their host site supervisor.

In 2019-2020, the watershed district hosted its first GreenCorps member, Amy Bakkum. Member Bakkum's workplan focused on stormwater best management practices and finding ways to engage the community around them. A community fair was planned for Spring 2020, where residents could sign up to "adopt" storm drains, learn about best management practices, and take-home native grasses and flowers to establish in their own yards. Due to the Covid-19 pandemic, this in-person event was cancelled, and the project adapted.

After consulting with partners, a design was created for an on-site gravel bed tree nursery. Utilizing the limited space surrounding the District office, Member Bakkum installed 15 aluminum tanks which housed 125 tree saplings through the spring and summer of 2020. Residents of the District were sent direct mailers encouraging them to "adopt" a tree sapling to take home in the fall after the roots could grow strong. Along with over 100 tree saplings, District residents were also sent home with native grass and flower seeds. Amid a global pandemic, the District found a way to safely put down roots and engage the community around stormwater best management practices.

This project, dubbed the Silver Lake Water Quality Improvement Project for its focus on that region of the District, has permanently increased the District's capacity for residential stormwater management. Trees will be housed again in 2021 with plans for expansion.

OPPORTUNITY PROJECTS

PRESERVE ASSOCIATION OPPORTUNITY PROJECT

In the fall of 2019, The Preserve Association approached the watershed district to discuss water quality projects on their campus. The Preserve Association represents 1,693 units and 187 acres of common property. Preserve Association Staff and District Staff have worked together to prioritize projects and have identified next steps. Implementation of high priority projects is projected for summer 2020.

ST. HUBERT OPPORTUNITY PROJECT

In 2018, District staff were contacted by St. Hubert Catholic School in Chanhassen about the possibility of partnering on a rain garden at the school. Initial consultation identified the potential for multiple best management practices on the site. With the adoption of the District's 10 Year Plan (the Plan) in July of 2018, the Opportunity Projects program was created specifically to address previously unidentified projects and partnerships. A stormwater retrofit of the school campus was identified as a potential project for this program. The District and school stakeholders worked together to identify potential Best Management Practices that would meet District goals.

In April 2019, SRF published a memo (St. Hubert Catholic School Opportunity Projects, April 2019) which identified projects that would reduce runoff volume and rate (Goal WQuan2), improve water quality (WQual 1), ecological biodiversity (WQual 3), educational opportunities and aesthetics of the property. Four project areas with multiple practices were identified.

In Fall of 2019, the District adopted a plan amendment to incorporate the St Hubert Opportunity Project in its 10-Year Plan. The project is anticipated to be in Design phase in 2020 and implementation in 2021.

STORMWATER PONDS: UNIVERSITY OF MINNESOTA

Stormwater ponds are the most commonly used method for controlling pollutants, such as phosphorus, which are found in stormwater runoff. Phosphorus pollution is the primary component influencing eutrophication in freshwater resources. Excess phosphorus can lead to increased algal growth, turbid water, and loss of biodiversity and desirable aquatic habitat. Urban watersheds, like the Riley-Purgatory-Bluff Creek Watershed, typically export 5 to 20 times the amount of phosphorus than less developed watersheds due to an increase in the amount of impervious cover (streets, sidewalks, and driveways) and surface runoff for a watershed (Athayde et al. 1983, Dennis 1985). Potential sources of phosphorus pollution in the Riley Purgatory Bluff Creek Watershed District include stormwater runoff, sediment erosion, grass clippings, lawn fertilizer, and pet waste.

In 2018, the District partnered with the University of Minnesota and the Cities of Bloomington, Chanhassen, Eden Prairie, Minnetonka and Shorewood to further investigate how stormwater ponds were functioning through intensive monitoring and soil analysis. Three ponds were selected, and iron filings were applied in the winter 2020 and 2021. The District will continue to monitor in 2021 to test the efficacy of the treatment and increase our understanding of stormwater ponds to improve their function.

CITY OF MINNETONKA

EDEN PRAIRIE LIVE • WORK • DREAM

CITY OF SHOREWOOD

CITY OF CHANHASSEN

CITY OF BLOOMINGTON MINNESOTA

WETLANDS

That portion of the RPBCWD that lies within Carver County has been assessed. A total of 282 wetlands were within the assessment area of which 24 wetlands are unassigned a management classification. Five of the unassigned wetlands were not assessed as they were inaccessible. The remaining 19 are either being compared to MNRAMs performed by others or have discrepancies in the data that are being evaluated. The District will evaluate the 24 wetlands and classify them in 2020.

No exceptional wetlands were identified although a few wetlands were identified as being sensitive communities, such as wet meadows, but the species composition had converted to primarily reed canary grass or other invasive species and did not have the diversity of species necessary to be considered exceptional. This information will be used as the District evaluate wetlands that have the potential to be rehabilitated as well as those with the potential for restoration.

Wetlands that rated at low quality were associated with agricultural land use or were surrounded by high intensity land use. These wetlands exhibited very low species diversity and were dominated by invasive species. These wetlands all had high inputs of untreated surface water runoff entering them and often exhibited a flow through condition with a channel connecting the inlet to the outlet.

CLASSIFICATION	COU	PERCE
UNASSIGNED	24	9%
EXCEPTIONAL	0	0%
HIGH	43	15%
MEDIUM	151	54%
LOW	64	23%
	282	100%

Low quality wetlands also tended to rate lower as they were not part of a larger assemblage of different habitats. Habitat fragmentation seems to be a factor in the degradation of habitat but still needs further exploration.

Of the 151 medium wetlands, thirteen areas were prior converted wetlands. These wetlands were excavated, or had stormwater runoff directly routed to them to be used as a stormwater treatment area prior to the 1991 MN Wetland Conservation Act or were mitigated for under the same that now serve as stormwater detention ponds.

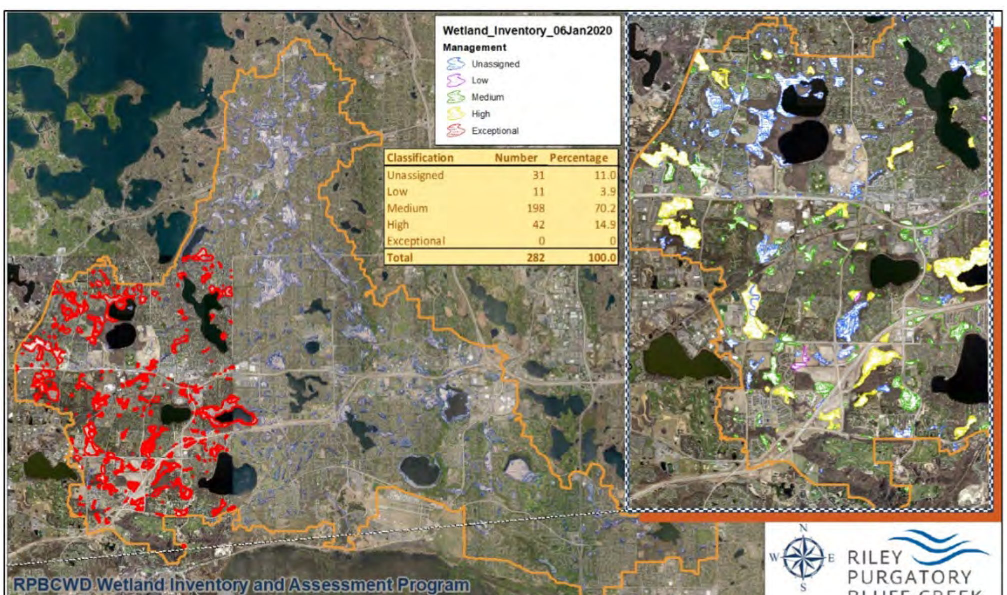


Figure 2: Currently Assessed Wetlands

BLUFF CREEK WATERSHED

The District is actively engaged in three projects in the Bluff Creek Watershed:

- Bluff Creek Tributary Restoration Project
- Chanhassen High School Reuse Project
- Wetland at Pioneer Trail

BLUFF CREEK TRIBUTARY RESTORATION PROJECT

In 2017, the District conducted a feasibility study and began design of the Bluff Creek Tributary Restoration Project. The site is located between Audubon Rd and Highway 212. The reach is approximately 1400ft. The vision for this project is to provide an ecologically diverse stream reach that significantly reduces streambank erosion and provides diverse habitat layers. Presently, the upper part of the reach has significant erosion. It is not as severe in the lower half of the reach, but the channel is incised and disconnected from the floodplain throughout. The project will provide greater stream depth variability, more channel bed substructure types, and varied channel velocities. The project will reduce erosion and improve water quality while also improving natural stream habitat for aquatic organisms. Providing better floodplain connectivity for Bluff Creek also enhances surrounding riparian habitat. By establishing a stable stream corridor, the project will also address the Minnesota Pollution Control Agency's (MPCA's) identified turbidity impairment within this reach of Bluff Creek. The project was delayed but started Fall of 2019. Completion of stabilization occurred in 2020. During 2021 vegetation establishment activities will continue.

CHANHASSEN HIGH SCHOOL

The District partnership with the city of Chanhassen and Eastern Carver County School District designed a stormwater reuse project for irrigation at Chanhassen High School in 2017. The goal of implementing the project was to reduce groundwater consumption, reduce discharge rates, volumes and pollutants to Bluff Creek (an MPCA impaired water), and increase the public awareness of stormwater reuse and groundwater conservation.

According to irrigation meter records, the school campus purchases an average of 3.8 million gallons (MG) of groundwater annually from the city of Chanhassen's domestic water supply to irrigate about 11 acres of green space (athletic fields and areas around the school building). This is equivalent to six Olympic-size swimming pools being filled annually or an average weekly irrigation rate at Chanhassen High School is 0.57 inches per week between May through September.

Through a partnership between the RPBCWD, city of Chanhassen and Independent School District 112, a stormwater reuse system could effectively irrigate nearly 75% of the green space on the high school campus by using 16% of the annual watershed runoff. The reuse system would meet 51% of the total school campus annual irrigation demand by using stormwater from a stormwater pond on the school campus to irrigate the north side of the high school campus (8.2 acres) through the irrigation system. The stormwater irrigation system will decrease the demand for groundwater at the high school athletic fields and grounds, with the potential for improvements and expansion in the future to meet additional demands.

The system was completed in 2019. The RPBCWD continued working with ISD 112 to refine the operations and install remote telemetry.

CITY OF CHANHASSEN

METROPOLITAN COUNCIL

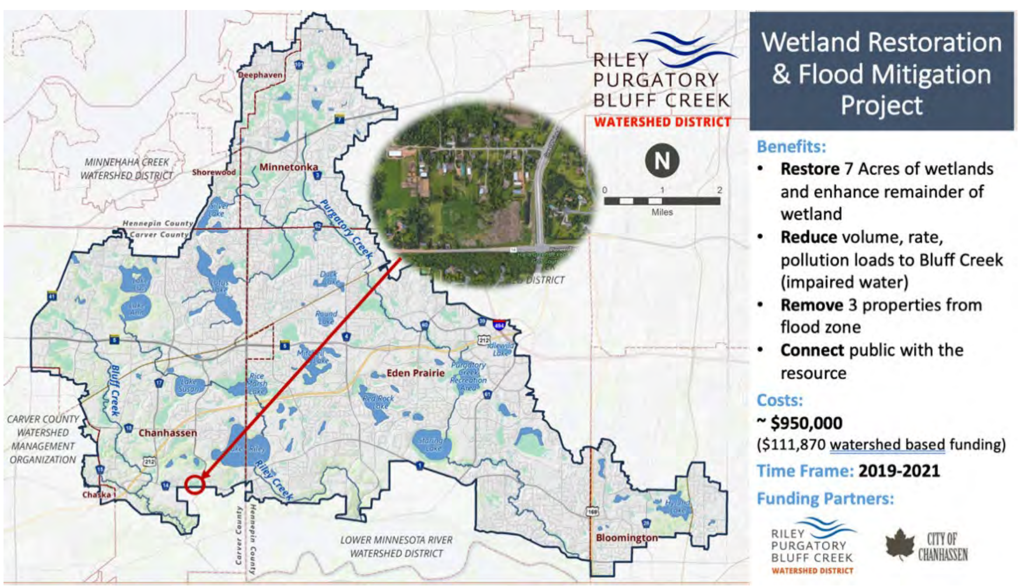
Eastern Carver County Schools
Exceptional, personalized learning

WETLAND RESTORATION AT PIONEER TRAIL AND T.H. 101

In 2019, the District was awarded a targeted watershed grant to:

- Restore 7 acres of wetland
- Reduce volume, rate, pollution loads to Bluff Creek
- Remove three flood prone structures
- Connect the public with the resource

All three parcels were purchased in fee title to remove the flood prone structures from the floodplain using a flood hazard mitigation grant from the Minnesota Department of Natural Resources (MNDNR) as well as funds from the City of Chanhassen and the RPBCWD. Two parcels were purchased by RPBCWD and the third by the city of Chanhassen. Staff is working with Chanhassen on the transfer of the property to RPBCWD for restoration purposes. The homes have been removed from the three properties although the septic systems still need to be removed from 730 and 750 Pioneer Trail. The feasibility study was conducted in early 2020. Design effort began in 2020 and will continue into 2021. Construction is anticipated to begin in late-summer and early-fall 2021.



PURGATORY CREEK WATERSHED

The District is actively engaged in two projects in the Purgatory Creek Watershed:

- Purgatory Creek Berm
- Lotus Lake Alum
- Silver Lake Restoration
- Scenic Heights
- Hyland Lake in-lake Phosphorus Load Control
- Duck Lake Watershed Load
- Mitchell Lake Subwatershed Assessment

PURGATORY CREEK BERM – EDEN PRAIRIE

The District with the City of Eden Prairie, worked together in 2020 on plans to repair the berm and improve the overflow structure in Purgatory Creek Park, Eden Prairie. The location is a very popular trail system, and the breach location is currently being utilized for common carp removal. This work will continue in 2021.

LOTUS LAKE ALUM

In 2018, the District completed an alum treatment on Lotus Lake. In 2021, the District continued monitoring the lake post-treatment.

SILVER LAKE WATER QUALITY PROJECT

The 2017 UAA update identified the Silver Lake subwatershed SiL_2 as a targeted location within the Silver Lake watershed to reduce the phosphorus loading and improve the water quality of Silver Lake. The UAA indicates that runoff from approximately 13.5 acres drains through the location of the potential stormwater treatment system.

This site presents several design and maintenance challenges including, but not limited to, drainage patterns, tree canopy, and topography. The UAA suggests that an iron enhanced sand filtration system treating discharge from Pleasantview Road and Ridge Road would be approximately 0.4 acres at the surface with the potential to reduce the annual phosphorus loading to Silver Lake by 6.3 pounds. The District completed the feasibility and, in early meetings with Chanhassen Parks and Natural Resources, determined that work should occur in channel to minimize tree loss.

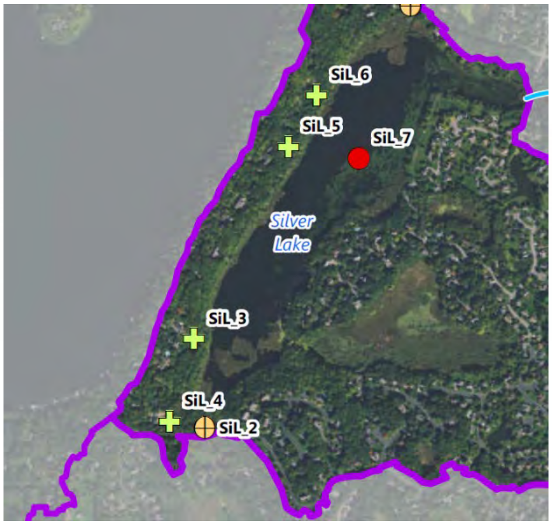


Figure SiL 1 - Location of SiL 2 in relation to Silver Lake

The project was ordered in 2020 which was followed by the development of a cooperative agreement with the City of Chanhassen. Detailed design started in 2020 and will be completed in 2021. Project construction is anticipated in 2021.

SCENIC HEIGHTS SCHOOL FOREST RESTORATION

A project to restore a healthy ecosystem that promotes clean water and creates habitat in the Purgatory Creek watershed

Summary

In 2017, RPBCWD joined with Scenic Heights Elementary School and other partners to embark on a project to restore the forested outdoor center on the school grounds. Invasive species like garlic mustard and buckthorn had outcompeted native plants in the forest, and erosion was a problem. Over the past fifteen years volunteers worked to try to control invasive species, plant natives, and tackle erosion. This restoration partnership builds on this good work to care for the forest and the watershed that it is a part of.

Details

Status: Active
Started: 2018
End: 2020
Cost: $260,000

Financial partners: Hennepin County, Minnetonka School District

Other partners: Scenic Heights Elementary, City of Minnetonka, Minnesota DNR, Boy Scouts, Girl Scouts

Learn more at rpbcwd.org

Site work began in the winter of 2018 with the removal of woody invasive plants. This dramatically opened the site, clearing space for what will be native prairie, oak savanna, and forest edge habitat. The eroded gully that allows stormwater to flow to the pond was restored, invasive plants were continually treated to prevent re-establishment. In the fall of 2018, volunteers planted over 100 native trees and shrubs. In 2019, vegetation management continued as well as several volunteer planting events. Vegetation management also occurred during 2020 and the project was completed at the end of 2020.

HYLAND LAKE IN-LAKE PHOSPHORUS LOAD

In 2019, the District partnered with Three Rivers Park District to apply Alum to Hyland Lake. Three Rivers Park District will continue to monitor Hyland Lake in 2021.

DUCK LAKE PARTNERSHIP

The Watershed District's 2018 Watershed Management Plan identified the need for a phosphorus load reduction project in the Duck Lake watershed. As this area is mostly residential, the District needed to look to our community members to become project partners. The District envisioned a range of actions (plant a raingarden, install a rainbarrel, plant a tree, create a downspout planter) residents could take to be a part of a community-level partnership to help protect Duck Lake.

The District kicked off the project in 2019, with a community meeting in which residents learned about the project's goals and timeline. In winter and spring of 2019, the District conducted outreach to engage subwatershed residents in the project and to sign up homeowners to plant a raingarden, install a rainbarrel, plant a tree, or host a downspout planter. In partnership with the City of Eden Prairie, the district was able to work with contractors to have trees installed in the spring of 2019. Interested residents also received rain barrels in the spring of 2019.

In the spring of 2020, the District worked with contractors to install downspout planters and raingardens for residents.

2019 Project numbers

As of December 2019, residents on 82 properties had installed or committed to at least one of the best managements practices (BMPs) identified for the project.

- 4 households working to install raingardens in 2020
- 9 households committed to hosting downspout planters
- 50 rain barrels distributed (31 households total)
- 38 trees installed

24.3% of all households in the sub-watershed are participating!

EDEN PRAIRIE
LIVE • WORK • DREAM

MITCHELL LAKE SUBWATERSHED ASSESSMENT

The Riley-Purgatory-Bluff-Creek Watershed District and the City of Eden Prairie are working together to implement projects to remove Mitchell Lake from the impaired waters list. A primary objective in the RPBCWD's plan is to identify opportunity projects based on emerging science and additional assessment. One key emerging issue is to evaluate potential internal phosphorous loading within stormwater ponds in the lakes' subwatersheds. The adaptive management strategy will target opportunity projects to assess the contribution of internal loading in storm water ponds, an emerging issue in urban stormwater systems. This project will also use updated pond data from the City's intensive pond inspection program to identify other phosphorus reduction opportunities. The proposed assessment will quantify formerly undocumented P loading to Mitchell Lake with the goal of protecting it. The project began in 2019 and the District anticipates completion in 2021.

RILEY CREEK WATERSHED

The District is actively engaged in three projects in the Riley Creek Watershed:

- Lake Riley Alum
- Lake Susan Park Pond
- Rice Marsh Lake Alum
- Rice Marsh Lake Water Quality Improvement
- Lower Riley Creek Restoration
- Middle Riley Creek
- Upper Riley Creek Restoration
- Lake Riley and Rice March Lake Subwatershed Assessment

LAKE RILEY ALUM TREATMENT

In 2015, the District implemented an alum treatment on Lake Riley to manage internal phosphorus loads coming from lake bottom. In 2019, the District continued monitoring and began the evaluation of the second dosing of alum was implemented in 2020.

LAKE SUSAN PARK POND

The Riley Purgatory Bluff Creek Watershed District (RPBCWD) in partnership with the City of Chanhassen, conducted a study of watershed treatment and stormwater reuse enhancement alternatives at the Lake Susan Park Pond in March 2017, building upon the Lake Susan and Rice Marsh Lake use attainability analysis (UAA) prescribed by the 1996 RPBCWD Water Management Plan (i.e. District Plan) and completed in 1999. The updated Lake Susan UAA recommended remedial measures to improve the lake's water quality and was completed in July 2013.

The 2013 UAA Update included several near-term projects in the Lake Susan implementation plan, including construction of an iron-enhanced sand filtration system at Lake Susan Park Pond and modifying the pond to increase dead pool storage by one foot. The 2017 Engineer's Report for the project evaluated several conceptual design combinations for water quality improvement and stormwater reuse. The recommended alternative includes water quality treatment through use of an iron enhanced sand filter (IESF) and stormwater reuse through irrigation of an adjacent ballfield.

CLEAN WATER LAND & LEGACY AMENDMENT

The project provides water quality treatment at Lake Susan Park Pond through use of an IESF and stormwater reuse through irrigation of an adjacent ballfield. It also includes erosion protection at the outlet of Lake Susan Park Pond to Riley Creek. The filtration system is located along the south side of Lake Susan Park Pond, in an area formerly used as an archery range to minimize impacts to upland vegetation.

The District completed the project in 2019. In 2020 the District continued monitoring the project and working with the City of Chanhassen to refine the system operations. Financial partners include the State of Minnesota and the City of Chanhassen.

RICE MARSH LAKE ALUM TREATMENT

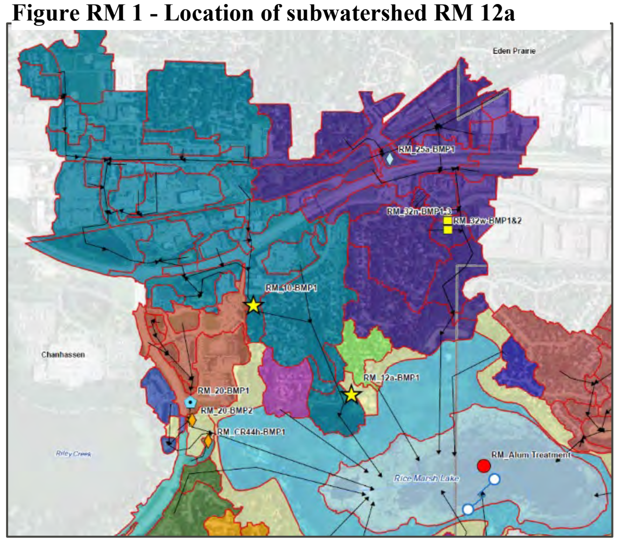
In 2018, the District implemented an alum treatment in Rice Marsh Lake to manage internal phosphorus loads coming from lake bottom. The District continues to monitor the treatment and assess effectiveness.

RICE MARSH LAKE WATER QUALITY IMPROVEMENT PROJECT

The *2016 Rice Marsh Lake and Lake Riley Use Attainability Analysis Update* identified the Rice Marsh Lake subwatershed RM_12a (shown in teal) as a targeted location within the Rice Marsh Lake watershed to reduce the phosphorus loading and improve the water quality of Rice Marsh Lake. Based on its project prioritization process that quantitatively considered project benefits and feasibility constraints using nine benefit categories and a total benefit, the District incorporated implementation of a best management practices in subwatershed RM_12a into its 2018 Plan.

A feasibility study for the project was completed in 2020. At the December 9, 2020 meeting of the RPBCWD Board of Managers, a public hearing was held to solicit public input on the proposed project. Ordering, design and construciton of the project is anticipated in 2021.

Figure RM 1 - Location of subwatershed RM 12a



LOWER RILEY CREEK RESTORATION

The Lower Riley Creek Restoration is a multi-year project that began in 2017. This section of the creek is severely eroded, incised and has many bank failures. Reach E has a deeply incised channel. As such, floods flows are concentrated in and near the main channel. This confinement results in faster flows and increases erosion potential within that reach. Site D3 is a ravine feature that conveys intermittent runoff from several residential lots to Riley Creek via a storm sewer outfall near the start of the ravine. Past agricultural practices and current runoff from the residential lots has resulted in an increase of both volume and runoff rate to the ravine. The increased volume and rate is exacerbated by the steep channel slope of the ravine. The existing storm sewer outlet includes riprap and geotextile, which has currently failed, resulting in further erosion near the storm sewer outlet. The invert of the ravine is actively eroding because the flows are highly confined by tall banks, resulting in the creation of several large scarps.

The vision for this project is to provide an ecologically diverse stream reach that significantly reduces streambank erosion, provides diverse habitat layers, and enhances the public's access and their understanding of why stable stream systems are important. This project will reduce erosion and improve water quality while also improving natural stream habitat for aquatic organisms. Providing better floodplain connectivity for Lower Riley Creek also enhances surrounding riparian habitat. By establishing a stable stream corridor, the Project will also address the Minnesota Pollution Control Agency's (MPCA's) identified turbidity impairment within this reach of Riley Creek. The Project's location in the Riley Creek Conservation Area provides opportunities for interpretive signage and future programming to educate the public on the importance of diverse stream corridors.

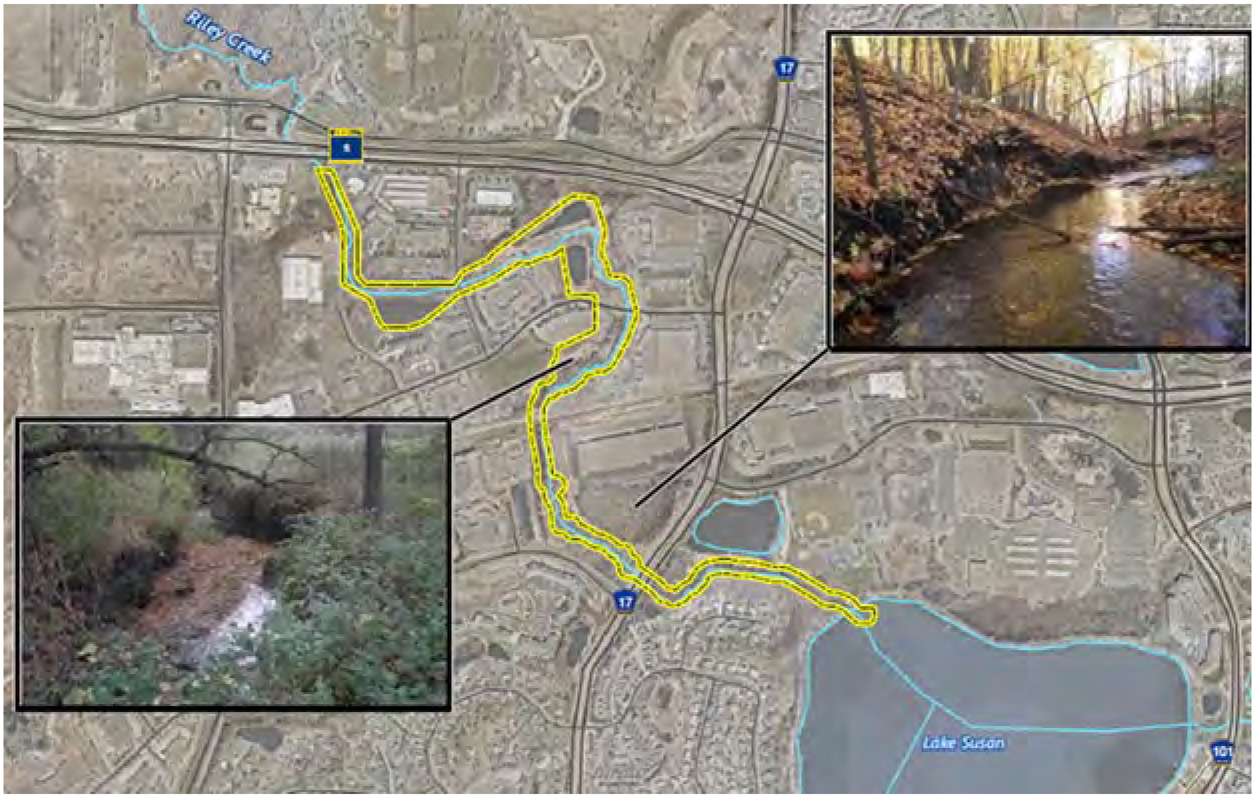
The District with the Lower Minnesota River Watershed District and the City of Eden Prairie are financially contributing to this project. The project was completed in 2020.

MIDDLE RILEY CREEK

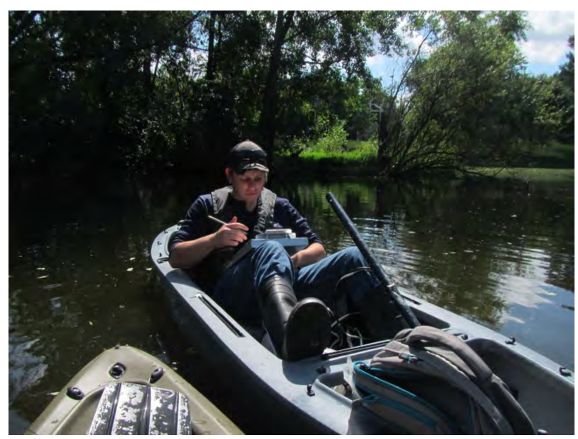
In 2019, Bearpath Golf Course approached the District with the idea of working together in the restoration of Middle Riley Creek. This area of the creek was identified in the 10-Year Plan as beginning in 2025. The project will be implemented in 2021. Bearpath Golf Course is a financial partner on the project.

UPPER RILEY CREEK

The Upper Riley Creek project was identified for restoration for 2019-2021. The feasibility analysis was put on hold in 2019 until the City of Chanhassen completed their hiring process for their Water Resources Coordinator and Public Works Director. The district developed the Upper Riley Corridor Enhancement Plan in 2020 with design/permitting anticipated in 2021/2022 followed by construction in 2022/ 2023. The City of Chanhassen has indicated a willingness to be a financial partner.



LAKE RILEY AND RICE MARSH LAKE SUBWATERSHED ASSESSMENT



The Riley-Purgatory-Bluff-Creek Watershed District and the City of Eden Prairie are working together to implement projects to remove Lake Riley and Rice Marsh Lake from the impaired waters list. A primary objective in the RPBCWD's plan is to identify opportunity projects based on emerging science and additional assessment. One key emerging issue is to evaluate potential internal phosphorous loading within stormwater ponds in the lakes' subwatersheds.

The adaptive management strategy will target opportunity projects to assess the contribution of internal loading in storm water ponds, an emerging issue in urban stormwater systems. This project will also use updated pond data from the City's intensive pond inspection program to identify other phosphorus reduction opportunities. The proposed assessment will quantify formerly undocumented P loading to Rice Marsh Lake and Lake Riley with the goal of protecting a previously completed in-lake sediment inactivation treatment and bolster an improving water quality history which has positioned Lake Riley on the verge of being delisted from the MPCA 303d list. Anticipation end of this project is 2021.

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engineering and environmental consultants

Memorandum

To: Riley-Purgatory-Bluff Creek Watershed District Board of Managers
From: Jen Koehler and Scott Sobiech, Barr Engineering
Subject: Silver Lake Water Quality Improvement Project – Recommendation to Award Project
Date: April 1, 2021
Project: 23/27-0053.14 024
c: Terry Jeffery – RPBCWD Interim Administrator

Recommended Board Action

It is recommended that the RPBCWD Board of Managers:

1) Award the project to Molnau Trucking LLC at the bid price of $128,936.18.

2) Authorize the President or interim administrator to sign the Notice of Award, execute the contracts, and sign the Notice to Proceed at the appropriate points in the contracting process.

3) Authorize the interim administrator to execute change orders within 10% of the contract amount.

4) Authorize Barr Engineering to revise the construction drawings should the private property owner and RPBCWD fail to execute the access agreement.

The Silver Lake water quality improvement project is located north of Pleasantview Road on the south end of Silver Lake in the city of Chanhassen, Minnesota. This project was identified in a December 2018 feasibility study for the area with the goal of the project to improve water quality in Silver Lake. The proposed project features include Pleasantview Road drainage improvements including the addition of curb and gutter, catch basin inlets, and storm sewer, ravine/channel stabilization and regrading, and the addition of five (5) iron-enhanced ditch check dams along the channel. A small portion of the work show on the construction drawings include filling in an eroded section of ravine on private property. Interim Administrator Jeffery is working with the private property owner to execute an access agreement, which was development RBCWD legal counsel, to convey the necessary property rights to RPBCWD. If the agreement is not executed that portion of the work would need to be eliminated from the construction documents.

The RPBCWD Board of Managers order the Silver Lake water quality improvement project at the March 2020 regular meeting for the design and preparation of construction documents for the recommended project from the feasibility study. The RPBCWD and the City of Chanhassen entered into a cooperative agreement in July 2020. The RPBCWD Board of Managers authorized bidding at their March 2021 meeting. Following the Board's authorization, the project was bid in March 2021. An advertisement for bid was circulated in local publications and on Quest Construction Data Network (CDN). Bids were opened on March 29, 2021 at a virtual bid opening. Six bids were received and are listed below in Table 1.

Table 1. Summary of Bids Received for the Silver Lake Water Quality Improvement Project

Bidder	Total Base Bid Entered on the Bid Form[1]
Molnau Trucking LLC	$128,936.18
BKJ Excavating	$149,926.20
Sunram Construction, Inc.	$162,231.00
Minger Construction Co., Inc.	$188,604.10
Urban Companies	$189,348.00
Rachel Contracting, LLC	$225,912.00

[1]Engineer's opinion of probable cost was $171.676.14, reflecting minor changes in quantities resulting from Addendum 1 during bidding.

After bid verification, Molnau Trucking LLC was the apparent lowest responsive bidder. As required in the instruction to bidders, the Engineer notified Molnau to submit its bid security in hard-copy wet-signature form. The bid security was received at Barr Engineering Co. on April 1, 2021 and placed in a secure location.

It is recommended that the RPBCWD Board of Managers:

- Award the project to Molnau Trucking LLC at the bid price of $128,936.18.
- We also recommend authorizing the President or interim administrator to sign the Notice of Award, execute the contracts, and sign the Notice to Proceed at the appropriate points in the contracting process.
- We also recommend authorizing the interim administrator to execute change orders within 10% of the contract amount.
- We also recommend authorizing Barr Engineering to revise the construction drawings should the private property owner and RPBCWD fail to execute the access agreement.

If the Board of Managers decides to award the project the following would be completed:

- An Authorized Representative signs the Notice of Award to be sent to the successful bidder
- Successful bidder provides the following information:
  - Fully-executed Notice of Award
  - Three fully-executed counterparts of the Form of Agreement

- Performance and Payment Bond
- Certificate of Insurance and all other insurance documentation identified in the Contract Documents

- Barr Engineering will coordinate with the successful bidder regarding the construction schedule
- Notice to Proceed is issued in May
- Construction begins within 10 days of Notice to Proceed with work being substantially completed by July 15, 2021 or work beginning after August 1, 2021 with work being substantially complete by September 30, 2021.

REDPATH
AND COMPANY

March 31, 2021

Terry Jeffery
Interim District Administrator
Riley Purgatory Bluff Creek Watershed District
18681 Lake Drive E.
Chanhassen, Minnesota 55317

Dear Terry:

Enclosed please find the checks and Treasurer's Report for Riley Purgatory Bluff Creek Watershed District for the one month and two months ending February 28, 2021.

Please examine these statements and if you have any questions or need additional copies, please call me.

Sincerely,

REDPATH AND COMPANY, LTD.

Mark Gibbs

Mark C. Gibbs, CPA
Enclosure

REDPATH AND COMPANY

To The Board of Managers
Riley Purgatory Bluff Creek Watershed District
Chanhassen, Minnesota

Accountant's Opinion

The Riley Purgatory Bluff Creek Watershed District is responsible for the accompanying February 28, 2021 Treasurer's Report in the prescribed form. We have performed a compilation engagement in accordance with the Statements on Standards for Accounting and Review promulgated by the Accounting and Review Services Committee of AICPA. We did not audit or review the Treasurer's Report nor were we required to perform any procedures to verify the accuracy or completeness of the information provided by the Riley Purgatory Bluff Creek Watershed District. Accordingly, we do not express an opinion, a conclusion, nor provide any form of assurance on the Treasurer's Report.

Reporting Process

The Treasurer's Report is presented in a prescribed form mandated by the Board of Managers and is not intended to be a presentation in accordance with accounting principles generally accepted in the United States of America. The reason the Board of Managers mandates a prescribed form instead of GAAP (Generally Accepted Accounting Principles) is this format gives the Board of Managers the financial information they need to make informed decisions as to the finances of the watershed.

GAAP basis reports would require certain reporting formats, adjustments to accrual basis and supplementary schedules to give the Board of Managers information they need, making GAAP reporting on a monthly basis extremely cost prohibitive. An independent auditing firm is retained each year to perform a full audit and issue an audited GAAP basis report. This annual report is submitted to the Minnesota State Auditor, as required by Statute, and to the Board of Water and Soil Resources.

The Treasurer's Report is presented on a modified accrual basis of accounting. Expenditures are accounted for when incurred. For example, payments listed on the Cash Disbursements report are included as expenses in the Treasurer's Report even though the actual payment is made subsequently. Revenues are accounted for on a cash basis and only reflected in the month received.

REDPATH AND COMPANY, LTD.

Redpath and Company, Ltd.

St. Paul, Minnesota
March 31, 2021

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT

Treasurers Report

February 28, 2021

REPORT INDEX

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Cash Disbursements
February 28, 2021

Accounts Payable:

Check #	Payee	Amount
5529	Landbridge Ecological Services	$7,480.62
5530	Abdo, Eick & Meyers, LLP	11,000.00
5531	Barr Engineering	89,701.97
5532	B9 Polar Waters, LLC	7,394.86
5533	Career Enhancements Options	1,300.00
5534	CenterPoint Energy	532.54
5535	CenturyLink	589.86
5536	C Lanphear Design	450.00
5537	Coverall of the Twin Cities	316.76
5538	ECM Publishers, Inc.	2,142.00
5539	Hansen Thorp Pellinen Olson, Inc.	1,433.00
5540	HealthPartners	6,211.41
5541	Amy Herbert	1,410.00
5542	Olivia R. Holstine	5.48
5543	Iron Mountain	162.57
5544	Principal Life Insurance Company	404.01
5545	Purchase Power	133.52
5546	Redpath & Company	7,039.22
5547	RMB Environmental Laboratories, Inc.	4,026.00
5548	LaTasha Slinden	249.90
5549	Smith Partners	18,415.01
5550	Southwest News Media	1,063.48
5551	Southwest News Media	651.26
5552	SRF Consulting Group, Inc.	15,317.59
5553	Xcel Energy	572.12
5554	David Ziegler	1,158.25
5555	Goeden Fisheries	1,500.00
	Total Accounts Payable:	**$180,661.43**

Payroll Disbursements:

Payroll Processing Fee	194.55
Employee Salaries	40,849.14
Employer Payroll Taxes	3,516.36
Employer Benefits (H.S.A. Match)	600.00
Employee Benefit Deductions	(822.54)
Staff Expense Reimbursements	206.10
PERA Match	3,063.71
Total Payroll Disbursements:	**$47,607.32**

VISA - 02/17/21	5,933.18
VISA - 2020 Credit Card Expenses	(2,352.05)
2020 Expense - Landbridge Ecological (retainage)	(4,980.62)
Total:	**($1,399.49)**

TOTAL DISBURSEMENTS: **$226,869.26**

Memos

The 2021 mileage rate is .56 per mile. The 2020 rate was .575
Old National VISA will be paid on-line.

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Fund Performance Analysis - Table 1
February 28, 2021

	2021 Budget	Fund Transfers	2021 Budget	Current Month	Year-to-Date	Year-to Date Percent of Budget
REVENUES						
Plan Implementation Levy	$3,575,000.00	-	$3,575,000.00	-	-	0.00%
Permit	25,000.00	-	25,000.00	9,200.00	9,400.00	37.60%
Grant Income	272,580.00	-	272,580.00	-	-	0.00%
Investment Income	30,000.00	-	30,000.00	49.90	219.61	0.73%
Past Levies	3,204,427.00	-	3,204,427.00	-	-	0.00%
Partner Funds	451,000.00	-	451,000.00	2,000.00	2,000.00	0.00%
TOTAL REVENUE	**$7,558,007.00**	-	**$7,558,007.00**	**$11,249.90**	**$11,619.61**	**0.15%**
EXPENDITURES						
Administration						
Audit	$15,000.00	-	$15,000.00	11,000.00	11,000.00	73.33%
Accounting (and Audit)	$31,000.00		31,000.00	7,233.77	10,297.92	33.22%
Advisory Committees	7,000.00	-	7,000.00	-	-	0.00%
Insurance and bonds	18,000.00	-	18,000.00	-	414.00	2.30%
Engineering Services	112,000.00	-	112,000.00	13,472.50	24,868.00	22.20%
Legal Services	84,000.00	-	84,000.00	9,562.34	15,326.03	18.25%
Manager Per Diem/Expense	30,000.00	-	30,000.00	2,800.00	3,425.00	11.42%
Dues and Publications	16,000.00	-	16,000.00	849.00	9,006.00	56.29%
Office Cost	190,000.00	-	190,000.00	13,620.43	30,539.02	16.07%
Permit Review and Inspection	140,000.00	-	140,000.00	5,636.47	17,235.65	12.31%
Professional Services	10,000.00	-	10,000.00	-	3,022.50	30.23%
Recording Services	15,000.00	-	15,000.00	1,410.00	3,075.00	20.50%
Staff Cost	802,054.00	-	802,054.00	41,852.78	73,521.48	9.17%
Subtotal	**$1,470,054.00**	-	**$1,470,054.00**	**$107,437.29**	**$201,730.60**	**13.72%**
Programs and Projects						
District Wide						
10-year Management Plan	$10,000.00	-	$10,000.00	$556.30	2,140.30	21.40%
AIS Inspection and early response	85,000.00	-	85,000.00	1,633.52	1,633.52	1.92%
Cost-Share/Stewardship Grant	346,735.00	-	346,735.00	2,405.15	23,864.41	6.88%
Data Collection and Monitoring	193,000.00	-	193,000.00	19,034.53	63,426.94	32.86%
Community Resiliency	111,058.00	-	111,058.00	2,432.00	3,822.00	3.44%
Education and Outreach	100,834.00	-	100,834.00	2,809.37	5,076.73	5.03%
Plant Restoration - U of M	61,613.00	-	61,613.00	-	-	0.00%
Repair and Maintenance Fund *	212,540.00	-	212,540.00	-	170.00	0.08%
Wetland Management*	111,248.00	-	111,248.00	16,247.61	29,404.11	26.43%
Groundwater Conservation*	229,444.00	-	229,444.00	450.00	450.00	0.20%
Lake Vegetation Implementation	83,083.00	-	83,083.00	-	2,290.28	2.76%
Opportunity Project*	317,480.00	-	317,480.00	-	-	0.00%
Stormwater Ponds - U of M	67,164.00	-	67,164.00	-	-	0.00%
Hennepin County Chloride Initiative	92,971.00	-	92,971.00	-	-	0.00%
Lower Minnesota Chloride Cost-Share	217,209.00	-	217,209.00	-	-	0.00%
Subtotal	**$2,239,379.00**	-	**$2,239,379.00**	**$45,568.48**	**$132,278.29**	**5.91%**
Bluff Creek						
Bluff Creek Tributary*	$7,251.00	-	$7,251.00	-	-	0.00%
Wetland Restoration at Pioneer	$665,285.00		665,285.00	9,388.60	17,846.57	2.68%
Bluff Creek B5 by Galpin	140,000.00	-	140,000.00	-	-	0.00%
Subtotal	**$812,536.00**	-	812,536.00	**$9,388.60**	**$17,846.57**	**2.20%**
Riley Creek						
Lake Riley - Alum Treatment*	$62,885.00	-	$62,885.00	-	-	0.00%
Rice Marsh Lake in-lake phosphorus load	45,636.00	-	45,636.00	-	-	0.00%
Rice Marsh Lake Water Quality Improvement Phase 1	634,147.00	-	634,147.00	6,157.50	6,609.50	1.04%
Riley Creek Restoration (Reach E and D3)	107,047.00	-	107,047.00	-	362.00	0.34%
Upper Riley Creek Stabilization	902,025.00	-	902,025.00	2,957.50	6,083.50	0.67%
Middle Riley Creek	192,363.00	-	192,363.00	20,542.50	28,150.50	14.63%
Lake Ann Wetland Restoration	50,000.00	-	50,000.00	-	-	0.00%
St. Hubert Water Quality Project	147,063.00	-	147,063.00	15,317.59	24,919.75	16.94%
Subtotal	**$2,141,166.00**	**$0.00**	2,141,166.00	**$44,975.09**	**$66,125.25**	**3.09%**
Purgatory Creek						
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	$34,899.00	-	$34,899.00	1,433.00	1,433.00	4.11%
Lotus Lake in-lake phosphorus load control	79,225.00	-	79,225.00	-	-	0.00%
Silver Lake Restoration - Feasibility Phase 1	207,208.00	-	207,208.00	14,008.80	26,709.30	12.89%
Scenic Heights	92,040.00	-	92,040.00	2,983.00	2,983.00	3.24%
Hyland Lake in-lake phosphorus load control	20,000.00	-	20,000.00	-	-	0.00%
Duck Lake watershed load	32,120.00	-	32,120.00	1,075.00	3,900.00	12.14%
Lotus Lake Kerber Pond	14,380.00		14,380.00		-	0.00%
Duck lake Partnership	235,000.00	-	235,000.00	-	-	0.00%
Subtotal	**$714,872.00**	**$0.00**	$714,872.00	**$19,499.80**	**$35,025.30**	4.90%
Reserve	**$180,000.00**	**$0.00**	180,000.00	-	-	0.00%
TOTAL EXPENDITURE	**$7,558,007.00**	**$0.00**	**$7,558,007.00**	**$226,869.26**	**$453,006.01**	**5.99%**
EXCESS REVENUES OVER (UNDER) EXPENDITURES	**$0.00**	**$0.00**	**$0.00**	**($215,619.36)**	**($441,386.40)**	

***Denotes Multi-Year Project - See Table 2 for details**

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
Muti-Year Project Performance Analysis - Table 2
February 28, 2021

	Total Lifetime Budget	FUNDING SOURCE District funds	Partner Fund	Grants	Current Year Budget	Costs Month End	Costs Year-to-Date	Total Costs to Date	District's Share Current Year	District's Share Future Years
Programs and Projects										
District Wide										
Community Resiliency	**$148,000.00**	$98,000.00	-	50,000.00	$111,058.00	$2,432.00	$3,822.00	$65,763.07	$75,000.00	60,000.00
Repair and Maintenance Fund	**277,005.00**	277,005.00	-	-	212,540.00	-	170.00	89,635.08	-	20,000.00
Wetland Management	**200,000.00**	200,000.00	-	-	111,248.00	16,247.61	29,404.11	143,155.99	-	70,000.00
Groundwater Conservation	**180,000.00**	180,000.00	-	-	229,444.00	450.00	450.00	1,005.85	50,000.00	79,000.00
Opportunity Project*	**300,000.00**	300,000.00	-	-	317,480.00	-	-	26,165.29	50,000.00	70,000.00
Stormwater Ponds - U of M	**106,092.00**	64,092.00	42,000.00	-	67,164.00	-	-	58,927.97	20,000.00	-
Hennepin County Chloride Initiative	**120,800.00**	19,000.00	-	101,800.00	92,971.00	-	-	27,829.77	-	-
Lower Minnesota Chloride Cost-Share	**217,209.00**	20,000.00	-	197,209.00	217,209.00	-	-	-	-	-
Subtotal	**$1,549,106.00**	**$1,158,097.00**	**$42,000.00**	**$349,009.00**	**$1,359,114.00**	**$19,129.61**	**$33,846.11**	**$412,483.02**	**195,000.00**	**299,000.00**
Bluff Creek										
Bluff Creek Tributary*	**$436,750.00**	$386,750.00	$50,000.00	-	$7,251.00	-	-	$391,498.69		
Wetland Restoration at Pioneer	**857,820.00**	450,000.00	-	407,820.00	665,285.00	9,388.60	17,846.57	660,383.73	450,000.00	-
Bluff Creek B5 by Galpin	**614,000.00**	614,000.00			140,000.00	-	0.00		140,000.00	614,000.00
Subtotal	**$1,908,570.00**	**$1,450,750.00**	**$50,000.00**	**$407,820.00**	**$812,536.00**	**9,388.60**	**$17,846.57**	**$1,051,882.42**	**$590,000.00**	**614,000.00**
Riley Creek										
Lake Riley - Alum Treatment 1st dose *	**$560,000.00**	$560,000.00	-	-	$62,885.00	-	-	$512,114.57	-	-
Rice Marsh Lake in-lake phosphorus load	**150,000.00**	150,000.00	-	-	45,636.00	-	-	104,364.65	-	170,000.00
Rice Marsh WQ 1	**300,000.00**	300,000.00	-	-	634,147.00	6,157.50	6,609.50	22,462.00	350,000.00	-
Riley Creek Restoration (Reach E and D3) *	**2,168,148.00**	1,615,000.00	553,148.00	-	107,046.00	-	362.00	2,228,219.03	40,000.00	-
Upper Riley Creek Stabilization	**950,000.00**	950,000.00			902,025.00	2,957.50	6,083.50	54,058.02	100,000.00	-
Middle Riley Creek	**45,000.00**		45,000.00		192,363.00	20,542.50	28,150.50	28,150.50	-	-
St Hubert	**178,865.00**		65,000.00	113,865.00	147,063.00	15,317.59	24,919.75	24,919.75	100,000.00	-
Subtotal	**$4,352,013.00**	**$3,575,000.00**	**$663,148.00**	**$113,865.00**	**$2,091,165.00**	**$44,975.09**	**$66,125.25**	**$2,974,288.52**	**$590,000.00**	**170,000.00**
Purgatory Creek										
Purgatory Creek Rec Area- Berm/retention area - feasibility/design	**$50,000.00**	$50,000.00	-	-	$34,899.00	1,433.00	1,433.00	$16,534.28	-	-
Lotus Lake in-lake phosphorus load control	**345,000.00**	345,000.00	-	-	79,225.00	-	-	265,773.75	-	345,000.00
Silver Lake Restoration Project WQ1	**268,013.00**	268,013.00	-	-	207,208.00	14,008.80	26,709.30	87,514.49	-	-
Scenic Heights	**260,000.00**	165,000.00	45,000.00	50,000.00	92,040.00	2,983.00	2,983.00	210,942.75	-	-
Hyland Lake Internal Load	**150,000.00**	130,000.00	20,000.00	-	20,000.00	-	-	128,612.41	20,000.00	150,000.00
Duck Lake watershed load	**220,000.00**	220,000.00	-	-	32,120.00	1,075.00	3,900.00	191,779.01	-	-
Subtotal	**$1,293,013.00**	**$1,178,013.00**	**$65,000.00**	**$50,000.00**	**$465,492.00**	**$19,499.80**	**$35,025.30**	**$901,156.69**	**$20,000.00**	**495,000.00**
Total Multi-Year Project Costs	**$9,102,702.00**	**$7,361,860.00**	**$820,148.00**	**$920,694.00**	**$4,728,307.00**	**$92,993.10**	**$152,843.23**	**$5,339,810.65**	**$1,395,000.00**	**$1,578,000.00**

See Accountants Compilation Report

Riley Purgatory Bluff Creek Watershed District
Balance Sheet
As of February 28, 2021

ASSETS

Current Assets

General Checking-Old National	$2,143,774.00	
Checking-Old National/BMW	23,256.03	
Investments-Standing Cash	3,037,844.30	
Investments-Wells Fargo	996,316.23	
Accrued Investment Interest	7.50	
Due From Other Governments	473,880.00	
Taxes Receivable-Delinquent	36,003.36	
Pre-Paid Expense	31,914.23	
Security Deposits	7,244.00	
Total Current Assets:		**$6,750,239.65**

LIABILITIES AND CAPITAL

Current Liabilities

Accounts Payable	$366,299.65	
Retainage Payable	27,616.74	
Withholding Taxes	757.89	
Permits & Sureties Payable	679,189.25	
Deferred Revenue	36,003.36	
Unearned Revenue	181,331.00	
Total Current Liabilities:		**$1,291,197.89**

Capital

Fund Balance-General	$5,900,428.16	
Net Income	(441,386.40)	
Total Capital		**$5,459,041.76**
Total Liabilities & Capital		**$6,750,239.65**

RILEY PURGTORY BLUFF CREEK WATERSHED DISTRICT
OLD NATIONAL BANK VISA ACTIVITY
February 28, 2021

DATE	PURCHASED FROM	AMOUNT	DESCRIPTION	ACCOUNT #	RECEIPT
02/21/21	Amzn.Mktp.	79.74	Covid Safety Supplies	10-00-4635	Y
02/21/21	Verizon Wireless	393.07	Monthly Telecommunications	10-00-4240	Y
02/26/21	Randy's Sanitation	104.97	Recycling/Trash Service	10-00-4215	Y
02/62/21	1Password	24.95	Monthly Software Subscription	10-00-4203	Y
03/01/21	Adobe, Inc.	193.15	Sofrware Subscription	10-00-4203	Y
03/01/21	General Delivery Service	25.28	Courier Service	10-00-4280	Y
03/02/21	Kowalski's Market	15.98	Office Supplies	10-00-4200	Y
03/09/21	Costco Warehouse	826.21	Office Supplies/New Hire Supplies	10-00-4200	Y
03/10/21	Microsoft	147.85	Monthly Subscription	10-00-4200	Y
03/10/21	MN Association of Watershed Dist.	99.00	MAWD Legislative Day Registration	10-00-4010	Y
03/11/21	USPS.COM Postal Store	294.35	Postage	10-00-4280	Y
03/11/21	Crumb Gour*	53.67	Meeting Supplies	10-00-4205	Y
		$2,258.22	**General Administration Total**		
02/18/21	American Water Resources Assoc.	179.00	AWRA Yearly Membership	20-05-4245	Y
02/21/21	Amzn.Mktp.	45.98	DC Equipment/2021 Field Season	20-05-4635	Y
02/24/21	Amzn.Mktp.	587.19	DC Equipment/2021 Field Season	20-05-4635	Y
03/02/21	SQ *Maxbotix, Inc.	647.36	DC Equipment/2021 Field Season	20-05-4635	Y
03/03/21	Adafruit Industries	145.59	DC Field Supplies	20-05-4201	Y
03/03/21	DKC*Digi Key Corp.	201.64	DC Field Supplies	20-05-4201	Y
03/03/21	Voltaic Systems	204.00	DC Equipment/2021 Field Season	20-05-4635	Y
03/05/21	Amzn.Mktp.	77.80	DC Equipment/2021 Field Season	20-05-4635	Y
03/10/21	Hologram	86.52	DC Software	20-03-4203	Y
		$2,175.08	**District-Wide Total**		
		$4,433.30	**GRAND TOTAL**		

See Accountants Compilation Report

RILEY PURGATORY BLUFF CREEK WATERSHED DISTRICT
18681 Lake Drive East
Chanhassen, MN 55317
952-607-6512
www.rpbcwd.org

Riley Purgatory Bluff Creek Watershed District Permit Application Review

Permit No: 2021-005

Considered at Board of Managers Meeting: April 7, 2021

Application Received complete: March 4, 2021

Applicant: Island Management LLC

Consultant: Civil Site Group, Matthew Pavek

Project: Lake Place – The applicant proposes the construction of a new apartment building and associated parking and driveway. A biofiltration basin with a rock storage reservoir below the draintile and subsurface stormwater management facility with a rock storage reservoir below the draintile will provide water quality treatment, rate control, and volume abstraction.

Location: 1361 Lake Drive West, Chanhassen

Reviewer: Heather Hlavaty, PE, and Scott Sobiech, PE, Barr Engineering

<u>Potential Board Variance Action</u>

Manager ______________ moved and Manager ____________ seconded adoption of the following resolution based on the permit report that follows, the presentation of the matter at the April 7, 2021, meeting of the managers and the managers' findings, as well as the factual findings in the permit report that follows:

Resolved that the variance request for Permit 2021-005 is approved, subject to the following conditions: 1. [CONDITION(S)]

<u>Proposed Board Action</u>

Manager ______________ moved and Manager ____________ seconded adoption of the following resolutions based on the permit report that follows and the presentation of the matter at the April 7, 2021 meeting of the managers:

Resolved that the application for Permit 2021-005 is approved, subject to the conditions and stipulations set forth in the Recommendations section of the attached report;

Resolved that on determination by the RPBCWD administrator that the conditions of approval have been met, the RPBCWD president or administrator is authorized and directed to sign and deliver Permit 2021-005 to the applicant on behalf of RPBCWD.

Upon vote, the resolutions were adopted, ______ [VOTE TALLY].

Applicable Rule Conformance Summary

Rule	Issue		Conforms to RBPCWD Rules?	Comments
B	**Floodplain Management and Drainage Alterations**		No	See Rule K variance discussion.
C	**Erosion Control Plan**		See Comment	See Rule Specific Permit Conditions C1 and C2.
D	**Wetland and Creek Buffer**		Not Required	
J	**Stormwater Management**	Rate	Yes	
		Volume	Yes	
		Water Quality	Yes	
		Low Floor Elev.	Yes	
		Maintenance	Yes	See Rule Specific Permit Condition J1.
		Chloride Management	See Comment	See stipulation #4.
		Wetland Protection	NA	
K	**Variances and Exceptions**		See Comment	Variance from compensatory storage location requirements in subsection 3.2 of the Floodplain Management and Drainage Alteration Rule requested. See Rule Specific Permit Condition K1
L	**Permit Fee**		Yes	$3,000 permit fee deposit and $2,000 variance fee received.
M	**Financial Assurance**		See Comment	The financial assurance has been calculated at $477,347.

Project Description

The proposed work will redevelop a 3.67-acre site along Lake Drive West off Powers Boulevard in Chanhassen, Minnesota. The existing imperious surface on the site is associated with a roadway and small parking lot. This application proposes constructing a new apartment building, associated parking and driveway, and stormwater management features. The proposed work will involve filling an existing onsite wetland and the associated floodplain. The city of Chanhassen, the local governmental unit responsible for administering the Wetland Conservation Act (WCA), determined the wetland to be incidental and issued a No Loss determination. Because the wetland was determined to be incidental, Rule D-Wetland and Creek

Buffers does not apply. The stormwater management system includes the construction of a biofiltration basin with a rock storage reservoir below the subsurface draintile used to dewater the basin and a subsurface stormwater management facility with a rock storage reservoir below the subsurface draintile. The combination of these two systems will provide water quality treatment, rate control, and volume abstraction. The biofiltration basin will also provide compensatory floodplain storage to offset the fill within the 100-year flood elevation of the incidental wetland.

The project site information is summarized below:

	Area (acres)
Total Site Area (acres)	3.67
Existing Site Impervious Area (acres)	0.11
Post Construction Site Impervious (acres)	1.82
New Site Impervious Area (acres)	1.82
Distributed Impervious Area(acres)	0.11 (100% disturbed)
Increase in Site Impervious Area (acres)	1.71 (>100% increase)
Total Disturbed Area (acres)	3.53

Exhibits:

1. Permit Application received January 29, 2021 (The applicant was informed on February 18 that the application was incomplete because of missing information related to Rule B analysis. Materials completing the application were received on March 4, 2021)
2. Stormwater Management Report dated December 4, 2020 (revised March 3, 2021)
3. Engineer's Opinion of Probable Cost for Stormwater Management features dated March 3, 2021
4. Project Plan Set (19 sheets) dated December 4, 2020 (revised March 3, 2021)
5. Geotechnical Evaluation Report by Haugo GeoTechnical Services dated November 23, 2020
6. Electronic P8 and HydroCAD models received on December 4, 2020 (revised March 3, 2021)
7. Response to RPBCWD Comments dated February 11, 2021
8. Response to RPBCWD Comments dated March 3, 2021
9. Lake Place Variance Request Memorandum dated March 3, 2021
10. Easement email from City of Chanhassen dated February 25, 2021
11. Private land disturbing activity email from HOA dated February 18, 2021
12. Minnesota WCA Notice of No-Loss Wetland Determination dated March 4, 2021

<u>Rule Specific Permit Conditions</u>

Rule A: Procedural Requirements

The project proposes land-disturbing activity on an adjacent parcel but the applicant has not provided information demonstrating permission from the adjacent property owner. To conform to RPBCWD Rule A requirements, the following revisions are needed:

A1. . A complete permit application includes all required information, exhibits, and fees and must be <u>authorized by all property owners</u> (Rule A, Subsection 2.3). Please provide written documentation demonstrating the necessary property rights and permissions to perform the proposed land disturbing activities on the adjacent property.

Rule B: Floodplain Management and Drainage Alterations

Because the proposed construction of the apartment building involves the placement of a total of 162 cubic yards of fill below the 100-year flood elevation of the incidental wetland (el. 934.23 msl), the project activities must conform to the RPBCWD's Floodplain Management and Drainage Alterations rule (Rule B). (Though the wetland has been determined by the City of Chanhassen to be incidental, it nonetheless is a "water basin" as defined in and for purposes of the RPBCWD rules.)

Because the project proposes a new structure, the project must conform with low floor elevation requirements set forth by Rule B, Subsection 3.1. The applicant is proposing to construct the apartment building with a low floor elevation of 932.0 ft which will be below the 100-year flood elevation of the proposed stormwater management facilities. Because the proposed stormwater management facilities have 100-year flood elevations above the proposed low floor, the applicant utilized the alternative low floor framework provided for in Rule J, Appendix J.1 – Low-Floor Elevation Assessment. Groundwater was discovered in soil boring SB#5 at an elevation of 922.5 feet, 9.5 feet below the proposed low floor elevation. According to *Plot 2: Minimum Depth to Water Table -clay or perched conditions*, the minimum permissible depth to water table is 8.5 and 5.0 feet respectively for the above and underground systems based on the stormwater facility horizontal separation (see below table). Because the provided separation is greater than the minimum permissible, the lowest proposed structure elevation meets the freeboard requirement in Rule B, Subsection 3.1.

Stormwater Facility	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Distance from Building to Adjacent Facility (feet)	Water Table Elevation (feet)	Minimum Permissible Depth to Water Table (feet)	Provided Depth from Low Floor Elevation to Water Table (feet)
Biofiltration Basin	932.00	932.93	25	922.5	9.5	9.5

Subsurface stormwater facility	932.00	935.63	24	922.5	5	9.5

Placement of fill below the 100-year flood elevation is prohibited unless fully compensatory flood storage is provided within the floodplain of the same waterbody (Rule B, Subsection 3.2). To offset the proposed 162 cubic yards of fill in the wetland, the applicant is proposing to provide 480 cubic yards of compensatory storage in the biofiltration basin below the 100-year flood elevation of 934.23, thus providing a net increase in the floodplain storage. However, because the compensatory storage is not provided within the floodplain of the existing incidental wetland, the applicant has requested a variance from this requirement of Rule B, Subsection 3.2. See the Rule K discussion for additional information on the variance request.

The engineer concurs with the applicant provided runoff modeling results that demonstrate the proposed project will decrease the flow rates leaving the site relative to existing conditions (see the rate control analysis in Rule J below). Because the proposed flow rates leaving the site will be lower than existing flow rates the project is not reasonably likely to adversely impact off-site flood risk or channel stability. The applicant also provided pre- and post-project water quality modeling to demonstrate no adverse impact to water quality. The modeling results show the total suspended solids and total phosphorus load leaving the site after the project will be less than the existing load leaving the site. This also supports the engineer's determination that the project meets the requirements of Rule B, subsection 3.3. Because no watercourses exist on the site, the Creekside restriction requirements set forth by Rule B, Subsection 3.4 do not impose requirements on the project. See Rule C analysis of the applicants submitted erosion control plan to demonstrate conformance with Rule B, Subsection 3.5. A note on the plans indicates that activities must be conducted to minimize the potential transfer of aquatic invasive species conforming to Rule B, Subsection 3.6.

The proposed project conforms to the floodplain management and drainage alteration requirements of Rule B with the exception of subsection 3.2, from which the applicant has requested a variance.

Rule C: Erosion and Sediment Control

Because the project will alter 3.53 acres of land-surface area (including the land-disturbing work on the adjacent property), the project must conform to the requirements in the RPBCWD Erosion and Sediment Control rule (Rule C, Subsection 2.1).

The erosion control plan prepared by Civil Site Group includes installation of silt fence, inlet protection for storm sewer catch basins, daily inspection, placement of a minimum of 6 inches of topsoil, decompaction of areas compacted during construction, and retention of native topsoil onsite. To conform to the RPBCWD Rule C requirements the following revisions are needed:

C1. The Applicant must provide the name and contact information of the individual responsible for erosion control at the site. RPBCWD must be notified if the responsible individual changes during the permit term.

C2. The anticipated construction schedule must be provided on the Plans.

Rule J: Stormwater Management

Because the redevelopment project will alter 3.53 acres of land-surface area, and increase the site imperviousness by more than 50%, the project must meet the criteria of RPBCWD's Stormwater Management rule (Rule J, Subsection 2.3) for all the impervious surface on the site.

The project includes installation of storm sewer to route runoff to a biofiltration basin with a rock storage reservoir below the subsurface draintile used to dewater the basin and a subsurface stormwater management facility with a rock storage reservoir below the subsurface draintileto provide runoff volume abstraction, water quality treatment, and rate control.

Rate Control

In order to meet the rate control criteria listed in Subsection 3.1.a, the 2-, 10-, and 100-year post development peak runoff rates must be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The applicant used a HydroCAD hydrologic model to simulate runoff rates for pre- and post-development conditions for the 2-, 10-, and 100-year frequency storm events using a nested rainfall distribution, and a 100-year frequency, 10-day snowmelt event. The existing and proposed 2-, 10-, and 100-year frequency discharges from the site are summarized in the table below. The proposed project is in conformance with RPBCWD Rule J, Subsection 3.1.a.

Discharge Location	2-Year Discharge (cfs)		10-Year Discharge (cfs)		100-Year Discharge (cfs)		10-Day Snowmelt (cfs)	
	Ex	Prop	Ex	Prop	Ex	Prop	Ex	Prop
Lake Drive West	1.8	1.3	3.7	2.7	7.6	5.9	0.2	0.2
Private Road South	2.0	1.1	4.1	2.3	8.7	4.4	0.4	0.3
Private Road East	0.6	0.0	1.2	0.0	2.3	0.0	0.1	0.0

Volume Abstraction

Subsection 3.1.b of Rule J requires the abstraction onsite of 1.1 inches of runoff from the impervious surface of the parcel. An abstraction volume of 6,831 cubic feet is required from the 74,524 square feet of regulated impervious area. Eight soil borings and five infiltrometer tests were performed by Haugo Geotechnical Services show that soils in the project area are typically lean clay, and infiltration testing reveals infiltration rates of 0.05 and 0.11 in/hr beneath the proposed stormwater management features. Because of the low in-situ infiltration measurements the site is considered restricted. Groundwater was discovered at elevations between 906.5 – 922.5.

For restricted sites, subsection 3.3 of Rule J requires rate control in accordance with subsection 3.1.a and that abstraction and water-quality protection be provided in accordance with the following sequence: (a) Abstraction of at least 0.55 inches of runoff from site impervious surface determined in accordance with paragraphs 2.3, 3.1 or 3.2, as applicable, and treatment of all runoff to the standard in paragraph 3.1c; or (b) Abstraction of runoff onsite to the maximum extent practicable and treatment of all runoff to the standard in paragraph 3.1c; or (c) Off-site abstraction and treatment in the watershed to the standards in paragraph 3.1b and 3.1c. Based on the measured infiltration testing results, the applicant is proposing rock storage beneath the draintile under the biofiltration basin and subsurface stormwater management facility to promote infiltration of runoff. Because the combined abstraction volume provided in the rock storage areas equates to 0.81 inches from all regulated impervious area for a restricted site, which is more than the minimum amount of 0.55 inches, the project conforms with Rule J, subsection 3.3a.

The designed abstraction performance for the project site is summarized in the table below.

	Abstraction Depth (inches)	Abstraction Volume (cubic feet)
Minimum requirement (0.55")	0.55	3,416
Provided	0.81	5,013

Plans indicate pretreatment for runoff entering the subsurface stormwater management facility and biofiltration basin is being provided by sump manholes and vegetated strips, thus the proposed project conforms with RPBCWD Rule J, Subsection 3.1b.1. The groundwater was observed at elevation 922.5 feet. The bottom of the proposed rock storage under the subsurface stormwater management system is set at 930.4 feet and the bottom of the rock storage below the biofiltration basin is at elevation 927.0 feet, thus providing more than the required three feet of vertical separation (Rule J, subsection 3.1.b.2).

Water Quality Management

Subsection 3.1.c of Rule J requires the Applicant provide for at least 60 percent annual removal efficiency for total phosphorus (TP), and at least 90 percent annual removal efficiency for total suspended solids (TSS) from site runoff, and no net increase in TSS or TP loading leaving the site from existing conditions. The Applicant is proposing to use a biofiltration basin with a rock storage reservoir below the subsurface draintile and a subsurface stormwater management facility with a rock storage reservoir below the subsurface draintile to achieve the required TP and TSS removals and submitted a P8 model to estimate the TP and TSS removals. The results of this modeling are summarized in tables below showing the annual TSS and TP removal requirements are achieved and that there is no net increase in TSS and TP leaving the site. The engineer concurs with the modeling, and finds that the proposed project is in conformance with Rule J, Subsection 3.1.c.

Annual TSS and TP removal summary

Pollutant of Interest	Regulated Site Loading (lbs/yr)	Required Load Removal (lbs/yr)	Provided Load Reduction (lbs/yr)
Total Suspended Solids (TSS)	1,292	1,163 (90%)	1,239 (95.9%)
Total Phosphorus (TP)	4.1	2.5 (60%)	3.6 (87.8)%

Summary of net change in TSS and TP leaving the site

Pollutant of Interest	Existing Site Loading (lbs/yr)	Proposed Site Load after Treatment (lbs/yr)	Change (lbs/yr)
Total Suspended Solids (TSS)	401	54	-347
Total Phosphorus (TP)	1.2	0.5	-0.7

Low floor Elevation

No structure may be constructed or reconstructed such that its lowest floor elevation is less than 2 feet above the 100-year event flood elevation according to Rule J, Subsection 3.6. The applicant is proposing to construct one building as part of the project with a low floor elevation of 932.0 ft. Because the proposed stormwater management facilities have 100-year flood elevations above the proposed low floor, the applicant applied the alternative low floor criteria in Rule J, Appendix J.1 – Low-Floor Elevation Assessment. Groundwater was discovered in soil boring SB#5 at an elevation of 922.5 feet, 9.5 feet below the proposed low floor elevation. According to *Plot 2: Minimum Depth to Water Table -clay or perched conditions*, the minimum permissible depth to water table is 8.5 and 5.0 feet respectively for the above and underground systems based on the stormwater facility horizontal separation (see below table). Because the provided separation is greater than the minimum permissible, the lowest proposed structure elevation meets the freeboard requirement in Rule J, Subsection 3.6.a (iv).

Stormwater Facility	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Distance from Building to Adjacent Facility (feet)	Water Table Elevation (feet)	Minimum Permissible Depth to Water Table[1] (feet)	Provided Depth from Low Floor Elevation to Water Table (feet)
Biofiltration	932.00	932.93	25	922.5	9.5	9.5
Subsurface Stormwater Management Facility	932.00	935.63	24	922.5	5	9.5

[1] Using Plot 2 in Appendix J1 of RPBCWD Stormwater Management Rule

Stormwater management facilities must be constructed at an elevation and location that ensure no habitable structure will be brought into noncompliance with the low floor criteria according to Rule J, subsection 3.6b. The following table summarizes the low floor analysis for the existing habitable structures adjacent to the proposed stormwater facilities. Because the proposed stormwater management facilities have 100-year flood elevations above the existing low floors, Rule J, Appendix J.1 – Low-Floor Elevation Assessment was used to analyze the adjacent habitable structures. Because the provided separation is greater than the minimum permissible, the elevation and location of the proposed stormwater facility meets the existing habitable structure requirement in Rule J, Subsection 3.6.b (ii).

Adjacent Habitable Structure	Low Floor Elevation of Building (feet)	100-year Event Flood Elevation of Adjacent Stormwater Facility (feet)	Distance from Building to Adjacent Facility (feet)	Water Table Elevation (feet)	Minimum Permissible Depth to Water Table[1] (feet)	Provided Depth from Low Floor Elevation to Water Table (feet)
Power Ridge Apartment Building (Permit 2016-039)	932.6	935.63	120	926	1.9	6.6
Structure to Southeast	~931[2]	935.63	42	922.5	8.3	8.5

[1] Using Plot 1 in Appendix J1 of RPBCWD Stormwater Management Rule
[2] Estimated as 10 feet lower than adjacent ground from topography data

Maintenance

Subsection 3.7 of Rule J requires the submission of a maintenance declaration. All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed.

J1. Permit applicant must provide a draft maintenance and inspection declaration. Once approved by RPBCWD, the plan must be recorded on the deed in a form acceptable to the District, and documentation of recordation must be provided to RPBCWD.

Chloride Management

Subsection 3.8 of Rule J requires the submission of chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan. To close out the permit and release the $5,000 in financial assurance held for the purpose, Permit applicant must provide a chloride management plan that designates the individual authorized to implement the chloride management plan.

Rule K: Variances and Exceptions

Rule B subsection 3.2 requires compensatory flood storage within the floodplain of the same waterbody. The Applicant requested a variance from this provision of RPBCWD's Rule B – Floodplain Management and Drainage Alterations.

The attached variance request letter submitted on behalf of the applicant cites several facts related to the development in support of the request. Rule K requires the Board of Managers to find that because of unique conditions inherent to the subject property the application of rule provisions will impose a practical difficulty on the Applicant. Assessment of practical difficulty is conducted against the following criteria:

1. how substantial the variation is from the rule provision;

2. the effect of the variance on government services;
3. whether the variance will substantially change the character of or cause material adverse effect to water resources, flood levels, drainage or the general welfare in the District, or be a substantial detriment to neighboring properties;
4. whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance. Economic hardship alone may not serve as grounds for issuing a variance if any reasonable use of the property exists under the terms of the District rules;
5. how the practical difficulty occurred, including whether the landowner, the landowner's agent or representative, or a contractor, created the need for the variance; and
6. in light of all of the above factors, whether allowing the variance will serve the interests of justice.

The local governmental unit (LGU) administering the WCA, City of Chanhassen, determined that the onsite wetland was incidental. Rule B subsection 3.2 requires compensatory flood storage within the floodplain of the same waterbody. The Applicant requested variances from these provisions of RPBCWD's Rule B – Floodplain Management and Drainage Alterations. The applicant asserts that the need for the variance results from the unique condition of the LGU's having approved complete elimination of the incidental wetland. Following is the RPBCWD engineer's assessment of information received relevant to the applicant's request for a variance from the compensatory flood storage criteria within the floodplain of the same waterbody:

- Related to variance criterion 1 – The project will involve 162 cubic yards of fill and 480 cubic yards of compensatory storage below the 100-year flood elevation but outside of the wetland floodplain, thus providing a net increase of 318 cubic yards of floodplain storage.
- With regard to variance criteria 2 and 3 – Because the proposed project will reduce the site discharge and pollutant loading leaving the site relative to existing conditions, as discussed in the Rule B, subsection 3.3 analysis, the proposed project is not reasonably likely to cause off-site adverse impacts. Because the project involves a net increase of storage below the 100-year flood elevation of the incidental wetland being filled, the proposed alterations are not likely to adversely affect offsite governmental services, water resources, flood levels, or neighboring properties. The proposed variance only impacts the applicant's property.
- Technical measures incorporated into the project plan to alleviate the practical difficulty (variance criterion 4) include creation of compensatory flood storage volume in the subsurface stormwater management facility and biofiltration basin to comply with RPBCWD regulatory requirements, but not within the same floodplain. Routing the developed site runoff to the proposed stormwater management facilities will allow the runoff to be stored in the facilities resulting in reduced site discharge as summarized in the rate control analysis of Rule J above. Because the incidental wetland will no longer exist the compensatory storage cannot be provided within the floodplain of the same incidental wetland.
- With regard to variance criterion 5, the applicant has created the circumstances leading to the variances, though it did so with the approval of another relevant regulatory body, the LGU administering WCA.

Because the project increase storage below the 100-year flood elevation of the incidental wetland which the LGU is allowing to be filled, the engineer finds there is an adequate technical basis for the managers to rely on to grant the requested variance.

Rule L: Permit Fee Deposit:

The RPBCWD permit fee schedule adopted in February 2020 requires permit applicants to submit a permit-fee deposit of $3,000 and an addition $2,000 for variance request to be held in escrow and applied to reimburse RPBCWD for the permit-application processing fee and permit review and inspection-related costs. When the permit application is approved, the deposit must be replenished to the applicable deposit amount by the applicant before the permit will be issued to cover actual costs incurred to monitor compliance with permit conditions and the RPBCWD Rules. The district received a permit fee deposit of $3,000 and an addition $2,000 for the variance request.

Rule M: Financial Assurance:

Rule C:

Perimeter Control: 3,300 L.F. x $2.50/L.F. = ...$8,250

Restoration: 3.53 acres x $2,500/acre = ...$8,825

Inlet Protection: 16 x $100/each = ...$1,500

Construction Entrance: 1 x $900/each =...$900

Rule J:

125% of Engineer's Opinion of Cost (1.25*$327,581) = ...$409,476

Chloride Management Plan = ...$5,000

Contingency (10%) $43,395

Total Financial Assurance...$477,347

Applicable General Requirements:

1. The RPBCWD Administrator and Engineer shall be notified at least three days prior to commencement of work.
2. Construction must be consistent with the plans, specifications, and models that were submitted by the applicant that were the basis of permit approval. The date(s) of the approved plans, specifications, and modeling are listed on the permit. The grant of the permit does not in any way relieve the permittee, its engineer, or other professional consultants of responsibility for the permitted work.
3. The grant of the permit does not relieve the permittee of any responsibility to obtain approval of any other regulatory body with authority.
4. The issuance of this permit does not convey any rights to either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

5. In all cases where the doing by the permittee of anything authorized by this permit involves the taking, using or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements or interests, the permittee, before proceeding therewith, must acquire all necessary property rights and interest.
6. RPBCWD's determination to issue this permit was made in reliance on the information provided by the applicant. Any substantive change in the work affecting the nature and extent of applicability of RPBCWD regulatory requirements or substantive changes in the methods or means of compliance with RPBCWD regulatory requirements must be the subject of an application for a permit modification to the RPBCWD.
7. If the conditions herein are met and the permit is issued by RPBCWD, the applicant, by accepting the permit, grants access to the site of the work at all reasonable times during and after construction to authorized representatives of the RPBCWD for inspection of the work.

Findings

1. The proposed project includes the information necessary, plan sheets and erosion control plan for review.
2. The Applicant has requested a variance from compliance with the Rule B criteria related to providing compensatory storage within the existing floodplain for placing fill within the floodplain.
3. The proposed project will conform to Rules C and J if the Rule Specific Permit Conditions listed above are met.

Recommendation:

Approval of the permit contingent upon:

1. Continued compliance with General Requirements.
2. Financial Assurance in the amount of $477,347.
3. Applicant providing the name and contact information of the individual responsible for erosion and sediment control at the site.
4. Receipt in recordation a maintenance declaration for maintenance of the stormwater management facilities. A draft must be approved by the District prior to recordation.
5. Written documentation demonstrating that the necessary property rights and permissions to perform the proposed land-disturbing activities (surface grading to construct a connect sidewalk) on the adjacent property to facilitate smooth grading between the project and existing neighboring site.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

1. Per Rule J Subsection 4.5, upon completion of the site work, the permittee must submit as-built drawings demonstrating that at the time of final stabilization, the pretreatment manholes and subsurface stormwater facility conform to design specifications and function as intended and

approved by the District. As-built/record drawings must be signed by a professional engineer licensed in Minnesota and include, but not limited to:

   a. the surveyed bottom elevations, water levels, and general topography of all facilities;
   b. the size, type, and surveyed invert elevations of all stormwater facility inlets and outlets;
   c. the surveyed elevations of all emergency overflows including stormwater facility, street, and other;

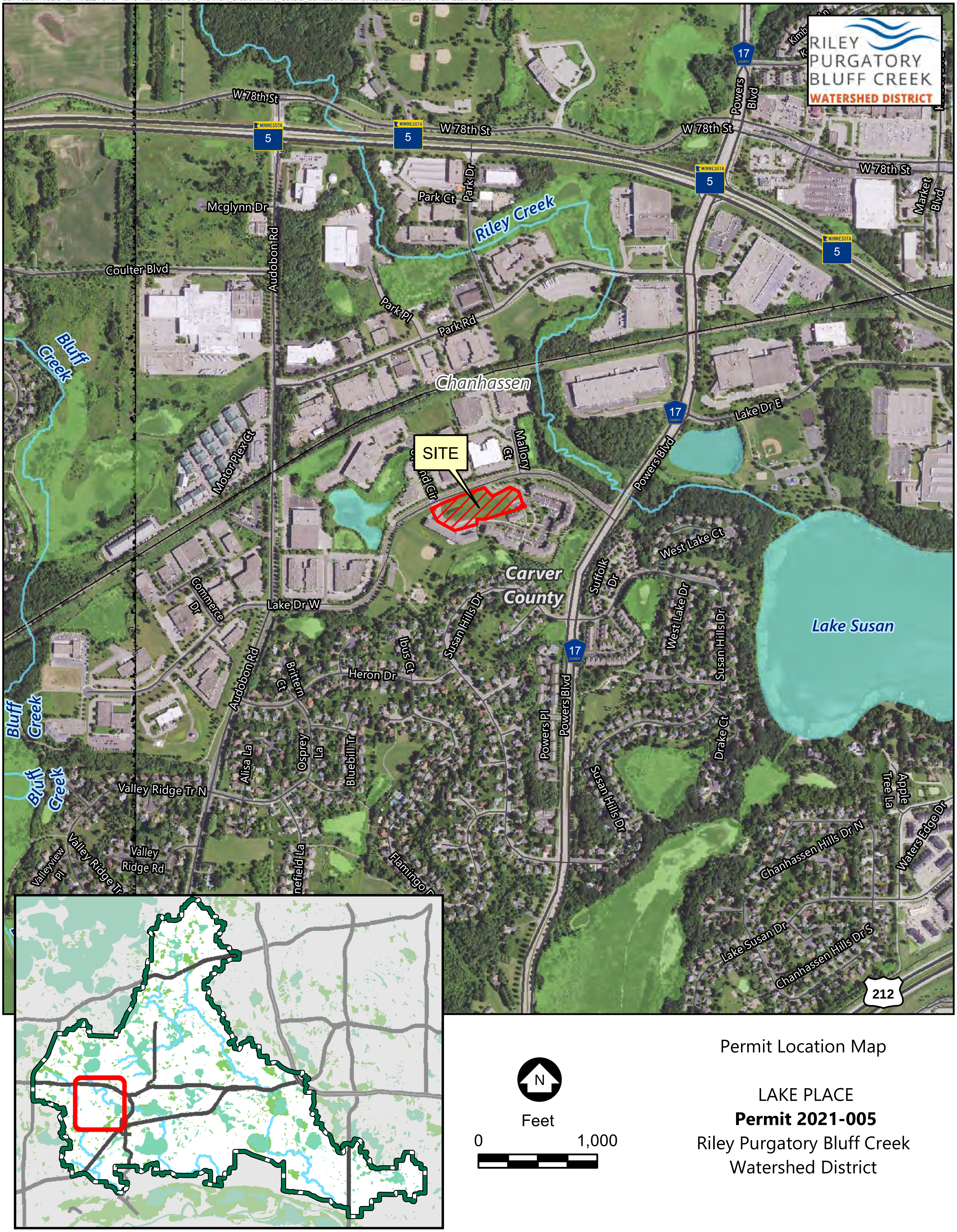
2. Providing the following additional close-out materials:

   a. Documentation that constructed infiltration facilities perform as designed. This may include infiltration testing, flood testing, or other with prior approval from RPBCWD
   b. Documentation that disturbed pervious areas remaining pervious have been decompacted per Rule C.2c criteria

3. The work on the Lake Place development under the terms of permit 2021-005, if issued, must have an impervious surface area and configuration materially consistent with the approved plans. Design that differs materially from the approved plans (e.g., in terms of total impervious area) will need to be the subject of a request for a permit modification or new permit, which will be subject to review for compliance with all applicable regulatory requirements.

4. To close out the permit and release the $5,000 in financial assurance held for the purpose of the chloride management, the permit applicant must provide a chloride management plan that designates the individual authorized to implement the chloride management plan and the MPCA-certified salt applicator engaged in implementing the plan at the site.

5. Replenish the permit fee deposit to the original amount or such lesser amount as the RPBCWD administrator deems sufficient within 45 days of receiving notice that such deposit is due in order to cover continued actual costs incurred to monitor compliance with permit conditions and the RPBCWD Rules.



Permit Location Map

LAKE PLACE

Permit 2021-005

Riley Purgatory Bluff Creek Watershed District

Memorandum

TO: Scott Sobiech

FROM: Ben Jore
Civil Site Group

DATE: 3/3/2021

RE: RPBCWD Permit 2020-070: Lake Place- Variance Request

As part of our application for a District permit, we are requesting a variance from RPBCWD Rule B3.2b.

We are requesting a variance from the requirement that compensatory storage be provided within the floodplain of the basin. The requirement cannot be met in the area the fill is occurring. Compensatory storage will be provided within a separate basin (1P – Above Ground Filtration Basin 1) that will exceed the floodplain storage lost due to filling.

Refer to the Floodplain Storage Figures in the report for fill and mitigation. The unique factors that support the requested variance are as follows:

The existing project site consists of green space, wetland, and a small parking area with through road. The proposed site consists of an apartment complex, associated parking, and stormwater management. The proposed site will remove the entire wetland and thus also the floodplain storage provided by the wetland. Due to the location of the wetland and site building parameters there is no feasible alternative to provide floodplain mitigation within the same basin. The site grading was designed to meet the requirements of the City for minimum and maximum grades while still meeting the required water volume and rate control requirements.

1.1 how substantial the variation is from the rule provision

The variance request is not substantial, adequate mitigation is provided in the proposed basin.

1.2 the effect of the variance on government services

There is no adverse effect on government services. The removal of the floodplain volume in the existing wetland will be replaced by the proposed basin. All maintenance onsite and as part of the basins will be the responsibility of the owner.

1.3 whether the variance will substantially change the character of or cause material adverse effect to water resources, flood elevations, drainage or the general welfare in the District or be a substantial detriment to neighboring properties

There will be no material adverse effect to water resources, flood elevations, drainage or general welfare in the District. The proposed basin provides the required mitigation to offset the fill within the floodplain. In addition, rate control is provided for all storm events. The project will meet or exceed District rules and will not impact neighboring properties.

1.4 whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance Economic hardship along may not serve as grounds for issuing a variance in any reasonable use of the property exists under the terms of the District rules

As the entire wetland footprint is being removed and a building is being constructed over the entire wetland footprint there are no technically or economically feasible alternatives to the variance.

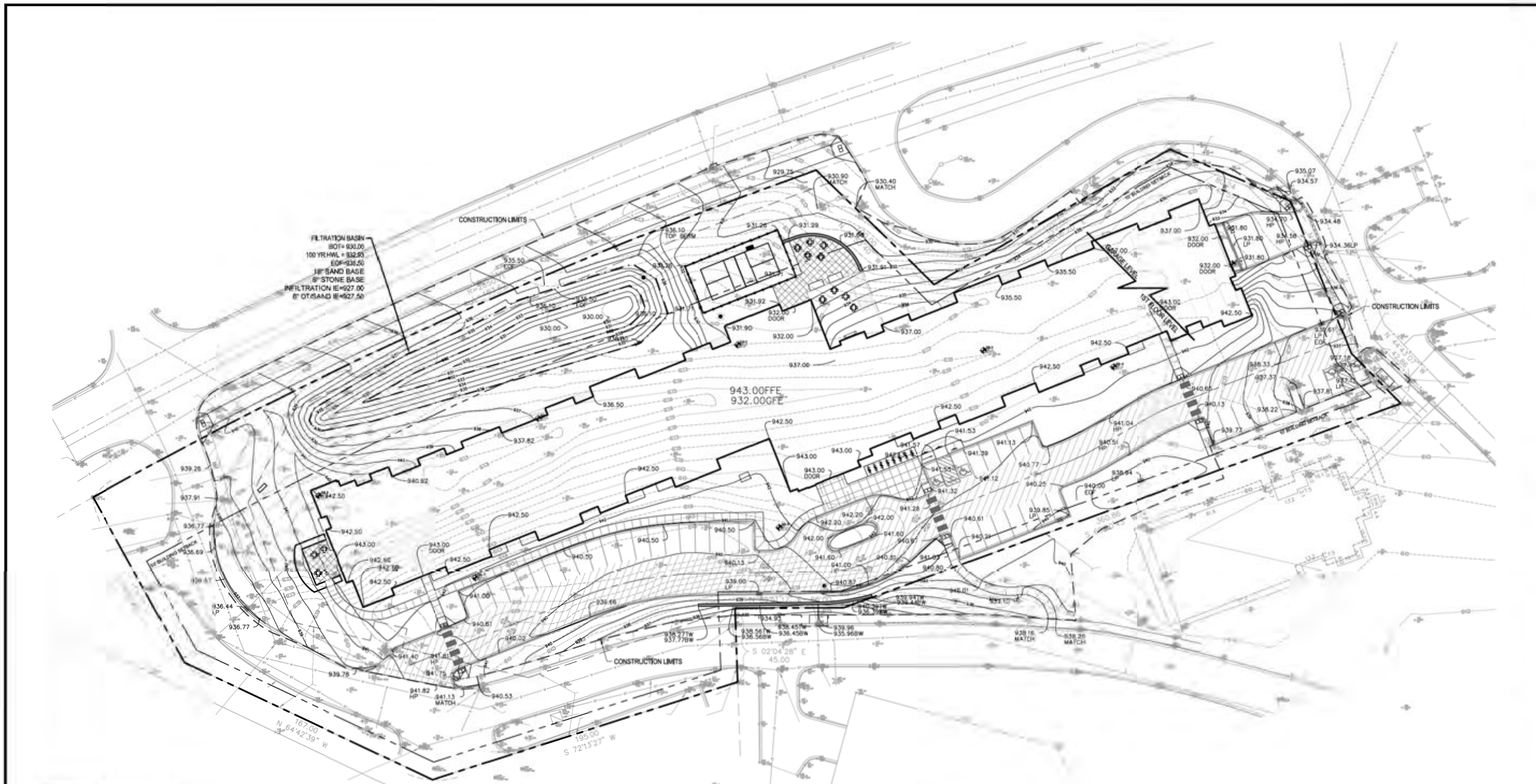
1.5 how the practical difficulty occurred, including whether the landowner, the landowner's agent or representative, or a contractor, created the need for the variance, and

The practical difficulty was not created by the landowner or the landowner's agents. The practical difficultly arises from compliance with the requirements of City and Watershed.

1.6 **in light of all of the factors, whether allowing the variance with serve the interests of justice**

Allowing the variance will serve the interests of justice by allowing the project to proceed as approved by the City of Chanhassen and by complying with the intent of the District rules by providing the required floodplain mitigation.

Ben Jore
Civil Site Group
Bjore@civilsitegroup.com



GENERAL GRADING NOTES:

1. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
2. SEE SITE PLAN FOR HORIZONTAL LAYOUT & GENERAL GRADING NOTES.
3. THE CONTRACTOR SHALL COMPLETE THE SITE GRADING CONSTRUCTION (INCLUDING BUT NOT LIMITED TO SITE PREPARATION, SOIL CORRECTION, EXCAVATION, EMBANKMENT, ETC.) IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER'S SOILS ENGINEER. ALL SOIL TESTING SHALL BE COMPLETED BY THE OWNER'S SOILS ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED SOIL TESTS AND INSPECTIONS WITH THE SOILS ENGINEER.
4. GRADING AND EXCAVATION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS & PERMIT REQUIREMENTS OF THE CITY.
5. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
6. PROPOSED SPOT GRADES ARE FLOW-LINE FINISHED GRADE ELEVATIONS, UNLESS OTHERWISE NOTED.
7. GRADES OF WALKS SHALL BE INSTALLED WITH 5% MAX. LONGITUDINAL SLOPE AND 1% MIN. AND 2% MAX. CROSS SLOPE, UNLESS OTHERWISE NOTED.
8. PROPOSED SLOPES SHALL NOT EXCEED 3:1 UNLESS INDICATED OTHERWISE ON THE DRAWINGS. MAXIMUM SLOPES IN MAINTAINED AREAS IS 4:1
9. PROPOSED RETAINING WALLS, FREESTANDING WALLS, OR COMBINATION OF WALL TYPES GREATER THAN 4' IN HEIGHT SHALL BE DESIGNED AND ENGINEERED BY A REGISTERED RETAINING WALL ENGINEER. DESIGN DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF GRADE STAKES THROUGHOUT THE DURATION OF CONSTRUCTION TO ESTABLISH PROPER GRADES. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR A FINAL FIELD CHECK OF FINISHED GRADES ACCEPTABLE TO THE ENGINEER/LANDSCAPE ARCHITECT PRIOR TO TOPSOIL AND SODDING ACTIVITIES.
11. IF EXCESS OR SHORTAGE OF SOIL MATERIAL EXISTS, THE CONTRACTOR SHALL TRANSPORT ALL EXCESS SOIL MATERIAL OFF THE SITE TO AN AREA SELECTED BY THE CONTRACTOR, OR IMPORT SUITABLE MATERIAL TO THE SITE.
12. EXCAVATE TOPSOIL FROM AREAS TO BE FURTHER EXCAVATED OR REGRADED AND STOCKPILE IN AREAS DESIGNATED ON THE SITE. THE CONTRACTOR SHALL SALVAGE ENOUGH TOPSOIL FOR RESPREADING ON THE SITE AS SPECIFIED. EXCESS TOPSOIL SHALL BE PLACED IN EMBANKMENT AREAS, OUTSIDE OF BUILDING PADS, ROADWAYS AND PARKING AREAS. THE CONTRACTOR SHALL SUBCUT CUT AREAS, WHERE TURF IS TO BE ESTABLISHED, TO A DEPTH OF 6 INCHES. RESPREAD TOPSOIL IN AREAS WHERE TURF IS TO BE ESTABLISHED TO A MINIMUM DEPTH OF 6 INCHES.
13. FINISHED GRADING SHALL BE COMPLETED. THE CONTRACTOR SHALL UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING, INCLUDING ADJACENT TRANSITION AREAS. PROVIDE A SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCES, WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE SHOWN, OR BETWEEN SUCH POINTS AND EXISTING GRADES. AREAS THAT HAVE BEEN FINISH GRADED SHALL BE PROTECTED FROM SUBSEQUENT CONSTRUCTION OPERATIONS, TRAFFIC AND EROSION. REPAIR ALL AREAS THAT HAVE BECOME RUTTED BY TRAFFIC OR ERODED BY WATER OR HAS SETTLED BELOW THE CORRECT GRADE. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO EQUAL OR BETTER THAN ORIGINAL CONDITION OR TO THE REQUIREMENTS OF THE NEW WORK.
14. PRIOR TO PLACEMENT OF THE AGGREGATE BASE, A TEST ROLL WILL BE REQUIRED ON THE STREET AND/OR PARKING AREA SUBGRADE. THE CONTRACTOR SHALL PROVIDE A LOADED TANDEM AXLE TRUCK WITH A GROSS WEIGHT OF 25 TONS. THE TEST ROLLING SHALL BE AT THE DIRECTION OF THE SOILS ENGINEER AND SHALL BE COMPLETED IN AREAS AS DIRECTED BY THE SOILS ENGINEER. THE SOILS ENGINEER SHALL DETERMINE WHICH SECTIONS OF THE STREET OR PARKING AREA ARE UNSTABLE. CORRECTION OF THE SUBGRADE SOILS SHALL BE COMPLETED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SOILS ENGINEER. NO TEST ROLL SHALL OCCUR WITHIN 10' OF ANY UNDERGROUND STORM RETENTION/DETENTION SYSTEMS.
15. TOLERANCES
    - 15.1. THE BUILDING SUBGRADE FINISHED SURFACE ELEVATION SHALL NOT VARY BY MORE THAN 0.30 FOOT ABOVE, OR 0.30 FOOT BELOW THE PRESCRIBED ELEVATION AT ANY POINT WHERE MEASUREMENT IS MADE.
    - 15.2. THE STREET OR PARKING AREA SUBGRADE FINISHED SURFACE ELEVATION SHALL NOT VARY BY MORE THAN 0.05 FOOT ABOVE, OR 0.10 FOOT BELOW, THE PRESCRIBED ELEVATION OF ANY POINT WHERE MEASUREMENT IS MADE.
    - 15.3. AREAS WHICH ARE TO RECEIVE TOPSOIL SHALL BE GRADED TO WITHIN 0.30 FOOT ABOVE OR BELOW THE REQUIRED ELEVATION, UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
    - 15.4. TOPSOIL SHALL BE GRADED TO PLUS OR MINUS 1/2 INCH OF THE SPECIFIED THICKNESS.
16. MAINTENANCE
    - 16.1. THE CONTRACTOR SHALL PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION, AND KEEP AREA FREE OF TRASH AND DEBRIS.
    - 16.2. CONTRACTOR SHALL REPAIR AND REESTABLISH GRADES IN SETTLED, ERODED AND RUTTED AREAS TO SPECIFIED TOLERANCES. DURING THE CONSTRUCTION, IF REQUIRED, AND DURING THE WARRANTY PERIOD, ERODED AREAS WHERE TURF IS TO BE ESTABLISHED SHALL BE RESEEDED AND MULCHED.
    - 16.3. WHERE COMPLETED COMPACTED AREAS ARE DISTURBED BY SUBSEQUENT CONSTRUCTION OPERATIONS OR ADVERSE WEATHER, CONTRACTOR SHALL SCARIFY, SURFACE, RESHAPE, AND COMPACT TO REQUIRED DENSITY PRIOR TO FURTHER CONSTRUCTION.

GROUNDWATER INFORMATION:

PER GEOTECHNICAL REPORT BY HAUGO GEOTECHNICAL SERVICES, DATED 11-23-2020 GROUNDWATER WAS OBSERVED AT ELEVATIONS RANGING FROM 906.40 TO 922.50

THE BORINGS & GROUNDWATER ARE AS FOLLOWS:

SB-3	906.40
SB-4	911.70
SB-5	922.50

PROPOSED FOOTING DRAIN TILE INVERT ELEVATION = 931.00

EROSION CONTROL NOTES:

SEE SWPPP ON SHEETS SW1.0 - SW1.5

CITY OF CHANHASSEN GRADING NOTES:

1. RESERVED FOR CITY SPECIFIC GRADING NOTES.

RILEY PURGATORY BLUFF CREEK SITE SPECIFIC NOTES:

1. ALL PERVIOUS AREAS SHALL BE DECOMPACTED WITH SOIL RIPPING EQUIPMENT TO 12" PRIOR TO SOD INSTALLATION.

GRADING PLAN LEGEND:

	EX. 1' CONTOUR ELEVATION INTERVAL
1137	1.0' CONTOUR ELEVATION INTERVAL
41.26	SPOT GRADE ELEVATION (GUTTER/FLOW LINE UNLESS OTHERWISE NOTED)
891.00 G	SPOT GRADE ELEVATION GUTTER
891.00 TC	SPOT GRADE ELEVATION TOP OF CURB
891.00 BS/TS	SPOT GRADE ELEVATION BOTTOM OF STAIRS/TOP OF STAIRS
891.00 ME	SPOT GRADE ELEVATION MATCH EXISTING
GB	GRADE BREAK - HIGH POINTS
	CURB AND GUTTER (T.O = TIP OUT)
EOF=1135.52	EMERGENCY OVERFLOW

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1" = 30'-0"

15'-0" 0 30'-0"

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TUSHIE MONTGOMERY ARCHITECTS

PRELIMINARY: NOT FOR CONSTRUCTION

PROJECT

LAKE PLACE

1361 LAKE DRIVE W. CHANHASSEN, MN 55317

TPS HOLDING LLC

350 HWY 7, SUITE 218 EXCELSIOR, MN 55331

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.

Matthew R. Pavek

DATE 12/4/20 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

DATE DESCRIPTION

DRAWN BY: KW, MJ REVIEWED BY: MP

REVISION SUMMARY

DATE DESCRIPTION

GRADING PLAN

C3.0

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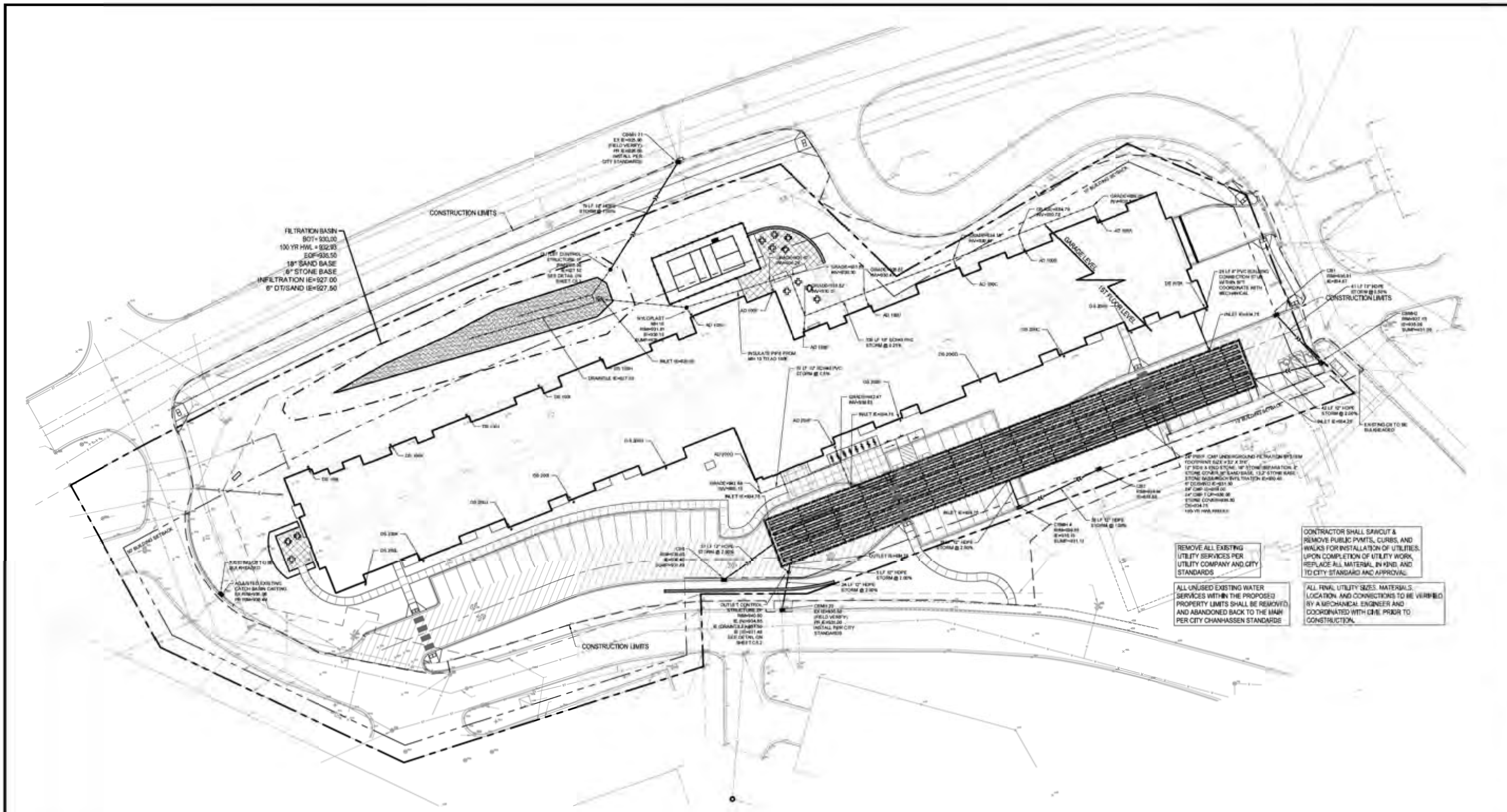

CITY OF CHANHASSEN UTILITY NOTES:

1. TRACER WIRE SHALL BE INSTALLED TO MARK DRAIN TILE WITHIN ALL SURFACE STORMWATER FEATURES.

UTILITY LEGEND

- DS=DOWNSPOUT FILTER, AD=AREA DRAIN
- CATCH BASIN
- MANHOLE
- GATE VALVE AND VALVE BOX
- PROPOSED FIRE HYDRANT
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- FES AND RIP RAP
- ROCK ABSTRACTION AREA

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Matthew R. Pavek

DATE 12/4/20 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
	CITY SUBMITTAL
	PRELIMINARY PRICING SET
	WATERSHED SUBMITTAL

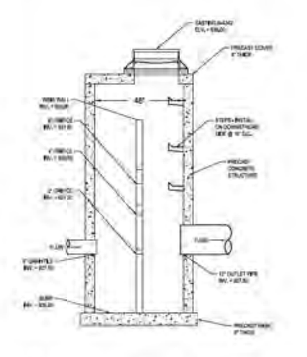
DRAWN BY: KW, WJ REVIEWED BY: MP
PROJECT NUMBER: 20331

REVISION SUMMARY

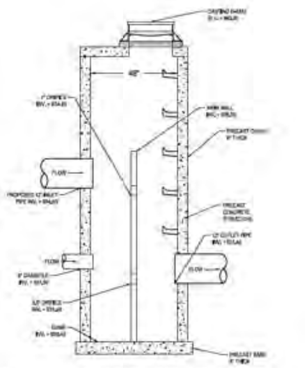
DATE	DESCRIPTION

UTILITY PLAN-STORM SEWER

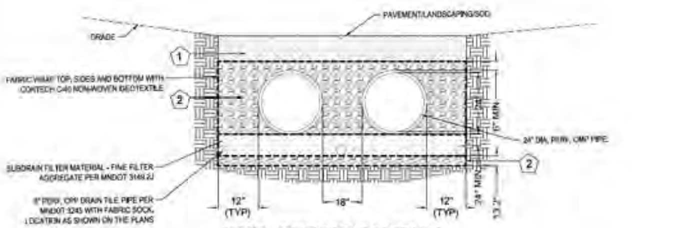
C4.1



1 OUTLET CONTROL STRUCTURE 1P
NTS



2 OUTLET CONTROL STRUCTURE 2P
NTS



TYP. SECTION DETAIL
NTS

KEY
1. TOPSOIL
2. FREE DRAINING ANGULAR WASHED STONE 3/4" - 2" PARTICLE SIZE (NON LIMESTONE MATERIAL THAT CONTAINS LESS THAN 5% DELETERIOUS MATERIALS).
INSTALL TO MIN. 95% STANDARD DENSITY PER AASHTO T99.

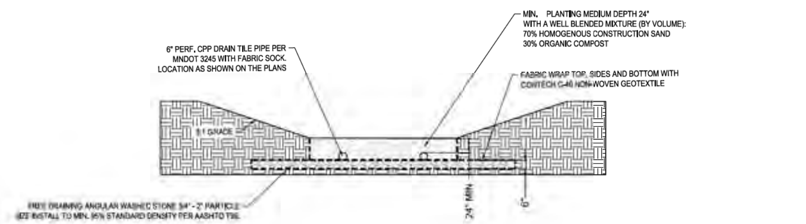
CONSTRUCTION SEQUENCING

1. INSTALL SILT FENCE AND/OR OR OTHER APPROPRIATE TEMPORARY EROSION CONTROL DEVICES TO PREVENT SEDIMENT FROM LEAVING OR ENTERING THE PRACTICE DURING CONSTRUCTION.
2. ALL DOWN-GRADIENT PERIMETER SEDIMENT CONTROL BMP'S MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITY BEGINS.
3. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
4. INSTALL UTILITIES (WATER, SANITARY SEWER, ELECTRIC, PHONE, FIBER OPTIC, ETC) PRIOR TO SETTING FINAL GRADE OF BIORETENTION DEVICE.
5. PERFORM ALL OTHER SITE IMPROVEMENTS.
6. SEED AND MULCH ALL AREAS AFTER DISTURBANCE.
7. CONSTRUCT RETENTION DEVICE UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA.
8. IMPLEMENT TEMPORARY AND PERMENATE EROSION CONTROL PRACTICES.
9. PLANT AND MULCH SITE.
10. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER THE CONTRIBUTING DRAINAGE AREA IS ADEQUATELY VEGETATED.

GENERAL NOTES

1. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
2. GRADING OF RETENTION DEVICES SHALL BE ACCOMPLISHED USING LOW-COMPACTION EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF UNDERLYING SOILS.
3. ALL SUB MATERIALS BELOW THE SPECIFIED RETENTION DEPTH (ELEVATION) SHALL BE UNDISTURBED, UNLESS OTHERWISE NOTED.

3 UNDERGROUND FILTRATION SYSTEM
NTS



TYPICAL SECTION VIEW

CONSTRUCTION SEQUENCING

1. INSTALL SILT FENCE AND/OR OR OTHER APPROPRIATE TEMPORARY EROSION CONTROL DEVICES TO PREVENT SEDIMENT FROM LEAVING OR ENTERING THE PRACTICE DURING CONSTRUCTION.
2. ALL DOWN-GRADIENT PERIMETER SEDIMENT CONTROL BMP'S MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITY BEGINS.
3. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
4. INSTALL UTILITIES (WATER, SANITARY SEWER, ELECTRIC, PHONE, FIBER OPTIC, ETC) PRIOR TO SETTING FINAL GRADE OF BIORETENTION DEVICE.
5. ROUGH GRADE THE SITE. IF BIORETENTION AREAS ARE BEING USED AS TEMPORARY SEDIMENT BASINS LEAVE A MINIMUM OF 3 FEET OF COVER OVER THE PRACTICE TO PROTECT THE UNDERLYING SOILS FROM CLOGGING.
6. PERFORM ALL OTHER SITE IMPROVEMENTS.
7. PLANT ALL AREAS AFTER DISTURBANCE.
8. CONSTRUCT BIORETENTION DEVICE UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREA.
9. IMPLEMENT TEMPORARY AND PERMANENT EROSION CONTROL PRACTICES.
10. PLANT AND/OR ROCK MULCH BIORETENTION DEVICE.
11. REMOVE TEMPORARY EROSION CONTROL DEVICES AFTER THE CONTRIBUTING DRAINAGE AREA IS ADEQUATELY VEGETATED.

GENERAL NOTES

1. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL SHALL BE REMOVED FROM THE PRACTICE PRIOR TO CONTINUING CONSTRUCTION.
2. GRADING OF BIORETENTION DEVICES SHALL BE ACCOMPLISHED USING LOW-COMPACTION EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF UNDERLYING SOILS.
3. ALL SUB MATERIALS BELOW THE SPECIFIED BIORETENTION DEPTH (ELEVATION) SHALL BE UNDISTURBED, UNLESS OTHERWISE NOTED.

4 ABOVE GROUND FILTRATION BASIN
NTS

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PRELIMINARY: NOT FOR CONSTRUCTION

PROJECT
LAKE PLACE
1361 LAKE DRIVE W. CHANHASSEN, MN 55317

TPS HOLDING LLC
350 HWY 7, SUITE 218 EXCELSIOR, MN 55331

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Matthew R. Pavek
DATE 12/4/20 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

REVISION SUMMARY

CIVIL DETAILS

C5.2

SWPPP NOTES:

1. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

2. THIS PROJECT IS GREATER THAN ONE ACRE AND WILL REQUIRE AN MPCA NPDES PERMIT, CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY EROSION CONTROL PERMITS REQUIRED BY THE CITY.

3. SEE SHEETS SW1.0 - SW1.5 FOR ALL EROSION CONTROL NOTES, DESCRIPTIONS, AND PRACTICES.

4. SEE GRADING PLAN FOR ADDITIONAL GRADING AND EROSION CONTROL NOTES.

5. CONTRACTOR IS RESPONSIBLE FOR SWPPP IMPLEMENTATION, INSPECTIONS, AND COMPLIANCE WITH NPDES PERMIT.

ALL SPECIFIED EROSION AND SEDIMENT CONTROL PRACTICES AND MEASURES CONTAINED IN THIS SWPPP ARE THE MINIMUM REQUIREMENTS. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.

CITY OF CHANHASSEN EROSION CONTROL NOTES:

1. RESERVED FOR CITY SPECIFIC EROSION CONTROL NOTES.

RILEY PURGATORY BLUFF CREEK EROSION CONTROL NOTES:

1. ACTIVITIES MUST BE CONDUCTED SO AS TO MINIMIZE THE POTENTIAL TRANSFER OF AQUATIC INVASIVE SPECIES (E.G., ZEBRA MUSSELS, EURASIAN WATERMILFOIL, ETC.) TO THE MAXIMUM EXTENT POSSIBLE.

LEGEND:

EX. 1' CONTOUR ELEVATION INTERVAL
1.0' CONTOUR ELEVATION INTERVAL
DRAINAGE ARROW
SILT FENCE / BIOROLL - GRADING LIMIT
INLET PROTECTION
STABILIZED CONSTRUCTION ENTRANCE
EROSION CONTROL BLANKET

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TUSHIE MONTGOMERY ARCHITECTS

PRELIMINARY: NOT FOR CONSTRUCTION

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Matthew R. Pavek
DATE 12/4/20 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
[illegible]	CITY SUBMITTAL
[illegible]	PRELIMINARY PRICING SET
[illegible]	[illegible]

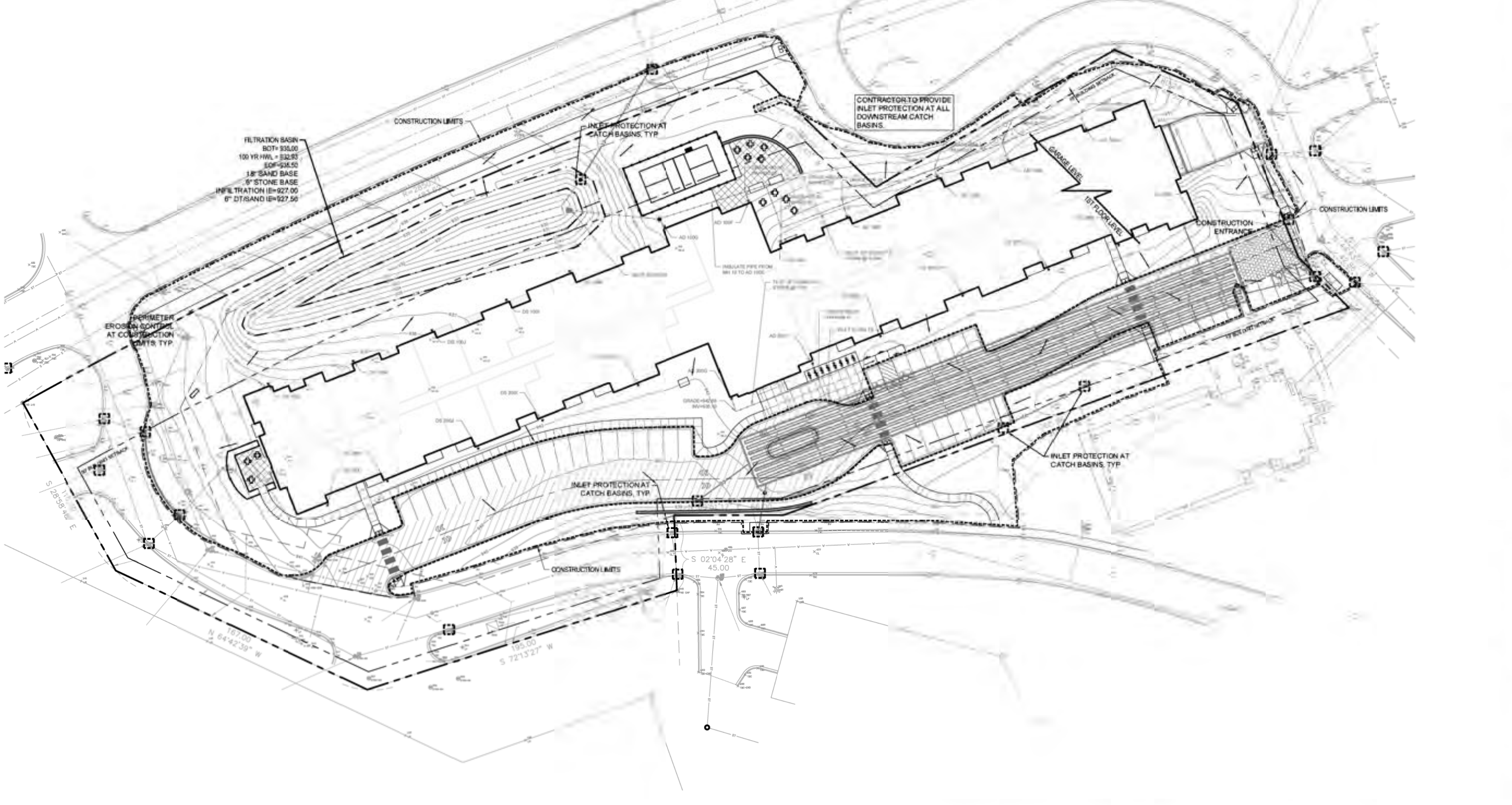
DRAWN BY: KW, BJ REVIEWED BY: MP
PROJECT NUMBER: 20351

REVISION SUMMARY

DATE	DESCRIPTION

SWPPP - EXISTING CONDITIONS

SW1.0



SWPPP NOTES:

1. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

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4. SEE GRADING PLAN FOR ADDITIONAL GRADING AND EROSION CONTROL NOTES.

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CITY OF CHANHASSEN EROSION CONTROL NOTES:

1. RESERVED FOR CITY SPECIFIC EROSION CONTROL NOTES.

RILEY PURGATORY BLUFF CREEK EROSION CONTROL NOTES:

1. ACTIVITIES MUST BE CONDUCTED SO AS TO MINIMIZE THE POTENTIAL TRANSFER OF AQUATIC INVASIVE SPECIES (E.G., ZEBRA MUSSELS, EURASIAN WATERMILFOIL, ETC.) TO THE MAXIMUM EXTENT POSSIBLE.

LEGEND:

- EX. 1' CONTOUR ELEVATION INTERVAL
- 1137 — 1.0' CONTOUR ELEVATION INTERVAL
- DRAINAGE ARROW
- SILT FENCE / BIOROLL - GRADING LIMIT
- INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION CONTROL BLANKET

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15'-0" 0 30'-0"

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TUSHIE MONTGOMERY ARCHITECTS

PRELIMINARY: NOT FOR CONSTRUCTION

PROJECT

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TPS HOLDING LLC

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Matthew R. Pavek

DATE 12/4/20 LICENSE NO. 44263

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
	CITY SUBMITTAL
	PRELIMINARY PROJECT SET
	[illegible]

DRAWN BY: KW, AJ REVIEWED BY: MP
PROJECT NUMBER: 20351

REVISION SUMMARY

DATE	DESCRIPTION

SWPPP - PROPOSED CONDITIONS

SW1.1

RESOLUTION NO. 2021-__

RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

Adopting amendments to the
Riley-Purgatory-Bluff Creek Watershed District Rules

Manager ______________ offered the following resolution and moved its adoption, seconded by Manager ______________ .

WHEREAS Riley-Purgatory-Bluff Creek Watershed District, a governmental subdivision with powers set forth in Minnesota Statutes chapters 103B and 103D, is authorized to act to achieve the purposes set forth in those chapters for the protection, conservation and beneficial use of the waters and resources of the Riley-Purgatory-Bluff Creek watershed;

WHEREAS Minnesota Statutes section 103D.341 requires the RPBCWD Board of Managers to adopt rules to accomplish the purposes of chapter 103D and implement the powers of the managers as specified on Minnesota Statutes section 103D.335;

WHEREAS RPBCWD has a comprehensive set of rules, which were adopted as amended December 11, 2019, and operates a permitting program in accordance with Minnesota Statutes section 103D.345;

WHEREAS while RPBCWD supports and promotes the use of vegetation to stabilize shorelines and streambanks –referred to in the RPBCWD Rules as "bioengineering" – whenever possible, RPBCWD also recognizes the benefits of maintaining shorelines stabilized with riprap and other hard-armoring techniques to prevent erosion and degradation that allows sediment and pollutants to enter water resources, and in 2018 RPBCWD amended its rules to streamline the permitting process for property owners seeking to maintain, but not expand, hard-armored shorelines, but in implementing the streamlined program, RPBCWD staff discovered that an expansion of the scope of work to which the streamlined program applied was necessary to allow such shorelines to be properly maintained;

WHEREAS RPBCWD developed focused set of minimal changes to its Rule F (and associated housekeeping changes to Rule D), to implement this correction, along with a memo explaining the changes and describing the reasons for proposing them, and on February 3, 2021, the RPBCWD Board of Managers authorized the issuance of the draft amendments for comment, and RPBCWD issued the proposed amendments, along with the supporting memo, and sent a copy of the proposed amendments to state review agencies, public transportation authorities that have jurisdiction within the watershed, Hennepin County and Carver County, and all cities and townships within the watershed, and posted the proposed amendments on the RPBCWD web site, and RPBCWD provided 45 days for comment in accordance with section 103D.341, and the comment period closed March 22, 2021;

WHEREAS in accordance with the February 3, 2021, direction of the board of managers, RPBCWD staff solicited input from members of the RPBCWD Technical Advisory Committee on the rules amendments, and TAC members provided no additional comments.

WHEREAS Two parties provided RPBCWD with written comments on the proposed amendments stating that they had no comments on the proposed amendments and on April 7, 2021, the managers held a duly noticed public hearing on the proposed amendments, at which RPBCWD received [__________] comments;

WHEREAS the board has reviewed and given due consideration to the comments received in preparing the final draft of the amendments; and

WHEREAS the RPBCWD Board of Managers finds the rules as revised to be sound, reasonable and fair; to serve to protect, conserve and manage the beneficial uses of the waters and resources of the watershed, and generally to promote the public welfare.

NOW, THEREFORE, BE IT RESOLVED that the board of managers hereby adopts the attached amended rules of the Riley-Purgatory-Bluff Creek Watershed District with such nonsubstantive revisions as the administrator, on advice of counsel, deems necessary to properly finalize amendment of the rules;

BE IT FURTHER RESOLVED that the rules so amended will be effective for all permit applications received complete on or after April 8, 2021;

BE IT FURTHER RESOLVED that the board directs the administrator to post the amendments, along with the final supporting memo and the responses to the comments received on the RPBCWD web site, and send the responses to commenters;

BE IT FURTHER RESOLVED that the board directs the administrator to integrate the rules as amended hereby into the watershed management plan as an administrative amendment under Minnesota Rules 8410.0140, subpart 1a; and

BE IT FINALLY RESOLVED, that the RPBCWD administrator is directed to publish notice of the adoption of the amendments, send a copy of the amended rules to the governing body of each city affected by the rules and to public transportation authorities with jurisdiction in the watershed, and file a copy of the amended rules in the offices of the Hennepin County Recorder and the Carver County Recorder, and otherwise to publish the amended rules in accordance with Minnesota Statutes section 103D.345.

The question was on the adoption of the resolution and there were ___ yeas and ___ nays as follows:

	Yea	Nay	Abstain	Absent
CRAFTON				
KOCH				
PEDERSEN				
WARD				
ZEIGLER				

Upon vote, the chair declared the resolution _________________.

* * * * * * * * * * *

I, ________________________, secretary of the Riley-Purgatory-Bluff Creek Watershed District, do hereby certify that I have compared the above resolution with the original thereof as the same appears of record and on file with RPBCWD and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this _____ day of _____________, 2021.

____
David Zeigler, Secretary

Memorandum

SRF No. 13385.00

To: Board of Managers
Riley Purgatory Bluff Creek Watershed District

From: Leah Gifford, PE
SRF Consulting Group, Inc.

Date: March 24, 2021

Subject: St. Hubert School Water Quality and Landscaping Project: Construction Administration Additional Fee Request

Purpose

The purpose of this memorandum is to request additional scope and fee to perform Construction Administration, out of scope Permitting, and Grant Management for the St. Hubert School Water Quality and Landscaping Project. The project will consist of a new tree trench, rain garden, native plant restoration, two outdoor classrooms, playground surface design, parking lot reconfiguration, and drainage and gully repair and will be constructed in the summer of 2021.

SRF's Scope of Work, executed in April 2020, assumed RPBCWD would be administering construction and SRF would serve as technical support providing bidding assistance, limited construction observation (3 weeks at 50% time), shop drawing review, review of Requests for Information (RFIs), punchlist coordination, and attendance at up to 4 construction meetings.

Out of Scope Tasks

Below is a summary of the tasks that we consider out of scope from the initial contract agreement and the estimated cost to complete these tasks.

Task	Hours	Average Rate	Cost
RPBCWD Permitting (H&H modeling, coordination, submittal preparation and followup) and City Zoning Permit	32	$105/hr	$3,360
Prepare, Post and Manage Bidding Process on QuestCDN	20	$105/hr	$2,100

Host In-person Pre-Bid Meeting, Virtual Award Opening, and Letter to the Board recommending Construction Award	12	$135/hr	$1,620
Construction Coordination by Project Manager (assumes 4 hours per week during construction)	48	$135/hr	$6,480
Addendum or Change Order (assumes 3, one addressing contractor questions and two during construction)	36	$110/hr	$2,640
Pay Applications and field review for payment purposes (assumes 3, one per month)	18	$110/hr	$1,980
Grant Management and Reporting	12	$135/hr	$1,620
Zoning Permit Fee			$50
Total	**178**		**$19,850**

Assumptions:

-Carver County SWCD will perform annual vegetation inspections during maintenance and warranty period.

-Construction will be from June 7 to August 27, 2021 (12 weeks). If planting extends into September and early October, that time is included above.

Conclusion

In conclusion, SRF is requesting authorization to amend the contract not to exceed $19,850, which includes both time and expenses, to account for additional scope items, including permit coordination and additional construction administration and observation.

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RESOLUTION NO. 2021-__

RILEY-PURGATORY-BLUFF CREEK WATERSHED DISTRICT
BOARD OF MANAGERS

Adopting policy providing for cost-share funding support for
bioengineered shoreline and streambank stabilizations

Manager ________________ offered the following resolution and moved its adoption, seconded by Manager _______________ .

WHEREAS Riley-Purgatory-Bluff Creek Watershed District, a governmental subdivision with purposes and powers set forth in Minnesota Statutes chapters 103B and 103D, is authorized to act to achieve the purposes set forth in those chapters for the protection, conservation and beneficial use of the waters and resources of the Riley-Purgatory-Bluff Creek watershed;

WHEREAS Minnesota Statutes section 103D.341 requires RPBCWD to adopt rules to accomplish, in part, the purposes of chapter 103D and implement the powers of the managers as specified in Minnesota Statutes section 103D.335, and in fulfillment of that mandate RPBCWD has a comprehensive set of rules, which were adopted as amended December 11, 2019, and operates a permitting program in accordance with Minnesota Statutes section 103D.345 that applies to and regulates the stabilization of shorelines of public water basins and of all watercourses in the watershed;

WHEREAS Riley-Purgatory-Bluff Creek Watershed District's 2018 10-Year Watershed Management Plan (Plan) affirms RPBCWD's commitment to operating a cost-share program to provide "incentive for [property owners] to implement watershed best management practices" (subsection 3.2.4);

WHEREAS the Plan specifically identifies its incentive programs as water-quality strategies to reduce deposition of sediments and pollutants to water resources (subsection 3.2.6.2), and commits to promoting "use of natural materials and bioengineering for the maintenance and restoration of shorelines and streambanks where appropriate" (*id.*).

WHEREAS in keeping with these goals, RPBCWD provides a streamlined permit-approval process for maintenance of hard-armored (riprapped) shorelines so they continue to prevent erosion and resulting deposition of sediment and pollutants to water bodies, but natural or bioengineered shorelines and streambanks present habitat and resource-protection benefits beyond mitigating sedimentation and pollution of resources, and bioengineering projects will be encouraged through RPBCWD providing affirmative incentives to property owners to undertake the regulatory and project-implementation burdens of maintaining or converting to bioengineered shorelines and streambanks, for both resource-protection and demonstration reasons; and

WHEREAS the RPBCWD Board of Managers finds that cost-share support for bioengineered shoreline and streambank-stabilization projects will be an effective contribution to the fulfillment of the Plan goals and strategies cited above, but that the Public Purposes Doctrine of the Minnesota Constitution Article X, section 1, requires that RPBCWD's support for private-property projects be directed to implementation of such goals and not regulatory compliance, except that there is overlap between RPBCWD staff support for cost-share projects and oversight of regulatory compliance such that staff costs should not be charged for regulatory compliance for cost-share projects.

NOW THEREFORE BE IT RESOLVED that the RPBCWD Board of Managers authorizes dedication of cost-share funding and contribution of all staff costs in support of bioengineered stabilization of shorelines and streambanks so long as:

1. The property owner applies and pays the applicable fees and charges for RPBCWD's assessment of compliance with applicable RPBCWD regulatory and permitting requirements;
2. The property owner retains the necessary technical expertise to support its application at its expense;
3. The project meets and fulfills all applicable cost-share program criteria.

The question was on the adoption of the resolution and there were ___ yeas and ___ nays as follows:

	Yea	Nay	Abstain	Absent
CRAFTON				
KOCH				
PEDERSEN				
WARD				
ZEIGLER				

Upon vote, the chair declared the resolution ________________.

* * * * * * * * * * *

I, ______________________, secretary of the Riley-Purgatory-Bluff Creek Watershed District, do hereby certify that I have compared the above resolution with the original thereof as the same appears of record and on file with RPBCWD and find the same to be a true and correct transcription thereof.

IN TESTIMONY WHEREOF, I set my hand this _____ day of ____________, 2021.

____

______________________, Secretary

RPBCWD Grant

City of Shorewood

Overview Map

March 2021

Real People. Real Solutions.

Map Document: \\arcserver1\GIS\SHWD_Basemap\ESRI\Maps\2021\SHWD_SilverLake_RPBCWD_Grant_11x17L.mxd | Date Saved: 3/25/2021 9:22:55 AM